

45241

# Amateur Radio

COMMUNICATIONS & TECHNOLOGY

MAY 2003

http://www.cq-amateur-radio.com

# CQ

**Pre-Dayton  
Product  
Preview**

**Mobile Special!**  
**Mobile Antennas To  
Buy or Build**  
**Mobile Mounting Tips**  
**CQ Reviews:**  
**ICOM IC-2720**  
**Dual-Band**  
**FM Mobile**

**On the Cover: Bob Heil, K9EID,  
of Belleville, Illinois, operates HF  
from his pink 1956 Thunderbird**

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AMATEUR'S JOURNAL

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TS-50S



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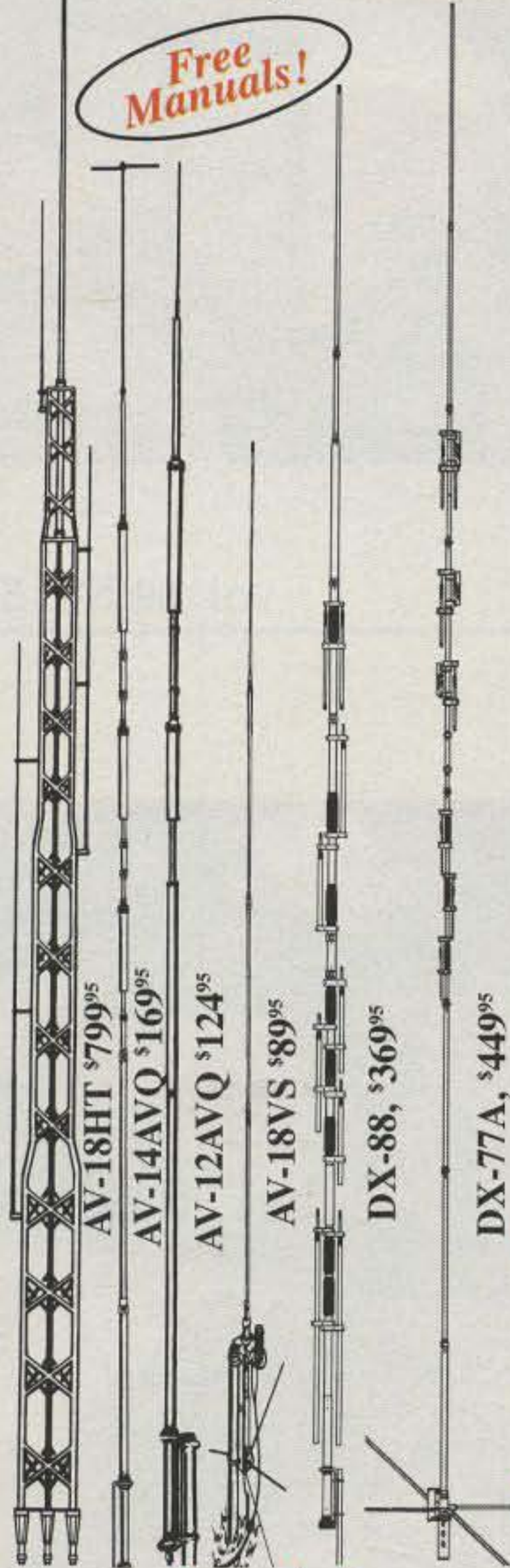
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# hy-gain. HF VERTICALS...

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## hy-gain<sup>®</sup> Classics

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

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

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

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**AV-18HT, \$799.95. (10,12,15,20,40,80 M, 160, 17 Meters optional). 53 ft., 114 lbs.**

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

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

**AV-12AVQ, \$124.95. (10, 15, 20 Meters). 13 ft., 9 lbs.** 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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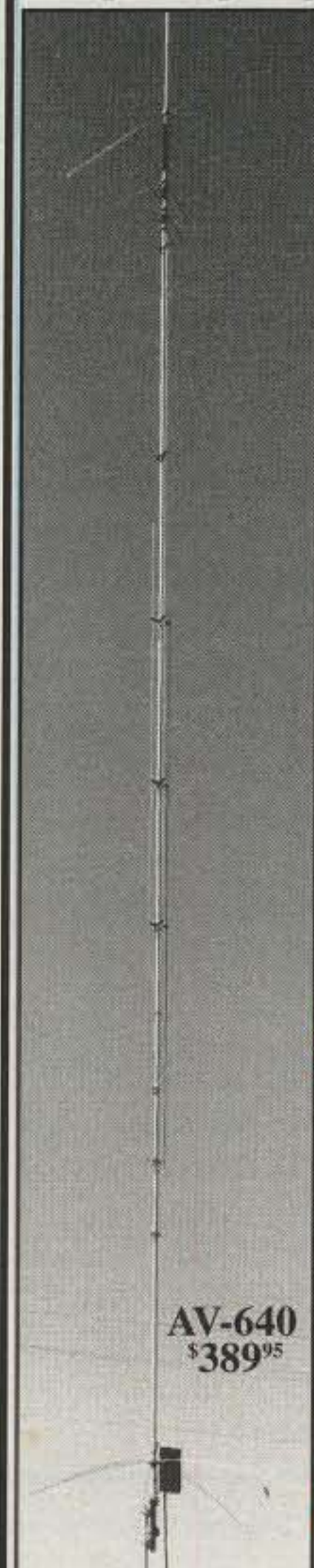
**DX-88, \$369.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs.** All bands are easily tuned with the DX-88's exclusive adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 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"

## hy-gain<sup>®</sup> PATRIOT

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



AV-640 \$389.95

**No ground or radials needed**  
Effective counterpoise replaces radials and ground.

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

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

**Full legal limit**  
Handles 1500 Watts key down continuous for two minutes.

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

**hy-gain<sup>®</sup> warranty**  
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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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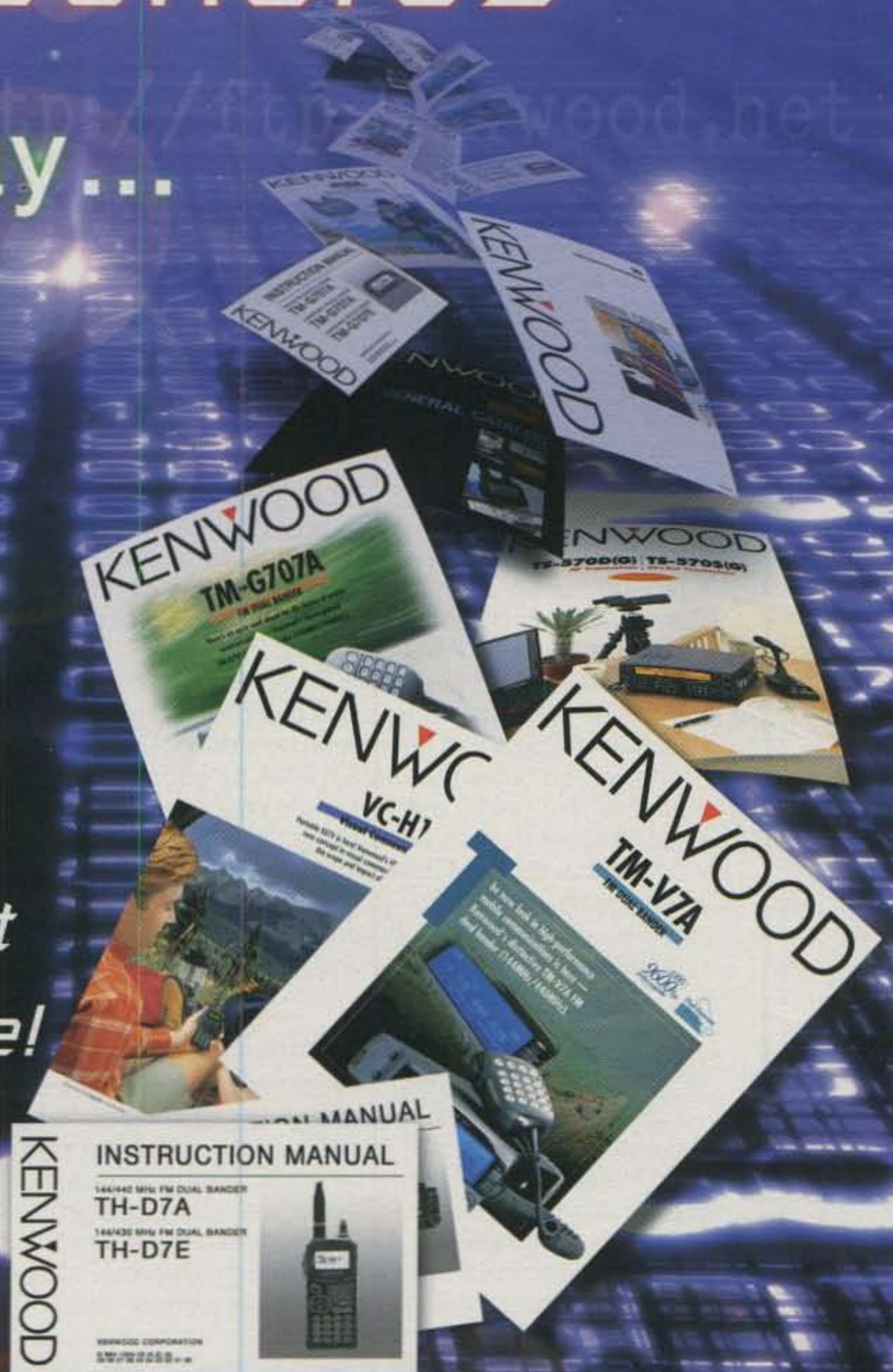
**ON THE COVER:** "Mic-meister" Bob Heil, K9EID, loves old cars and old radios. He's combined both with a 1956 Collins KWM-1 mounted under the dash of his 1956 Ford Thunderbird. (Photo by Larry Mulvehill, WB2ZPI)

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## FCC May Require Interference Immunity Standards for Receivers

The FCC has issued a Notice of Inquiry seeking comments on possibly requiring receiver manufacturers to build in a certain level of interference immunity. For years amateurs have been frustrated by trying to explain to neighbors that interference problems were really the result of poor design in their TVs, stereos, cordless phones, and other receivers. The FCC is seeking comments on the current immunity performance and interference tolerance of existing receivers, possibilities for improving receiver immunity, and possible approaches to achieving desired levels of receiver immunity, including the possibility of mandatory standards. It's FCC ET Docket 03-65.

## No Automatic Ham Shutdown in Event of War

As this is written, the U.S. is on the verge of taking military action against Iraq, but no attack has yet occurred. *The ARRL Letter* reports that thanks to a change in FCC rules made just before the Gulf War, there will be no automatic shutdown of amateur radio in the event of a declared war or national emergency. However, hams will need to observe FCC directives related to wartime activity and make spectrum available as needed for government use. Most amateur allocations above 225 MHz (and some below) are shared with the U.S. government. During the last declared war in which the U.S. was involved, World War II, amateur radio was shut down for the duration.

## AMSAT Puts "Eagle" Project on Hold

AMSAT-NA President Robin Haighton, VE3FRH, reports in his March "President's Letter" that current levels of contributions to the amateur satellite organization are not sufficient to pay for building and launching future satellites, and that one of two projects currently under way is being put on hold. AMSAT-NA is currently working on two new satellites, named "ECHO" and "Eagle." While ECHO is still on schedule for possible launch later this year, the launch of Eagle has been delayed indefinitely.

Haighton notes that AMSAT-NA "is generally in good shape," but points out that while costs for building and launching satellites keep rising, "the current economic conditions do not encourage members to contribute at the levels necessary" to meet these costs. Haighton added that AMSAT's board of directors is "looking at many other aspects of raising funds" for future projects.

## New General Class Syllabus Released

The group that writes U.S. amateur licensing exams has released the syllabus, or overall structure, of the new General Class tests that will replace current exams in 2004. The 35-question exam will consist of six questions on FCC rules, six questions on operating procedures, three on propagation, five on amateur radio practices, two on electrical principles, one each on circuit components and practical circuits, two on signals and emissions, four on antennas and feedlines, and five questions on RF safety. Details are available on the web at <http://www.arrl.org/arrlvec/pools.html>. The Question Pool Committee of the National Conference of Volunteer Examiner Coordinators is inviting comments and possible exam questions between now and July 15. Comments and questions should be e-mailed to the QPC members at [w4ww@arrl.net](mailto:w4ww@arrl.net), [vec@arrl.org](mailto:vec@arrl.org), [w5yi@w5yi.org](mailto:w5yi@w5yi.org), and [Johnston.john1@worldnet.att.net](mailto:Johnston.john1@worldnet.att.net).

## Hamvention Future in Dayton Uncertain

Organizers of the Dayton Hamvention™ are hoping to keep the show in its current location indefinitely, but nothing beyond this year is certain, according to *The ARRL Letter*. This year's show, on May 16-18, will be the last one under the Dayton Amateur Radio Association's current five-year contract with Hara Arena, and negotiations for a new contract will not begin until after the show is over. While Hamvention Production Manager Garry Matthews, KB8GOL, is quoted as saying there are no plans to move, the *Letter* says he admits that "we've looked at alternative locations in case something happens. Anything could happen to Hara."

The problem, if the contract with Hara is not renewed, according to Matthews, is that there is no other venue in the Dayton area that will support the show at its current size. The *Letter* notes that DARA has quietly dropped "Dayton" from the show's official name, opening the possibility of moving the Hamvention to another city. Meanwhile, Matthews told the ARRL that war worries are holding down advance ticket sales and that the annual banquet is being replaced by an award-winners' reception at Hara Arena on Saturday evening. Hamvention officials also insist that a last-minute change in leadership will have no effect on this year's show; General Chairman Jim Trangenstein, KB8OUO, stepped down in March for personal reasons and was replaced by Pat Neff, N8IGS.

## Pirate Broadcaster Loses Ham License

The FCC has pulled the amateur license of Thomas Brothers, ex-KI8BE, of Berkley, Michigan, in connection with Brothers' alleged operation of an unlicensed FM broadcast station from his home in 2001. In addition, the FCC is banning Brothers from applying for a new amateur license for five years from the effective date of the cancellation.

## Automatic Control Privileges Suspended

The operators of two repeaters being investigated by the FCC have been notified that those repeaters may not be under automatic control until the FCC review is completed. David Price, WA6FUL, of Redwood City, California, and Michigan repeater co-owners Sheri Gilbert, K5YHA, and William Gilbert, K5EKP, were all told in letters from their respective FCC District Directors that their repeaters may not be operated under automatic control until the FCC review of alleged violations is completed and the District Director approves resumption of automatic control.

## Spectrum Protection Act Reintroduced

The Amateur Radio Spectrum Protection Act has been reintroduced in both the House and Senate, according to the ARRL. The bill would protect amateur radio spectrum from being reallocated unless the FCC provided "equivalent replacement spectrum" on other frequencies. An identical bill died without action last year. The House version of the bill, HR 713, was introduced by Florida Representative Michael Bilirakis; the Senate version, S. 537, was introduced by Idaho Senator Michael Crapo. The ARRL, which is promoting the bill, encourages amateurs to urge their representatives in Congress to support and/or co-sponsor the legislation.

*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.*

# AMERITRON . . . 800 Watts . . . \$799

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



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Suggested Retail

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

## Near Legal Limit™ Amplifier



AL-572  
**\$1395**  
Suggested Retail

New class of Near Legal Limit™ amplifier gives you 1300 Watt PEP

SSB power output for 65% of price of a full legal limit amp! Four rugged Svetlana Russian 572B tubes. Instant 3-second warm-up, plugs into 120 VAC. Compact 8 1/2"Hx 15 1/2"Dx 14 1/2"W in. 160-15 Meters. 1000 Watt CW output. Tuned input, instantaneous RF Bias, dynamic ALC, parasitic killer, inrush protection, two lighted cross-needle meters, multi-voltage transformer.

## HF Linears with Eimac 3CX800A7



AL-800H  
**\$2595**  
Two tubes, 1500 W plus

AL-800  
**\$1775**  
Single tube, 1250 Watts

These HF linears with Eimac® 3CX800A7 tubes cover 160-15 Meters including WARC bands. Adjustable slug tuned input circuit, grid protection, front panel ALC control, vernier reduction drives, heavy duty 32 lb. grain oriented silicone steel core transformer and high capacitance computer grade filter capacitors. Multi-voltage operation, dual illuminated cross-needle meters.

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

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

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

## AMERITRON offers the best selection of legal limit amplifiers

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

### Ameritron's most powerful Linear



AL-1500  
**\$2995**  
Suggested Retail

Ameritron's super powerful amplifier uses the herculean Eimac® 8877 ceramic tube. It's so powerful that 65 watts

drive gives you the full legal output -- and it's just loafing because the power supply is capable of 2500 Watts PEP.

### Ameritron's 3CX1200A7 linear Amp

AL-1200  
**\$2545**  
Suggested Retail



Get ham radio's toughest tube with the Ameritron AL-1200 -- the EimacR 3cx1200A7.

It has a 50 Watt control grid dissipation. What makes the Ameritron AL-1200 stand out from other legal limit amplifiers? The answer: A super heavy duty power supply that loafs at full legal power -- it can deliver the power of more than 2500 Watts PEP two tone output for a half hour.

### Ameritron's dual 3-500 linear

AL-82  
**\$2445**  
Suggested Retail



This linear gives you full legal output using a pair of 3-500s. Most competing linears using 3-500s can't give you 1500 Watts because their lightweight power supplies can't use these tubes to their full potential.

## AL-80B . . . Desktop Killowatt 3-500ZG Amplifier



Ameritron's AL-80B kilowatt output desktop linear amplifier can double your average SSB power output with high level RF processing

AL-80B  
**\$1299**  
Suggested Retail

using Ameritron's exclusive Dynamic ALC™!

You get cooler operation because the AL-80B's exclusive Instantaneous RF Bias™ completely turns off the 3-500ZG tube between words and dots and dashes. It saves hundreds of watts wasted as heat for cooler operation and longer component life.

You get a full kilowatt PEP output from a whisper quiet desktop linear. It's a compact 8 1/2"Hx 14"Dx 15 1/2" inches and plugs into your nearest 120 VAC outlet. Covers 160 to 15 Meters, including WARC and MARS (user modified for 10/12 Meters with license).

You get 850 Watts output on CW, 500 Watts output on RTTY, an extra heavy duty power supply, genuine CLASSIC® 3-500ZG tube, nearly 70% efficiency, tuned input, Pi/Pi-L output, inrush current protection, multi-voltage transformer, dual Cross-Needle meters, QSK compatibility, two-year warranty, plus much, much more!  
**Made in the U.S.A.**

## AMERITRON no tune Solid State Amplifiers

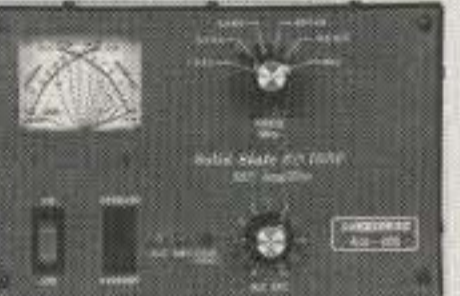
### ALS-500M 500 Watt Mobile Amp



AL-500M  
**\$799**  
Suggested Retail

Ideal Mobile amplifier uses 13.8 VDC mobile electrical system, very compact 3 1/2"x9"x15 inches, extremely quiet, 500 Watts output, 1.5-22 MHz coverage, instant bandswitching, no tuning, no warm-up, no tubes, SWR protected.

### ALS-600 Base 600 Watt Amp



AL-600  
**\$1299**  
Suggested Retail

No tuning, no fuss, no worries -- just turn it on and operate. Includes AC power supply, 600 Watts output, continuous 1.5 to 22 MHz coverage, instant bandswitching, fully SWR protected, extremely quiet, very compact. Amp is 6x9 1/2"x12 inches.

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



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

### ADL-1500 Dummy Load with oil . . . \$69<sup>95</sup>



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

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



Stops power-up inrush current and absorbs momentary high voltage spikes to your amplifier. ICP-120 for 110 to 120V, ICP-240 for 220-240 V.

### ATR-20 1.2 kW SSB Antenna Tuner . . . \$49



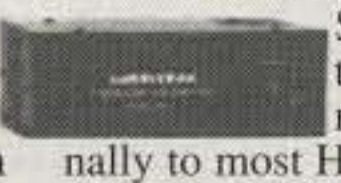
Designed to handle the full SSB power of Ameritron's AL-811/811H/80B/500M/600 and other 1.2 kW SSB amplifiers. Cross-Needle meter, roller inductor, more!

### ARB-704 amp-to-radio interface . . . \$49<sup>95</sup>



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

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



Self-contained, connects externally to most HF amps. Handles 2.5 kW PEP, 2 kW CW. Six times faster than vacuum relay. 6x4x9 1/2 in.

### ATP-100 Tuning Pulser lets you safely tune your amplifier . . . \$49<sup>95</sup>



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

### ADL-2500 Fan cooled 2500W dry dummy load . . . \$199<sup>95</sup>



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

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## "Wooden" It Be Nice?

The sound grabbed me first, as I walked down the long hall that leads from the Charlotte Hamfest to the Charlotte Woodworking Show. Yes, the wood show and the hamfest were back together again and I was happily heading toward my annual (except for last year) "comparison shopping" expedition.

The sound ... it was the sound of a power saw cutting wood, and it drew me in to the "feel" of the wood show before I reached the end of the hall. I could *hear* that things were happening down there; people were *doing* things. I was psyched before I saw a single tool.

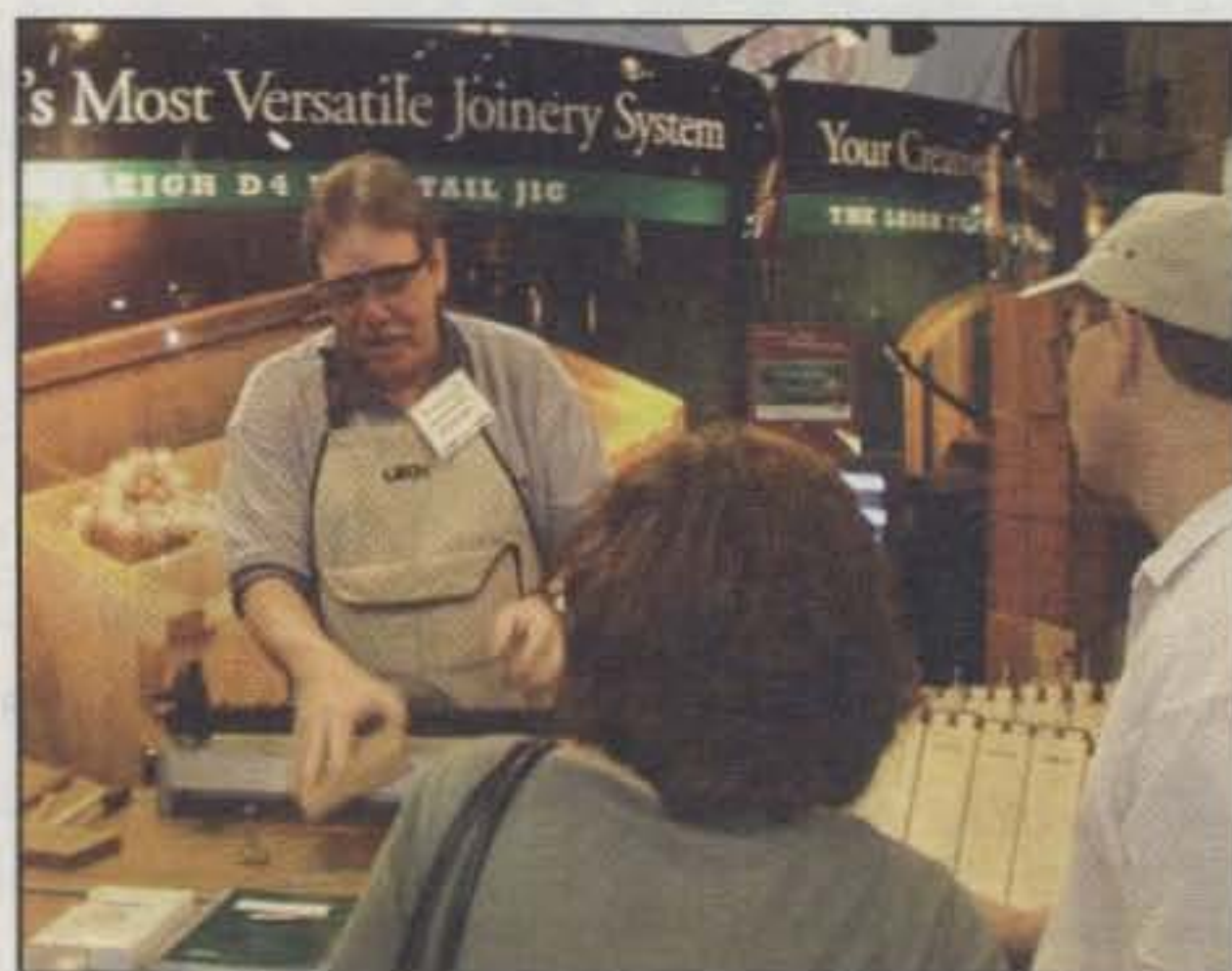
"Anybody can walk into a hardware store and buy tools," said Chuck, the show manager. "By our third or fourth show, we realized we had to offer something more in order to get people to come." The "something more" was obvious as I walked through the show—virtually every booth featured one or more people wearing headset mics, talking through little speakers, and *doing* things ... *showing* people how this tool or that accessory would help them build their projects better, more easily, or more efficiently. Even their forums were active, with presenters *demonstrating* how to use certain tools or make certain items. Plus, the show was unapologetically commercial. Everyone was there to buy or sell tools or widgets, and nobody pretended otherwise. And, it was *crowded*. On a *Sunday morning*, when the hamfest down the hall was practically empty.

I don't think hams are any more religious than woodworkers, and the two hobbies appeal to basically the same socioeconomic groups. So there must have been something special to bring out crowds of woodworkers on Sunday morning while most hams stayed home. Excitement, perhaps?

As I walked back down the hall to the hamfest, I was struck by the silence ... no sounds of radios being demonstrated, of salespeople in headset mics, of excitement. As I've said in the past, Charlotte is a good hamfest, one of the best, in my book. But imagine how much better it (and others) could be with a little more action, a little more noise, a little more excitement ... especially since there *are* exciting things going on in our hobby and there were exciting new radios and accessories at the hamfest.

For example, one of the major manufacturers had its new UHF digital radio there—digital data at 128 kb/s via a standard Ethernet card, along with analog and digital voice—plus a new entry in the backpack radio market. Both are very cool radios and both were demonstrated—but at the opening of the show on Sunday morning, resulting in essentially a private demo for our ad manager and me, plus a few dealers and another few early-bird customers. Actually, it was a pretty good crowd, considering how few people were there at the time. Lesson: *any* demonstration draws a crowd. But think of how big the crowd might have been, and where the level of excitement might have been, if instead of having the demo early on Sunday morning, it had been at noon on Saturday—and in a forum area right on the hamfest floor. This is what they do at the wood show.

The Charlotte folks did take at least one good step in that direction, inviting Bob Heil, K9EID, to do a forum on "The Science of Sound." Now, in addition to making excellent microphones, Bob is a master showman. He exudes enthusiasm. He builds excitement. Yet anyone who wanted to hear him talk had to leave the hamfest floor, take an elevator to the fourth floor and wander until they found the right room. There was *no* opportunity for Bob's infectious enthusiasm to pull in people off the floor who hadn't been aware until just



*Activity is the key to excitement and interest, whether it's at a woodworking show or a hamfest. At the Charlotte Woodworking Show, nearly every booth had a demonstration — and a crowd.*

then that they needed to learn more about audio. Only those who were already curious had the opportunity.

Of course, not every forum is appropriate for an "open" room, but many are, especially those that involve demonstrations, as so many more could and should. As I've said in this space many times before, ours is a hobby based on magic and excitement—the magic of communicating through the air without wires and the excitement of making that far-off contact or trying something new and different. Our hamfests should be focal points for sharing and spreading the excitement and the magic. It's a joint responsibility of the show sponsors and, primarily, the vendors. Live demonstrations and hands-on opportunities for trying things out can go a long way in the right direction. We can learn a lot from the woodworkers. Remember, they still build their own stuff!

### Cross-Linking: Ham Radio and the \$2 Million Violin

One interesting contrast between ham radio and woodworking is that, unlike most hardware stores, most ham radio stores *do* have stations set up so you can try out the gear before you make up your mind. Most ham stores also have something that hardware stores *used* to have, but have lost in these days of hardware superstores: they're social gathering spots as well as places to buy and sell radios. And this can lead to all sorts of interesting interconnections. For example...

Last January, when Contributing Editor Gordon West, WB6NOA, was on his annual winter visit to New York, one of his many evening stops was at KJI Electronics in Caldwell, New Jersey. Since he'd spent the day at CQ and since I live right down the road from KJI, I gave him a ride and stuck around for a while.

*(Continued on page 111)*

#### CQ #1 at Dayton

CQ is moving to a new booth at this year's Dayton Hamvention®—Booth #1 in the main arena, across from ICOM and MFJ. Just look to your right as you enter the main arena from the lobby ... that's where we'll be! We're #1!



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**•The following Special Event stations are scheduled for May:**

**N1C**, from Newington Amateur Radio League Hamfest, Newington, CT; 1700Z May 31 to 2300Z June 1 on CW 28.030, 21.030, 14.030, and SSB 28.550, 21.300, 14.250 MHz. QSL to NARL, P.O. Box 31013, Newington, CT 06111. More info: Nomar Vizcarrondo, NP4H, <n4ph@arrl.net>.

**KU2US**, Armor on the Air, from Conesus, NY, and several other stations throughout the U.S.; 2100Z May 2 to 2100Z May 4, no frequencies given. QSL station contacted.

**N2T**, Peekskill/Cortlandt ARA third anniversary Special Event station, Peekskill/Cortlandt, NY; 1300–1900Z May 3 on 28.350, 21.350, 14.280, 7.240 MHz. For certificate QSL to PCARA, P.O. Box 146, Crompond, NY 10517.

**N2UL**, Robert D. Grant United Labor ARA Special Event, Fort Monmouth, NJ; 1200–2400Z May 26 on 28.420, 21.360, 14.260 MHz. For certificate QSL to RDGULARA, c/o WA2VJA, 112 Prospect St., Nutley, NJ 07110-0716.

**W1ACT**, 10th annual Martha's Vineyard Gay Head Lighthouse DXpedition, IOTA NA-046, Massachusetts; 1400Z May 2 to 1700Z May 4 on 14.260, 21.260, 28.460, 146.550 MHz. For QSL send SASE to Roland Daignault, N1JOY, 19 Davis Rd., Westport, MA 02790 (e-mail: <n1joy@arrl.net>).

**W2EF**, from Grover Cleveland's birthplace, Caldwell, NJ; West Essex ARC; 1400–1900Z May 24 on SSB 28.350, 21.330, 14.250, 7.250 MHz ( $\pm 20$  kHz). For special Grover Cleveland \$1,000 bill certificate send QSL with your contact number and SASE to W2EF (WEARC), P.O. Box 54, Essex Fells, NJ 07021.

**W8BI**, from Dayton Hamvention®, Dayton Ohio; Dayton ARA; May 16–18 on SSB 3.870, 7.270, 14.270, 18.130, 21.370, 28.670, 147.55 simplex; CW 3.650, 7.050, 10.110, 14.050, 18.090, 21.050, 28.050 MHz ( $\pm$ QRM). QSLs and certificates: DARA W8BI, P.O. Box 44, Dayton, OH 45401. Special Event Chairman Ron Doyle, N8VAR, welcomes all ops to use their license privileges at the station.

**W8YAF**, from Memorial Day commemoration, Yankee Air Force Museum, Willow Run Airport, Bellevue, MI; 1200–2000Z May 26 on 7.270 MHz SSB. For certificate send QSL and SASE to Frank Nagy, N8BIB, 24315 Waltz Rd., New Boston, MI 48164-9167.

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

May 3, **Wexauke ARC Amateur Radio & Computer Swap Meet**, Cadillac Junior High School, Cadillac, MI. Table information: Brian Polk, 231-743-6860, e-mail: <bandb@netonecom.net>. (Talk-in 146.98; exams 10:30 AM, pregristration required beginning at 8:30 AM [limit 50])

May 3–4, **ARRL West Texas Section Convention and Key City ARC Hamfest**, Abilene Civic Center, Abilene, TX. Contact Peg Richard, KA4UPA, 915-672-8889, e-mail: <ka4upa@arrl.net>. (Talk-in 146.160/760; exams)

May 3–4, **BirmingHamfest & Computer Show, ARRL Alabama State Convention**, Zamora Temple, east of Birmingham, AL. Call 205-368-7361, or see <www.w4cue.com>. (Talk-in 146.88; exams 9 AM and 1 PM Sat., 9 AM Sun.)

May 10, **Reno Spring 2003 Ham Swap**, Salvation Army Headquarters, Reno, NV. Contact Gary Grant, K7VY, <kyvy@netzero.net>. (Talk-in 147.060 +[123]; exam info Don Freeman, W7FD, e-mail: <donauld\_freeman@sbcglobal.net>)

May 10, **Appalachian AR Group Hamfest**, Fireman's Park, Fredericksburg, PA. Contact Dick Wise, K3MIK, 717-534-2945; e-mail: <info@aa3rg.org>; <www.aa3rg.org>. (Talk-in 146.640 [-600])

May 16–18, **Dayton Hamvention®**, Hara Arena, Dayton, OH. See <http://www.hamvention.org>.

May 18, **MIT Radio Society Hamfest**, MIT, Cambridge, MA. Contact Nick, KA1MQX, 617-253-3776 (9–5 M–F), <http://web.mit.edu/w1mx/www/swapfest.html>. (Talk-in 146.52, 449.725/444.725 –PL 114.8)

May 24, **East Carolina Antique RC Swapfest**, Kiwanis Club, Greenville, NC. Contact Herman Schnur, K4CTG, 252-752-2264, e-mail: <hschnur@cox.net>.

May 25, **Maryland FM Assn. Hamfest**, Howard County Fairgrounds, West Friendship, MD. Contact MFMA, P.O. Box 351, Hanover, MD 21076 (phone 301-641-5313 between 6–10 PM). (Talk-in 146.76, 224.76, 444.00).

May 30–31, **Rochester Hamfest**, Monroe County Fairgrounds, Rochester, NY. Call 585-424-7184; e-mail: <info@rochesterhamfest.org>; <www.rochesterhamfest.org>

May 31, **Sangamon Valley RC Hamfest**, Illinois State Fairgrounds Cooperative Extension Building, Springfield, IL. Contact Ed Gaffney, 217-628-3697, e-mail: <egaffney@family-net.net>. (Talk-in 146.685–; exams 9 AM)

May 31, **Bergen ARA Spring Hamfest**, Westwood Regional Jr./Sr. High School, Washington Township, NJ. Contact Jim Joyce, K2ZO, 201-664-6725; e-mail: <k2zo@arrl.net>; <www.bara.org>. (Talk-in 146.19/.79; exams 8–10 AM)

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## Small Motorized Mobile HF Antennas

BY GORDON WEST,\* WB6NOA

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### Hi-Q 3/80

You may have seen the precision-engineered Hi-Q line of mobile antennas recognizable by the clear coil cover and internal, inside-the-coil, 360-degree moving contacts. Charlie Gyenes, VE7BOC, actively works his mobile antennas on 75 and 160 meters throughout the world and takes great pride in the heavy-duty engineering behind each of his Hi-Q mobile, all-band HF antennas.

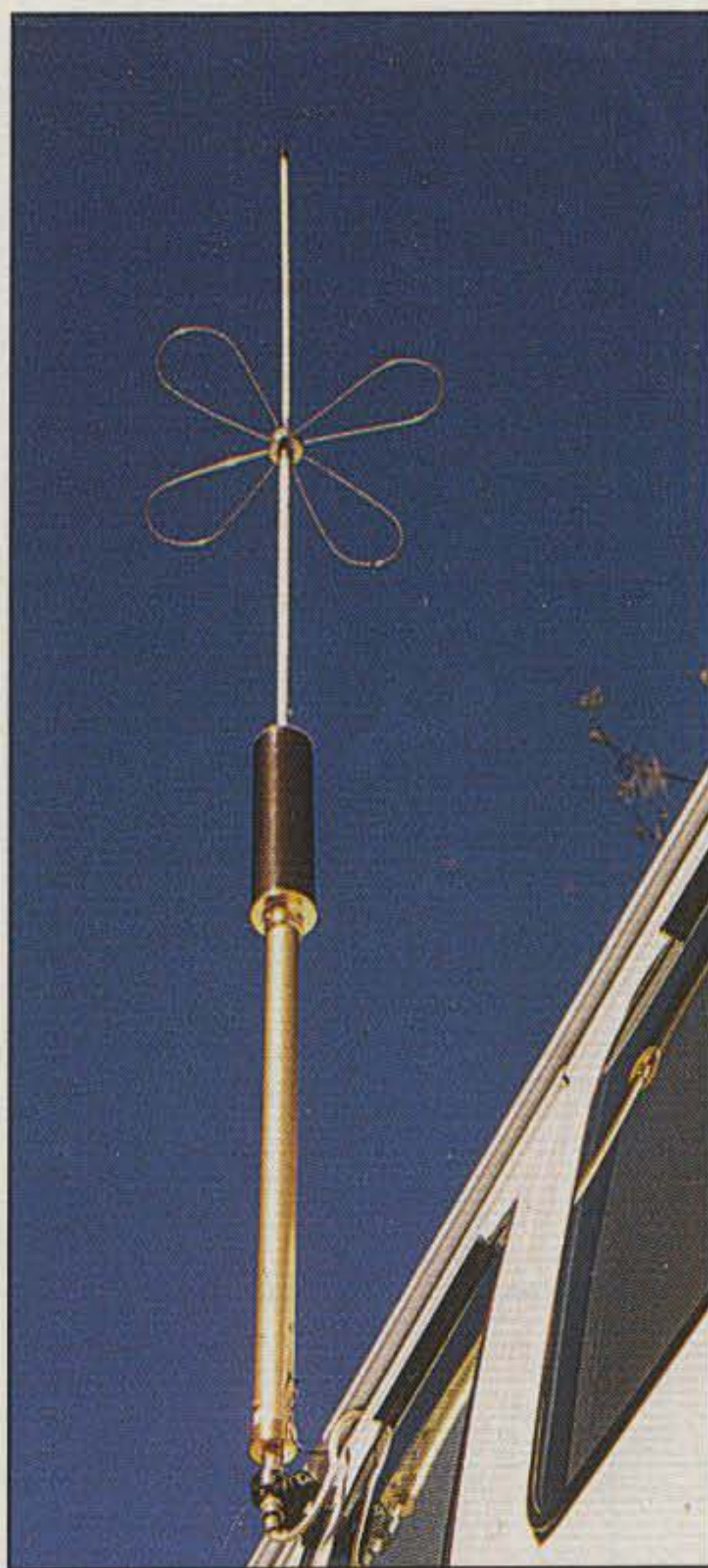
However, Charlie's antennas are designed to be supported by a heavy-duty bumper mount or trailer hitch. Therefore, when hams started asking about mounting the antennas on lightweight trunk-lip mounts such as the popular Diamond K-400 which accepts  $\frac{3}{8} \times 24$  threaded whips (not a good idea), Charlie went back to his workshop to look for a solution. He took his 3 foot shaft, 6 pound antenna with its 3 inch or 4 inch coil and computer modeled it down to a 2 foot shaft, 2 $\frac{1}{2}$  inch diameter coil, almost-any-length whip

you supply for the top, weighing in at just 3 pounds and covering 80 through 10 meters!

Inside the base is the German-manufactured drive motor that runs from 6 to 24 volts DC input, using less than 300 milliamps of current at 12 volts DC. Reversing the polarity runs the motor up or down, and the motor is fitted with an overload, open-circuit device that quickly stops the voltage feeding the motor when it detects it has run the silver-plated, beryllium copper, 360-degree contactor assembly to the extreme top or bottom of the antenna's fixed coil.

The Hi-Q short-body antenna easily makes it down to 75 meters, and even has many turns to spare if you experiment with capacitive loading midway up the top whip. This antenna actually invites experimentation to see how important a capacity hat may be to decrease the number of turns necessary for resonance.

Charlie computer models all of the antennas to ensure the feedpoint impedance will not require any bulky external shunt coils. We ran this new lightweight antenna on our communications van from 10 to 80 meters, and the SWR was always below 1 $\frac{1}{2}$  to 1. When we compared the shorter and more lightweight Hi-Q antenna with the big monster, stainless-steel, 3 inch coil Hi-Q antenna on the rear of the communications unit, performance was nearly equal on 10 through 30 meters, although the bigger whip did a slightly better job on 40 and 75 meters. However, down on 75 the new short-body



The lightweight Hi-Q 3/80 mounted on the author's van with a window-clip mount. You can put the whip of your choice on top of the coil and operate 80-10 meters in your car at maximum legal power. (WB6NOA photo)

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

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Hi-Q owner Charlie Gyenes, VE7BOC, holds two versions of his new light-weight antenna next to the much larger original version for comparison. (WB6NOA photo)

Hi-Q antenna ran circles around single-band, center-loaded fiberglass whips.

The new, lightweight 3 pound antenna easily "hears" resonance when you listen on 75 meters; run the motor to adjust the internal loading sleeve for maximum background noise. On 40 meters and higher, the noise coming out of the motor sometimes makes it difficult to actually hear the resonant spot, so a quick glance at your transceiver's SWR dip is a great way to go—as long as you are pulled off the road during re-tuning. If you can spot the antenna in your rearview mirror, you can also "eyeball" when the internal beryllium disk is in the ballpark for resonance.

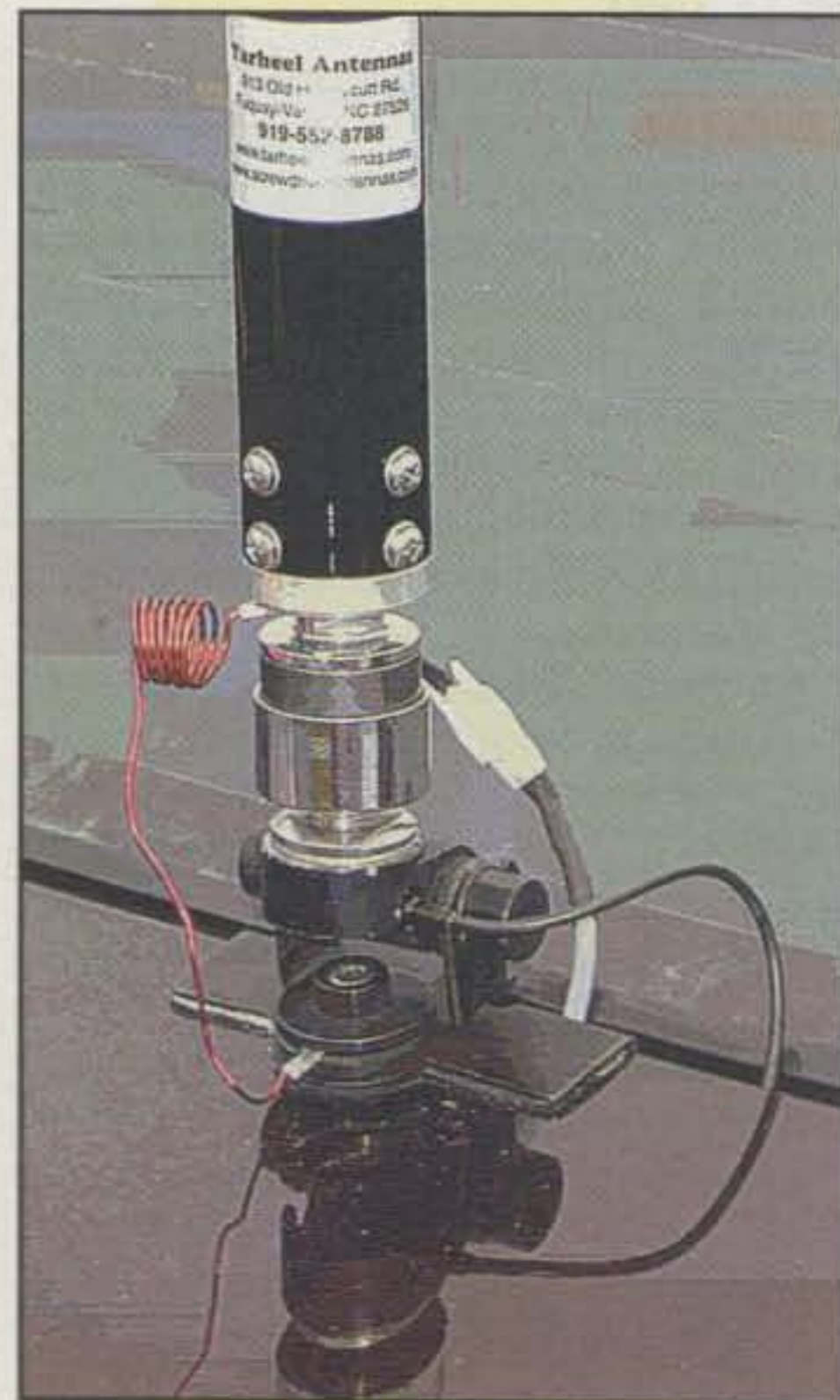
Automatically seeking a perfect match without having to push an up/down switch and listen for resonance is Charlie's next step with this new lightweight, short-body, motorized Hi-Q antenna.

"Little Tarheel"

Tarheel Antennas, another well-respected manufacturer of motorized HF antennas, introduced its "Little Tarheel" model at almost the same time High-Q



The "Little Tarheel" motorized, multi-band HF mobile antenna from Tarheel fits comfortably onto a trunk-lip mount and covers 40 through 6 meters with up to 400 watts PEP. (Photo courtesy Tarheel Antennas)



Close-up view of the base of the "Little Tarheel" where it connects to a trunk-lip mount. (Photo courtesy Tarheel Antennas)

introduced its lightweight mobile antenna. The "Little Tarheel" is a motorized HF antenna that covers 6 through 40 meters and features a 3/8 inch stud to work with the Diamond K400 series mount or Comet series mounts. It's also set up to work with several automatic tuners already on the market.

"All of our antennas come with sensors already pre-installed," comments Tarheel's Robert Young, NC4ME. "If someone should decide to add one of the auto controllers such as AMC, Sam, MFJ, or Am-Comm, everything is ready."

The antenna is shipped with 15 feet of "plug-and-play" control cable, a manual control box, ferrite decoupling core, base matching coil, and even an Allen wrench to tighten the set screw to the whip. The lower mast diameter is 1 1/2 inches, and the mast length is 18 inches. It is within this lower section that the internal 12 volt DC motor works the coil contact assembly up and down. Unlike the High-Q design in which a contactor runs up and down a fixed coil for resonance, the Tarheel antenna motor runs the coil up and down a fixed contactor, causing the ultimate length of the antenna to lengthen or shorten. At full extension for 40 meters the antenna is 54 inches long. When the antenna is retracted all the way in the 6 meter position, it is 48 inches long.

"We designed this antenna for the person who wants to enjoy high-frequency mobile, but does not wish to go to major mounting extremes to get that HF antenna on the vehicle," adds Young. He found (as Charlie did, too) that the higher up on the vehicle the antenna is mounted, the less ground loss there is and the stronger your signal will sound at the other end of the radio circuit.

Rated at 400 watts peak envelope power, the Little Tarheel features a 1/2 amp, slow-blow fuse in case the operator runs the antenna continuously up or down against its ultimate travel. The fuse will blow long before the motor overheats. The motor itself is also decoupled from the DC source to minimize receiver noise pick-up as the motor is driving the tuning coil up and down and the operator is listening for a peak in noise level, indicating resonance. A quick glance at transmit to your SWR meter will quickly confirm when you have found the exact tuned spot on the antenna.

### Hitting the Road

Both of these antennas stand up well at highway speeds on a relatively small lip-

type mount, without the need for nylon guy ropes. This new class of lightweight, small-profile, motorized antennas should make HF mobile operation viable for a whole new group of hams

who have shied away from the activity for fear of "looking strange" or lowering the resale value of their vehicles. The radios are small, and now so are the antennas. ■

### For More Information

For more information on these new lightweight, motorized, HF mobile antennas, contact:

Hi-Q Antennas, c/o Charlie Gyenes VE7BOC/W6, 21085 Cielo Vista Way, Wildomar, CA 92595; phone: 909-674-4862; fax: 909-245-2031; e-mail: <sales@hiqantennas.com>; web: <http://www.hiqantennas.com>.

Tarheel Antennas, 913 Old Honeycutt Rd., Fuquay-Varina, NC 27526; phone: 919-552-8788; fax: 919-552-4970; e-mail: <tarheelantennas@aol.com>; web: <http://www.tarheelantennas.com>.

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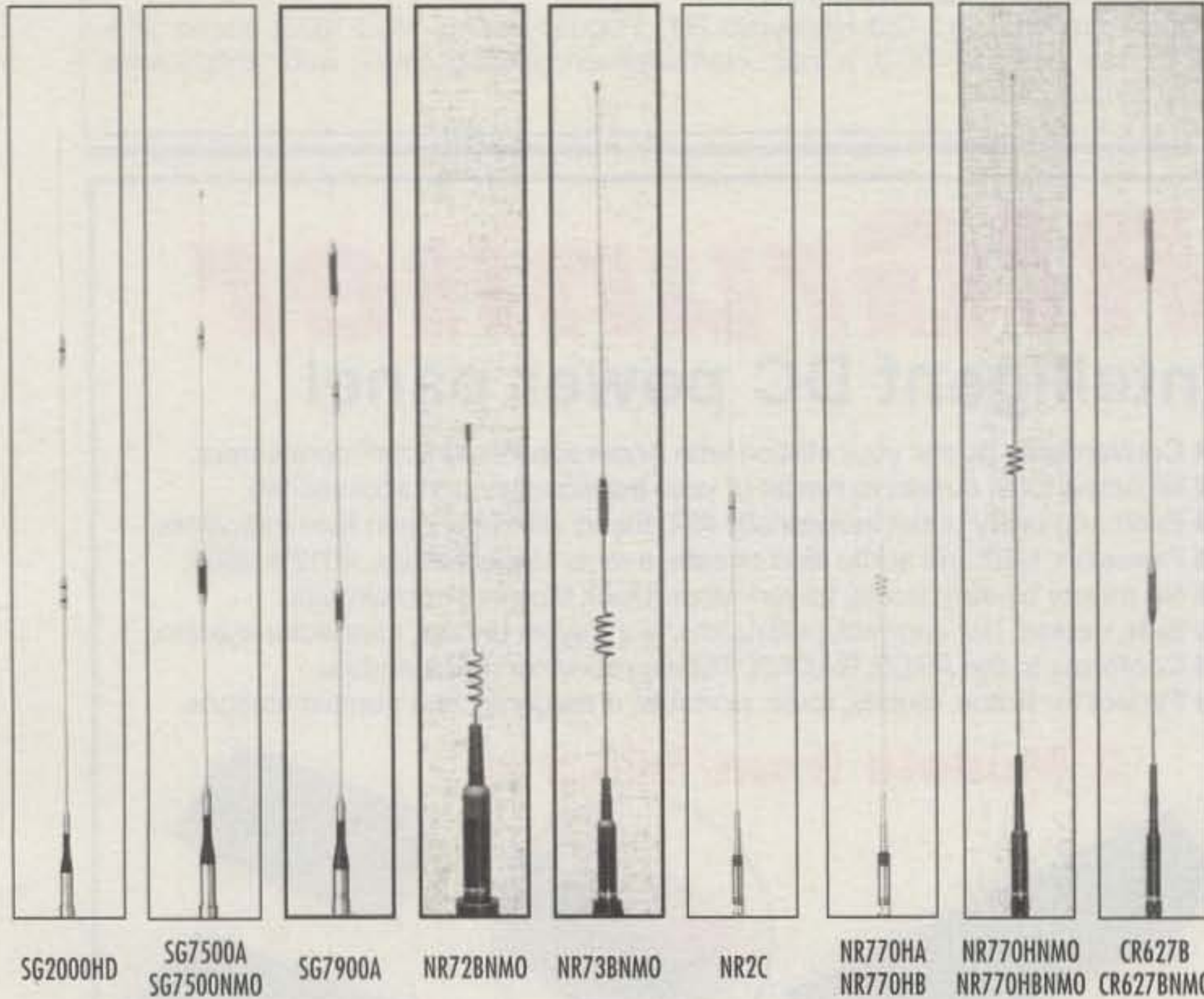
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**Mount Connection:** UHF  
**Length:** 54"  
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### MX62M

Use with HF/VHF mobile  
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### FOLD-OVER

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& NR770SA.)

MODEL	BAND (MHz)	WATTS	CONN.	HT. IN.	ELEMENT PHASING
NR72BNMO <sup>6</sup>	2m/70cm	100	NMO	13.8	1/4λ, 1/2λ
NR73BNMO	2m/70cm	100	NMO	33.5	1/2λ, 1-5/8λ
NR770HA <sup>7</sup>	2m/70cm	200	UHF	40.2	1/2λ, 2-5/8λ
NR770HNMO <sup>8</sup>	2m/70cm	200	NMO	38.2	1/2λ, 2-5/8λ
NR770RA	2m/70cm	200	UHF	38.6	1/2λ, 2-5/8λ
SG7000A <sup>6</sup>	2m/70cm	100	UHF	18.5	1/4λ, 6/8λ
SG7500A	2m/70cm	150	UHF	40.6	1/2λ, 2-5/8λ
SG7500NMO	2m/70cm	150	NMO	41.0	1/2λ, 2-5/8λ
SG7900A <sup>*</sup>	2m/70cm	150	UHF	62.2	7/8λ, 3-5/8λ

MODEL	BAND (MHz)	WATTS	CONN.	HT. IN.	ELEMENT PHASING
NR2C	2m	150	UHF	55.5	1/2λ+1/4λ
SG2000HD <sup>*</sup>	2m	250	UHF	62.6	1/2λ+3/8λ
SG6000NMO <sup>6,9</sup>	6m	150	NMO	39	1/4λ
CR224A <sup>6</sup>	2m/1-1/4m	150	UHF	68.5	7/8λ, 2-5/8λ
CR320A <sup>6</sup>	2m/1-1/4m 70cm	200 100/200	UHF	37.4	1/4λ, 1/2λ, 2-5/8λ
CR627B <sup>6,9</sup>	6m/2m/	120	UHF	60	1/4λ, 1/2+1/4λ/
CR627BNMO <sup>6,9</sup>	70cm	120	NMO	60	2-5/8λ

1/4λ rated in dBi.

<sup>\*</sup> Not recommended for Magnet Mount

<sup>8</sup> NR770HBNMO some specifications but in black finish.

<sup>6</sup> Grounding required.

<sup>9</sup> 52-54MHz only

<sup>7</sup> NR770HB some specifications but in black finish.



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

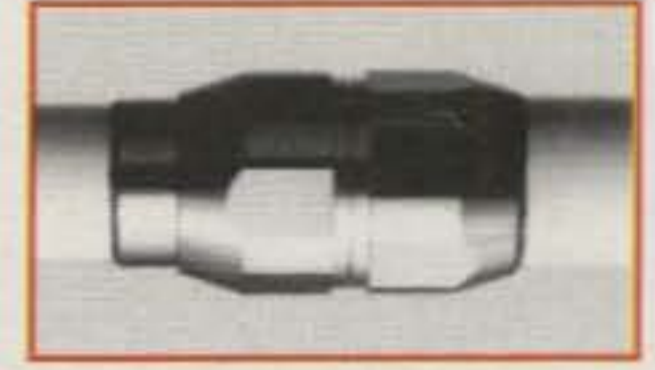
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- Wide frequency bandwidth
- Heavy duty fiberglass radome
- Stainless steel mounting hardware and radials
- Type-N Cable connection
- Compact size for easy mounting/installation

#### Specifications:

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

### X500HNA

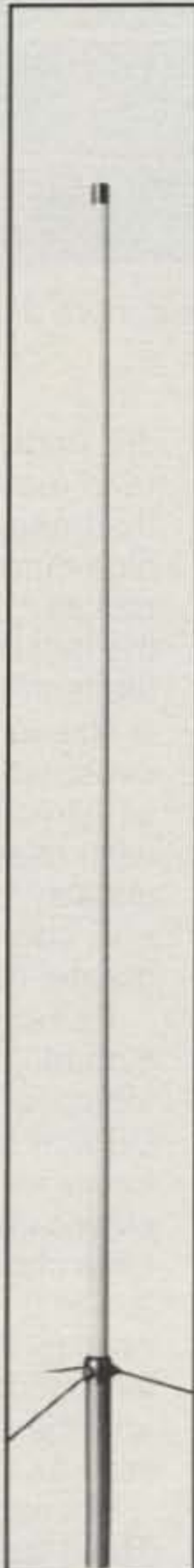
Diamond Antenna's best base station repeater antenna. Designed for strength and performance, the X500HNA is pretuned to achieve maximum gain in both the 2m and 70cm amateur bands.

#### Features

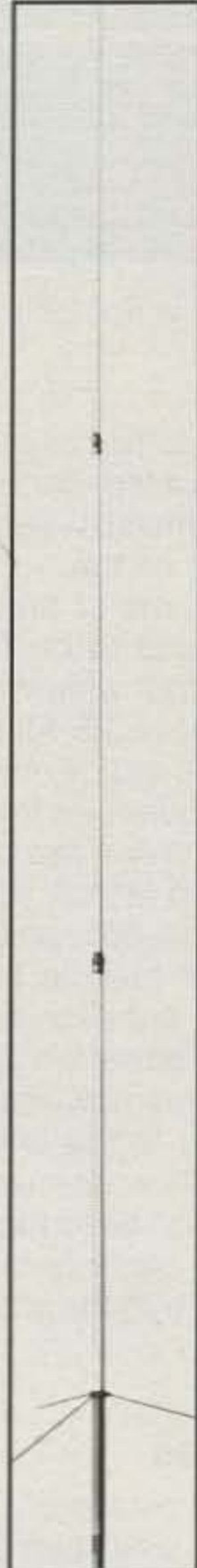
- Heavy duty fiberglass radome
- Overlapping outer shells for added strength
- Stainless steel mounting hardware and radials
- Strong-waterproof joint couplings
- Type-N Cable connection
- Wide band performance

#### Specifications:

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



X50NA



X500HNA

### DIAMOND Mono-Band Base/Repeater Antennas

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

### DIAMOND Dual-Band Base/Repeater Antennas

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

### DIAMOND Tri-Band Base/Repeater Antennas

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

<sup>1</sup> Heavy duty aluminum construction.

<sup>2</sup> F-718A: 440-450MHz, F718L: 420-430MHz.

<sup>3</sup> X510N: 144-147/430-440MHz.

<sup>4</sup> 1/4λ, rated in dBi. Most requirement: 1.4"-2.4".

<sup>5</sup> 2m: 146-148; 100 watts

<sup>6</sup> 52-54MHz. only; DPGH62 adjustable from 50-54MHz.

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

[www.rfparts.com/diamond](http://www.rfparts.com/diamond)

Take one modified helical CB whip, add even a low-power transceiver, and mix well while driving (safely, of course), and you've got the world at your fingertips. What's a "helical CB whip"? Read on...

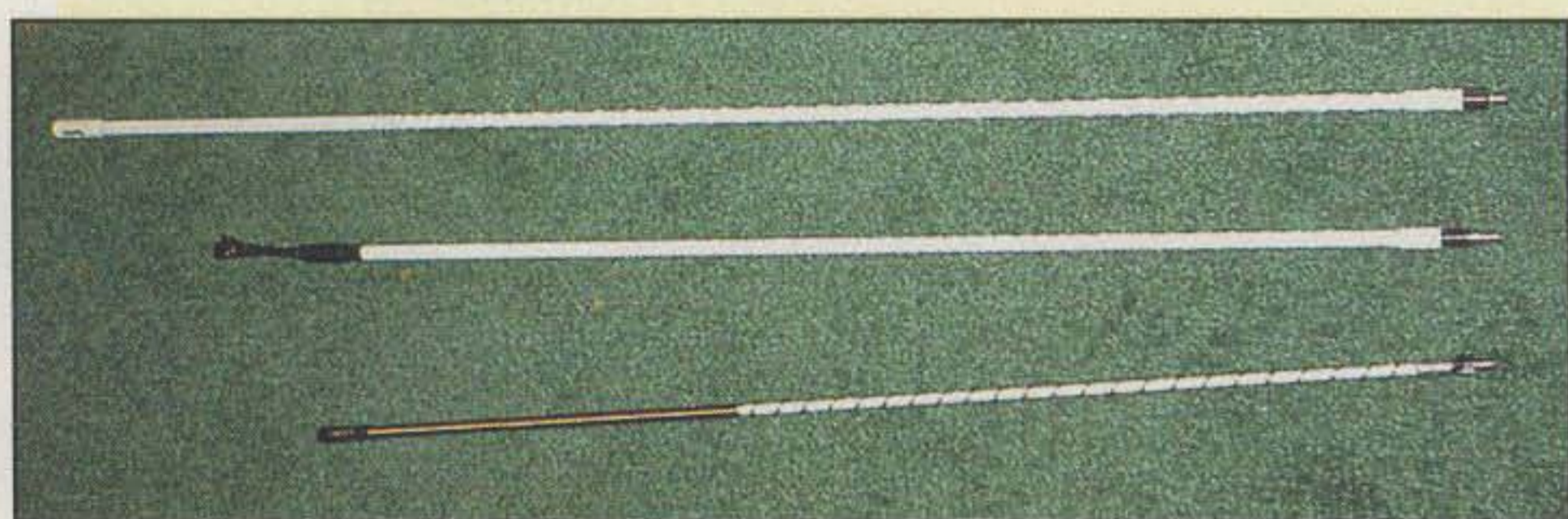
## Easy Mobile Antennas for 10 & 15 Meters

BY KARL SCHULTE,\* WA2KBZ

**Z**L2xx this is WA2KBZ/Ø, QRP mobile in Missouri, over." I waited anxiously to see if my flea-power 5 watt rig and minimal antenna would get through the pile-up. Back he came (Okay, it was after my fourth try) with "Go ahead the QRP mobile station, you are 57 in New Zealand, over." I did it! I had wondered if using my FT-817 and a tiny 3 foot modified CB whip would get me to the other side of the world, and the 10 meter QSO was now in the logbook. I was later to make numerous contacts around the U.S., to Europe, South America, and "Down Under" with that combination and a similar 4 foot version on 10 and 15 meters.

The efficiency of these short, modified CB helical whips is so high that I am on my way to DXCC mobile using them and a QRP rig. While I do have several full-size mobile antennas from Mark Products (makers of the Heliwhip© and its variations, as well as private-label CB whips for the trucker field—more on this below), Hustler, and so on, which are all fine products, I often find them too large. When flying or using rental cars, or when the XYL objects ("it looks silly up there!"), a shorter antenna is called for. The Outbacker is available in several models that would have fit the bill, but I like to play with antennas and wanted something much cheaper (in case airline security was to take it away).

In my Motorola career, I was the "Chief HF Consultant" for a number of years, designing HF systems worldwide and working with various antenna companies to find the elusive solution to a small, but efficient HF mobile antenna. One of those companies was Mark Products (see box for contact informa-



Three of the whips described, both 3 and 4 foot models.

tion). The firm's antenna family uses a fiberglass core and winds a top-loaded, roughly helical coil of enameled wire on it, most of the turns being on top.

In testing various versions of these antennas, they were found to be far more efficient than an 8 foot whip with a base tuner, except above 25 MHz, where the 8 foot whip was nearly resonant. In the middle HF frequencies from 10 to 18 MHz, they were only a few dB below a full 1/4-wave whip at their resonant point. Bandwidth was poor on 80 and fair on 40 (pick your favorite frequency and stay near it), but excellent (nearly the entire phone band) on 20. There are other companies now making copies, but I will refer to the originals in this article, as that is what I used as the basis of the antennas described. With small variations, the same general procedure should work with the other similar products.

### Top-Loaded Antennas

First, why use top-loaded antennas? In a simple way, a vertical whip can be considered as half of a vertical dipole, with the car body (or earth) taking the place of the other half. The maximum current of a dipole antenna is in the mid-

dle portion, so the maximum current (and radiation) of the vertical whip is at the bottom half. Base loading puts the high-current section into a very poorly radiating coil (or tuner). Top loading is the most efficient for a given length, as the high-current portion of the antenna is able to radiate. I won't go into the full explanation here, as this is mostly a construction article. The center-loaded whip (also seen at large truck stops) is midway between the other two types and can be modified as well, but at greater cost.

Visit a RadioShack store, a large truck stop along the highway, and other distributors, and you will find a wall full of CB accessories (many of use to hams, by the way). You should see a variety of plastic-covered whips with spiral wire turns showing through the plastic, some thin and some a bit thicker. The useful ones for this project are the 4 foot and 6 foot models. Try for a fatter glass core and the white or red covers (easier to label as to its modified frequency).

Prices vary, but \$8 to \$14 is typical. The 6 foot version is more efficient by a few dB, but the 4 foot model is easier to pack. The 3 foot model is okay, with reduced performance on 10, but only if you have a 100 watt rig, not QRP. I will

\*3515 Schott Rd., Jefferson City, MO 65101  
e-mail: <wa2kbz@aol.com>

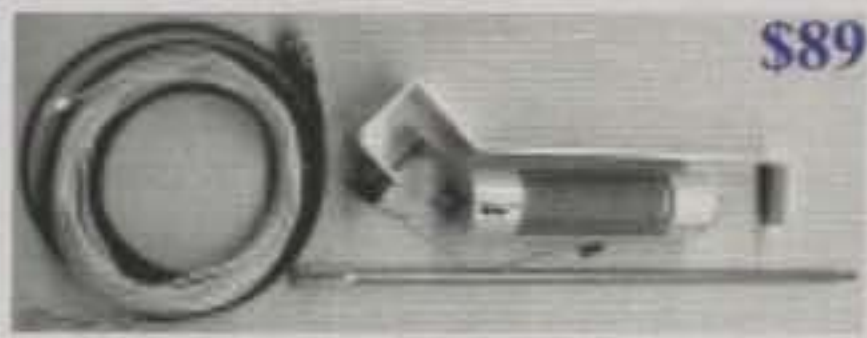


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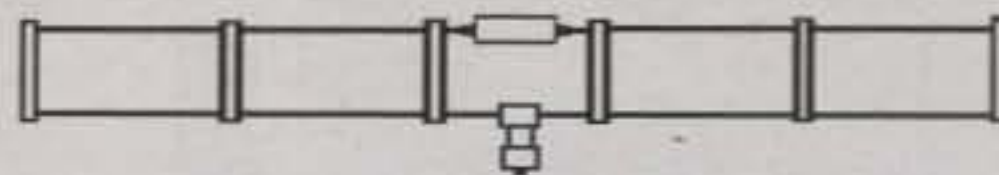
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- SWR < 3:1 from 30Mhz to 54 Mhz
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Tens of thousands of these antennas have been supplied to the US military, Special Forces, Marines. They can be found on every continent in the world. They will operate NVIS and ALE for your emergency management needs.



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BWD-45	— 45 Ft, 40 thru 6M, 7 - 54 Mhz	— CU	— \$209
BWD-65	— 65 Ft, 75 thru 6M, 4 - 54 Mhz	— CU	— \$219
BWD-90	— 90 Ft, 160 thru 6M, 1.8 - 54 Mhz	— CU	— \$229
BWDS-65	— 65 Ft, 75 thru 6M, 4 - 54 Mhz	— S/S	— \$349
BWDS-90	— 90 Ft, 160 thru 6M, 1.8 - 54 Mhz	— S/S	— \$374
FDMK	— Mounting Kit for all models		— \$39

address the 4 footer, but the technique is applicable to all of the above.

As purchased, the whip is tuned to about 27 MHz and is meant to screw into a standard-thread CB mobile mount, a number of which will be hanging right next to the antennas. For portable, no-holes operation (assuming you don't have a tractor trailer truck), the magnet mount is best. This will work for smaller ham whips as well, by the way. The antenna should be used in the mount you tune it up with, as there will be variations among mirror, trunk-lip, and magnet mounts, as well as general location of mounting (roof or trunk). A heavy-duty, plastic-covered white whip with a red cap is likely to be a Mark Products "private label" antenna. Whichever choice you make, you must be able to see the wire spiral beneath a soft plastic cover.

### Retuning Tools

You will need to have/buy/borrow a wattmeter or SWR meter and a short coax jumper (every ham should have one of these anyway). With the SWR bridge between the radio and antenna in its mount, tune to the bottom edge of 10 meters, set it for low-power CW or FM out, and check SWR. Record it (it will be very high). Begin the frequency change to 10 meters by sliding off the cap (toothpicks carefully slid under the cap to break vacuum may help). Using needle-nose pliers or tweezers (your wife will have these), pull up the end of the wire and remove about three turns.

### On Your Mark...

If you try to find Mark Products on the internet today, you'll succeed, but you won't find any HF antennas. When I worked at Motorola, Mark Products had already merged to become Anixter-Mark; later it split off, again becoming just plain Mark, then Mobile Mark. Finally, the company sold off its low-frequency antenna line to Solarcon, in Holland, Ohio. It appears that Solarcon sells only to dealers, not directly to consumers. Information is available on the web at <<http://www.solarcon.com>> or by phone at 800-445-3991. Two other manufacturers of helical-whip CB antennas are Aerpro International in Australia (<<http://www.aerpro.com>>) and Wilson Antennas in Rock Island, Illinois (<[www.wilsonantenna.com](http://www.wilsonantenna.com)>).

Using a flat-blade screwdriver, push the cut end of the antenna wire back down inside the plastic cover. It must lie flat against the other turns to avoid corona.

Put the plastic cap back on, return the antenna to its rooftop place, close the car door (after you get back in!), and recheck SWR. It should be lower. If you have an MFJ HF or HF/VHF Analyzer, you can go below the 10 meter band and find its resonant point and follow it up into the 28.4 MHz target point for SSB. You may not use your ham radio, as it would be illegal to transmit, even with a 1 watt signal, outside of the band. Go up to about 28.1 and recheck; it should be worse. This step ensures that you did not take off too much and go past the lower edge of 10. Take off another turn and repeat the above. Proceed slowly and carefully.

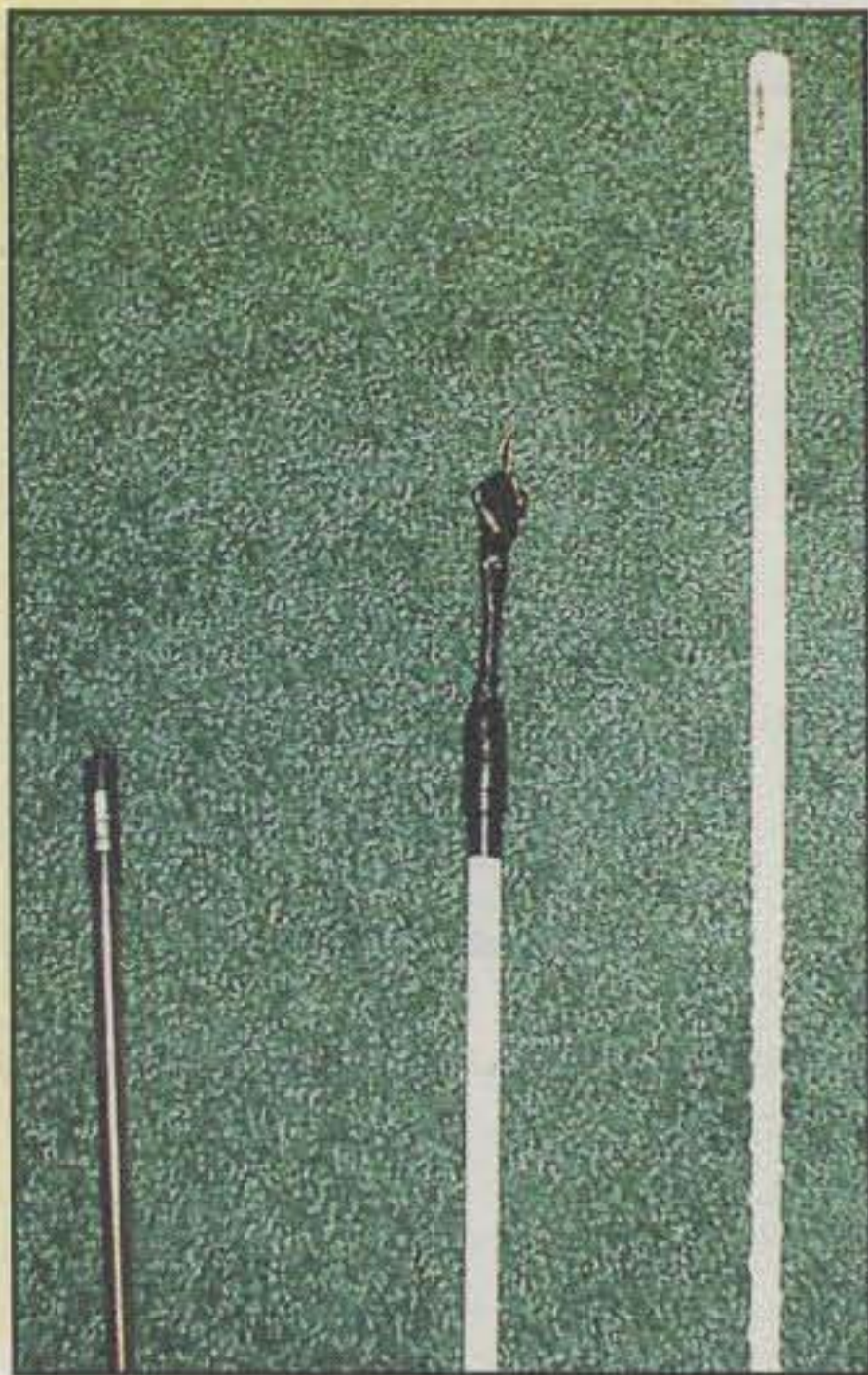
When you are very close, a turn or two too much will jump you up into the FM portion of 10 meters instead of the SSB sub-band. You may have to cut away some of the outer wrap, but always leave at least 1/4 inch above the last turn. I have done this on six antennas, and it takes about 15 minutes to do it right. Lose patience and you could keep going up to 6 meters as a consolation prize!

By the way, this 11-10 meter version can work on 6 meters as well; just be careful and go slowly. A calibrated SWR antenna tool such as the MFJ Analyzer or equivalent is recommended. This will allow 6 meter FM (vertical polarization) with a 3 foot antenna and very good efficiency.

### On-the-Air Check

Being sure that you have the last/top turn pushed down flush and the cap back on, you are now ready to use it. As an added advantage, the plastic anti-static weatherproof cover reduces rain static as you drive (and helps you find the car in the parking lot).

First check the bandwidth; a 4 foot whip centered on 28.4 MHz should work from 28 to 28.9 with good to very good SWR. It will be no more than one-half to one S-unit below a full-size whip, and—if it is placed on the roof—equal to an 8 foot whip mounted on the bumper. You will be able to get into parking garages and gas stations without breaking glass and scraping up the antenna on the roof. The 3 and 4 foot



Close-up of the top sections and the gradually increasing pitch of the helical windings. The 15 meter antenna has a "top hat" covered with tape and a few turns of wire capacitively coupled outside of the tape to fine tune it.

versions are easily packed in a two-suitcase (but keep the magnet away from video and audio tapes!). The 6 foot version on the roof will be superior to a full-size whip on the bumper by several dB, but doesn't travel as well. All of them also reduce intermod from out-of-band signals, acting like a pre-selector. Ten meters is still hot, so come join the fun!

### 15 Meter Version

The first half of this article discussed how to make a quick modification to a helically wound CB whip to get on 10 meter mobile quickly and cheaply. The same antennas can be made to work on 15 meters and are also effective (I just worked six states on the east and west coasts, South America, and some Europeans with a 4 foot version using my 5 watt FT-817; one QSO was even made with 2 watts). Reports varied from 53 to 59, depending on band conditions. I used a 3 footer in Turkey with the same rig last year and made several QSOs around Europe until I got my long wire up.

To operate on 15 with one of these whips, which again are found at RadioShack and most large truck stops, there are two ways to go: cheap and harder but neater, or cheap and easy but a bit unprofessional. I'll describe both. As before, you will need a calibrated signal

source (MFJ Analyzer or ham rig) and an SWR bridge, but also some heat-shrink tubing (large hardware store, RadioShack, etc.), some large tinned lugs for #8 wire, tools, and perhaps copper-coated welding rod or hobby-store brass wire.

In either case, remove the top cap, drill a small (about  $1/16$  inch) hole in the top, and set it aside. With needle-nose pliers, pull up the end of the antenna wire approximately 8 inches. *Do not cut it yet!* Thread the wire into the cap hole and replace the cap where it was. With a knife, scrape off the enamel at the top of the wire, place a lug there, and *gently* squeeze it with the pliers to make contact. It should not slide, but be able to be "unsquozed" to loosen it. With the antenna in its mount/location, check SWR at 21 MHz. Using an MFJ Analyzer is definitely easier, as you can find its real resonance and better judge how much to adjust. As the added capacity of the top wire has greater effect on the frequency than the few turns removed, the frequency will be much lower than 11 meters, probably around 19 MHz (as it was for me). By clipping off small ( $1/4$  inch) pieces of wire and replacing the end lug (you'll need several), you will walk the antenna up to the *bottom* edge of 15 meters. Be patient! The goal is almost reached.

Now put two pieces of heat shrink over the wire (lug off), shrinking each in turn. Drop a bit of Q-dope (dissolved Lucite) or clear fingernail polish at the base of the wire where it enters the outer wrap to lock it place. *When it dries*, replace the end cap, with wire (now covered by two layers of shrunk shrink) sticking up through it. Replace the end lug (trim enough wrap to bare/clean off the wire at the tip). Check SWR; it will have changed. If it moved down, clip off a little bit of wire, replace the lug, and recheck. A small change in the top section will make a big change in frequency. If you go too far, say up to 21.5, use the next-size lug. As long as you end up with your resonant/minimum SWR point anywhere between 21.2 and 21.4, it will make a fine 15 meter mobile antenna.

The last step is to final-crimp and solder the lug to the wire, coat the joint and lug with Krylon spray or clear polish, and recheck SWR. Even extra solder can change it a few kHz. A tiny bit clipped off the end of the lug (do not leave any sharp points) or a few turns of black tape at the base of the end cap will affect frequency; you can use this to fine tune. Mine was at 1.2:1 on 21.35 less than an hour after I started the project.

Now what about the brass wire? For



Close-up of the top of the helical winding. The last turn **must** be pressed flush against the turns below it to avoid corona effects from its sharp end.

those who feel that a good signal is not enough, but also want good looks (the first version will look odd, especially to XYs), the wire or brass rod can be used for the end of the antenna. It must be thick enough to stay vertical in wind (70 mph) but flexible so it will bend if it hits something. You must drill a small hole in the top of the fiberglass rod, close to dead center, about  $1/2$  inch deep. It should be just a hair larger than the wire used so that glue or epoxy (a thin coat on the end of the wire/rod) will fill the gap. Mount the brass hobby rod or copper-coated welding wire in the hole. Remove approximately 6 inches of wire coils and cut off the wire, but leave enough to wrap around the brass wire where it enters the fiberglass (after thoroughly cleaning off enamel and epoxy). Solder the antenna wire end to the brass wire/rod. After it cools, coat with nail polish and slip one just-big-enough heat-shrink tube over the brass and shrink it. Using a heat gun or soldering iron held close (rather than a match) is best, as the nail polish may ignite with a flame and leave a carbon film. Put the cap on over the wire, clean off the wire end, gently put on the lug, and proceed as above to move resonance into 15 meter SSB.

The lug on the end acts as a loading capacitor (like a tiny top hat) and makes the antenna safer to eyeballs. Now you can still work mobile DX when the sunspots fade and kill 10 meters! ■

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**T-2X, \$649.95.** Extra heavy duty Tailtwister antenna rotator! For large antennas up to 20 square feet wind load when mounted in-tower, or 10 square feet when mast mounted with optional support bracket. Triple 138 ball bearing race, strong electric locking steel wedge brake. Control Box has an illuminated directional indicator with North or South center of rotation scale, separate snap-action brake and rotation control switches. Accepts masts up to 2 1/16 inches diameter. Rotator size is 14 1/16 Hx9 3/16 D in.

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Rotator Specifications	T2X	HAM-IV	CD-45II	AR-40
Wind Load capacity (inside tower)	20 sq. ft.	15 sq. ft.	8.5 sq. ft.	3.0 sq. ft.
Wind Load (with mast adapter)	10 sq. ft.	7.5 sq. ft.	5.0 sq. ft.	1.5 sq. ft.
Turning Power (in pounds)	1000	800	600	350
Brake Power (in pounds)	9000	5000	800	450
Brake Construction	Electric wedge	Electric wedge	Disc brake	Disc brake
Bearing Assembly/How many	Tripl race/138	Dual Race/96	Dual race/48	Dual race/12
Mounting Hardware	Clamp plate	Clamp plate	Clamp plate	Clamp plate
Control Cable Conductors	8	8	8	5
Shipping Weight (pounds)	28	24	22	14
Effective Moment (in tower)	3400 ft/lbs.	2800 ft/lbs.	1200 ft/lbs.	300 ft/lbs.

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County hunting is a very popular activity among mobiling hams. In fact, since not every county has resident hams, some amount of mobile operating is virtually a necessity in the process. KØZT shares his strategies for "working 'em all."

## How to Finish USA-CA

BY JIM LABO,\* KØZT  
USA-CA #1051

**T**he USA-CA (USA Counties Award), sponsored by CQ magazine, is the premier domestic operating award. Just over 3200 amateurs have reached the basic level of 500 confirmed counties. With some focused operating, this can be done in less than a year. However, having the persistence to work and confirm all 3077 counties takes real dedication. Only 1059 have done it to date.

While I have observed a two-year completion of USA-CA (typically it takes about three years of concerted effort) it took me nine years of more on than off work. This award is often a decade-long project that needs some means to keep your interest high for the long run and some finishing techniques. The two best long-term helpers are going mobile yourself and *giving out* counties and becoming a County Hunter (CH) Net Control Station (NCS) or Assistant NCS.

### Going Mobile

Going out and running, or putting out, counties will definitely keep up your interest. It is just fun to be on the receiving end of a pile-up. Also, CH pile-ups can become thick, but are still manageable. Everyone else's enthusiasm in working you will add to your enthusiasm to keep on county hunting. A day running your counties and working the other mobiles does wonders for your growing county totals, too. I try to make enough trips to run my home state completely every few years.

The hidden long-term benefit is that giving out counties now will really help to get those last few counties later.

### NCS/Assistant NCS

If you are not able to or not interested in going mobile yourself, then helping the NCS (net control station) is your key

\*7382 S. Zephyr Way, Littleton, CO 80128  
e-mail: <KØOST@arrl.net>

### NEED LIST for KØZT

If going to any of these counties please e-mail me at KØOST@arrl.net

<b>ALABAMA</b> Bibb Cherokee Perry Randolph	<b>IDAHO</b> Lemhi	Nicholas Owsley Robertson Spencer Taylor	<b>N. DAKOTA</b> Dunn Grant Griggs McIntosh Mercer Towner Traill	Stanley Tripp Ziebach
<b>ARKANSAS</b> Madison	<b>KANSAS</b> Atchison Cheyenne Clay Gove Grant	<b>LOUISIANA</b> Jackson	<b>NEBRASKA</b> Blaine Colfax Nance	<b>TENNESSEE</b> Jackson Lewis Macon Marshall Monroe Rhea Trousdale Unicoi
<b>COLORADO</b> Broomfield Costilla Jackson Montezuma Phillips Sedgwick Summit	<b>KENTUCKY</b> Allen Bracken Carlisle Casey Crittenden Floyd Franklin Greene Greenup Henry Knott Leslie Livingston	<b>MAINE</b> Androscoggin Hancock Knox Waldo	<b>NEW MEXICO</b> Taos	<b>TEXAS</b> Bandera Cottle Dawson McCulloch Terry
<b>GEORGIA</b> Bleckley Butts Dawson Jones Lamar Marion Schley Turner Worth	<b>MONTANA</b> Carter Fallon	<b>MISSOURI</b> Cass Chariton Worth	<b>NEW YORK</b> Montgomery Richmond Saratoga Schoharie	<b>VIRGINIA</b> Craig Floyd Mathews Richmond
<b>IOWA</b> Emmet Lyon Ringgold Wayne	<b>N. CAROLINA</b> Ashe Chowen Mitchell Rowan Tyrrell Washington Wilson	<b>OKLAHOMA</b> Beaver Cotton Haskell	<b>S. DAKOTA</b> Brule Gregory Haakon Hanson Perkins	<b>W. VIRGINIA</b> Webster
				Last update: 1-Sept-01

Fig. 1— The need list that I enclosed with my MRCs at about 150 remaining counties. The list became more effective as the number of remaining counties decreased.

to finishing USA-CA. As an NCS or assistant, you always get first crack at the mobile without having to break the pile-up! Plus, your name and call become known so that when you need the last few, you will be remembered as a contributor.

If you check the MARAC (Mobile Amateur Radio Awards Club) all CW USA-CA records, you will find several entries for Ed, WA6VJP (SK), the legendary NCS of the CW net. While Ed

did run mobile occasionally, his record five times finishing all CW USA-CA is directly attributed to the time he spent as CW NCS. His last three awards were at two-year intervals. Being an NCS or an Assistant NCS can dramatically shorten your time to achieve USA-CA.

### Finishing Techniques

Most of my counties were worked on the CH Nets, 14.056.5 CW or 14.336



*A rental car I used in the fall of 2000 on my job in Uintah County, Utah. Working other mobiles on the County Hunter nets helped keep my sanity during long boring trips, and greatly helped my county totals.*

Phone. However, a significant portion were worked in the California, Georgia, Michigan, Minnesota, North Carolina, Pennsylvania, and Texas QSO Parties, plus the spring MARAC CW contest. Make full use of these county-exchange contest opportunities.

At about 2800 to 2900 counties, though, my rate of working new counties each month started dropping off rapidly. Just waiting for counties to be run was no longer productive. I had to become more active in working the remaining counties. Here are the methods I used to speed up the process.

### About 200–250 remaining

At about 200–250 counties I first started getting my needed counties in front of other county hunters by making a one-page list of my remaining counties (fig. 1). My need list was also invaluable for a rapid check at the start of a mobiles run. I kept copies in the shack and in the car with my mobile rig, and especially included a copy with my MRCs (mobile reply cards, the county hunter's QSL for multiple contacts). I received back a lot of suggestions about hams to contact for help. Some were obvious, but quite a lot were unique suggestions. The smaller the list became, the more effective it was in getting the attention of my needed counties when mailed with my MRCs.

If you have not done it already, get a set of state maps showing the counties. Mark up all that you have worked and confirmed. You cannot tell if a mobile is headed toward or away from your needed county without a good set of county work maps.

Next I started looking very closely at the planned trips on the County Hunter websites (<<http://www.cquest.com/ch>>

and <<http://www.countyhunter.com>>). While not all mobile trips are posted online, I checked these sites several times a week. I did not want to miss any needed counties due to lack of information. I kept a copy of important run itineraries on my shack desk. Thus, I could watch the mobile's progress and be waiting when he (or she) entered my needed county. A road atlas in the shack helped me estimate when the mobile would be in the next county.

One technique I did not try but I would recommend in hindsight is to get a portable baby monitor or install a remote speaker from the shack. You don't want to miss a county, but you don't want to be tied down waiting for a needed county either. However, be considerate. Not everyone in the family wants to listen to the CH net!

### About 100 Remaining

At about 100 remaining counties I got my list of needed counties posted on the K3IMC site (<<http://www.cquest.com/ch>> and other county hunter websites. Some hunters post their needs much earlier, but it really became critical at this stage of the hunt. Other county hunters are much more inclined to help when there are only a few counties remaining in their state.

I also recommend you carefully review all your MRCs and especially your QSLs for correctness. I waited to do this until I had only *one* remaining county to work. It took me several days, and I got a rude surprise when I discovered that I had entered an old QSL in my USA-CA file to the wrong county! I got very, very lucky that on the same day I made this discovery, as Herb, W9GBH, post-

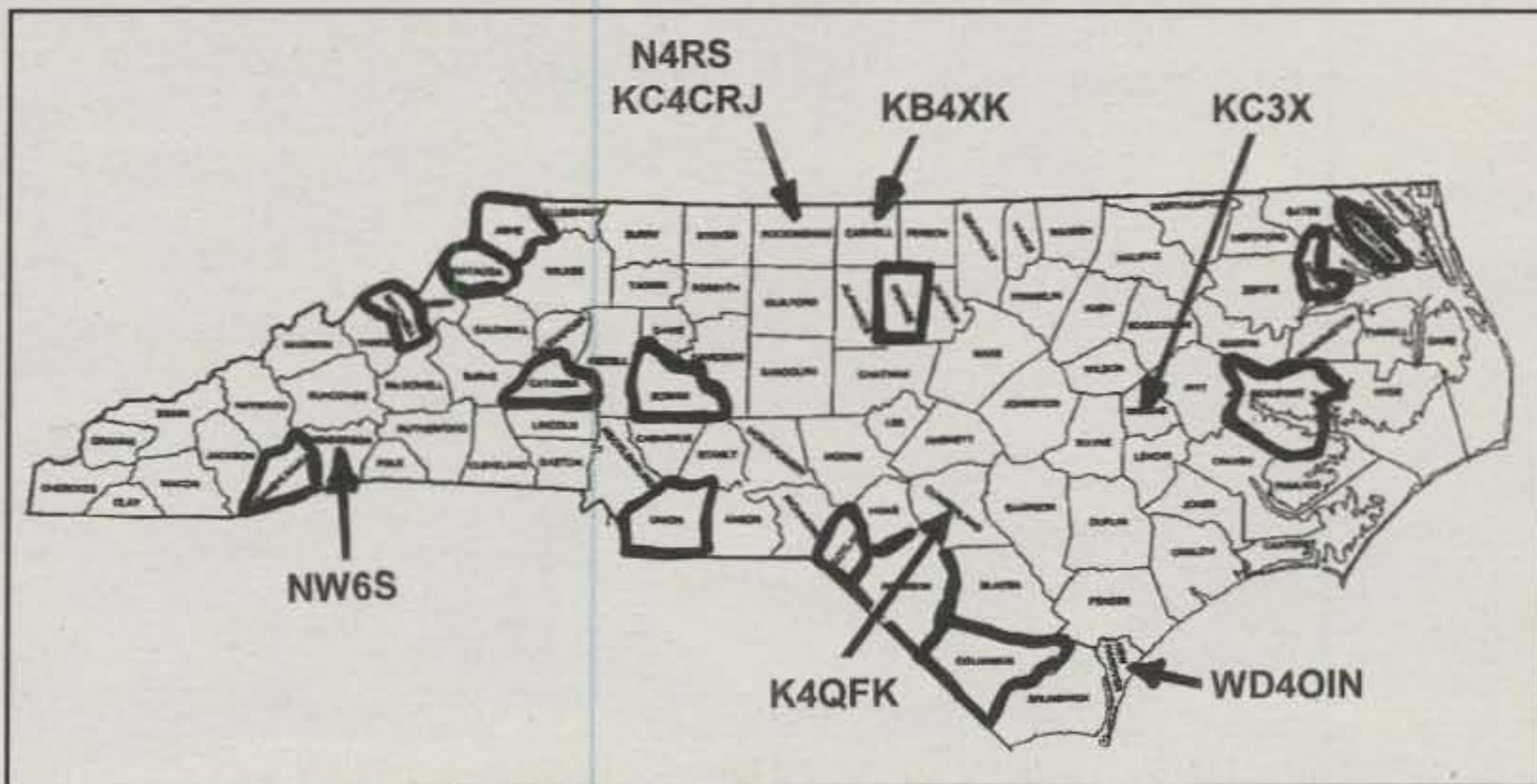
ed a planned trip with an overnight stop next to my now-needed very last county! You don't want any surprises at the end of the hunt.

The US Postal Service Zip Code website (<<http://www.usps.gov>>, then click on "Find ZIP Code") is invaluable for using current and old pre-Zip-Code addresses to determine the county. This was the tool that showed me I had a problem.

This is also the time to check your old logs for unconfirmed contacts in your needed counties. I discovered after I had confirmed them all that I had worked—many, many times—a county hunter in one of my last ten needed counties! Since he was on his second time around USA-CA, he never needed



*My mobile rig in a typical rental car installation. The TS-50 and MFJ tuner are strapped down in the passenger seat. The antenna is a mag-mount 20 meter Hamstick. I have used this versatile arrangement in a lot of cars to make my 11,000+ mobile contacts from 655 counties plus work 70 countries!*



*Fig. 2—Mapping how close known mobile operators are to my needed CW counties. If they're close, I request a schedule. All get a copy of my needs in their state for their future trip planning. (Source: US Dept of Commerce, via <<http://www.lib.utexas.edu/maps.state/>>)*

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to QSL my mobile CH Net contacts. It took a lot of time to set up a schedule with a non-county hunter to work and confirm that county. It would have been much easier to get a QSL from the county hunter I had already worked! Take some time to re-examine your mobile logs for fixed station counties. It can be very productive.

I also seriously started searching for who could help me with my remaining counties. I started by checking the MARAC and K3IMC data bases (<<http://www.marac.org>> and <<http://www.cquest.com/ch>>) for county hunters living in the counties I needed. The MARAC membership database and the K3IMC e-mail database are both searchable by state. From a state sort I looked for any county hunters located in a needed county. I did not get lucky with this technique, but you might.

I also searched through my logs and made a list of all the mobiles I had worked. Some mobile operators are not in either database above. I did not want to overlook any potential help. I cross-checked this list for home counties and marked my state maps with the home counties of all these mobile operators (see fig. 2). If one was within an estimated hour's drive from a needed county, I contacted him with my close-in need list.

Every Friday I checked the K3IMC and County Hunter dot com <<http://www.countyhunter.com>> trip pages for mobiles planning to run my needed counties that weekend.

### Last 25

With 25 remaining counties I got down to serious begging! I was told that begging was required at this level, and it really helps speed things up. While keeping my needs in front of CHers with the Special Needs website pages and my need list in MRCs to key county

hunters, I started searching outside the CH community. I started searching the callsign directories and similar county searchable databases for my needed counties. I tried to find three calls with e-mail addresses for each remaining county—one being an amateur club callsign if possible. I then e-mailed one in each county, asking for a schedule with suggestions on times and CW/phone frequencies (see fig. 3). I also asked (if they could not help) if they could recommend someone else for me to contact in my needed county. If there was no response after a week or two, I went to the next call on my list. Normally the first request got a schedule or a lead to someone who did give me a contact.

In a few cases no one responded to my three different requests. Then I went back to other County Hunters in that state asking for help. For example, I'd worked Dave, KØERM, back in 1998. An e-mail to Dave asking about others closer to my last South Dakota county yielded several amateurs in Sioux Falls who ran mobile. One was Jim, NIØI, who agreed to a schedule three weeks later when he would be making a trip through Hanson County for what I thought would be my very last county.

Be sure to check more than one callsign directory. Some will have an e-mail address that is not listed in others. If there is no e-mail address listed for any of the amateurs in your call directory search, you may have to write some conventional letters. While slower, it may be your best hope. I did need to do this a few times.

As I went through this process I kept good notes on whom I contacted and how. When I worked a needed county, I sent a thank you message to everyone in that county I had previously e-mailed.

I also found that enclosing a "newsletter" with my request really helped with non-county hunters. It helped show that

To: xxxxx@xxxxx.xxx  
Subj: Help with Schoharie county, NY

Tom, WB2KLD;

I am a County Hunter and am down to 10 counties to finish my USACA award for working all 3077 counties and am getting anxious to finish this up by fall. Schoharie NY is one of those ten remaining.

You are listed as the e-mail address of the Schoharie County ARC. I would like to schedule a contact with you, or someone else from your club you could suggest, at your convenience.

If you work CW I would suggest 14.054 MHz in the evening or on the weekend. Or if you would prefer SSB, pick a frequency. Living in the Mountain time zone I don't get home from work until 2345Z most weekdays.

I search the County Hunters website's Planned Trip listing often, monitor the county hunter net frequencies, and serendipity has been very good to me checking the frequencies on my commute to and from work.

But I sure would like to speed this up a bit. One of the older hands told me there would be a certain amount of begging, and asking help from strangers, that comes into play at this stage to short cut the process, so here I am asking for help. HI

Attached for your amusement is a short chronicle of the joy and frustration in the search to work all 3077 counties.

If you can help I would greatly appreciate it, or can you suggest another ham in Schoharie County?

73,  
Jim Labo KØZT  
303-xxx-xxxx  
29 June 02

Fig. 3— My begging letter asking for a schedule or a recommendation.

I only needed a few counties, and it put a face on the "beggar." I also included a copy of my narrative "A Day in the Search of a County Hunter," which gave them a taste of the county hunter's quest.

While you are narrowing your search do not lessen your time in monitoring the nets and tracking mobiles in states you still need. I found many unexpected surprises.

There are no resident amateurs in Blaine County, Nebraska, and I could not find any amateurs with e-mail addresses in any of the bordering counties. I sent out several letters seeking referrals and waited. A week or two later I heard the 14.336 phone NCS running Carol, KIØJD/m, inside my skip zone in western Nebraska. After her run she QSY'd to 7.238 MHz, and I went down to ask her about a CW contact from her county line. However, before I could break her pile-up, she worked Don, W9GUY/m, in Blaine County, NE! I lost

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all interest in that CW request! After Carol completed her run, Don ran Blaine and I had a quick contact and finished another state. I had heard Don earlier on .336 when he was in my skip zone, but had not realized he was traveling west. So keep monitoring and serendipity will strike amazingly often!

### Last Ten

More of the above with greater intensity. I checked the nets, checked the planned trips, kept my needs current on the websites, and kept e-mailing for leads and schedules.

I noticed that Jeff, W9MSE, had posted a planned trip to western Tennessee for an education meeting and then a late-day trip to North Carolina passing next to my last needed county in TN. A quick e-mail to Jeff asking for a slight detour into Marshall County got his attention. He said he would be on a tight schedule to reach NC, but he would keep it in mind. I thanked him and said I would listen along on his trip and see what his schedule would allow. Jeff came back later saying he had looked at my posted needs and had been thinking about a day trip to eastern NC in the area of my last two counties in NC and to keep in touch. He did make that detour for my last in TN and also made that day trip for my last two counties in NC. I kept my needs posted, asked politely and gave things some time!

I also checked my e-mail often. I did not want to miss any offers of help. If I made a schedule, I kept it. Sometimes I used the 14.336 for an evening schedule when the net was in open session. I made sure I helped everyone else who needed to work that county.

### Conclusion

It takes a concerted search for leads on who can help you with your dwindling number of remaining counties. However, remember that this is a hobby. Politely plant the seeds of what you need and give them time to grow. County hunters are some of the nicest people, and they do go way out of their way to help a fellow county hunter. Eventually someone will think "Jim, KØZT, needs that county and I will be going near there soon. I'd better call or e-mail him."

While the first county is just as important as the last, I would like to thank those who helped me with the last dozen counties: N4RS/m, WB2KLD, W9GUY/m, N2YQZ, WA4ILO/m, AC7WO, KU8E/m, NY4N/m, W9MSE/m (3), NIØI/m, and W9GBH/m. Your Ham-helping-Ham spirit will always be remembered. ■

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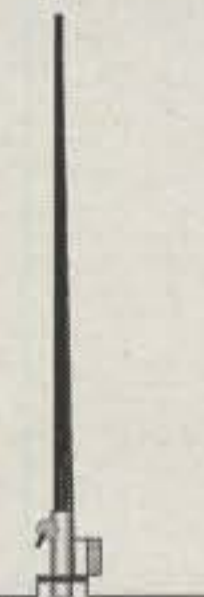
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OB9-2W	9	17-12	33 feet

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## CQ Reviews:

# The ICOM IC-2720

## Mobile VHF/UHF Transceiver

BY GORDON WEST,\* WB6NOA



The ICOM IC-2720H is a full-fledged dual-band, 2 meter/440 MHz mobile transceiver.

The new ICOM IC-2720H is indeed a full-fledged dual-band, 2 meter/440 MHz mobile transceiver. I raise this point at the beginning of this review because some of the mobile transceivers that are advertised as dual-banders are not truly *dual band*. The amateur radio industry has never agreed on a definition for "dual-band technology," many times referring to a mobile radio with two-band capabilities, but only one band at a time. I would like to see these hard-working radios classified as two-banders.

### Features

When I say that the ICOM 2720H is a *full-fledged* dual-bander, I mean it will receive *simultaneously* both VHF and UHF bands, plus all of the following:

- VHF/VHF in-band dual simultaneous receive
- UHF/UHF in-band dual simultaneous receive
- Automatic cross-band transceive

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

- Independent controls for each band
- Separate audio outputs for each band
- Equal-size left/right VHF/UHF LCD back-lit displays

Thus, this is what I mean when I tell you the ICOM we tested is indeed a *full-fledged*, dual-band mobile transceiver!

The 2720H ships from the factory with two mounting brackets and hardware, the big bracket to secure the body of the transceiver and the MB-84 remote-control head bracket to place the LCD control head just about anywhere in the vehicle you can easily see it for driving safety. Eleven and a half feet of ICOM separation cable is supplied for ample playing around with where you want to mount the LCD control head. (For those of you who would like to mount the head on the body of the 2720 itself, the optional MB-85 combination bracket gives you two additional mounting methods.)

Most of you will probably opt for using the cable and mounting the rig and the control head in different places. I suggest that you wire up the equipment and try different locations for the LCD control head in the bright sunlight, as well as in the dark, to figure out exactly *where* up high on the dash you want to mount it for ease of operation, easy viewing, and of paramount importance, driver safety to let you keep your eyes on the road ahead. The included remote-control bracket does not allow the head to swivel up and down, so it's best to check where you plan to mount the head for the very best viewing angle. With any fancy LCD display, some angles are better than others for seeing the very best contrast of black letters against the light background. You can see this with the equipment turned on, by slightly tilting the LCD display up, straight on, and then slightly down.

The transmitter puts out 50 watts on VHF and a little over 35 watts on UHF, so make absolutely sure you go with a mobile or base-station power supply that can handle at least 15 amps key-down for many, many minutes in case you're long-winded or you decide to operate as a net control. A built-in fan keeps the equipment cool on high-power transmit, but be certain to use only heavy-gauge red and black cables so

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## IC-2100H 25N 2M Mobile Transceiver

- Cool dual display • 50 watts
- CTCSS encode/decode w/tone scan
- Backlit remote control mic
- Mil spec 810, C/D/E\*1
- Auto repeater
- 113 alphanumeric memories

LOW PRICE



## IC-W32A Dual Band Transceiver

- 2M, & 70CM @ 5W
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- Auto repeater
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## IC-2720H Dual Band Mobile

- 2M/70CM
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- Dynamic Memory Scan (DMS)
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- AM aircraft RX
- 182 memories
- CTCSS encode/decode w/tone scan
- Remote head capable • Auto repeater

LOW PRICE



## IC-V8000 2M Mobile Transceiver

- 75 watts
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ICOM's IC-2720 true dual-band transceiver comes set up for separate installation of the radio and the control head, including an 11 foot separation cable and two separate mounts. A special mount for using the radio in one piece is an option. LCD contrast on the control head is at its best when tilted slightly down in relation to the viewer. (WB6NOA photos)

your wires don't start roasting. The 2720 comes with fused power cables that are long enough to go easily from under seat to your vehicle battery through a grommet-protected hole in the firewall. Don't even *think* of running this equipment off your accessory lighter plug!

ICOM includes its deluxe HM-133 full-function microphone with more buttons and bells than you will probably ever really need. It was good to see a radio that has all these features and a companion microphone that lets you work the features without having to reach over to the LCD face.

The ICOM dual-bander has a built-in duplexer, so a single SO-239 chassis connector accepts your dual-band antenna PL-259.

### Power Up!

We couldn't wait to get the unit powered up and see what the receiver was like in a heavy intermod environment, and how far out of band we could receive its rating of 118 MHz through 550 MHz, and public safety from 810 MHz through 999 MHz, cellular excluded.

We powered up the 2720 and adjusted both left and right squelch and volume controls; VHF initially showed up on the left side and UHF on the right side. You can select on which band you want to play around either off the microphone or in the upper left- or right-hand corner of the equipment push-buttons marked MAIN.BAND. The word "main" appears for the main band over the frequency on the display.

The first thing we noticed as we tuned around the 2 meter band was automatic repeater offset. This is great for newcomers. Since many repeaters throughout the country now require sub-audible tone or DTCS, we could easily get to the tone set-up mode by pushing SET. Push SET briefly several times to get

around to tone encode, which is illustrated as "rt" on the bottom of the display, and flashing "t" above the actual tone frequency. Now rotate the main-band knob for the tone encode of your choice. To enable tone decode, push the SET button one more time and notice CT in the lower portion of the display and "T SQL" flashing in the upper portion of the display. If your local repeater is using DTCS, push the SET button one more time to get to encode, and one more time for decode. You exit out of the SET mode by briefly keying the microphone or rereading the detailed instruction manual which says push "CLR A MW" to exit the set mode. I just hit the mic.

We found some really interesting things in the SET mode, such as:

- Four levels of display dimmer for nighttime use
- Display color amber or green
- Repeater tone encode
- Repeater tone decode
- Digital tone coded squelch code
- Digital tone coded squelch polarity
- Repeater offset other than normal
- Tuning steps
- Scan resume timer
- Channel skip setting
- Transmit and receiver narrow or normal setting
- Selection of AM for monitoring weather satellites
- Weather alert on or off
- Local oscillator normal or reverse

That last one, local oscillator normal or reverse, might allow you to reject interference or reduce image frequencies. We didn't find any noticeable birdies on receive, but if we did and if it was an interfering internal signal on a frequency of our choice, we would try the local oscillator shift to put it somewhere else.



The 2720's standard microphone comes with lots of buttons, letting you control nearly all major radio functions from the microphone.

On the wide/narrow set function, the wide setting that is factory default gives normal FM deviation on transmit and pass-band receive of 5 kHz. In the narrow setting, we could hear the audio become a little bit more pinched, and our transmit deviation was cut in half to 2.5 kHz, which our local repeater favors. As the 2 meter and 440 MHz bands become more congested, everyone should think about tightening up on transmit and receive deviation, and all you need to do is turn up the volume a little bit louder to easily hear a 3 kHz deviation from your particular "narrow" repeater.

### On-the-Air Testing

Our first test was running the equipment mobile in an area of heavy VHF/UHF action, including plenty of land-mobile transmitters outside the ham-band edges. The ICOM IC-2720H did a remarkable job of keeping out off-band squawks, tones, and chatter, with additional help from the squelch attenuator circuit, which may be turned on to select up to 10 dB of additional receiver attenuation.

This southern California test was repeated during my visit to New York City and Long Island during LIMARC's Ham Radio University in January. Throughout the city, VHF and UHF reception was still possible with just the



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SS-12	10	12	1 1/2 x 6 x 9	3.4
SS-18	15	18	1 1/2 x 6 x 9	3.6
SS-25	20	25	2 1/4 x 7 x 9 1/2	4.2
SS-30	25	30	3 1/4 x 7 x 9 1/2	5.0



MODEL SS-25M

**DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS**

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-25M*	20	25	2 1/4 x 7 x 9 1/2	4.2
SS-30M*	25	30	3 1/4 x 7 x 9 1/2	5.0



MODEL SRM-30

**RACKMOUNT SWITCHING POWER SUPPLIES**

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25	20	25	3 1/2 x 19 x 9 1/2	6.5
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**WITH SEPARATE VOLT & AMP METERS**

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3 1/2 x 19 x 9 1/2	6.5
SRM-30M	25	30	3 1/2 x 19 x 9 1/2	7.0



MODEL SRM-30M-2

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SRM-30-2	25	30	3 1/2 x 19 x 9 1/2	11.0

**WITH SEPARATE VOLT & AMP METERS**

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3 1/2 x 19 x 9 1/2	10.5
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- VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

**NEW SWITCHING MODELS**

- SS-10GX, SS-12GX
- 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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\*ICS - Intermittent Communication Service

# Go Mobile!

get there with  
**COMET**  
 & **Maldol**  
 HF/Multiband  
 Mobile Antennas

**Maldol NEW MH-511** • Tri-band 6M/2M/70cm HT Antenna  
 • Length: 4" • Conn: Male SMA

**Maldol MH-510** • Tri-band 6M/2M/70cm HT Antenna  
 • Gain: 0/0/3.2dBi • Length: 20.75" • Conn: Male SMA

**COMET HB-224** • Tri-band 2M/220/70cm HT Antenna  
 • Gain: 1.3/1.4/1.8dBi • Length: 11.5" • Conn: Male SMA

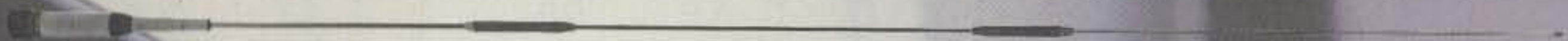
**Maldol MH-510** • Tri-band 2M/220/70cm HT Antenna  
 • Gain: 0/1.8/3.2dBi • Length: 14" • Conn: Male SMA

**NEW**



**NEW**

**Maldol NEW EX-510B/EX-510B NMO** • Tri-band 6M/2M/70cm with fold-over  
 • Gain & Wave: 52MHz 1/4 wave 146MHz 2.15dBi 1/2 wave 446MHz 5.5dBi 5/8 wave x 2  
 VSWR • Length: 37" • Conn: PL-259 or NMO style • Max Power: 50W FM

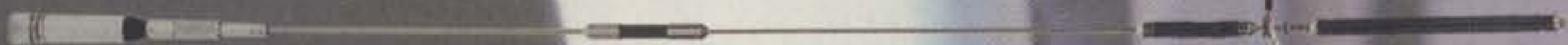


**NEW**

**COMET SB-18** • Tri-band 6M/2M/70cm with fold-over  
 • Gain & Wave: 52MHz 0dBi 1/4 wave • 146MHz 4.5 dBi 6/8 wave • 446MHz 7.2dBi  
 5/8 wave x 3 • Length: 58" • Conn: PL-259 • Max Pwr: 120W



**COMET NEW UHV-4** • Quad-band 10M/6M/2M/70cm with fold-over hinge  
 • Gain & Wave: 10M & 6M 1/4 wave 2M 2.15dBi 1/2 wave 70cm 5.5dBi 5/8 wave x 2  
 • Length: 55" • Max Power: 10M 120W SSB 6M/2M/70cm 100W FM • Conn: PL-259



**COMET UHV-6** • HF/6M/2M/70cm Mobile Antenna \*80/\*20/\*17/40/15/10/6/2M/70cm Mobile antenna with fold-over hinge  
 • Gain & Wave: 2M 2.15dBi 1/2 wave • 70cm 5.5dBi 5/8 wave x 2 • VSWR: HF 1.6:1 or less, 6M-70cm 1.5:1 or less • Length: 44" (min), 78" (max) • Max Pwr: HF 120W SSB, 6M 200W SSB/100W FM, 2M/70cm 100W FM • \*L-14 optional 20M coil • \*L-18 optional 17M coil • \*L-3.5 optional 75/80M coil • Features: • 6M/2M/ 70cm operation is constant. You CHOOSE the HF coils you want to add, up to four stock or optional. One vertical, the rest horizontal. • Easily mounts to standard trunk/door mount in minutes • Economical • Fold-over hinge built in  
 • Select the duplexer or triplexer for your specific radio(s). CF-706A, CF-530, CFX-514N.

**NEW**



**COMET UHV-6**  
 Fold-Over Position

**Maldol NEW HMC-05** • \*40/20/15/10/6/2/70cm Mobile antenna with fold-over hinge  
 • Gain & Wave: HF 1/4 wave 2M 2.15dBi 1/2 wave 70cm 5.3dBi 5/8 wave x 2 • VSWR: HF-6M 1.6:1 or less 2M/70cm 1.5:1 or less • Length: 66" • Max Power: HF 120W SSB 6/2/70cm 150W FM  
 \*AH-67 optional 40M coil

For a complete catalog, call or visit your local dealer. Or, contact NCG Company.

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**COMET BNC-24** • Dual-band 2M/70cm HT Antenna  
Gain: 2.15/3.5dBi • Length: 17" • Conn: BNC  
*Super flexible featherweight whip*

**COMET SMA-24** • Dual-band 2M/70cm HT Antenna  
Gain: 2.15/3.5dBi • Length: 17" • Conn: SMA  
*Super flexible featherweight whip*

**Maldol MH-209** (BNC Conn) • 2M/70cm Dual-band HT Antenna  
**Maldol MH-209SMA** (SMA Conn)  
Gain & Wave: 0 1/4 wave • Length: 3" Soft flexible rubber

# Go Mobile!

get there with

## COMET™

### & Maldol

## Dualband Antennas

**NEW**  
Challenger Series

COMET'S Newest Mobiles!  
Sleek, Super-Flexible,  
Dark Chrome Finish

**NEW**  
APEX Series

MALDOL'S Newest Mobiles!  
Bright Chrome and Brushed  
Aluminum Finish!

**NEW** **AX-50** • Dual-band 2M/70cm  
Gain & Wave: 2M 1/4 wave • 70cm 5/8 wave • Length: 21" • Conn: PL-259 • Max Power: 60W

**NEW** **AX-15** • Dual-band 2M/70cm w/fold-over  
Gain & Wave: 2M 1/2 wave center load 3.2dBi • 70cm 5/8 wave x 2 5.7dBi • Length: 30" • Conn: PL-259 • Max Power: 60W

**NEW** **AX-95** • Dual-band 2M/70cm w/fold-over  
Gain & Wave: 2M 1/2 wave center load 3.3dBi • 70cm 5/8 wave x 2 5.8dBi • Length: 38" • Conn: PL-259 • Max Power: 60W

**B-10/B-10NMO** • Dual-band 146/446MHz cellular look-a-like  
Gain & Wave: 146MHz 0dBi 1/4 wave, 446MHz 2.15dBi 1/2 wave • Length: 12" • Conn: B-10 PL-259/B-10NMO NMO • Max Pwr: 50W

**SBB-2/SBB-2NMO** • Dual-band 146/446MHz  
Gain & Wave: 146MHz 2.15dBi 1/4 wave, 446MHz 3.8dBi 5/8 wave center load • VSWR: 1.5:1 or less • Length: 18" • Conn: PL-259 or NMO Style • Max Pwr: 60W

**NEW** **EX-10/EX-10NMO** • Dual-band 146/446MHz  
Gain & Wave: 146MHz 2.6dBi 1/2 wave, 446MHz 4.9dBi 5/8 wave x 2 • VSWR: 1.5:1 or less • Length: 29"  
• Conn: PL-259 or NMO Style • Max Pwr: 100W

**SBB-5/SBB-5NMO** • Dual-band 146/446MHz w/fold-over  
Gain & Wave: 146MHz 2.5dBi 1/2 wave • 446MHz 5.5dBi 5/8 wave x 2 • Length: 39" • Conn: SBB-5 PL-259/SBB-5NMO NMO • Max Pwr: 120W

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

**NEW** **C757/C757NMO** Challenger Series • Dual-band 146/446MHz w/fold-over  
Gain & Wave: 146MHz 2.15dBi 1/2 wave, 446MHz 5.5dBi 5/8 wave x 2 • VSWR: 1.5:1 or less  
• Length: 38" • Conn: PL-259 or NMO Style • Max Pwr: 80W

**COMET NEW CP-5M/5NMO/3/8-24**  
Universal mount and coax cable combos.  
(SQ-239, NMO, 3/8-24/PL-259) Heavy-duty,  
adjustable RS-730 trunk/van/ SUV/truck  
door mount and deluxe cable assembly. 16'  
6" length w/18" mini RG-188A/U type coax.  
Max antenna 70".

**NEW** **C767/C767NMO** Challenger Series • Dual-band 146/446MHz w/fold-over  
Gain & Wave: 146MHz 3.5dBi 1/2 wave center load, 446MHz 6.0dBi 5/8 wave x 2 center load • VSWR: 1.5:1 or less  
• Length: 40" • Conn: PL-259 or NMO Style • Max Pwr: 80W



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*Gordo's review process includes a "bake test" in which he runs a radio key-down for an extended period—into a dummy load, of course—to test the effectiveness of its cooling system. He reports that the IC-2720 passed with flying colors (and was really tasty with chocolate icing! NO! Do NOT try this at home! Chocolate icing will void your warranty!).*

normal amount of hash heard in the background. Many New York City hams will tell you that it takes a very good receiver to pull in 2 meter or 440 MHz signals without getting hammered by 162 MHz weather frequencies and/or powerful paging transmitters at 152 and 157 MHz. With the wide-band receiving capabilities this equipment offers, I was impressed that it could stay locked into what we had tuned to in the first place!

Emergency communicators will appreciate simultaneous receive on VHF and UHF. I am a member of the United States Coast Guard Auxiliary, Flotilla 27, so I program our flotilla repeater just outside the 2 meter ham-band limits on the left display, and I program our Auxiliary marine VHF channel near 157 MHz on the right side. On UHF a ham could program a UHF repeater on the left side and simultaneously monitor public-safety

frequencies at 460 MHz on the right side. Occasionally a VHF or UHF simultaneous monitor creates a faint birdie in one of the bands, but this is quickly eliminated with the handy IF reverse option available in the SET mode.

### Beyond the Basics

For autopatch use there are 12 DTMF 24-digit memory channels that could also double as repeater or remote-base up and down codes. For packet, the 2720 offers a mini-DIN 6-pin connector to run at 9600 bps.

As for all those priority, scanning, searching, and sampling receive modes, the ICOM 2720 has them all! The very detailed instruction manual takes you through easy stuff—for instance, programming up to 212 memory channels or getting into more exotic modes such as breaking all of these

channels into 10 banks for selective scanning, band transfers, call channels, band scan, memory scan, program scan, band-edge searching, skipping scan channels, priority, and even some friendly beeps to let you know that someone is calling you specifically in the DTCS or CTCSS mode. ICOM even takes the weather channels and gives them weather alert plus their own specific memory slots, too.

Sure, you can do all of this button-pushing from the supplied full-feature microphone whose buttons you'll want to lock out so you don't accidentally hit a wrong button and put the radio in lala land. And just in case you do (as I did) get the radio into some strange mode, you can do a partial reset without having to dump all of your memory channels by following the simple instructions for getting things back to normal.

Of course, data cloning could allow you to transfer a friend's 2720 frequencies into your set in a flash. ICOM recommends the OPC-474 cloning cable which simply plugs into each speaker #2 jack. This particular cable, like the head separation cable, looks mighty similar to ones available at our local electronics parts stores in case you are on a tight budget.

You can also clone data from a personal computer using the optional CS-2720 cloning software and optional cloning cable OPC-478U, or 478 regular. Many pages in the instruction manual are also dedicated to 1200 bps and 9600 bps packet using either G3RUH or GMSK modes.

According to Pat Marcy, W7PZ, of ICOM America, other writers who were loaned 2720s were equally impressed with how well the equipment performed in downtown city intermod areas, and how relatively easy it was for beginners to get started programming all those channels without having to constantly refer to the well-illustrated instruction manual. She indicated I would favor the 2720 over my favorite, but no longer available, color LCD display IC-2800, and I must admit that being able to easily see the display in the bright sunlight and not get hammered with intermodulation was a big treat. I was very impressed with the unit's performance.

The suggested list price for the IC-2720 is \$479.99. For more information, visit your ICOM dealer or go to <http://www.icomamerica.com> for more technical specs on this *real* dual-band, heavy-duty, 2 meter/440 MHz transceiver. ICOM America, 2380 116 Ave. NE, Bellevue, WA 98004 (phone 425-454-8155). ■

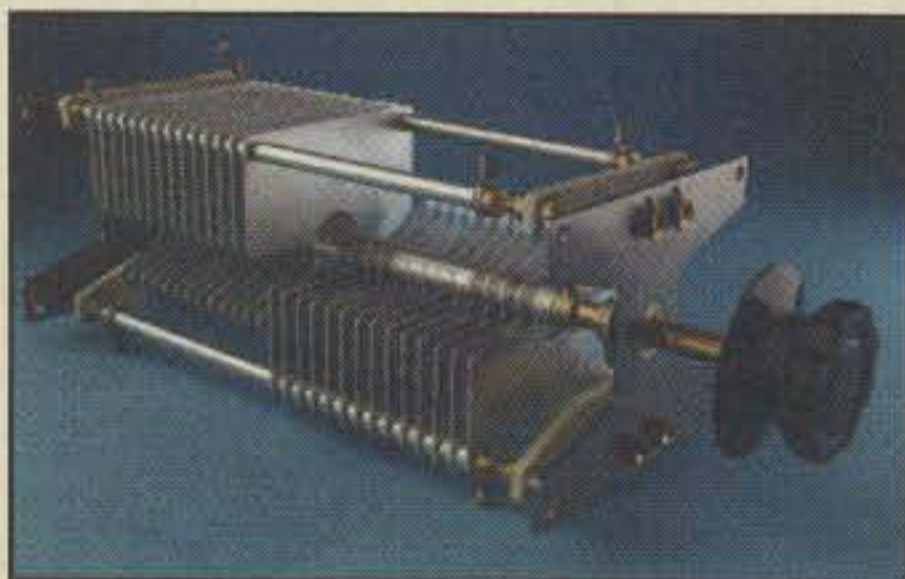
### Reader Feedback

Reader Jeff Goldman, K3DUA, writes:

With reference to the article on Antenna Tuners in the March 2003 issue of *CQ* magazine, there is an error in the caption of the picture on the top of page 56. The variable capacitor shown is truly a split-stator cap, but that is *not* what it would be called. It is a differential capacitor. A true split-stator cap has both sections of the cap doing the same thing as the shaft is rotated—that is, they both would change values at the same rate. The cap shown has one section increasing as the other section decreases with rotation of the shaft.

This differential cap is *not* the type that would be used in a balanced tuner; both halves of the cap need to tune in the same direction.

*Jeff: The caption states that "...balanced units will use differential or split-stator capacitors such as this one. ..." Thus, it seems that we are correctly identifying it as a differential capacitor, which according to both you and CO2KK is also a split-stator cap. So I'm not sure that there's a problem there. Now to the question of whether the differential cap shown is the right one for the job, I'm sure you are correct; CO2KK may have been limited to photographing the capacitors he had on hand. We regret any confusion. — W2VU*



# MFJ Apartment Antenna

Covers 40 thru 2 Meters . . . Mounts outdoor to windows, balconies, railings . . . works great indoors mounted to desks, tables, bookshelves



MFJ-1622 **New MFJ-1622 Apartment Antenna lets you**  
**\$99<sup>95</sup>** **New!** operate 40 thru 10 Meters on HF and 6 and 2 Meters on VHF with a single antenna!

Its universal mount/clamp lets you easily attach it to window frames, balconies and railings. It also works great indoors mounted to a bookshelf, desk, or table. It's not a 5 element yagi, but you'll work your share of exciting DX!

Highly efficient air wound "bug catcher" loading coil and telescoping 5 1/2 foot radiator lets you really get out! Radiator collapses to 2 1/2 feet for easy storage and carrying.

It includes coax RF choke balun, coax feed line, counterpoise wire and safety rope. Handles 200 Watts PEP.

Operating frequency is adjusted by moving the "wander lead" on coil and adjusting counterpoise for best SWR.

## MFJ Ground-Coupled Portable Antenna Base

Provides effective RF ground and stable mount for vertical antennas . . . Antennas radiate well with low SWR



MFJ-1904 **MFJ**  
**\$99<sup>95</sup>** **New!** Ground-Coupled Portable Antenna Base™ provides an effective RF ground 160 through 2 Meters and a stable mount for vertical antennas.

Capacitive coupling to ground is a time-proven principle. It needs no tuning and antenna radiates well and gives good SWR on all bands. Performance is similar to mobile stations when using a mobile antenna but is far better with longer antennas.

The base can support a lightweight multi-band vertical antenna -- like the all band Hy-Gain 18AVS and the bandswitching MFJ-1795 -- and provide a semi or permanent installation.

You can easily set up and take down vertical antennas for stealth operation and hide the base by covering it with dirt.

The MFJ-1904 is a 2x2 foot stainless steel square with reinforcing bends that greatly strengthens it. Folded and tapered six-inch stainless steel legs firmly anchor the MFJ-1904 into the ground.

Built-in antenna mount with SO-239 coax connector and two U-bolts lets you mount most standard and homebrew vertical antennas.

Standard 3/8-inch x 24 mobile mount is built-in for MFJ Mobile Whips, bug catchers, Hustlers and screwdriver antennas.

Two handles make carrying and removing the base fast and easy. You can also attach radials for improved performance.

## 33 Feet Telescoping fiberglass Mast . . .

Collapses to 3.8 feet, weighs 3.3 lbs.

Super strong fiberglass mast has huge 1 1/4 inch bottom section. Flexes to resist breaking. Resists UV. Put up full size inverted Vee dipole/vertical antenna in minutes and get full size performance!

MFJ-1910  
**\$79<sup>95</sup>**

## MFJ Vertical for Antenna Restricted Areas

40, 20, 15, 10 Meters, Automatic Band Switching Perfect for permanent or portable operation in antenna restricted areas. Hide behind trees, fences, buildings, in bushes -- only 7 to 10 feet tall (adjustable).

MFJ-1795  
**\$149<sup>95</sup>** **New!**

Low angle of radiation for DXing, omni-directional, handles 1500 watts PEP, low SWR.

Highly efficient end-loading. Entire length radiates.

Ground mounts with suitable ground such as MFJ-1904 Ground-Coupled Antenna Base, radials or ground rods. Or roof mount with radials.



## HF mini-Bugcatcher

Highly efficient 40 - 6 Meter base-loaded 5 1/2 foot Bugcatcher mobile antenna . . . Use light duty mounts Become an "HF Mobileer" almost instantly with this new MFJ high-efficiency mini-bugcatcher mobile antenna! Have tons of fun rag-chewing and DXing on the HF bands. Turn boring drives into fun-filled ham adventures.

MFJ-1624  
**\$79<sup>95</sup>** **New!**

Attach a simple mount to your vehicle (mounts: trunk lip, MFJ-347, \$39.95; mirror or luggage, MFJ-342, \$9.95; tri-magnet, MFJ-338T, \$19.95) . . . Screw in your MFJ mini-bugcatcher . . . Throw your rig into your car, plug into cigarette lighter and turn power down to 20 Watts (to avoid overloading your cigarette lighter; MFJ-1624 handles 300 Watts PEP). Operate!

Bugcatcher design uses large highly-efficient air-wound inductor -- far out performs other compact HF antennas. Exclusive built-in inductive matching network keeps SWR low. 5 1/2 foot whip collapses to 2 1/2 feet for easy storage and low garages. Base loaded for minimum wind load and light duty mounts. Change band by moving wander lead. 3/8x24 in. mount.

## MFJ Portable Antenna

MFJ-1621  
**\$89<sup>95</sup>**



Operate from apartments, homes, hotels, campsites, beaches or any antenna restricted area. Work all bands 40, 30, 20, 17, 15, 12 and 10 Meters.

DXCC, WAZ, WAC, WAS have been won with the MFJ-1621! Compact 6x3x6 inch cabinet has 4 1/2 foot telescoping whip, built-in antenna tuner, field strength meter and 50 feet coax. Handles 200 Watts.

## MFJ Super High-Q Loop

MFJ's tiny 36 inch diameter high-efficiency loop antenna performs like a full-size dipole! Operate 10 thru 30 MHz continuously -- including WARC bands!

Ideal for limited space -- apartments, small lots, motor homes, attics or mobile homes.

Mounts vertically or horizontally. Low angle radiation gives you excellent DX.

Super easy-to-use! Remote control auto-tunes to desired band, then beeps. No control cable needed. Handles 150 watts.

Fast/slow tune buttons and built-in two range Cross-Needle SWR/Wattmeter lets you quickly tune to your exact frequency.

All welded construction, no mechanical joints, welded butterfly capacitor with no rotating contacts, large 1.050 inch diameter round radiator -- gives you highest possible efficiency. Heavy duty thick ABS plastic housing has ultraviolet inhibitor protection.



## Free MFJ Catalog

Visit: <http://www.mfjenterprises.com> or call toll-free 800-647-1800

• 1 Year No Matter What™ warranty • 30 day money back guarantee (less s/h) on orders direct from MFJ

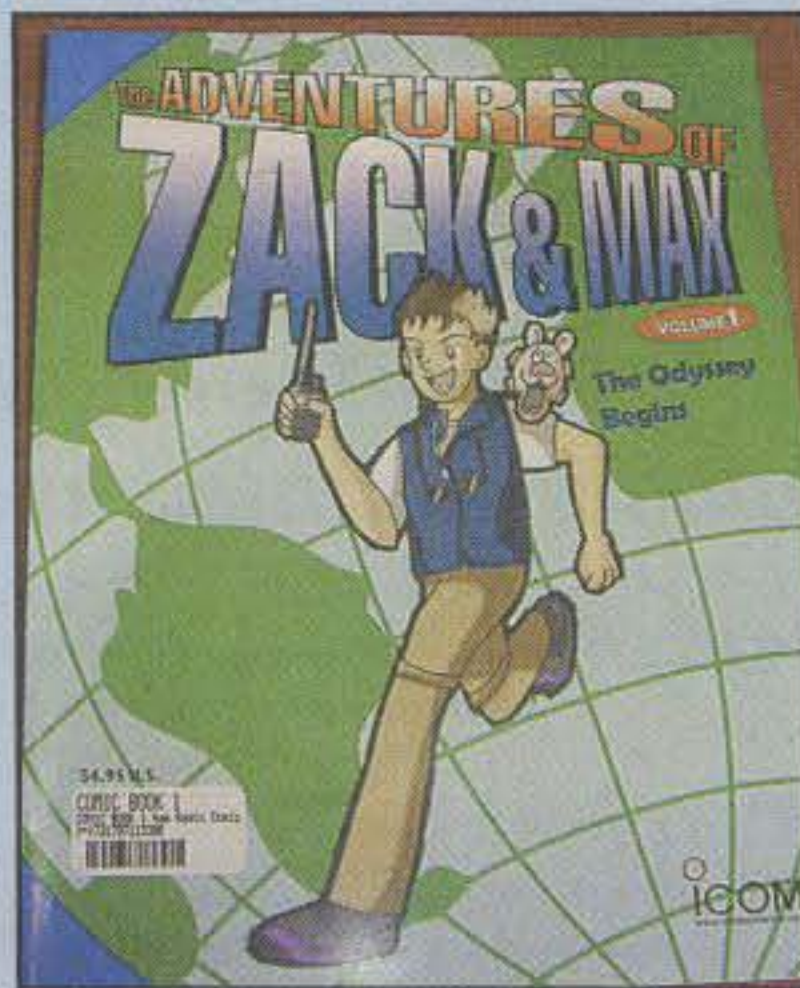
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FAX: (662) 323-6551 8-4:30 CST, Mon.-Fri. Add shipping. Prices and specifications subject to change. (c) 2001 MFJ Enterprises, Inc.

<http://www.mfjenterprises.com> for instruction manuals, catalog, info



ICOM's ID-1 hooks up to a computer via a standard Ethernet connection and runs 128 kbps data as well as analog and digital voice.



The Adventures of Zack and Max is a 21st-century ham radio comic book featuring Japanese "anime" cartoon styles and aimed at young teens. It's produced by and available from ICOM America.



The IC-703 is ICOM's entry into the backpack radio market. The head is detachable and ICOM even offers a custom-designed backpack with special pouches, slots for cable pass-throughs, and even a rain covering.

## Dayton Sneak Preview

Once again this year, several manufacturers took advantage of mid-winter hamfests to preview new models before their "official" introduction at Dayton this month. Here's what we saw at Charlotte:

### ICOM

ICOM America previewed two new radios at the Charlotte Hamfest, the digital ID-1 and the backpack-ready IC-703. While a prototype of the ID-1 was on display last year at Dayton, the ICOM folks had two complete working stations set up in Charlotte.

The ID-1 is a 1270 MHz radio that does analog voice, digital voice, and data at 128 kb/sec via a standard Ethernet port on a computer. This is 10 times faster than 1200 baud packet and essentially lets you operate a 10 watt (1 watt low power) wireless network. Tied into a D-Star repeater, the ID-1 can be a port on a wide-area wireless network. The digital voice quality was excellent, and while the software on the demo rig had an 8 kHz bandwidth for digital voice, the production models planned to roll out at Dayton will feature a 4.8 kHz DV bandwidth with the potential for compression to 3 kHz in the future for HF use. When the radio is in digital voice mode, it also sends out a data packet with each transmission, including the sending station's callsign and other customizable information. This appears on the other radio's control panel. The radio is controllable via either a detachable front panel (separation cable is an option) or a virtual front panel on your computer (via a second, USB, connection). Possible uses suggested so far by testers have included multi-window ATV, streaming video, experiments with weather balloons, and live Doppler radar for SKYWARN activations. No price had been set as of Charlotte.

The IC-703 is ICOM's entry into the backpack HF market, and it even comes with an optional backpack that's custom-designed for carrying the radio and operating while on foot. There's a special pouch on the ICOM backpack for the removable front panel, so you can bring that around in front of you while wearing the radio on your back! The 703 will

operate at either 5 or 10 watts, depending on the supply voltage. The radio constantly monitors power supply voltage, and if it drops below 11 volts DC, automatically drops into low-power mode. There will be two models available; one covers HF only (160–10 meters) and the other includes HF plus 6 meters. Both include a built-in automatic antenna tuner, but at the expense of an internal battery pack. They'll sell you an external battery or you can supply your own. The receiver includes the same DSP (digital signal processing) circuitry found on the IC-706, and there is no drop in audio level when the radio shifts from high to low power. ICOM planned to have the IC-703 available by the end of March, but did not have a price set as of the Charlotte Hamfest.

ICOM also introduced a new ham radio comic book, *The Adventures of Zack and Max*, which it will make available to clubs, schools, and individuals for promoting amateur radio to young people. Using the popular Japanese "anime" style, the book brings ham radio comics into the 21st century.

### Yaesu

Yaesu's new FT-857 was actually introduced at Orlando, but it was generating a lot of interest at Charlotte as well. Most likely a successor to the FT-100D, Yaesu says the 857 is the world's smallest HF/VHF/UHF mobile transceiver, at just over 6" x 9" x 2". Despite the tiny size, it puts out 100 watts on HF and 6 meters, 50 watts on 2 meters, and 20 watts on 70 centimeters . . . sort of a cross between the larger FT-897 and the backpacking FT-817. The 857 also features a detachable front panel (separation cable is an add-on), plus DSP on both receive and transmit audio. It includes a built-in CW keyer and offers an external automatic antenna tuner as an option. The wide-coverage receiver tunes 100 kHz–56 MHz, 76–108 MHz, 118–164 MHz, and 420–470 MHz. You can even choose among 32 different background colors for the LCD screen!

### Alinco

Alinco introduced its new DR-620 dual-band mobile radio at



Yaesu's FT-857 is small enough to fit into a backpack, but it's a full-featured 100 watt HF/VHF/UHF all-mode radio designed primarily for mobile and portable use.



The Alinco DJ-620 is a new dual-band FM mobile rig with options for digital voice and for 1200/9600 baud packet, and includes a direct input for a GPS receiver with the packet option.



The RIGblaster Pro from West Mountain Radio is an all-in-one audio box that includes traditional RIGblaster support for sound card digital modes, plus a built-in speech processor and much more.

Charlotte. With a maximum of 50 watts out on 2 meters and 35 watts on 70 centimeters (both bands offer 10 watt and 5 watt levels as well), the radio is a true dual-bander in that you can monitor both VFOs at the same time, configured as VHF/UHF, VHF/VHF, or UHF/UHF. The sub-band audio mutes on transmit, preventing the annoyance of a loud signal suddenly popping up on your second band while you're talking on the first. Like many of Alinco's recent radios, the DR-620 offers a digital voice option, although the 620's digital voice format is *not* compatible with that of previous Alinco models (the company says the audio quality is much better). The radio also offers narrow FM ( $\pm 2.5$  kHz deviation), which is coming into use on a growing number of repeaters in crowded areas. There's also an optional TNC unit which gives you 1200 and 9600 baud packet capability, along with a direct GPS receiver input for APRS (Automatic Position Reporting System) use. (*When is somebody just going to build the GPS receiver into the radio? My \$15 digital cell phone has one!*)

Frequency stability is helped by a temperature-compensated crystal oscillator (TCXO). The receiver has broad coverage, including the FM broadcast band, 108–174 MHz and 335–480 MHz. There's some interesting military and other federal communications you can monitor in the 300 MHz range, commonly found on scanners but a rarity in ham rigs.

### RIGblaster Pro

West Mountain Radio brought its new RIGblaster Pro to both Orlando and Charlotte. This "big brother" of the original and very popular RIGblaster digital-mode interface units includes built-in rig control (for computer-controllable radios), built-in speech processor, and digital voice recorder (using the computer's sound card), four different ways to configure receive audio, and of course, all the connections and switching that you need for using sound-card-generated digital modes with your HF or VHF radio. (Watch for a review in an upcoming issue of *CQ*.)

### Mini Motorized HF Mobile Antennas

Both Tarheel Antennas and Hi-Q have introduced small versions of their popular motorized HF mobile antennas, small

enough to sit securely on a trunk-lip mount or a heavy-duty magnet mount (the type with three big magnets). Tarheel had its "Little Tarheel" on display at Orlando and Charlotte and sold out at both shows. See WB6NOA's article elsewhere in this issue for more on this new generation of HF mobile antennas.

At the Orlando hamfest, High Sierra introduced its "Derringer" base antenna, a combination of two horizontally-mounted motorized antennas that gives you a very low-profile tunable dipole.

### MFJ

MFJ has rolled out several new items, mostly in the category of antennas and antenna accessories. There's a new discone antenna (MFJ-1868), which transmits on 50, 144, 222, and 440 MHz, and receives anything from 25–1300 MHz; a quad-band fiberglass base antenna for 50, 144, 222, and 440 MHz; a tri-band FM mobile antenna for 2, 220, and 440 (MFJ-1434); the MFJ-1819 portable antenna stand; the MFJ-267 1500 watt dry dummy load and wattmeter; and the Ameritron RCS-10L, an 8-position remote coax switch with built-in lightning protection.

### And Finally...

While AOR wasn't at either Orlando or Charlotte, when I came back to the office, I found one of their new AR-8200 MkIIIB handhelds waiting on my desk to be reviewed. This is a receive-only radio, but it covers 530 kHz to 3 GHz (cellular blocked) with *all modes*, including SSB, CW, wide, narrow and super-narrow FM, and wide and narrow AM. According to AOR, it's the world's first all-mode handheld receiver with this breadth of frequency coverage. I'm looking forward to getting it home, charging it up, and using the optional PC interface to download computer-control software from the AOR website.

It's likely that other manufacturers will be introducing additional new models at Dayton, so keep your eyes open if you're there; and if you're not, keep watching the pages of *CQ* for announcements, ads, and reviews.

— W2VU

# The Columbia Search: Lessons Learned

In last month's column we reported on the amateur radio response to the search and recovery of debris from the Space Shuttle Columbia. Amateur radio participation was ending as we went to press. This month we'll take a look at some of the important points learned. Later we'll look at hams preparing for the worst and raising awareness at the same time.

On February 1, 2003 the calm of an early Saturday morning was shattered in much of Texas by an explosion at 8:15 AM Central Time. Within five minutes a local net was operational. By 9:00 AM 18 Nacogdoches ham radio operators were involved with the initial assessment of the situation. For the next two weeks amateur radio operators would be serving in the public interest. The following are excerpts from comments made during an on-the-air debriefing of the operation.

## Figuring Out What To Do

In most disasters you can define the area that is affected by the emergency. A plane crash is normally a localized event. However, Columbia was traveling faster (12,500 miles per hour) and higher (203,000 feet) than any commercial aircraft. Kevin Anderson, KD5CCH, was in charge of support operations in Nacogdoches.

"All day Saturday was spent determining the extent of the debris in the three county area. Sunday was more reactionary with people calling in with debris," said Anderson. "The Feds were rolling in and plans were being made as to how to proceed. We jumped in with the locals; we still had no idea as to the extent of the services we were going to be asked to provide. As the Feds rolled

in, they very quickly found out that they couldn't operate over the area they had to cover. Their communications were very limited. The only thing that was truly reliable was ham radio. We had someone shadowing all of the main officials."

## Demands were Extensive

There was a need to manage the large number of hams who were volunteering to help. How do you get sufficient help without having too much help? The needs and the terrain changed hourly. Those hams who volunteered showed up with the best attitudes. The local hams were working with little sleep and were reacting to the needs of the moment. Everyone went with the flow.

"People were riding with the Department of Public Safety, the FBI, and the National Transportation Safety Board, and walking in the woods," Anderson continued. "The hams worked with teams that were identifying debris locations by using GPS. During the course of the day they could be told to go back and locate a particular object and then go back to locating debris. Overall 188 different hams assisted in Nacogdoches. The hams drove over 60,000 miles in their personal vehicles and logged 5500 man hours."

According to Anderson, the hams got a lot of commendations from the Incident Commander and many of the agencies on the scene. "The one word that was used the most was 'professional.' Everyone conducted themselves in a very professional manner and pitched in and did the best they could."

## Key Points Identified

During the critique, several participants offered comments about their experiences during the search. Each comment makes an important point from which all of us can learn when we're called

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

*Amateur radio operators worked with local and federal officials to locate pieces of the shuttle debris. Here the Columbia nosecone is removed from the woods. (FEMA News photo by Mark Wolfe)*



*"At a time when many critics are claiming that amateur radio is archaic and irrelevant, operators using normal ham equipment as well as Wireless Internet, Echolink, and APRS demonstrated that the technical capabilities of amateur radio hobbyists remain uniquely capable of meeting real world communication needs in the 21st century."*

*... Jim Lawyer, AA5QX*

to serve. The single most important point that operators mentioned in their comments was to be prepared.

Richard Miller, KD5PXM, said, "We didn't know what we were going to do, but we did know where to go and what frequencies to use and that was very helpful. We took our own maps and were able to navigate around without needing to ask for directions, and that proved to be very helpful."

Nancy McCain, K5NLM, said, "I promise never to get in another (state) trooper's car again without my own map, regardless of what my assignment is. Other operators indicated that having land navigation skills was a plus."

It is important to be familiar with your gear before you get to the disaster. Gordon Gremillion, K5LTC, said some people bought or borrowed GPS equipment, but didn't know how to use it or program it before they took it into the field. Many of the state and federal officials were not familiar with the area.

Equipment setup was also a problem at times. "Many of the Red Cross vehicles have fiberglass bodies, so setting up an antenna was a challenge," said Doug Kildore, KD5OUG. "I wound up using a metal door frame to mount my magnetic mount antenna."

Paul Newman, KA5TYW, commented that the field relay teams had two operators with them, and in many cases a third operator would have been useful to deal with people who walked up with questions. "Many times there were simultaneous calls from operators in the field and from net control," said Newman. "Having two operators allowed those calls to be handled in a timely and efficient manner."

### Management and Informational Tools

Management and informational tools come in all forms, including paper and electronic. The key is to have a method

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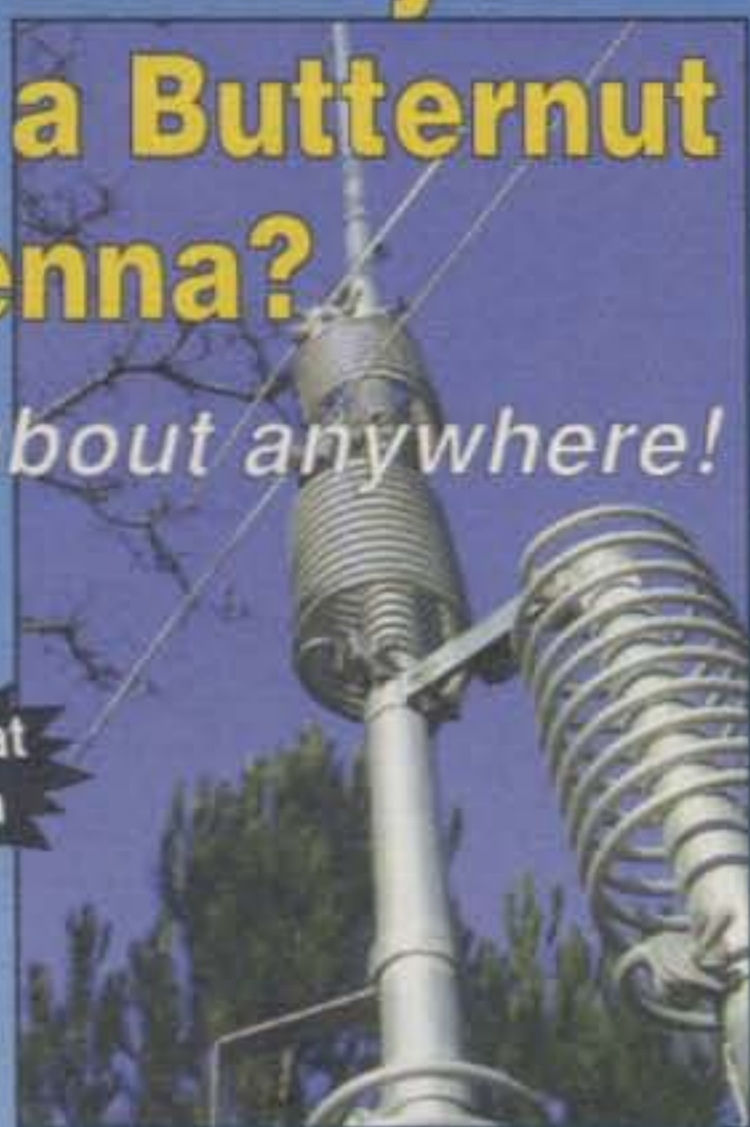
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Captain David Tennesen, NL7MT, a hurricane-hunter aircraft pilot, describes the importance of amateur radio as he flies into and out of the hurricane. (Courtesy of W4EHW Staff)



Hurricane Specialist Stacy Stewart of the National Hurricane Center says surface reports collected via ham radio are used by forecasters to augment their advisories. (Courtesy of W4EHW Staff)

to manage the situation. Paul, KA5TYW, suggested that all radio communications/messages should be logged. He explained that many times the ability to refer to logs ensured that information being passed was not a duplicate of a previous message, but new information. Kevin, KD5CCH, said there were a number of incidents when there were multiple sensitive items located about the same time and the logged messages kept it all straight. Plus, he added, "Having information logged builds confidence in our ability to operate at the level of other professionals."

Daily briefings were extremely useful for providing operating frequencies, procedures, and assignments. With information changing daily, the operators needed to follow the instructions given in these briefings. "Most operators came well prepared, but some didn't and just couldn't be used," said Anderson. "It is imperative that operators find out what is needed and come prepared to work."

Managing volunteers was a major task. Tim Lewallen, KD5ING, said "Many people were receiving e-mails from people wanting to volunteer. There was no one uniform way to volunteer nor one contact point." Identifying a source to get out the latest information was important. Here the ARRL Section Web Page was used. Another possibility would be to establish an e-mail alias to handle vol-

unteer inquiries. As the dynamics of the event changed or the coordinator changed, the address to which the alias was being forwarded could be changed as necessary. Several individuals are working on sign-up utilities and on-line databases to manage resources for at least a 48 hour period.

With the dynamics of the operation changing frequently, along with the needs of so many agencies, the coordinators needed a method to manage the requests and the resources. High-speed wireless internet technology added an enormous resource to the command operations. Bill Fell, KK5PB, said it provided e-mail, weather, and other information capabilities.

### EchoLink's Contribution

Many volunteers traveled from areas where they could not hear the local repeaters that were being used for the operation. Johnny Davis, Jr., K5JD, said "Echolink provided direct contact between the affected area and the remote support operations. Re-transmitting net audio in remote cities generated awareness of the operation and the nature of the operation's needs. Hearing 'local' operators from the remote cities formed a tie to the event and stimulated additional volunteering of operators. Real-time retransmitting (of) net audio gave the event immediacy and relevancy to those who listened

*"I know that if we have a major problem and I make a distress call on our HF Ham Radio, as many as 50 people may hear our coordinates." . . . Captain David Tennesen, NL7MT, a hurricane-hunter aircraft pilot.*



and increased awareness of amateur radio's role in disasters. It also encouraged self-evaluation by listening hams of their own preparedness for such an event." (Only a small portion of the traffic was on the repeater hooked to EchoLink.)

"At a time when many critics are claiming that amateur radio is archaic and irrelevant," said Jim Lawyer, AA5QX, "operators using normal ham equipment as well as Wireless Internet, Echolink, and APRS demonstrated that the technical capabilities of amateur radio hobbyists remain uniquely capable of meeting real-world communication needs in the 21st century."

The time to prepare is *before* a disaster hits. One operator commented that everything he needed in the east Texas operation was covered in the ARRL Emergency Communication courses. "It was tiring (and) uncomfortable," said Mike Heskett, WB5QLD, "but a very rewarding experience."

### Planning for Weather Woes

Severe weather season is upon us. Spring is tornado season in the Midwest; hurricane season begins May 15 in the western Pacific and June 1 in the Atlantic. In order to be prepared for this year's hurricane season, W4EHW, the amateur radio group at the National Hurricane Center, recently hosted its eighth annual conference. Representatives from the Hurricane Watch Net, various local and state emergency agencies, and operators from the U.S., Jamaica, St. Lucia, the Bahamas, the Cayman Islands, the U.S. Virgin Islands, and Bermuda were in attendance.

Operators at the NHC gather real-time weather reports from stations in a hurricane's path. This information is then given to the hurricane forecasters. Julio Ripoll, WD4JR, Assistant Amateur Radio Coordinator at the National Hurricane Center, explained that even though scientific data is being gathered by satellites, air reconnaissance, and sometimes radar, these "surface reports" are very important, as they give the forecasters a better understanding of what is actually happening at the ground level. "Many times the data collected via ham radio fills in gaps where no other data was available at that time," said Ripoll. "The descriptions from stations in the affected areas also give a human aspect to otherwise scientific numbers."

Last year W4EHW was on the air for over 140 hours and collected over 300 reports. Ripoll said operators at the NHC collected information from the Hurricane



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Massachusetts hams will raise awareness about missing children with a special event station on May 26. (Courtesy of Sheree Greenwood, KB1HLZ)

Watch Net on 20 meters and various Caribbean 40 meter nets, and for the first time they used the IRLP VHF/UHF repeater network. This past season bilingual operators played a major role due to the location of Hurricanes Lili and Isidore over Cuba and the Yucatan Peninsula. Other topics included the CARMEN Project and the Citizen's Weather Observers Program.

CARMEN is the Caribbean Amateur Radio Meteorological Emergency Network, and its purpose is to increase the quantity and quality of measured weather reports from the Caribbean islands and Central America. Donated weather-measuring equipment is given to qualifying amateur radio stations in selected areas. The Citizen's Weather Observers Program, which is sponsored by NOAA, uses automatic weather data gathered from APRS stations and non-ham weather enthusiasts via the internet. Mike Pilgrim K5MP, net manager of the Hurricane Watch Net, explained how the HWN Net Control Stations are located in different parts of the country in order to accommodate propagation changes during a hurricane operation. By doing this, the HWN makes sure that the stations in the affected area are being heard and their information can be relayed to NHC.

Captain David Tennesen, NL7MT, a hurricane hunter aircraft pilot, described the importance of amateur radio as he flies into and out of a hurricane. He explained that he has become a "connoisseur of turbulence" after years of flying through hurricanes. During his flights he experiences gravitational force (G-

Force) readings between  $-0.5$  G and 3.5Gs.

"Ham radio serves a vital backup link to NHC, if other means of communications fail," he said. "I know that if we have a major problem and I make a distress call on our HF ham radio, as many as 50 people may hear our coordinates." This is why one of the two HF radios on board is dedicated to ham radio.

### What's New for 2003?

Hurricane computer models continue to improve, allowing the NHC's three-day forecasts to be replaced this year by a new five-day forecast. However, NHC Hurricane Specialist Stacy Stewart told the group that surface reports collected via ham radio are still used by forecasters to augment their advisories.

Next month a new callsign will be used at the National Hurricane Center. Starting June 1 the ham station there will be WX4NHC instead of W4EHW. This is following a national trend of weather-related stations using the WX prefix. Ripoll believes this "will give us better on-the-air recognition, as WX is understood to mean weather and NHC is well known as National Hurricane Center."

### News & Notes

**Armed Forces Day.** This month marks the 53rd anniversary of the Armed Forces Day Military/Amateur Crossband Communications Test. The event will take place on May 10 so as not to conflict with the Dayton Hamvention® the following weekend. One noticeable difference this year is that military stations in other countries will not be participating in the event because of their support of military operations around the world.

The annual celebration will feature the traditional military-to-amateur crossband communications SSB voice test and the Secretary of Defense message receiving test. Bill Sexton, Public Awareness Coordinator for Army MARS, said, "These tests give amateur radio operators and shortwave listeners an opportunity to demonstrate their individual technical skills and receive recognition from the Secretary of Defense and/or the appropriate military radio station for their proven expertise. QSL cards will be provided to those making contact with the military stations. Special commemorative certificates will be awarded to anyone who receives and copies the digital Armed Forces Day message from the Secretary of

Defense." Further information, including stations and frequencies, can be found at: <http://www.netcom.army.mil/MARS>.

**Missing Children.** Later this month Massachusetts amateurs will try to bring new attention to the plight of missing children when they operate a special event station on May 26th. Radio Operators for Missing Children, KB1HGK, will be on the air from 11 AM to 4 PM Eastern Time. The event is sponsored by several missing children's organizations, businesses, and the Central Massachusetts Amateur Radio Association.

Sheree Greenwood, KB1HLZ, event coordinator, told CQ that they "hope to bring attention to the over 2300 children who are reported missing each day." They will be operating from West Brookfield, Massachusetts on 7.225, 14.250, and 21.325 MHz. Greenwood feels that radio operators are in a unique position to get the word out over significant distances, possibly saving the life of a child. She said, "When minutes count, ham radio can make a difference."

**ARRL Helps You Tell Our Public Service Story.** The ARRL's new video, *Amateur Radio Today*, showcases the public-service contributions made by hams throughout the country. Narrated by former CBS news anchorman Walter Cronkite, KB2GSD, the video highlights ham radio's response on September 11, 2001; ham radio's part in helping various agencies respond to wildfires in the western U.S. during 2002, and ham-radio-in-space educational initiatives. *Amateur Radio Today* is ideal for presentation at clubs, government meetings, civic organizations, and any other venue where you want to vividly illustrate what amateur radio has to offer the public. However, it may not be broadcast. The video can be downloaded from the ARRL website or ordered from the League on a CD or VHS tape.

### With Thanks

As always, this column would not be possible without input from you, the readers. I would like to thank Jim Lawyer, AA5QX; Julio Ripoll, WD4JR; Bill Sexton, N1IM; Sheree Greenwood, KB1HLZ; and the ARRL for providing information for this month's column.

Next month is Field Day. Have you thought about how you are going to promote amateur radio public service? Do you have a story to tell? Drop us a note. Until next time . . .

73, Bob, WA3PZO

# Reader Survey

## May 2003

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

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

Since this month's issue is a mobile special, we wanted to learn more about your mobile operating habits.

Please indicate...

Circle Survey  
Card #

1. ... whether you operate amateur radio from any non-fixed location:
- |           |   |
|-----------|---|
| Yes ..... | 1 |
| No .....  | 2 |

**Please answer the remaining questions only if you answered "yes" to Question 1.**

2. ... the approximate percentage of your operating time away from a fixed location:
- |              |   |
|--------------|---|
| 0-25% .....  | 3 |
| 26-50% ..... | 4 |
| 51-75% ..... | 5 |
| 76-99% ..... | 6 |
| 100% .....   | 7 |
3. ... which bands you operate while mobile (select only one):
- |                      |    |
|----------------------|----|
| HF only .....        | 8  |
| VHF/UHF only .....   | 9  |
| HF and VHF/UHF ..... | 10 |
4. ... which modes you operate while mobile (select all that apply):
- |                               |    |
|-------------------------------|----|
| FM voice .....                | 11 |
| SSB voice .....               | 12 |
| CW .....                      | 13 |
| Digital (other than CW) ..... | 14 |
| Amateur TV .....              | 15 |
| Other .....                   | 16 |
5. ... where you operate while mobile (select all that apply):
- |   |    |
|---|----|
| In a car or other passenger vehicle .....       | 17 |
| In a truck or other commercial vehicle .....    | 18 |
| On a bicycle .....                              | 19 |
| On a motorcycle .....                           | 20 |
| On a boat/ship .....                            | 21 |
| On a bus or train .....                         | 22 |
| On an airplane .....                            | 23 |
| On horseback or other live transportation ..... | 24 |
| While walking on roads/streets .....            | 25 |
| While hiking on trails, etc. ....               | 26 |
6. ... whether your mobile station is (select all that apply):
- |  |    |
|--|----|
| Permanently installed in a motor vehicle ..... | 27 |
| Temporarily installed in a motor vehicle ..... | 28 |
| Permanently installed on a bicycle .....       | 29 |
| Temporarily installed on a bicycle .....       | 30 |
| Handheld .....                                 | 31 |
| Backpack-carried .....                         | 32 |
| Other .....                                    | 33 |

Thank you for your responses. We'll be back with more questions next month.



### What You've Told Us...

Our March survey asked about operating awards, and while more than half of you (56%) said you do **not** consider yourself to be an award-chaser (40% said yes and 4% had no opinion), a nearly equal number of you have at least one operating award: 55% of you hold the Worked All States award, followed by 49% with DXCC (DX Century Club), 46% with Worked All Continents, and 23% with Worked All Zones. After that it drops off sharply, with 11% holding *CQ*'s WPX (prefixes) award, 10% with the *CQ* DX award, 9% with the USA-CA (counties) award, 7% with the "Worked 100 Nations" (W-100-N) award, and 6% each with VUCC (VHF/UHF Century Club) and IOTA (Islands On The Air) awards.

Awards and award-chasing are considered an important part of amateur radio, even by many of you who don't consider yourselves to be award-chasers, with 68% agreeing with that statement, 25% disagreeing, and 6% with no opinion. Those of you who have reached the top level of an operating award (honor rolls, etc.) are an elite few—only 16% of those responding to the survey have achieved this goal with at least one award; 74% have not; and 6% don't keep track.

The greatest number of you (34%) uses a variety of operating methods and activities to make contacts needed for award credit. Among the other options for a primary method of making these contacts, 16% of you said general operating; 13% said contests; 4% rely on DX clusters via the internet (2% prefer clusters via radio); 3% DXpeditions; and 1% each depend on DX award nets and "other" to snag those contacts.

Finally, a majority of you (53%) rely on magazine award columns to inform you about available awards, followed by 32% who say they don't chase awards, then by 8% "other," 7% World Wide Web, 5% other hams/off-air, and 3% other hams/on-air.

This month's free subscription winner is John Good, W1GS, of Londonderry, New Hampshire.



## is #1 at Dayton Hamvention!

**CQ is moving to a new booth at this year's Dayton Hamvention®—Booth #1 in the main arena, across from ICOM and MFJ. Just look to your right as you enter the main arena from the lobby . . . that's where we'll be! We're #1!**

## WRC-2003 to Consider Six Options for 40 Meters

**W**hat to do with 40 meters? This is one of the items up for consideration at this summer's World Radiocommunication Conference (WRC-03) that is of great interest to amateurs all over the world. As any ham who currently tries to operate on 40 meters at night knows all too well, there's a big problem on the band and the problem is this: Only 7000–7100 kHz is allocated worldwide to the Amateur Radio Service. Only International Telecommunications Union (ITU) Region 2—North and South America—has an amateur allocation stretching up to 7300 kHz. In the rest of the world 7100–7300 kHz is an international broadcasting allocation (41 meters). This means that there's shared CW and voice usage of the 7000–7100 segment by hams in Europe, Africa, and Asia, much to the displeasure of CW operators in the Western Hemisphere; and tremendous interference on 7100–7300 between hams in Region 2 and broadcasters in Regions 1 and 3. In addition, hams trying to work DX on 40 must often resort to "working split," listening on one frequency and transmitting on another, resulting in greater interference potential (from not hearing if anyone else is on your transmit frequency) and inefficient spectrum use (using two frequencies for a contact instead of one).

Amateur radio representatives have tried to get a possible realignment of the 40 meter allocations considered at past WRCs and finally got it on the agenda for this one. The options that will be presented to the delegates for consideration at WRC-03 were developed at last fall's Conference Preparatory Meeting (CPM). Countries may make other proposals, but the CPM options will be the starting point.

On the question of what to do about 40 meters, the CPM came up with five different ways to change things, along with a sixth option of leaving things as they are now. Two of the five methods would provide the worldwide 300 kHz amateur allocation that the International Amateur Radio Union (IARU) is seeking. All six maintain the existing 300 kHz exclusive amateur allocation in ITU Region 2—North, Central, and South America.

The output of the Conference Preparatory Meeting is a huge technical report that is more than 700 pages long. The CPM Report addresses each WRC-03 agenda item and contains different options along with the advantages and disadvantages of each for satisfying the item.

Fourteen pages of the CPM Report specifically deal with Agenda item 1.23, the possible realignment of the 7 MHz amateur and broadcasting allocations. (For more on the CPM and other amateur radio issues, see last month's "Washington Readout.")

### Background

The need for a realignment of the amateur and broadcasting allocations has been apparent for a number

of years. Until 1938 the 7000–7300 kHz band was exclusively allocated to the Amateur Service on a worldwide basis. Over the next 20 years, though, conditions in Europe and Asia gradually led to a reduction in Amateur Service spectrum to 7000–7100 kHz in ITU Regions 1 and 3. This change became effective at WRC-59. The Region 2 allocation remained unchanged at 7000–7300 kHz.

Three decades later, in 1990, a study on "Compatibility Considerations Arising From the Allocation of Spectrum to HF Broadcasting" concluded that "...the sharing of frequency bands by the Amateur Service and Broadcasting Service is undesirable and should be avoided, because of system incompatibility between Broadcasting and Amateur." The study also said that:

(a) the entire 300 kHz amateur allocation is required in Region 2 for the Amateur Service,

(b) some movement in frequency of the allocation to the amateur services around 7 MHz may be acceptable,

(c) a reduction of the amount of contiguous spectrum allocated to the Broadcasting Service in the 7 MHz band is unacceptable to broadcasters, but there is flexibility with regard to the actual location of this band, and

(d) some sharing between the Amateur Service and the Fixed/Mobile Service may be possible.

The 2003 CPM Report said, "For the Amateur Service, the usefulness of the allocations around 7 MHz for worldwide links is limited because only 100 kHz of spectrum between 7000 and 7100 kHz is common to Region 2 and Regions 1 and 3."

"Given the large disparity in signal levels between the two services," the report continued, "broadcasting transmissions cause interference to the sensitive receivers used in the Amateur Service during periods of good propagation between Regions 1 and 2. The degree of interference experienced in Region 2 varies with the time-of-day, season, solar activity, and distance from broadcasting stations in other regions."

### Six Possible Solutions Proposed

The CPM came up with six possible methods to satisfy the agenda item, along with the advantages and disadvantages of each. Five methods result in additional allocations for the Amateur Service in Regions 1 and 3 immediately above its current 7000–7100 kHz allocation and retention of the current allocation of 7100–7300 kHz in Region 2, with the broadcasting service in Regions 1 and 3 moving up in frequency.

Some methods also provide additional allocations to the broadcasting service in Region 2. In some cases the band above 7350 kHz—currently allocated to the fixed service on a primary basis and the land mobile service on a secondary basis—would be affected. Additional methods may be introduced at WRC-03.

Some administrations, particularly those of developing countries, are of the opinion that due to the technical, operational, and economic impacts of the

\*National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (phone 817-461-6443) e-mail: <w5yi@cq-amateur-radio.com>

various proposed re-alignments, the corresponding time-frames need to be sufficiently long in order to enable these administrations to implement the decisions, if they are adopted. This could mean a delay in making any eventual changes, although other administrations feel the proposals themselves offer sufficient phase-in times.

Here are the six methods suggested by the CPM as possible approaches to a realignment at 40 meters, along with the advantages and disadvantages of each:

### Method A (1 of 6)

This method provides a worldwide exclusive allocation to the amateur service of 7000–7300 kHz and a worldwide primary allocation to the broadcasting service of at least 250 kHz of contiguous spectrum above 7300 kHz.

In order to reduce the impact of the changes to the broadcasting, fixed, and land mobile services to manageable levels, this option would be introduced over several years in two stages (starting date: D1 and completion date: D2) as follows:

#### Stage 1 (see table: Method "A")

6765–7000 kHz	Fixed and mobile (except aero., mobile, co-primary)
7000–7100 kHz	Amateur and amateur-satellite co-primary (No change)
7100–7200 kHz	Amateur primary
7200–7300 kHz	Broadcasting primary Regions 1 and 3, amateur primary Region 2 (No change)
7300–7450 kHz	Broadcasting primary

5.142 The use of the band 7200–7300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3.

D1 could range from the date of entry into force for the WRC-03 changes and 1 April 2007.

#### Stage 2 (see table: Method "A")

6765–7000 kHz	Fixed and mobile (except aero. mobile)
7000–7100 kHz	Amateur and amateur-satellite co-primary (No change)
7100–7300 kHz	Amateur primary
7300–7550 kHz	Broadcasting primary

D2 = 3 to 5 years after D1 and no later than 2010.

### Advantages

#### Amateur service

- Global harmonization.
- Conforms with the present Region 2 amateur allocation.
- Removal of regional amateur/broadcasting incompatibility.
- Spectrum requirements will be met in Regions 1 and 3.

#### Broadcasting service

- Global harmonization of 7 MHz broadcasting band.
- Additional spectrum in Region 2.
- Improved relationship between the 7 MHz broadcasting band and the 6 MHz and 9 MHz broadcasting bands, to meet changing propagation.
- Removal of regional amateur/broadcasting incompatibility.

### Disadvantages

#### Broadcasting service

- Economic impact of broadcast spectrum shift. Both broadcasters and listeners may be affected and/or face extra costs. However, it is easier for the broadcasting service to adapt under this two-stage process, rather than if all the changes came into effect at a single date.

**Table: Method "A." Example of stage 1 of a realignment process**, which improves the utility of the band allocations

around 7 MHz while retaining regional differences during an interim period, commencing at date D1 and running to date D2.

6765–7450 kHz* Allocation to services		
Region 1	Region 2	Region 3
	6765–7000 FIXED MOBILE (except aero. mobile)	
	7000–7100 AMATEUR AMATEUR-SATELLITE	
	7100–7200 AMATEUR	
7200–7300 BROADCASTING	7200–7300 AMATEUR	7200–7300 BROADCASTING
	7300–7450 BROADCASTING	

As shown, the changes are appropriate to a first stage implementation date D1, as determined by WRC-03, but prior to 1 April 2007.

**Example of stage 2 of a realignment process**, which provides for globally harmonized allocations around 7 MHz, following an interim period, retaining regional differences, commencing at date D2.

6765–7450 kHz Allocation to services		
Region 1	Region 2	Region 3
	6765–7000 FIXED MOBILE (except aero. mobile)	
	7000–7100 AMATEUR AMATEUR-SATELLITE	
	7100–7300 AMATEUR	
	7300–7550 BROADCASTING	

### Method B (2 of 6)

This method provides a worldwide exclusive allocation to the amateur service of 7000–7200 kHz; a regional allocation of 7200–7300 kHz to the amateur service in Region 2 and to the amateur, fixed, and mobile except aeronautical mobile services in Regions 1 and 3; and a worldwide primary allocation to the broadcasting service of 7300–7550 kHz.

In order to minimize the time-frame for access to the new proposed bands for the amateur service, the frequency band 7100–7200 kHz can be allocated to the amateur service (in Regions 1 and 3) on a secondary basis from 1 January 2005.

This option would be introduced over several years in two stages:

#### Stage 1 (see table: Method "B")

6765–7000 kHz	Fixed and mobile (except aero. mobile, co-primary)
7000–7100 kHz	Amateur and amateur-satellite co-primary
7100–7200 kHz	Amateur, fixed and mobile (except aero. co-primary) Regions 1 and 3, amateur primary Region 2
7200–7300 kHz	Broadcasting primary Regions 1 and 3, amateur primary Region 2 (No change)
7300–7450 kHz	Broadcasting primary

\*Note: In each table, copy centered pertains to all three regions.

7450–8100 kHz Fixed and mobile (except aero. mobile, co-primary)

D1 = 1 April 2007.

**Stage 2 (see table: Method “B”)**

6765–7000 kHz Fixed and mobile (except aero. mobile, co-primary)  
 7000–7100 kHz Amateur and amateur-satellite co-primary (No change)  
 7100–7200 kHz Amateur primary  
 7200–7300 kHz Amateur, fixed & mobile (except aero. mobile) co-primary Regions 1 & 3, amateur primary Region 2  
 7300–7550 kHz Broadcasting primary  
 7550–8100 kHz Fixed and mobile (except aero. mobile) co-primary

D2 = 25 October 2009.

**Advantages**

*Amateur service*

- Conforms with the present Region 2 amateur allocation.
- Removal of regional amateur/broadcasting incompatibility.
- Spectrum requirements will be met in Regions 1 and 3.

*Broadcasting service*

- Global harmonization of 7 MHz broadcasting band.
- Additional spectrum in Region 2.
- Improved relationship between the 7 MHz broadcasting band and the 6 and 9 MHz broadcasting bands, to meet changing propagation.
- Removal of regional amateur/broadcasting incompatibility.

**Disadvantages**

*Amateur service*

- Requires sharing of 100 kHz with fixed and mobile services in Regions 1 and 3.

*Broadcasting service*

- Economic impact of broadcast spectrum shift. Both broadcasters and listeners may be affected and/or face extra costs. However, it is easier for the broadcasting service to adapt under this two-stage process, rather than if all the changes came into effect at a single date.

**Table: Method “B.” Example of stage 1 of a realignment process**, which improves the utility of the band allocations around 7 MHz while retaining regional differences during an interim period, commencing at date D1.

6765–8100 kHz Allocation to services		
Region 1	Region 2	Region 3
6765–7000 FIXED MOBILE (except aero. mobile)		
7000–7100 AMATEUR AMATEUR-SATELLITE		
7100–7200 AMATEUR FIXED MOBILE (except aero.)	7100–7200 AMATEUR	7100–7200 AMATEUR FIXED MOBILE (except aero.)
7200–7300 BROADCASTING	7200–7300 AMATEUR	7200–7300 BROADCASTING
7300–7450 BROADCASTING 7450–8100 FIXED MOBILE (except. aero. mobile)		

**Example of stage 2 of a realignment process**, which provides for globally harmonized allocations around 7 MHz, following an interim period, retaining regional differences, commencing at date D2.

6765–8100 kHz Allocation to services		
Region 1	Region 2	Region 3
6765–7000 FIXED MOBILE (except aero. mobile)		
7000–7100 AMATEUR AMATEUR-SATELLITE		
7100–7200 AMATEUR		
7200–7300 AMATEUR FIXED MOBILE (except aero.)	7200–7300 AMATEUR	7200–7300 AMATEUR FIXED MOBILE (except aero.)
7300–7550 BROADCASTING 7550–8100 FIXED MOBILE (except aero. mobile)		

**Method C (3 of 6)**

This method provides a worldwide exclusive allocation of 200 kHz to the amateur service in the band 7000–7200 kHz. There would be no change to the allocation between 7200–7300 kHz. A worldwide exclusive allocation of 100 kHz would be allocated to the broadcasting service in the band 7350–7450 kHz.

6765–7000 kHz Fixed and mobile (except aero. mobile) co-primary  
 7000–7100 kHz Amateur and amateur-satellite co-primary  
 7100–7200 kHz Amateur primary  
 7200–7300 kHz Broadcasting primary Regions 1 and 3, amateur primary Region 2 (No change)  
 7300–7450 kHz Broadcasting primary  
 7450–8100 kHz Fixed & mobile (except aero. mobile) co-primary

**Advantages**

*Amateur service*

- Worldwide exclusive allocation increases to 200 kHz.
- Doubles spectrum available to amateur service in Regions 1 and 3.
- Decrease of regional amateur/broadcasting incompatibility.
- Allocation of 300 kHz is maintained in Region 2.
- Provides improved regional operability for the amateur service through the availability of 200 kHz of common spectrum.

*Broadcasting service*

- Worldwide exclusive allocation increases from 50 to 150 kHz.
- Increases broadcasting allocation in Region 2 by 100 kHz.

**Disadvantages**

*Amateur service*

- 300 kHz exclusive worldwide requirement is not met.
- Regional sharing w/broadcasting is not eliminated.

*Broadcasting service*

- Regional sharing w/amateur is not eliminated.
- Some economic impact to broadcast spectrum shift. Both broadcasters and listeners may be affected and/or face extra costs.

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**Table: Method "C"**

6765–8100 kHz Allocation to services		
Region 1	Region 2	Region 3
6765–7000 FIXED MOBILE (except aero. mobile)		
7000–7100 AMATEUR AMATEUR-SATELLITE		
7100–7200 AMATEUR		
7200–7300 BROADCASTING	7200–7300 AMATEUR	7200–7300 BROADCASTING
7300–7450 BROADCASTING		
7450–8100 FIXED MOBILE (except aero. mobile)		

The implementation date for this option should be 1 April 2007.

**Method D (4 of 6)**

This method would provide a worldwide exclusive allocation to the amateur service at 7000–7300 kHz with no resultant loss or gain of spectrum by the broadcasting service. Also, to help compensate for the loss of spectrum by the fixed and mobile services in Regions 1 and 3, and to provide for more flexibility, the mobile service would be elevated to co-primary status with the fixed service.

In order to reduce the impact of the changes to the broadcasting, fixed, and land mobile services by allowing sufficient time for administrations to manage this transition, these changes would be introduced over several years with a completion date of 1 April 2010. The following schedule outlines a proposed timeline of the transition:

**As of entry into force of the Final Acts of WRC-03:**

- 7100–7300 kHz Broadcasting primary and amateur secondary in Regions 1 and 3. No change in Region 2.
- 7350–7550 kHz Broadcasting co-primary with fixed and land mobile secondary in Regions 1 and 3. No change in Region 2.

**As of 1 April 2007**

- 7100–7300 kHz Amateur exclusive worldwide.
- 7300–7350 kHz Broadcasting worldwide.
- 7350–7550 kHz Broadcasting primary, fixed and land mobile secondary in Regions 1 and 3. No change in Region 2.

**As of 1 April 2010**

- 7350–7550 kHz Broadcasting exclusive Regions 1 and 3. No change in Region 2.

**Advantages**

*Amateur service*

- Global harmonization.
- Conforms with the present Region 2 amateur allocation.
- Removal of regional amateur/broadcasting incompatibility.
- Spectrum requirements will be met in Regions 1 and 3.

*Broadcasting service*

- Removal of regional amateur/broadcasting incompatibility.
- No loss of spectrum to broadcasting service

**Disadvantages**

*Broadcasting service*

- Economic impact of broadcast spectrum shift. Both broadcasters and listeners may be affected and/or face extra costs. The impact is eased by a three-stage, rather than a one-stage, process.
- The lack of interregional realignment as requested in the agenda item.

**Table: Method "D." Example of the Table of Frequency Allocations** as it would appear after the completion of the realignment process.

6765–7350 kHz Allocation to services		
Region 1	Region 2	Region 3
6765–7000 FIXED MOBILE (except aero. mobile) 5.138 5.139		
7000–7100 AMATEUR AMATEUR-SATELLITE 5.140 5.141		
7100–7300 AMATEUR	7100–7300 AMATEUR	7100–7300 AMATEUR
7300–7350 BROADCASTING 5.134 5.143		
7.350–8.100 kHz Allocation to services		
Region 1	Region 2	Region 3
7350–7550 BROADCASTING	7350–7550 FIXED	7350–7550 BROADCASTING
MOBILE (except aero. mobile) 7550–8100 FIXED MOBILE (except aero. mobile) 5.144		

**Method E (5 of 6)**

This method would provide a worldwide allocation of 200 kHz to the amateur service in the band 7000–7200 kHz. The band 7100–7200 kHz is also allocated to fixed and land mobile services with co-primary status in Regions 1 and 3. There would be no change to the allocation between 7200–7300 kHz. A worldwide exclusive allocation of 100 kHz would be allocated to the broadcasting service in the band 7350–7450 kHz.

- 6765–7000 kHz Fixed primary and land mobile secondary (No change)
- 7000–7100 kHz Amateur and amateur-satellite co-primary (No change)
- 7100–7200 kHz Amateur, fixed and land mobile co-primary in Regions 1 and 3, amateur primary in Region 2
- 7200–7300 kHz Broadcasting primary in Regions 1 and 3, amateur primary in Region 2 (No change)
- 7300–7450 kHz Broadcasting primary
- 7450–8100 kHz Fixed primary and land mobile secondary (No change)

**Advantages**

*Amateur service*

- Worldwide allocation increases from 100 kHz to 200 kHz.



- Doubles spectrum available to amateur service in Regions 1 and 3.
- Some improvement of regional amateur/broadcasting alignment.
- Allocation of 300 kHz is maintained in Region 2.
- Provides improved regional operability for the amateur service through the availability of 200 kHz of common spectrum.

**Broadcasting service**

- Worldwide exclusive allocation increases from 50 to 150 kHz.
- Increases allocation to broadcasting in Region 2 by 100 kHz.

**Disadvantages**

*Amateur service*

- 300 kHz exclusive worldwide requirement is not met.
- Regional amateur/broadcasting alignment is not completely achieved.

*Broadcasting service*

- Regional amateur/broadcasting alignment is not completely achieved.
- Economic impact of broadcast spectrum shift, both broadcasters and listeners may be affected and/or face additional costs.

**Table: Method "E"**

6765–8100 kHz Allocation to services		
Region 1	Region 2	Region 3
6765–7000 FIXED MOBILE (except aero. mobile)		
7000–7100 AMATEUR AMATEUR-SATELLITE		
7100–7200 AMATEUR FIXED LAND MOBILE	7100–7300 AMATEUR	7100–7200 AMATEUR FIXED LAND MOBILE
7200–7.300 BROADCASTING		7200–7300 BROADCASTING
7300–7450 BROADCASTING		
7450–8100 FIXED MOBILE (except aero. mobile)		

The implementation date for this option should be 1 April 2007.

**Method F (6 of 6)**

WRC-03 may decide to make no changes to the allocations under this agenda item.

No change to Article 5 is required under this method.

**Advantages**

*Broadcasting service*

- No change to current allocations.

**Disadvantages**

*Amateur service*

- The current situation and resultant difficulties arising from unharmonized amateur service bands will continue.

*Broadcasting service*

- Regional amateur/broadcasting alignment is not achieved.

**Regulatory and Procedural Considerations**

If any of the above methods, except Method F, are adopted, the appropriate consequential amendments to the (International) Radio Regulations would need to be considered.

**The Fixed and Mobile Wild Card**

One interesting aspect of all five of the CPM's proposals for change is that only the interests of the amateurs and the broadcasters were considered, even though most of the plans would impact frequency allocations of the fixed and mobile services. Many fixed and mobile services on HF today are government services, including military. In fact, the U.S. military is a significant user of this spectrum, and as a result, the U.S. government has not yet settled on a position on the matter. The FCC, concerned with the interests of broadcasters and amateurs, appears to support making changes. However, the National Telecommunications and Information Administration (NTIA), which represents federal government spectrum users, opposes any changes because the military says it needs access to these frequencies. The advantages and disadvantages to fixed and mobile users of pushing the broadcast band up into "their" frequencies apparently have not been considered by the CPM, and it's likely that at least some of these users have the ear of their respective government policy-makers.

The only certainty on this issue is that there is no way to predict the outcome. We'll have to wait and see what, if anything, the delegates from around the world decide this summer.

73, Fred, W5YI

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# A New Breed of Audio Power Amplifiers

In a previous column we briefly mentioned the new power amplifier series of chips offered by Linear Technology. After having personal experience with one of these, we thought it would be a good idea to give experimenters a brief view of what these chips are and how they can be used. If you build anything that deals with audio, I am sure that you will find this month's topic interesting.

The "Boomer" series, as it is called, consists of a series of audio power amplifiers designed for small, low-power, consumer-oriented applications, and as a result they are relatively inexpensive. The unit we will use for our example is the LM4861; others in the series are similar in operation, but with more "bells and whistles." This device produces one watt of output from a 5 volt supply with 1% maximum distortion, doesn't need a high-value electrolytic capacitor to couple to a speaker, and comes in a tiny surface-mount package. Compared to the old standby LM386, this chip produces more output power, is much smaller, uses fewer external components, has a low current shutdown mode, and costs about the same.

Fig. 1 is the basic schematic of the LM4861. The chip consists of two power operational amplifiers. A1's gain is set by the ratio of  $R_f$  divided by  $R_1$ , and A2's gain is set to 1 (inverting). This results in an output gain of  $2(R_f/R_1)$  and an output at pin 8 that is 180 degrees out of phase with the output at pin 5. Such an arrangement is called a "bridged mode" configuration and allows a speaker to be connected to these points without the need for a high-value (physically large) coupling capacitor.

Another advantage is that since two amplifiers drive the speaker, the voltage swing is double, which results in four times the output power of one amplifier (as used in the LM386). In addition, since the outputs are biased at half the  $V_{cc}$  input, no DC offset occurs across the speaker, and hence the elimination of the output coupling capacitor. Since this capacitor is not required, the low frequency response of the chip is set by the input capacitor, which is much smaller in value as well as physical size,

since it operates into a high-impedance load. It should also be noted that when  $R_{in}$  and  $R_f$  are equal in value, the voltage gain of the LM4861 amplifier is 2. If higher gain is required, the ratio may be changed as indicated above. For higher gains, a feedback capacitor ( $C_f$ ) should be added to prevent possible

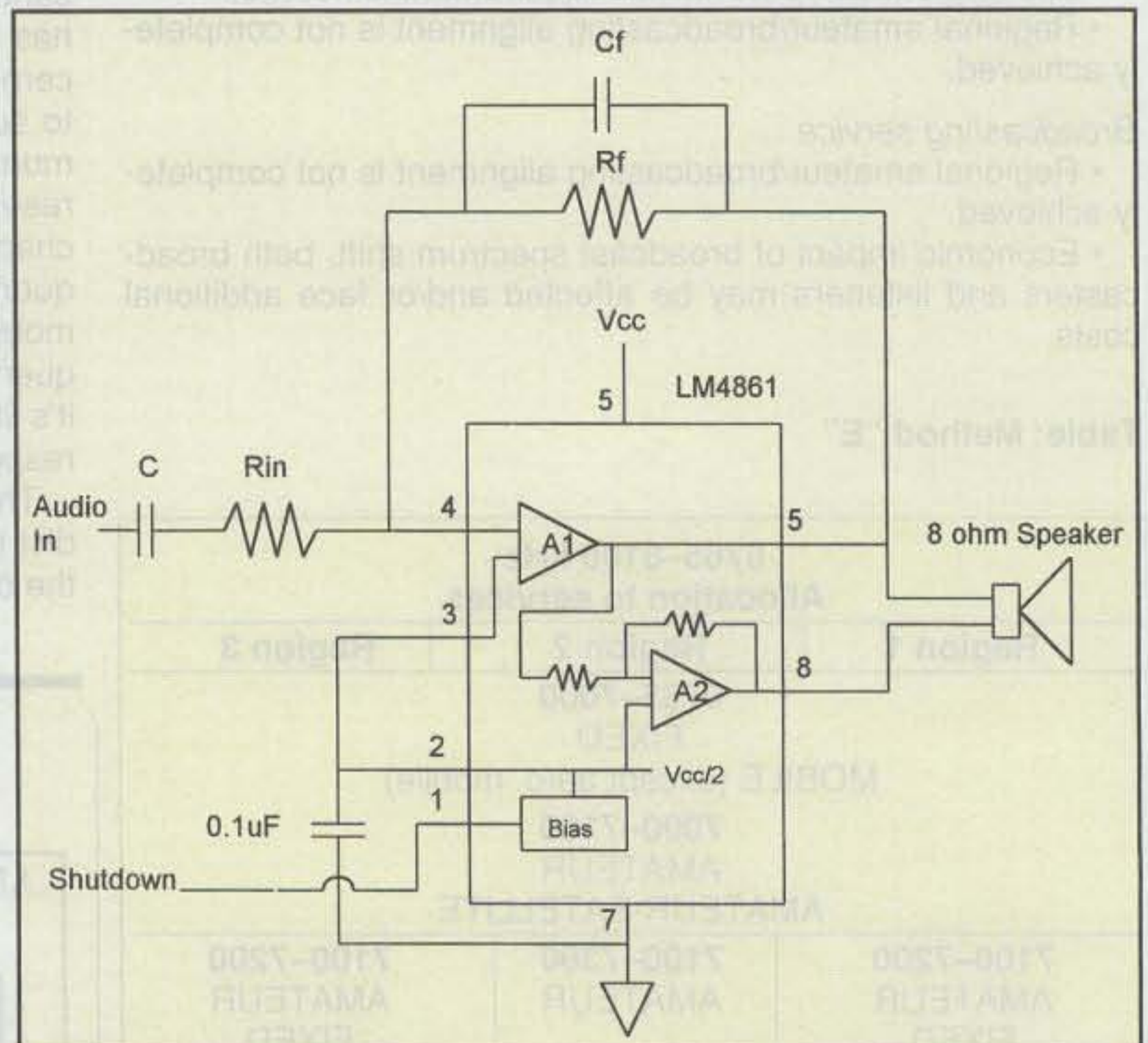


Fig. 1— Basic LM4861 audio amplifier circuit.

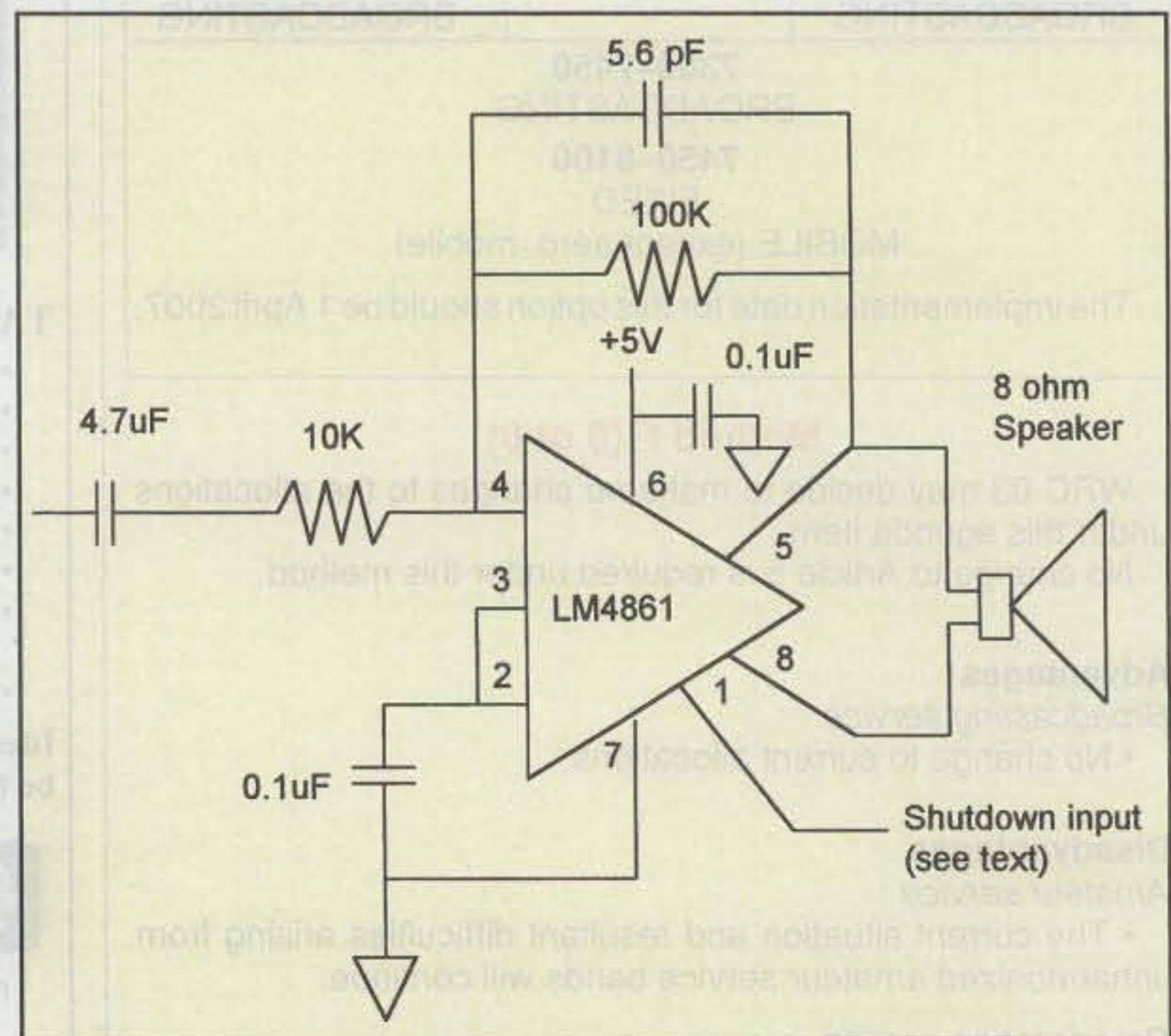


Fig. 2— One watt amplifier with a gain of 20.

\*c/o CQ magazine

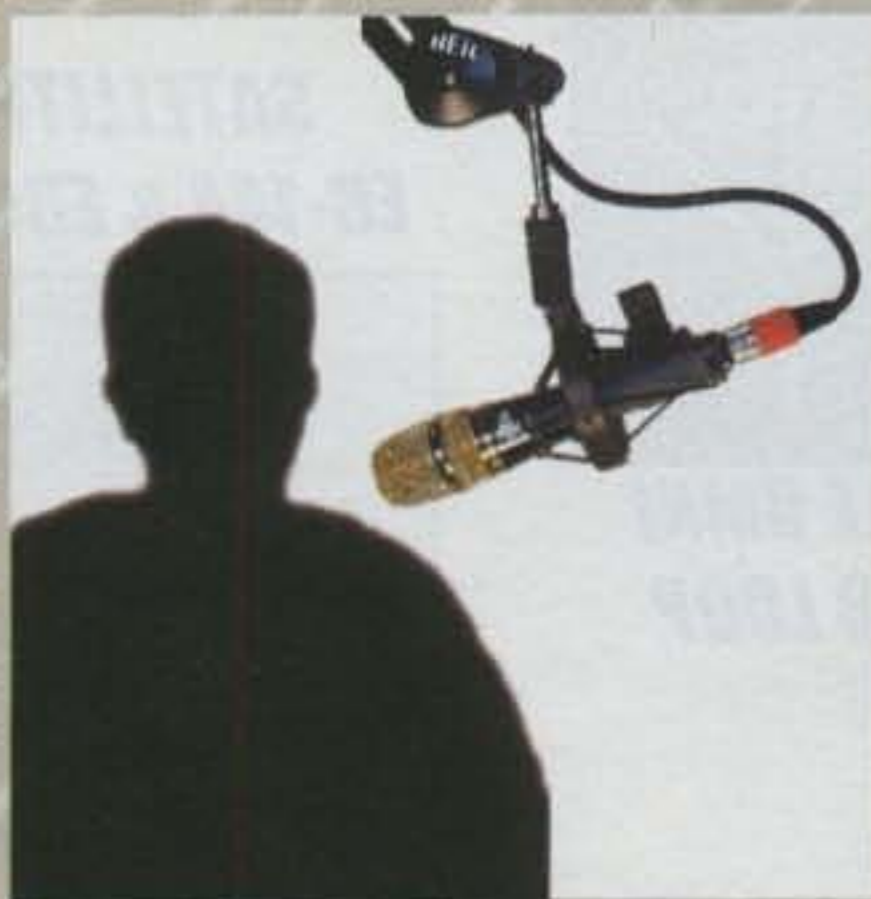
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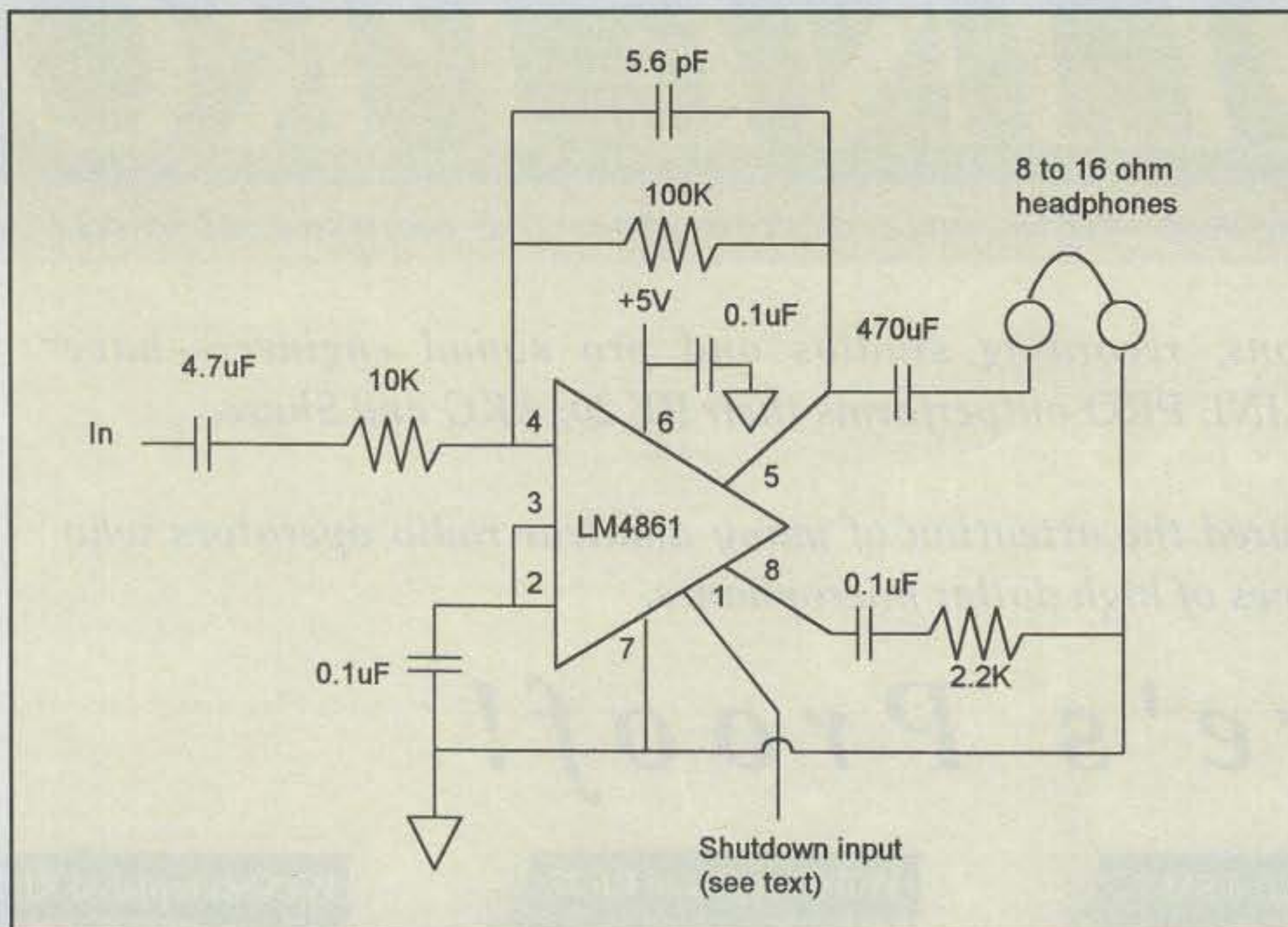


Fig. 3— Single-ended audio amplifier with a gain of 10.

LM386 in most applications. Not only does it use fewer components (and smaller ones to boot), it will provide more than a watt of output compared to the 100 milliwatts or so for the LM386 circuit. Furthermore, pin 1 may be connected to ground for full operation, or to Vcc for shutdown. If single-ended operation is desired for driving grounded loads or headphones, where higher power is not required, the circuit of fig. 3 may be used. In this configuration the output coupling capacitor is required and the overall voltage gain drops to 10, since the second amplifier is not used. The 0.1  $\mu$ F cap and 2.2K resistor are added to stabilize the unused stage.

I hope this introduction to the "bridged output" amplifier is of use to the various experimenters out there and that you will take a good look at it when designing your next audio amplifier. In addition, I would like to mention that the frequency response of the LM4861 extends well into the 100 kHz region for gains of 10 to 20. This makes it capable of providing high-quality audio at moderate distortion levels.

For complete information on the LM4861 and others in the "Boomer" series, visit [LinearTechnology.com](http://LinearTechnology.com) on the net.

73, Irwin, WA2NDM

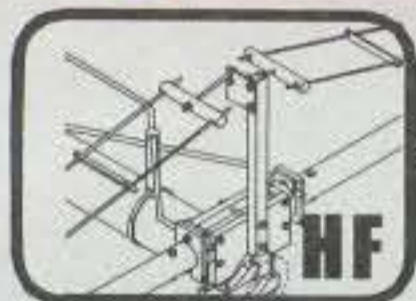
oscillations. This capacitor limits the bandwidth and can be chosen to "tailor" the frequency response as needed.

The LM4861 also contains a shutdown pin which can be used to place it in a low current mode when it is not in use (such as in a push-to-talk application). When

pin 1 is grounded, the amplifier operates normally. When it is connected to Vcc, the amplifier shuts down and only draws 0.6 microamperes from the Vcc line! Now for a couple of practical circuits.

Fig. 2 is a gain of 20 audio power amplifier that can be used to replace the

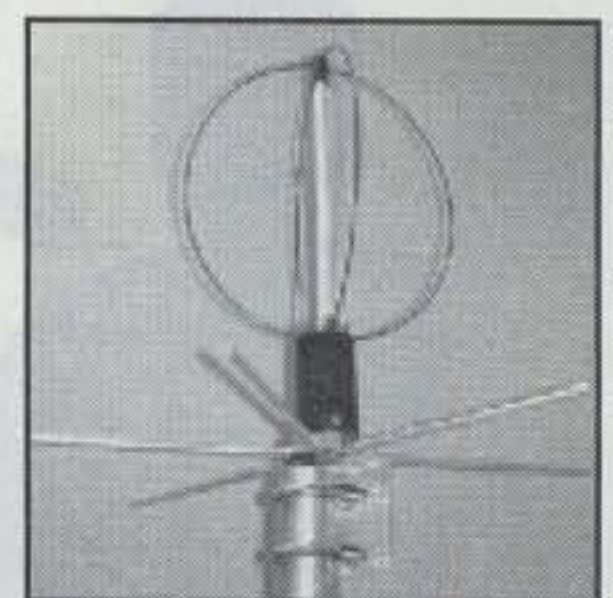
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# Keys 2003—Part I

## The Remarkable Romance Continues

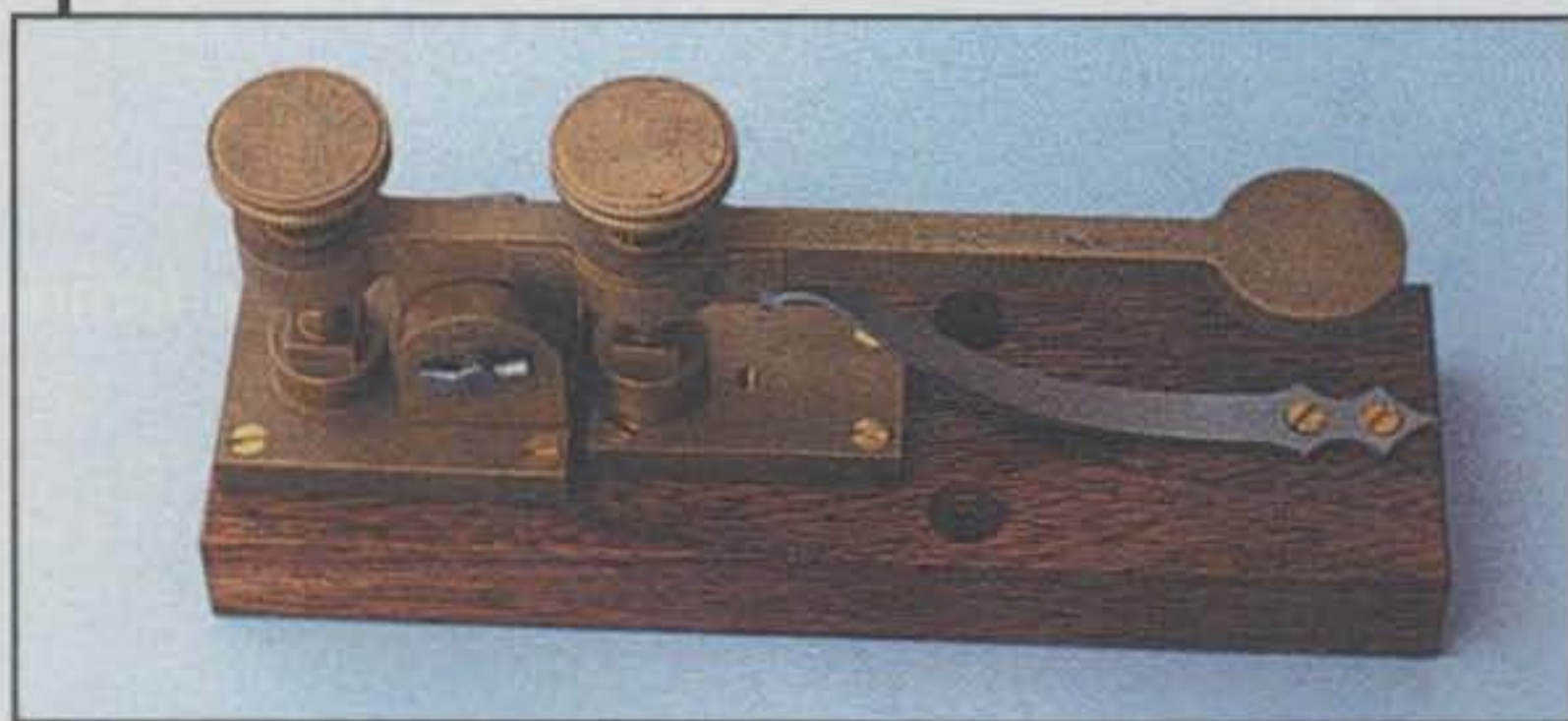
**O**h the glitz . . . the glamour . . . the irresistible beauty . . . the sheer romance of them all! Yes, friends, your relentless demand for still more views and discussions of amateur radio's all-time favorite accessory have been heard and are being honored with yet another keys extravaganza here in this column. It is a killer, too, with keys and paddles of all types vying for a place in the spotlight, and in the heart of every true radio telegrapher.

What makes keys so special? Their variety, designs, craftsmanship, and the operators who use them, naturally! Some keys are large, some are small, some are simple, some are complex, and a good CW aficionado can use almost any of them to communicate as effectively by hand as by voice. In fact, CW probably has an extra advantage over SSB for contesting and/or DXing. How so? You can work two stations simultaneously by operating split-frequency style with dual VFOs and full break-in. You transmit to one station while listening to the other station in between your transmitted dots and dashes, then toggle VFOs to reverse the sequence. The concept works great for increasing contest scores, too. Run a few *off-the-air* practice sessions, then try it. You can do it. Just think positively! Pardon the excess enthusiasm, but life in the CW lane is just *very* exciting. Now let's bring on the keys!

### Vail Correspondent Replica Key

Two exceptionally rewarding aspects of featuring keys in this "World of Ideas" column are sharing noteworthy details of our telegraphic history with

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



*Photo 1— This recently introduced gem is a Vail Lever Correspondent replica key. It is an accurate reproduction of the first full-mechanism key that Samuel F. B. Morse's assistant, Alfred Vail, made for Morse to use in 1844, and it represents a noteworthy piece of telegraphic history. The key is made by R. A. Kent in England, imported to the U.S. by Alpha Delta Communications, Inc. It truly has the look and feel of a 19th century key.*



*Photo 2— Prior to Vail's development of the Lever Correspondent, Morse used a simple "strap key" like the one shown here (and also found on many toy/practice telegraph sets of yesteryear). Basically, the key uses a strap of spring metal mounted to a board and fitted with a knob to make connection with a contact below the knob. It was crude, but it worked!*

you and highlighting new items of special interest. The new Vail Lever Correspondent replica key shown in photo 1 fills both of these objectives to a tee. The key is made by R. A. Kent in England, imported to the U.S. by Alpha Delta Communications, Inc., and measures 3"H x 7"W x 2"D. It is a quite authentic reproduction of the very first full-mechanism hand key that machinist Alfred Vail made for colleague Samuel F. B. Morse in 1844.

The key sports a large brass mechanism with a long steel spring mounted on an oak wood base, and it really looks like old-time telegraphy. Prior to the Vail key, Morse just used a strap of spring metal mounted to a board to send code (an example is shown in photo 2). Vail's original Lever Correspondent was used in several early demonstrations of landline telegraphy which ultimately ushered in the era of telegraphy and electronic communications.

This replica key is thus an item every radio amateur can own, display, and even use on the air, and it is available from Alpha Delta Communications, Inc., P.O. Box, Manchester, KY 40962, order line 888-302-8777, or via <www.alphadelta.com>.

### Classy Little Convertible

Another unique item we are sure you will appreciate knowing about is the smart-looking GHD Model 307 Convertible Paddle shown in photo 3. We call it "convertible" because it is two paddles in one. When its red fingerpieces are attached to the two outer levers on its mechanism, it is a dual-lever/iambic paddle, but when you affix the fingerpieces to the center lever, it becomes a single-lever paddle. Cool!

The paddle does not fall short on glamour, either. It sports a flawless chrome finish with Cadillac-red

# MFJ DX Beacon Monitor

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MFJ DX Beacon Monitor lets you instantly see on world map which beacon you're hearing on your transceiver . . . No need to copy 22 wpm CW . . . Positively identify beacons even if CW is weak, fluttery or distorted . . . Tells you where to point your antenna . . . Fascinates visitors . . .

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MFJ's new DX Beacon Monitor lets you instantly see which beacon you're hearing on your transceiver -- an LED lights up on its world map to show you the beacon location and where to point your antenna.

It's fascinating to hear and watch each beacon location light up as they become active across the world.

It's great for DXers, contesters, ragchewers and SWLers.

## The International Beacon Network

The International Beacon Network provides a reliable source of signals for determining HF propagation 24 hours a day.

It consists of 18 beacons evenly located throughout the world.

Each beacon transmits on 14.1, 18.11, 21.150, 24.93 and 28.2 MHz.

The transmit sequence moves westward from New York across North America, Asia, Pacific to Africa, Europe and South America.

On each frequency, each beacon transmits for ten-seconds -- its call sign at 22 wpm CW and a one-second dash at 100 Watts and three one-second dashes at 10, 1, 0.1 Watts.

When each beacon completes a transmission it goes silent on that band and switches to the next higher band.

For more information see Oct/Nov, 1994, Sept, 1997 QST and Jan 1999, Sept/Dec 2001, Jan 2002 Practical Wireless of U.K.

## How are band conditions?

Tune to a beacon frequency. If band conditions are good, you'll hear each beacon identifying in Morse and four dashes each at a lower power level.

The more beacons you hear, the more open the band is to different parts of the world.

The more dashes you hear per beacon, the better the quality of propagation and the more robust the band is. If you hear the 100 milliwatt dashes from many beacons

you know the band is wide open!

In just three minutes you'll know how band conditions are worldwide.

It's interesting to see how propagation vary from day to day -- what beacons you can hear and at what power level.

You may find that the band is wide open but nobody is on.

## Which band is best to reach a particular part of the world?

By storing the beacon frequencies in your transceiver's memory, you can quickly check all five bands to see which band has the best propagation to a particular part of the world.

## MFJ DX Beacon Monitor lets you instantly see on world map which beacon you're hearing

You don't have to copy CW at 22 wpm to identify a beacon.

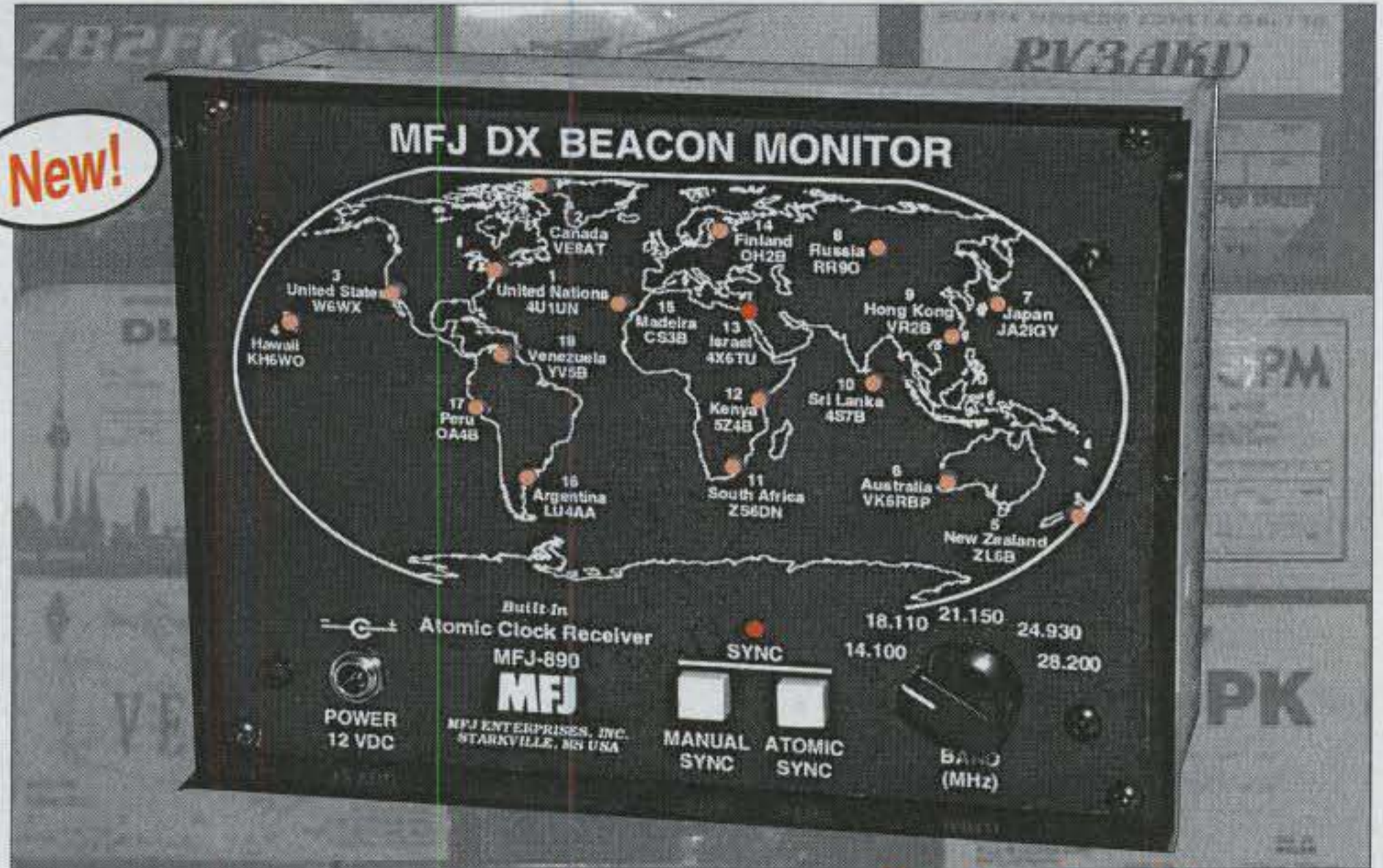
When you hear a beacon, an LED instantly lights up on a world map to show you its location. You can positively identify each beacon -- even if the signal is weak, and the CW is fluttery or distorted.

The world map display also tells you where to point your antenna.

won't even know you just passed the code test!

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## How does it work?

The transmit sequence of the beacons are precision timed using GPS (Global Positioning Satellites).

The MFJ DX Beacon Monitor duplicates this precision timing sequence and lights an LED to show which beacon is transmitting. A microprocessor and a built-in WWVB atomic clock receiver provides ultra precise synchronization. Has manual sync for use anywhere in the world. MFJ-890 is not a beacon receiver that receives beacons directly.

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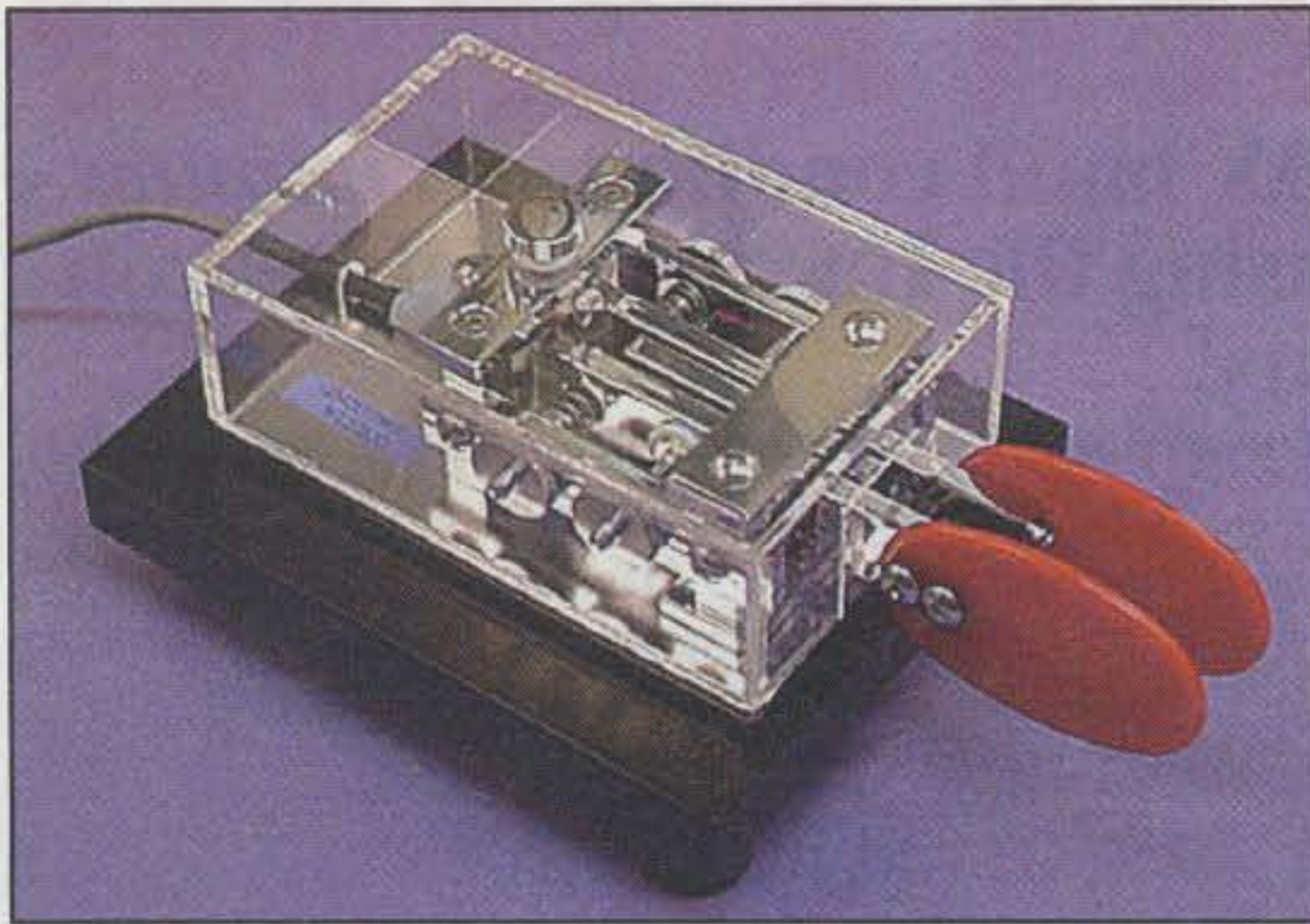


Photo 3— Would you like to have a dual-lever iambic paddle for deluxe home use and a single-lever paddle for error-free mobilizing? This GHD Model 307 has both capabilities, plus it has an integral dust cover and optional black base for mounting to or fitting on a variety of surfaces. Glossy chrome mechanism is complemented by red fingerpieces for maximum flash. This beauty is available from Marshall Emm of Morse Express.

fingerpieces and can be used handheld style, attached to a rig, or mounted on its optional black base.

The GHD 307 has gap and tension adjustments for each lever, gold-plated contacts, and an integral dust cover to keep it looking and working like new. The paddle measures 2.1" x 3.25" and its optional black base is 3.25" x 4.0". This little beauty is imported from Japan and is available from Marshall Emm, N1FN, of Morse Express, 2460 S. Moline Way, Aurora, CO 80014, telephone order line 1-800-238-8205, or via <www.MorseX.com>. Check it out. A true CW enthusiast never has enough keys!

### Views from Germany

Reading about keys is almost as enjoyable as collecting and using them, and our good friend Gregor Ulsamer, DL1BFE,

Photo 4— Everyone likes to study the designs of various keys, and the new book *Faszination Morsetasten* from Gregor Ulsamer, DL1BFE, is loaded with views of unique German keys. It highlights over 100 years of keys, and is written in German, with clear drawings of mechanisms and superb photos. It is available from DL1BFE.

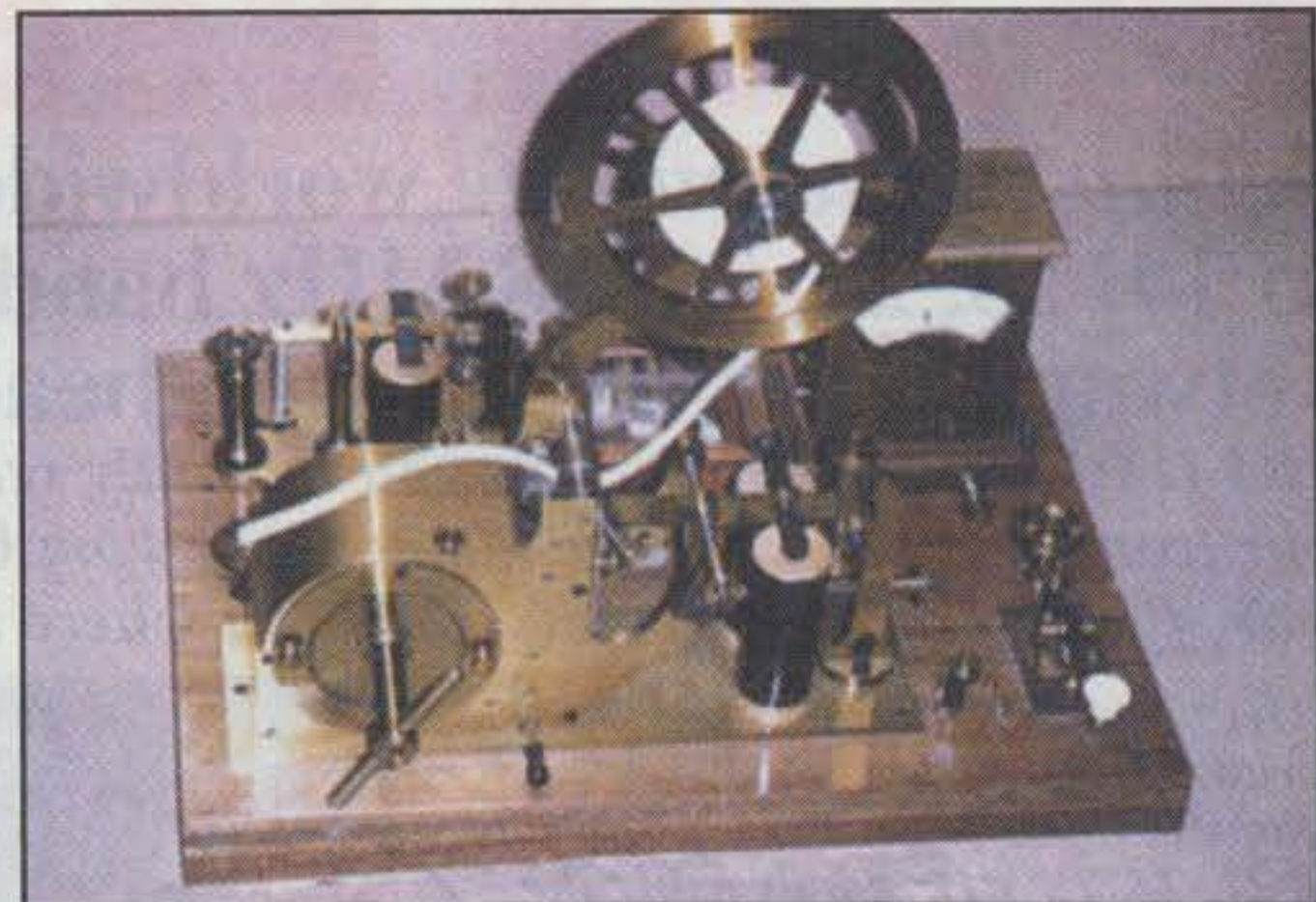
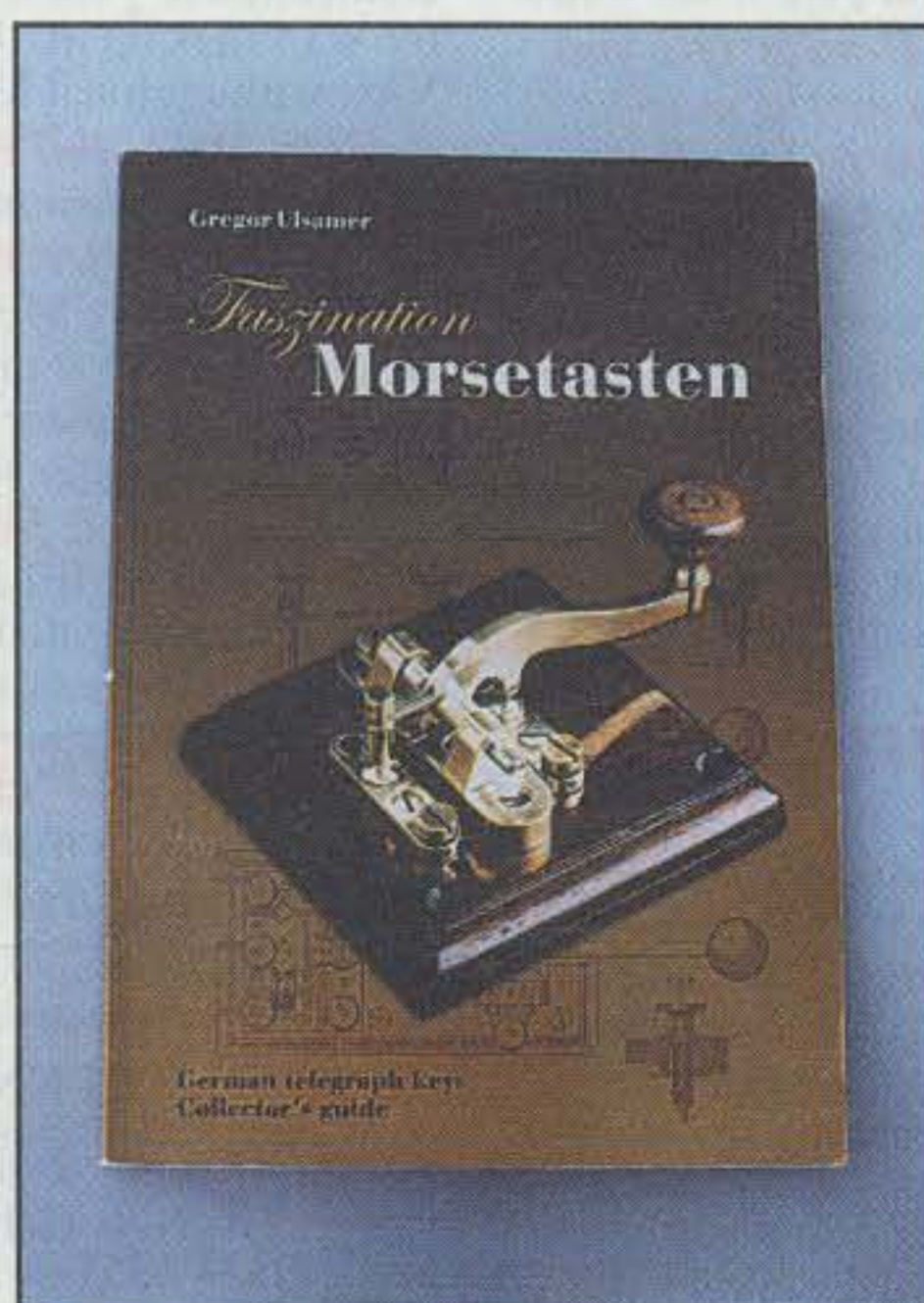


Photo 6— The Tragbarer Feldtelegraph, also featured in Ulsamer's *Faszination Morsetasten*, prints incoming Morse code in raised Braille-type letter form on paper tape. It was used by military forces to silently read messages in the dark during times past.

has put together a captivating new book on the subject (photo 4). Ulsamer's *Faszination Morsetasten* describes numerous keys of German and European origin, including some of the most unusual items imaginable. The book is written in German, but the photos are excellent, so deciphering general details on highlighted keys is fairly easy with study and patience. Check with Gregor, DL1BFE, Logumer Strasse 66, D-26723 Emden, Germany, or e-mail: <dl1bfe@emsnet.de> for availability and cost.

Looking at *Faszination Morsetasten*, we spotted some photos of unique CW instruments that simply had to be included in this "Keys Special." First is the Knallfunkensender shown in photo 5. This is the famous Grasshopper key made by the Marconi Wireless Company. It was used with a first-generation (unmodulated CW) spark-gap transmitter on Borkum Island, northwest Germany during the early 1900s. Next is the Tragbarer Feldtelegraph, or portable military telegraph, that was made by Kapsch in Austria in 1910 (photo 6). It reads Morse code and presses related characters onto a paper strip in Braille-like form so soldiers could silently copy

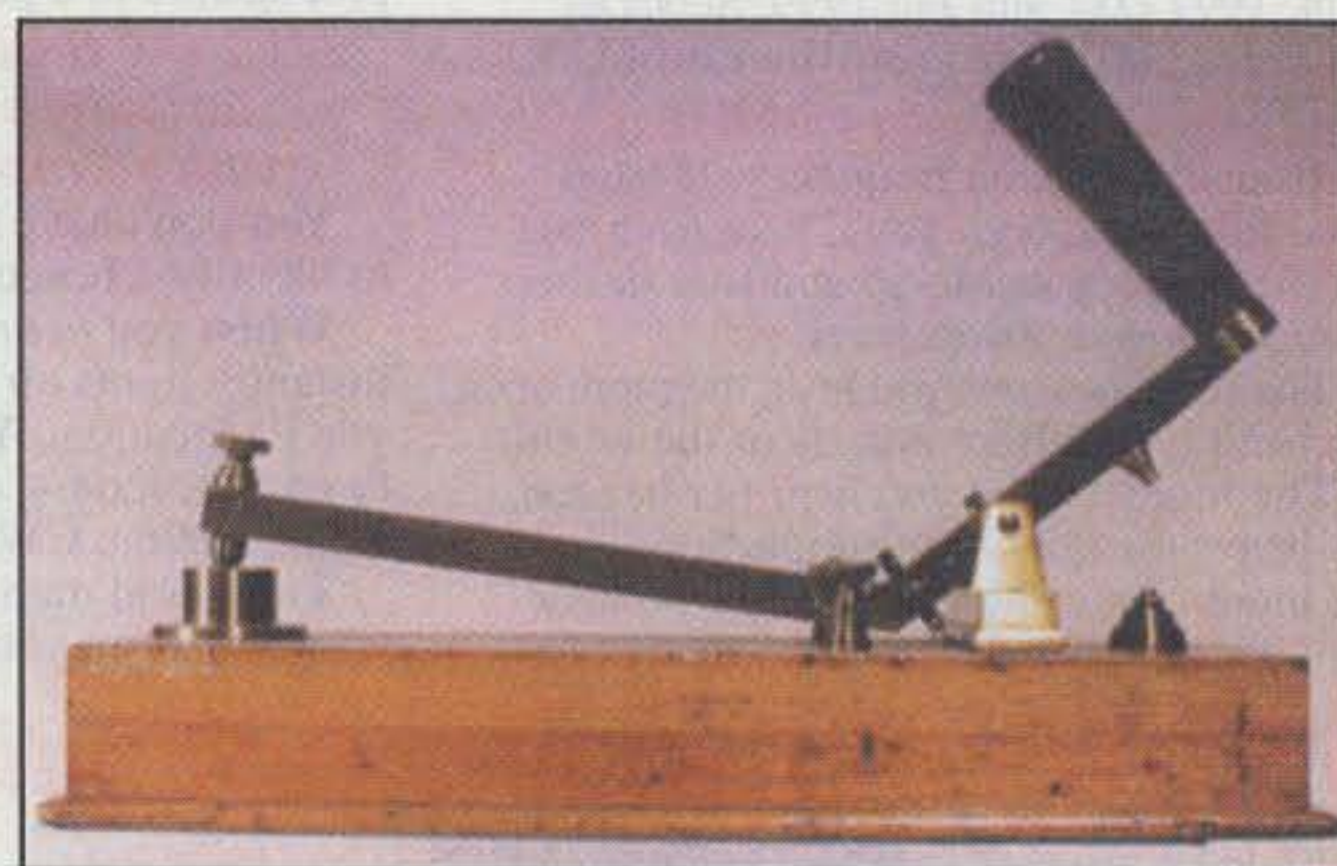


Photo 5— Yes, friends, this is an honest-to-goodness real key! It is called a Knallfunkensender, and it was made by the Marconi Wireless Company and used with an early-model spark transmitter on Borkum Island (Germany) around 1905. This Grasshopper key is only one of many unusual CW items featured in the book *Faszination Morsetasten* available from DL1BFE.





Photo 7— No, this is not a capacitor-tuned key, but rather a genuine three-mode spy key. You use the pen's tip (on left side of photo) to set code wheels on typewriter-looking arms in the box, and then transmitted Morse is automatically encrypted. In the second mode, the crank on the right draws Morse-coded film through the box to send high-speed CW. In the third mode, this Agentenfunk-Taste R-350M, also featured in DL1BFE's Faszination Morsetasten, functions as a regular hand key.

### True Tales of Telegraphic History

There is a historically significant story behind the Vail Correspondent replica key shown in photo 1—a story we hope our friends will remember and later pass on to future generations of amateurs.

Samuel F. B. Morse was an artist and an entrepreneur, and his first telegraph system reflected those facts. The system consisted of a hanging pen that made marks on a length of canvas slowly being drawn through a window-frame-type stretcher to print dots and dashes. A pair of electromagnets connected to a key and battery via a long length of wire or telegraph line attracted the metal-case pen, causing its printed line to move from side to side. Morse then devised his famous code for reading the printed lines according to letters of the alphabet. Incidentally, Morse's original canvas stretcher-type printer and several other items relative to early telegraphy were on display in the Western Union telegraph offices at 655 South Orcas Street, Seattle, Washington during the 1990s. I don't know if the site/ building still exists today. Can anyone update the record?

Subsequent evolution in the telegraph followed natural steps. Someone—assumedly Vail—noted the canvas stretcher/printer's unique sounds associated with dots and dashes and devised the famous telegraph sounder. Higher current batteries were made. Earth ground was substituted for one of the telegraph line's two wires. Larger sounders and mainline and ponyline relays were added for boosting voltage levels over long distances. Telegraph lines began crossing the country. Hundreds of small telegraph companies sprang up, with runners hand-carrying messages between companies. The New York and Mississippi Valley Printing Telegraph Company (the largest owner of lines) bought out eleven other companies and their lines and became the Western Union Telegraph Company.

Marconi invented wireless telegraphy, and large ships (including the *Titanic*) were outfitted with wireless apparatus. The unfortunate sinking of the *Titanic* proved the merits of wireless communications. The rest of the story is, well, history.

Our thanks and congratulations to R. A. Kent and Alpha Delta Communications for keeping the history of telegraphy alive (hopefully forever!) with the Vail Lever Correspondent Key!

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Photo Courtesy of K5LXP

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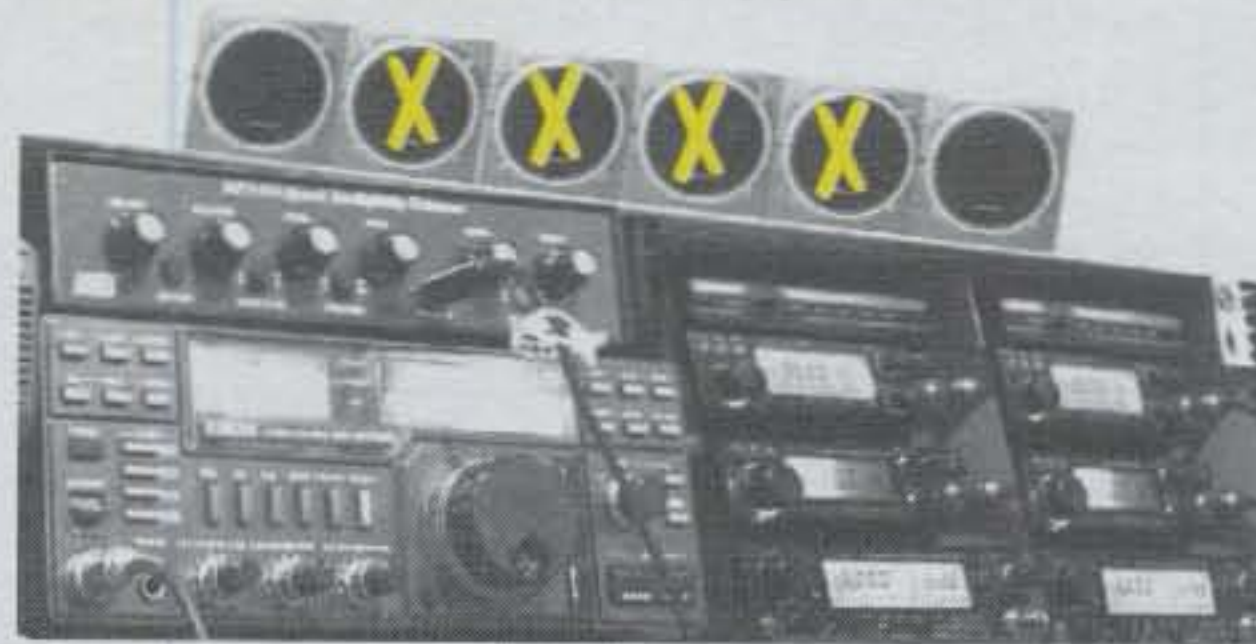


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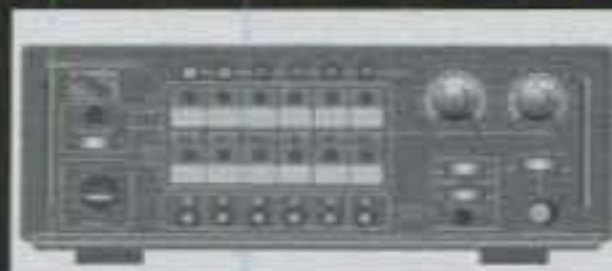
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MA40/MA550..... \$849/1399  
 MA770/MA850..... \$2359/3649  
 TMM433SS/HD ..... \$1139/1379  
 TMM541SS..... \$1499  
 TX438/TX455 ..... \$979/1579  
 TX472/TX489 ..... \$2459/4579  
 HDX538/HDX555 ..... \$1269/2269  
 HDX572MDPL..... \$5899  
**Please call for help selecting a US Tower for your needs. Shipped factory direct to save you money!**

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4-40'/50'/60' ..... \$539/769/1089  
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 12-30'/40'..... \$579/899  
 15-40'/50' ..... \$1019/1449  
 23-30'/40' ..... \$899/1339  
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 1/2"x12"EE / EJ Turnbuckle . \$18/19  
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 20 FT x 25" ..... \$315  
 22 FT x .12" / 21 FT x .18"..... \$149/235

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 PLP2739 Big Grip (4000) ..... \$8.50  
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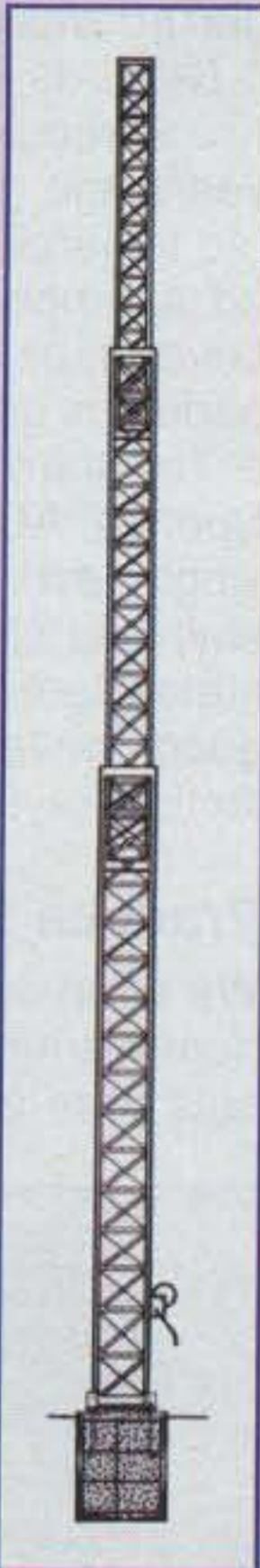
## TX SERIES CRANK-UP TOWERS

- Handles 35 square feet of antenna load at 50 MPH, 14.75 square feet at 70 MPH.
- All models supplied with hinged T-base, anchor bolts, hand winch (except motor drive models), top plate, and rotor plate.
- 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	\$1,269	\$979
TX-455	55'	22'	670	\$1,915	\$1,579
TX-472	72'	22'8"	1040	\$3,147	\$2,459
TX-472MDPL	72'	22'8"	1210	\$5,064	\$3,999
TX-489	89'	23'4"	1590	\$5,475	\$4,579
TX-489MDPL	89'	23'4"	1800	\$8,212	\$6,429



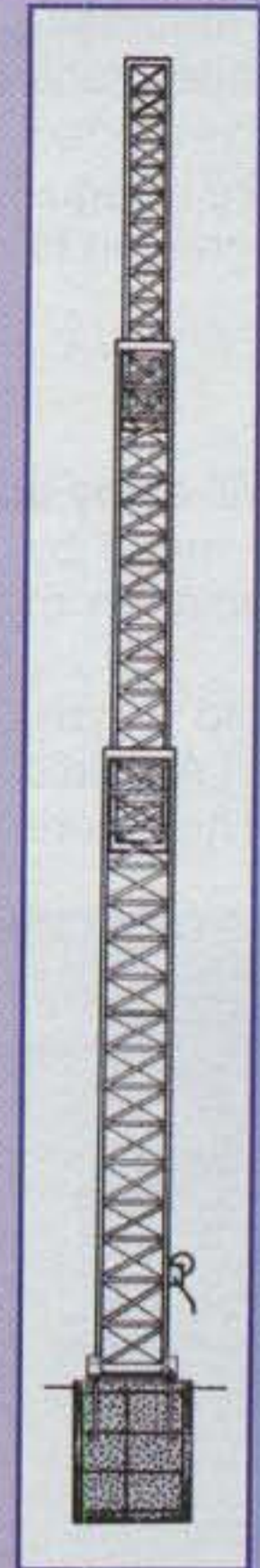
## HDX SERIES CRANK-UP TOWERS

- Heavy duty, handles 44.7 square feet of antenna load at 50 MPH, 35 square feet at 70 MPH.
- All models supplied 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	\$1,642	\$1,269
HDX-555	55'	22'	870	\$2,874	\$2,269
HDX-572MDPL	72'	22'8"	1600	\$7,528	\$5,899
HDX-589MDPL	89'	23'8"	2440	\$9,855	\$7,699
HDX-689MDPL	89'	23'8"	3450	\$19,039	\$14,999
HDX-5106MDPL	106'	24'8"	3700	\$20,719	\$15,999



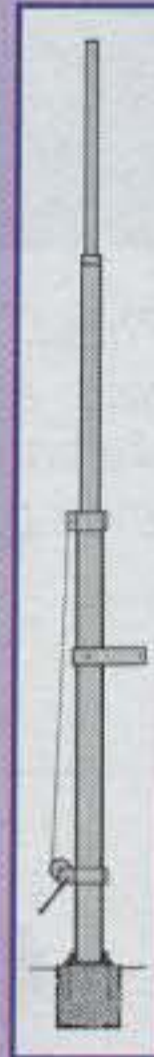
## MA SERIES CRANK-UP MASTS

- Handles up to 22 square feet of antenna load. (See chart below)
- MDP & MDPL models include motor drive.
- All models supplied 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	\$1,007	\$849
MA-550	55'	22'1"	435	22	9	\$1,704	\$1,399
MA-550MDP	55'	22'1"	620	22	9	\$3,258	\$2,729
MA-770	71'	22'10"	645	15.5	5.5	\$2,810	\$2,359
MA-770MDPL	71'	22'10"	830	15.5	5.5	\$4,445	\$3,729
MA-850MDPL	85'	23'6"	1128	15.3	6.3	\$5,991	\$5,029



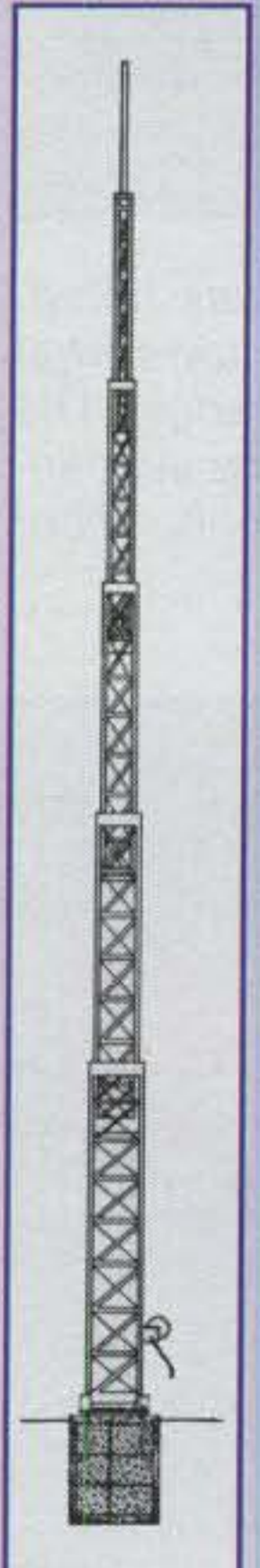
## TMM SERIES COMPACT CRANK-UP TOWERS

- 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 supplied 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	\$1,355	\$1,139
TMM-433HD	33'	11'4"	400	\$1,624	\$1,379
TMM-541SS	41'	12'	430	\$1,779	\$1,499



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messages by “feel” in the dark. The Agentenfunk-Taste R-350M shown in photo 7 is a tri-mode spy key. First, its special pen can be used to select a secret code that automatically encrypts its transmitted Morse. Second, its side crank is used to send high-speed Morse by pulling a special coded film through the box, and third, the R350M acts like a regular straight key. Our special thanks to Gregor for agreeing to share these views with *CQ* readers.

### Handsome Homebrews

Space is now getting tight, but we are sure you will enjoy a quick view of three neat home-assembled keys made by friends just like you—folks with a sincere appreciation of Morse and CW.

First is the exquisite hand key made by Arnold Sayre, W8WVM (photo 8). You may recall seeing some of Arnold’s homebrewed classic rigs here in past columns. They were

marvelous in every detail, and this key is no exception. It sports a ball-bearing suspension, silver contacts, and a glazed walnut base.

Next is a blue-base iambic paddle that Harvey Knickerbocker, K6SK, made for Bob Crawford, WO6I, a few years ago (photo 9). The paddle measures 2” x 3” and has red fingerpieces and a heavy base made from pouring melted automobile wheel weights into a 2” x 3” tin below the base. Lever gaps are independently adjustable, and Bob says the paddle is quite a joy to use.

The third homebrew item is a “Texas Key” which Wes Spence, AC5K, found at a hamfest (photo 10). The key is a single-lever paddle built to resemble an oil well. It is made of stainless steel, fitted with a clear fingerpiece, and as Wes states, looks much better than it works. However, it makes a good conversation piece. That’s fine, as half the fun of collecting keys is admiring their design!

### Practice Sets

We wrap up Part I of this year’s “Keys Special” with some heartwarming views of those ever-popular telegraph practice sets from eras past (photos 11, 12, and 13). These items

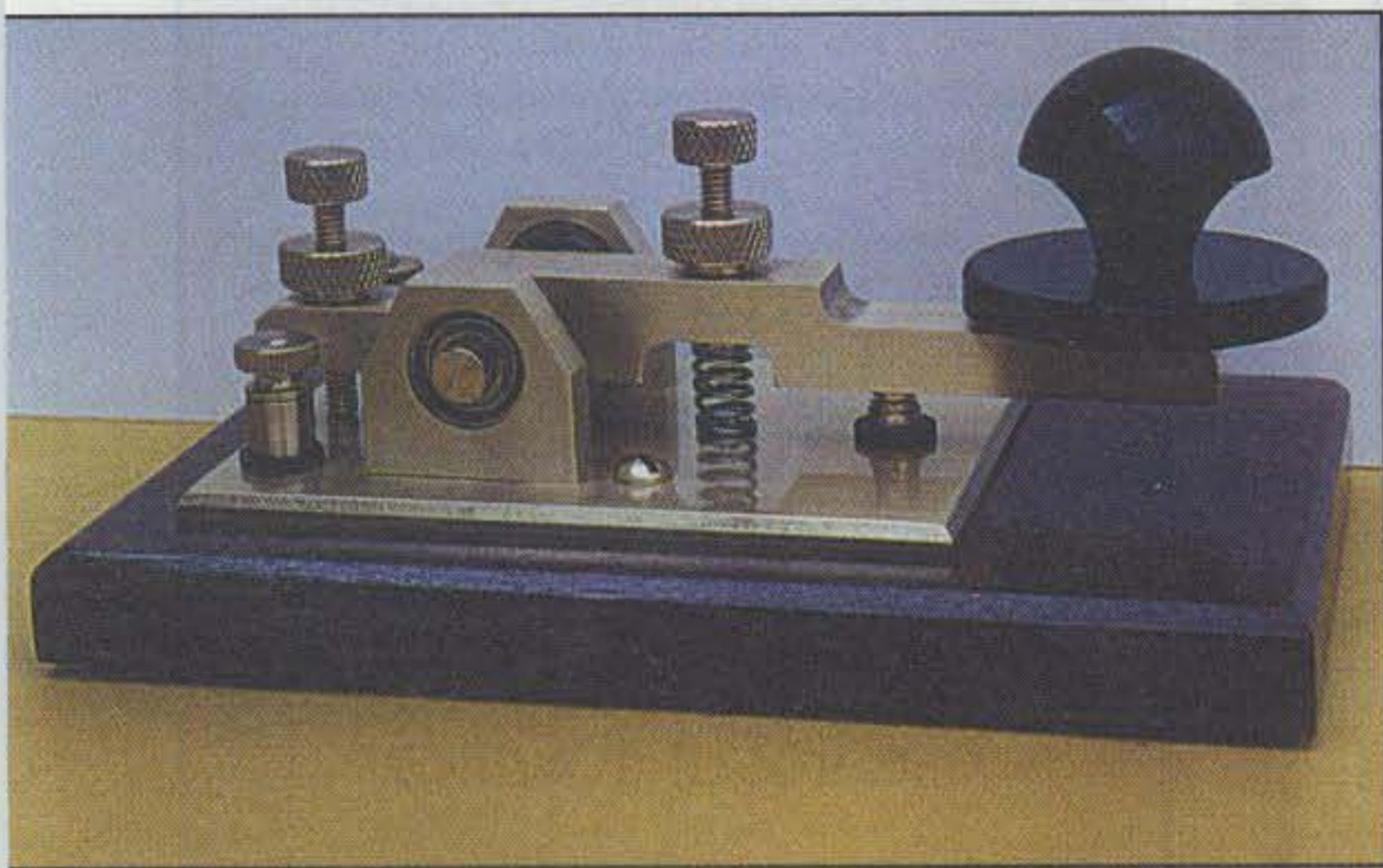


Photo 8— This marvelous Morse manipulator was homebrewed by Arnold Sayre, W8WVM, and vividly shows what one can accomplish with dedication and patience. The key sports heavy-duty silver contacts, ball-bearing suspension, and a refurbished 40-year-old Navy knob. Nice! (Photo by W8WVM)

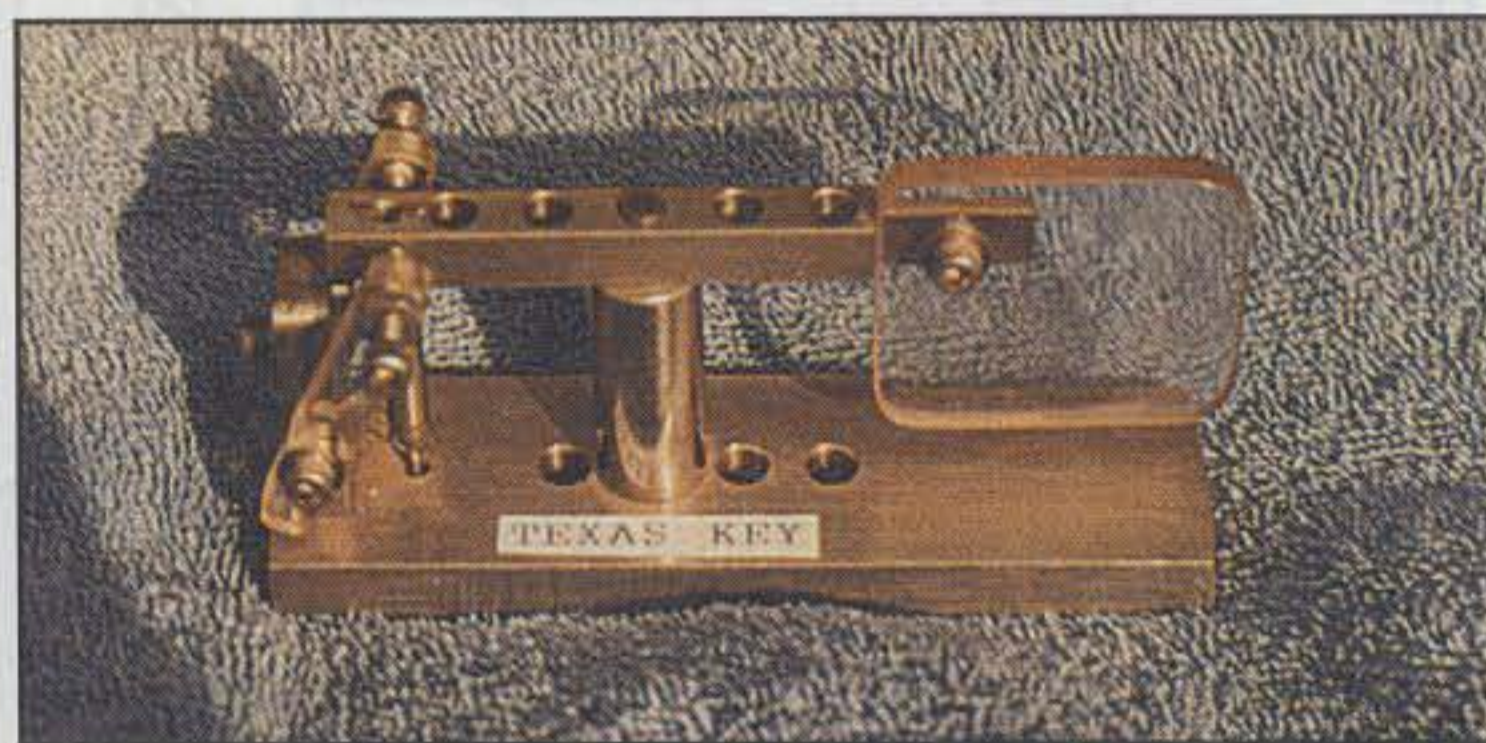


Photo 10— Every key, bug, and paddle is special in its own way, and this “Texas Key” that Wes Spence, AC5K, purchased at a Texas hamfest reflects that fact. It is a single-lever paddle fashioned after—you guessed it—a Texas oil well. (Photo courtesy AC5K)

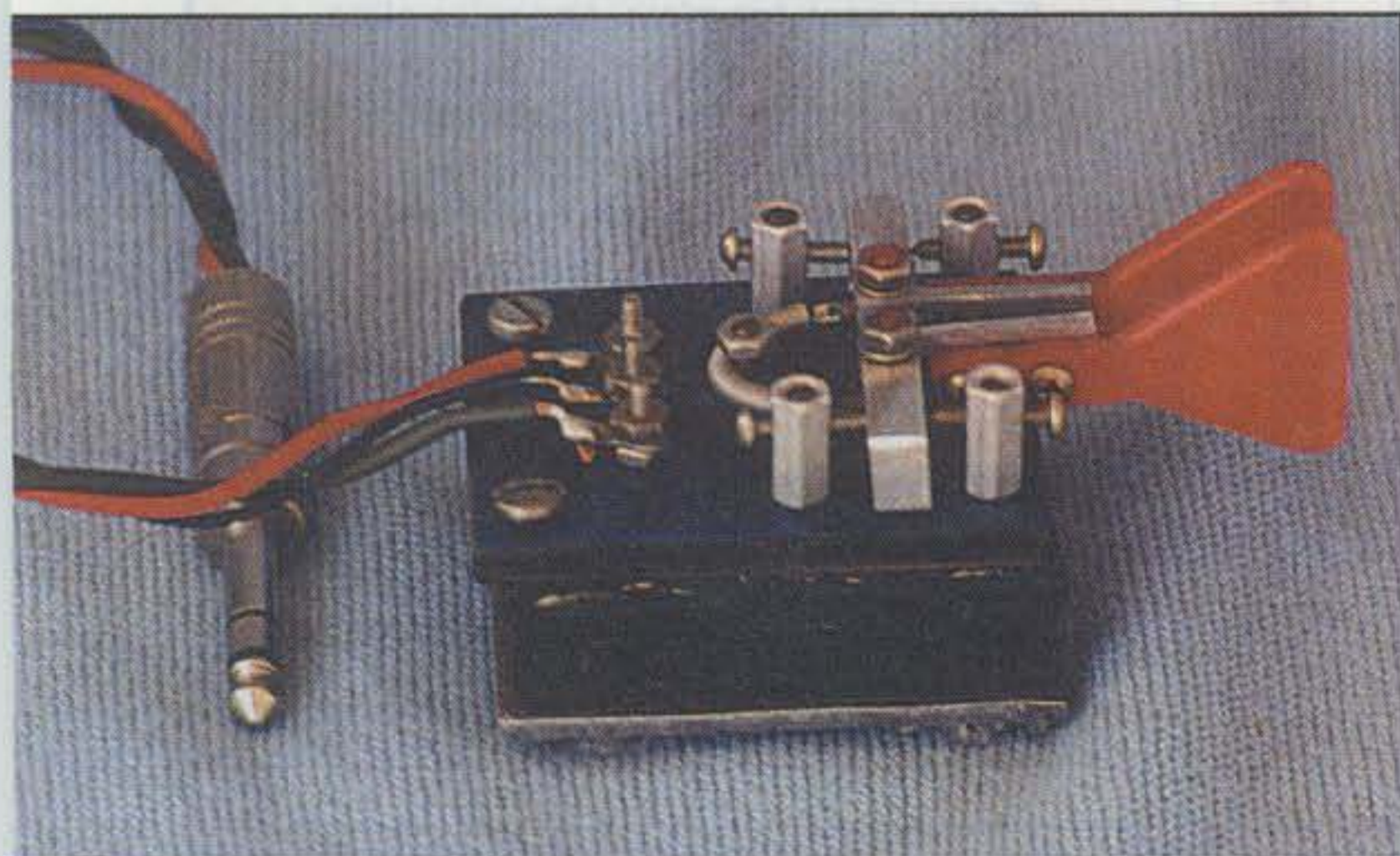


Photo 9— Harvey Knickerbocker, K6SK, homebrewed this red, white aluminum, and blue-base paddle for his friend Bob Crawford, WO6I. It sports independently adjustable contacts, an extraheavy “no walk” base, and, according to Bob, works very well. (Photo courtesy WO6I)

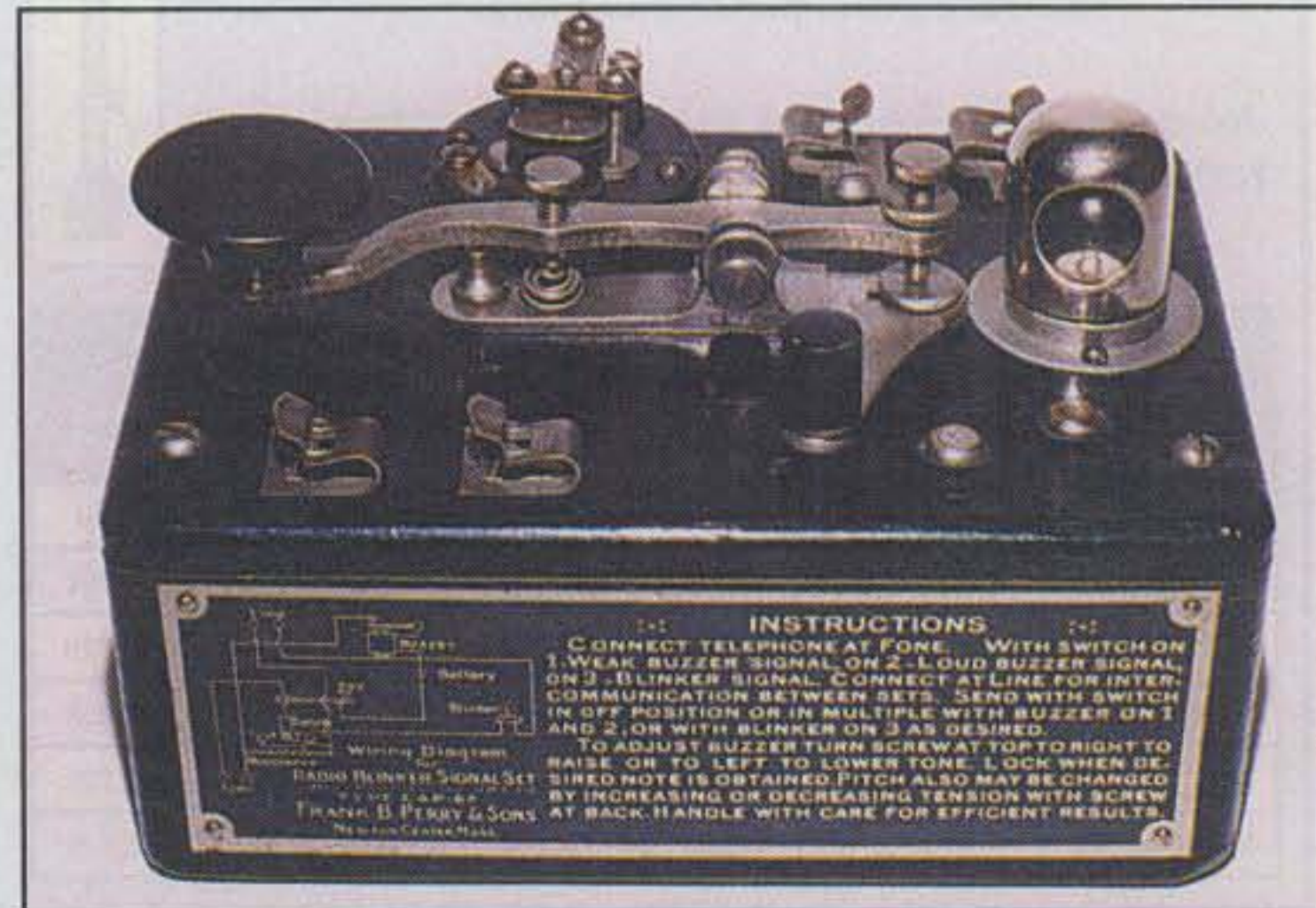


Photo 11— Telegraph practice sets such as this Frank B. Perry & Sons unit are popular collectibles, especially when accompanied by their original papers and boxes. This unit has both buzzer and blinking light, and belongs to key collector extraordinaire Gil Schlehman, K9WDY.

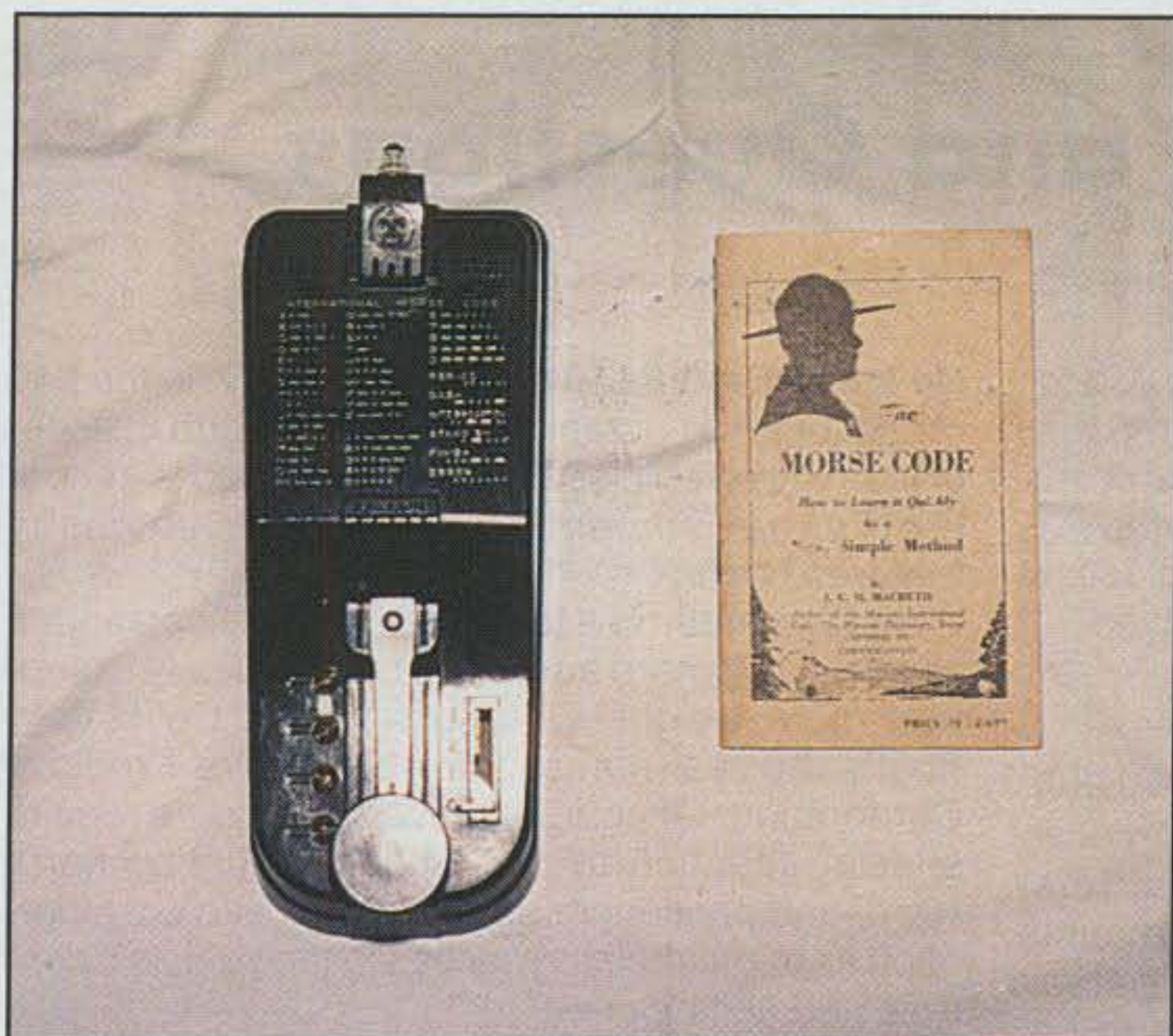


Photo 12— This item is a Fleron Signaler. It was made during the 1940s and was also designated the official Boy Scout signaler of the time. Note the Boy Scout emblem atop the lamp mount at the rear. Batteries for operation fit inside unit. (Photo courtesy owner Miles Hess, WB4YQE)

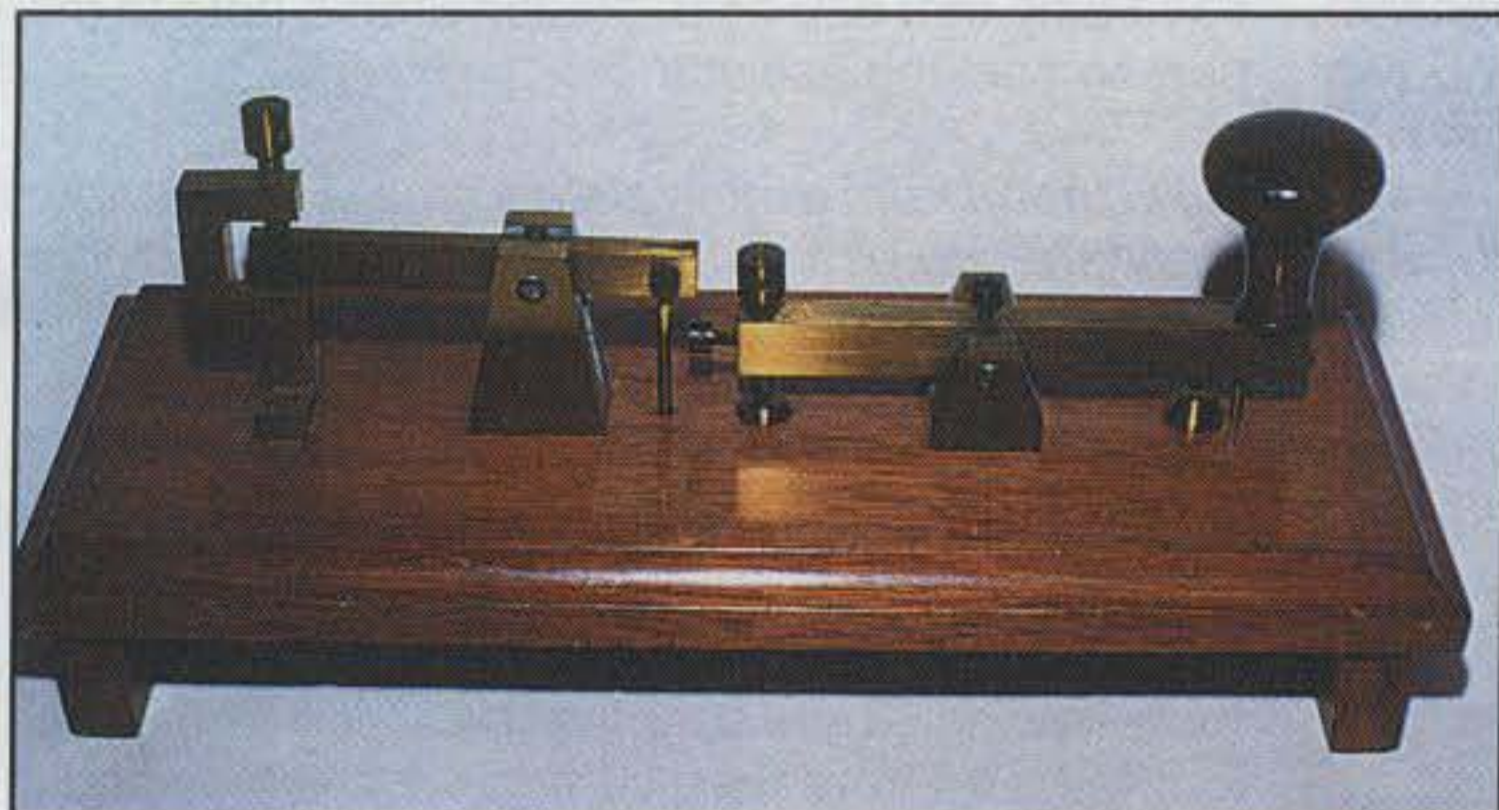


Photo 13— Mechanical learner's sets date back to the late 1800s and early 1900s. They are now scarce, and few are in exquisite condition like this British Walters 40S unit. Note the push rod below the key's knob links to and activates the sounder's arm on the left. A true collector's prize! (Photo courtesy Gil Schlehman, K9WDY)

have become special collectibles, incidentally, and are now complementing many private key collections. Practice sets in original boxes and sporting original documentation are especially favored.

Our first item is a combination buzzer and blinker set made by the Frank B. Perry and Sons Company during the 1940s (photo 11). Batteries load into the bottom section, a mating set connects by binding post on the side, and a switch selects buzzer or blinker function. Cool!

Next up is the Fleron Signaler made by Fleron and Son, Inc. of Trenton, New Jersey during the 1940s. This is another "light and buzzer" unit, and it was also designated the "official Boy Scout Signaler" of the '40s. Note the official Boy Scout symbol atop lamps mounted at the rear. This practice set belongs to Miles Hess, WB4YQE.

Our final item is a mechanical learner's set, the British Walters model 40S shown in photo 13. This is a combination key and sounder on a beautifully crafted, perfectly maintained wood base, and it probably was made between 1880 and 1910. The sounder has no electromagnet. Notice the pushrod below the key's knob. It links to the sounder's arm, so pressing the key produces the normal "click-click" plus the sounder's famed "click-cluunk." It is a most impressive piece. Our special thanks to collector supreme Gil Schlehman, K9WDY, for sharing with readers views of this set plus the Frank B. Perry and Sons set in photo 11.

## Conclusion

That it for space for this time, friends, but stay tuned for Part II of the "Keys Special" and a special treat coming in a few months. Meanwhile, we invite you to drop us a photo and a note describing your own special key—commercially or privately made or homebrewed. It is an excellent way to share details of your pride-and-joy with the rest of the world in an "everyone wins" manner. Just be careful if you decide to run a (non-mandatory) advertisement for your item here in CQ the same month. Resultant orders could overflow your mailbox and make you famous in the world of CW! Could you handle that?

Another blowout special featuring classic microphones that are totally awesome is planned for next month, so stay tuned and keep on hamming!

73, Dave, K4TWJ

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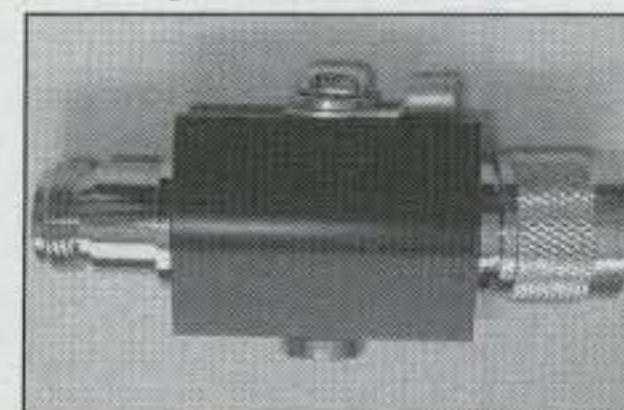
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(Picture: RTM-LSP354-600)

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# Mounting Tips and Questions

**G**reetings, Road Warriors, and thank you for the warm reception to the first column that appeared in this magazine. It's obvious there's a lot of interest in mobile operations (as evidenced by the focus of this issue), so let's follow up on some of the correspondence I received.

## Mounting Control Heads and Mics

We received a great tip from Jeff Lee, KF6NXQ, on using Panavise™ (or similar) "no hole" mobile telephone mounts to mount control heads, HTs, and/or microphones. Having used these mounts in three cars myself, I had forgotten how nice they look and how well engineered they seem to be. The mounts make no visible holes in your dash. They usually are installed by removing some trim, and then make use of existing screws that secure items such as your car's radio or other devices. In the units I have seen, they seem to be engineered to be clear of the airbag deployment zone, and they provide a sturdy place to attach equipment as long as you keep the weight at a reasonable limit. My unit holds a cell phone mount and two microphones. I have also used it to secure HTs (see photos).

What with the new cell phones intended for shirt pockets, it would not surprise me to see the demand for in-car cell-phone mounts diminish. It probably would be wise to check on the availability of mounts that fit your car sooner, rather than later. The item you're asking for is called a "vehi-

cle specific mount." They can be costly, in the \$40 range, but the custom fit and look is worth it, especially in new vehicles. One source of info is <[http://www.panavise.com/nf/comm/indash/indash\\_features.html](http://www.panavise.com/nf/comm/indash/indash_features.html)>.

Another method is to use a universal floor mount, which is a bit more ambitious but also likely to support more weight. One such unit is CellMate™ (that's the real name) from Interactive Products Corporation. Of course, universal mounts require special attention to placement, mounting hardware, and passenger safety, along with consideration as to maintaining access to the vehicle's controls and accessories.

The internet is a great source of interesting supplies. Try doing a search on "cell phone mounts."

## Help Requests

One of the wonderful attributes of hams is their willingness to help one another. Our first column generated some of the following requests. If you have a tip that can help, please drop a note to the person seeking assistance.

*I've gone from a minivan to a small Ford Ranger standard cab pickup and know I don't have room for my radios! My radios don't have removable heads, so that makes installation even harder. (The vehicle has) a stick shift, so any help from your readers would be a big help.*

—<[ShermN8POE@webtv.net](mailto:ShermN8POE@webtv.net)>

I have also received a few requests similar to the following. There seems to be a long-term problem with RFI from Ford vehicles. Having owned a

\*5904 Lake Lindero Drive, Agoura Hills, CA 91301  
e-mail: <[aa6jr@cq-amateur-radio.com](mailto:aa6jr@cq-amateur-radio.com)>

*Kenwood TM-D700 control head nicely placed on a Panavise mount in 1999 Dodge Ram 2500 by KF6NXQ. (KF6NXQ photo)*



# The Ultimate Portable QRP Rig!



## Why do we call the '703 the ultimate portable QRP rig?

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- **HF or HF & 6M only.** Icom's engineers focused on the bands that really mean the most to QRP operators. A VHF/UHF rig is called a HT!
- **Internal Antenna Tuner.** 160-10M or 160-6M, depending on the version. Internal, automatic and designed with latching relays so no current draw when the match is achieved.
- **DSP.** That's right, Automatic Notch and Noise Reduction is included.
- **Smart Power Mode.** The '703 is one smart radio! It knows when to throttle back the current to prolong the life of your battery.
- **Low Current Consumption.** This QRP rig will rival some handheld radios, as the current drain is as low as 300mA when on 9.6VDC
- **CW Memory Keyer.** Contest QRP is so sweet with the internal CW Memory Keyer. 3 memories capable of holding 50 characters each.
- **Big Ears.** Sensitivity of 0.16uV at 10dB S/N rivals some of the big rigs. This helps compensate for antenna compromises when you're in the field!
- **Cold Hands.** Don't worry, the '703 comes with the TXCO, so your frequency will not drift when you touch the knob with cold hands. Ready for outdoors!
- **No Assembly Required.** The '703 is ready to go when you are!
- **Way Cool Optional Backpack.** A must have accessory! So cool, '706 owners will have to own one!



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Custom-fit mounts by Panavise (and others) use existing holes for concealed mounts. Here we see "during" and "after" shots from Jeff, KF6NXQ, as he installed a Panavise mount for his HT on a 2001 Ford Explorer. Jeff reports the entire process took about 30 minutes. Panavise includes instructions with its mounts. (KF6NXQ photos)

few myself, I have first-hand experience. "Public Enemy Number One" appears to be the electrically noisy fuel pump, but there are other emitters. Read on:

*I need some help and I'm running out of places to go. I'm experiencing an RFI problem with a new 2002 Mercury Mountaineer with a 4.6L, V8 engine. I have talked with some local hams and feel certain that my mobile installation is correct. I have talked to the dealership, and they admit that the RFI problem is over their head. I have written Ford Customer Service and they insist that I work through the dealer. I'm getting nowhere fast. I have gone to the web for help from RFI interest groups and have followed up on several suggestions, none of which has blocked the RFI from entering the rig. Can you help? I suspect that I am not the only radio amateur that has the Ford 4.6L, V8 engine, with coil-on plug technology.*

*I am open for suggestions, contacts, regrets, or sympathy. I would welcome the opportunity to speak with anyone who might want to understand the details of this issue. Thank you in advance for your help. —Paul J. Pagano <wa4aa@arrl.net>*

What's really strange to me is that Ford is the primary supplier of police vehicles in the USA, their Crown Victoria being the car of choice of many public-safety agencies. Granted, most police and fire communications are FM, but suppressing electrical noise would seem to be in the interest of Ford engineers. Finding dealers with technicians who are familiar with radio-related problems is a rarity. A Ford contact suggests you tell the dealer to contact its internal "Dealer Service Connection." It's a hotline from dealers to Ford engineers for sticky problems. Ford also suggests owners use its website, <<http://www.ownerconnection.com>>. However, before we lay it all on Ford, here's a similar problem in a Honda product:

*I have a severe ignition noise problem with my year 2000 Acura. Seems they use a device called a coil pack; each spark plug has its own coil. The noise radiates along the body of the car. Taking a receiver like a transceiver around the car, the spark noise is as strong in the front as it is in the back. Do you know of any ham who has had this problem and been able to reduce or eliminate the ignition noise? — Thank you & 73, Marty, WD9ABG <wd9abg@aol.com>*

And here's one that's a bit different:

*I run a VHF dual-band radio in a 2000 Ford F-150 counterpoise. I don't hear all that well, and with the windows open it is very difficult to have a QSO above about 25 mph. The little 2 inch speaker in the ICOM doesn't quite cut the road noise. The AM/FM broadcast RCVR has lots of audio. A friend of mine bought one of those devices that slip into the cassette deck of a car radio. He connected the AF output of his 2 meter radio through the tape adapter and is able to blast enough audio to meet his needs. I was going to do the same thing with the extra enhancement of using the stereo right/ left channels as 2 meters and 1.25 meters. The problem is I don't want the tape drive running all the time I'm using the ham rig.*

*There does seem to be an answer. The basic Ford radio/cassette player has an option for a CD player. My truck doesn't have the optional player, yet the radio has controls for the CDs. It seems reasonable to assume that there are connections somewhere on the back of the radio to bring in AF from a CD changer. Couldn't those same inputs be used to bring in AF from a ham radio?*

*I don't have the U-shaped tool that is required to extract the radio from the dashboard. With the experience and resources you have available, what do you think? What kind*



## Some Mobile Mounting Tips

A good mobile installation involves preparation and a plan. Before you begin, do research on your vehicle and learn as much as you can about its design and its limitations. *Safety First* is the "prime directive" for mobile work! When you're ready to proceed, here are some pointers:

1. Disconnect the battery before you begin. In most newer cars this will result in the loss of radio-station memories and the car's "learned" operating profiles. Better this than risking a fire! It is reported that some newer cars might malfunction as a result of lost battery voltage. Again, check the owner's manual or check with your dealer prior to your project.

2. Be certain that your placement of wires is away from sources of heat and abrasion. Do not underestimate under-hood temperatures. Avoid hot exhaust-system parts, turbochargers, and other heat sources. Use heat shielding where needed. Most radio manufacturers recommend direct connection of the radio power leads to the battery. Place fuses as close to the battery as possible and fuse both leads. Plan your work accordingly.

3. Know your car's construction. You must be certain that hole

you're drilling will not pierce a fuel line, brake line, or a computer lurking on the other side of the firewall.

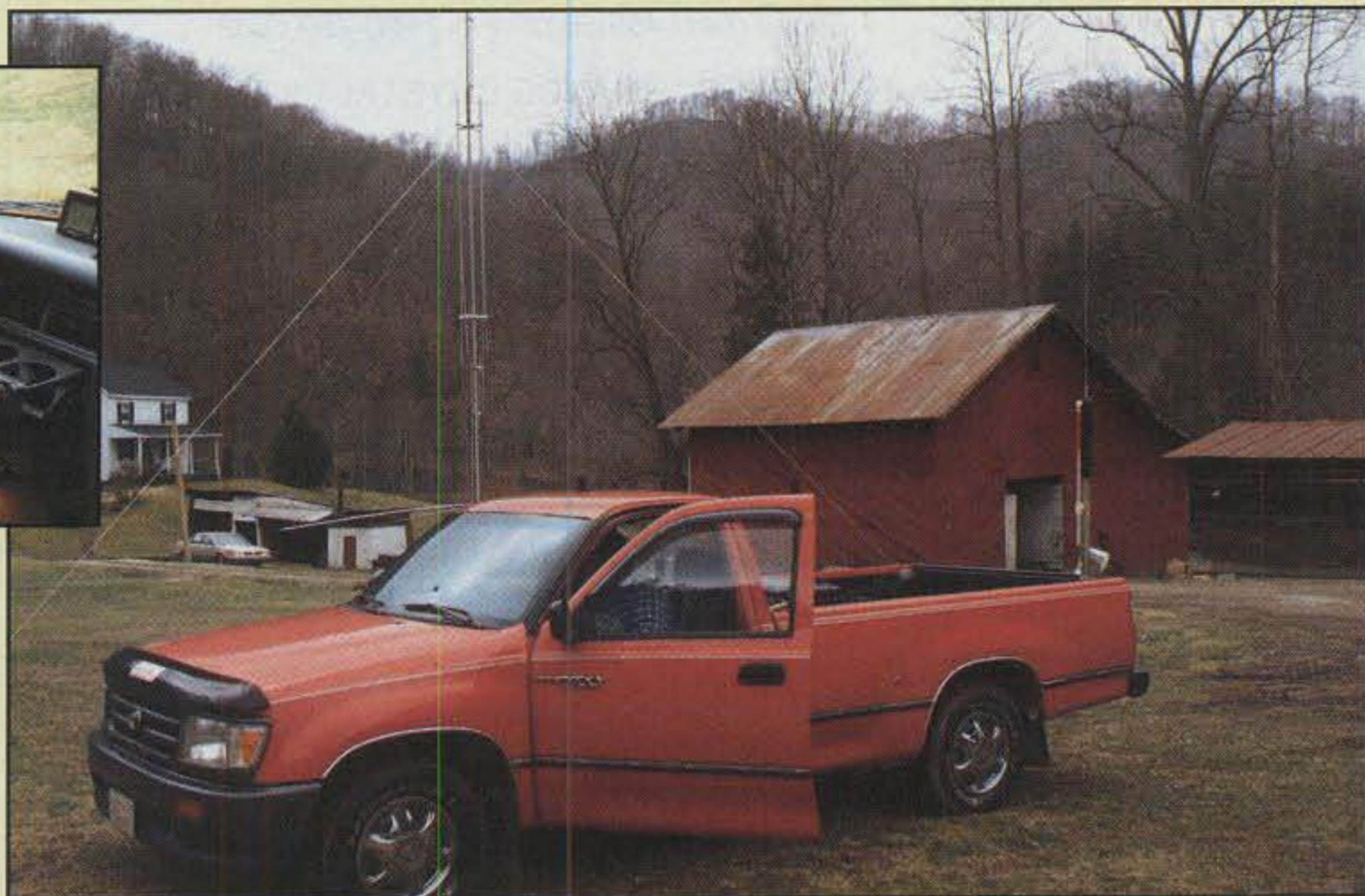
4. Triple check the intended placement of your radio and its related components. It must not interfere with driver controls, the operation of accessories, and power seats, and most important, it must be clear of the air-bag deployment system. Make sure your radio equipment is secure so that it will not become a "missile" in the event of an accident.

5. Don't ignore antenna and coax issues. Many cars are now constructed from composite (non-metallic) materials. Some car bodies may be a mixture of composite, steel, and/or other non-ferrous metals. These factors not only influence your success on the air, they could also result in exposing passengers to high RF levels. Also, a coax in close proximity to a computer could mean trouble.

6. A word to the wise on operations: Play it safe. Many states are now tracking accidents caused by "driver inattention." This category includes radio and cell-phone use, and it could be a factor in assessing liability in an accident. When conditions warrant, put the mic aside and just drive.



*Danny Ray Hayes, WA4HFJ, makes the most of mobile operations with his Toyota pickup. He can work all bands, including 160 meters! (WA4HFJ photo)*



*Close-up of WA4HFJ's antenna connection in the bed of his pickup truck. (WA4HFJ photo)*



*Radio setup inside WA4HFJ's truck. (WA4HFJ photo)*

of connectors are on the back of a factory-installed radio? What is their pin out? It would be nice to wire the ham rig to the broadcast radio, select CD, and blow away all that AF QRN.

—73, Paul

Interesting question, Paul. Let's see what our creative readership comes up with! BTW, you can get the DIN radio "U-shaped" removal tools from most tool suppliers, including those MAC<sup>TM</sup> and SnapOn<sup>TM</sup> mobile tool-supply trucks you often see near car dealers

and vehicle repair shops. That's where I got mine!

### Some Sources

Here are some places from which you can seek information relative to your vehicle. Direct phone calls to designers are not possible, because the engineers who work for manufacturers are not really there to help with individual problems, particularly in response to phone inquiries. If we bury them in phone calls, chances are the help will

go farther "underground." I'll pass along more info on manufacturer help as it becomes available.

### Chrysler

Write to:  
Daimler Chrysler Technology Center  
800 Chrysler Drive East  
Auburn Hills, MI 48326-2757

### GM

Write to:  
Milford Proving Grounds EMC facility  
Department MR  
Mail Code 483-340-111  
General Motors Proving Ground  
3300 General Motors Road  
Milford, MI 48380-3726

### Ford

Ford suggests contacting their customer-service hotline, 800-392-3673, or their customer website, <<http://www.ownerconnection.com>>.

For those of you headed to the Dayton Hamvention® this month, Ford, GM, and Chrysler are scheduled to be there ready to help with ham questions. Be sure to look them up.

### Oooops!

What's the dumbest thing you've done involving mobile operations? While "how to" tips are useful, sometimes, "here's where I messed up" stories can be even more enlightening. Share some of your sorrow with an avid audience. Your name can be withheld on request, but the education of the ham community is what we seek. Okay, we might snicker, too. Just promise you won't ride me too hard for my trying to carry on a QSO with another ham who was operating on a 222 MHz repeater. Trouble was, I was transmitting to him (and jamming an ongoing conversation) on 2 meters. Love those tri-band radios! At least I kept my eyes on the road. Another favorite was my plan to stick a magnetic GPS antenna on the trunk of my Mercury Grand Marquis. Imagine the look on my face as the antenna slid off the aluminum trunk lid. Foiled again! (groan)

Send your "true confessions" to the e-mail address shown on the first page of this column.

### Movin' On Down the Road

We've packed a lot into this visit! There's a wealth of information on mobiling elsewhere in this issue, so be sure to check it out. Like this month's contributors, don't be afraid to drop a note with your question or suggestion. 'Til next time . . .

73, Jeff, AA6JR



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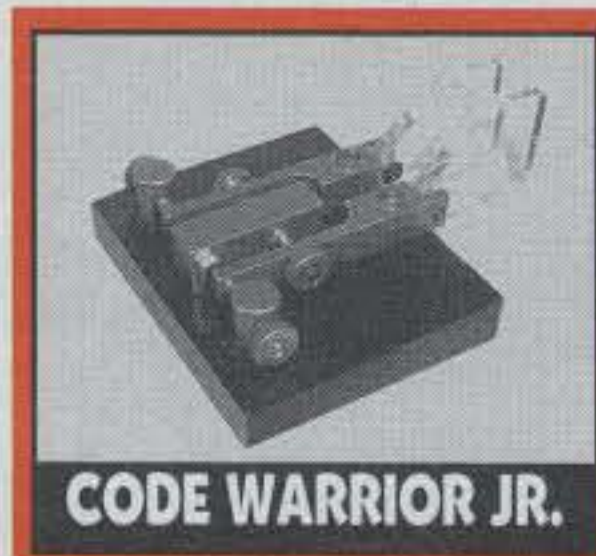
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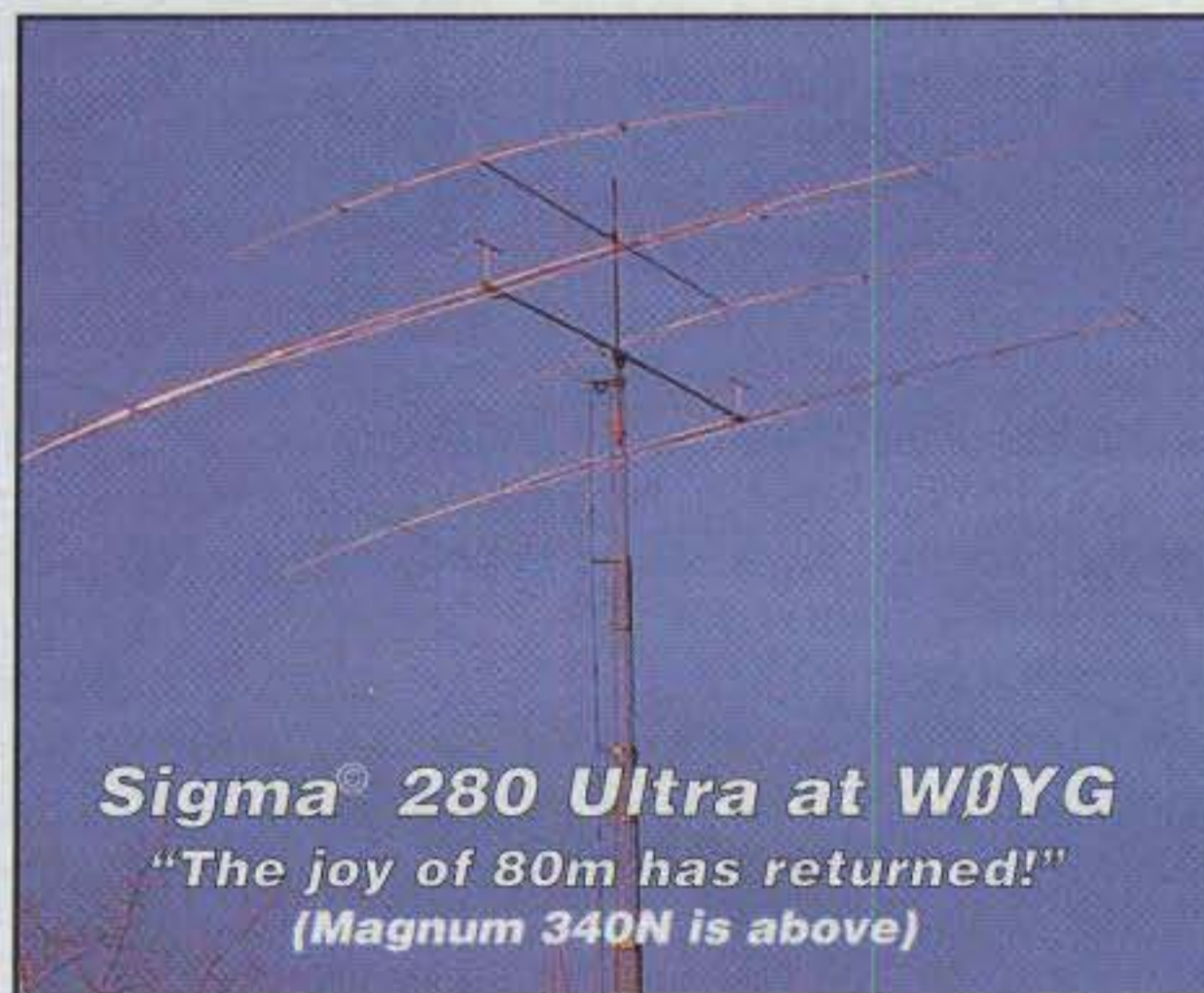
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BY WAYNE YOSHIDA,\* KH6WZ

# Making the Right Connections: RF Connector Assembly

I firmly believe that there are some "hardware" skills all amateur radio operators need to possess in order to keep their stations operating efficiently. The first and most major skill is soldering. Soldering is what holds all electronic parts together. Knowing how to solder properly will enable you to do it yourself, and save yourself both time and money, two very precious commodities these days.

The skill and art of soldering are not hard to master and will provide you with a tool to increase your enjoyment for a lifetime. You youngsters out there may even develop a career path from all of this ham radio activity, like a lot of us "old folks" already have.

Very good tutorials on soldering and building electronics projects appear in the building guides provided by companies that produce electronic kits, such as Ramsey Electronics <<http://www.ramseyelectronics.com>> and Elecraft <<http://www.elecraft.com>>.

As I write this, I remember my eighth grade Electric Shop teacher, Mr. Brotherton (I never knew his first name), saying, "You must learn to crawl before you can walk" as he made all of us make wire splices with a torch-heated soldering iron, paste flux, and 50/50 solid solder (we won't do that here). He wanted to emphasize that we must possess the basic skills before we could attempt anything else. I guess that's good advice.

The most important part of successful soldering is the proper application of heat to the joint. The phrase often used is "Heat the work, not the solder." This means placing the hot iron tip at the intersection of the wire and another wire, or the wire and a printed-circuit-board (PCB) foil trace, heating the junction (not the solder), and then applying solder to the heated wires and/or PCB foil. In other words, do *not* attempt to use solder las you would hot-melt glue, dripping molten solder onto the connection. It won't make a good electrical bond.

In order to learn the skill, you must actually do it, and practice, practice, practice. Get a good soldering iron or soldering station, some 60/40 or 63/37 rosin-core electronics solder, and a simple tool kit. Again, the websites mentioned above have good recommendations. Practice on scraps of wire you might find around the garage, or perhaps you can get some scraps from a fellow ham. The wire size and the insulation color do not matter, and you may want to get both solid and stranded wire for your practice sessions. You may be able to get various

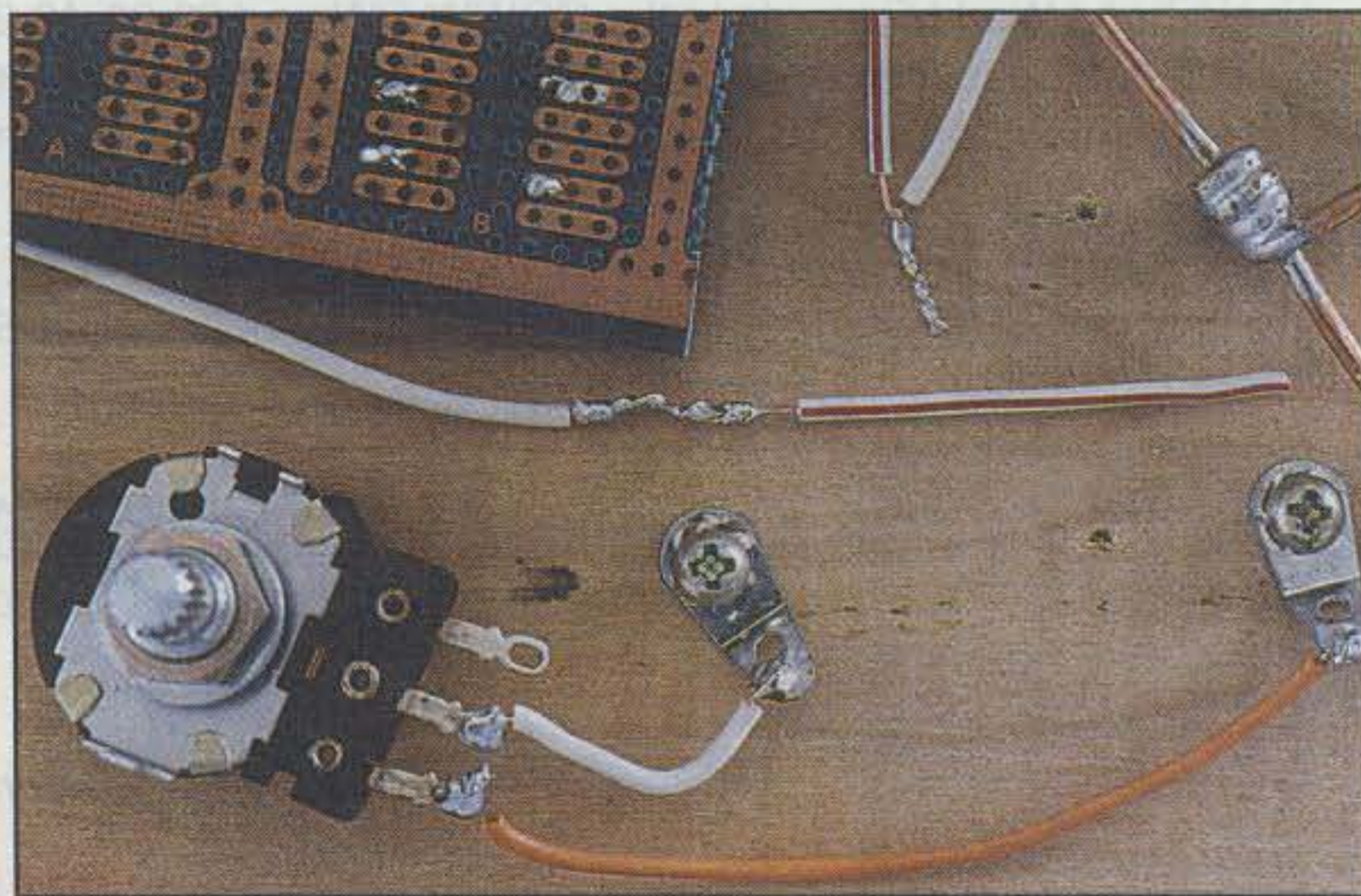


Photo 1— The soldering practice board. Practice making wire splices with both stranded and solid copper wire. These connections are especially useful for wire antennas, including the trusty dipole.

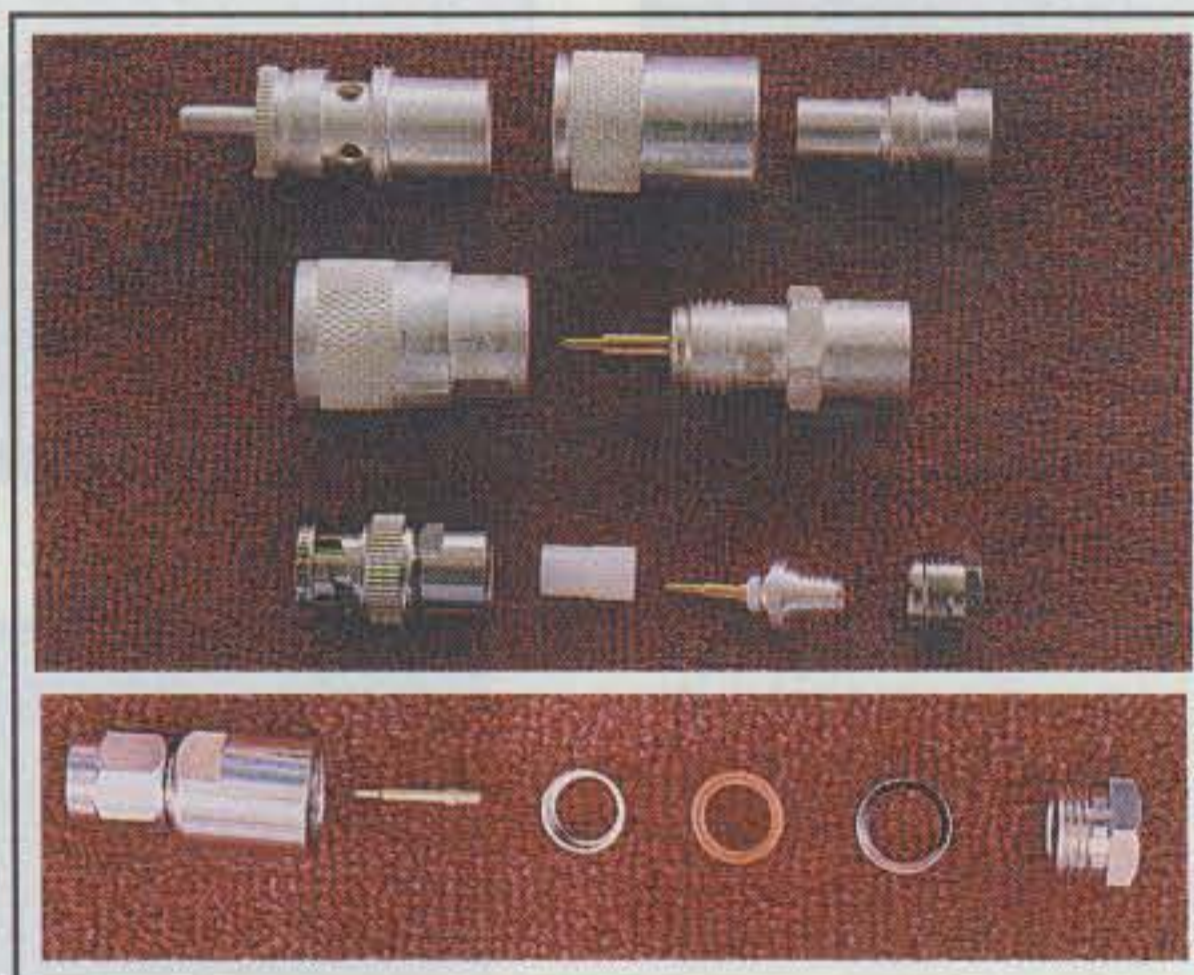


Photo 2 – The most popular RF connectors you will use in your shack. Top to bottom: PL-259 and reducer for RG-8X coax, Type N, BNC, and SMA. The Type N is the "new and simplified" connector, available at most ham radio shops. It's highly recommended for UHF and microwave use, or any installation requiring as little feedline loss as possible.

terminals, connectors, and components from a junked computer or other gadget. Try splicing wires together and wiring connectors and terminals (see photo 1). (Ed. Note: Solder makes good electrical joins, but you cannot depend on it for the physical strength of a connection. Make sure you start out with a good mechanical connection before heating the joint and applying the solder.)

## Make Your Own Cables

As hams we tend to have "wires all over the place."

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Photo 3— No need to measure. My thumb indicates where the outer jacket needs to be removed. Notice that the length of cable is slightly longer than the connector length, as indicated by the center pin.



Photo 6— Again, my thumb indicates where to cut. The shield and center insulator will be cut so that the cable will fit into the connector body, and stop where the Teflon® insulator joins the connector body.



Photo 4— Carefully remove a section of the outer jacket. See text for a neat technique to prevent nicking the braid.

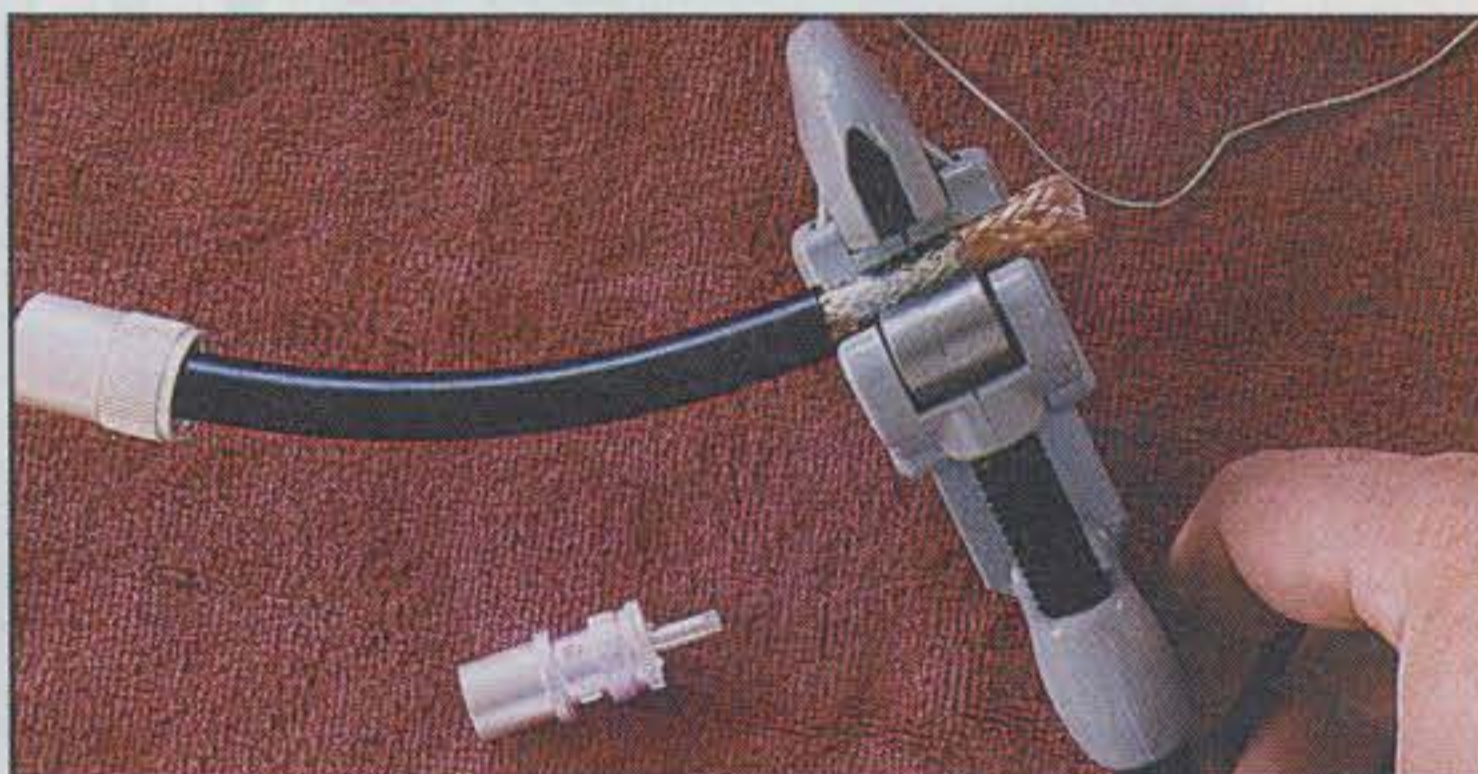


Photo 7— The tubing cutter makes removing the shield and center insulator quick and easy. Do not cut into the center conductor.



Photo 5— Tin the braid. As the solder melts into the braid, "wipe" the hot tip back and forth and along the braid, depositing a very thin film of solder on the shield. This turns the outer braid into a piece of tubing.



Photo 8— Screw the connector body onto the cable as far as it will go, and solder the shield to the body. When done properly, the molten solder will get sucked into the shield. Solder the center conductor to the center pin and trim the end. File the end smooth if necessary.

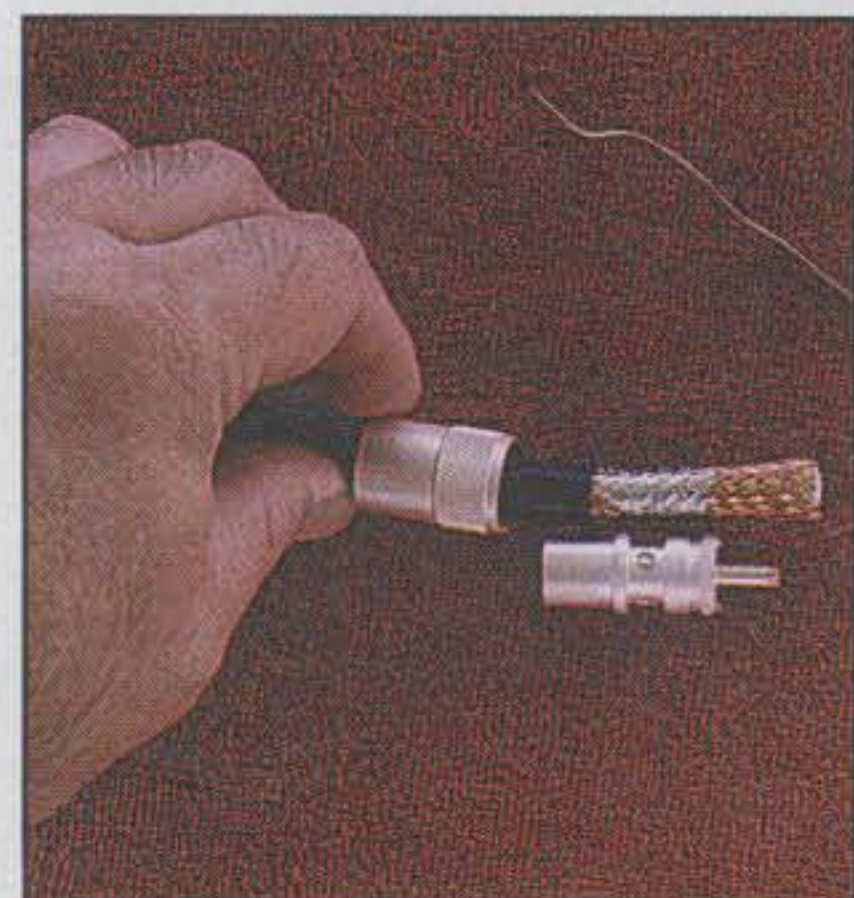


Photo 9— This is how it should look.



I hear this same phrase from the spouses of fellow hams all over the world, so I think this fascination with wires is a universal trait for us. Making your own cables may even be required, if what you need is not available off-the-shelf. Rather than asking a friend to build a cable for you, or paying someone else to do it, you can do it yourself and gain some independence.

Once you get the hang of soldering, building custom cables becomes an easy task. Here are some of the tips and tricks I use. I learned some of these techniques by reading instruction sheets and books, but the best tips came from watching others, actually doing it, and learning from my mistakes.

Photo 2 shows the most common RF connectors you will see in a ham shack. As I did some research on this month's topic, the Google search engine reported 682 references to "soldering PL-259." I sort of knew that soldering the PL-259 was "controversial," and there are many different ways to properly assemble this ubiquitous connector, but I had no idea how hot this topic is.

I ran into an interesting entry on the ARRL site, in which VHF contester (and former *CQ* magazine VHF Editor) Steve Katz, WB2WIK/6, advises that you should *not* solder the coax braid to the connector shell. Go to <http://www.arrl.org/tis/info/pdf/12076.pdf>.

Steve's advice must be sound, since he treated his connectors to a high-potential (hi-pot) test. Hi-pot testing uses high voltages (500 volts and above) to check for dielectric performance. Hi-pot testing can find defects that a conventional continuity test will not find, such as high-resistance shorts.

### Tools of the Trade

You'll need some good tools for good soldering. If you don't have these basic tools, this is a great excuse to go to your nearby tool store. A good soldering iron or soldering station is a must. I use the Weller WTCPS soldering station, with an 800-degree chisel tip installed. A sharp utility knife will be needed for cutting insulation. The most important tool for this job: a good tubing cutter with a sharp blade. I use the Ridgid Number 15 (<http://www.ridgid.com>). I am assembling a length of RG-213 to a PL-259 in the sequence of photos beginning with photo 3. You may want to consult the instruction sheet for your particular connector for exact dimensions and similar details. These techniques can simplify PL-259 assembly and can be applied to soldering the "new type" Type N connector.

### PL-259 Connector Assembly Tricks and Hints

1. Remove a section of the outer jacket using a sharp utility knife. Do not nick the braid. Here's a neat trick I learned from John Johnson, WB6LMN. Bend and pinch the cable so that the jacket is under tension. Take a sharp knife and gently press the blade into the insulation. Continue to gently press the blade into the jacket, going around the circumference of the cable. Do not "saw" or "slice" the jacket.

2. Tin the shield. Use 63/37 solder for its lower melting temperature. I learned this trick from contest partner Mike Reagan, NI7T. The tinned section of the shield should end up being under the ring of holes in the connector body. Notice where the outer jacket ends. You want some of the outer jacket to be screwed into the connector body. Oh yes, remember to insert the outer shell onto the cable before the body. Do it now, because if the housing isn't installed, the only remedy is to chop off the connector and start all over . . . and don't laugh, as I've done this too many times for it to be funny.

3. Use a tubing cutter to remove some of the shield and center insulator. Do not cut into the center conductor. If you

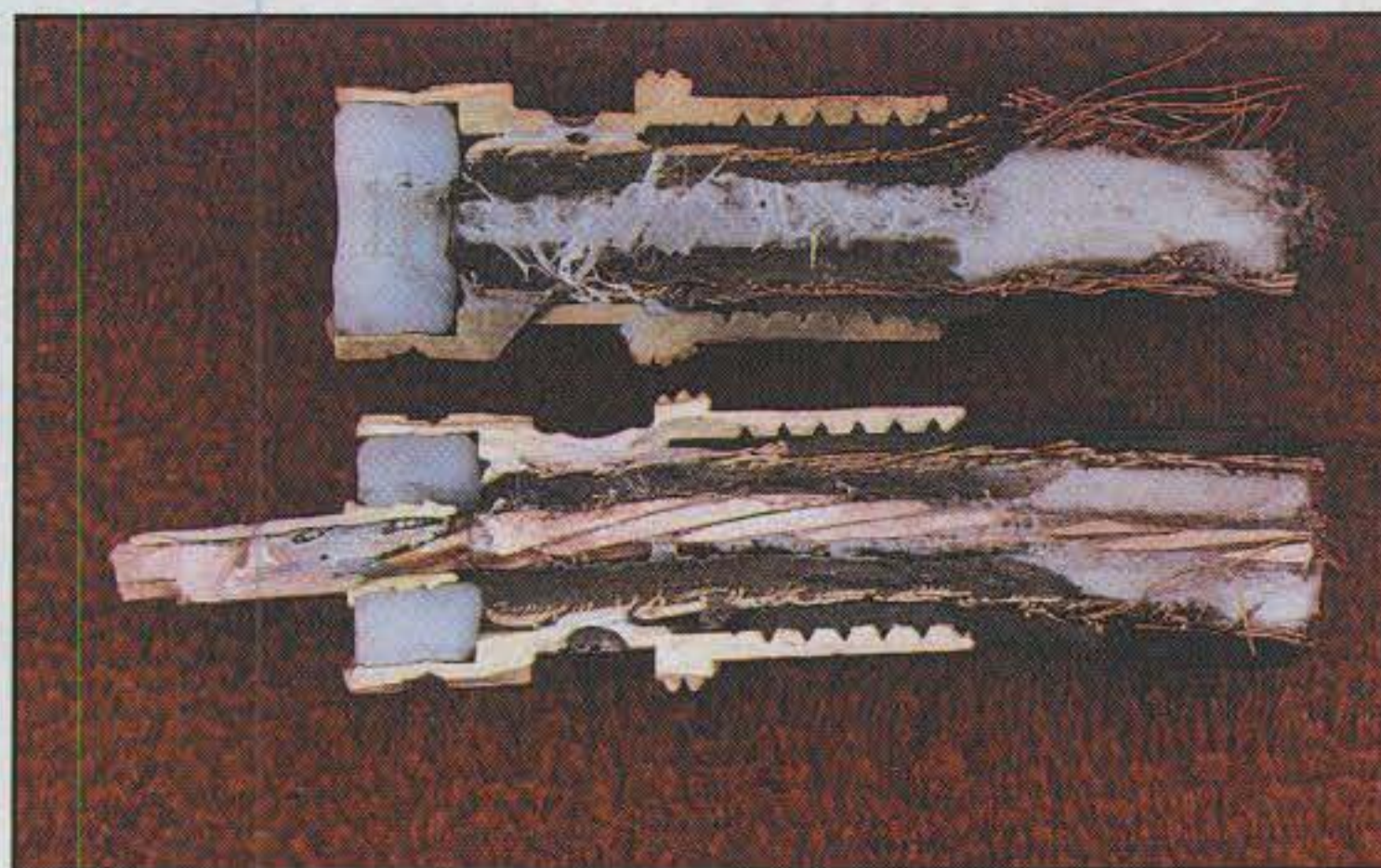


Photo 10— I have always been curious about what my PL-259 connectors look like on the inside, so I sliced this one in half length-wise. (See text for details.)



Photo 11— As a final touch, I add a call sign label to the cable and used heat-shrink tubing to add strain relief.

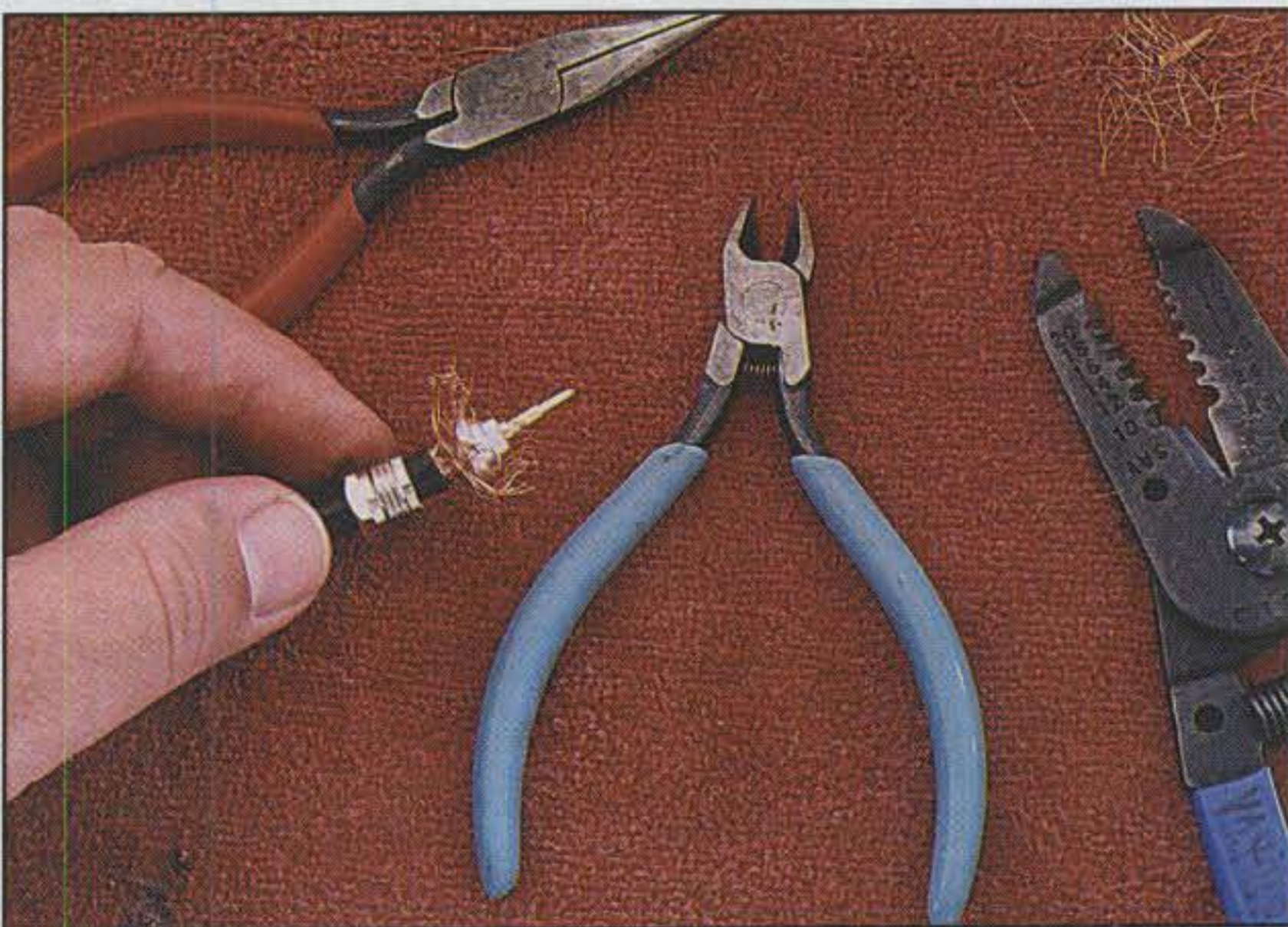


Photo 12— The BNC connector is smaller than the PL-259, so care must be taken to avoid internal shorts.

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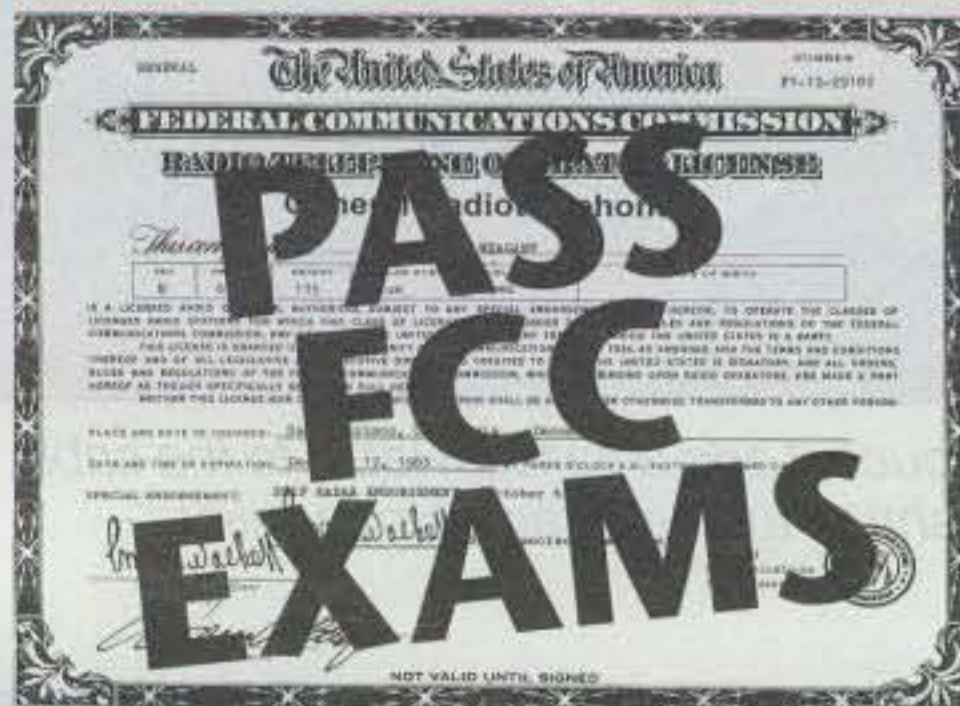
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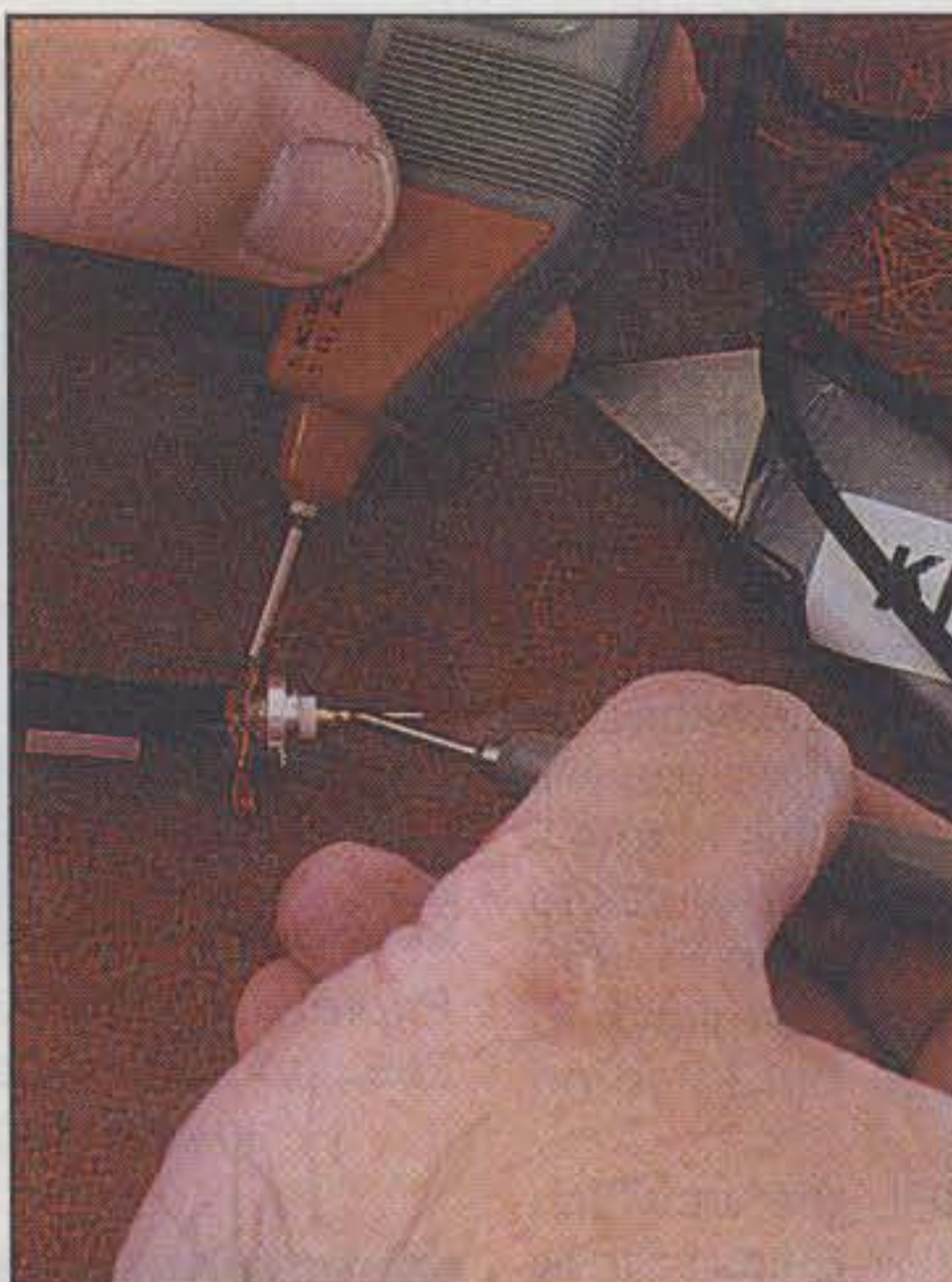


Photo 13- Check for short circuits between the center pin and shield as you assemble any connector.

do, you will have to start all over. If you do not have a tubing cutter, you can use the utility knife by pressing the blade into the tinned shield and rolling the cable back and forth. Keep your fingers out of the way, and again, make sure you do not cut into the center conductor. Now remove the piece of center insulator and shield at the same time by twisting and pulling. This also twists the center conductor, preparing the cable for the next step.

4. Last chance to make sure the outer shell is slipped onto the cable first, and in the right direction (threads facing the end of the cable). Then insert the cable into the connector body. Screw the connector body onto the cable as far as it will go, and solder the shield to the body. When done properly, molten solder will get sucked into the shield. If the solder "balls up," you do not have enough heat to make a good connection. Get a higher temperature (higher wattage) iron. Solder the braid to the connector through all four holes. Solder the center conductor to the center pin and trim the end. File the end smooth if necessary.

I have always been curious about what my PL-259 connectors look like on the inside, after all that work, so I took my Dremel® Moto-Tool and sliced this connector in half length-wise (see photo 10). The center conductor has been fused (soldered) into the brass center pin. The center insulator remained in a constant diameter throughout the connector body, and the shield has been fused (soldered) into the connector body, creating an alloy of the copper from the shield,

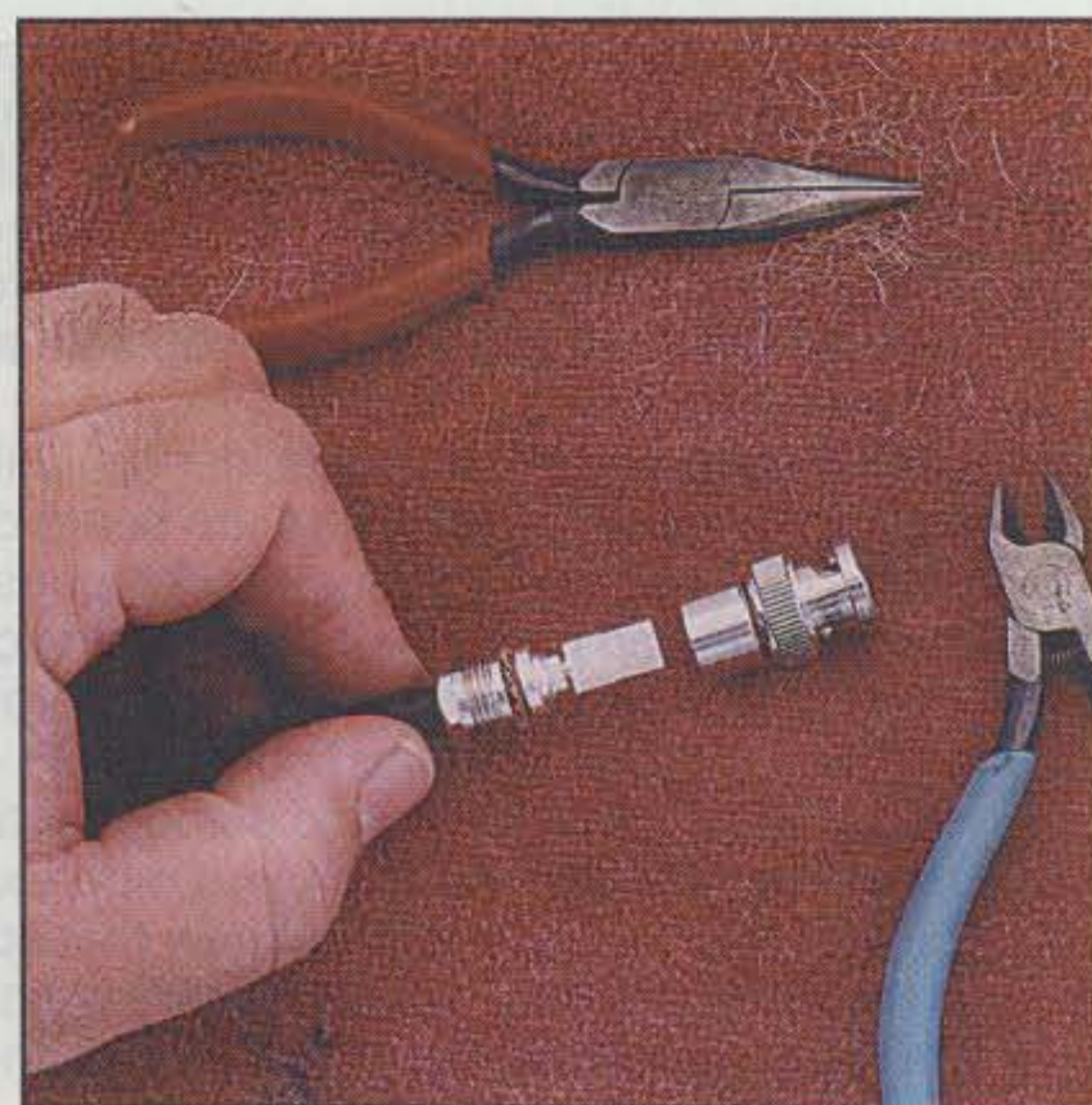


Fig. 14- Slide the shell onto the assembly. Hold the cable and connector body still with a wrench while you turn the locknut. Try not to twist the connector body, since that may twist the wires inside the connector.



Fig. 15- All done. Left to right: PL-259 on RG-213, PL-259 with RG-8X reducer, BNC on RG-8X with SMA on RG-8X. As a final touch I added a callsign label to the cable and used heat-shrink tubing for added strain relief.

the silver-plated brass from the connector body, and the tin-lead solder. This is exactly what should happen inside.

As a final touch I add a callsign label to the cable and used heat-shrink tubing for added strain relief. You can even add other cable data such as length, frequency band, or what antenna is at the other end, such as "2M Beam" (see photo 11).

### Other RF Connectors

The BNC connector is possibly a better connector to use at VHF and is actually simpler to assemble. Well, usually. As I assembled the connector for this arti-



## Build It or Buy It?

Even though the goal of this month's column is to help you learn to build your own cables, there are times when buying certain cables makes more sense. An example is the wonderful handful of shielded audio cables I found at a local electronics surplus shop. This was a great deal—pairs of brand-new, 3 foot, shielded audio cables, with gold-plated RCA connectors on each end for 65 cents each. That is cheaper than the price of a single plug! Thus, in this case, it made more sense to buy it, rather than make it. Of course, deals like these aren't universally available, so you still will need to make something, or even modify a cable, for a particular need.

cle, I somehow managed to short the cable (see photo 12). As it turns out, the center conductor was not tinned along its entire length, and bent outwards enough to short against the outer (ground) shell. Tinning the center conductor properly and trimming the length just right fixed the problem. I suggest that you check for shorts and open connections with an ohmmeter several times during assembly (see photo 13).

The SMA connector seems to scare a lot of people. In fact, when I went to my local ham radio store and asked for "a few SMA connectors so I can make my own cables," the otherwise friendly salesperson looked at me like I was crazy. I ordered some SMAs by mail from Universal Radio in Ohio. The SMA is an interesting plug, since it accommodates RG-8X coax and is assembled exactly like a BNC connector. Check <<http://www.universal-radio.com/catalog/parts/bncconn.html>>. Very good step-by-step instructions for semi-flex coax to SMA connector assembly appear on the website [wavelen.com](http://www.wavelen.com): <<http://www.wavelen.com/allong/smaassembly/smaassembly.html>>.

## A Lifetime Skill

Soldering is a skill that you can easily learn with a bit of practice. Adding the skill of soldering to your amateur radio repertoire will increase your ability to maintain and maybe even build your own station equipment. The PL-259 connector is the most commonly used antenna connector in amateur radio, so it is very important to know how to do it right.

Speaking of building stuff, have you built any useful radio or accessory projects recently? Send me a photo of your project with a short description of what it is and what it does, and I'll mention the best ones in this column.

73, Wayne, KH6WZ

# Can YOU Find the



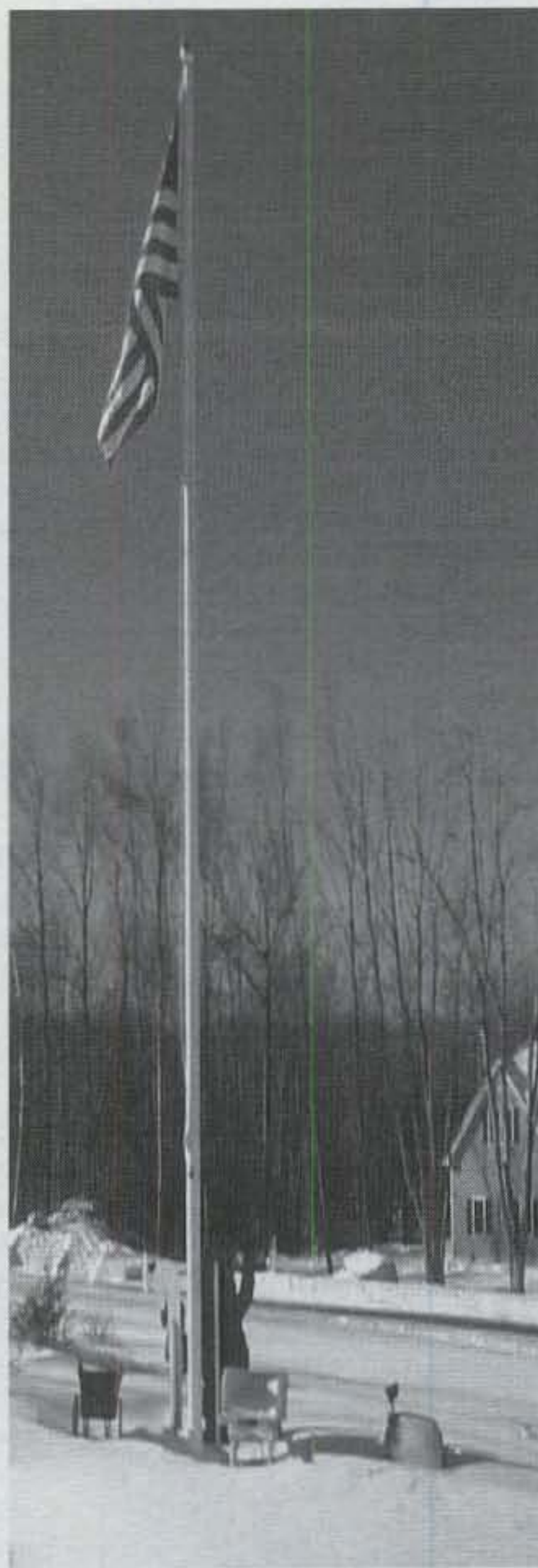
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# Tubes, Transistors, and ICs—Simplified

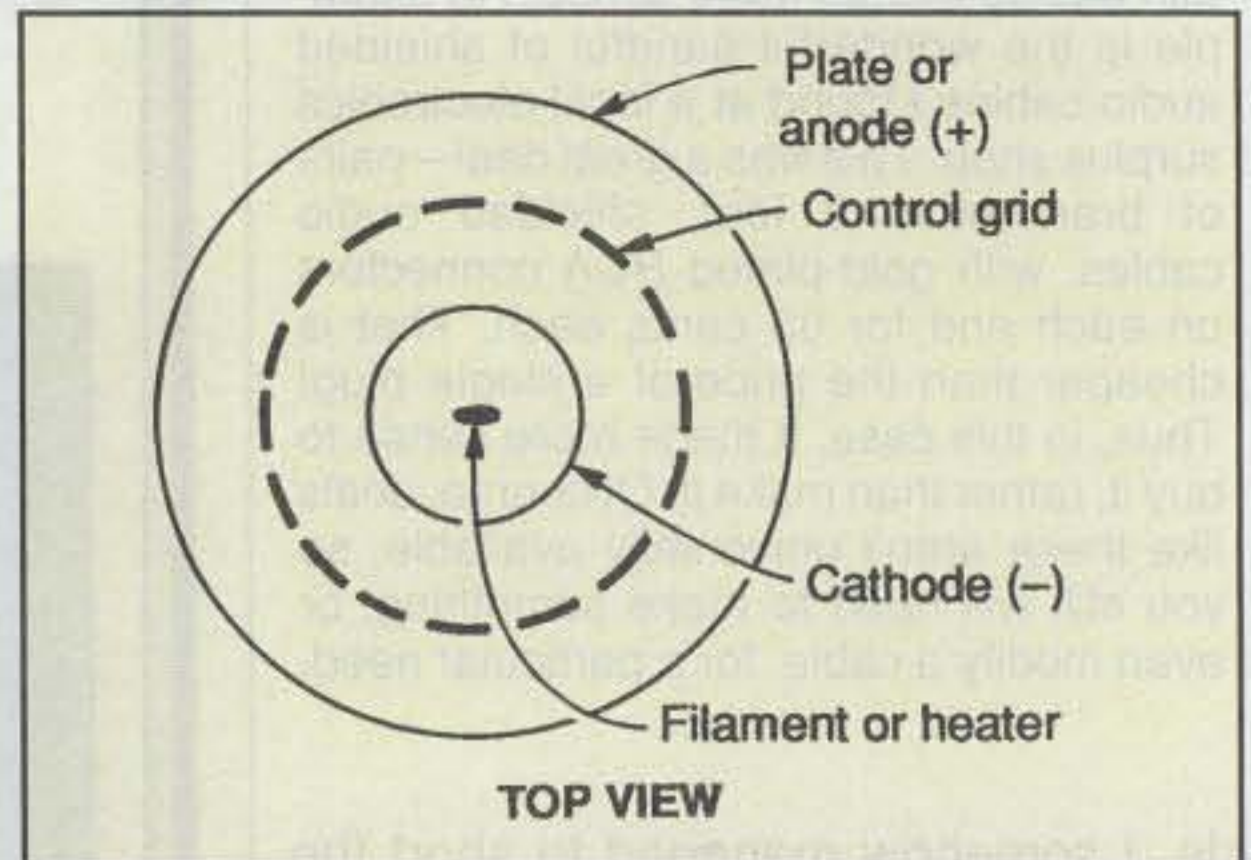
**A**s you will recall, our March “How It Works” column featured an introductory discussion of four basic components used in all types of electronic circuits: resistors, capacitors, coils, and transformers. We promised that a future column would discuss vacuum tubes, transistors, integrated circuits, and microprocessors. Well, friends, that is precisely our focus this time, and I am sure you will find it quite beneficial for understanding the general operation of electronic’s prime amplifying and signal-enhancing devices.

Again we must emphasize that this is ground-floor information everyone—especially our friends with a limited technical background—will find useful on a daily basis. Indeed, expanding your knowledge of linear devices and analog circuits is particularly attractive in today’s all-digital-oriented world. With school personnel and students concentrating almost exclusively on digital concepts and computer wizards on every corner, individuals with a decent grasp of analog and RF concepts are becoming scarce. The vacancy is also becoming obvious in our continuing use of well-aged analog circuit designs. Soon analog specialists will dic-

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*Photo A— This small sampling of vacuum tubes represents all-time transmitting favorites in amateur radio past and present. They are (left to right rear) the 3-500Z and 211, and the 811 and 211; in front are the 6146 and the 6L6. Will tubes ever become fully outdated? Let’s hope not, as they can produce beautiful, rich-sounding audio unattainable with solid-state devices.*



*Fig. 1— Outline of how the various elements in a vacuum tube are positioned. Electrons given off by the hot cathode are “pushed” by negative voltage on the cathode and “attracted” by positive voltage on the plate. A small input voltage applied to grid controls cathode-to-plate flow of electrons through the tube. (Discussion in text.)*

tate their own salaries. Grin, stand proud, know you are special, and read on!

## The Why and How of Vacuum Tubes

Ever since the early days of radio, vacuum tubes have been widely used as RF and AF amplifying devices, and they are still quite popular today. Why? They are relatively inexpensive, easy to understand, and a stout-hearted means of acquiring high power (photo A). Many audio enthusiasts and professional musicians also emphasize that vacuum-tube-type amplifiers exhibit superb sound, because they produce second-harmonic distortion, which is pleasing to the ear. On the other hand, solid-state or transistorized amplifiers produce odd-harmonic distortion, which most ears perceive as brash. Fortunately, tailored-response microphones and audio equalizers included in the newer HF transceivers minimize this idiosyncrasy, so we all can sound good on the air.

Simply explained, vacuum tubes operate on the principle of using a small input signal to control a large flow of output current. In many ways this concept can be compared to a water faucet: A small amount of force on its valve controls a large amount of water flowing through it. Likewise, the water’s force is not excessive for the faucet, and its valve is also tight enough to “stay put” where it is set, so continuous “hold-back tension” or valve readjustment is not required.

By electrically heating a filament of wire in the center of a vacuum tube or by covering that filament with a thin metal wrapper called a cathode, hot electrons are freed within the vacuum (fig. 1). By mounting a collector plate or anode at a slight distance from, but still around, the filament or cathode and applying voltage (negative to filament/cathode and positive to plate), current flow results.

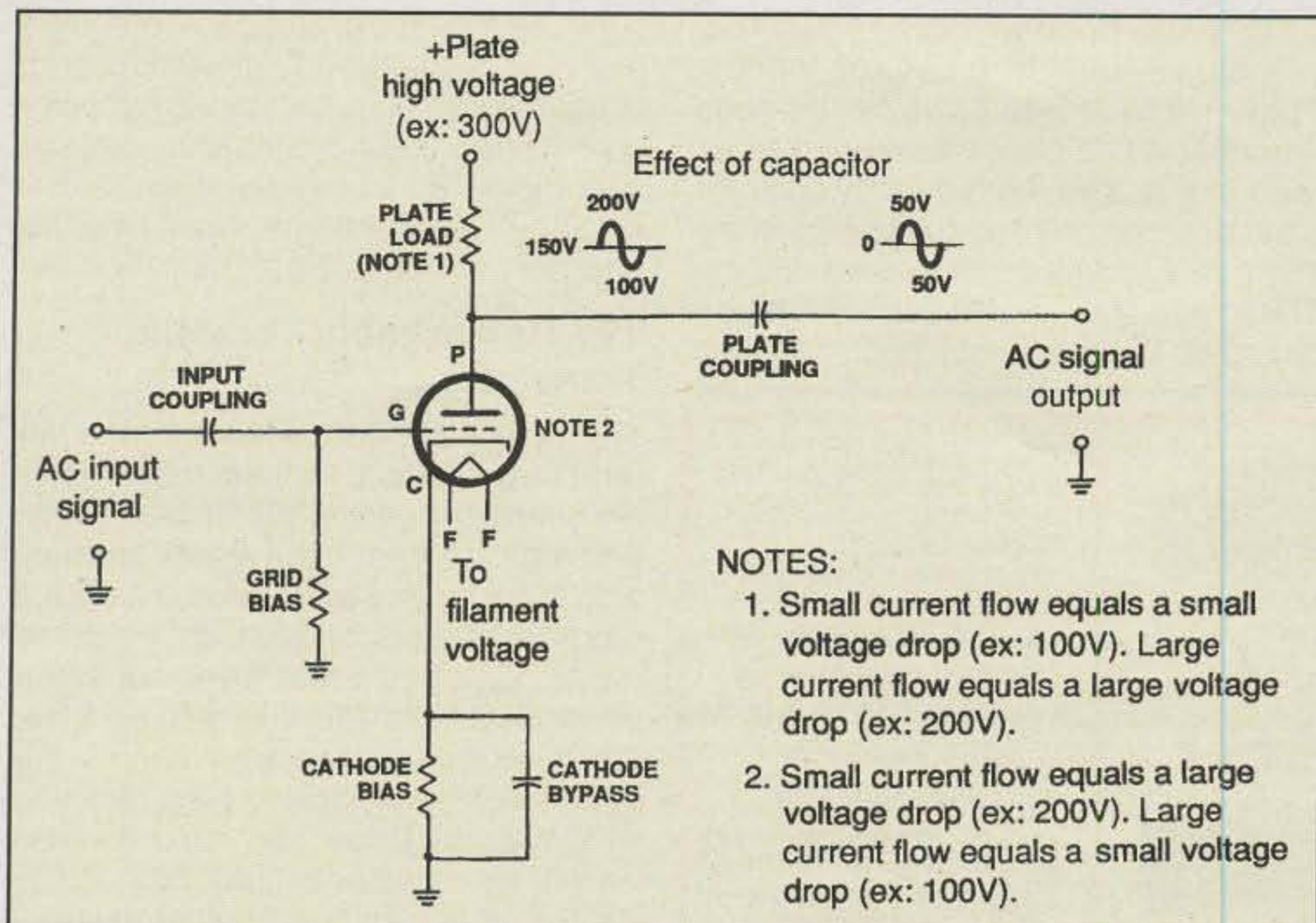


Fig. 2— Outline of a basic, common cathode-type amplifier circuit. Ratio of grid and cathode resistances establishes bias point of the tube and operating class of the stage. Grid is usually more negative than cathode to limit current flow through tube and plate load resistance. When an incoming signal drives grid positive, current through tube and load resistance increases.

Then by placing a fine mesh or grid of wire between the filament/cathode and plate/anode and applying voltage between that filament/cathode and plate, the flow of current can be controlled. This grid voltage is commonly referred to as (grid) bias: It is a DC voltage to set or "hold back" the no-signal or idling plate current. The greater this grid bias, the lower the idling plate current—and vice versa. An incoming (AC) signal is then superimposed on the (DC) bias voltage, causing

thus cut off or reduce current flow through the tube. When an input signal then drives the grid positive, more current flows through the tube. This change in current through the tube causes a change in output voltage to develop across a plate/load resistor. Capacitors then couple the change (AC) to a following amplifier stage or output section/device.

The previously described effect can again relate back to our water-faucet analogy by visualizing it with a high water

it to instantaneously increase and decrease. Plate-current flow varies accordingly, delivering, or outputting, an electrical reproduction of the input signal.

A tube's bias typically is established by the ratio of its grid and cathode resistance, as illustrated in fig. 2. By juggling the value of these resistances, the grid can be made more negative than the cathode (with respect to ground) and

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Up to this point we have considered only three-element tubes, or triodes. There are, however, four-element/tetrode and five-element/pentode tubes (and more). The extra grids accelerate electrons, minimize space charge in the vacuum, and reduce stray capacitance. They will be discussed in future columns. Popular circuit configurations

such as common cathode (common meaning "grounded"), grounded grid, and grounded plate (which we call cathode follower), and amplifier classes such as A, B, and C will also be discussed at another time. Now let's talk about transistors!

## The Remarkably Versatile Transistor

Transistors are both similar to and different from (small) vacuum tubes. They are similar in that they produce an amplified copy of a weak input signal, and they also have three internal elements like a triode. In a transistor, however, electrons move across different layers of semiconductor materials, whereas in a tube, electrons move between elements in the open space of a vacuum. The direction of that current flow may also be from emitter to collector or from collector to emitter, depending on whether the transistor is an NPN or PNP.

Some of the most popular types of transistors are shown in photo B, and their related circuit symbols are illustrated in fig. 3. Need an easy way to remember the "bipolar" types? Notice two wires connect to "first base" or just base on the left, and one of those wires has an arrow to indicate that it is the emitter. If that arrow is **Not Pointing in**, the transistor is a **NPN**. If the arrow is **Pointing in**, the transistor is a **PNP**. Folks usually say NPN-type transistors are the easiest to understand, as they conduct current in the same direction as a tube (from negative-polarity emitter to positive-polarity collector). Conversely, PNPs conduct from negative-polarity collector to positive-polarity emitter. Confusing? Just remember current always flows "against the arrow" on any transistor's emitter—in via one lead, across the base, and out via the other lead.

How much opposition or resistance a transistor's base offers to current flow "across it" depends on the amount of bias and the input signal level applied between the base and emitter. In this respect, a (bipolar) transistor base may also be visualized as a variable resistor with its collector-to-emitter resistance controlled by an input signal. An easy way to visualize this effect is shown in fig. 4. In 4(A) the transistor is reverse biased, or cut off, with the collector and emitter separated by a high resistance. In 4(B) the transistor is forward biased, or turned on, with the collector and emitter almost touching via low-resistance path. Understand this is only an analogy. The collector and emitter do not actually move, but the idea is easy to visualize and remember.

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Photo B— Transistors are also produced in a wide variety of styles, and the most popular types for amateur radio use are shown here. They are (left to right) the classic bipolar, the FET, and the power MOSFET.

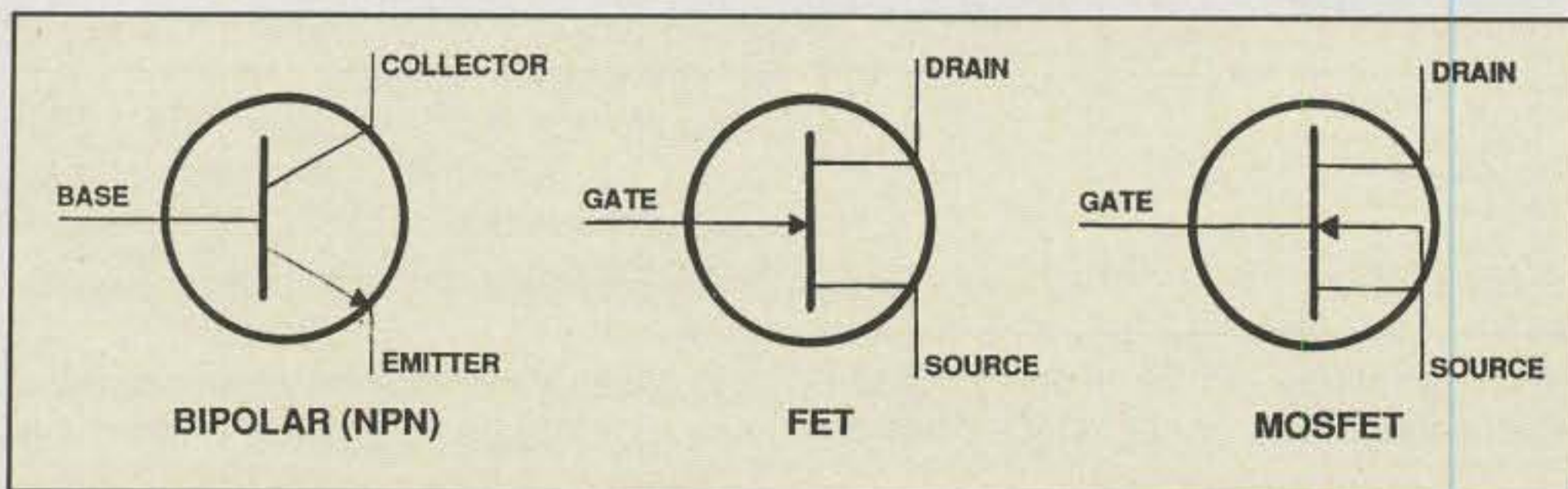
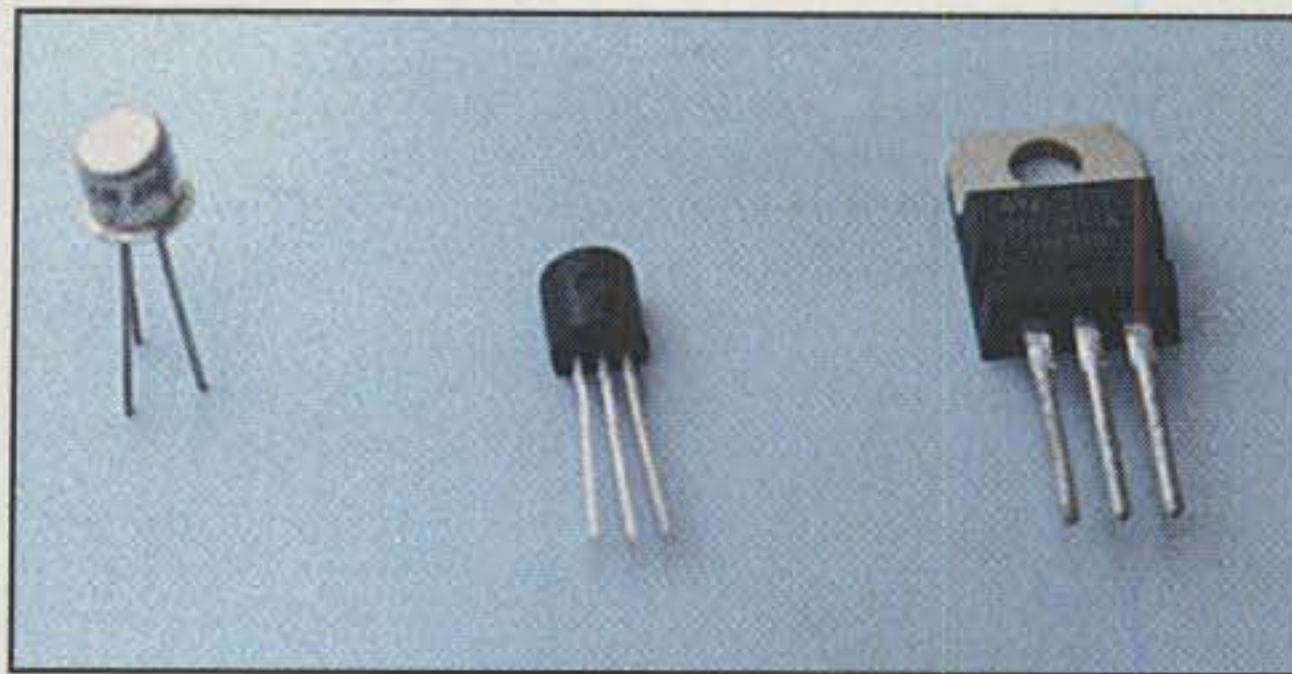


Fig. 3— Circuit symbols for three of the most popular types of transistors used in amateur radio applications: bipolar NPN, an FET, and a MOSFET.

Since regular transistors are low-current devices with continuity between their elements, they are biased slightly differently from vacuum tubes. Typically, two resistors are connected between the circuit's positive and negative points and serve as a voltage divider to electrically "center the base" so it is between the emitter's and collector's voltage level (fig. 5). An incoming signal is then applied across the base-to-emitter resistor so it adds to and subtracts from (reverse) base bias voltage. This change in bias causes current through the transistor to vary, which in turn varies current through and the voltage drop across the collector/load resistor. Capacitors then block DC (operating) voltage on the collector while passing AC (its signal) to a following stage or output device. But wait, you say. Only one coupling capacitor is usually shown (from the collector side of the load resistor). Where is the other capacitor? Sharp thinking, amigo! It is the output (filter) capacitor in the power supply—or the capacitor connected across the battery in portable units. We will delve into more specific details later.

Now let's consider combining a large group of transistors and other components in a single integrated package.

### Integrated Circuits

The obvious next step after the development of transistors involved combining numerous tiny resistors, capacitors, transistors, and diodes to form complete circuits in a single package—the integrated circuit (photo C). Although

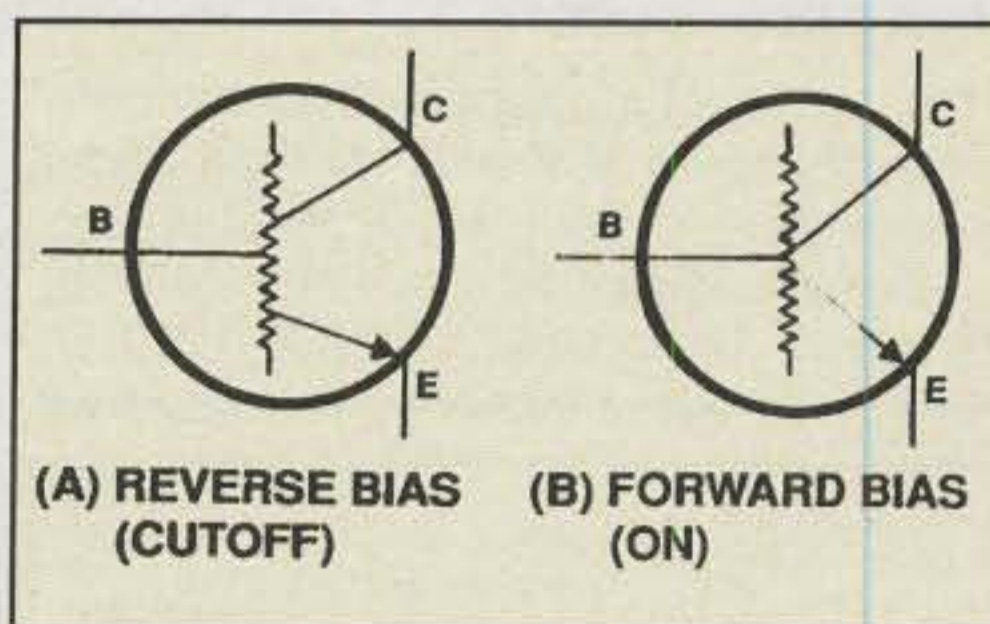


Fig. 4— A simple way to visualize a reverse-biased/cut-off transistor (A) and a forward-biased transistor (B). In (A) electrons must travel across a high-resistance base, while in (B) they can go right from emitter to collector. **This is only an analogy for ease of understanding.** (Discussion in text.)

highly innovative in design, the first ICs were quite basic in nature and required a fair number of external support components for operation. As technology progressed, incorporating larger values of inductance and capacitance into ICs became more feasible, and they began to replace full "discrete component" stages in communications gear of all types. That evolution is still going strong today, with linear-type ICs serving as oscillators, mixers, IF amplifiers, product detectors, audio amplifiers, and more. Power ICs for RF amplifiers have also gained a foothold, and linear ICs or "signal- and sound-processing ICs" are today's primary electronic devices for RF applications.

We also should point out that there are two separate groups, or classes, of

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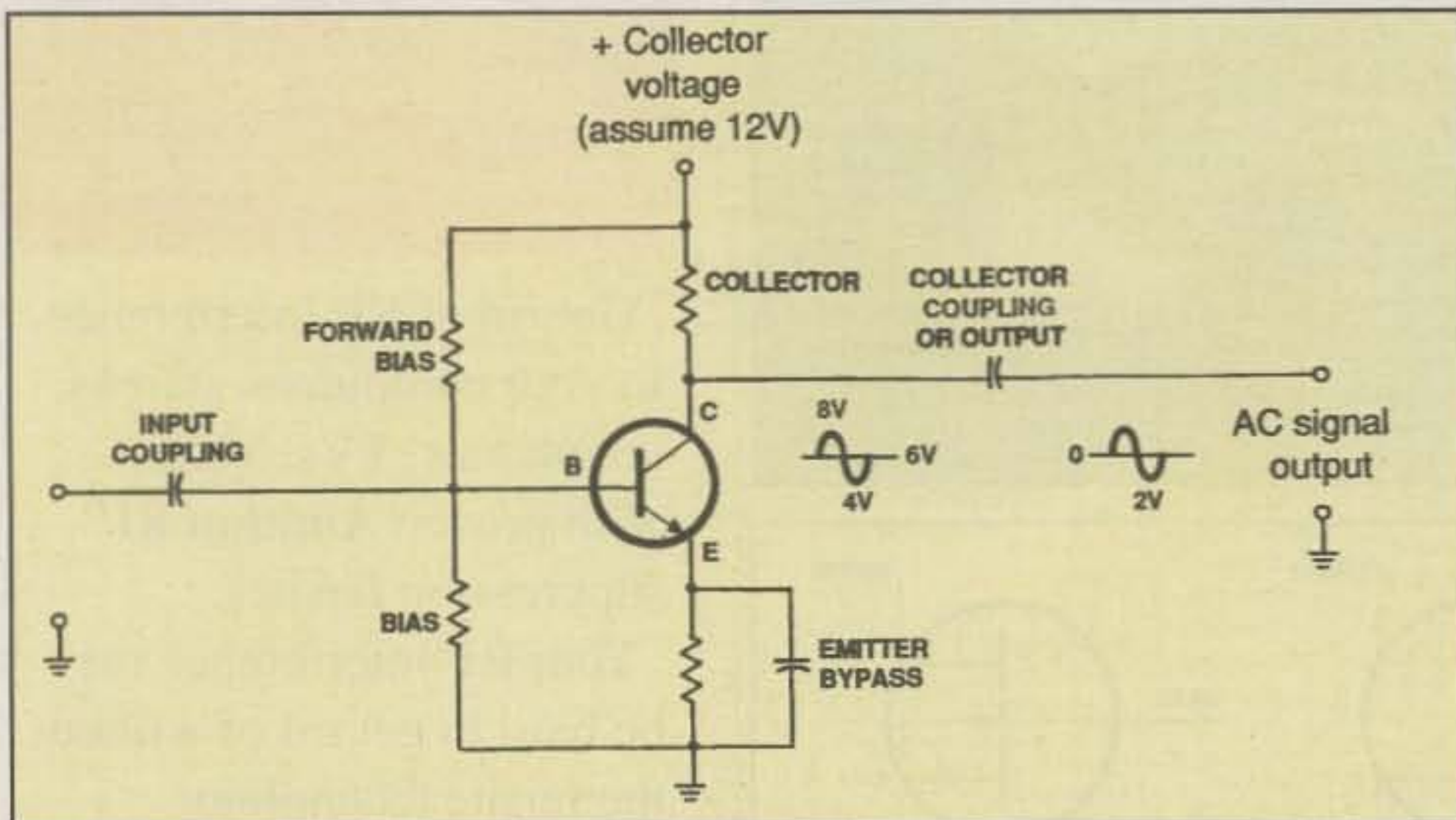


Fig. 5— Outline of a common emitter-type amplifier circuit. Ratio of base and emitter resistances set bias point and operating class of stage. (Discussion in text.)

integrated circuits—linear (or signal-related) ICs and digital (or logic-related) ICs. The latter group is best known for mathematical or numerical-related applications such as counting up or down (scanning, for example), dividing frequencies, serving as memories, and other logic functions. This data-processing area is also growing like wild-

fire and expanding into another specialized area—microprocessors.

### Microprocessors

This marvel of modern technology consists of digital ICs and mathematical processors, making up a special-purpose "mini-computer on a chip." It has its own bi-directional address, control,

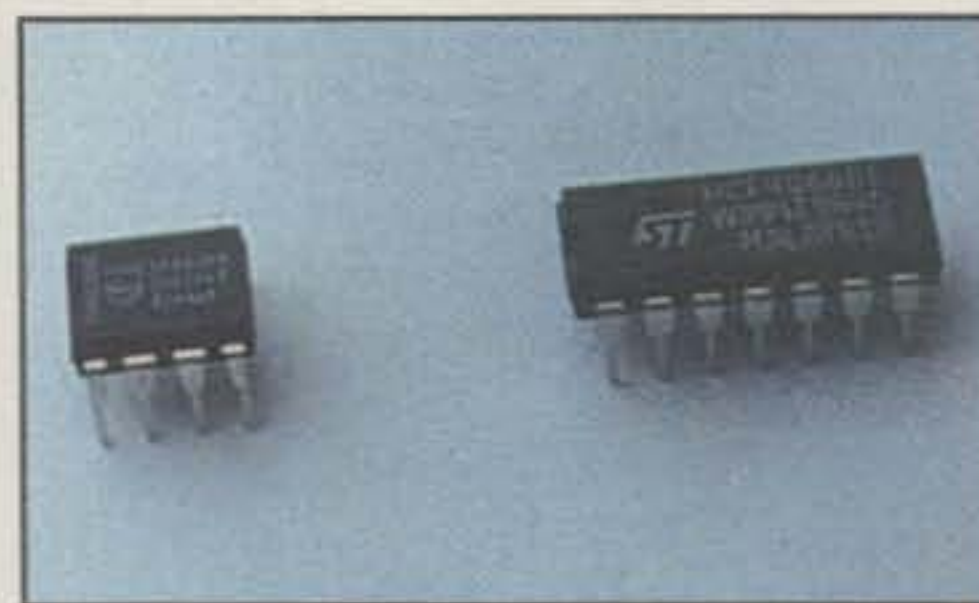


Photo C— Integrated circuits contain a group of extra-small and interconnected transistors, diodes, resistors, and capacitors in a tiny package. Many ICs serve as full stages in transceivers. Popular varieties shown here are Dual In-line Package (DIP) and mini-DIP ICs.

and data buss lines for exchanging data with external devices while performing functions such as storing frequencies, calculating antenna-tuning data, performing Digital Signal Processing (DSP), etc. Indeed, anything that can be converted or translated into digital logic is a prime candidate for microprocessor enhancement or control.

In the case of DSP, the microprocessor performs a continuous series of mathematical calculations or algorithms checking for redundancy. Data that changes between sampled calculations is considered speech and passed, while data that is similar is considered noise or a tune-up carrier and rejected (Yup—that's the logic behind DSP).

Bandpass filtering can also be performed by allowing only data at the (DSP) clock or sample rate to be processed while deleting other data as being outside the clocked or filtered bandwidth. Then, specifying precisely how close to or removed from the clock rate the data must be to pass determines the shape and flare of (DSP) filter skirts. Further developments in this area are endless, with 16, 32, and increasingly higher bit counts being utilized to handle more signal data with greater resolution. This is our present "state of the art" and the path of future evolution.

### Conclusion

As you probably have surmised, this month's featured topics are quite open-ended, and our discussions could continue for many more pages. Ah, but we are again out of space. We thus will bow out with an invitation to join us for future columns when more discussions of amplifiers, circuit configurations, and simple-to-homebrew antennas will be highlighted.

73, Dave, K4TWJ

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# From Weather Stations to Contest Logs

**A**s this month's title suggests, we have a large variety of products to cover this month, from new radio gear to an upgrade to a popular logging program, so let's dig right in!

## Radio Gear

**Davis Weather Stations.** Davis Instruments, in business since 1963, manufactures and distributes several distinct product lines. Of most interest to radio amateurs is its weather line. It includes an assortment of weather-monitoring stations for use in a wide variety of applications.

Davis weather stations, available since 1989, feature state-of-the-art technology at affordable prices, being used by homeowners, schools and colleges, industry, agriculture, and others. The company boasts that no matter who you are, chances are it has a station that meets your needs.

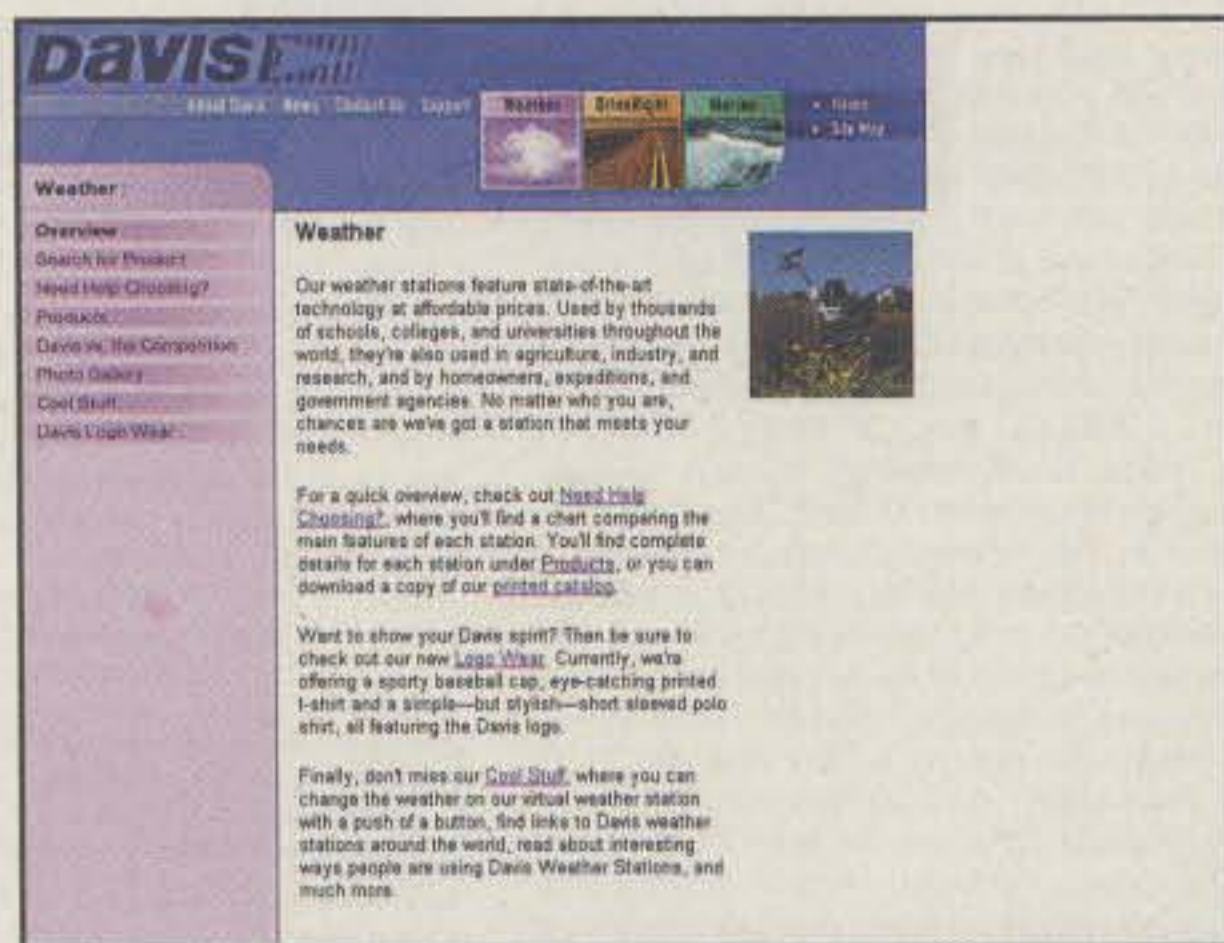


Fig. 1— Davis weather stations feature state-of-the-art technology at affordable prices. The attractive, well-organized Davis Instruments website helps you select the right product for you. (W8FX screen capture from the Davis Instruments website)

The popular, new Vantage Pro® weather stations offer instant updates and multiple alarm stations to let you keep an eye on critical weather conditions; an optional data logger and PC software are available for even more analysis. The stations, wireless or cabled, are excellent for monitoring barometric pressure, temperature, humidity, rainfall, wind speed and direction, and other weather conditions. On-screen graphing is available, as are various installation items and accessories. The original Weather Wizard III, Weather Monitor II, and specialty stations are also sold by the company.

For more information or a free catalog, contact Davis Instruments, 3465 Diablo Ave., Hayward, CA 94545 (1-800-678-3669; e-mail: <sales@davisnet.com>; on the web: <http://www.davisnet.com>).

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

com>). The firm's website (fig. 1) even lets you sign up for an e-newsletter that's full of interesting stories, tips on maintenance and installation, and timely reminders.

## Accessories for the Shack

**HEAR IT SPEAKER** from GAP Antenna Products, Inc.®. To most amateurs, GAP Antennas is known as a maker of quality, multiband HF vertical antennas, such as the Challenger DX, Voyager DX, Eagle DX, and Titan DX. Recently, GAP Antennas has branched out by adding several accessories to its well-regarded product lines.

One such non-antenna accessory is the British-import HEAR IT SPEAKER (photos A and B); its advent has even prompted GAP to use the catchy slogan "Why just listen when you can HEAR IT?" The new unit combines the latest in digital signal processing (DSP) technology with a compact, yet rugged speaker. The small device, which can be used with practically any transceiver, significantly removes background noise, static, and whatever else may interfere with your listening enjoyment. A plug-in-and-go device, all you need is a source of 12–28 VDC. A 4 ft. fused power lead is furnished, as is a 6 ft. audio cable, which is terminated in a standard 3.5 mm jack.

Some features include fully adaptive noise canceling, typically 20 dB; 8 user-selectable noise canceling levels; a bi-color LED to indicate power drain and noise canceling activation; an input sensitivity control; an adjustable mounting bracket; and an earphone jack with noise cancellation. The unit weighs less than one pound. The HEAR IT SPEAKER is \$159 plus shipping from GAP; it's also available from GAP dealers.

For more details or a catalog, contact GAP Antenna Products, Inc., 99 North Willow Street,



Photo A— The British-import HEAR IT SPEAKER offered by Gap Antenna Products combines the latest in digital signal processing (DSP) technology, with a compact, rugged speaker. The small speaker, the front of which is seen here, significantly removes background noise, static, and whatever else may interfere with your listening enjoyment. A plug-in-and-go device, all you need to fire it up is a 12–28 VDC source. (Photo courtesy Gap Antennas)



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**IC-703-PLUS**  
HF + 6 mtr



**IC-706MKIIG**  
HF+2+6 mtr+440Mhz



**IC-2720H**  
2 mtr+440Mhz



**IC-R75A**  
Shortwave receiver



**PCR-1000**  
receiver



**IC-R3**  
receiver



**IC-756PROII**  
HF + 6 meter Deluxe



**IC-746PRO**  
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2 meter



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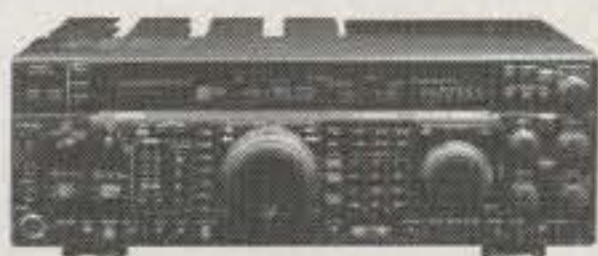


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Photo B— On the back of the GAP Antennas HEAR IT SPEAKER are a set of “filter select” DIP switches to provide eight levels of noise cancellation. The switches allow the user to easily determine how much noise canceling he would like the unit to effect, level 1 giving the least amount of noise cancellation and level 8 providing the most. (Photo courtesy Gap Antennas)

Fellsmere, FL 32948 (772-571-9922; e-mail: <gap@gapantenna.com>; on the web: <http://gapantenna.com>).

**Battery Adapters de N6GCE.** Are you having trouble locating the right battery, adapter, or connector for military-surplus gear? If so, Brooke Clarke, N6GCE, just may come to the rescue. Brooke makes a number of battery adapters for difficult-to-fit military-surplus equipment.

Especially instructive is Brooke’s noting that while today you still can get a limited number of military batteries that have some or no charge, in a few years even these batteries no longer will be available. Having a battery adapter available can be a real blessing, in that it allows you to use common cells in place of a specialized battery, which may be difficult or impossible to obtain.

The major advantage of this approach is that you can have the equivalent of a fully-charged battery just by installing fresh cells. Another advantage relates to the fact that as battery technology advances, the most common cell sizes “see” the new technology, like the current advances that are taking place with “AA” cells. By using a battery adapter, you can get the benefit of these new technologies much sooner than with specialized batteries, which may be locked into older technology.

An example of one of Brooke’s newest products is the 257477BA battery adapter (photo C). Priced at \$59, the adapter lets you power the military PRC-25, PRC-74, and PRC-77 radios using 10 common “D” cells in the adapter. No modifications to the radios are required. Brooke also offers other battery adapters, antenna adapters, digital clocks, and other products, including some still in development, which are depicted on his websites.

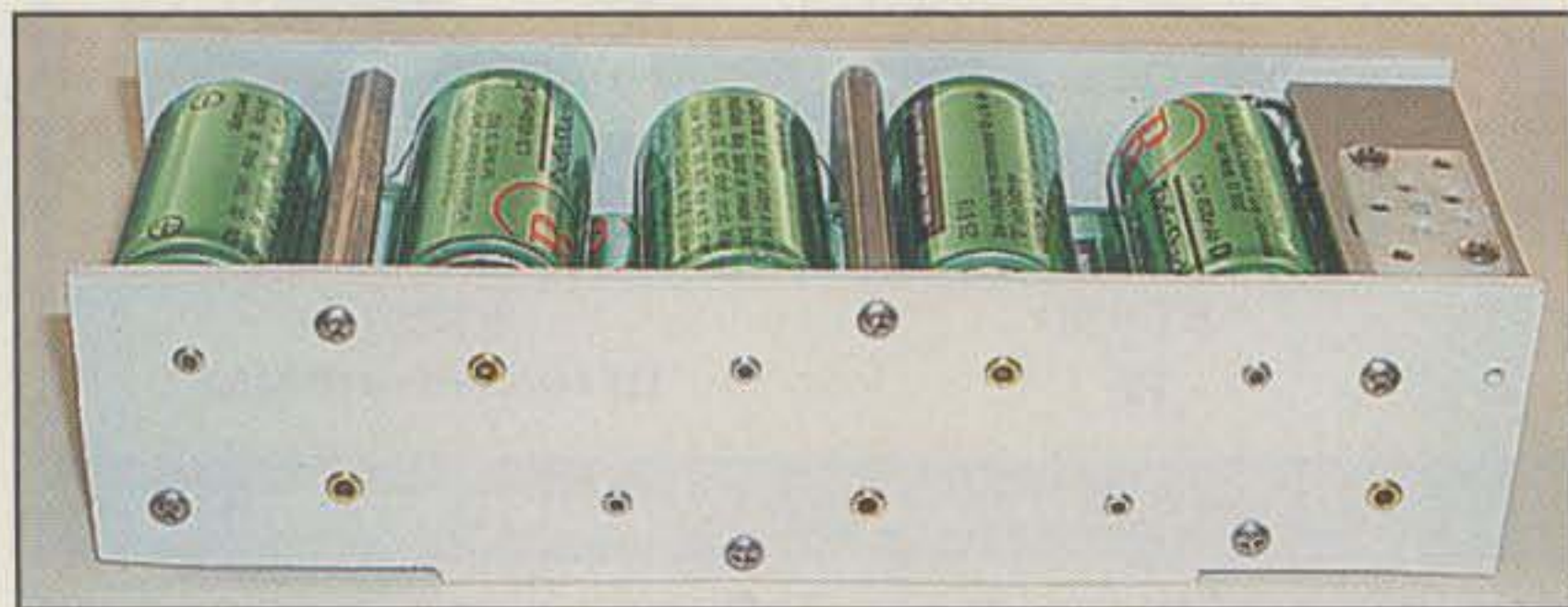


Photo C— The 257477BA battery adapter allows the military PRC-25, PRC-74, and PRC-77 radios to be powered by using ten common “D” cells in the adapter. No modifications to the radios are required. Brooke Clarke, N6GCE, offers many other battery adapters, antenna adapters, digital clocks, and other products. (Photo courtesy Brooke Clarke, N6GCE)

For more information on his products, contact Brooke Clarke, N6GCE (707-463-2380; e-mail: <brooke@prc68.com>; on the web: <http://www.prc68.com>).

**CAIG Laboratories Products.** Have you ever tried any of the environmentally safe, contact cleaner and connector enhancing treatments offered by CAIG Laboratories? The firm’s several families of products are reasonably priced, and their use can indeed make a world of difference in performance. Related products offered include lubricants, cleaners/degreasers, solvents, anti-static and shielding compounds, conductive inks, conformal coatings, lint-free-accessories, and more.

One very popular CAIG Laboratories product is the DeoxIT™ contact deoxidizer/cleaner/enhancer; not just a few amateur radio enthusiasts swear by the stuff. You can use it on almost any electrical or electronic device, including most everything from light-bulb sockets, batteries, switches, and computer connectors, to the connections on expensive amateur radio rigs. DeoxIT is said by the manufacturer to increase performance and reliability of all equipment and devices.

CAIG Laboratories also offers a web sample special. It consists of a handy assortment of five 2 ml precision squeeze tubes of their popular preventive-maintenance products including DeoxIt, for \$9.95 plus shipping. Details of the sample package are found on their website, where monthly specials also abound.

For more information, contact CAIG Laboratories, Inc., 12200 Thatcher Court, Poway, CA 92064 (858-486-8388; e-mail: <caig123@caig.com>; web: <http://www.caig.com>).

**K-Y Filter Company Super Filters.** Are you experiencing some tough-to-solve radio frequency interference (RFI) problems, either in your neighbors’ homes or in your own radio shack? If so, investigate the products offered by the K-Y Filter Company of Davis, California. The firm offers a variety of specialized RFI filters, both for amateur and non-amateur uses. These include modem/telephone filters, security-alarm RFI filters, AC line RFI filters, and more.

Perhaps the most popular filters in the company’s product line are the Modem/Telephone Super Filters for HF and AM radio interference. These filters, which use a special nickel-zinc choke, are plug-in modem RF filters for convenient, inexpensive, and effective performance on all modems and telephones. Each filter is terminated with a modular plug and will work on all dial-up modems. The filters are said to attenuate RF better than any other inexpensive plug-in filter on the market.

Of special note, the company now manufactures two different types of filters. The Model RF-1 is for HF (shortwave) interference, while the Model AM-1 is for AM broadcast band interference. You can easily construct a two-line filter with two single-line filters.

For detailed product descriptions, pricing, and additional helpful tips and other information on RFI and RFI troubleshooting, contact K-Y Filter Company, 3010 Grinnel Place, Davis, CA 95616 (530-757-6873; e-mail: <ki6ky@

ix.netcom.com>; web: <http://www.ky-filters.com/cq.htm>.

## Antennas and Accessories

**NEFO-600 Series Fiber-Optic Connectors from Nema Electronics.** Recently, Nema Electronics International of North Miami, Florida, introduced a new series of multi-contact fiber-optic connectors. The new filters are for both indoor and outdoor broadcast and communications applications.

The cost-effective NEFO-600 series of connectors (photo D) includes both cable- and panel-mount plugs and jacks as well as dust caps. The Nema connector design allows for use of between two and six contacts, giving the user the flexibility of future expansion. The cable-mount bodies incorporate a rugged strain relief as well as multi-keyed polarization and a positive lock design. The items are available from stock. Nema also offers a complete set of tooling and test equipment.

For more details, contact Nema Electronics International, 12240 N.E. 14th Ave., North Miami, FL 33161 (1-800-522-2253; e-mail: <info@nema.com>; web: <http://www.nema.com>). You'll find the entire Nema catalog available online at the website.

## Software and Computers

**Paper Chasers' Log from NØOKS.** DXers take note! We recently heard from Mark Kachel, NØOKS, who told us that several months ago he purchased the rights to the well-known and respected DXLog from Drew Vonada-Smith, K3PA. Mark says he's been working diligently on a worthy Windows® upgrade to DXLog, and his program now is ready to go. As such, the new logger (see fig. 2) allows all DXLog users to import their current DXLog data into Paper Chasers' Log. The new program also imports file data from several other popular QSO logging programs in addition to DXLog, including Digipan, LogEQF, and NetLogger.

In addition to tracking DXCC, the Paper Chasers' Log tracks a large number of other awards—too many to mention here. Of course, the new program will do the usual log things well, such as printing envelope and QSO confirmation labels and generating have/need reports for the awards. Full details on the program are available at <http://www.n0oks.com>.

You can download and install the program from Mark's website and import your DXLog data files. When you exit the program, all of your data will be saved. However, only 50 QSOs (contacts) will

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be available the next time you run the program. The 50-QSO limitation is controlled by the initialization file. When you purchase the program (it's only \$25), Mark sends you an initialization file that removes the 50-QSO limitation.

For more information on Paper Chasers' Log, contact Mark Kachel, NØOKS, via the NØOKS Freeware website at <<http://www.n0oks.com>>; or e-mail Mark at <[kachels@wi.rr.com](mailto:kachels@wi.rr.com)>. Mark's other website, which supports his industrial software products from MWK Software, is at <<http://www.mwksoftware.com>>.



Photo D—Nemal Electronics International has introduced a new series of multi-contact fiber-optic connectors for both indoor and outdoor broadcast and communications applications. The NEFO-600 series includes both cable- and panel-mount plugs and jacks, as well as dust caps. (Photo courtesy Nemal Electronics International)

**Software Announcements from N3FJP.** In several columns we profiled N3FJP's Amateur Radio Software Site. As we have pointed out, many useful shareware and freeware amateur radio programs are offered here. The site, designed and operated by Scott Davis, N3FJP, is at <<http://www.n3fjp.com>>.

Recently, Scott made several announcements relating to his programs. These include the availability of new software, N3FJP's Network Contest Log, and N3FJP's CQ WPX Network Contest Log. Like the rest of his contesting software, these programs are easy and intuitive to use, and check for duplicates (including partials), list all contacts, list multipliers, provide a country look-up function, write Cabrillo files for contest submission, provide many current statistics, and more.

Scott says that the network versions of his software are almost identical to the standalone versions in appearance, and they perform all the same functions. The code, however, has been modified extensively so that the programs will function on a local area network (LAN). With the network versions of the programs you can have as many PCs updating the log file simultaneously as your LAN will support!

Another announcement is that a State QSO Party Contest Log is in the works, in response to the requests Scott has received for such a program. It's his goal to eventually incorporate all of the active state QSO parties into one program, with screens and scoring designed around each specific state QSO party.

Scott also says he's adding a rig-interface feature to his contesting programs. Finally, he's in the process of adding visually-impaired support, interface hardware, and packet spots to his software. Stay tuned!

For more details, contact G. Scott Davis, at 118 Glenwood

Date	Time	Band	Mode	Power	Call	rst-s	rst-r	qsl via	Comments	qsl-s	qsl-r	DXCC	ITU
11/17/2002	22:37:30	Mtr	CW	100	KT2DX	599	599			NO	NO	Burkina F	
11/17/2002	22:45:30	Mtr	CW	100	KT2DX	599	579			NO	NO	Burkina F	
11/17/2002	23:51:12	Mtr	CW	100	HCBN	599	599			NO	NO	Galapagos	
11/18/2002	00:00:12	Mtr	CW	100	FWBFP	599	599			NO	NO	Wallis & F	
11/18/2002	04:11:10	Mtr	CW	100	HCBN	599	599			NO	NO	Galapagos	
11/19/2002	10:36:40	Mtr	CW	100	J3BAA	599	599			NO	NO	Grenada	
11/19/2002	11:25:40	Mtr	CW	100	YN4SU	599	599			NO	NO	Nicaragua	
11/19/2002	22:36:20	Mtr	RTTY	100	CYMM	599	599	VE3NE		NO	NO	Sable Isler	
11/20/2002	05:56:17	Mtr	CW	100	CS6R	599	599	OH3RI		NO	NO	The Gamb	
11/20/2002	08:36:30	Mtr	CW	100	J67RN	599	599	JA7SC		NO	NO	St. Lucia	
11/20/2002	08:48:30	Mtr	CW	100	J67RN	599	599	JA7SC		NO	NO	St. Lucia	
11/21/2002	04:17:17	Mtr	CW	100	HCBN	599	599			NO	NO	Galapagos	
11/21/2002	08:02:20	Mtr	CW	100	EW6A3PK	599	599			NO	NO	Senegal	

Date	12/05/2002	Time	13:12	Call	NØOKS	Location	MILWAUKEE, WI 53217
Band	75 Extra	RST Sent	59	QSL Sent	NO	Location	MILWAUKEE, EN68, 43.15N 87.91W
Mode	SSB	RST Recd	59	QSL Recd	NO	Country	United States of America
Propagation	Terrestrial	DXCC	United States of America	Award		Multiple ITU Zones	6, 7, 8
Power	10	ITU Zone	7	1	Worked All States	Award Entry	WI Wisconsin
Beam Heading	0 Degrees	CO Zone	4	2	Genstat #		1577
Distance	0 Miles	Continent	NA	3	Genstat Director's #		139
QSL Via		Grid Square	EN63	4	US Wisconsin Counties		Milwaukee
Gender	M	QTH	Home	Comments	All this for \$25		

Fig. 2—Mark Kachel, NØOKS, has purchased the rights to the popular DXLog from K3PA. As such, Paper Chasers' Log is the Windows® upgrade for DXLog. Besides tracking DXCC, the new logger tracks a large number of awards. (W8FX screen capture from the Paper Chasers' Log website)

Rd., Bel Air, MD 21014-5533 (e-mail: <[snkdavis@aol.com](mailto:snkdavis@aol.com)>; web: <<http://www.n3fjp.com>>). Please note that registration fees—cash, checks, or money orders—should be made payable to G. Scott Davis, and you should include your call-sign and e-mail address. Purchase may also be made by credit card via PayPal.

## From the Bookshelf

**New antennex Book Release from L.B. Cebik.** In previous columns we profiled books by noted antenna authority L.B. Cebik, W4RNL, most recently the LPDA Notes series. Now, antennex (which, by the way, stands for "antenna eXperimentation") has released another impressive W4RNL opus.

The new W4RNL book is *Moxon Rectangle Notes*, said to be the most complete study to date of this special antenna design, pioneered by G6XN. The volume analyzes why the Moxon antenna works as it does, and the book supplies many practical designs for amateur bands ranging from 80 meters through the UHF range. The book also provides both methods and means of designing a Moxon rectangle for almost any frequency simply by knowing the design frequency and the desired element diameter.

*Moxon Rectangle Notes* has over 210 pages of text in nine well-illustrated chapters. As a bonus, the author has included every model used in his study, and the collection also contains model-by-equation files. Included in the file collection is the AC6LA Windows® program for generating Moxon dimensions. Also, in a special chapter the author introduces several methods of computerized Moxon design.

The Moxon book is available in PDF format, either on CD or by download. For further details about this new release and pricing, go to: <<http://www.antennex.com/Sshack/moxon/moxon.html>>. The website is sponsored by antennex Online Magazine, P.O. Box 271229, Corpus Christi, TX 78427-1229 (1-888-855-9098; e-mail: <[info@antennex.com](mailto:info@antennex.com)>; web: <<http://www.antennex.com>>). Be sure to check out the website, which is chock full of e-books, CD-ROM collections, online antenna articles, software, modeling files, and other types of useful and authoritative antenna information.

## Radio Resources

**Radio Daze.** In seeking out "What's New" in amateur radio, we sometimes find that we've actually rediscovered "what's new about something old." This is especially the case when we take a look at firms such as Radio Daze and what they offer.

Radio Daze bills itself as your source for vintage radio and electronics. The firm is dedicated to what it refers to as the golden age of radio and electronics, the 1920s through the 1950s, when the vacuum tube reigned supreme. The firm seeks to become the premier source of components, products, services, supplies, and information for the vintage electronics marketplace.

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For more information or a catalog, contact Radio Daze, LLC, 7 Assembly Drive, Mendon, NY 14506 (1-800-456-6494; e-mail: <info@radiodaze.com>; web: <http://www.radiodaze.com>).

## We Get Letters

Before wrapping up things this month, we would like to acknowledge some of the good folks who took the time and trouble to correspond with us in recent months. A tip of the W8FX hat goes to Don Morton, W7LBN; Richard Henf; Brooke Clarke, N6GCE; Mark Kachel, NØOKS; Jack L. Stone; Gerardo C. Moriel; Ric, C6ANI; Steve Lindenfeld; Valery Kharchenko, RA6YR; among all the rest.

*Note:* If you e-mail us, please include your full name and callsign, if any. It would be nice to know we're corresponding with a real person, and not just an e-mail address. Thanks!

## Wrap-Up

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

*Overheard:* Are you risk-adverse? If so, consider that some of life's most gratifying experiences are from accepting and taking risks. 73, Karl, W8FX

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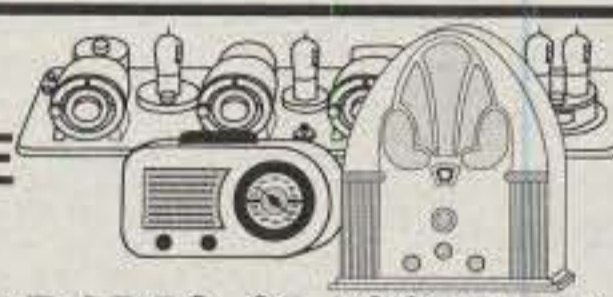
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## New Ultra-Microwave DX Records Set

The following information is from Brian Justin, WA1ZMS, and came to us via Buck Rogers, K4ABT:

We (Pete Lascell, W4WWQ, and I) pushed our 322 GHz "DX" to 1.4 km on March 4, 2003, at 0117 UTC. W4WWQ was located at 37-21-14.7, 79-10-13.7, FM07ji. WA1ZMS was located at 37-21-23.6, 79-11-10.8, FM07ji. The distance was 1.432 km. The frequency was 322.6 GHz. The mode was FSK-CW. The temperature was 0° C. The dew point was -6.7° C. The relative humidity was 61%. The pressure was 992 mb. The atmospheric loss was 10.6 dB/km (Wow!).

We likely would have had better results if we had had a day with a lower dew point. The QSO on the WA1ZMS end was tough at best. Problems with frequency stability limited the application of weak-signal software such as Spectran, etc. Therefore, good old-fashioned 5 wpm CW and headphones were used. Since one station has a better RX mixer than the other (isn't that always the case!) Pete, W4WWQ, had about 6 dB of margin on his end, while I had 0 dB on mine.

The gear is the same that was used in the recent past for other 241/322 GHz QSOs. Photos of gear can still be found at <http://www.mgef.org>. For this QSO the 80 GHz drive level into the diode multiplier was reduced during RX to get a lower conversion loss.

I hope that others can get some gear running on +300 GHz and give this DX record a smashing!

Later in the month, W4WWQ, KA4YNO, and I took to the local hills and managed three QSOs on 120 GHz, with our best DX being 20.6 km. The former record was held by W0EOM and KF6KVG at 11.6 km back in 1999.

Details of the longest QSO are: March 11, 2003, at 0341 UTC. W4WWQ/4 was located at 37-22-48.7, 79-21-20.3, FM07hj. WA1ZMS/4 was located at 37-29-46.6, 79-32-15.7, FM07fl. The distance was 20.631 km. The weather at the WA1ZMS end of the QSO was temperature -2.7° C; dew point -18.3° C; relative humidity 29%; pressure 906 mb. The calculated loss was ~1.09 dB/km.

An interesting point to note: As the WX gets colder, the total loss per km can go up as oxygen replaces water vapor. This is an interesting twist for the bands near oxygen-absorption lines. The same thing can happen on 75 GHz at the low end of the band.

That's it for me on 120 GHz. Now it's W0EOM's turn, or time for someone else to join the competition.

Remember, DX records are made to be broken. Had the weather not turned dry/cold here, I'd be stopped at 12 km. Photos and a noisy audio file can be found at [http://www.mgef.org/zms\\_120.htm](http://www.mgef.org/zms_120.htm).

—73, Brian, WA1ZMS

Pete, W4WWQ, adds:

We found a beautiful line-of-sight path today while taking a Sunday afternoon drive in the countryside, with the temperatures in the high 60s. We went back tonight and knocked out another DX world record on 120,000 MHz. This can be habit forming, hi. It was just a couple of weeks ago when we (Brian, WA1ZMS, and I) busted the 322 GHz record at 1.4 km.

To those folks who ask why a measly 12 km at 120 GHz when last year we did about the same at 241 GHz, well, there is an oxygen resonance line in the frequency spec-

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May 6	Highest Moon declination
May 9	First Quarter Moon
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May 11	Very good EME conditions
May 16	Full Moon
May 16	Moon Perigee
May 16-18	Dayton HamVention® (see text)
May 18	Very poor EME conditions.
May 19	Lowest Moon declination.
May 23	Last Quarter Moon.
May 25	Moderate EME conditions.
May 30-June 2	Six Club WW Contest (see text)
May 31	New Moon. Very poor EME conditions.

—EME conditions courtesy W5LUU.

trum at about 120 GHz and oxygen attenuates the heck out of the signal. As the dew point goes down, the moisture in the air is replaced by more oxygen, so it is lucky to find that sweet spot between the moisture and oxygen.

This microwave operating sure doesn't have QRM or pile-ups, but it is like pulling that rare country out of the mud. Not only do you have to figure out what frequency to listen on, but it usually keeps drifting as equipment warms up. A few hundred kilohertz is not unheard of. Oh, yes, then there is the problem of aiming the antenna in the right direction, or it doesn't make any difference what frequency you are on.

If you ever get a chance to witness a ham microwave operation, ask if you can operate, too, getting credit for being on that band and making a QSO, even though you won't get credit for building the gear. There are very few hams who have operated on most of the bands. No one has claimed to have operated on all of them yet.

—73, Pete, W4WWQ

### Feedback on 802.11b and Shuttle Columbia Recovery

The following is from Ron Curry, N6QL, regarding the March column on 802.11b:

Thanks for the article in CQ this month about 802.11b. I had a couple of comments to share and am not quite sure how best to do it, so here goes.

In reference to your comment about the amateurs in Livingston County, Michigan possibly having the first amateur 802.11b network, this is quite incorrect and not possible. I don't know who the first is, but I have been running such a network since 1997, first on the 900 MHz band with FHSS equipment conforming to amateur FCC rules (not 802.11 though), and then when the FCC relaxed the spread-spectrum rules on amateur bands several years ago, on 2.4 GHz with 802.11b DSSS radios. In 1997 I demonstrated digital voice repeater linking (similar to what IRLP is today) to the CalNet repeater group during one of their nets by linking my 1.2 GHz repeater to their 70 cm statewide system over a 900 MHz FHSS digital voice link.

My 802.11b "amateur" network has been up for years. It covers a distance of approximately 15 miles using 100 mw of power and a wire-mesh dish antenna with 24 dBi of gain. It is used to communicate digital voice, control, and telemetry information to and from my 1.2 GHz and 900 MHz repeater system on a 2500 foot mountain site, as well as to provide internet and web cam services to my airplane hangar at the local airport—nearly 10 miles away. The system is legal as a Part 15 system, since it conforms to all rules in that part. However, it is configured to conform to amateur rules in terms of IDing and frequency. This network provides 11 Mbit of data bandwidth.

I don't know whether this is the first, but it has been in operation since *long* before the ARRL got interested.

I should also note that I got in touch with the ARRL people who were highlighted in a recent article in *QST* and on the ARRL website and told them of my work. They asked me many questions about how I did it, etc., and promised to include me in their project, but then I never heard anymore from them.

On another note, I'm a bit concerned about the apparent lack of responsibility and the arrogance with this project. There is talk of running high power and the use of omni-directional antennas, which will cause considerable interference to the many Part 15 users—as well as other amateurs. First, this is not needed, and under the FCC rules these systems should (and can) be operating at minimal power. I have done tests with 100 mw and have achieved reliable communications over distances of 25 miles with careful attention to using low-loss cabling, quality receivers, and high-gain antennas (still legal for Part 15, by the way). This limit was not due to a limit of the radios, but rather my time limitations for doing longer range testing.

Second, this attitude of "we are amateurs and Part 15 users have no rights" as articulated in the March 2003 issue of *CQ* is misguided. This type of operation is likely to raise the ire of commercial Part 15 equipment vendors and users who will rally against the amateur community under the banner of "the greater good."

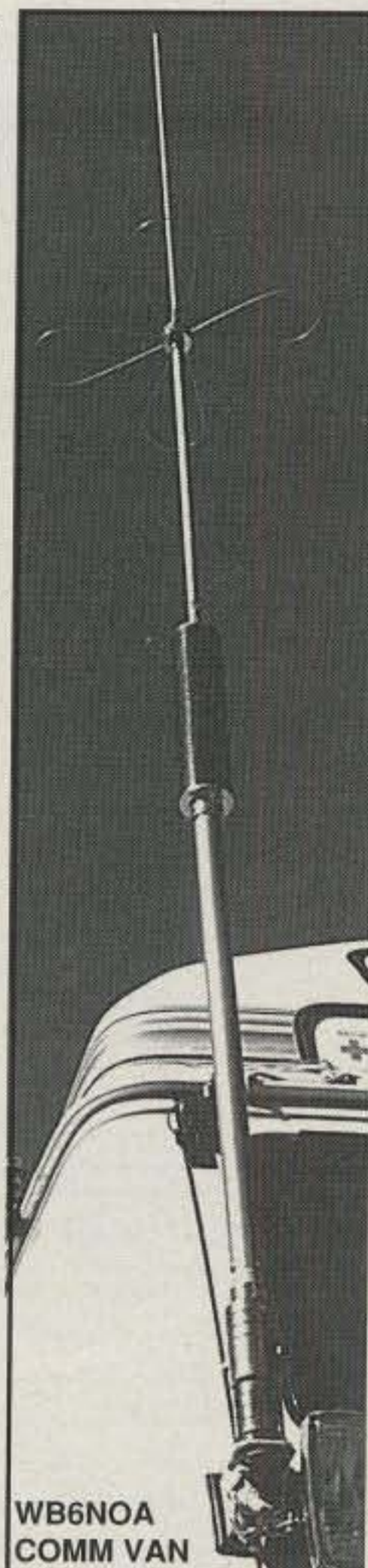
I strongly suggest that any amateur who is interested in using 802.11b equipment for amateur use start doing so now. I believe this is a straightforward effort for any amateurs with even a small amount of microwave experience. It is quite easy to do and not nearly as complicated as outlined in the ARRL article. —73, Ron Curry, N6QL

This is from **John Champa, K8OCL:**

Congratulations on an informative, well written, and balanced article in the March issue of *CQ*. Your positive perspective is most appreciated.—Very 73, John Champa, K8OCL, ARRL Chairman, High Speed & Multimedia Working Group

From **Doug Kilgore, KD5OUG**, via John Champa, K8OCL:

An 802.11b high-speed internet link was used by hams in Nacogdoches, Texas during the *Columbia* shuttle recovery efforts. The



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equipment for the link was provided by Michael Willett, KD5MFM, from McKinney, Texas, to link Net Control in Nacogdoches with the internet. The system was installed by Michael and several Nacogdoches hams, including Robert Judy, KD5FEE, James McLaughlin, KD5POY, and Tim Lewallen, KD5ING, one week after the shuttle disaster.

The link utilized a mix of directional antennas to provide a robust link through the intense radio traffic in the area. Spanning a highway, and approximately a quarter-mile distance, the link was comprised of Aironet devices (now Cisco Systems). The equipment used included a BR-500 stand-alone bridge-router connected into the LAN/internet cloud at the Budweiser Distribution Center, and a PCI card in a tower-style PC in the ForeTravel recreational vehicle located on the Expo Center grounds. The PC in the RV ran Windows® 2000. Along with the radio card, the PC also included a standard Ethernet card, and was configured by James to run as a DHCP host and router, allowing several PCs to connect to the internet via a local hub in the ForeTravel RV.

The radio cards were set to produce 100 mw of power and utilize the Direct Sequence Spread Spectrum encoding/modulation technique with a center frequency of 2437 MHz (U.S. channel 6). At the Budweiser Distribution Center, a 24 inch parabolic dish made by David Clingerman, W6OAL, at Olde Antenna Labs in Parker, Colorado, was connected to approximately 50 feet of LMR-400 coax terminated on-site with N connectors. The dish was mounted on a wooden 2 x 2, cross-braced by two more wood 2 x 2s held to a plywood pallet by lag screws.

The pallet was placed on the roof by the local fire department, which arrived at the Budweiser Distribution Center with a hook and ladder fire truck to help with access to the roof. On the Expo Center side, an 11-element shrouded Cushcraft antenna was mounted on a temporary mast held secure to the RV with a radiator hose-style pipe clamp.

Net Control utilized the link for looking up callsigns, communicating quickly via e-mail, and monitoring weather radar, as rain tracked across the area often during the week after the shuttle event.

This application and installation of the 802.11b link was one of many examples demonstrating the extensive capabilities of volunteer amateur radio operators, government authorities, and local businesses teaming together to help during a crisis.

Pictures of the link as well as other operations may be seen at <<http://www.k5rwk.org/Shuttle/index.html>>.

Many thanks to the Budweiser Distribution Center for their network and open facility generosity and support; the Nacogdoches Fire Department for the lift; Tim Lewallen for materials, support, and the volunteer fire department truck and ladder; Robert for running wires and planning; and James for the hub and his configuration assistance!

—Submitted by Doug Kilgore, KD5OUG, Richardson Wireless Klub Webmaster, <[kd5oug@arrl.net](mailto:kd5oug@arrl.net)>, Richardson, TX



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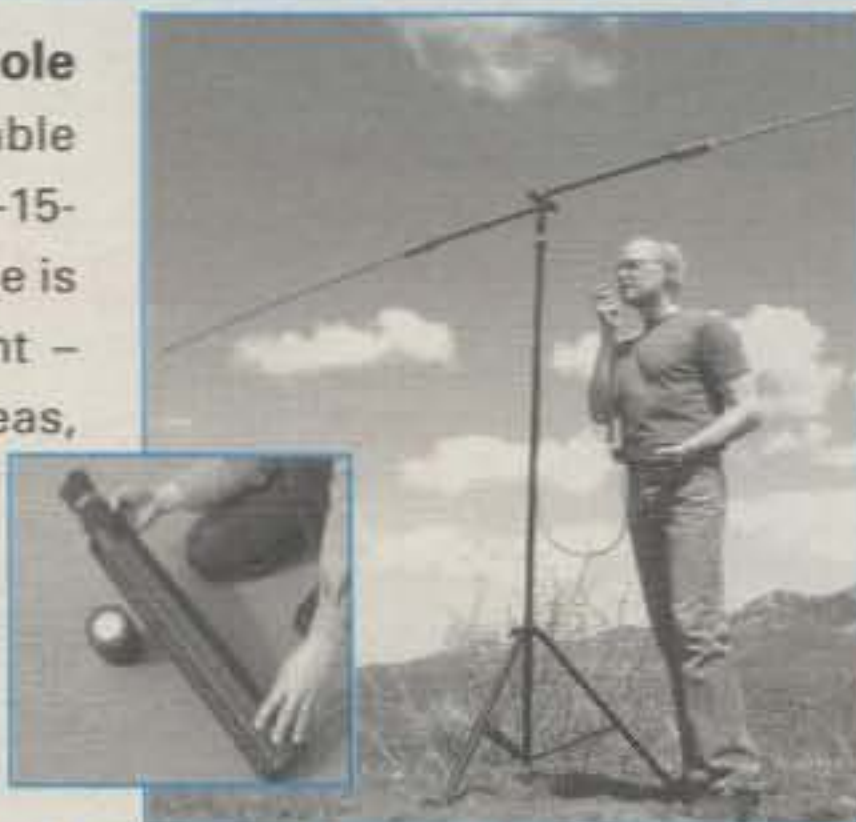
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## IF9FT Silent Key

The following is from Marius Cousin, F8DO:

We have the deep sadness to tell you the death of Marc, F9FT, Sunday morning, March 2, 2003. Marc was a pioneer for EME and manufacturer of the famous Tonna 9-element Yagi in the earlier '60s and later the 16-element version. He was a passionate person about antennas and the ham radio hobby until the end of his life. We lost a friend and a great OM. You can send e-mail to his son F5SE and the family at <Franck@cbsky.net>. Marc, we will never forget you!

## W1LP/MM No More?

From Clint Walker, W1LP, via Shelby Ennis, W8WN, comes the following:

I will not be going back to the *Marine Chemist* as she has been sold for scrap. The ship could only carry oil until the end of 2003 in U.S. waters, so I knew her days were numbered. The owners ended up getting rid of her early, which was a somewhat of a surprise. By now she has made her final voyage to India, where she was scheduled to be cut up for scrap. She didn't go quietly, however, being grounded for a short time in the Columbia River near Rainier.

The former owners are supposedly going to be getting something to replace her, but I'm not holding my breath.

I also work when I am at home as a harbor pilot taking ships through the Cape Cod Canal and into Narragansett Bay. I have been planning for a few years to make the transition to doing this full time and this may be that time.

There are also a lot of jobs at the moment on government ships for the Sealift to Iraq. I might do this for a bit, although I am probably just going to be a full-time pilot. It might be hard to work on 10 GHz from the Persian Gulf anyhow.

The days of W1LP/MM on the VHF/UHF bands may be a memory. We'll see.

## New Versions of LinWSJT and UKW Tools

The following is from Jonathan Naylor, HB9DRD/G4KLX:

I am happy to announce the availability of new versions of two of my software packages. They both run under Linux and are open source (GPL).

The first is LinWSJT 0.4, which is an implementation of the FSK441 and JT44 data modes for use with Meteor Scatter and EME/Tropo, respectively. New with this release is the FSK441 program as well as changes to the JT44 program, although these are not visible to the user. Both programs make use of the sound card in a PC to do the receiving and transmitting; the hard work is done by Digital Signal Processing functions within the program. The only real requirement is that the computer clock is within one second or so of the correct time.

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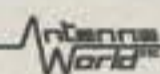
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Within the package is a Word 2000 document outlining in simple language some of the techniques that are used.

The second piece of software is UKW Tools, which allows for the plotting of terrain so that radio paths can be investigated. The actual data used for this must be obtained separately over the internet. This is a minor revision of the previous release and fixes a couple of bugs.

Both of these packages can be found on my web pages <<http://www.qsl.net/g4klx>> under Software. There you will also find MTrack, my satellite tracking program, and Baken, which visualizes European V/U/SHF beacons. Both of these latter two packages have whiskers on.

## On the Air

This is from **John Geiger, NEØI:**

Got in on my first tropo of the season on March 15. Thanks to Jim, W5SSG, for alerting me on 2 meters. Thanks also to Don, NL7CO, for leaving town on business. We always get 2 meter openings when he is out of town!

I started with KE5QR in EM15 on 2-meter FM simplex. On 2 meters I worked: NØLIE EM27, WRØF EM29 (for a new grid), WØEKZ EM17, NØDQS EN22 (for a new grid), and W5FKN EM13. I also went up to 70 cm and worked NØLIE (for a new grid), WRØF (for a new grid), and WØEKZ.

I got two new grids on 2 meters, and two new grids on 70 cm this morning. Unfortunately, I had to go to work and missed the end of the opening.

—73, John, NEØP, EM04to

Your editor also heard of others who got in on the action on that Saturday, including Sam Whitley, K5SW. Apparently, the opening extended from south Texas to the Midwest for most of the day.

## Current Conferences

**Dayton HamVention®.** The Dayton HamVention® will be held as usual at the Hara Arena in Dayton, Ohio, May 16–18. For more information, please see <<http://www.hamvention.org>>.

**Ham Social at IEEE Symposium.** The following is from **Al Katz, K2UYH:**

I have arranged for the first "Ham Social" at this year's IEEE/MTT International Microwave Symposium in Philadelphia. It will be in the program with other announcements of IMS social activities.

The reception is scheduled for Sunday June 8th from 7:30 to 9:30 PM in the Conference Center, room 307 AB. This location is in the same building and not far from the RFIC Reception also scheduled for Sunday evening.

Among the corporate sponsors for the social are Linearizer Technology, Inc., Sonnet Software, Synergy Microwave Corp., and High Frequency Electronics Publishing.

—73, Al, K2UYH

## Current Contests

**Spring Sprints.** The 50 MHz Sprint will be from 2300 UTC Saturday, May 10 until 0300 UTC Sunday, May 11. Complete rules may be found at <<http://www.ETDXA.org>> by clicking on the VHF link. Please note: This information corrects and updates listings in the Winter issue of *CQ VHF* magazine.

**Six Club WW Contest.** The following is from Jerry Daugherty, W9FS:

The Six Club World Wide Contest is set for late May, beginning May 30 at 2300 UTC and ending June 2 at 0200 UTC. The contest rules are: Each QSO is worth one (1) point in your own country, two (2) points for each contact out of your country, and one (1) extra point for each Six Club member you make contact with and get his/her Six Club number in your log. Note that all calls and numbers must be correct and complete to count. All entries must be received by June 30, 2003.

Score: Total points multiplied by total grids worked equals total score. Send all logs to Wayne Lewis, W4WRL, Contest Director, either via e-mail at <[W4WRL@aol.com](mailto:W4WRL@aol.com)>, or via his home address: 3338 South Cashua Dr., Florence, SC 29501-6306.

## Call for Papers

Calls for papers are issued in advance of forthcoming conferences either for presenters to be speakers, or for papers to be published in the conferences' *Proceedings*, or both. For more information, questions about format, media, hardcopy, email, etc., please contact the person listed with the announcement. Information on the latter two listings below courtesy the *ARRL Letter* Vol. 22, No. 11, March 14, 2003. To date this year the following organizations or conference organizers have announced calls for papers for their forthcoming conferences:

**Central States VHF Society** (conference dates July 25–27): Contact Joe Lynch, N6CL, at <[n6cl@utulsa.edu](mailto:n6cl@utulsa.edu)>. The deadline for submitting papers is May 10, 2003.

**Microwave Update** (conference September 25–28, 2003): Contact Jim Christiansen, K7ND, at <[k7nd@att.net](mailto:k7nd@att.net)>. The deadline for submitting papers is July 1, 2003.

**Digital Communications Conference** first call for papers: TAPR and the ARRL have issued the first call for papers for presentation at the 2003 Digital Communications Conference. The 22nd annual conference will be September 19–21 at the Marriott Hartford Windsor Hotel near Hartford, Connecticut. Paper topics can include software-defined radio, digital voice, dig-

ital satellite communications, GPS, APRS, DSP, HF digital modes, internet interoperability, spread spectrum and 802.11 technologies, using Linux in amateur radio, updates on AX.25, and other wireless-networking protocols. Presentation at the conference is not required for publication. The deadline to submit papers for consideration is August 5. Submissions may be sent either by e-mail or postal mail to Maty Weinberg, KB1EIB, ARRL, 225 Main St., Newington, CT 06111. The DCC is designed for all levels of technical experience, not just for the expert, and is meant to be a weekend of fun and learning for all who have more than a casual interest in any aspect of amateur digital communications. For more information on the DCC, visit the TAPR website: <www.tapr.org/dcc/index.html>.

**Space Symposium** call for papers: The 2003 AMSAT-NA Annual Symposium has issued a first call for papers to be presented at the conference, set for October 17-19 in Toronto, Ontario. Authors may present their papers during the symposium or simply offer them for inclusion in the symposium *Proceedings*. Subject matter should be of general interest to amateur radio operators involved in satellite communications. Suggested topics include operating techniques, antenna design and construction, spacecraft design and construction, current mission status, proposed satellite missions, and telemetry acquisition and relay. The deadline to submit abstracts is June 15. Copy-ready papers are due by August 15. Electronic submittal is preferred in MS-Word format to Wayne Chandler, VE3WHC <ve3whc@amsat.org>.

### And Finally . . .

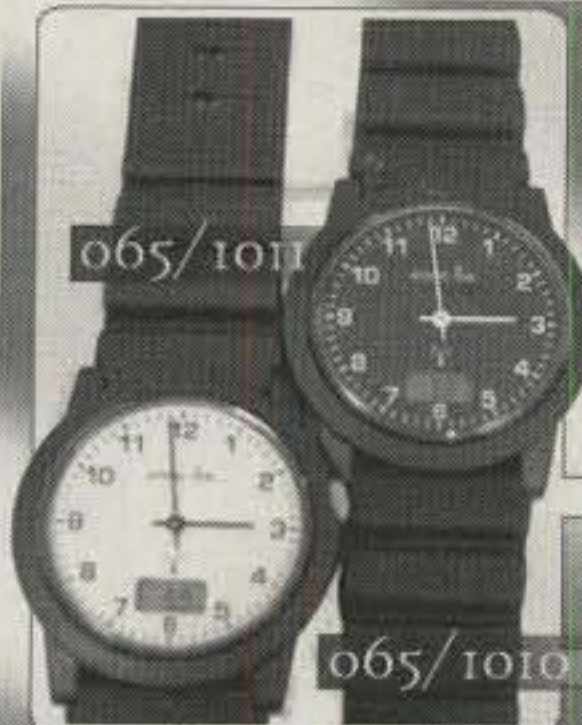
This has been a bit of a clean-up column, with a lot of odds and ends needing to be publicized. As you can see, there is a lot happening on the VHF+ ham bands these days. For more detailed coverage of what's happening, take a look at our sister publication, *CQ VHF* magazine. You can order a subscription for \$25 for one year (U.S. addresses) from CQ Communications. I have been enjoying immensely putting together each of the issues this past year, and would love to see something written by you in one of the forthcoming issues.

Until next month (when we will have even more exciting news to report)...

73, Joe, N6CL

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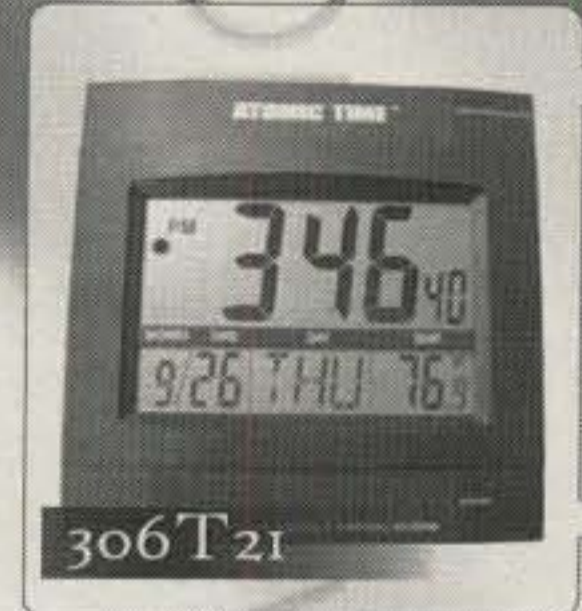
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## A Busy Month for DXers, On and Off The Air

**A**h, the month of May. As I write this in early March, I am enjoying clear, 70-degree weather in the mountains of western North Carolina. I hope the trend continues into May, but I'm sure there will be periods of cooler weather before this appears in print. However, I can think ahead to the month of May and the events that will be happening and are being planned now.

As I mentioned last month, the 54th Annual International DX Convention at Visalia will be the first weekend in May. Then we have the Dayton HamVention® May 16-18. The following weekend is the CQ WW WPX CW Contest, so the month of May has plenty of action to keep all of us busy.

One item scheduled for Dayton that I haven't mentioned is the annual Contest Dinner. Tim Duffy, K3LR, gives the details:

The North Coast Contesters are pleased to announce The 11th Annual Dayton Contest Dinner, which will be held Saturday night, May 17, at 6:30 PM (cash bar opens at 5:30 PM) at the Crowne Plaza Hotel, 5th and Jefferson Streets (next to the Convention Center) in the Van Cleve Ballroom. Price is \$31.00 per person. Seating is random and not reserved and is limited to 300. Deadline for ticket orders is May 6, 2003 (*no exceptions*). There will be no tickets at the door. For tickets contact Craig Clark, K1QX, Radioware and Radio Bookstore, P.O. Box 209, Rindge, NH 03461 (<<http://www.radio-ware.com>>). You can place your order by calling 1-800-457-7373, or 1-603-899-6957 for international callers, Monday through

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*Wayne, K9YNF/HR9 conducted a one-man IOTA DXpedition to Roatan Island (NA-057) January 11-18, 2003. Inspired by the VP8 South Sandwich team, he operated in the "MicroLite" fashion (low power and simple antennas), making nearly 1000 contacts with almost 50 countries in one week of part-time operation. His wife enjoyed the sights around the island while Wayne played radio. (Photo courtesy Wayne, K9YNF)*



*Bob Schmieder, KK6EK, spent the month of January visiting family and friends in Europe. While in Germany he stopped to visit with Franz, DJ9ZB, and is shown here at the DJ9ZB operating position. (Photo courtesy Bob, KK6EK)*

Friday from 10 AM to 6 PM eastern time, or by fax 1-603-899-6826 (24 hours). You can also e-mail your order to: <[jjclark@prexar.com](mailto:jjclark@prexar.com)>. Visa, Mastercard, American Express accepted (no COD orders). E-mails must include charge card information, callsign, and return address information.

Many contest operators from around the world attend this event. If you enjoy radio contesting, you do not want to miss this dinner! Master of Ceremonies is Tim Duffy, K3LR. Rich Strand, KL7RA, will be the guest speaker.

The 2003 Contest Hall of Fame Inductions will be formally announced by the CQ WW Contest Director and CQ Contest Hall of Fame member Bob Cox, K3EST.

Another feature of Dayton is the annual gathering of 160 meter enthusiasts. The Topband banquet will be Friday night, May 16 at Neils Heritage House Restaurant, 2323 Schantz Avenue in Dayton. The social hour (cash bar) starts at 6:30 PM with dinner at 8. Cost is \$27 US per person. Contact Randy Schaaf, W9ZR, by mail at 3600 S.B. & K Road, Galena, OH 43021, or by e-mail at: <[w9ZR@aol.com](mailto:w9ZR@aol.com)>. This event brings together 160 meter fans from around the world for food, drink, and camaraderie.

### DX Operations

Two major DXpeditions are now history: VP6DIA from Ducie Island and STØRY from Sudan. At this writing it is impossible to know the results of either of these operations which are happening later in March. I can only hope that you were able to work both of them on the bands/modes you wanted/needed.

There are so many things going on in the world at this moment that I can't make any predictions about what will happen for the remainder of the

## The WAZ Program

### 10 Meter SSB

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### 20 Meter SSB

1108 .....N5VYS

### 10 Meter CW

179 .....JN3SAC

### 12 Meter CW

36 .....N2QT 37 .....K6YUI

### 15 Meter CW

308 .....JA5MOO

### 17 Meter CW

47 .....K6YUI

### 40 Meter CW

230 .....AA5BT

### 80 Meter CW

58 .....AJ1H

### 6 Meters

58 .....NH7RO (25 zones)

### 160 Meters

183 .....K4WM (32 zones)  
178 .....W9NGA (endorsement 35, 36 zones)

### All Band WAZ

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4849 .....IK2SGB	4853 .....IK0PEA
4850 .....VE5LWS	4854 .....IT9IVN
4851 .....WA4AJX	4855 .....AD0BC

#### Mixed

8210 .....K7BG	8213 .....SP8MI
8211 .....DL3BAG	8214 .....W4HPW
8212 .....N8LJ	

#### All CW

353 .....IK1QBT	355 .....K7XN
354 .....PY2VG	

#### RTTY

138 .....KA4RRU

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, Paul Blumhardt, K5RT, 2805 Toler Road, Rowlett, TX 75089. 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 Paul Blumhardt. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. K5RT may also be reached via e-mail: <k5rt@cq-amateur-radio.com>

year for DXing. Travel to many areas of the world is restricted now, and it could get worse. Only time will tell.

I understand that there are now a very large number of DXers who are at number one Honor Roll Mixed Mode or Phone status. This is due to North Korea providing the last one for hundreds of DXers. Number one for CW remains limited without any significant operation from North Korea. With the current political situation, it appears that it will be a long time before we see any further activity from North Korea on any mode, let alone CW.

Support for DXpeditions is provided by a number of organizations around

## The WPX Program

### CW

3193 .....T94GB

### SSB

2858 .....N3WD

### Mixed

1913 .....N3WD

**CW:** 500 T94GB, 550 OM7CA, 1050 WA2VOV, WB9IHH, 1300 HB9DOT, 2550 W8UMR.

**SSB:** 400 KT2C, 500 WB9IHH, IZ0BNR, 600 N3WD, 800 W8UM, 1050 VE7SMP, 2000 I3ZSX, 4100 F6DZU.

**MIXED:** 650 N3WD, 1150 DF7ZS, 1250 WB9IHH, 2700 W8UMR.

**10 meters:** WB9IHH, T94GB, N3WD.

**15 meters:** T94GB

**20 meters:** T94GB

**40 meters:** T94GB

**80 meters:** T94GB, N3WD

**160 meters:** WB9IHH

**Asia:** T94GB

**Africa:** OK1FED

**No. America:** T94GB, N3WD

**Europe:** T94GB, N3WD

**Oceania:** WB9IHH

**Award of Excellence Holders:** N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, I0JX, WA1JMP, K0JN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SM0AJU, N5TV, W6OUL, WB8ZRL, WA8YM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, DK4SY, UR2QD, AB0P, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA,

HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KB0G, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1PO, K9LNU, YB0TK, K9QFR, 9A2NA, W4UW, NX0I, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MC, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DE0DAQ, I1WXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, W0ULU, K9XR, JA0SU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, KZ1R, CT4UW, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, I7PXV, S57J, EA8BM, DL1EY, K0DEQ, KU0A, DJ1YH, OE6CLD, VR2UW, 9A9R, UA0FZ, DJ3JSW, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RA0FU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, W4GP, K4LQ, K0KG, DL6ATM, VE9FX.

**160 Meter Endorsement:** N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SM0DJZ, DK3AD, W3ARK, LA7JO, SM0AJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, UR1QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N8JV, ONL-4003, W5AWT, KB0G, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YB0TK, K9QFR, W4UW, NX0I, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, WB0DD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JA0SU, I5ZJK, I2EOW, KS4S, KA5CLV, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, K0DEQ, DJ1YH, OE6CLE, HB9BIN, N1KC, SM5DAC, S51U, RA0FU, UA0FZ, CT4NH, W1CU, EA7TV, LY3BA, RW9SG, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, W4GP, DL6ATM.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to "CQ WPX Awards," P.O. Box 593, Clovis, NM 88101 USA. **NOTE:** WPX will not accept prefixes/calls which have been confirmed by computer-generated electronic means.



No introduction is necessary for one of the best-known low-band DXers in the world. This is John, ON4UN, another stop on Bob, KK6EK's trip to Europe. (Photo via KK6EK)

the world. One of these is the Northern California DX Foundation. It has recently begun a program soliciting donations of radios and radio-related equipment. Items donated to this IRS approved (501(c)(3) foundation are valid for tax-deduction purposes.

### Pile-up Behavior

It seems that every time a relatively rare DXpedition comes on the air we see

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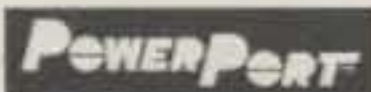
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UG-21B/U	N Male RG-8, 213, 214 Kings	5.00
9913/PIN	N Male Pin for 9913, 9086, 8214 Fits UG-21 D/U & UG-21 B/UN's	1.50
UG-21D/9913	N Male for RG-8 with 9913 Pin	4.00
UG-21B/9913	N Male for RG-8 with 9913 Pin	6.00
UG-146A/U	N Male to SO-239, Teflon USA	7.50
UG-83B/U	N Female to PL-259, Teflon USA	7.50

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## 5 Band WAZ

As of March 15, 2003, 613 stations have attained the 200 zone level and 1317 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:  
NX4D

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

N4WW, 199 (26)	SM7BIP, 199 (31)
W4LI, 199 (26)	PY5EG, 199 (23)
K7UR, 199 (34)	SP5DVP, 199 (31 on 40)
W8PGL, 199 (26)	KY7M, 199 (34)
W2YY, 199 (26)	W8AEF, 199 (40)
VE7AHA, 199 (34)	K8RR, 199 (26)
IK8BQE, 199 (31)	UU5JR, 199 (4)
JA2IVK, 199 (34 on 40m)	EA5BCX, 198 (27, 39)
KL7Y, 199 (34)	G3KDB, 198 (1, 12)
NN7X, 199 (34)	KG9N, 198 (18, 22)
IK1AOD, 199 (1)	K0SR, 198 (22, 23)
DF3CB, 199 (1)	UA4PO, 198 (1, 2)
F6CPO, 199 (1)	JA1DM, 198 (2, 40)
KC7V, 199 (34)	9A5I, 198 (1, 16)
GM3YOR, 199 (31)	K5PC, 198 (18, 23)
VO1FB, 199 (19)	K4CN, 198 (23, 26)
KZ4V, 199 (26)	KF2O, 198 (24, 26)
W6DN, 199 (17)	G3KMQ, 198 (1, 27)
W6SR, 199 (37)	N2QT, 198 (23, 24)
W3NO, 199 (26)	OK1DWC, 198 (6, 31)
K4UTE, 199 (18)	W4UM, 198 (18, 23)
HB9DDZ, 199 (31)	US7MM, 198 (2, 6)
RU3FM, 199 (1)	K2TK, 198 (23, 24)
HB9BGV, 199 (31)	K3JGJ, 198 (24, 26)
N3UN, 199 (18)	W4DC, 198 (24, 26)
OH2VZ, 199 (31)	N4XR, 198 (22, 27)
KSMC, 199 (22)	OE2BZL, 198 (1, 27)
W1JZ, 199 (24)	N4POX, 198 (24, 26)
K2UU, 199 (26)	RU3DX, 198 (1, 6)
W1WAI, 199 (24)	UT5JAJ, 198 (12, 30)
W1FZ, 199 (26)	N8PR, 198 (18, 24)
UT4UZ, 199 (6)	

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

W7AH (161 zones)	UT5JAJ (198 zones)
K1OA (173 zones)	K7XN (163 zones)
IK4HLO (186 zones)	IK0LNN (176 zones)
9A2AJ (190 zones)	

Endorsements:

AA5BT (190 zones)	LA7FD (200 zones)
N8PR (198 zones)	W9NGA (200 zones)
W4UW (191 zones)	K3UA (200 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, Paul Blumhardt, K5RT, 2805 Toler Road, Rowlett, TX 75089. 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 Paul Blumhardt. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. K5RT may also be reached via e-mail: [k5rt@cq-amateur-radio.com](mailto:k5rt@cq-amateur-radio.com).

another round of complaining about some part of the operation. Either the operators can't control the pile-ups; they aren't working the right bands at the right times for one part of the world or the other; they don't ID often enough; etc., etc. It invariably gets around to being spread all over the world via the various reflectors, and in many cases ends up with some name-calling and on and on. It borders on the absurd when you see this going on, and the worst part is that



This trio enjoy a lighter moment when visiting with Bob, KK6EK, when he stopped to see them during his European trip in January. Left to right: Peter, ON6TT; Ghis, ON5NT; and Mark, ON4WW. (Photo via KK6EK)

many of those doing all this are long-time DXers who should know better.

I have talked about pile-up behavior in the past, and yet it still goes on in every major pile-up. If I didn't know better, I would think that these people were not hearing the DX station at all. He comes back to "W2 ALPHA," and we hear a hundred other callsigns being thrown at him that do not have any relation to those letters/number. I keep see-

## CQ DX Awards Program

### SSB

2395.....W2VU	2397.....W6DPD
2396.....W6WI	2398.....W4MPY

### CW

1039.....EA3AXM	1041.....W4MPY
1040.....N7YY	

### SSB Endorsements

320.....N7RO/335	320.....CT1AHU/331
320.....EA2IA/335	320.....PY2DBU/325
320.....W6DPD/335	320.....W6WI/323
320.....PA5PO/335	320.....N1KC/320
320.....EA4DO/335	300.....RW9SG/307
320.....W5RUK/334	275.....AC6WO/294
320.....W3AZD/333	250.....W4MPY/268
320.....W2FKF/331	

### CW Endorsements

320.....EA2IA/334	300.....N1KC/302
320.....PA5PO/334	300.....W9IL/300
320.....N7RO/333	275.....WA4DOU/275
320.....W4MPY/333	200.....N7YY/208
320.....K1FK/322	

### RTTY Endorsements

310.....PA5PO/311
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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. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10, 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.

## 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	K4MOG.....334	K4CN.....333	N4AH.....331	K9OW.....328	OK1MP.....325	K1FK.....322	K9OW.....313	W9IL.....300
K2FL.....334	EA2IA.....334	W4MPY.....333	W2VJN.....331	K8PV.....327	WA8DXA.....325	K6CU.....321	N1HN.....313	K0HOW.....299
K9BWO.....334	PA5PO.....334	K6GJ.....332	W2UE.....330	W4QB.....327	I5XIM.....325	HA5DA.....321	PY4WS.....313	WG7A.....295
K9MM.....334	K2ENT.....333	KA7T.....332	N4CH.....330	W4UW.....327	K5UO.....325	VE7DX.....320	K9DDO.....312	KE3A.....295
W7OM.....334	K3UA.....333	W8XD.....332	I4LCK.....330	I1JQJ.....327	IK2ILH.....325	IK0ADY.....320	W3II.....312	KD8IW.....288
K2JLA.....334	WB5MTV.....333	WBJLC.....332	VE7CNE.....330	YU1TR.....327	N5FW.....325	WG5G/QRPP.....320	W6YQ.....310	EA3BHK.....282
N7FU.....334	W7CNL.....333	K8LJG.....332	4N7ZZ.....330	I4EAT.....327	9A2AA.....325	HA5NK.....319	YT1AT.....310	YC2OK.....282
K2OWE.....334	YU1HA.....333	YU1AB.....332	W6DN.....330	DL8CM.....327	N4OT.....325	F6HMJ.....319	KF8UN.....308	DJ1YH.....281
N4MM.....334	DL3DXX.....333	K5RT.....332	K7LAY.....330	SM6CST.....327	LA7JO.....324	N7WO.....318	IK0ADY.....307	UA9SG.....279
F3TH.....334	IT9QDS.....333	N0FW.....331	WB4UBD.....330	N4KG.....327	SM5HV/HK7.....324	G3KMQ.....317	YU7FW.....306	XE1MD.....278
F3AT.....334	G4BWP.....333	PT2TF.....331	K9IW.....329	IT9TQH.....326	9A2AJ.....323	OZ5UR.....317	LU3DSI.....302	EA2CIN.....278
DJ2PJ.....334	K4CEB.....333	K6LEB.....331	G3KMQ.....329	I2EOW.....326	W6SR.....323	F5OIU.....317	F5OIU.....302	I3ZSX.....276
WA4IUM.....334	K4IQJ.....333	VE3XN.....331	KZ4V.....329	NC9T.....326	KU0S.....322	K8JJC.....315	N1KC.....302	G3DPX.....275
W4OEL.....334	W0HZ.....333	W1WAI.....331	N5HB.....329	K4JLD.....326	KE5PO.....322	HB9DDZ.....314	KH6CF.....301	WA4DOU.....275
W2FXA.....334	N5FG.....333	K2JF.....331	K1HDO.....328	W4LI.....325	W7IIT.....322	CT1YH.....313	VE7KDU.....300	
N4JF.....334	N7RO.....333	K3JGJ.....331	K7JS.....328					

### SSB

K6YRA.....335	PY4OY.....335	N4CH.....333	W8ZET.....332	I2EOW.....329	DK5WQ.....327	WA4ZZ.....322	VE3CKP.....311	K7ZM.....292
K2TQC.....335	VE3XN.....335	4N7ZZ.....333	K1UO.....332	VE7DX.....329	UY5XE.....327	WN9NBT.....322	CT1YH.....311	OA4EI.....292
W6EUF.....335	4Z4DX.....335	KE5PO.....333	EA3BMT.....332	W2FGY.....329	KW7J.....327	LU5DV.....322	YV5NWG.....311	N8SHZ.....291
K2JLA.....335	N7RO.....335	VE1YX.....333	DL9OH.....331	CT1EEN.....329	KE5K.....327	N3RX.....321	LU3HBO.....310	K0OZ.....291
K4MOG.....335	I0ZV.....335	XE1VIC.....333	N2VW.....331	KE4VU.....328	W6SR.....326	XE1CI.....321	SV3AQR.....310	I3ZSX.....290
IK1GPG.....335	EA2IA.....335	I4LCK.....333	YZ7AA.....331	K1HDO.....328	N4KG.....326	CT1ESO.....321	HA6NF.....310	W4PGC.....290
K5OVC.....335	IN3DEI.....335	W2JZK.....333	YV1JV.....331	K5UO.....328	K7TCL.....326	YT1AT.....321	HB9DDZ.....310	YV5NWG.....287
N0FW.....335	EA4DO.....335	K8LJG.....333	WA4WTG.....331	K8F8UN.....328	W5LLU.....326	EA8TE.....321	WA5MLT.....310	VE7HAM.....285
K9MM.....335	PA5PO.....335	K3UA.....333	EA1JG.....331	EA3EQT.....328	W9HRQ.....326	W6MFC.....321	EA3BHK.....307	KK0DX.....285
W6BCQ.....335	K9OW.....335	K4JLD.....333	W8KS.....331	W0ULU.....328	W4QB.....326	K3LC.....320	RW9SG.....307	VE7SMP.....284
XE1AE.....335	W6DPD.....335	VE4ACY.....333	YV5IVB.....331	K1EY.....328	K8PV.....326	N4CSF.....320	N1ALR.....306	F5RRS.....284
W7OM.....335	WD0BNC.....334	K0KG.....333	KX5V.....331	KZ4V.....328	DL6KG.....326	N4HK.....320	XE1MDX.....305	CT1CFH.....284
KZ2P.....335	DU9RG.....334	W4WX.....333	I8LEL.....331	XE1D.....328	W4LI.....326	DL3DXX.....320	EA5OL.....305	W0IKD.....283
IK8CNT.....335	K2FL.....334	VE2WY.....333	K3JGJ.....331	KD8IW.....328	WR5Y.....326	K0FP.....320	WB2AQC.....305	EA3CYM.....283
VK4LC.....335	W0YDB.....334	WB3DNA.....333	N5ORT.....331	ZL1BOQ.....328	IK0IOL.....325	EA1JG.....320	KC4FW.....304	W9ACE.....283
OE7SEL.....335	W4UW.....334	K6GJ.....333	PT2TF.....331	KE3A.....328	K9IW.....325	EA7TV.....320	K3BYV.....303	KB0RNC.....282
VE3MR.....335	K9BWQ.....334	W9SS.....333	W2FKF.....331	W9IL.....328	WA4JTI.....325	SV1RK.....320	YC2OK.....303	F5JSK.....281
VE3MRS.....335	W4NKI.....334	K9PP.....333	CT1AHU.....331	I1EEW.....327	NI5D.....325	N1KC.....320	WB2NQT.....303	WN6J.....281
K4MZU.....335	WB4UBD.....334	W2CC.....333	EA3JL.....331	SV1ADG.....327	KC4MJ.....325	WA4DAN.....319	VK3IR.....303	IK8TMI.....281
OZ5EV.....335	W4UNP.....334	VE7WJ.....333	W6DN.....330	DL8CM.....327	PY2DBU.....325	CE1YI.....318	VE7KDU.....302	KK5UY.....280
N7BK.....335	W8AXI.....334	W3AZD.....333	K8CSG.....330	I1JQJ.....327	K7HG.....324	W5OXA.....317	W2GZI.....302	YU1TR.....280
K7LAY.....335	VE2GHZ.....334	VE2PJ.....332	YV1CLM.....330	F9RM.....327	AC7DX.....324	YV4VN.....317	N5QDE.....302	KA5OER.....280
ZL3NS.....335	OE2EGL.....334	YV1KZ.....332	LA7JO.....330	XE1MD.....327	K0HOW.....324	EA5GMB.....317	KD4YT.....302	F5INJ.....279
N4MM.....335	WA4IUM.....334	YV1AJ.....332	AB4IQ.....330	I4EAT.....327	EA3BKI.....323	K6RO.....316	KK4TR.....301	EA3CWT.....278
OZ3SK.....335	K5RT.....334	KS0Z.....332	AE5DX.....330	W3GG.....327	W6WI.....323	N5HSF.....316	SV2CWY.....300	VE2DRN.....277
K7JS.....335	W2FXA.....334	N5ZM.....332	KB2MY.....330	AA6BB.....327	K4JDJ.....323	KE4SCY.....315	4X6DK.....300	9A9R.....277
XE1L.....335	N4JF.....334	I8KCI.....332	WS9V.....329	SM6CST.....327	EA3BMT.....323	CP2DL.....314	YT7TY.....300	W6UPI.....276
YU1AB.....335	W6SHY.....334	LU4DXU.....332	K2JF.....329	WD8MGQ.....327	WW1N.....322	WZ3E.....314	XE2NLD.....300	VE2AJT.....275
OE3WWB.....335	W5RUK.....334	VE4ROY.....332	ZL1AGO.....329	CX4HS.....327	F6BFI.....322	KD5ZD.....314	K6GFJ.....299	Z31JA.....275
K5TVC.....335	K4CN.....334	W7FP.....332	N5FG.....329	I0SGF.....327	N5GF.....322	K9YY.....313	WA1ECF.....295	G4URW.....275
N5FG.....335	EA3KB.....334	K9HQM.....332	W9OKL.....329	IT9TQH.....327	LU7HJM.....322	N0MI.....313	AC6WO.....294	4Z5FL/M.....275
DJ9ZB.....335	K2ENT.....333	CT1EEB.....332	DU1KT.....329	IT9TGO.....327	K5NP.....322	W5GZI.....311	N5WYR.....293	

### RTTY

K2ENT.....331	N14H.....325	K3UA.....318	G4BWP.....312	N5FG.....305	KE5PO.....297	I1JQJ.....289	YC2OK.....280
WB4UBD.....329	EA5FKI.....320	W2JGR.....316	PA5PO.....311	W4EEU.....299	I2EOW.....291	W4QB.....280	

ing comments from DXpeditioners about the on-the-air discipline shown by the Japanese operators. When a DX station calls for "JA7 QUEBEC," you might hear one or two "possible" JA7Q stations respond, but the rest of the JA's don't scream and yell a dozen other calls. Why is it the rest of the world has to be so rude?

Some time ago I recommended a book written several years ago by a DXer, for DXers. In it the author gives operating tips and suggestions that are as valid today as they were when the book was written. That book is now out of print, but I'm sure it is on the shelf of many hamshacks. Perhaps it is time again to dig it out and read (re-read) the do's and don'ts for DXers.

DXing should not make a nervous wreck of you. Ham radio, whatever the

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The volcano on Montserrat (VP2M) was still active when the Low Land DXpedition Team operated from there during their Caribbean Tour 2002. (Photo courtesy Ronald, PA3EWP)

'specialty' you derive your pleasure from, should be fun. If it isn't fun, you can't enjoy it. Bragging rights only go so far. So what if your 5 KW and 6-over-6-over-6 beat out 1000 others trying to work the DX station? I'd be satisfied in knowing that my 100 watts and 3-element tribander at 50 feet let me work the station before the operation ended. As

long as the DX gets in the log, that's what matters. To sit and call and call and call some more, regardless of to whom the DX station came back, is pointless, only causing needless interference and possibly costing someone a contact with a much-needed DXpedition.

Let's be more conscious of what we are doing and *listen* and respond only when it is appropriate to do so. If your callsign is not "W2 ALPHA," then don't say anything. *Wait* and give W2A a chance to make the contact.

The DX operators at the other end are doing their best to pull even part of a callsign out of massive QRM. Let's be patient and courteous enough to give them a chance to do what they are spending *their* time and money to do—*make us happy*. Remember, they don't *have* to be out there. They don't *have* to sit and listen to endless QRM. However, they are there *for you*. Have the common decency to give them an opportunity to have a little fun, too.

Until the next time, enjoy the chase, be courteous, and have fun!

73, Carl, N4AA

## QSL INFORMATION

D44TT via DJ1MM	GJ0AAA via G3TXF	J75PL via AA1M
D44TT via 4L5A	GM4YXI via N3SL	J75RN via W1USN
D68C via G3SWH	H44MS via DL2GAC	J77A via K0SN
D88S via DS4CNB	HB0/DJ2IA via DJ2IA	J79AK via 8R1AK
DL4PI via K3DI	HB9/ON8DX via AI5P	J79BEY via G1SSL
DL6KVA/6Y5 via DL6KVA	HC1/NP3D via W3HNC	J79RJ via DJ7RJ
DP1ANF via RK1PWA	HC1HC via NE8Z	J8/W8KKF via AC8G
DU1KT via KU9C	HC2SL via HC2GT	J80D via AC8G
DU9AXJ via DU1BP	HC8DH via UT5EVH	JI5RPT/6 via JI5RPT
E20AJ via HB9AOF	HG1S via HA1KSA	JI5USJ/6 via JI5USJ
E44Q pirate	HH4/K3VN via K3VN	JM6DZB/JD1 via JM6DZB
EA8/G4RGK via G4RGK	HH4/K4QD via K4QD	JW/SM0BSO via SM0BSO
EA8/OH6XX via OH6XX	HH4/N2WB via N2OO	JW/SM0LQB via SM0LQB
EA8/OH9MM via OH9MM	HH4/W4WX via W4WX	JW/SM1TDE via SM1TDE
EI/DH5ST via DH5ST	HH6/DL7CM via DL7CM	JW0HU via SP3WVL
EK3SA via DK6CW	HH6/DM2AYO via DM2AYO	JW5RIA via LA5RIA
EK6TA via DJ0MCZ	HK0VGJ via HK0VGJ	JW5UF via LA9VDA
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EW8AO via EW8AO	HL9KQ via K4BAI	K9YNF/HR9 via K9YNF
EX8M via EX8F	HR1RQF via EA7FTR	KB6DAW/KH9 via NT4TT
EY8MM via K1BV	HR2/F2JD via F6AJA	KC4/N2TA via N2TA
EY8WW via K1BV	HS0ZAB via N8GZ	KH2/N3FW via JA2VFW
EY90MT via K1BV	HS0ZAM via W4OMK	KH2F via JA2TBS
F/K3DI via K3DI	HS0ZAU via NA6MM	KH6/W4ZYV via AH7G
F5VHQ/HI9 via F5VHQ	HS0ZAV via NV7E	KH6/ZL1BQD via ZL1BQD
FG/F6FXS via F6FXS	HS0ZDG via K4YT	KH6BB via K1ER
FG5FC via F6DZU	HS0ZDY via SM3DYU	KH6JEB/KH7 via K1ER
FK0RR via ZL1BQD	HV0A via IK0FVC	KH6XT via N9NU
FK8GJ via F6CXJ	IH9P via KR7X	KH9/AH2BE via NT4TT
FM5WD via W3HNC	IH9P via OK1MG	KL7CQ via AC7DX
FP0CA via K2RW	II1D via IZ1CCE	KP2A/VS6CT via 9M6CT
FP5AA via K2RW	IV3NCC/A41 via IV3NCC	KP4SQ via KD8IW
FP5EJ via K2RW	J3/DJ7RJ via DJ7RJ	KV2AA via W3HNC
FP8CA via K2RW	J3/W8KKF via AC8G	
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FR5KH/J via F6FNU	J37LR via VE3EBN	
FR5ZL via FR5ZL	J38G via AC8G	
FS/K3DI via K3DI	J73K via AC8G	

(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," P.O. Box 3071, Paris, TN 38242; phone 731-641-4354; e-mail: <golist@golist.net>.)



# Packet Spotting: Friend or Foe of Contesting?

BY JOHN DORR, \*K1AR

Contesting

## May's Contest Tip of the Month

Many of us can recall those times when, after a contest, a station tells us that they were calling and calling but we never came back to them. Usually it's because we were beaming in the wrong direction or there was heavy QRM. One trick to consider is to utilize alternative receiving antennas as part of your station's arsenal. A beverage antenna, for example, can be an effective receiving tool on the high bands. The same is true for a vertical. You may be surprised to learn that more often than not, a weak signal calling you is simply someone coming from a different direction. A quick switch to your receiving antenna may help you pull out the call and put a new multiplier in the log.

Every once in a while, there's a subject that needs to be discussed that not everyone is going to agree on. In fact, with some hams that includes the subject of contesting itself. Over the past few years, I've observed the rapidly growing addiction to the use of packet spotting in contesting. For those of you who don't understand the concept (and I suspect there aren't many at this point), packet spotting is nothing more than utilizing the widespread presence of PacketCluster™ (and other products) nodes throughout the world for the purpose of communicating the frequency and callsign of a contest multiplier and/or QSO. The idea seems simple enough on the surface, yet it has taken on a life of its own in our contesting ranks. Indeed, it has become an obsession that has truly changed the face of contest operating—unfortunately, without particularly positive results.

The original concept of packet spotting has its roots in the late 1980s, when Dick Newell, AK1A, brought his PacketCluster product to market. It seemed benign enough at the time. Local DXers and contesters utilized the tool to enhance their "spotting" capabilities. If a local group was more advanced in its thinking, it may have even linked one or two of the PacketCluster nodes together into a mini-network of sorts.

Clearly, in today's environment the face of packet spotting has changed. The vast majority of users enter the packet world via the internet. Huge, worldwide networks are in place with literally hundreds of nodes networked together. At peak times it's not uncommon to see thousands of users connected from virtually every part of the world. Frankly, one should marvel at this achievement in ham radio from a technological point of view.

Unfortunately, the concept went bad somewhere along the way. As you'll discover in my commentary this month, I believe this may be less the case in casual DXing circles (although we have our moments in that world as well). However, it is absolutely the situation we face during high-profile contest operating.

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e-mail: <K1AR@contesting.com>

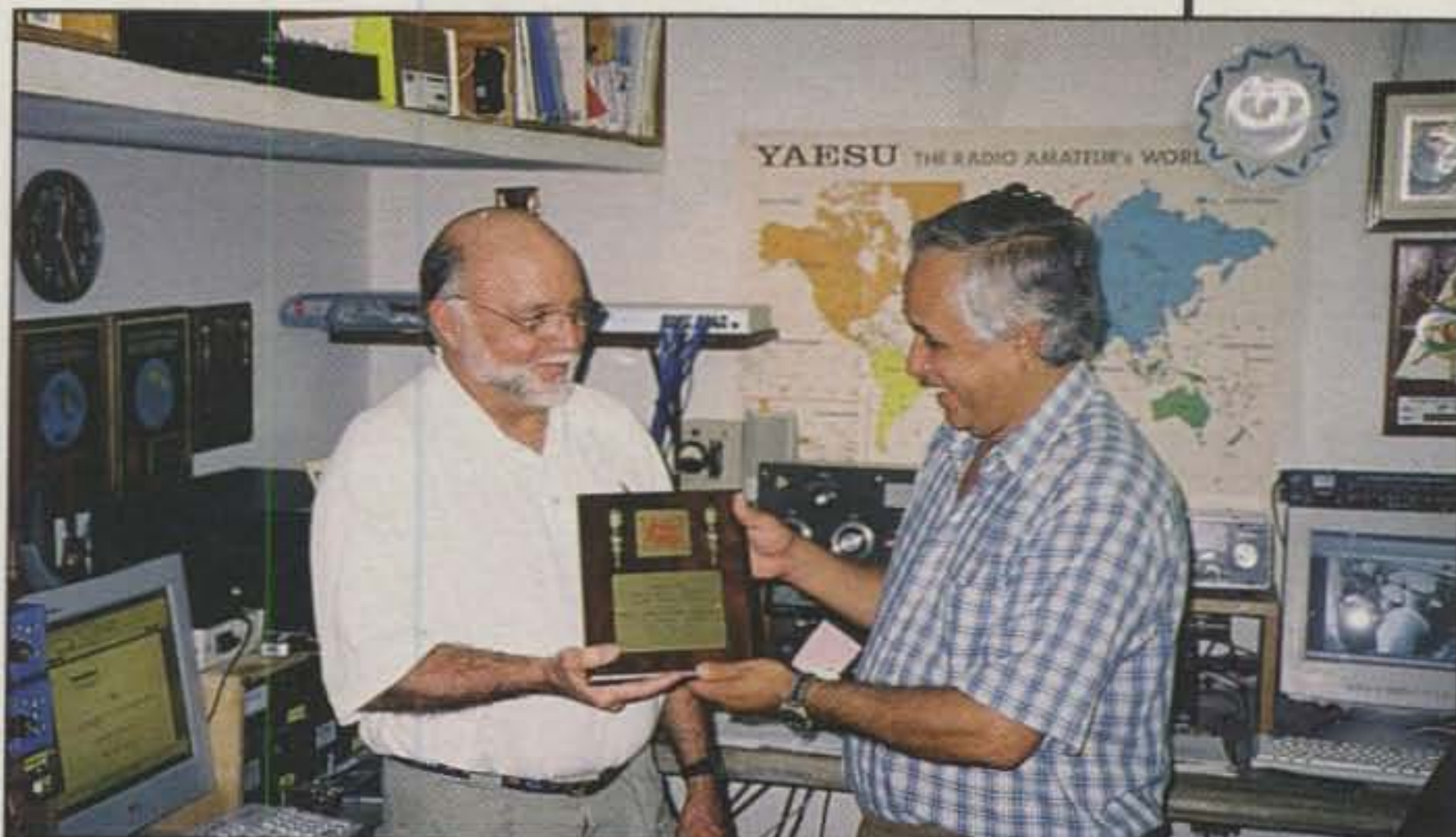
## Calendar of Events

Apr. 26-27	SP RTTY DX Contest
Apr. 26-27	Helvetia Contest
Apr. 26-27	Florida QSO Party
May 3-4	ARI Int'l DX Contest
May 3-4	MARAC County Hunter's CW Contest
May 3-4	New England QSO Party
May 3-4	Indiana QSO Party
May 10-11	CQ-M DX Contest
May 10-11	Volta RTTY Contest
May 17-18	Baltic DX Contest
May 17-18	US Counties SSB QSO Party
May 24-25	<b>CQ WW WPX CW Contest</b>
May 31-June 1	Great Lakes QSO Party
June 7-8	IARU Region 1 Field Day
June 14	Portugal Day Contest
June 21-22	All Asian CW Contest
June 28-29	ARRL Field Day

## Packet Pile-ups

Newer contesters may find it hard to believe, but there once was a day in contesting when operators simply tuned the bands and found/worked rare multipliers/QSOs all by themselves. Before the days of packet, we sometimes would utilize 2 meters as the multi-op tool of choice for DX spotting. I remember the old days of operating at W2PV's multi-op station, where we had assigned 2 meter spotting operating positions (much like ensuring coverage on the HF bands themselves), including the use of the local radio club in Schenectady, NY to help us along.

Unfortunately, with the ubiquitous access to packet that exists in today's contesting environment, a new dynamic has been created. Now, when an interesting or needed station is spotted, the masses swarm on that station like a pack of



Bill, W5SJ, presents André, PY0FF, on behalf of his QSL Manager Bill, W9VA, and donor, Fred Laun, K3ZO, with his 2000 CQ WW plaque for winner World, Single Operator, 7 MHz SSB! André was delighted to add this award to his growing wall collection. (Tnx W5SJ)

hungry wolves. Instant pile-ups are created as a result, and the operating skill now becomes that of "who can get there first." Computer logging programs contribute to this behavior, as they have nicely integrated the packet environment with the software so that moving to a spot is nothing more than a key-stroke away.

While it's fair to say that packet perhaps has increased the availability of needed multipliers, it has also facilitated unacceptable operating methods. It has become so easy to QSY to these spots that everyone does it. Often, callers don't even listen before they start calling. There's so much pressure to get there first that poor operating becomes the norm. I equate this operating environment to someone jumping into a running car and flooring the gas without first deciding where he (or she) is even going. It's just important that he's moving.

To a large extent, we've created this monster. Frankly, some of the fun of contesting has left us as we move from one packet pile-up to the next. It's become a rare event to find that useful multiplier first. The numbers simply are against you. It seems that contest weekends have become days of bouncing around the packet pile-ups that rapidly grow into dozens of callers as our contest machines lead us to water. If this is discouraging to operators of big stations, one can only imagine how the little pistol must feel over the course of a weekend. Think about it as you're trying to work that TG9 or FO5 on 10 meters who decided to show up on Sunday afternoon and subsequently was spotted on packet.

In some contests, this dynamic is not limited to rare multipliers. For example, in the last ARRL SSB DX Contest, I wit-

nessed packet pile-ups on random JA stations, mostly due to the limited activity at the end of the contest. It was disconcerting indeed to join a pile-up of 40 other stations all simply trying to log a contest QSO.

### Busted Callsigns

As the use of packet spotting has increased over the years, it seems that our operating practices have declined. If you take a look at Table I, you'll see some embarrassing evidence of this claim. Over the course of a contest weekend, literally hundreds of busted callsigns make their way into the packet system. For the 2003 ARRL DX SSB Contest I counted more than 125 bad calls posted! Unfortunately, as I've seen first-hand from CQ WW log checking, they also make it into contest logs. Again, many of us just don't listen. We point and click on a spot, go work it, and don't even bother to listen to the callsign of the station that was just worked. The result: bad QSOs make it into our logs. More important, we've just contributed to the growth of poor operating techniques.

I'm continually amazed at the number of bad calls that make it into the system. Frankly, it's nothing less than sloppy operating. This is all about taking the time to get it right, which includes one key attribute—listening. As in most of life, if we spent as much time listening as we did transmitting, we'd be amazed at the increase in our operating accuracy and effectiveness.

### Intimidation of Casual Operators

If you've ever operated from overseas, you've experienced packet pile-ups.

For an experience operator, these are really not a big deal. It's all part of the game. However, it's another story if you're simply a casual operator trying to help out by giving the contest a bit of your spare time. Casual operators are not interested in large pile-ups. In fact, they're really not even interested in the contest itself per se. They're more interested in deciding whether they should operate their radio or go to the beach that day. As the packet wolves descend on these poor fellows, the endless calling often results in the casual operator hitting the off button on the radio. Contesting loses in this scenario.

Intimidation can even be a factor for the experienced operator. The worldwide nature of packet usage creates awareness of interesting stations that normally would not be noticed in certain geographical areas due to propagation. However, as that low-band multiplier gets spotted after East Coast sunrise, we start calling away, creating a difficult copying environment for even the best of operators. Again, where have we benefited from this situation?

### Reduction in Contest Fundamentals

I'll admit that I'm a traditionalist in most aspects of life. Believe it or not, in the early years it took me a while to warm up to the notion of contest logging software. At the time, I was convinced that it simply would slow me down. As one who cut his contesting teeth in the late 1960s and early '70s, I'm a product of the old school. I worked contest QSOs the old fashioned way: I found them by tuning the bands. Now I'm not so rigid that I don't see the benefit that comes from packet spotting. In fact, as I type this, I have a TELNET window running in background connected to my local W1GQ packet node. However, when it comes to contesting, packet has created a serious decline in operating basics. It's as if without packet, we have become unable to work the contest by ourselves. Loss of the packet network can create a serious crisis in some operators' minds. When reading some of the soapbox comments after a contest, it seems that the subject of packet prevails over the events of the contest itself. I see it at club meetings, hamfests, local gatherings, and many other places.

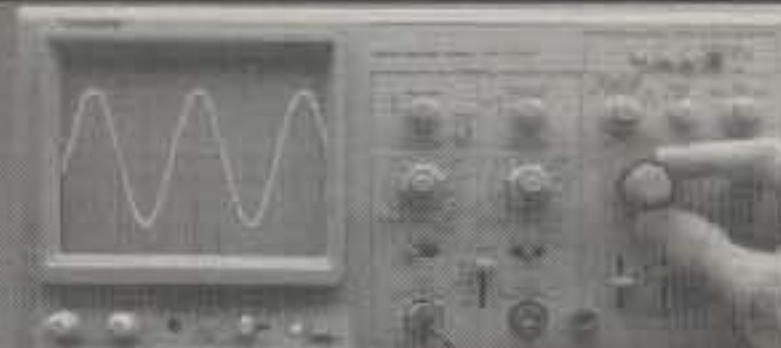
In many ways, packet spotting has become a dependency to us. For many of the newer contesters, they have never truly learned the fine skill of tuning the bands and finding needed QSOs. The world of packet spotting is all they know. As an example, I recent-

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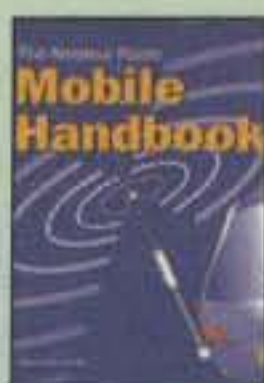
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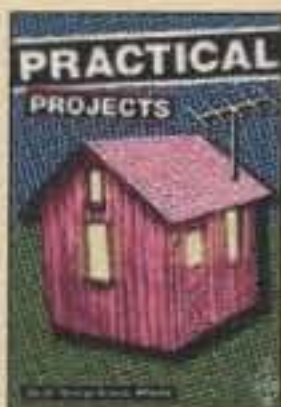
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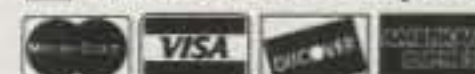
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ly read the comments of an aspiring contester on qrz.com. Strikingly, one of his remarks was to state a goal of gaining proficiency in the use of packet radio as a critical factor to his long-term success in contesting. Not once did he mention the notion of getting the basics of "operating 101" down pat.

### Cheating is Inevitable

Whether we choose to admit it or not, packet spotting has created another dynamic in contesting—cheating. Over the years, I've subscribed to the concept that the vast majority of testers are honest. I still think that. However, as with any large group, there's always a small subset that sees life differently. Fortunately, most of them eventually get caught. However, the availability of packet has become an irresistible factor for some of our ethically challenged members, with the lines of single operating becoming blurred in their minds.

Perhaps of greater concern is what I would describe as the casual cheater. This is not the hard-core cheating single operator who uses packet spotting all weekend in a way to dramatically improve his score. Rather, it's the operator who chooses to pick his spots (pun intended). Over the course of a weekend, he may work 10 or 20 spotted stations as a way of adding a percentage point or two to his score. It's like the fellow who has quit smoking and only occasionally grabs one or two cigarettes when the urge hits him.

The bottom line is that cheating is cheating, and whether you do it once in a weekend or make a career out of it, you and contesting both lose.

### Out-of-Band Operation

Until the past year I never thought that out-of-band operation was that much of a factor in contesting, but while operating at PJ2T, I was amazed at the number of U.S. stations who called me outside of the band. At first, I assumed they simply were not looking at their VFOs and making honest mistakes along those lines. Then it struck me: The culprit was packet spots. Again, in the "point and call" mode that has become so common, spots hit our computer screens and off we go, with little regard to whom we're calling or what frequency they're on. You would be amazed at the number of stations who called me at PJ2T while I operated on 21140. Little pistols and high-profile multi-multi stations were all in there. It was truly an equal-opportunity example of poor operating.

During this past ARRL DX SSB contest, as an experiment we spotted a legitimate DX station operating on 21190 just to see what would happen. As sure as the sun rises, U.S. stations appeared on the frequency and worked him—again, small and large stations alike. It was a sad commentary on the negative effects of packet.

### And Finally . . .

The reality of packet spotting is that the technology is out of the gate. Whatever your position is on the subject, there's probably no turning back at this point. Or is there? As an experiment last year, N2RM participated in the ARRL DX CW contest as a Multi-2 entry with one notable change in operating strategy—no packet! Not only did they do well, they won the category, beating the likes of our K1AR operation from K1EA's station operating with the full support of the packet network. Did their multiplier totals suffer from lack of packet? No. In fact, we virtually were tied. Here's the comparison of multipliers:

Band	K1AR	N2RM
160	47	45
80	80	80
40	94	93
20	118	115
15	123	123
10	122	117
<b>Total</b>	<b>584</b>	<b>573</b>

If I seem a bit passionate about the subject this month, it's with good reason. Packet spotting, while offering perceived value to many testers, has become a matter of serious concern. I work in technology and use it every day. Unfortunately, packet spotting is a great technology that has gotten out of hand. Of even greater concern is the fact that there doesn't seem to be any driving force to do something about it. All of us own a piece of this challenge. Would contesting's interests be better served if packet spotting simply went away? I spend very little time wondering what the answer to that question is anymore. What do you think?

Well, at the very least I've raised the controversy level up a notch this month. It's a healthy practice for testers to be introspective about their practices and methods of operation. I welcome your comments and input on this month's topic, or any other topic for that matter.

That's all that time and space will allow for this month. See you in the next contest.

73, John, K1AR

# Marine-Mobile Mobiles

An e-mail inquiry from Bill Pederson, KM1C, asked whether while operating from U.S. territorial waters he could make valid contacts as he navigated from Florida northward along the Intra Coastal Waterway. Since Bill wasn't going into "international waters," his vessel is considered to be just like any other mobile station, and if he knew that he was within the legal boundaries of a county, he could give that out as a valid county contact. I suggested that he should make reference to charts and maps that validate the territorial boundaries of the county.

What about the contacts you make from a vessel? Can they be used for your own USA-CA award totals? Yes. Rule B.1. of the USA-CA Award program states that the award is issued "for all county contacts made, regardless of calls held, operating QTHs, or dates."

While some of the counties Bill gives out may be common, none will be "interstate."



George Tomlinson, N3ISH, USA-CA All Counties #1053.

## George Tomlinson, N3ISH USA-CA All Counties #1053

The following is from George, N3ISH, who completed USA-CA All Counties on October 3, 2002:

I started out in ham radio in June 1981. I joined the Penn Wireless Radio Club right away and was active working contests. I did Field Day every year and had a good time. Then I started doing the Pennsylvania QSO Party with a good friend, Paul, KA3JOI. We had a lot of fun participating in the contests. Early on I completed Worked All States with 2 watts, and that was a thrill.

I knew about the county hunters and did get contacts back then, but I did not take it seriously. My wife, Mary, NV4Z, told me how to get going chasing counties. With Mary having "five stars," I had a lot of catching up to do. I started on my way in October 2000 and spent a lot of time on the air. We have put out a lot of counties going up the east coast to New Jersey, then to Murfreesburg, Tennessee, and on to Memphis, where Mary is from. The

\*12 Wells Woods Rd., Columbia, CT 06237  
 e-mail: <k1bv@cq-amateur-radio.com>

### USA-CA Honor Roll

500		1500	
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K2RP.....	3226	VE1WT.....	1354
LZ1CY.....	3227		
WB8FBJ.....	3228	2000	
VE1WT.....	3229	KA4NZG.....	1251
OK1DG.....	3230	WB8FBJ.....	1252
OK1AXB.....	3231	VE1WT.....	1253
1000		2500	
WW8O.....	1619	WQ5A.....	1170
K9UQN.....	1620	WB8FBJ.....	1171
WB8FBJ.....	1621	VE1WT.....	1172
VE1WT.....	1622		
		3000	
		WB8FBJ.....	1079

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.

### USA-CA Special Honor Roll

- Jerry Bailey, WB8FBJ  
 USA-CA All Counties #1058  
 February 21, 2003
- Ed Messenger, N8OYY  
 USA-CA All Counties #1059  
 February 25, 2003

best thing is that you meet a lot of good people along the way. I have friends that I would not have had if I had not gotten on the County Hunters Net.

When I first started out I had to get used to the call-signs. I got a lot of contacts fairly quickly until I got over the 2000 mark. Then it slowed up. I had a lot of help along the way, though, from the control operators and mobiles. Most of all, Mary helped with the paperwork so I could stay on the air and keep getting contacts. I also had a lot of help from Jim, KZ2P.

It did not take long to find out that I had a lot of friends all over the country and outside the U.S. as well. All of a sudden they started calling me by my first name. Then I had to learn their names, and that took some time. Now I was getting going! The more counties I worked, the more I liked working them. I think county hunting worked its way into my blood.

I don't have a big beam, and I thought it would be hard to get all the counties. I found out that wasn't the case. I have a dipole up 18 feet, and I found out that it was enough to talk to anywhere in the country, and even outside the U.S., as I talked to Alan, VK4AAR, almost every day.

It was very exciting to go mobile and put out counties. Mary and I put out the whole state of Florida. We have put out counties in 20 states. Now I am waiting to go a



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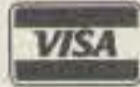
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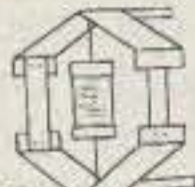
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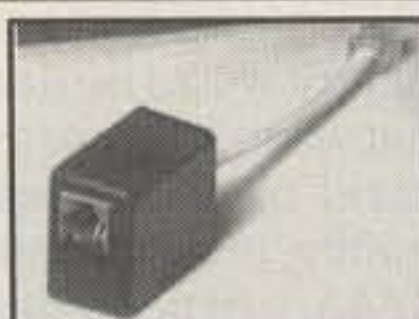
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50 WORKED ISLANDS

The Salento Islands Award is issued by the Sezione ARI Lecce and the Salento DX Team for contacting islands in the Brindisi, Lecce, and Taranto provinces of Italy.

One of the goals of the OKDX Foundation is to organize and fund radio amateur expeditions to rare countries and regions where no or low amateur radio activity exists. They also sponsor contests and the award shown here.



second time around. I hope to get out and put out more counties. I know that by the time this appears in print I will have done the east coast and then worked my way back to Florida. The trip will take us through 15 states and a lot of counties. I will meet more new friends and a lot of old ones. I know that you can't go anywhere else and meet friends as I have on the County Hunters Net.

The best thing that happened to me is when I talked to Mary back in 1984. I didn't know this would happen at the time, but we were married on September 2, 2000. With Mary pushing me, I had a good instructor. With everything within my reach, I went on to get the USA-CA All Counties Award.

I want to thank all of my friends for helping me get my first star. If you are not a county hunter, you don't know what you're missing.—73, George, N3ISH

### U.S. Counties QSO Party

One of the "tricks of the trade" for county hunters is taking advantage of contests and state QSO parties where the county is part of the exchange. Thus, what could be better than a contest where the objective is to work different counties?

The 2003 U.S. Counties QSO Party (formerly known as the MARAC County Hunters Contest SSB) will be held the weekend of May 17-18, 2003. Duane, WV2B, writes that based on previous results, there's the possibility of being able to work over 500 different counties during the contest. Full information is available on the internet at <http://www.stpaulisland.net/countycontest.html>.

stpaulisland.net/countycontest.html>. If you don't have internet access, send an SASE to WV2B or VE1OP at their callbook or qrz.com addresses. Duane and Scott have been working to publicize the contest. Many mobiles are expected to be active and can be worked as they operate from each county.

### Awards Available

**OKDX Foundation Award.** The Czech Republic's OKDX Foundation is a non-profit organization with the aim of organizing and funding radio amateur expeditions to rare countries and regions where no or low amateur radio activity exists. They also organize activities during major international contests. Any station may join the group, and the small membership fee is used for the above purposes. Anyone may earn a handsome award certificate based on the following rules.

The OKDX award is available to all stations who earn 150 points as follows:

Each QSO with OK5DX, each band = 5 points

Each QSO with a member of the OKDX Foundation = 2 points

Each QSO with a DXCC country during an OKDXF expedition = 15 points

Each QSO with more than 200 DXCC countries = 5 points

Each QSO with more than 250 DXCC countries = 10 points

Each QSO with more than 300 DXCC countries = 15 points

Contacts must have been made since 14 January 1994. List of OKDXF expeditions: ZA/OK5DX, ZA9A, 3V8BB, IH9/OK5DX, FO0/OK5DS, FO0/OK1VD, FO0/OK1KT, FO0/OK1TN, ZK1KTT, ZK1TNN, 5W0SZ, 5W0VD, 5W0VV, AH8, KH8/KF4MIW, 3D2KT, 3D2TN, 3D2CB, 3D2WC, 3D2WC/R, 3D2CB/R. Send GCR list and fee of 8 IRCs, \$US8, 10DM, or 60kc for OK stations to OKDX Foundation, P.O. Box 73, 293 06 Kosmonosy, Czech Republic. The member list is at <<http://www.okdx.cz/indexan.htm>>.

**Salento Islands Award.** If you've chased islands during the summer months, you almost certainly will have worked Italian islands aplenty. The long Italian coastline is dotted with hundreds of islands, and those islands located along the Brindisi, Lecce, and Taranto province coastlines are valid for the award. For non-Italian stations the number of islands needed is modest, but it will still be a challenge. A smaller number of stations have earned the plaque, which is pictured in this column.

The award is issued by the Sezione ARI Lecce and the Salento DX Team. SWL okay. All active (not deleted) islands in the Brindisi, Lecce, and Taranto provinces are valid. Contacts must be after 1 January 1980. Italians need 20 islands, EUs need 15, and all others need 10. A list of the islands can be found at <<http://www.qsl.net/ari-lecce/siaeng.htm>>. CW, Phone, RTTY, and Mixed modes available. All bands may be used. A special plaque is available: Italians need 50 confirmed islands, other EUs need 35, and rest of world 25.

For the award send GCR list and fee of \$US10, 8 Euros, or 20 IRCs (for plaque, fee is \$US15, 13 Euros, or 35 IRCs) plus SASE if cards are sent. Apply to: ARI Sezione, SIA Award Manager IK7VJX, P.O. Box 161, I-73100 Lecce, Italy.

**Worked Northern Caucasus Award (WNCA).** One of the most colorful certificates I've seen in a long time comes from RA6LMF in the Northern Caucasus of Russia. This section of Russia is composed of 12 republics, territories, and areas, each with its own flag and symbol. The geographic location of a Russian station generally can be determined by the first letter of the suffix. Therefore, the sponsor of the award, RA6LMF, is located in the "Rostov" area. The fee for the award is very modest, although you may want to use Registered Mail to ensure the funds arrive.

Contact stations located in the Russian territory of Northern Caucasus. It is

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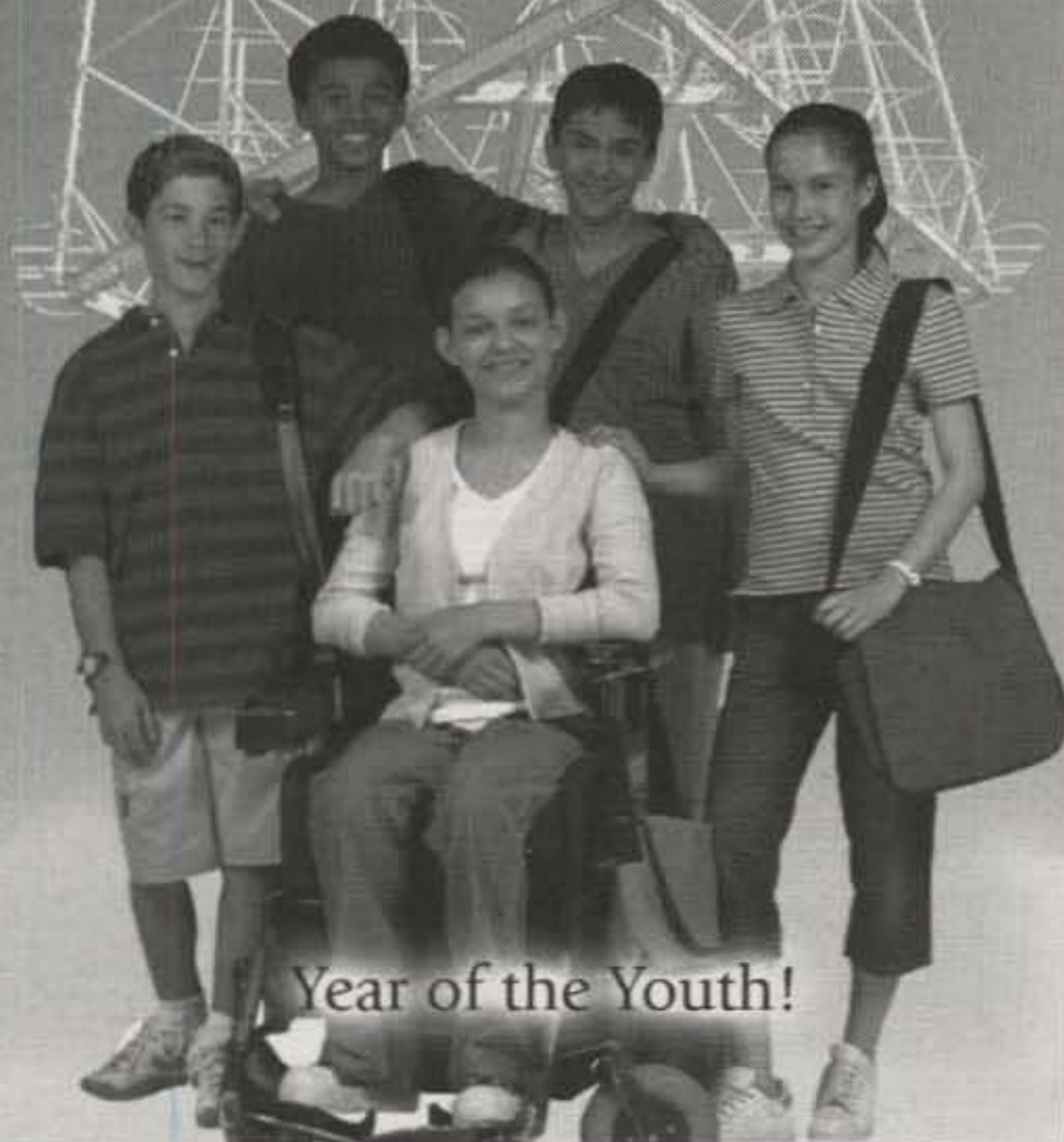
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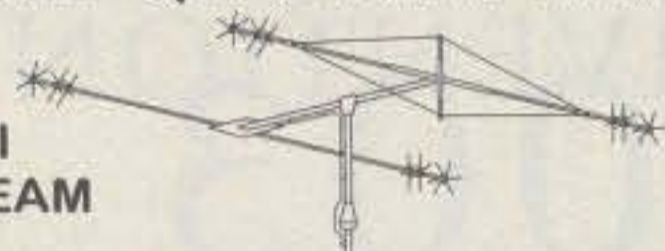
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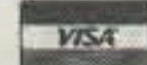
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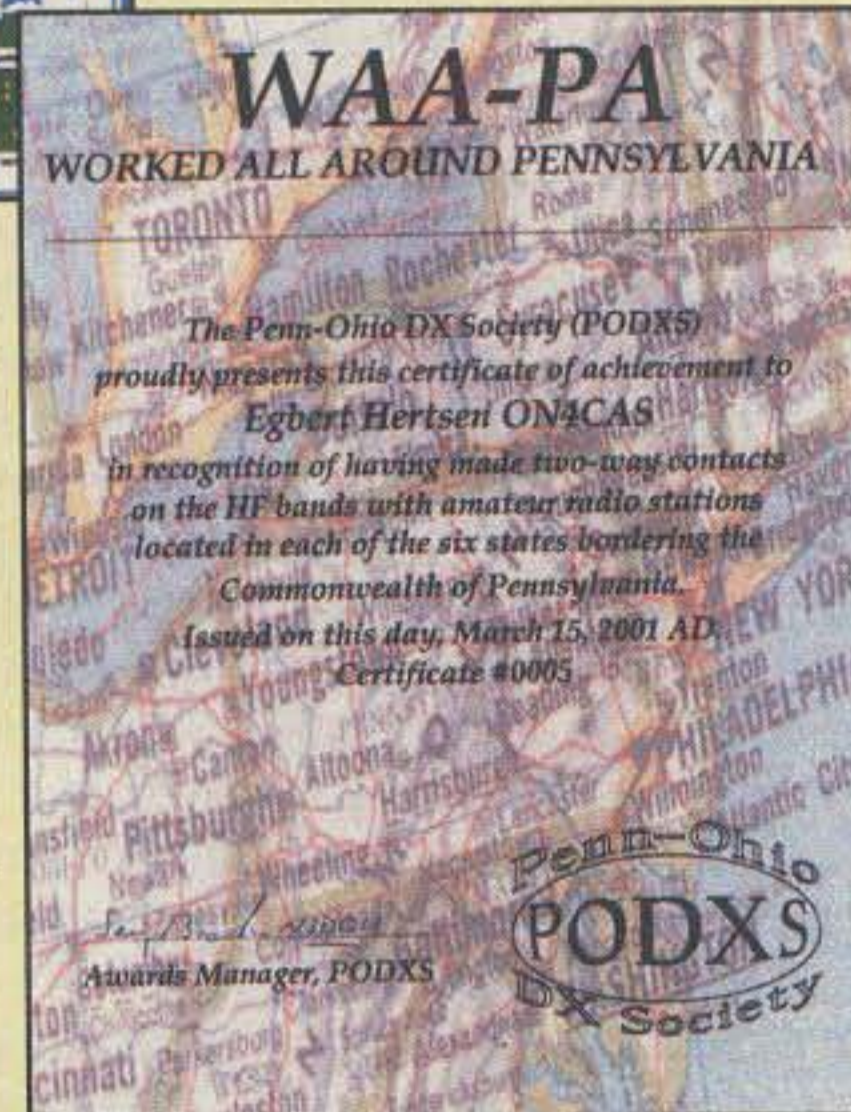
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Sponsored by RA6LMF, the WNCA Award is issued for contacting stations in the Northern Caucasus of Russia, which is composed of 12 republics/territories/areas.

The Worked All Around PA Award is one most stations, U.S. and DX, should have little trouble earning, and it's free as well. It is sponsored by the Penn-Ohio DX Society.



necessary to make 12 QSOs, one from each of the 12 republics/territories/areas of the Northern Caucasus as follows:

- RA6 A, B, C, D: Krasnodar territory
- RA6 E: Karachaevo-Circassian Rep.
- RA6 H, F, G: Stavropol territory
- RA6 I: Republic Kalmykia
- RA6 J: Republic Northern Ossetia
- RA6 L, M, N: Rostov area
- RA6 P: Republic Chechen Republic
- RA6 Q: Republic Ingushetia
- RA6 U: Astrakhan area
- RA6 W: Republic Dagestan
- RA6 X: Republic Kabardino-Balkariya
- RA6 Y: Republic Adygea

You may substitute any two stations located in Rostov-on-Don for any missing territory, republic, or area. All bands and modes. SWL okay.

WNCA-VHF is available for making 12 QSOs with stations located in not less than three of the republics/territories/areas of Northern Caucasus on frequencies higher than 30 MHz. The VHF version is not available for SWLs.

Send GCR list and fee of \$US2 for Russians, \$US3 for CIS countries, and \$US5 for all others. Apply to: Sergey S. Denisenko (RA6LMF), P.O. Box 1092, Rostov-on-Don, 344091, Russia (e-mail: [ra6lmf@mail.ru](mailto:ra6lmf@mail.ru)).

**Worked All Around PA Award.** Some of the awards shown in this

month's column are pretty challenging, but here's one most stations, U.S. and DX, should have little trouble earning—and it's free as well.

Sponsored by the Penn-Ohio DX Society, well known for their extensive PSK31 awards series, contact each of the six states surrounding Pennsylvania on HF using any mode. The states are Delaware, Maryland, New Jersey, New York, Ohio, and West Virginia. Although the award is free, an SASE with postage would be appreciated. Apply to: Jay Budzowski, N3DQU, 109 S. Northview Ave., New Castle, PA 16102-1633 (e-mail: [N3DQU@aol.com](mailto:N3DQU@aol.com)).

## URL of the Month

The Triple H Net has issued over 770 worked all states certificates to operators in all 50 states and 17 foreign countries since 1976. The net operates 364 days a year on 7.235 MHz starting at 0700Z. They also offer 30 other certificates in a very large and impressive program aimed at the night-owl amateur. You can find out all about this group by visiting <http://www.qsl.net/triplehhh>.

To write this column each month I need your input. I'm interested in seeing your club or group's award with complete rules and samples. Free publicity is the key to a successful award program. CQ will do its part to help!







Fig. 2— Mirror image hot spots showing where you would aim your signal if you wish to work the United Kingdom.

A useful feature is BeamFinder's projection of the ionospheric mirror on your map. Imagine the ionosphere as a mirror by which you would see the image of the Earth mirrored in the sky. You would see a distant location at a specific spot on that ionospheric mirror at a specific azimuth and angle. This is somewhat comparable to a radio antenna and how it "sees" radio waves in the sky mirrored from the ionosphere. Using BeamFinder's mirror-image map, you can plan the direction of your radio signal, such as is shown in fig. 2. You can see how critical the antenna's beam is when targeting a specific geographical area.

The skip distance in radio propagation depends on the layer height and the antenna's vertical beam width. Long-skip distances are achieved with a low antenna beam elevation and vice versa. BeamFinder allows you to view the maximum DX

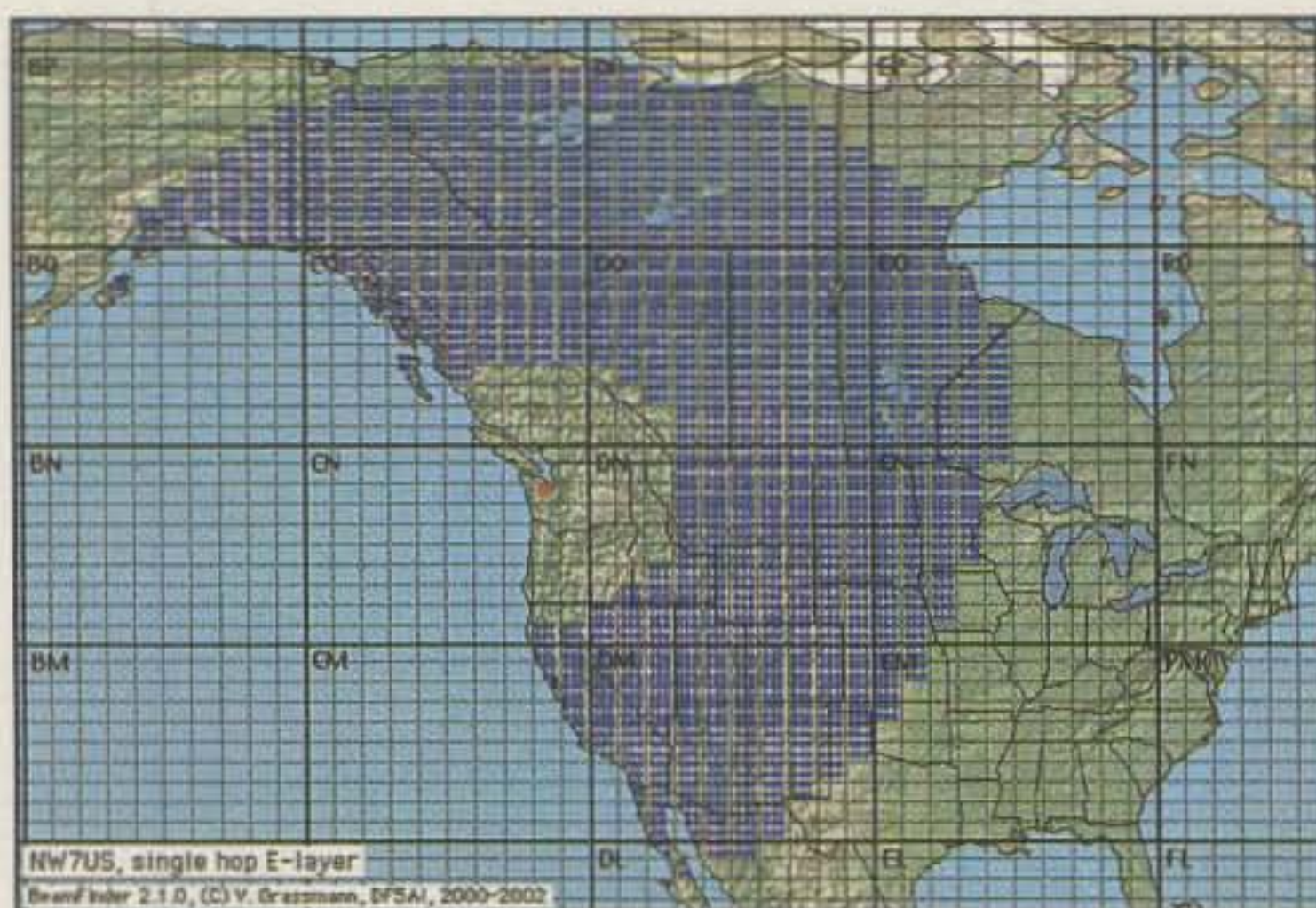


Fig. 3— One-hop map for the QTH of NW7US.

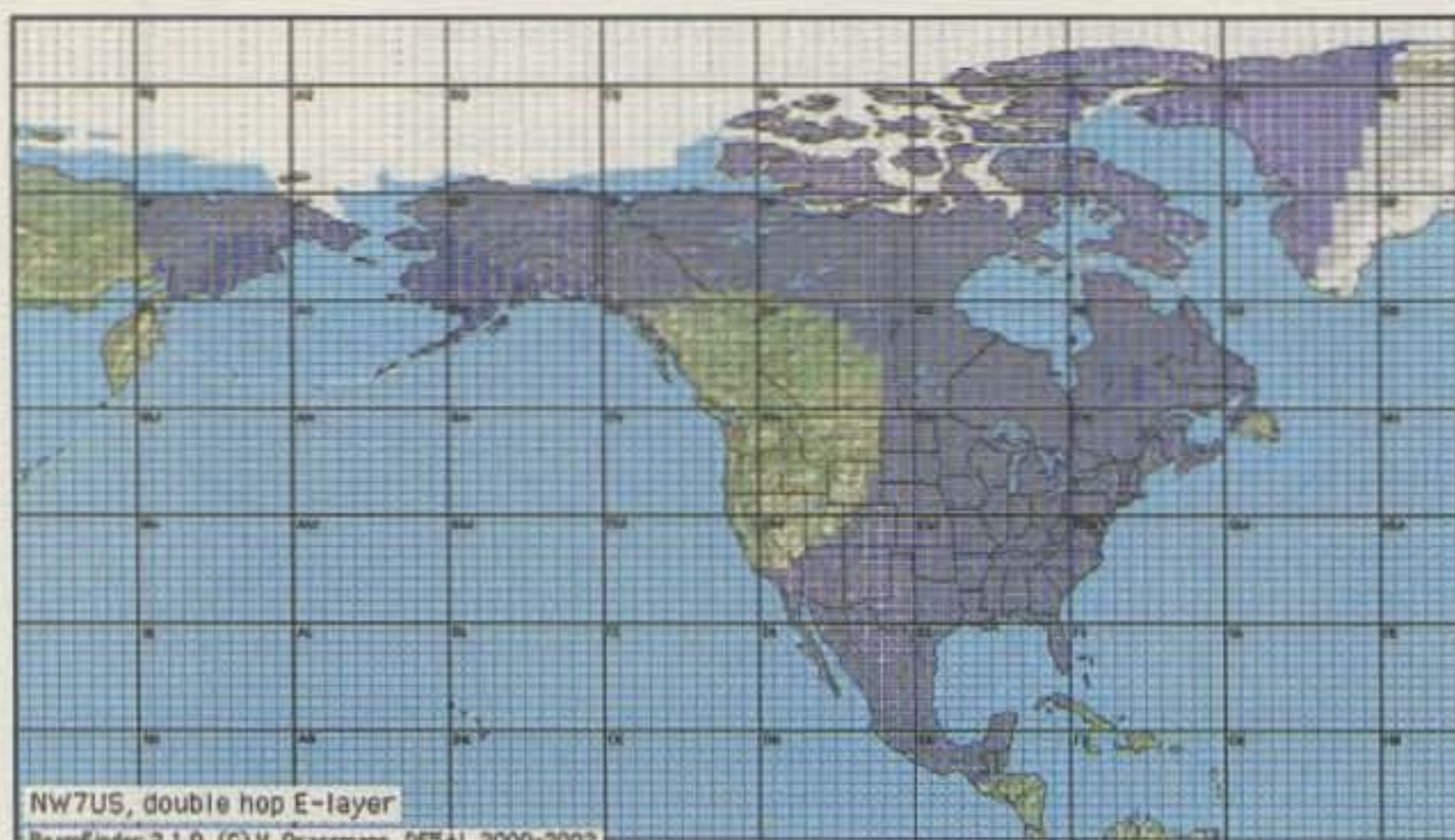


Fig. 4— Two-hop map for NW7US QTH.

access area in the case of one-, two-, and three-hop propagation. Fig. 3 shows the one-hop map using my QTH and a sample antenna, and fig. 4 shows the two-hop map from my QTH.

The ability of BeamFinder to analyze sporadic-E propagation makes this an exciting program. Fig. 5 is an example showing the geographical ring area in which Es clouds would appear between 0 and 5 degrees elevation with respect to a radio station in central France. The Es link between Sweden and Italy represents optimum data to the Es analyzer because of the geographical position of the Es cloud located in the ring.

Another hot feature is the "Hot spot analysis in Aurora and FAI Propagation." BeamFinder incorporates the model of backscattering of radio waves caused by irregularities in the E-layer that are oriented along the Earth's magnetic-field lines. Using this model, the software plots the regions in the ionosphere fulfilling the geomagnetic requirements for aurora and FAI propagation. In addition, BeamFinder can calculate the corresponding DX access areas. Fig. 6 is the plot of my available aurora/FAI DX target areas.

The software does not stop there. BeamFinder will calculate and plot the aurora/FAI scatter curve of a path. This allows you to view the required scatter volume curve which both antennas must target.

BeamFinder requires at minimum an Apple Macintosh Power PC (PPC) running MAC OS 8.x or 9.x with 60 Mbytes RAM, 12 Mbytes of hard-disk space, and a high-resolution monitor providing 32,768 screen colors. Are you a Windows® user? Volker states on his web page that he would like to receive requests for a Windows® version. If enough of us request it, perhaps he will find it worthwhile to create such a version.

### Current Solar Cycle Progress

Sunspots have been observed telescopically for more than 300 years. Daily records have been available since the mid-18th century. Today, sunspots are observed telescopically each day by a worldwide network of more than 30 solar observatories. While the telescope at each participating observatory is calibrated against a standard, results can vary among observations. Measurements strongly depend on observer interpretation and experience and on the stability of the Earth's atmosphere above the observing site.

To compensate for differences, the Royal Observatory of Belgium computes the daily international number as a weighted average of measurements made from the network of cooperating observations. They report an observed monthly mean sunspot number of 46 for February 2003, down 34 points from January 2003. That's a real dip in this cycle's activity, clearly indicating the sure decline toward the solar cycle minimum. The recorded low for February was 10 on February 17, and the high was 93 on February 9.

Each solar cycle is based on the monthly smoothed sunspot number, which is calculated by creating a 12-month running average of the monthly mean sunspot number. The smoothed sunspot number centered on August 2002 is 99, down four points from July. A smoothed sunspot level of 59 is expected for May 2003, plus or minus 10 points.

The Dominion Radio Astrophysical Observatory of Canada, located at Penticton, British Columbia, reports a mean value of 125 for the February 2003 level of 10.7 cm solar flux, down from January's 144.6. The 12-month smoothed 10.7 cm flux cen-

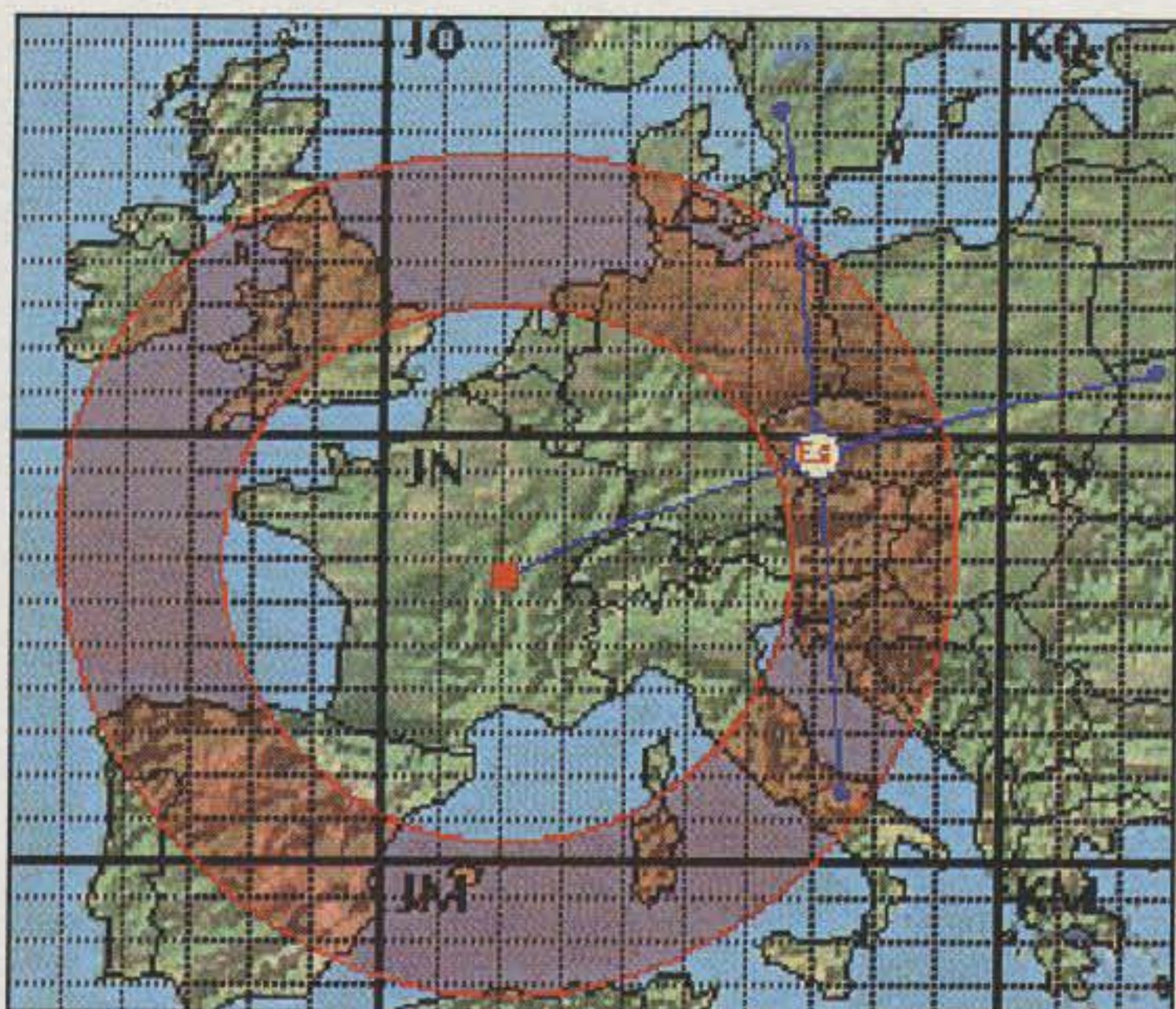


Fig. 5— Sporadic-E analysis.

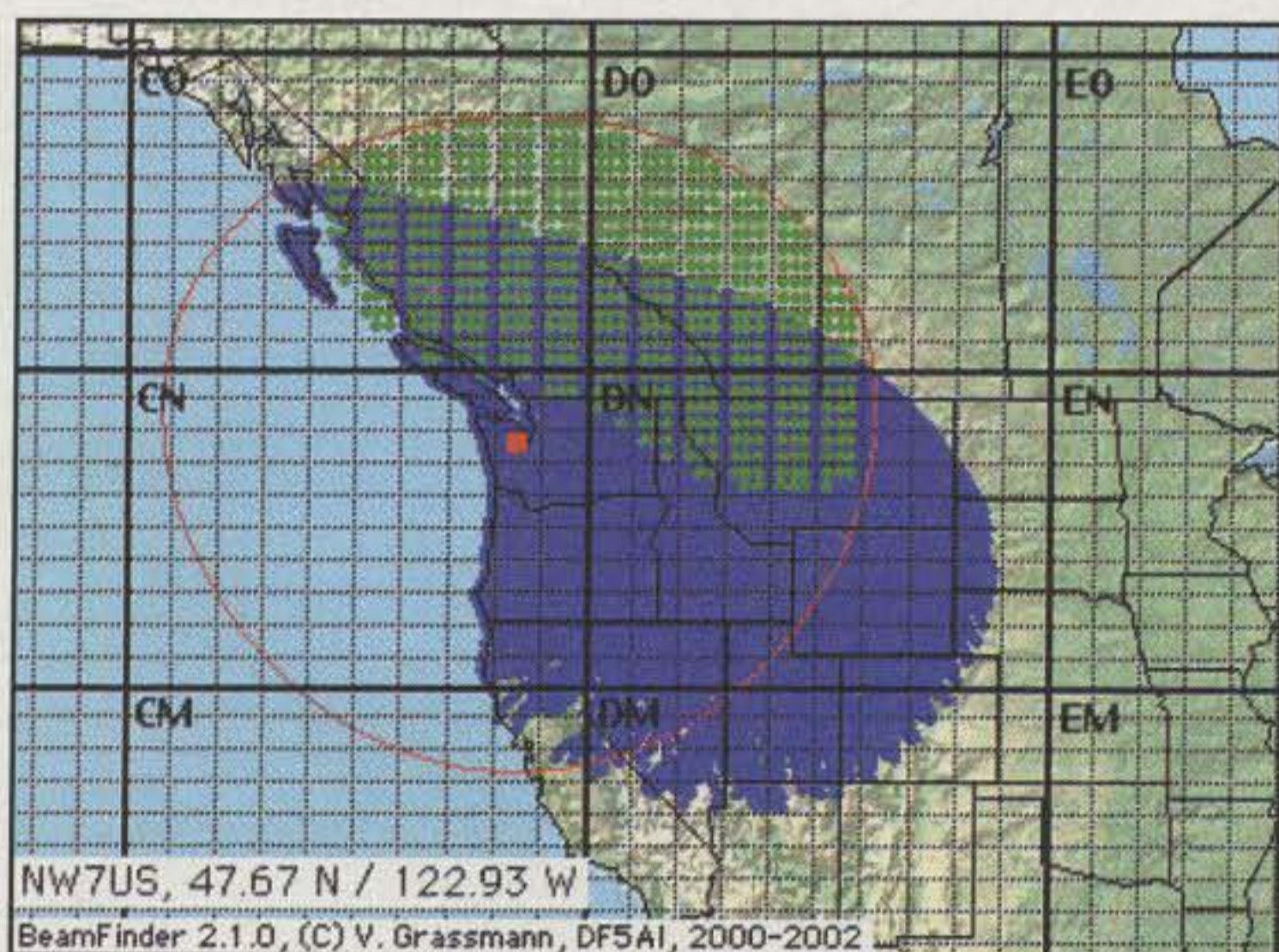


Fig. 6— Analysis of aurora/FAI target areas for NW7US.

tered on August 2002 is 169.5, down from July's 176. A smoothed 10.7 cm solar flux of about 117 is predicted for May 2003, plus or minus about 16 points.

The observed monthly mean planetary  $A_p$  index for February 2003 is 15, up from the previous several months. The 12-month smoothed  $A_p$  index centered on July 2002 is 14.3.

### May Conditions

In May, optimum frequencies for DX propagation are lower during most of the daylight hours, but higher during the late afternoon, early evening, and nighttime hours than were observed during the winter months. A considerable increase is expected in  $E_s$  ionization during the month, and this should result in more frequent short-skip openings on the HF bands, and on 6 meters as well. A seasonal increase in the static level is also normal for May.

The following is an overall picture of high-frequency amateur band openings expected during May 2003. For specific times of DX openings, refer to the DX Propagation charts that

appeared in last month's column. This month's column contains Short-Skip Propagation Charts valid for May and June, as well as charts centered on Alaska and Hawaii. The Short-Skip Charts contain propagation forecasts for openings varying in distance between 50 and 2300 miles. For day-to-day propagation conditions expected during the month, see the "Last-Minute Forecast," which appears at the beginning of this column.

**10 and 12 meters:** Except for an occasional daytime opening to some southern or tropical areas, not many DX openings are forecast for these bands during May. The afternoon hours are the best time to check for DX openings. Frequent short-skip openings between distances of approximately 750 and 1400 miles, though, should be possible.

**15 meters:** A seasonal decrease in DX openings is normal for May. Some fairly good openings still are possible towards the south during the late afternoon and evening. Numerous short-skip openings, between about 600 and 2300 miles, should be possible almost daily.

**17 and 20 meters:** These should be the best bands for DX during May. Opening shortly after sunrise, good DX conditions are expected to one area or another through the evening hours. These bands may also remain open to southern and tropical areas through much of the nighttime hours as well. DX conditions should peak during the late afternoon and early evening, with openings possible to almost all areas of the world. Very frequent short-skip openings are also forecast for distances between about 350 and 2300 miles. Quite often, especially during the late afternoon, optimum conditions may exist for both the short and long skip, and stations a few hundred miles away will be heard at the same time as DX stations from several thousand miles away, causing considerable QRM.

**30 meters:** This band will often play a major role in DX propagation, with somewhat better nighttime propagation than 40 and solid daytime propagation into many areas of the world. Exotic DX can be found here on CW and other digital modes. Check this band often during the course of the day.

**40 meters:** Fewer DX openings are expected because of the shorter hours of darkness and the higher level of static. Fairly good openings should still be possible, however, to several areas of the world from shortly before sunset, through the hours of darkness, until shortly after sunrise. Good daytime short-skip openings can be expected over distances of between approximately 150 and 750 miles, with nighttime openings extending up to the one-hop limit of 2300 miles.

**80 meters:** Fewer hours of darkness and higher static levels are also expected to reduce DX openings on this band, but a few fairly good ones should still be possible. Check during the hours of darkness. Excellent short-skip openings are forecast for the daylight hours over distances ranging between 50 and 250 miles. During the hours of darkness the short-skip range should increase up to approximately 2300 miles.

**160 meters:** Propagation conditions on this band have passed their seasonal peak and should decline until the early fall. Openings up to a distance of 1000 miles or so should be possible this month during the hours of darkness. An occasional opening well beyond this range may also be possible when static levels are exceptionally low.

### VHF Ionospheric Openings

Sporadic-E ionization is expected to increase considerably during May, and fairly frequent 6 meter short-skip openings should be possible. These are likely to occur over distances

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of approximately 1000 to 1400 miles. Although sporadic-E openings can take place at just about any time, the best time to check is between 10 AM and 2 PM and again between 6 and 10 PM local daylight time. During periods of intense and widespread sporadic-E ionization, two-hop openings considerably beyond 1400 miles should be possible on 6 meters. Short-skip openings between about 1200 and 1400 miles may also be possible on 2 meters.

A seasonal decline in trans-equatorial (TE) propagation is expected during May. An occasional opening may still be possible on 6 meters toward South America from the southern tier states and the Caribbean area. The best time to check for 6 meter TE openings is between 9 and 11 PM local daylight time. These TE openings will be north-south paths that cross the geomagnetic equator at an approximate right angle.

### HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An \* indicates the best time to listen for 160 meter openings. An \*\* indicates possible 10 meter openings.

2. The propagation index is the number that appears in ( ) after the time of each predicted opening. In the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the "Last-Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 AM; 13 is 1 PM, etc. On the Short-Skip Chart appropriate daylight time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EDT, on a circuit between New York and Texas, the time at the midpoint would be CDT, etc. Times shown in the Hawaii Chart are in HST. To convert to daylight time in other USA time zones add 3 hours in the PDT zone; 4 hours in the MDT zone; 5 hours in the CDT zone; and 6 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 15 or 3 PM in Los Angeles; 18 or 6 PM in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to daylight time in other areas of the USA subtract 7 hours in the PDT zone; 6 hours in the MDT zone; 5 hours in the CDT zone; and 4 hours in the EDT zone. For example, at 20 GMT it is 16 or 4 PM in New York City.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

5. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado 80302.

## CQ Short-Skip Propagation Chart May & June 2003 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	08-10 (0-1) 10-14 (0-2) 14-18 (0-1) 18-22 (0-2) 22-00 (0-1)	08-10 (1) 10-14 (2) 14-18 (1-2) 18-22 (2) 22-00 (1) 00-08 (0-1)	08-10 (1-0) 10-22 (2-0) 22-23 (1-0) 23-08 (1-0)
15	Nil	07-10 (0-1) 10-14 (0-2) 14-18 (0-1) 18-22 (0-2) 22-01 (0-1)	07-10 (1-2) 10-14 (2-3) 14-18 (1-3) 18-20 (2-3) 20-22 (2) 22-01 (1)	07-10 (2-0) 10-17 (3-1) 17-20 (3-2) 20-22 (2-1) 22-23 (1) 23-07 (1-0)
20	10-21 (0-1)	07-10 (0-2) 10-13 (1-3) 13-18 (1-4) 18-20 (1-3) 20-21 (1-2) 21-23 (0-2) 23-07 (0-1)	07-08 (2) 08-10 (2-3) 10-13 (3-4) 13-18 (4) 18-20 (3-4) 20-21 (2-4) 21-23 (2-3) 23-01 (1-2) 01-07 (1)	07-08 (2) 08-10 (3-2) 10-16 (4-3) 16-21 (4) 21-23 (3) 23-01 (2) 01-07 (1)
40	08-10 (1-2) 10-12 (2-4) 12-18 (3-4) 18-20 (2-4) 20-22 (1-3) 22-00 (0-2) 00-08 (0-1)	08-10 (2-4) 10-15 (4-2) 15-16 (4-3) 16-20 (4) 20-22 (3-4) 22-00 (2-3) 00-08 (1-2)	08-09 (4-3) 09-10 (4-2) 10-15 (2-1) 15-16 (3-1) 16-19 (4-2) 19-22 (4) 22-00 (3-4) 00-03 (2-4) 03-05 (2-3) 05-08 (2)	08-09 (3-1) 09-10 (2-1) 10-16 (1-0) 16-19 (2-1) 19-22 (4-3) 22-03 (4) 03-05 (3) 05-07 (2) 07-08 (2-1)
80	08-11 (4) 11-19 (4-3) 19-22 (4) 22-00 (3-4) 00-06 (2-3) 06-08 (3-4)	08-10 (4-1) 11-16 (3-0) 16-18 (3-1) 18-19 (3-2) 19-20 (4-2) 20-00 (4) 00-06 (3-4) 06-08 (4-3) 10-11 (4-0)	08-09 (1) 09-10 (1-0) 10-16 (0) 16-18 (1-0) 18-20 (2-1) 20-23 (4-3) 23-03 (4) 03-06 (4-3) 06-08 (3-2)	08-09 (1-0) 09-18 (0) 18-20 (1-0) 20-21 (3-1) 21-23 (3-2) 23-03 (4-3) 03-06 (3-2) 06-08 (2-1)
160	06-09 (4-1) 09-10 (2-0) 10-19 (1-0) 19-21 (3-1) 21-23 (4-2) 23-06 (4-3)	06-09 (1) 09-19 (0) 19-21 (1-0) 21-23 (2-1) 23-01 (3-2) 01-04 (3)	08-09 (1-0) 09-21 (0) 21-23 (1) 18-20 (2-1) 23-01 (2-1) 01-04 (3-2) 04-07 (2) 07-08 (1)	08-21 (0) 21-01 (1) 01-04 (2) 04-06 (2-1) 06-07 (1) 07-08 (0-1)

## ALASKA May & June 2003 Openings Given in GMT #

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	Nil	20-02 (1)	22-00 (1) 00-02 (2) 02-04 (3) 04-05 (2) 05-06 (1) 10-12 (1) 12-14 (2) 14-16 (1)	Nil
Central USA	Nil	21-04 (1)	22-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 12-13 (1) 13-15 (2) 15-16 (1)	08-12 (1)
Western USA	Nil	20-23 (1) 01-03 (1) 03-05 (2) 05-06 (1)	00-02 (2) 02-04 (3) 04-07 (4) 07-08 (3) 08-09 (2) 09-15 (1) 15-18 (2) 18-00 (1)	07-09 (1) 09-14 (2) 14-15 (1) 11-13 (1)*

**HAWAII**  
**May & June 2003**  
**Openings Given in Hawaiian**  
**Standard Time #**

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	Nil	12-15 (1) 15-17 (2) 17-19 (1)	13-15 (1) 15-17 (2) 17-19 (3) 20-04 (2) 04-08 (1)	19-20 (1) 20-23 (2) 23-02 (1) 21-23 (1)*
Central USA	Nil	12-15 (1) 15-18 (2) 18-20 (1)	15-16 (2) 16-17 (3) 17-19 (4) 19-20 (3) 20-22 (2) 22-04 (1) 04-05 (2) 05-07 (3) 07-09 (2) 09-15 (1)	19-20 (1) 20-21 (2) 21-01 (3) 01-02 (2) 02-04 (1) 20-21 (1)* 21-00 (2)* 00-03 (1)*
Western USA	13-17 (1)	09-12 (1) 12-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	06-08 (4) 08-16 (3) 16-19 (4) 19-20 (3) 20-22 (2) 22-05 (1) 05-06 (3)	18-19 (1) 19-20 (2) 20-22 (3) 22-02 (4) 02-04 (3) 04-05 (2) 05-07 (1) 19-20 (1)* 20-22 (2)* 22-02 (3)* 02-04 (2)* 04-05 (1)*

\*Indicates best times to listen for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.

For 12 meter openings interpolate between 10 and 15 meter openings.

For 17 meter openings interpolate between 15 and 20 meter openings.

For 30 meter openings interpolate between 40 and 20 meter openings.

Propagation charts prepared by George Jacobs, W3ASK.

Auroral activity is generally lower than in March and April, due to the change in the orientation and position of the Earth and magnetosphere in relation to the solar wind. Watch for *Kp* values above 6, which occur on days of Below Normal and Disturbed HF conditions. Refer to the Last-Minute Forecast for those days in May that are expected to be in these categories. Point your antenna north when this condition exists, and check 6 and 2 meters. You will find that CW is the modulation and mode of choice, as the signals you will hear on aurora will be raspy and very distorted. For a live viewing of aurora conditions, check out <<http://aurora.n1bug.net/>>, as well as my propagation page, <<http://prop.hfradio.org/>>.

May has few meteor showers, the *Eta Aquarids* being the most active. This shower occurs between April 19 and May 28, peaking around May 6, 2003. It has a peak rate of up to 60 per hour, and it is more prominent in the Southern Hemisphere.

Most meteor showers are at their best after midnight. After midnight you're on the leading edge of the Earth and you're meeting the meteors head-on. Before midnight you're on the trailing edge of the Earth and the meteors have to catch

up to you. As a result, not only are more meteors seen in the pre-dawn hours, but their impact speeds encountering the Earth's atmosphere are much higher and the meteors are generally faster and brighter. This causes greater ionization, which is what you use to refract your radio signal.

### Summary

I have created a new resource at my propagation center website, <<http://prop.hfradio.org>>. If you are using a News Headline Reader (such as found at <<http://www.voidstar.com/node.php?id=142>>), you can create a channel for the latest propagation data (solar flux, *Ap*, *Kp*, solar wind, and so forth) by entering this channel URL: <<http://hfradio.org/propsupport/prop.rss>>. If you are using a WAP device (for example, a WAP cell phone), go to <<http://wap.hfradio.org>> for the same information, plus a great number of other resources. You might also wish to have my automated e-mail reports. You can sign up at <<http://prop.hfradio.org/ealert/>>.

Until next month, I wish you great DX. Write to me with questions or observations, and look for me on the bands!

73, Tomas, NW7US

### Zero Bias (from page 6)

Word had spread that Gordon was going to be visiting and among the many hams who came to say hi and shake hands (in person rather than on the radio) was one who also happens to be a violinist with the New Jersey Symphony Orchestra. The orchestra, it happens, had just finished acquiring 30 rare Italian violins and violas. Old violins must be played in order to retain their sound and their value, and that means the violinists have to take them home to practice on them. And that's why this one particular ham just happened to have with him a \$2 million Guarneri del Gesù violin! It wasn't too hard to persuade him to take it out of its case and show it to us and tell us its history. It was a little more difficult to persuade him to play a little for us, but he finally did. What an experience! Listening to an incredibly rare instrument ... at a distance of about 3 feet, along with a lesson in violin history and mechanics. (Guarneri, by the way, was a contemporary and competitor of Stradivarius, and his violins today fetch as much as or more than a Stradivarius. We were in very rarified air!) And all because of ham radio.

If it wasn't for ham radio, I never would have had this opportunity. If it wasn't for ham radio, I never would have had the opportunity to spend a day on a yacht in Long Island Sound, watching a sailing race; or to get a police escort through the streets of New York; or to ride across the Verrazanno Narrows Bridge just ahead of 30,000 runners in the New York City Marathon. In March, Bob Hopkins, WB2UDC, wrote about how ham radio led him to friendship with an astronaut and a very special contact with that astronaut on board the shuttle Columbia.

Ham radio opens doors. Doors to friendships, doors to careers, doors to unique experiences. Sometimes, ham radio even opens the door to ... ham radio. A while back, Bob Hopkins told me about two graphic designers who'd gotten in touch with him about writing a book based on the QSL card collection of a deceased ham—a ham who, by coincidence, I had worked many times on a local repeater. He just dropped me another note to let me know

the book is nearly finished—but mostly to tell me that the two authors who started out with a stack of curiosities were so excited by what they learned in the course of their research that both of them have now become hams as well! We look forward to telling their story on these pages in the not-too-distant future.

And I guess that brings us full circle for the month—sharing the excitement of ham radio, whether at a hamfest, a club meeting, in one-on-one conversations, or even from beyond the grave—this is what will assure the future of our hobby.

73, Rich, W2VU

### A Warning About Deep-Discount CQ Subscriptions

*A Note From the Publisher...*

We've been hearing from hams who claim they "won" an auction on E-Bay for a 3-year CQ subscription for \$27, or found some other online source of a 1-year subscription for \$10 or \$15. *These are not authorized by CQ and you are very likely getting ripped off!*

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73,  
 Dick Ross, K2MGA  
 Publisher, CQ

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