



Amateur Radio

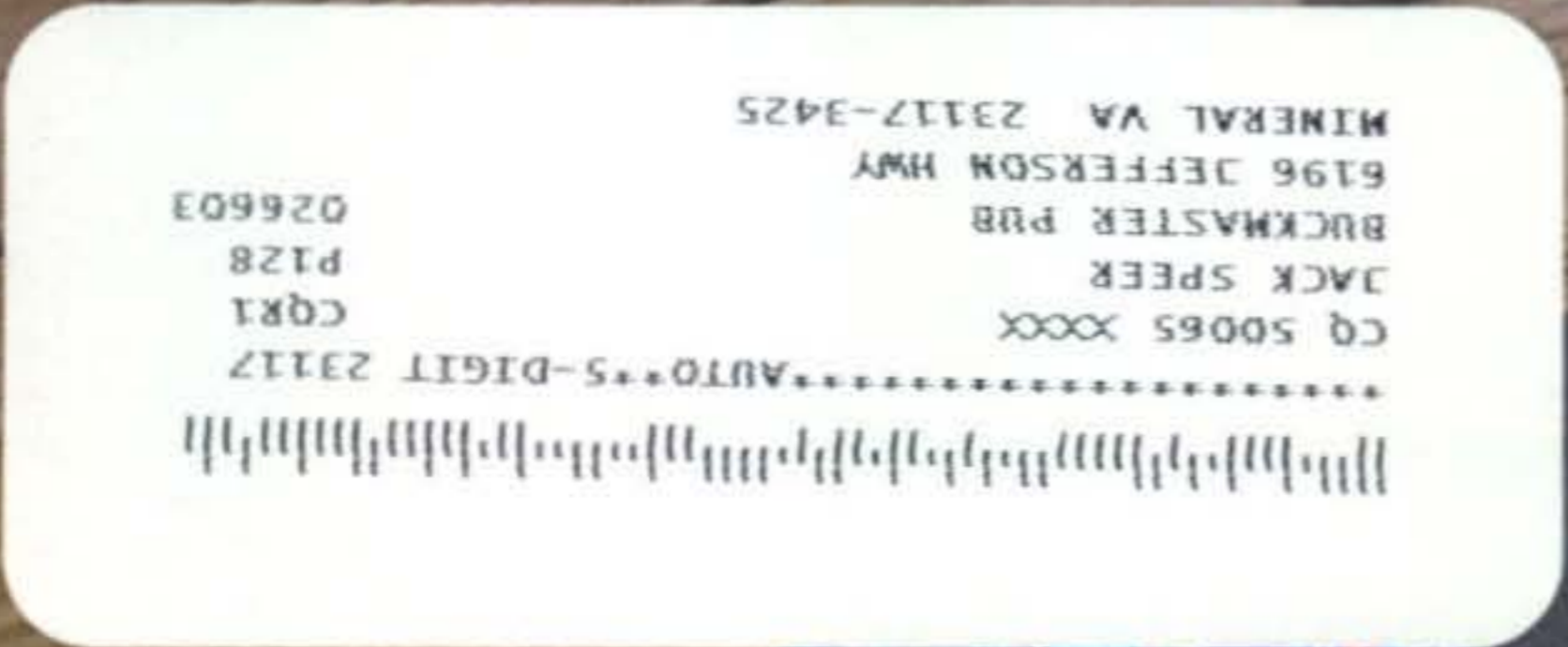
COMMUNICATIONS & TECHNOLOGY
AUGUST 2010

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



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On the Cover: Family affair: Jeff (KJ4MCL), dad Terry (KQ4LS) and brother Jason (KJ4MCK) Grider operate together from Cookeville, Tennessee. Details on page 70.



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¹Note that certain frequencies are unavailable. ²5W output

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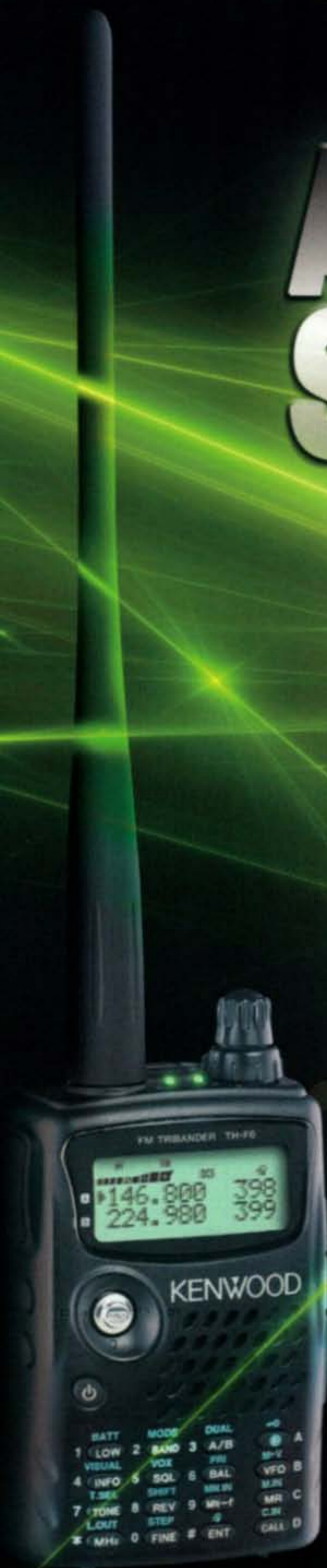
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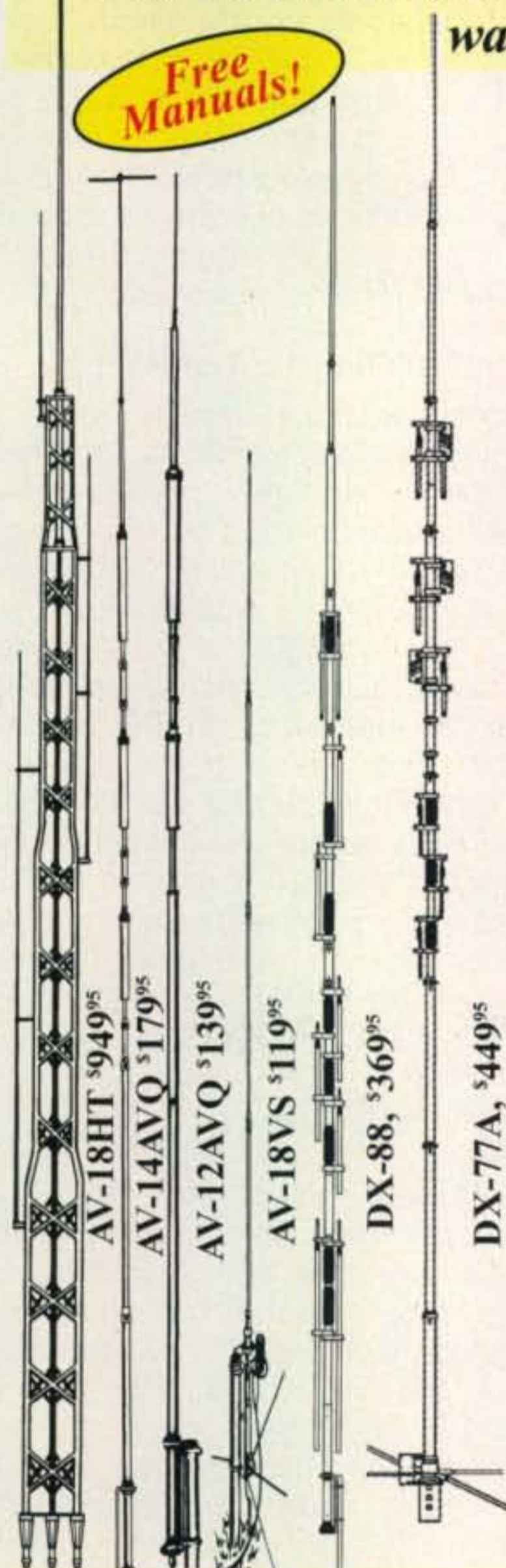
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Model #	Price	Bands	Max Power	Height	Weight	Wind Surv.	Rec. Mast
AV-18HT	\$949.95	10,15,20,40,80	1500 W PEP	53 feet	114 pounds	75 MPH	-----
AV-14AVQ	\$179.95	10,15,20,40	1500 W PEP	18 feet	9 pounds	80 MPH	1.5-1.625"
AV-12AVQ	\$139.95	10/15/20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	\$119.95	10 - 80 M	1500 W PEP	18 feet	4 pounds	80 MPH	1.5-1.625"
DX-88	\$369.95	10 - 80 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	\$449.95	10 - 40 M	1500 W PEP	29 feet	25 pounds	60 mph no guy	1.5-1.625"

Busy Hurricane Season Predicted

The National Oceanic and Atmospheric Administration's Climate Prediction Center says it anticipates a busy Atlantic hurricane season this year (the Atlantic hurricane season began on June 1). The center says it is likely that there will be 14 to 23 named storms, of which 8 to 14 may develop into hurricanes (with sustained winds above 73 miles per hour), and 3 to 7 may become major hurricanes, of category 3 or higher (out of 5). NOAA is the parent agency of both the National Weather Service and the National Hurricane Center.

Ham radio operators will again activate station WX4NHC at the National Hurricane Center this year, beginning the fourth decade of a formal relationship between amateur radio and the NHC. Hams in areas threatened or affected by tropical storms or hurricanes are encouraged to gather and relay information to the Center through WX4NHC. The Hurricane Watch Net on 14.325 MHz is activated whenever a tropical storm or hurricane in the Atlantic basin threatens to hit land. WX4NHC may also be contacted via Echolink and IRLP, using Echolink's WX-Talk conference room (node 7203) or IRLP node 9219. See <www.wx4nhc.org>, <www.hwn.org>, and <www.voipwx.net> for more details.

WX4NHC and its contributions are being featured on the National Hurricane Center's Hurricane Preparedness Observations web page at <<http://www.nhc.noaa.gov/HAW2/english/forecast/observations.shtml>>.

Hamvention Attendance Continues to Recover

After hitting a low of 17,253 in 2008, attendance at the Dayton Hamvention® was up this year for the second straight year, according to the Dayton Amateur Radio Association. DARA says 2010 attendance was 19,750, up nearly 900 from 2009 and up 2500 from 2008. The highest attendance ever at Dayton was 33,669 in 1993, according to DARA.

W3BE Proposes Bringing Back Disaster Radio Service

John Johnston, W3BE, who spent years administering the Amateur Radio Service at the FCC before retiring, has proposed creating a new Disaster Radio Service—made up entirely of licensed amateurs—to operate during disasters and drills without regard to whether an operator is paid or employed by the agency on whose behalf he/she is operating. The Notice of Proposed Rule Making suggests that the DRS follow the MARS (Military Auxiliary Radio System) model of using hams as its operators and frequencies shared with or near current ham allocations. Since all operators would hold ham licenses, licensing in the proposed DRS would be by rule, and no separate licenses or callsigns would be issued. At press time, the FCC had not responded to the petition.

No Signals from Satellite Headed for Venus

Initial joy over strong signal reports from a ham satellite on a journey to Venus have been tempered by the satellite's silence after the first day of transmissions. The UNITEC-1 satellite was built in Japan and was designed to help hams and universities "develop their capabilities to receive ... interplanetary signal(s)," according to the AMSAT News Service. The first round of signals on May 21 were the only ones received, however, and at press time a month later, the satellite remained silent. Updates (if any) are available on the UNITEC-1 website at <<http://sites.google.com/site/unitec1ops>>.

South African Hams on Standby During World Cup Games

The South African Radio League's "Hamnet" emergency communications organization was on standby to provide backup communications across the country during the World Cup soccer (football) tournament held there in June and July. "Every city in every province has its own arrangements," according to a Hamnet bulletin, which reminded hams that "you are not expected to man any station anywhere... Your role is merely to be on standby should we need you at a specific point. Should a call out come, we will place people who live closest to the point where you are required to possibly pass information to the (Joint Communication Centre). Hence 2 metres will be the preferred mode of transmission."

FCC Proposes Massive Overhaul of Part 95

The FCC in early June released a 92-page Notice of Proposed Rule Making aimed at streamlining and reorganizing the rules for the personal radio services covered under Part 95 of the Commission's rules. These services include CB, GMRS (General Mobile Radio Service), FRS (Family Radio Service), MURS (Multi-Use Radio Service), and others. Highlights of the proposal include a recommendation to eliminate individual station licenses for GMRS, allow transmission of GPS location information on GMRS channels, and ban the inclusion of FRS capability on radios intended for use in public safety services. The NPRM also asks for comments on whether the widely-ignored distance restriction on CB contacts is still necessary and whether the rules should specifically permit the use of hands-free microphones for CB transceivers. The complete NPRM may be found on the FCC's website. It is WT Docket 10-119.

FCC Goes After Ham Bootlegger, Overpowered CBers

FCC Special Counsel Laura Smith continues to chase down alleged rulebreakers in both the amateur and CB services. In one rather bizarre case, she charges that a Matthew J. Lapham is illegally operating on the ham bands as KC5RLU, which is licensed to Matthew A. Lapham of Baker, Louisiana. The real KC5RLU, Smith says, is currently serving in the U.S. Air Force in Iraq. No word on whether the two Matthew Laphams are related.

Also in early May, Smith cited seven CBers for allegedly using excessive power and, as a result, causing interference either to neighbors' home electronics, other CBers or, in one case, the 10- and 12-meter ham bands. While these letters are made public, responses from the individuals cited generally are not.

China's President Watches Ham Satellite Contact

Chinese President Hu Jintao visited the amateur radio station at the China Science and Technology Museum in Beijing on May 31 and, according to the AMSAT News Service, watched and listened as several children made contacts via the Chinese-built HO-68 amateur satellite. ANS quotes Michael Chen, BD5RV/1, one of five hams accompanying the president, as saying that President Hu "encouraged (the children) for further activities and confirmed the positive effects of amateur satellites."

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

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Photo : From left HC-1.5KAT (HF 1.5kW Tuner with Auto Band Set Feature), HL-2.5KFX (HF 1.5kW MOSFET Linear) and IC-7700 Transceiver



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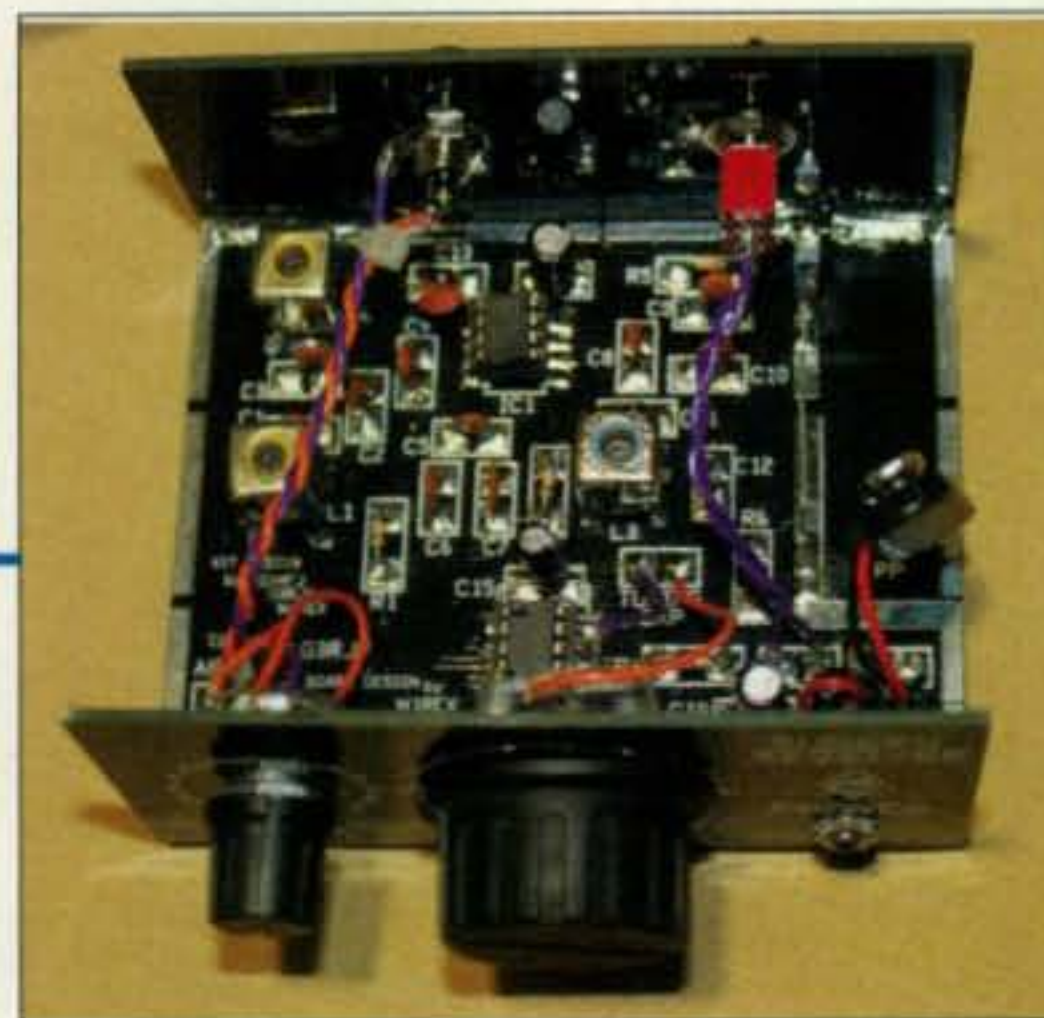
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brick wall /brĭk - wôl/ - *noun*

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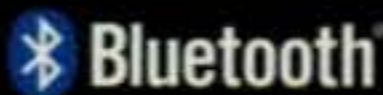
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Still “Successfully Dying” After All These Years

The drumbeat of misinformation continues unabated among many of our fellow hams—“Ham radio is dying.” “Our numbers are dropping.”—often including hams who convey this “information” to the news media, which unknowingly reinforce the perception among the general public that ham radio is on its way out.

Fact¹: As of May 31, 2010, there were 691,982 active licenses in the FCC amateur radio database. After adjusting for a change in the way the FCC kept track of its statistics back in 1997, this represents the *all-time high number of amateur radio licensees*.

Fact²: As of June 18, 2010, nearly 17,000 new people had joined the ranks of amateur radio licensees *so far this year*. This is 3000 people more than the same point last year (a record-setting year for new hams), and 600 people more than became hams in the *entire year of 2005*.

But Are They Active?

A few weeks ago at Ham-Com in Texas, a ham asked me where I thought the hobby was heading. I said I believe the future looks bright and that we are at or near our all-time high number of licensees (I didn't have the above stats handy at the time).

“But how many of them are active?” he responded.

“That's the \$64,000 question,” I said, adding, “and that answer depends on how you define active.”

“Well, I judge by the number of lookups a person has on QRZed,” he replied. “The more lookups they have, the more active they are.”

His method is valid ... to a point. A high number of lookups on QRZ.com probably does indicate a high level of on-air activity, but more specifically, it generally indicates a high level of *HF* activity, for which QSL cards are most commonly exchanged. On the other hand, the ham who is very involved in his local radio club, participates regularly in public service and emergency communications, and maybe helps keep the club repeater on the air ... but isn't on HF very much ... may not meet the “QRZ standard” for being considered “active.”

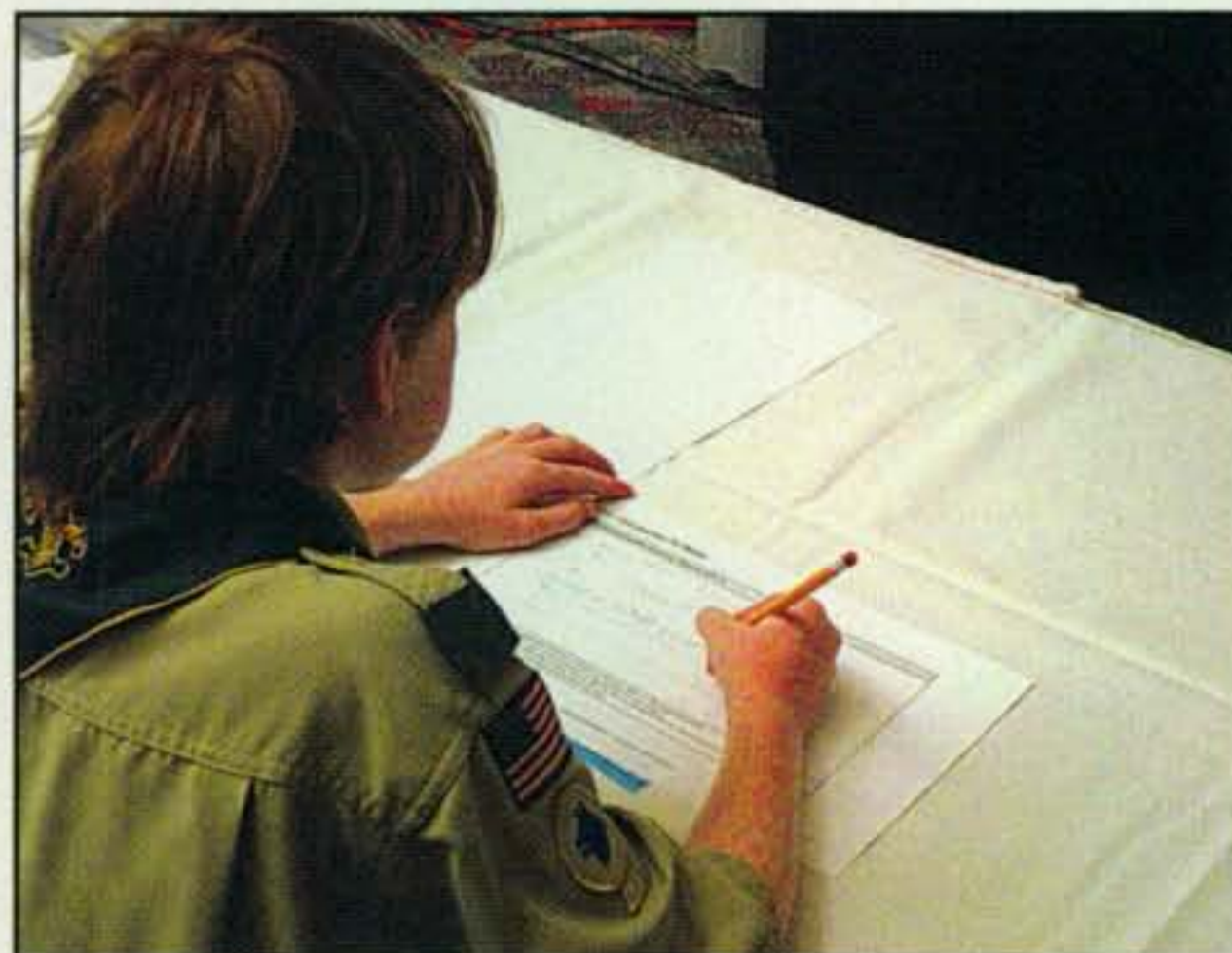
Neither would the ham whose main activity involves talking with longtime friends in different parts of the world, who don't need his QSL card and wouldn't need to look him up on QRZ, even if he talked on the air with them every day or every week.

Neither would the ham whose primary interests lie in experimenting, designing, and building new things, and whose on-air activity may be limited to testing out a new piece of gear or some new software. This amateur may be actively advancing the radio art, but might not be considered “active” based on his number of QRZ lookups.

The FCC used to have an activity standard for renewing your license. Back in the day, you needed to show you had been on the air for minimum amount of time in order to qualify for renewal³. It was an arbitrary standard, to be sure, but a standard nonetheless. This requirement went away in the late 1970s, though, and since then, the definition of an “active” ham has been subject to wide interpretation. The fact is that activity levels are difficult to quantify, or to qualify, which is why we have to rely on licensing statistics to assess the health of the hobby. So let's look at some licensing statistics:

Crunching the Numbers

There is widespread agreement that the so-called “gold-



More than 130 Scouts from the Dallas area attended a daylong Radio Merit Badge course at the Ham-Com hamfest in June. All of them learned about ham radio and four went home with licenses.

en age” of ham radio was in the 1950s and 1960s, when American-made equipment dominated the market for commercially-built gear and when solid-state technology had not yet made enough inroads to displace tube gear and discrete components, making it still quite feasible for individual hams to build and repair their own radios. No fancy microprocessors, no microscopic surface-mount components. Real components and real tubes for real radios built by real hams.

In 1960, according to ARRL statistics, there were 227,500 “real hams” in the United States. Let us assume, since this was the Golden Age, that every one of those 227,500 hams was active on the air on a regular basis, easily meeting the FCC activity requirement.

Now let's look at 2010, as ham radio suffers through its supposed death-throes. Let's say that only one-third of our current roughly 700,000 licensees are actually active on the air on a regular basis. Let's see... that's 700,000 times point-3-3-3 ... and that comes out to ... 233,100, or over 5000 more active hams today than the total number of licensed hams in 1960. If we make the numbers a little more realistic and assume that “only” 75% of 1960 hams were active and that 50% of today's hams are active (by whatever definition you choose), that would give us approximately 346,000 active hams now vs. 170,625 in 1960, or *roughly double the number of active hams today than in the so-called Golden Age*.

It is oh-so-clear that ham radio is dying. Another fact is that old-timers have been predicting the imminent death of ham radio ever since it came back from the dead at the end of World War II. It's never been quite the same as it was in the past, and the operators just aren't like they were in the good old days. Ham radio was going to be killed off by, successively, the Novice and Technician licenses, CB, computers, cell phones, the internet, and social networking. Each of these supposed threats has, in fact, contributed to its vitality. I will repeat once again—for the benefit of the 100,000+ new people who have joined our ranks in the past four years and haven't heard my favorite slogan before—“Ham radio: Successfully dying for more than 60 years.”

(Continued on page 10)

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

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HAM-IV

The most popular rotator in the world!

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T-2X
\$799⁹⁵

T-2XD
\$1229⁹⁵
with DCU-1

CD-45II

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



CD-45II
\$449⁹⁵

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

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

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

HAM-V

HAM-V
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with DCU-1

For medium antenna arrays up to 15 square feet wind load area. Similar to the HAM IV, but includes DCU-1 Pathfinder digital control unit with gas plasma display.

Provides automatic operation of brake and rotor, compatible with many logging/contest programs, 6 presets for beam headings, 1 degree accuracy, auto 8-second brake delay, 360 degree choice for center location, more!

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



DCU-1
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AR-40

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AR-40
\$349⁹⁵



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

HDR-300A

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HDR-300A
\$1499⁹⁵



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

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

W1H, in commemoration of Hiram Percy Maxim, W1AW, who married the daughter of the governor of the State of Maryland and is buried in Hagerstown, MD's Rose Hill Cemetery; Antietam Radio Association (W3CWC) on Aug. 14–15. Frequencies: 14.290, 7.178, 3.902 MHz \pm QRM. Also on W3CWC's two repeaters. Special QSL card for an SASE and contact information sent to WA3EOP (address available at QRZ.com) or to: W3CWC, Antietam Radio Association, P.O. Box 52, Hagerstown, MD 21741.

K5R, 5th annual special event station K5R to commemorate the anniversaries of Hurricanes Katrina and Rita, Hammond, Louisiana; Southeast Louisiana Amateur Radio Club (SELARC); Aug. 28 and 29 from 1400–2000 UTC each day. Club members will be operating on 7.250 and 14.250 MHz (\pm QRM), and also in other areas of the general portions of the HF bands. Send an SASE for a QSL to: SELARC/K5R, P.O. Box 1324, Hammond, LA 70404. More information: <<http://www.selarc.org>> or on the Yahoo group site: <<http://groups.yahoo.com/group/K5R>>.

K8FBN, from the 29th Annual Sweet Corn Festival, Fairborn, Ohio, Aug. 21 and 22. Operations on 75, 40, and 20 meters SSB and PSK-31. QSL to K8FBN, 36 E. Routzong Drive, Fairborn, OH 45324.

W8AL, from the Pro Football Hall of Fame Festival, Canton ARC; Aug. 5–8 from 1300–2400Z each day on 7.265 and 14.265 MHz. For unfolded certificate send 9 \times 12 SASE to Donald E. Perry, WQ8J, 968 Culverne Ave. NW, Massillon, OH 44647.

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

Aug. 21–22, Huntsville Hamfest & ARRL SE Division Convention, Von Braun Center, Huntsville, Alabama. For details go to: <www.hamfest.org>. **See us at the CQ Booth.**

Aug. 22, **Denver Radio Club Hamfest**, Jefferson County Fairgrounds, Golden, Colorado. (Talk-in 145.490 or 448.625 [both 100 Hz]; exams 10 AM). Contact Bryan Steinberg, KB0A: <drcfest@w0tx.org>.

Aug. 22, **2010 East Central Illinois Hamfest**, Vermilion County Fairgrounds, Danville, Illinois. Contact Kathy Tucker, KD5GPR, e-mail: <gkt6399@aol.com>, phone: 217-765-2098; <www.vcarahamfest.info>

Aug. 28, **Owen-Monroe Amateur Radio Hamfest**, Owen County Fairgrounds, Spencer, Indiana. Co-sponsored by Owen County ARA and Bloomington ARC. Contact Katie Smith, K9INU, e-mail: <k9inu@arrl.net>, phone: 812-829-2149. (Talk-in 146.985, 136.5 PL; exams 1 PM)

Aug. 28–29, **Boxboro ARRL New England Convention**, Holiday Inn, Boxborough, Massachusetts. For details go to: <www.boxboro.org>. **See us at the CQ Booth.**

Aug. 28–29, **The Kansas QSO Party**, CQ KsQP. Information: <<http://www.ksqsoparty.org/>>.

zero bias (from page 8)

A Great Idea

Oh, and as far as all those kids who are no longer getting interested in ham radio, Ham-Com featured a day-long Radio Merit Badge program for Scouts from throughout the Dallas area. More than 130 boys attended and virtually all earned their merit badges and got an introduction to ham radio through not only their lessons and demonstrations, but also through their free admission to the hamfest.

Plus, the hamfest committee agreed to pay the exam fee for any Scout who studied ahead of time and came to the show with proof of having scored at least 80% at least three times on online practice tests. Four young men brought in the required paperwork, and all four went home at the end of the day as newly-licensed amateurs. Congratulations to them, and to the Ham-Com committee for such a wonderful idea. May you be widely copied, to help make sure that ham radio continues "successfully dying" for at least another 60 years. 73, W2VU

1. Courtesy Joe Speroni, AH0A, <www.ah0a.org>; May is the last full month for which statistics were available at press time.

2. Courtesy Allen Pitts, W1AGP, ARRL Media Relations Director

3. In 1970, Section 97.3 of the FCC rules said a ham seeking to renew a license needed to be able to demonstrate a minimum of 2 hours of operating time in the 3 months preceding the renewal application, or a minimum of 5 hours in the preceding 12 months. The rules at the time also required all transmissions to be logged.

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A publication of



CQ Communications, Inc.
25 Newbridge Road
Hicksville, NY 11801 USA.

CQ Amateur Radio (ISSN 0007-893X) Volume 66, No. 8. Published monthly by CQ Communications, Inc., 25 Newbridge Road, Hicksville, NY 11801. Telephone 516-681-2922. E-mail: <cq@cq-amateur-radio.com>. Fax 516-681-2926. Web site: <www.cq-amateur-radio.com>. Periodicals Postage Paid at Hicksville, NY 11801 and at additional mailing offices. Subscription prices (all in U.S. dollars): Domestic-one year \$36.95, two years \$66.95, three years \$96.95; Canada/Mexico-one year \$49.95, two years \$92.95, three years \$135.95; Foreign Air Post-one year \$61.95, two years \$116.95, three years \$171.95. U.S. Government Agencies: Subscriptions to CQ are available to agencies of the United States government including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed. Entire contents copyrighted 2010 by CQ Communications, Inc. CQ does not assume responsibility for unsolicited manuscripts. Allow six weeks for change of address.

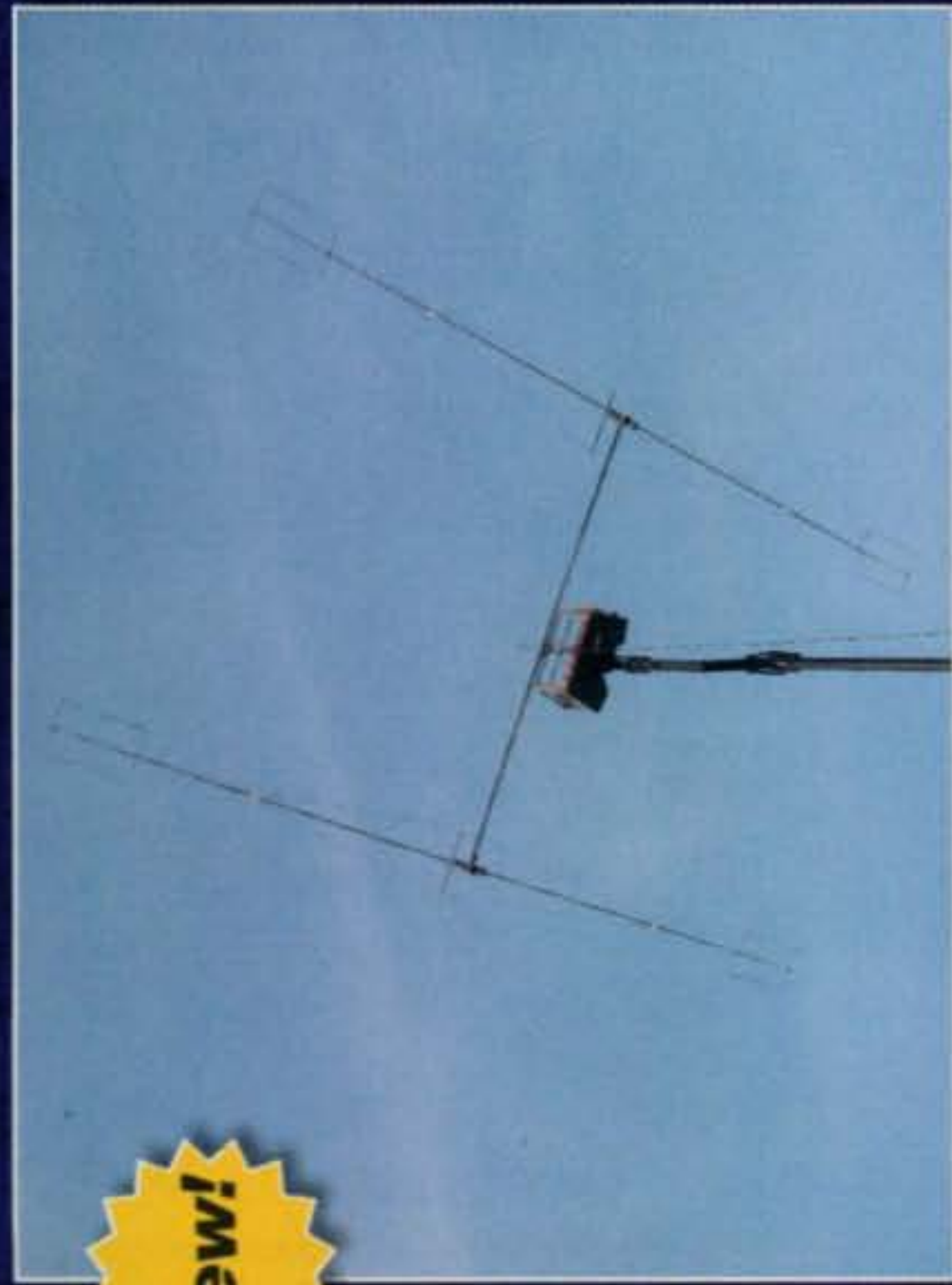
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Many contest DXpeditioners head south, to warm, sunny, places such as the Caribbean or the Canary Islands. But not these guys ... (they may get cold, but they rack up pretty impressive scores!)

“From Zone 2 Canada, This is VE2DXY” Operating a Contest DXpedition for CQ WW SSB

BY ANDY VAVRA,* KD3RF/VE2DXY and IRWIN DARACK,† KD3TB

VE2DXY's antennas at sunset, looking out over the St. Lawrence River. (All photos courtesy of the authors)

Our families, friends, and neighbors think we're crazy ... and maybe we are. Who in their right mind would travel 1,000 miles from home to operate an amateur radio contest from a northern location where it's cold and there is snow and ice? Why not head south to some warm Caribbean country where you can drink piña colodas and lie on the beach?

Sun, sand, and surf are great, but for our contesting team it's the friendship, the challenge, the pile-ups, the spirited competition, and the warm Canadian hospitality that bring us back year after year to Zone 2 in northern Canada.

The VE2DXY Zone 2 contesting team is made up of a dedicated team of experienced operators from the Philadelphia area. Our core group consists of Andy Vavra, KD3RF/VE2DXY, Irwin Darack, KD3TB, and Bill Ballantine, K3FMQ. In 2009 two new operators joined the team—Ken Nicely, N3PSJ, and Sebastian Jean, VE2GTZ. Andy, Irwin, Bill, and Ken all are members of the Frankford Radio Club, a club dedicated to improving contesting performance.

Why Zone 2?

The definition of rare DX is the contact your buddy made that you didn't, and with that thought in mind our goal has always

been to help put Zone 2 in the logs of as many fellow amateurs as possible. Although our team has activated Zone 2 seven times since 2002, our inspiration actually came from the tropics during CQ WW SSB 2001, when we operated from East Malaysia using Irwin's callsign 9M6TBT. At the end of the 2001 contest there were only two areas of the world we did not work, Zone 2 and Zone 33, and our thinking was that many other amateurs must have missed getting Zone 2 into their logs as well.

Zone 2 is a rare zone in northeastern Canada (see sidebar "What's So Rare About Zone 2?") and a highly desired multiplier in the CQ WW contests, and we have been thanked on the air numerous times for activating it. Zone 2 is also a rare zone for CQ's Worked All Zones award. The thanks we receive are extremely gratifying, but we also get something from the operation itself, as it gives our team the opportunity to *be* rare DX – a station everyone else wants to contact. If you have never operated from a highly desired location or been on the receiving end of a pile-up, you have to experience it at least once to be able to understand what we mean.

Traveling to Zone 2 was an easy choice when we were looking for a contesting location. Although it is in a northern climate and does not have the trans-equatorial propagation the Caribbean power-house stations benefit from, it is an enjoyable destination, relatively easy to reach by car, and in a safe, politically stable country with a warm and friendly population.

With some research, and help from our friends in Canada, we identified a spot north of the 50th parallel and in 2002 our first DXpedition was born. Except for taking a year off in 2003 when we operated from Antigua with the Frankford Radio

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The VE2DXY contesting team: from left, Andy Vavra, KD3RF/VE2DXY; Sebastian Jean, VE2GTZ; Bill Ballantine, K3FMQ; Irwin Darack, KD3TB; and Ken Nicely, N3PSJ.

Club at V26DX, we have returned to Zone 2 every year since, handing out contacts to other contesters worldwide for this much-needed part of the world.

We carry everything with us on a trip to a location that takes nearly 20 hours behind the wheel to reach. It's an exhausting trip, but not without its rewards, as we travel through some of the most rugged and beautiful country in the northeastern U.S. and Canada to reach our destination. Each year's trip is different and has its own unique challenges, however, and in the pre-dawn darkness of October 23, 2009 we crawled along for more than three hours in near whiteout conditions during an early season snowstorm in the mountains north of Quebec City.

Although the weather can be less than cooperative in late October, the scenery along the way is breathtaking and makes the effort worthwhile. We cross deep river gorges by ferry boat, and travel along mountain ridges and through small rural towns and fishing villages as we make our way along the northern banks of the St. Lawrence River. We have seen whales and eagles in their natural settings, and keep a sharp lookout for moose and bear that

would be disastrous if we collided with one while en-route.

Going Portable

In many respects the mini DXpedition that we do each year to activate Zone 2 for the contest has a lot in common with other, more exotic DXpeditions you may have read about. We never leave North America, but travel more than 1,000 miles from home and bring *everything* we need for a "Field Day" style portable operation: rigs, amplifiers, antennas, masts, feedline, tools, and spare parts. We set up everything on-site the day we arrive and take it all down again on Sunday night after the contest is over. Checklists and customs forms are prepared in advance and everything is carefully packed.

Just like the larger DXpeditions that travel by air to more exotic destinations and have baggage and weight limitations for what they can carry, we also have to be prudent about how much equipment we take on the trip. Everything has to fit in one vehicle, and for economy of space, ease of setup, and operating consistency between stations we adhere to the principles of "keep it simple" and configure our multi-

2 operation with identical radios, antennas, computers, and logging software. By following this approach it is much easier for the operators not to have to learn a whole new setup when changing positions during the contest.

Improving Results: A Constant Effort

Over the past eight years we have constantly worked at improving our results, meeting as a team months in advance to decide what we will do in terms of operating skills, transmitting and receiving equipment, antennas, and logging software in the coming year. CQ WW SSB 2009 was no exception. In fact, we ended up with brand new transceivers and antennas.

We upgraded our rigs to Elecraft K3s in order to resolve intrastation interference problems. We got the bonus of improved sensitivity and selectivity that let us pull many more weak stations out of the noise. At the other end of the feedlines, we replaced all but one of our ground-mounted verticals (which had been suffering interference from an industrial plant across the river) with full-wave loops and wire beams.

Based on the results we experienced in 2009, we are now convinced that full wave loop antennas are the way to go for our treeless location in Zone 2. In 2010, we will be equipping the station with a homebrew two-element quad for 10 and 15 meters, a two-element Vee Beam for 20 meters, single-element delta loops on 40 and 80 meters, and an inverted L antenna for 160 meters.

The Effects of Propagation

Each year, we compare our logs with previous year's contacts, looking for areas of similarity and difference between solar activity, the number of contacts, countries and zones we have worked. During the post-contest season, we review the comparisons, and discuss ideas for improving our results in future contests.

Despite somewhat weak propagation our overall score in CQWW SSB 2009 was higher than ever achieved in previous years. When you take into account the benefits gained from the lower noise, higher efficiency loop antennas we used in 2009, improved radios and a moderate improvement in the solar flux, it becomes apparent why our numbers of contacts, countries and zones increased. [For a detailed analysis of how solar conditions affected our propagation, see "Digging Deeper -- Solar Flux, the A-Index and CQWW

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What's So Rare About Zone 2?



Co-authors Andy Vavra, KD3RF/VE2DXY, and Irwin Darack, KD3TB, celebrate crossing the 50th parallel at Port Cartier, northern Quebec, officially entering CQ Zone 2.

Back in 1934, the editors of *R/9* magazine, a predecessor of *CQ*, announced the Worked All Zones award for which they divided the world into 40 geographic zones. These zones also constitute multipliers (along with countries) for the CQ World-Wide DX Contest. Some zones are easier than others to contact. One of the more difficult is Zone 2, designated as the "Northeastern Zone of North America." It is difficult because even though it is quite large geographically, it is quite sparsely populated. Here is the official description from the WAZ Award Rules:

Zone 2. Northeastern Zone of North America: VO2 (Labrador), the portion of **VE2** Quebec north of the 50th parallel, and Nunavut Territories east of 102 degrees (includes the islands of King Christian, King William, Prince of Wales, Somerset, Bathurst, Devon, Ellesmere, Baffin, and the Melville and Boothia Peninsulas, excluding Akimiski Island, Bear Islands, and East Pen Island in Hudson Bay).

If you look at a zone map, such as the one at http://www.hamatlas.eu/waz/Strefy_mapy/Quebec.jpg or http://www.hamatlas.eu/waz/Strefy_mapy/World_2.jpg, you will see that the vast majority of Quebec's population is in Zone 5, south of 50° north latitude. So in order to work Zone 2, the person you contact must be either in Labrador, the eastern portion of Nunavut, or in Quebec north of the 50th parallel. According to WAZ Award Manager Floyd Gerald, N5FG, one of the most common errors in award applications relates to contacts claimed for Zone 2 with stations that were actually in Zone 5 (a complication is that some Zone 5 stations in northern Quebec mistakenly think they are in Zone 2).

Propagation from Zone 2" on the CQ website. Follow the link from the August 2010 highlights page.]

Going Beyond Amateur Radio

Something we did differently for the VE2DXY DXpedition in 2009 is an idea we would like to suggest to the amateur radio community: Publicize *your* event, no matter how small or modest. What started for us as a personal website at <http://www.wix.com/andyvavra/VE2DXY> quickly turned into a full-fledged on-line presence that gained notice from the non-amateur community and has received comments from all over the world. More information about the VE2DXY Zone 2 CQ WW SSB Contest DXpedition, including a daily blog of our activities, a link to a YouTube video from our 2008 DXpedition, links to online logs, and brief bios can be found at our website.

However, we didn't stop there, because back in the middle part of 2009 Hewlett-Packard solicited entries for the "HP in Real Life" website from people who had unique stories to tell about how they were using HP computers. We submitted



New team member Ken Nicely, N3PSJ, happily engages his first pileup as a rare zone in CQ WW SSB.



"Listening this frequency and 7.43," Andy Vavra, KD3RF/VE2DXY operates 40 meters split during the late night shift.

a story about VE2DXY and amateur radio, and were pleasantly surprised when HP's advertising agency got in touch with us to let us know that we were selected as one of three (*now five—ed.*) stories to be presented on the HP website at <<http://www.hp.com/united-states/reallife/hamradio.html>>. We were interviewed about amateur radio and our experiences operating from Zone 2, and how HP's products were helping "Bring Voices to Quiet Corners of the Earth."

The attention from HP is a testament that amateur radio can still generate interest and awareness in the general public when it is presented in the right ways. Showing how we connected technology—from controlling our radios via computer links, to logging, to internet packet spotting networks—was fascinating to HP and its advertising agency. Be sure to visit both websites, and leave a note for us in the comments area of the VE2DXY website if you like what you see.

Conclusion

It may be tempting for readers to think of this article as a checklist to follow for a mini-DXpedition of your own, but it is nothing more than a description of our experiences and what worked for us. Preparation and planning are critical

elements of any DXpedition, and contesting from a rare location can be both fun and rewarding, but can be a disaster if you are not properly prepared, especially once you go outside of your home country. Your results and experiences will definitely be different.

It has taken us eight years to get to where we are now. We learned the hard way, from how to get through Homeland Security and U.S. Customs to functioning in a part of the world that does not speak our native language, and from fixing antennas in freezing rain during a howling nor'easter to tearing amplifiers apart during the contest to repair defective relays and failed bias circuits. Thus, learn from our experiences, and whether you have in mind a mini DXpedition, an IOTA, or a VHF rover that you want to try, start modestly and be prepared, but most of all have fun doing it!

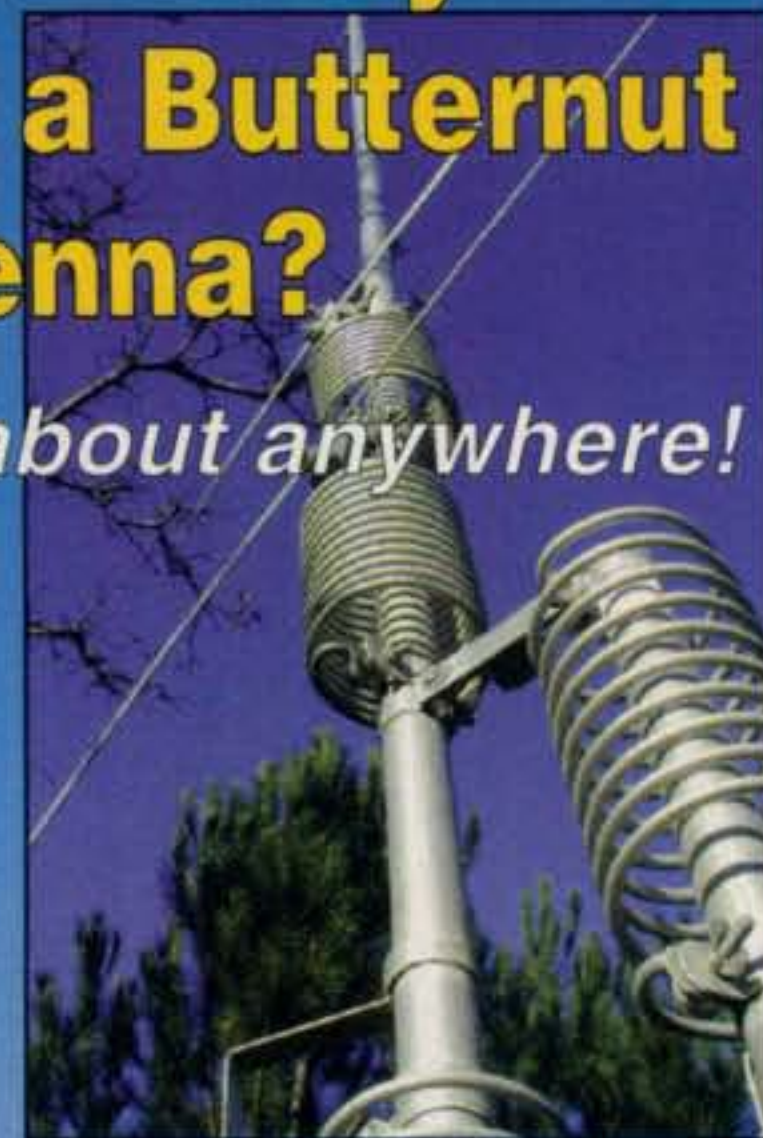
Contesting and DXing are great ways to learn new skills, improve your station, make new contacts, and work new countries and zones. You don't have to be a big gun or in a rare location to have a good time. Therefore, when the next contest comes along, turn on your radio and make a few contacts, even when poor propagation, modest stations and antennas, limited budgets, and common beliefs say otherwise.



The VE2DXY antenna farm overlooking the north shore of the St. Lawrence River. The river, which is tidal at this point, contains enough salt water as a ground plane to provide an excellent path over water to the US and the Caribbean.

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Many radio clubs sponsor basic ham radio licensing courses. Far fewer run upgrade classes. Here are some tips from Gordo for organizing an outdoor, hands-on course for already-hams.

Organize Your Own Backyard Upgrade Class

BY GORDON WEST,* WB6NOA

The path for Technician Class operators to upgrade to General Class has been easier since the FCC eliminated the Morse code exam for all license classes. However, upgrading still takes a lot of study, and a formal class with trained mentors can be very helpful.

Renting a classroom for ham radio training can be expensive, though, and neighborhood community centers likely will ask for expensive insurance policies as well. Rented facilities may also have little to no outside access for live antenna demos. Therefore, how do you make an upgrade class affordable, educational, and fun? The answer? Take it outside during warm-weather months in a cooperating club member's backyard!

With required home study and workbook completion before class, a weekend Technician-to-General upgrade class will be very popular. Add live equipment and outside HF dipole and vertical antenna demos and expect a big crowd!

Our local American Red Cross volunteer communications team made up the student body for our first outdoor upgrade course. With volunteer instructors and donated facilities, the class was free except for the cost of textbooks. A date was set in springtime and the big back yard of Kevin, KG6MIH, Bobbie, KG6MIF, and Cliff, KG6MIG, Guice was commissioned for the classroom. A patio cover provided shade and there was wheelchair access for our communicators with special needs.

Kevin, KG6MIH, with his own wheelchair, is also an Extra Class Volunteer Examiner whose credentials allow him to take part in testing on Sunday afternoon where the students come to him! Our class photographer was Pandora Nash-Karner, KE6ZVD, who came in from several hundred miles away to both digitally document the class and take her own General Class upgrade training and exam (all of the photos accompanying this article are by Pandora).

Well ahead of time, Suzy, N6GLF, prepared all students with their General Class theory pre-study assignments. Workbooks had been provided in which students answered additional questions based on their book study before the weekend class. (Go to <instructor@W5YI.org> for pre-study pages.)

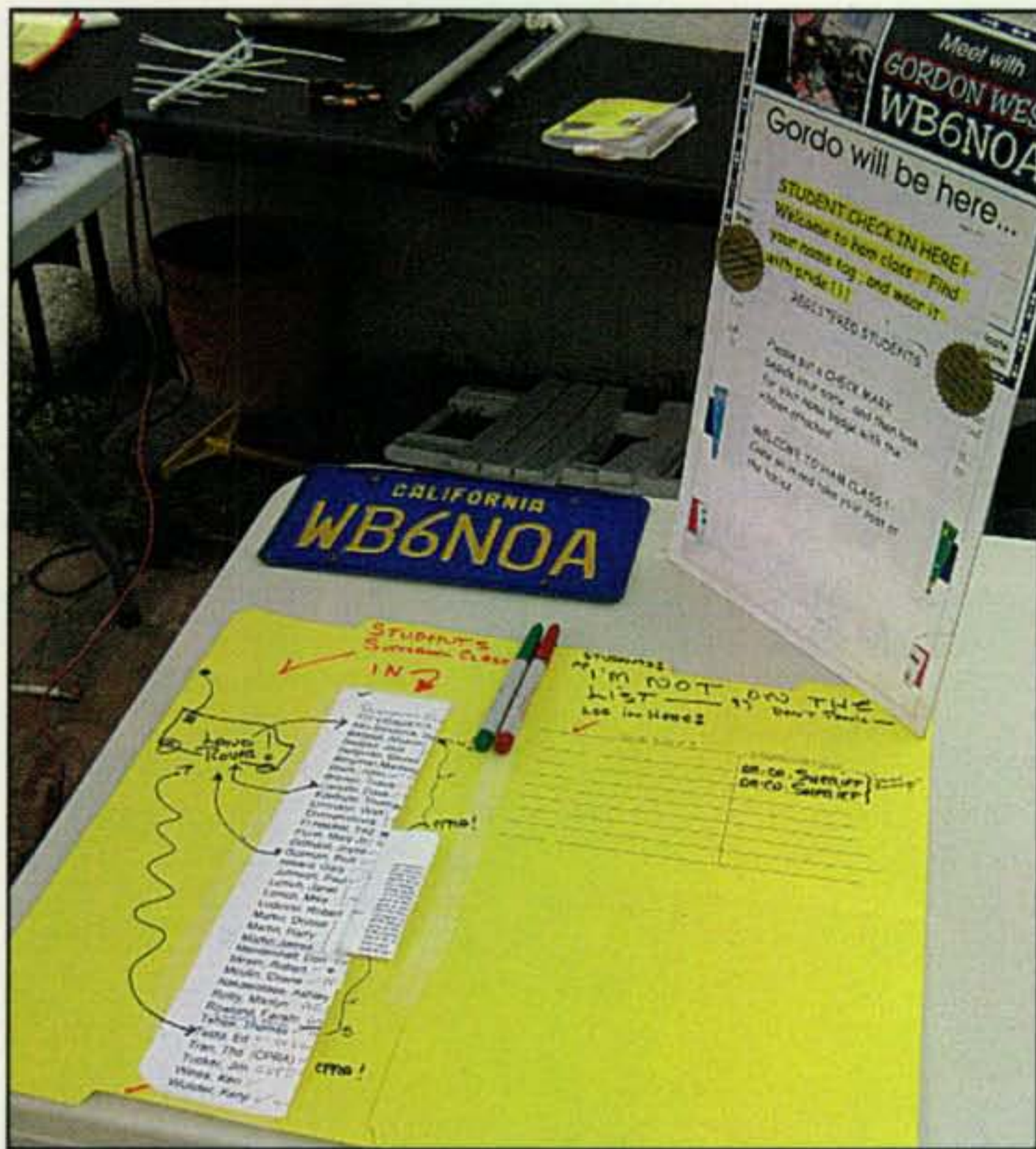
Hands-On Instructions

The backyard class at "Kevin's house" focused on live equipment, operating procedures, antennas and antenna safety,

and two fun-filled days of learning and playing radio. We started at the front of the book with rules and regulations and ended the next day with RF Safety, relating book questions to the real world of using radios and antennas.

Here are some of our backyard ham-upgrade experiments:

- Dipoles vs. tripod verticals
- Demos of various HF radios on different antennas
- Evaluating SWR with MFJ analyzers
- Making live contacts and operating courtesy
- All about antenna safety around radio frequency emissions
- Built-in vs. external automatic tuners
- Manual tuners and tune-up procedures
- Hearing DSP (Digital Signal Processing) at various levels



This backyard upgrade class had about three dozen students pre-registered. Pre-registration and before-class preparation are essential for success in one- or two-day licensing courses. (All photos by Pandora Nash-Karner, KE6ZVD, of <PandoraAndCompany.com>)

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

- Solar panels and batteries
- Making your first contact

There were plenty of highlights during the two-day backyard class. Kevin assisted with talk-in on Saturday morning, and the neighborhood quickly filled up with vehicles. Neighbors were alerted ahead of time, and their kids were invited to take part in the ham radio excitement.

Digital communications were demonstrated by Tom, W6WC, and Bill, K6ACJ. This gave the students an exciting computer view of radio whistles (PSK) that can be turned into live text. The mobile units dispelled the myth that new General Class operators would need to take a drill to their vehicles to install a mobile HF antenna. Our new students saw the many advantages of lip-mounts and magnetic-mount, high-frequency antenna systems—no holes need to be bored for these!

Co-host Cliff, KG6MIG, an avid electronics buff, had plenty of solar panels and gel-cell batteries to demonstrate throughout the weekend. Cliff and Kevin provided the students with some terrific high-frequency contacts from their roof-mounted, five-band vertical antenna affixed to an iron plumbing pipe on the backside of the roof. We continuously underscored the importance of RF safety around antennas, as well as personal safety when working with any roof-mounted antennas and dangerous power lines 75 feet away. Our mobile antenna demos required all students to wear protective glasses.

On Sunday, our first contact was on 20 meters with a station on the East Coast. We described our class, our equipment, our antenna ground as the wrought-iron fence surrounding the swimming pool, and our antenna system as seven feet of old sprinkler pipe insulated from ground. This crazy lash-up allowed us to demonstrate a manual tuner, and to illustrate that nearly anything can be turned into an effective antenna system, maybe only 2 dB down from the professional roof-mounted 5-band vertical! Everyone laughed!

Sunday afternoon was test time, and those who had completed their home study before class hardly missed any questions on the Element 3 General Class exam. Those who completed only a portion of the home study tended to miss five or six questions, and the few who had little chance to work on the pre-study generally opted to take another class at a later date. Home study makes teaching the class and testing a breeze!



Gordo's better side is facing the students as he explains what they need to understand in order to pass the General Class upgrade exam. Note all of the props and display items on the table in the foreground.

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“Finally, before the students arrive, and before any antenna demos, check for safety.”

The weather cooperated, all demos were successful, and the backyard venue allowed many more live antenna tests than I could have pulled off inside a classroom.

Suggested Class Size and Logistics

We recommend keeping the class size to about 30. This makes managing the facilities and related accommodations, including “munchies” easier. Classes smaller than 30 will drain the “Elmer.” While I have taught classes of 10 and 15, the enthusiasm and excitement of a larger class is contagious. However, too large a class can be unwieldy, and we’ve found 30 to be “just right,” although “your mileage may vary.”

Speaking of munchies, thanks to Tom, KI6GOA, with the American Red Cross Orange County chapter, “flipping burgers” was just a part of his upgrade requirement!

Finally, before the students arrive, and before any antenna demos, *check*



A wide variety of rigs and possible setups brought to the class helped students understand what their options would be for getting on HF once they passed their General exam.

for safety. Make sure no one will trip over your portable PA system speaker wires, that all mobile antennas have rubber ball tips, and that any multi-band verticals on the lawn for display have sharp elements covered with lightweight rubber play balls. Coax cable on

the lawn must have no trip hazards. Think Safety!

Will we do more classes in a backyard? Absolutely! It sure beats *talking* about antennas when you can actually string up antennas and see how they play with live radio checks.



Test equipment and a portable power supply were among the items put to use in the many demonstrations during the two-day class.



Sunday afternoon was test time, with volunteer examiners administering the Element 3 General Class exam. Those who put in the most effort before the weekend class had the highest scores.

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Results of the 2009 CQ WW DX SSB Contest

BY BOB COX,* K3EST

Expanded Results on the Web

Editor's Note: Having more than 6000 logs submitted for the CQ WW SSB Contest is wonderful, but it does put a squeeze on space. In order to assure that the efforts of all entrants are recognized through the publication of complete line scores, certain other elements of our contest reporting have been moved to the CQ website. Please visit the CQWW DX Contest page on the CQ website (follow the links from <www.cq-amateur-radio.com>) for QRM, expanded top scores listings, and more. And thanks for being part of the world's largest participation sporting event!—W2VU

The 2009 CQ WW DX SSB Contest was a welcome surprise. After a sun stuck with no sunspots for more than a year, the CQ WW brought its own sunspots to the party; the bands came to life. As usual, the CQ WW SSB is better than 100 sunspots. Stations from all over the world were on the air: I enjoyed the weekend" (IK2MLS); "With a solar flux index of 76 the contest stood under good stars this year. The bands were burning! The propagation held me in my shack" (DF5LR); "Wonderful 10m opening from sunset to sunrise during the two days of this contest" (F5RD).

As has been mentioned before, the CQ WW is a fantastic competition which brings out the best in amateur radio: teamwork, station construction, antenna design, propagation knowledge, and operating skills. Just turn on your radio and you can join in the fun. Once you listen to the bands during the CQ WW, you will be hooked. You can be guaranteed to have a good time. The CQ WW is a celebration of ham radio skill and effort. New and experienced hams who try the CQ WW become addicted. After all the logs were counted, an amazing number emerged: 6065 received entries. Below are presented the results of many of the efforts.

A yearly reminder: If you want to know how long it is until the 2010 CQ WW SSB test, check out the website of OT5A: <http://www.on7lr.org>. Read on to see how you and your friends ended up. Everyone who operated the CQ WW in 2009 was a winner and had a chance for great fun.

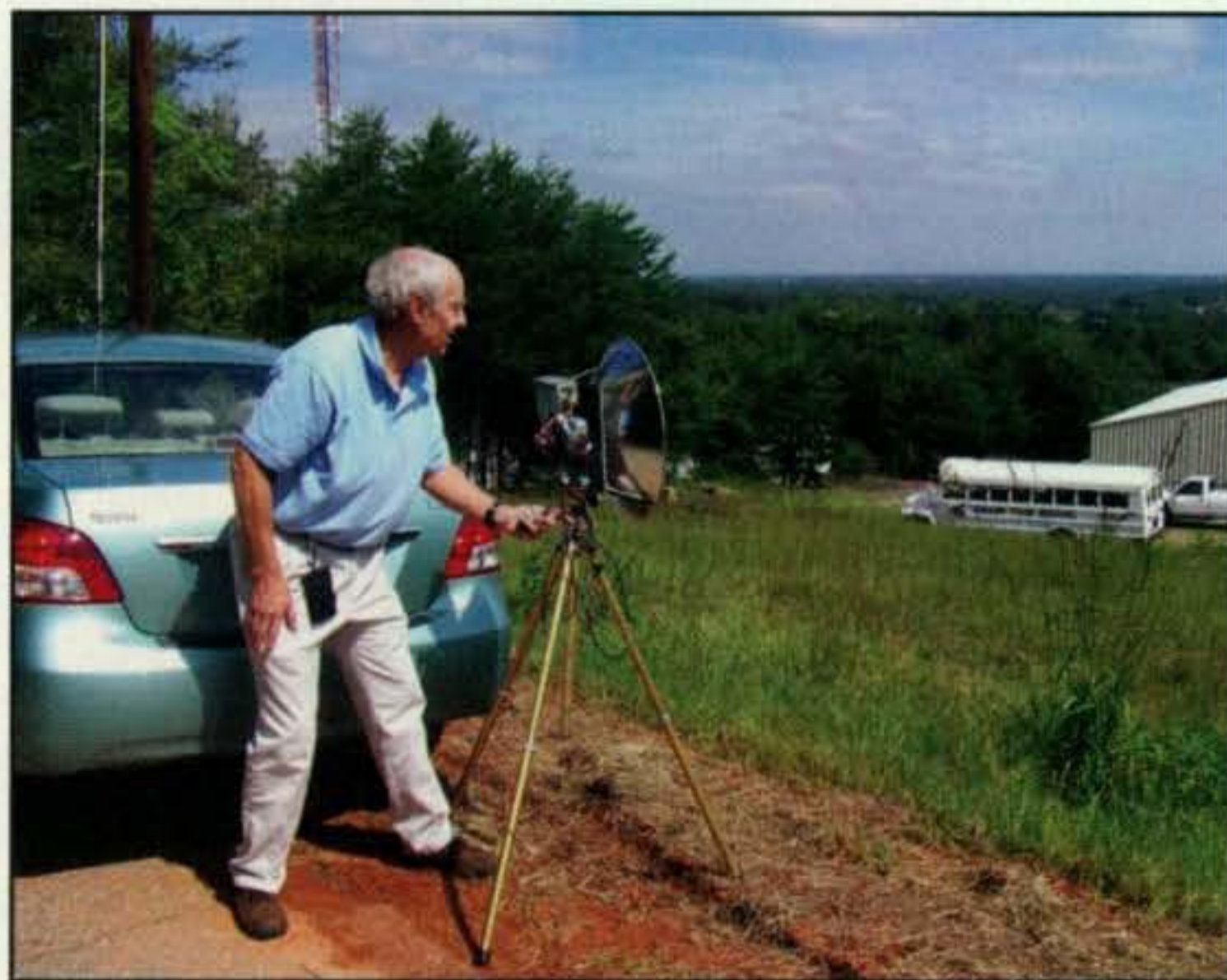
High Power, All Band

The top spot in this difficult category went to an operator familiar with winning the CQ WW. Rich, N6KT, put his considerable skill to work talking HC8A to the world high score. HC8A sits on the side of a dormant volcano on San Cristobal Island, and Rich took full advantage of the location and propagation to find the path to top honors. Second place world was Jim, W7EJ, operating from CN2R. Third place world again went to several-time world winner Tom, W2SC, operating 8P5A from beautiful Barbados. Taking first place in Europe and fourth in the world was Tonno, ES5TV, operating from super station 4O3A. Just a few QSOs behind, placing second place in Europe and fifth in the world, was Jukka, OH2UA, operating from CR2X. From Slovenia, Tine, S50A, took his station to third place in Europe. Krassy, K1LZ, did a fabulous job and took top U.S. honors! What a great job and score. Doug, K1DG, took U.S. second place from Long Island, Maine. Ken, K4ZW, took third place from his countryside QTH in Virginia. Other worthy efforts from propagationally challenged areas which should be mentioned were those of DU1BP, VK4CZ, EX8MAT, XV1X, YC9MDX, 9M8Z, JT1ZO, UN9L, UN7MMM, A61C, VU2PAI, HS0ZEE, and XU7FMZ. The continental winners were: North America: 8P5A (W2SC), Africa: CN2R (W7EJ), Asia: RC9O (UA9PC), Europe: 4O3A (ES5TV), Oceania: KH7XS, South America: HC8A (N6KT), Japan: JA0JHA, U.S.: K1LZ.

Low Power, All Band

To enter the low power category all you need is a transceiver and an antenna. You will be surprised at what you can work with 100 watts.

*e-mail: <k3est@cqww.com>



Doug, K4LY, finished #1 QRP USA.

Running low power places you in the most popular contesting category. For this reason, to make the Top Scores box really means something. It is a real challenge.

Operating from beautiful Aruba, John, KK9A, operating as P40A, again took away the top world low power trophy. Five years in a row is quite an achievement! World second place went to Sébastien, F8IVJ, using his contest call, 6V7Q, while on his honeymoon! Third place in the world and number one in Asia was taken by 7Z1SJ operated by Sulaiman; a great job from Saudi Arabia! LY9A operated by Gediminas, LY3BA, took first place in Europe. Gediminas's efforts always place him near the top. This time he took top honors. Congratulations! Second place Europe went to low power champion Marius, YO3CZW. Taking Europe third place was Franc, S51F, operating from the sunny side of the Alps. In the U.S., we had a repeat winner from 2008, Art, K1BX. Great operating, Art! Second place went to Ed, N1UR. Third place U.S. went to John, N8AA, from southwest Ohio. BD1TCC, 4L1FP, VR2ZQZ, VR2PX, JY5CC, JY4NE, A41MX, HS0ZHC, HS0ZCW, UK9AA, FO8RZ, A31KK, KH0/JK2VOC, and DV1JM all had excellent scores from interesting locations. The continental winners were: North America: K1BX, Africa: 6V7Q (F8IVJ), Asia: 7Z1SJ, Europe: LY9A (LY3BA), Oceania: KH0/JK2VOC, South America: P40A (KK9A), Japan: JH3CUL, U.S.: K1BX.

QRP

The QRP category sharpens your tuning skills and the rewards are very satisfying. You can work a lot of stations with 5 watts or less. It is interesting to note that QRP stations range from a few milliwatts to 5 watts, which is quite a power difference! Our world winner this time was Dmitry, RX1CQ, operating from his station just north of St. Petersburg, Russia. Long-time QRPer Douglass, K4LY, took second place world and first place U.S. from northwestern South Carolina. Third place world and number two Europe was Norbert, DK1YY. Second in the U.S. was Chris, KA1LMR, and taking third in the U.S. by repeating a top score west of New Jersey was Philip, N0KE. Third place in Europe went to Angel, EA3FF. Special mention must be made of the fine score of Izuno-san, JR4DAH, #11 in the world and #1 in Asia. The top zone 3 scorer was Bill, W8QZA, operating W6QU. He was followed closely by Randal, ND0C. JA2MWV, VK4ATH, PY2BN, JG4AKL, and 9M6/W8AY (RA3AD) are to be congratulated for their outstanding efforts. The continental winners were: North America: K4LY, Africa: (no entry), Asia: JR4DAH,

Europe: RX1CQ, Oceania: VK4ATH, South America: PY2BN, Japan: JR4DAH, U.S.: K4LY.

Assisted

"I worked assisted and I spent too much time chasing DX-cluster spots; I have lots of multipliers but at least 500 less QSOs. Difficult to break, at times, the big pile-ups on cluster

spots" (9A2EU). It takes a lot of discipline to achieve a good balance between chasing packet spots and running stations. The top scoring stations know how to do it just right. A reminder: use of *any* QSO spotting tool places you in the assisted category. The use of any Skimmer either internally or externally also places you in the assisted category.

The top assisted score in the world came from ER4DX operated by Sergey, UT5UDX.

Great job, Sergey! Second place world and number one in Asia was RG9A operated by Yuri, UA9AM. Third place world and second in Europe went to CR6K, the contest call of Felipe, CT1ILT. Third place in Europe went to Daniel, E73M. First place in the U.S. was taken by Gene, W3UA/1, operating from New Hampshire. Second place went to Charles, K3WW, who never ceases to amaze everyone by his dedication to the assisted category. Third place

TROPHY WINNERS AND DONORS

SINGLE OPERATOR
World All Band
 HC8A (Opr.: Richard Smith, N6KT)
 Donor: Southern California DX Club

World Low Power
 P4\$SA (Opr.: John Bayne, KK9A)
 Donor: Slovenian Contest Club

World QRP
 Dmitry A. Sokolov, RX1CQ
 Donor: Jeff Steinman, N5TJ

World Assisted
 ER4DX (Opr.: Sergey S. Rebrov, UT5UDX)
 Donor: Glenn Johnson, W0GJ

U.S.A.
 Krassy Petkov, K1LZ
 Donor: Potomac Valley R.C. - KC8C Memorial

U.S.A. Low Power
 Arthur Hambleton, K1BX
 Donor: North Coast Contesters

U.S.A. QRP
 Douglass Allen, K4LY
 Donor: Pat Collins, N8VW

U.S.A. Assisted
 Gene Shablygin, W3UA/1
 Donor: John Rodgers, WE3C

U.S.A. Zone 3
 Mitch Mason, K7RL
 Donor: Dave Pruett, K8CC & Greg Surma, K8GL

U.S.A. Zone 4
 Mike Wetzell, W9RE
 Donor: Dave Pruett, K8CC & Greg Surma, K8GL

Canada
 VC3O (Opr.: Ron Vander Kraats, VE3AT)
 Donor: Contest Club Ontario
 VE3WT Memorial

Caribbean/C.A.
 8P5A (Opr.: Thomas Georgens, W2SC)
 Donor: Alex M. Kasevich, W1CDC

Europe
 4O3A (Opr.: Tonno Vahk, ES5TV)
 Donor: Potomac Valley R.C. - W4BVV Memorial

Europe Low Power
 LY9A (Opr.: Gediminas Lucinskas, LY3BA)
 Donor: Scott Jones, N3RA & Tim Duffy, K3LR

Russia
 Anatoly Yu. Medvedev, UA4WKW*
 Donor: Roman Thomas, RZ3AA

Africa
 CN2R (Opr.: James Sullivan, W7EJ)
 Donor: CQ magazine

Asia
 RC9O (Opr.: Anatoly Polevik, UA9PC)
 Donor: CQ magazine

Japan
 Akira Minagawa, JH0JHA
 Donor: Tack Kumagai, JE1CKA

Japan Low Power
 Eiji Souno, JH3CUL
 Donor: Western Washington DX Club

Oceania
 KH7XS (Opr.: Wilbert E Kollenbaum, K4XS)
 Donor: Northern California DX Club

South America
 PZ5M (Opr.: Michael Kasrich, AJ9C)*
 Donor: Yankee Clipper Contest Club

SINGLE OPERATOR, SINGLE BAND
World - 28 MHz
 Juan Manuel Morandi, LU1HF
 Donor: Joel Chalmers, KG6DX

World - 21 MHz
 ZX5J (Opr.: Sergio Almeida, PP5JR)
 Donor: Robert Naumann, W5OV

World - 14 MHz
 D44AC (Opr.: Luca Aliprandi, IK2NCJ)
 Donor: North Jersey DX Assn. - K2HLB Memorial

World - 7 MHz
 UP0L (Opr.: Vladimir Vinichenko, UN9LW)
 Donor: Fred Laun, K3ZO - K7ZZ Memorial

World - 3.7 MHz
 Jeffrey T. Briggs, VY2ZM
 Donor: Fred Capossela, K6SSS

World - 1.8 MHz
 EI7M (Opr.: Dmitrij Pavlov, LY3MM)
 Donor: CQ magazine

USA - 28 MHz
 Charles Dietz, W5PR
 Donor: Donald Thomas, N6DT

USA - 21 MHz
 Victor Walz, N2PP
 Donor: 11PM Dayton Pizza Gang

USA - 14 MHz
 Jerry Rosalius, WB9Z
 Donor: Yankee Clipper Contest Club -
 KC1F Memorial

USA - 7 MHz
 Daniel Handa, W7WA
 Donor: Stanley Cohen, W8QDQ

USA - 3.7 MHz
 Joseph Gagliardi, Jr, AA1BU
 Donor: CQ magazine

USA - 1.8 MHz
 Manuel Fonseca, Jr., W2MF
 Donor: Glenn Johnson, W0GJ

Carib./C.A. (21 MHz)
 Jean-Pierre Lauwereys, P43A
 Donor: Nate Moreschi, N4YDU

Europe - 28 MHz
 Emil Tafro, E71A
 Donor: Charles Dietz, W5PR

Europe - 21 MHz
 Suad Zukic, E77XZ
 Donor: Tine Brajnik, S50A

Europe - 14 MHz
 RZ3AXX (Opr.: Vladimir Umanets, UA9BA)
 Donor: Charles Wooten, NF4A

Europe - 7 MHz
 YT8A (Opr.: Ceha Dusan-Dule, YU1EA)
 Donor: John Warren, NT5C

Europe - 3.7 MHz
 GI5K (Opr.: Chris Smith, M0LLL)
 Donor: Ted Demopoulos, KT1V

Europe - 1.8 MHz
 Viesturs Jakovlevs, YL2SM*
 Donor: Robert Kasca, S53R

Oceania (7 MHz)
 Dusko Dumanovic, ZL3A
 Donor: Bruce D. Lee, KD6WW

Asia - 14 MHz
 9K2K (Opr.: Abdallah Hamad Al-Muzayan, 9K2GS)
 Donor: Charles Shinn, W7MAP

Japan - 14 MHz
 Akira Asai, JA8RWU
 Donor: Take Yokoyama, JL1BLW

MULTI-OPERATOR, SINGLE TRANSMITTER
World
 CN3A (Oprs.: IK2QEI, IK2SGC, IK1RQT, IK1SPR,
 IZ2FFK, I2WIJ, IK1HJS, IV3ZXQ, CN8WW, CN8WK)
 Donor: So. Calif. DX Club - W6AM Memorial

U.S.A.
 W3BGN (Oprs.: W3BGN, K2TW)
 Donor: Carolina DX Association

Carib./C.A.
 VP5DX (Oprs.: N4KE, AB4UF, N4EPD,
 NW4C, NU4Y)
 Donor: Bob Raymond, WA1Z

Africa
 CR3A (Oprs.: CT3BD, CT3DL, CT3DZ, CT3EE,
 CT3EN, CT3IA, CT3KU, CT3KY, CT3NT, CT4NH)*
 Donor: Doc Sayre, W7EW

Asia
 P33W (Oprs.: UR0MC, RW3QC, RA6LBS,
 UA2FZ, RX3DCX, RW4WR, RA3AUU)
 Donor: Edward L. Campbell, NX7TT
 AA6BB and KA6V Memorial

Japan
 JH4UYB (Oprs.: JH4UYB, JA1FXR)
 Donor: Bob Epstein, K8IA

Europe
 TM6M (Oprs.: F1AKK, F4DXW, F4ELK, F5TTU,
 F8DBF)
 Donor: Bob Cox, K3EST

Oceania
 AH2R (Oprs.: JI3ERV, JR7OMD, JH7QXJ)
 Donor: Junichi Tanaka, JH4RHF

South America
 FY5YE (Oprs.: F1HAR, F5HRY, F6FGZ,
 F6FVY, F8CMF, FY5FY)
 Donor: Victor Burns, K16IM -
 The Cuba Libra Contest Club

MULTI-OPERATOR, TWO TRANSMITTERS
World
 AO8A (Oprs.: EA8AH, EA8CAC, EA8ZS, EA5DY,
 OH1MA, OH3RB, OH5XT, OH6RX)
 Donor: Array Solutions

U.S.A.
 WE3C (Oprs.: WE3C, N3RD, NN3Q, KQ3V,
 KQ3F, K3CT)
 Donor: Kimo Chun, KH7U & Mike Gibson, KH6ND
 Dan Robbins, KL7Y Memorial

Europe
 IR4X (Oprs.: I4TJE, I4VEQ, I4EAT, I4IKW,
 I4AVG, IK4DCT, IZ3EYZ, IK4AUY, IW2MJQ,
 IZ2FDU)
 Donor: Aki Nagi, JA5DQH

Oceania
 AH\$SBT (Oprs.: 7L1FPU, JE1NDE, JG7PSJ,
 JI5RPT, AH0BM)
 Donor: Japan CQ Ham Radio

MULTI-OPERATOR, MULTI-TRANSMITTER
World
 PJ2T (Oprs.: W0CG, G3NKC, G4XUM, WA4PGM,
 K6AM, K8LEE, W9JUV, N0VD, N0YY)
 Donor: Dave Leeson, W6NL and Barb Leeson, K6BL

U.S.A.
 K3LR (Oprs.: K3LR, N2NC, N2NT, K6AW,
 W3TX, W2RQ, K8GL, IK2YCW, K3LA, K1AR,
 N6MJ, K3UA, DL6LAU, LU7DW, N3GJ, LW8EXF)
 Donor: Jim Lawson, W2PV Memorial

Europe
 DR1A (Oprs.: DB6JG, DF6JC, DJ1YFK,
 DJ6ET, DJ7EG, DJ7EO, DK2CX, DK5TX,
 DK6WL, DL1MGB, DL3DXX, DL6FBL, DL8WPX,
 DL9DRA, DO2WW, PA1TX, SV2KBS)
 Donor: Finnish Amateur Radio League

Japan
 JR5VHU (Oprs.: JR5VHU, JM1UWB, JA5FDJ,
 JA5JCC, JH5FIS, JH5RXS, JR5JAQ, JR5PWV,
 JJ6WYS, JK6RIP)
 Donor: Masahiro Kitagawa, JH3PRR

CONTEST EXPEDITIONS
World Single Operator
 HT2N (Opr.: Michael Tessmer, K9NW)
 Donor: National Capitol DX Assn.
 Stuart Meyer, W2GHK Memorial

World Multi-Single
 4U1ITU (Oprs.: RW3AH, SV3SJ)
 Donor: Gail Sheehan, K2RED

World Multi-Multi
 SU1KM (Oprs.: SU1KM Team)
 Donor: CQ magazine

*Second place

in the U.S. went to Bill, N4LA, in North Carolina. The efforts of some good multipliers—BD5BAJ, 5B/G3RXQ, KG6DX, ZK2DL, VR2YYW, UP4L, 9M6/JJ2CJB, IG9R, and IG9S—put a lot of QSOs in contester's logs. The continental winners were: North America: V31MW (NØHJZ), Africa: ZS4U, Asia: RG9A (UA9AM), Europe: ER4DX (UT5UDX), Oceania: KG6DX, South America: ZX2B (PY2MNL), Japan: JH1NBN, U.S.: W3UA/1.

Multi-Single

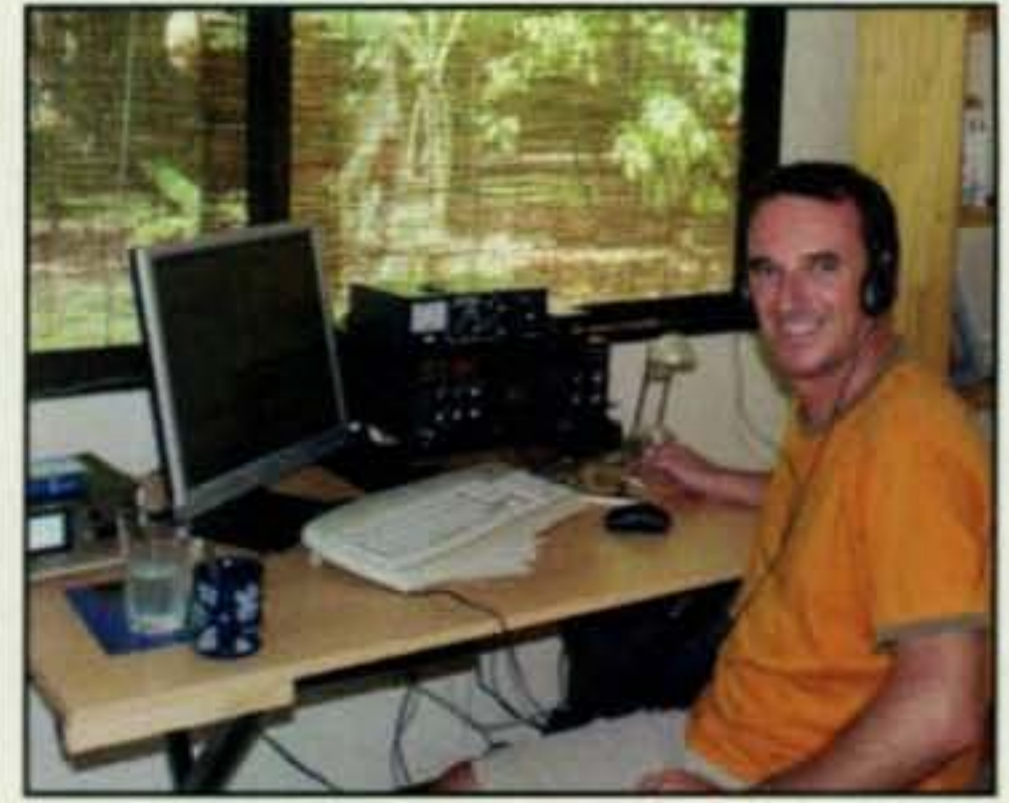
The top three winners from 2008 repeated their positions in the 2009 competition. They say three times is a charm. CN3A took world first place for three years in a row. The team from CN3A has everyone else chasing their efforts. What a great job they did. Reprising their second place world finish from last year was P33W. A team from the Radio Amateur Club of Kourou, operating as FY5YE on the French Guyana coast, came in third place. They summed up what many contestants thought when they said, "Conditions were a lot better than last year, especially on 10m, where we had a very good EU opening on Sunday, and a rather good one to NA." Most multi-single operations take place in Europe. This year there were 173 different teams who put in a lot of hard work to have fun in the contest. Doing a fine job and taking the top position was radio club F6KHM using its

club call, TM6M. Second place went to the Bosnia and Hercegovina contest team of E7DX. Third place in Europe again went to the Salgotarjani Varosi Radio Klub, HG6N.

A MS team from the Frankford Radio Club, W3BGN, took advantage of the good conditions to beat back a challenge from the Potomac Valley Radio Club's K3EST/4. Just a few QSOs separated the two scores. Not far behind but about 2300 miles farther west was the marvelous effort of N2IC/5. N1MM/6 took top honors from the U.S. West Coast. Outstanding performances were turned in by many teams. Some of the rarer ones appearing in many logs were: 3DAØWW, AH2R, EK8WA, TS9A, TC7KA, B7P, A73A, A47RS, 9K2HN, HSØAC, VR2C, YEØX, and 4LØA. The continental winners were: North America: VE3EJ, Africa: CN3A, Asia: P33W, Europe: TM6M, Oceania: AH2R, South America: FY5KE, Japan: JH4UYB, U.S.: W3BGN.

Multi-Two

The Multi-Two category needs two stations manned nearly all the time, and stations have to move skillfully and smoothly as the propagation changes. The AO8A team operating from Gran Canaria proved they could do it three wins in a row. Pekka's (OH1RY) international group finished #1 in the world. Another zone 33 team, EE9Z, rose to the occasion by taking sec-



Phil, FO8RZ, gave out a new one to many.

ond place in the world. Jorge, EA9LZ, mentioned that all the money collected from direct QSL to EE9Z is donated to an orphanage located in Tangier, CN. Third place in the world and first place in Europe went to IR4X. They have been having a good time on a mountaintop near Bologna for a very long time. As mentioned above, IR4X took top European honors. Second place in Europe went to OL4A. Their operation takes place from Brezina. Here you can find also 8 towers at heights from 13m to 52m. Third place in Europe went to Radio Club Varazdin, 9A7A. Making them the M2 team to

TOP SCORES

WORLD SINGLE OPERATOR All Band HC8A.....14,987,592 CN2R.....13,526,045 8P5A.....12,098,900 403A.....10,373,592 CR2X.....10,006,334		UNITED STATES SINGLE OPERATOR All Band K1LZ.....6,265,620 K1DG.....5,933,696 K4ZW.....4,654,793 W9RE.....4,187,780 K5ZD/1.....4,005,504		EUROPE SINGLE OPERATOR All Band 403A.....10,373,592 CR2X.....10,006,334 S5ØA.....5,484,636 GW4BLE.....4,622,391 OH8X.....4,364,312		YR8V.....362,411 S52ØT.....239,443	
7 MHz E79D.....338,541 OK1WCF.....226,738 YT2T.....210,240		7 MHz K16LZ.....39,280 W5ZO.....14,539 W5RI.....8,308		7 MHz E79D.....338,541 OK1WCF.....226,738 YT2T.....210,240		7 MHz E79D.....338,541 OK1WCF.....226,738 YT2T.....210,240	
3.7 MHz OK1FPS.....75,960 IV3KFB.....71,400 YT3R.....53,331		3.7 MHz WA6WPG.....2,944 K2SZ.....1,440 KG9Z/8.....1,260		3.7 MHz OK1FPS.....75,960 IV3KFB.....71,400 YT3R.....53,331		3.7 MHz OK1FPS.....75,960 IV3KFB.....71,400 YT3R.....53,331	
28 MHz LU1HF.....881,784 PW5G.....807,552 E71A.....312,741		28 MHz W5PR.....36,360 K2EK/4.....17,865 K4WI.....16,170		28 MHz E71A.....312,741 S56M.....255,576 UU1DX.....178,852		28 MHz OK1FPS.....75,960 IV3KFB.....71,400 YT3R.....53,331	
21 MHz ZX5J.....2,456,622 ST2KSS.....2,029,632 P43A.....1,583,113		21 MHz N2PP.....557,039 N8II.....398,426 W6YA.....364,820		21 MHz W1WBB.....385 K3TW.....340		21 MHz SP5CJY.....16,506 F5SSK.....13,824 DL3KZA.....11,480	
1.8 MHz SP5CJY.....16,506 F5SSK.....13,824 DL3KZA.....11,480		21 MHz N2PP.....557,039 N8II.....398,426 W6YA.....364,820		1.8 MHz W1WBB.....385 K3TW.....340		1.8 MHz SP5CJY.....16,506 F5SSK.....13,824 DL3KZA.....11,480	
QRP All Band RX1CQ.....489,775 K4LY.....369,380 DK1YY.....326,459 EA3FF.....284,382 KA1LMR.....268,320		14 MHz WB9Z.....991,660 AA1K/3.....885,222 K1IM.....266,640		QRP All Band K4LY.....369,380 KA1LMR.....268,320 NØKE.....188,088 N1TM.....156,140 N8XA.....96,807		QRP All Band RX1CQ.....489,775 DK1YY.....326,459 EA3FF.....284,382 HA6IAM.....236,808 RW3AI.....223,746	
14 MHz D44AC.....3,000,096 9K2K.....1,590,699 4L8A.....1,452,378		7 MHz W7WA.....336,720 N7DD.....336,335 W6YI.....316,288		14 MHz RZ3AXX.....1,227,640 CT1JLZ.....1,082,900 S57AL.....1,074,597		14 MHz RX1CQ.....489,775 DK1YY.....326,459 EA3FF.....284,382 HA6IAM.....236,808 RW3AI.....223,746	
7 MHz UPØL.....1,045,265 ZL3A.....788,000 YT8A.....774,400		7 MHz W7WA.....336,720 N7DD.....336,335 W6YI.....316,288		7 MHz YT8A.....774,400 ES5MC.....650,848 YU7W.....500,975		7 MHz HA6IAM.....236,808 RW3AI.....223,746	
3.7 MHz VY2ZM.....573,780 GI5K.....479,853 OG5B.....295,245		3.7 MHz AA1BU.....157,257 K7ZV.....118,752 ND8DX.....24,034		ASSISTED All Band W3UA/1.....3,666,817 K3WW.....3,503,694 N4LA.....3,272,337 AA3B.....2,741,760 N3RS.....2,535,702		ASSISTED All Band ER4DX.....7,661,916 E73M.....6,643,920 CR6K.....6,612,060 TK9R.....6,231,573 S57DX.....5,477,650	
1.8 MHz E17M.....125,584 VE3PN.....76,626 YL2SM.....67,837		3.7 MHz AA1BU.....157,257 K7ZV.....118,752 ND8DX.....24,034		1.8 MHz E17M.....125,584 YL2SM.....67,837 UU7J.....65,685		3.7 MHz GI5K.....479,853 OG5B.....295,245 YL3FT.....206,180	
MULTI-OPERATOR SINGLE TRANSMITTER CN3A.....20,052,100 P33W.....19,388,448 FY5KE.....19,358,440 CR3A.....16,195,382 TS9A.....14,632,939		1.8 MHz W2MF.....14,784 N4TZ/9.....6,533 W3GH.....5,687		MULTI-OPERATOR SINGLE TRANSMITTER W3BGN.....4,008,312 K3EST/4.....3,947,601 N2IC/5.....3,890,656 NØNI.....3,852,585 K8AZ.....3,708,750		MULTI-OPERATOR SINGLE TRANSMITTER TM6M.....11,459,650 E7DX.....10,236,288 HG6N.....10,186,302 OM8A.....9,768,200 OM7M.....9,656,000	
Low Power All Band P4ØA.....7,129,408 6V7Q.....2,846,844 7Z1SJ.....2,352,770 LY9A.....2,249,140 K18X.....1,994,512		Low Power All Band K1BX.....1,994,512 N1UR.....1,657,082 N8AA.....1,292,231 W3LL.....938,587 N5DO.....587,860		Low Power All Band LY9A.....2,249,140 YO3CZW.....1,398,186 S51F.....1,287,728 CR5M.....861,714 DL6DCD.....848,725		Low Power All Band OM8A.....9,768,200 OM7M.....9,656,000	
MULTI-OPERATOR TWO TRANSMITTER AO8A.....24,644,952 EE9Z.....17,374,344 IR4X.....15,092,576 OL4A.....13,175,342 C4I.....13,031,604		7 MHz KJ4KVC.....929 KJ4WMH.....100		MULTI-OPERATOR TWO TRANSMITTER WE3C.....12,985,334 N5DX.....5,257,616 KB1H.....5,006,925 N1LN/4.....4,511,188 KØTV/1.....4,360,755		MULTI-OPERATOR TWO TRANSMITTER IR4X.....15,092,576 OL4A.....13,175,342 9A7A.....11,873,622 RW2F.....10,104,720 HG1S.....9,658,728	
28 MHz PU2MTS.....201,983 LU6FOV.....193,860 PY1NX.....185,500		28 MHz KJ4KVC.....929 KJ4WMH.....100		28 MHz IWØHBY.....164,274 YT2B.....114,080 SV9GPV.....62,000		28 MHz IR4X.....15,092,576 OL4A.....13,175,342 9A7A.....11,873,622 RW2F.....10,104,720 HG1S.....9,658,728	
21 MHz 5B/HA5PP.....806,680 HI3K.....631,289 HG3M.....554,820		21 MHz W6AFA.....159,732 N1NK.....85,028 W9ILY.....79,897		21 MHz HG3M.....554,820 ES1LBK.....301,112 EA1CBX.....195,480		21 MHz DR1A.....20,693,196 DFØHQ.....17,542,980 9A1P.....14,807,474 YT9X.....13,336,324 LZ9W.....12,691,960	
14 MHz UK9AA.....751,518		14 MHz K2MFY.....158,877		14 MHz S57RTH.....362,934		14 MHz LZ9W.....12,691,960	

ALPHA AMPLIFIERS

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try to beat, WE3C's station in eastern Pennsylvania again took the top U.S. honors in this popular category. Drawing from Missouri and Arkansas contesters, N5DX took second place in the U.S. Third place went to Dick's team at KB1H located in far eastern Connecticut. The far west U.S. stations of NK7U and K6IDX deserve special mention for their efforts. There were several stations that put nice multipliers on the air and made big scores: YE2R, ZS9X, AH0BT, B4B, JU1DX, 4U1UN, and EE9Z. FB job! The continental winners were: North America: WE3C, Africa: AO8A, Asia: C4I, Europe: IR4X, Oceania: AH0BT, South America: PJ4K, Japan: JA1YPA, U.S.: WE3C.

Multi-Multi

Every year a select group of entrants takes on the ultimate challenge and enters the multi-multi category. Over the years MM stations have contributed greatly to contesting knowledge. Many innovations that we use originated from this category. The top world score this time was the Caribbean Contest Consortium, PJ2T. PJ2T, located at a QTH called "Signal Point," is situated on half an acre of ocean-front property within the grounds of what used to be called the Coral Cliff Hotel. What a great

job this seasoned group did from Sint Martha's Bay. The number two score in the world and number one in Europe went to DR1A. DR1A is the contest callsign of the DF0CG crew. A nice picture of their QTH appears on QRZ.com. Third place world went to the Rhein-Ruhr DX Association team at CR3L. The MM battle in the U.S. is always competitive. Repeating from 2008, K3LR took top honors. Tim's crew broke into first place over friendly rival KC1XX. Matt's team took U.S. second place honors. Third place in the U.S. went to Frank's team at W3LPL. As mentioned above, the top European score was made by DR1A. They were followed by DF0HQ, the club call of the Ilmenau Contest Club. That is perhaps the only MM club in the world that uses quads. Third place went to 9A1P, Radio Club Porec. The Chinese team B1Z made a big effort which allowed many contesters to log a new one. The JR5VHU team, from the Shikoku mountaintop QTH, showed their muscle by taking first in Japan, edging out the eastern Nara team of JA3YBK. The continental winners were: North America: K3LR, Africa: CR3L, Asia: JR5VHU, Europe: DR1A, Oceania: WH2DX, South America: PJ2T, Japan: JR5VHU, U.S.: K3LR.

Team Contesting

You can make a team with five contesters from anywhere. You can be on team and still submit your score for your local club. All you need to do is register your team anytime before the contest begins. You can submit your team list to <teams@cqww.com>. Again this year the Worldwide Young Contesters (C6APR memorial group) team took top honors. Second place went to the Yankee Clipper Contest Club team honoring the C6APR operators. Third place went to the famous Chiltern DX Club. The results of team contesting are as follows:

1. **Team WWYC (C6APR memorial group):** 4O3A (ES5TV), CR2X (OH2UA), CR6K (CT1ILT), NN3W, OY3AA (OZ1AA): 29,144,949.
2. **C6APR YCCC:** K1RX, N1SV, FS/K1XM, W1UE, K1LI: 16,115,121
3. **Chiltern DX Club:** 9M8Z (9M6DXX), GW4BLE, 5B/G3RXQ, M0GHQ, G3UEG: 13,783,423.
4. **Contest Club Finland Team Finlandia:** OH8X (OH6UM), OH4A (OH6KZP), OG6N (OH6NIO), KH6/OH7WV: 11,772,255.
5. **Florida Contest Group Globetrotters:** CX7TT (K6CT), HS0ZCW (K4VUD), KH7XS (K4XS), VP9/W3TB, K9OM: 9,761,087.

TOP SCORES IN MOST ACTIVE ZONES

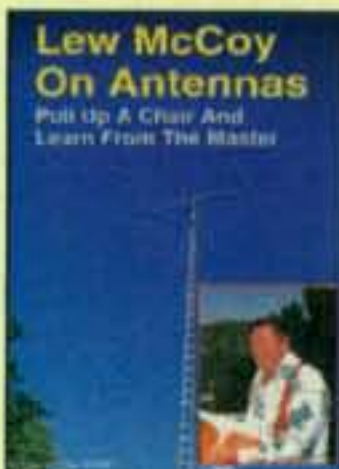
Zone 3	K1RX 3,988,912	RO4W 1,817,158
K7RL 2,557,412		UA6UDV 1,679,940
K6XX 1,301,688	Zone 14	UY0ZG 1,669,910
K5RR/7 1,233,585	CR2X 10,006,334	
K6NA 1,206,373	GW4BLE 4,622,391	Zone 20
N6OR/4 784,125	GA2MP 2,670,376	LZ3FN 2,820,853
Zone 4	EA1DR 2,532,152	OD5WPX 1,976,405
VC3O 6,606,719	PA3AAV 1,991,616	SV9CVY 1,590,408
W9RE 4,187,780	Zone 15	4X/EA5RM 1,527,708
VE3CX 1,759,320	4O3A 10,373,592	*YO3CZW 1,398,186
N8BJQ 1,489,536	S58A 5,484,636	Zone 25
K4AB 1,335,880	OH8X 4,364,312	JA0JHA 4,342,032
Zone 5	LY8O 4,030,290	JA7NVF 1,436,925
K1LZ 6,265,620	SP9LJD 3,975,482	JQ1BVI 1,320,462
K1DG 5,933,696	Zone 16	JA2PAC 1,263,100
K4ZW 4,654,793	US5D 3,583,884	JE1LFX 1,060,113
K5ZD/1 4,005,504	UA4WKW 2,358,199	

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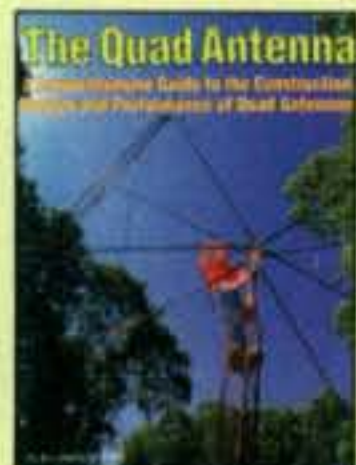


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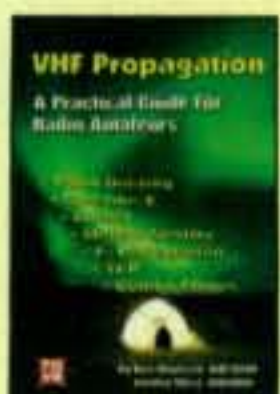


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6. Florida Contest Group Heat: K1TO, K5KG, K5RQ, N4UU or using KM4MK, N6AR: 5,929,727.

7. VK Contest Club Kookaburras: VK7ZE, VK4CZ, VK3TDX, VK6HZ, VK3TZ: 4,169,551.

8. Grupo DXXE Low Calories 1: A31KK (XE1KK), XE1GRR, XE1AY, XE3N, XE1R: 1,822,616.

9. Grupo DXXE Full Calories: XE2K, XE2AU, XE2S, XE1CQ, XE1MM: 1,715,713.

BAND-BY-BAND BREAKDOWN—TOP ALL BAND SCORES

Number groups indicate: QSOs/Zones/Countries on each band

WORLD TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
HC8A	123/13/22	446/28/76	1437/29/109	1340/35/116	2978/34/122	1567/27/76
CN2R	367/14/62	488/21/82	1218/32/113	1172/36/120	1813/34/118	1118/26/109
8P5A	153/14/30	573/19/75	1867/29/113	2165/33/113	2508/32/104	683/20/65
403A	219/10/55	776/27/87	1770/33/115	2075/38/122	2325/31/119	465/26/81
CR2X	258/13/60	695/24/86	1321/28/98	1861/30/95	3174/31/122	469/19/61

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

CN3A	92/13/60	688/23/97	1545/35/124	1872/37/135	3688/39/150	604/20/106
P33W	141/10/58	761/21/92	1727/32/124	1739/37/133	3170/38/140	1083/29/114
FY5KE	165/16/62	524/27/96	1160/34/122	1676/39/154	3366/34/143	1080/25/104

WORLD MULTI-OPERATOR TWO TRANSMITTER

A08A	115/13/62	1062/23/90	1977/32/128	2539/37/142	3947/38/153	1020/23/111
EE9Z	129/8/40	738/19/86	2085/31/114	2348/34/121	2509/34/118	1179/20/74
IR4X	156/11/57	1078/22/96	1915/37/140	2290/38/150	2785/39/151	491/26/105

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

PJ2T	327/16/62	1006/23/92	2294/31/121	2858/37/135	3201/33/132	900/21/80
DR1A	1115/17/76	2001/26/111	2984/37/146	3658/39/157	2307/39/157	734/25/102
CR3L	182/8/50	535/17/79	2213/32/119	2292/36/132	3477/33/128	829/20/79

USA TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
K1LZ	105/14/52	494/18/79	813/23/89	1364/29/108	1200/26/107	19/8/13
K1DG	114/16/57	514/20/87	465/24/90	1155/31/121	1351/26/119	36/8/15
K4ZW	43/13/31	240/18/71	737/23/90	866/34/116	1147/27/105	44/9/22
W9RE	42/10/22	152/18/66	374/28/99	1024/34/121	1102/27/114	46/8/18
K5ZD/1	45/10/22	238/14/66	494/24/90	1415/28/106	933/18/89	37/8/13

USA MULTI-OPERATOR SINGLE TRANSMITTER

W3BGN	58/12/36	179/18/76	355/28/97	841/31/126	944/29/131	42/9/23
K3EST/4	41/11/27	142/19/74	537/30/109	1374/33/128	535/29/121	6/6/6
N2IC/5	19/10/17	80/24/57	727/32/102	677/36/135	968/35/129	39/14/25

USA MULTI-OPERATOR TWO TRANSMITTER

WE3C	83/16/57	686/25/98	1340/29/117	2229/38/161	1886/32/144	92/13/39
N5DX	38/11/18	185/23/83	823/32/116	1325/36/133	992/33/131	78/9/19
KB1H	40/8/26	239/18/82	332/27/102	1408/35/120	1064/29/124	70/8/16

USA MULTI-OPERATOR MULTI-TRANSMITTER

K3LR	390/22/72	1074/28/111	1949/32/136	3223/40/174	2162/34/150	235/16/43
KC1XX	264/16/61	915/25/102	1566/31/127	2787/39/162	2355/31/146	230/13/33
W3LPL	308/19/68	895/25/104	1738/32/127	2673/38/162	1768/32/146	162/14/36

EUROPE TOP SINGLE OPERATOR ALL BAND

Station	160	80	40	20	15	10
403A	219/10/55	776/27/87	1770/33/115	2075/38/122	2325/31/119	465/26/81
CR2X	258/13/60	695/24/86	1321/28/98	1861/30/95	3174/31/122	469/19/61
S50A	102/12/52	408/23/71	1030/31/102	1355/32/98	1015/32/108	153/22/74
GW4BLE	155/11/58	510/16/67	696/25/89	1257/31/83	1013/27/94	160/17/55
OH8X	252/10/59	624/22/79	888/29/96	1858/34/116	693/31/101	58/7/30

EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

TM6M	153/15/67	853/22/99	882/36/130	2113/37/141	2241/38/141	221/21/91
E7DX	223/15/62	1034/24/94	1215/34/130	2190/39/148	1665/37/155	399/26/110
HG6N	307/10/54	904/25/102	1071/35/128	1674/37/144	2153/38/152	152/28/104

EUROPE MULTI-OPERATOR TWO TRANSMITTER

IR4X	156/11/57	1078/22/96	1915/37/140	2290/38/150	2785/39/151	491/26/105
OL4A	275/13/63	1215/24/95	1777/36/127	2927/39/154	2041/39/153	186/24/92
9A7A	260/10/60	1356/22/91	1220/35/128	2145/39/141	2404/37/150	624/24/101

EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

DR1A	1115/17/76	2001/26/111	2984/37/146	3658/39/157	2307/39/157	734/25/102
DF0HQ	1097/16/71	2363/28/109	3283/37/146	2691/39/170	1582/38/160	660/25/106
9A1P	540/11/60	1554/21/91	2828/35/125	3137/38/141	1987/37/129	1110/24/102

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BAND ACTIVE ELEMENTS

20m	2
17m	3
15m	3
12m	3
10m	3
6m	3

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10. Louisiana Contest Club Team #1: W5WZ, N5RKK, W5WMU, K5ER, NA5Q: 1,660,377.

11. Maritime Contest Club #1 Team: VA1MM, VE1OP, VA1CHP, VY2LI: 1,245,996.

12. Florida Contest Group Lakers: K5AUP, N4BU, N4DXI, W4STB: 932,760.

13. VK Contest Club Kangaroos: VK2KDP, PA0MIR, VK2BJ, VK4AN: 760,263.

14. Florida Contest Group Magic: AE4TE, N4EEB, N4WO, NF4A: 455,261.

15. Florida Contest Group Grizzlies: N4BP, W4AMS, W4ZW: 229,670.

16. Grupo DXE Low Calories 2: HK3W, XE1EE, XE2WWW, XE1YYD, TG9AJR: 203,446.

17. Louisiana Contest Club Team #2: KA5M, KC5WA, W5PEM, KB5YEG: 126,828.

18. Green Hornets: W3GH, K3RWN, KB3LVH, K3RMB, AB3GY: 97,411.

19. Louisiana Contest Club Team #3: KG5VK, K5OR: 30,661.

20. Florida Contest Group Rockets: K5WW: 14,118.

Records

Beating an existing record is a real accomplishment. Take a look at the record list at cqww.com. You might find that you have a chance to take on the personal challenge of going for a new record. If you discover an error in the record list, please document it and let us

know at <questions@cqww.com>. Below are the outstanding efforts which resulted in setting new world or continental SSB records during the 2009 contest. Congratulations!

World: A3.7 SP3GEM. **U.S.:** A7 N2ZX. **North America:** A7 N2ZX. **Africa:** 14 D44AC (IK2NCJ). **Asia:** 7 UP0L; A14 RW9USA. **Japan:** L14 JG2KKG; M2 JA1YPA. **Europe:** L7 E79D; A14 DL2ARD; A3.7 SP3GEM. **Oceania:** None. **South America:** A3.7 YV6BXN.

Special Mention

The CQ WW is a great place to pick up new QSOs for your WPX, DXCC, and many other awards. During the 2009 SSB contest there were 235 different countries in the QSO data base! The CQ WW is famous for DXpeditions. Why not make a plan and travel to a nearby country that is rarer than your own? You will be pleasantly surprised that you are now the hunted! Some of the exotic callsigns appearing in entrants' logs making the contest more interesting for all of us were:

V25Z, AA5R/C6, 8P5A, W3TB/VP9, ZF2AH, FS/K1XM, OX2A, J37K, J37T, HQ9R, TO7A, HT2N, PJ7/AH8DX, V48M, PJ7MF, IG9/I2ADN, D44AC, 3B8GT, 5R8FU, EA9IE, CN2R, CN2P, 6W1RY, S79MI, 6W1RY, 6V7Q, ST2KSS, 5H3EE, C4M, 107 Chinese entrants(!), 5B/

HA5PP, H2E, C4Z, 4X/EA5RM, XU7FMZ, 8Q7EJ, JT1ZO, JD1BIA, TA2ZAF, YM3A, TA2/DL7BC, A62ER, OH0X, OH0JFP, CR2X, OY3AA, J43J, EI/ON4EI, 4O3A, CT1JLZ, IM0/IK0FMB, GZ5Y, 9M8Z, 9M8YY, 3D2KJ, KH6LC, KH7XS, YC2VRG, KH0/JK2VOC, A31KK, R1ANY, P40A, HC8A, PZ5M, 9M6/W8AY, V31MW, J68JA, IG9S, IG9R, EA8/OH6CS, EA8CMX, 5B/G3RXQ, EA6/AA5UK, TK9R, EI/W5GN, ER4DX, IS0/K7QB, 9M6/JJ2CJB, ZL4NX, ZK2DL, DP1POL, V26B, VY2TT, TI5N, YS1YS, VP5DX, T46A, EE9K, CR3A, CQ9T, CN3A, 3DA0WW, TS9A, P33W, P39P, VR2C, 4L0A, 9K2HN, A47RS, TC7KA, 4U1ITU, V6B, AH2R, YE0X, FY5KE, AA4V/VP9, VP2V/KN5H, 4U1UN, AO8A, EE9Z, JU1DX, AH0BT, PJ4K, VP5T, KP2M, SU1KM, CR3L, OH0Z, HB0/HB9AON, and PJ2T.

Comments

The week before the contest brought a collective shock to all of us when we learned of the tragic loss of the C6APR team on their way to Crooked Island. We dedicate this CQ WW SSB Contest to the C6APR team of W2EJ, K3IXD, K4QO, and W3PP. They were following their passion for this great hobby.

For the 2009 CQ WW SSB contest we received 6065 logs, of which 5922 were electronic! In case you are wondering, that is a 17% increase in entrants over the previous year. Wow! Thanks to all the contesters around the world who sent in a log. Please send in your log no matter how small. Your effort to submit an electronic log allows for a fairer adjudication process. Submitting an electronic log is easy. Send your SSB log to <ssb@cqww.com> (CW to <cw@cqww.com>). Please send your log in Cabrillo format. If your radio has a computer interface, please submit a log with exact frequencies. Exact frequencies help in the log-checking process as well as with statistical analysis of band openings.

Before you submit your log, you can help us a great deal by double-checking your Cabrillo submission. Please make sure your category is correctly indicated. If you are submitting a single-band entry, please check that your chosen category matches what is in your log. If you did everything OK, you will get back an acknowledgment from the robot. If you are having submission problems, we can help you at <questions@cqww.com>. If you make a mistake on your first submission, you can resubmit your log. It will replace the first submission. We archive all your submissions.

The CQ WW Contest Committee provides several ways for an entrant to check his/her log



John, N8AA, took 3rd place USA low power.



Haibo, BD1TCC was #1 low power in China.

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CN-801V

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for category, club, and operator. Soon after you submit your log and long before the final results are published in *CQ* magazine, a *log received list* with your category is posted on the CQ WW site (cqww.com). Look over this list to find if your data is accurate. If it is not OK, please let us know at <questions@cqww.com>. About one month before the results become finalized in *CQ*, you will receive via e-mail a password that will allow you access to your log analysis (rpt). You can look over the report to again verify your category. You can see information concerning the CQ WW on our web page at: <http://www.cqww.com>.

Top Scores: If you plan to try to make the Top Scores box, you can count on your log being scrutinized. Running more power than the rules of your category allow, the use of undeclared QSO spotting help, the use of additional operators for a single operator entry, two signals simultaneously on the same band, or on separate bands at the same time if you are single operator, is in violation of the CQ WW rules. If you are multi-single, do not alter the times in the log to conform to the ten-minute rule. The CQ WW has at its disposal many methods to verify the score of an entrant. All the work of the CQ WW CC is to ensure a fair contest.

If you are a single operator in *any* single operator category, you cannot receive help that could impact your score in *any* way from *another person or any QSO spotting network*. Spotting yourself is against the rules. Using a QSO spotting network is OK; *just claim to be assisted*. The CQ WW has few requirements: log the callsign of the station you are talking to and follow the rules of your chosen category. For the 2009 contest our software and extensive data analysis suggested that some logs probably should be in the assisted category. We sent out a QSO spotting inquiry to over 75 stations in the Top Scores box. We asked them to confirm that they really were *not assisted*. The following stations replied yes, they were assisted: 3V8SS, E73W, EF1W, HA8BE, HI3TEJ, HK1X, IK4TVP, IT9RWB, IW7EBE, LX7I, LZ1NG, LZ2JA, LZ9X, PU2LEP, PY2WC, RV0AL, SN3X, SP4XQN, SV2DCD, UA3BS, UT7MW, UW1M, UX2X, UZ0U, YO8WW, YO9HP, YT5C, YU2A, and YU7ZZ. We wish to publicly thank each of them for their cooperation and honesty and for helping to maintain the high integrity of the Top Scores box. Their clarification helped to realize the real winners' proper standing. Everyone enters the contest to fairly compete and have fun. A fair competition means that everyone is obeying the same written rules. You can find the complete CQ WW rules at cqww.com.

There are several submission errors which you can help to correct. **MS and M2 categories:** Please indicate in the submitted log which of your transmitters is making each contact. All contesting logging programs allow transceiver designation during setup. **U.S. Location:** For U.S. entrants please make sure your operating QTH is shown correctly. We need this information to place you in the right call area within the results. **Single band entrants:** Single band entrants can make QSOs on other bands as a check log. Please submit the *QSOs made on all bands* you operate. Indicate in the comments section of the Cabrillo header that all contacts on your *non-entry* bands are to be a check log.

Thanks

Creating the results you see in *CQ* magazine is just the final product of a lot of work. Entrant log submission problems, incomplete logs, forgotten band changes not in log, incorrect call indicated as used in the contest, and a myriad of other subtle problems are sorted out behind the scenes. Using an armamentarium of log-checking tools and data sources, the CQ WW Contest Committee has done its best to certify the winners.

The members of the CQ WW CC who provided insight into many contesting topics are: CT1BOH, EA3DU, ES5TV, DJ6QT, DL6RAI, E21EIC, ES5TV, F6BEE, G3SXW, JE1CKA, K1AR, K1DG, K3LR, K3WW, K3ZO, K5TR, K5ZD, K6AW, KM3T, KR2Q, KT3Y, LY3BA, N2AA, N2NC, N2NT, N3ED, N5KO, N6AA, N6TR, N6TW, N8BJQ, N9RV, OH6LI, PA3AAV, PY5EG, S50A, VA7RR, VE3EJ, W3ZZ, W5OV, W6OAT, W0YK, and ZS4TX. A special thank you to Ken, K1EA, who spent countless hours making the CQ WW database the best in contesting. Thanks as always to John, K1AR, and Tim, K3LR, for their advice. We want to thank Barry, W5GN. Barry has provided the machinery to send certificates to you in a timely manner. Over many years, Larry, N6TW, has been a solid rock in contributing to the results of the CQ WW. Larry, congratulations on your CQ Contest Hall of Fame induction in May 2010! Finally, we want to thank Sergio, EA3DU, as he leaves the CQ WW CC, for his 14 years of help. He has helped solve numerous problems behind the scenes.

Congratulations to all the winners and entrants! CU in the 2010 contests!
73, Bob, K3EST

(Continued on page 101)

In case you didn't make it to Dayton, or even if you did but couldn't see everything, here is our annual look at the new products introduced at this year's show, starting with transceivers, amplifiers, and receivers.



The 2010 Dayton Hamvention® Safari – Part I

BY JOHN WOOD,* WV5J

Ah, Dayton! It's heady wine for ham radio aficionados who love to make new friends, visit with old friends, and see all the new products unveiled by manufacturers at this annual gathering that has been called the largest event of its type in the world.

Seeing all the new products displayed was our goal on the third and final day of this 59th annual Hamvention®. The CQ team of Advertising Manager Don Allen, W9CW, Editor Rich Moseson, W2VU, and "What's New" columnist, John, WV5J, gave up our entire Sunday morning in ham radio Nirvana just to find for you, dear reader, the best and newest that amateur radio manufacturers officially debuted at the big show.

For the sake of organization, we'll start this article with HF transceivers and amplifiers and then check out VHF/UHF mobile rigs and handhelds,

before ending our tour with stand-alone receivers. Thus, let the tour begin...

HF Transceivers

ICOM IC-9100. Promoted by ICOM as "The All-Around Transceiver," the IC-9100 could very well be the answer for the majority of hams wondering how they can enjoy a lot of what amateur radio has to offer when their budget says they can only afford to purchase one HF rig. This radio covers the ham HF bands (from 160 to 10 meters), plus 6 and 2 meters, all with 100 watts; 430–450 MHz with 75 watts; and 1.2

GHz (with optional UX-9100 unit) with 10 watts; and handles SSB, CW, RTTY, AM, and FM modes. It also comes with dual independent 32-bit DSP double-conversion superheterodyne receivers, a multi-functional display, an out-of-the-box capability for satellite operation and RTTY (without the need for a PC or other external unit), and has a built-in voice synthesizer and automatic antenna tuner for HF to 6 meters. The IC-9100 also accepts optional equipment for D-STAR and GPS position-reporting function. Pricing for this transceiver has not been released. For additional information, visit <www.icomamerica.com>.

Yaesu FT DX 5000. One of the most visually impressive HF transceivers displayed at this year's Hamvention® was the Yaesu FT DX 5000. This is Yaesu's new series of premium-class amateur HF radios, which come in three versions: the FT DX 5000, 5000 MP, and 5000D. All three receive 30 kHz to 60 MHz, transmit 10 to 200 watts CW, LSB, USB, FM, RTTY, and packet (5 to 50 watts in AM mode) from 1.8 to 29.7 MHz, plus 50–54 MHz. The SM 5000 Station Monitor is included with the MP and D models, but it's listed as an option



ICOM's new IC-9100 covers the HF ham band plus 6/2 meters, 70 cm, and with an add-on board, 1.2 GHz.

*New Products Editor
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TN 38139
e-mail: <wv5j@cq-amateur-radio.com>
(Note: This article replaces this month's
"What's New" column)



THE NEW 10-30LP12 LOG PERIODIC



The 10-30LP12 removes the concern many share regarding the complexity and cost of other multiband antennas. This Higher Performance log periodic covers every frequency..instantly, from 10 to 30 MHz ! Just one feedline is all you need to access this flawless feature. From moments after it was installed at the M2 test facility on the West Coast, U.S.A., stations in Europe were contacted using just 100W on 17M, 15M and yes, 12M. This antenna is definitely a band opener.

M2 has done everything possible to keep cost down and performance up. This standard version is built for 80 plus MPH winds and years of no maintenance, trouble free performance. For those who don't need 30M, we designed it without the rear element and boom section. It becomes the 13-30LP11 with the same specifications, less 30M on a 37 ft. boom. An optional kit will add the boom and rear element if you need the full coverage.

THE NEW 6M-1000 SOLID STATE AMP



The 6M-1000 represents the culmination of many years of solid state amplifiers designed by Ken Holladay, K6HCP (KLM, Mirage and RF Concepts). Physical size and weight are the smallest ever for this kW amp. When combined with a lightweight switching power supply at 7-10 lbs, the 6M-1000 is perfect for DXpeditions and field day operations. It will make a great addition to any home station as well. EME and Meteor scatter usage are capable with either CW or the very popular JT6M & JT65A. Full power output of 1 kW for 50 seconds using JT65A should be possible for hours. Two temperature controlled whisper fans cool the finned heat sink and will cycle on and off as needed. If external preamp and relays are used, the amp supplies 12VDC and also sequences a N.O. key line.

COMING SOON 2 METER 1KW AMPLIFIER !



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WORLD CLASS PRODUCTS



The Yaesu FT DX 5000 comes in three different models and is built for the serious ham. It covers HF plus 6 meters.

for the basic FT DX 5000. All three come with two crystal roofing filters (600 Hz and 3 kHz), two independent receivers, and a high-speed automatic digital antenna tuner. Yaesu has available a raft of unique options and accessories that are, as the brochure explains, "designed to meet the demands of serious amateur radio operators." Street pricing for this unit starts at approximately \$5,500. For more information, go to <www.yaesu.com>.



Kenwood has a new HF rig on the market. The TS-590 HF+6 transceiver is expected to be available this fall.

Kenwood TS-590. Kenwood was also showing its newest HF transceiver during the Hamvention®, the TS-590, but there was only a prototype to see and touch, and very little information about the rig was available. We were able to find out that the transceiver offers digital signal processing, 100-watt output, an automatic antenna tuner, and a dual conversion receiver. It covers 160 to 6 meters and functions in modes CW, LSB, USB, AM, FM, and FSK. Kenwood officials tell us the radio is expected to ship in late August and be in the stores by October. So far, the MSRP has not been released, but a "street price" around \$1800 is expected. As more information about the TS-590 becomes available, we'll relay it to you in the pages of CQ's monthly "What's New" column. Also go to <www.kenwoodusa.com>.

Flex-Radio 1500. One of the most interesting radios we looked at during our Dayton tour was Flex-Radio's new



The new Flex-1500 from FlexRadio is a QRP SDR, or low-power software-defined radio. It puts out 5 watts on the HF ham bands plus 6 meters.

Flex-1500 HF-6m, 5-watt, software-defined transceiver. Like most SDRs, the display on the computer screen is more attractive than the small (2.4" high x 4" wide x 7" deep) box that is the actual radio, especially with Flex Radio's new version 2.0 PowerSDR software. Interfacing the radio with your computer is done easily through a USB 2.0 cable. Priced at under \$700, the 1500 lets you operate SSB, CW, AM, FM, and digital modes while it receives from 490 kHz to 54 MHz. On the 1.5-pound radio are connections for an RJ-45 microphone, headphones, CW key, antenna out, computer interface, transverter, ground, 10-MHz reference signal in, and 13.8 volts DC input. Dominating the PowerSDR screen is the spectrum display which can also serve as a PSK waterfall, while around it are on-screen buttons to select numerous receive and transmit parameters, including frequency, mode, and VFO choice. For more information, visit <www.flex-radio.com>.

Ten-Tec QRP Transceivers. Our Ten-Tec friends from Sevierville, Tennessee unveiled a pair of two-band, CW QRP transceivers at this year's Hamvention® designated as R4020/R4030. The R4020 covers 40 and 20 meters, while the R4030 covers 40 and 30 meters. As simple, lightweight, palm-of-your-hand, trail-friendly dual-band transceivers, these Ten-Tec units offer a surprising package of features such as a bright, easy-to-read LCD display that informs you of frequency, mode, supply voltage, S-meter, RIT, and more, plus a powerful DDS electronic synthesizer that gives you 5–16 MHz for general-coverage receiving, a convenient 20-frequency memory bank, low current consumption at 55 mA on receive or about 550–950 mA on transmit depending on supply voltage, built-in adjustable keyer with automatic CQ and callsign insertion for memory keying, a connection for a straight key or your favorite key paddle, 8-ohm headphone output (requires stereo plug), and an RIT (receive incremental tuning)



Also in the QRP category is a pair of new dual-band transceivers from Ten-Tec. The 4020 (pictured) covers 40 and 20 meters; the 4030 covers 40 and 30!

that allows for 10-Hz or 100-Hz tuning. Each QRP rig is priced at \$249 and more information about both can be found at <www.tentec.com>.

Alinco DX-SR8. After apparently focusing on improving its USA line of VHF and UHF HTs for the past few seasons, Alinco surprised a few of its followers at Dayton this year with the debut of its new HF transceiver, the DX-SR8. Featuring a detachable front control panel and a size that can fit on your shelf as easily as it can go into a car or boat, the Alinco DX-SR8 transmits 160 to 10 meters including the 5.3 MHz band (T model only). Covering SSB, CW, and FM with 100 watts power and AM with 40 watts, and a general-coverage receiver that listens from 135 kHz to 30 MHz, the DX-SR8 also comes with a large digital readout, front-firing speaker, and a front-panel keypad for direct frequency input. Retail pricing has not yet been released, but more information about the DX-SR8 can be found at <www.alinco.com>.



Alinco's first new HF entry in several years is the 160- to 10-meter DX-SR8. It includes a general-coverage receiver that tunes down to 135 kHz.



TAPR's Hermes transceiver is a 'high-performance software-defined radio' (HPSDR) putting out 15 watts on 160–20 meters.

TAPR Hermes. Over at the TAPR booth, folks were showing off their new Hermes transceiver. Billed as a "high performance software defined radio," the Hermes covers DC to 16 MHz with a maximum output power of 15 watts. It's designed for techies who like to tinker and features open-source software architecture. No definite pricing figures were available, but more information about the Hermes is; just visit www.openHPSDR.org.

HF Amplifiers

Alpha 8406. Six-meter enthusiasts who attended the Dayton Hamvention® this year had a reason to stop by the RF Concepts booth if they wanted to get a glimpse of the new Alpha 8406 1.5-KW, 6-meter amplifier. Designed specifically to operate from 50 to 54 MHz, the Alpha 8406 draws its power from one 4CX1500B tetrode and utilizes manual



Tokyo Hy-Power's HL-550FX puts out 600 watts on 160–6 meters and weighs only about 20 pounds.

tuning. Price for this band-specific amplifier as shown on the RF Concepts website, www.rfconcepts.com, is \$4250.

Tokyo Hy Power HL-550FX. With 6 meters gaining in popularity and more and more HF transceivers including the "magic band," it's no surprise that the engineers at Tokyo Hy Power have developed the HL-550FX all-solid-state, 600-watt linear amplifier to cover 1.8 to 54 MHz and handle SSB, CW, and RTTY. What is surprising is that this no-tune amp comes with forced-air cooling and a number of high-speed protection circuits in case of overdrive, high SWR, and DC over-voltage, all packed into a compact, lightweight 20-pound package. On the front is an analog multimeter that shows forward output power and reflected power, along with voltage and current draws. The sale price for this versatile unit is \$2400, and it's expected to be ready for distribution beginning in September. For more information, visit www.tokyohypower.com.

Elecraft KPA-500. There was lots of activity all weekend at the Elecraft booth, with a large number of visitors expressing interest in seeing the prototype of the KPA-500, Elecraft's new



The Alpha 8406 is a 6-meter-only amplifier, generating up to 1500 watts of output.



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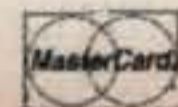
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3CX1500A7	4CX800A	572B	3-500ZG
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3CX3000A7	4CX1500B	810	M338/TH338
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Elecraft has entered the standalone amplifier market with its 1.8–54 MHz solid-state KPA-500 that, logically, puts out 500 watts.

solid-state, 500-watt, diode-switched amplifier which operates from 1.8 to 54 MHz. The KPA-500 features auto-band select and reportedly works with any HF radio. A price has yet to be set for this new arrival, but Elecraft officials expect to be taking orders by the holidays and hope to ship units before January 2011. For more information visit <www.Elecraft.com> on the web.

SPE Expert 2K-FA. Yes, a 2-KW linear amplifier was on display at the Dayton Hamvention®, thanks to the folks at RF Concepts and SPE, and they described it as “the most advanced solid-state automatic linear amplifier in the world.” Priced at \$9395, the SPE Expert 2K-FA operates on HF and 6 meters (1.8 to 54 MHz) and works with most of the HF radios on the market today. This unit is fully automatic and capable of continuous operation. It features an advanced switching power supply, a built-in automatic tuner, and a USB port for PC control and for downloading software upgrades. For more information visit <www.rfsolutions.com.au>.

Yaesu VL-2000. On display at the Yaesu booth at Dayton but not expected to be available for sales until the Christmas holidays was the company's

new VL-2000 linear amplifier. Teamed with the matching VP-2000 power supply, the VL-2000 makes for a formidable station addition, since it has a built-in antenna tuner and provides the full legal limit for amateur transmission on the 160 to 10 meter bands plus 6 meters. The MRSP for the VL-2000 was not available at the time, but additional information should show up online soon at <www.yaesu.com>.

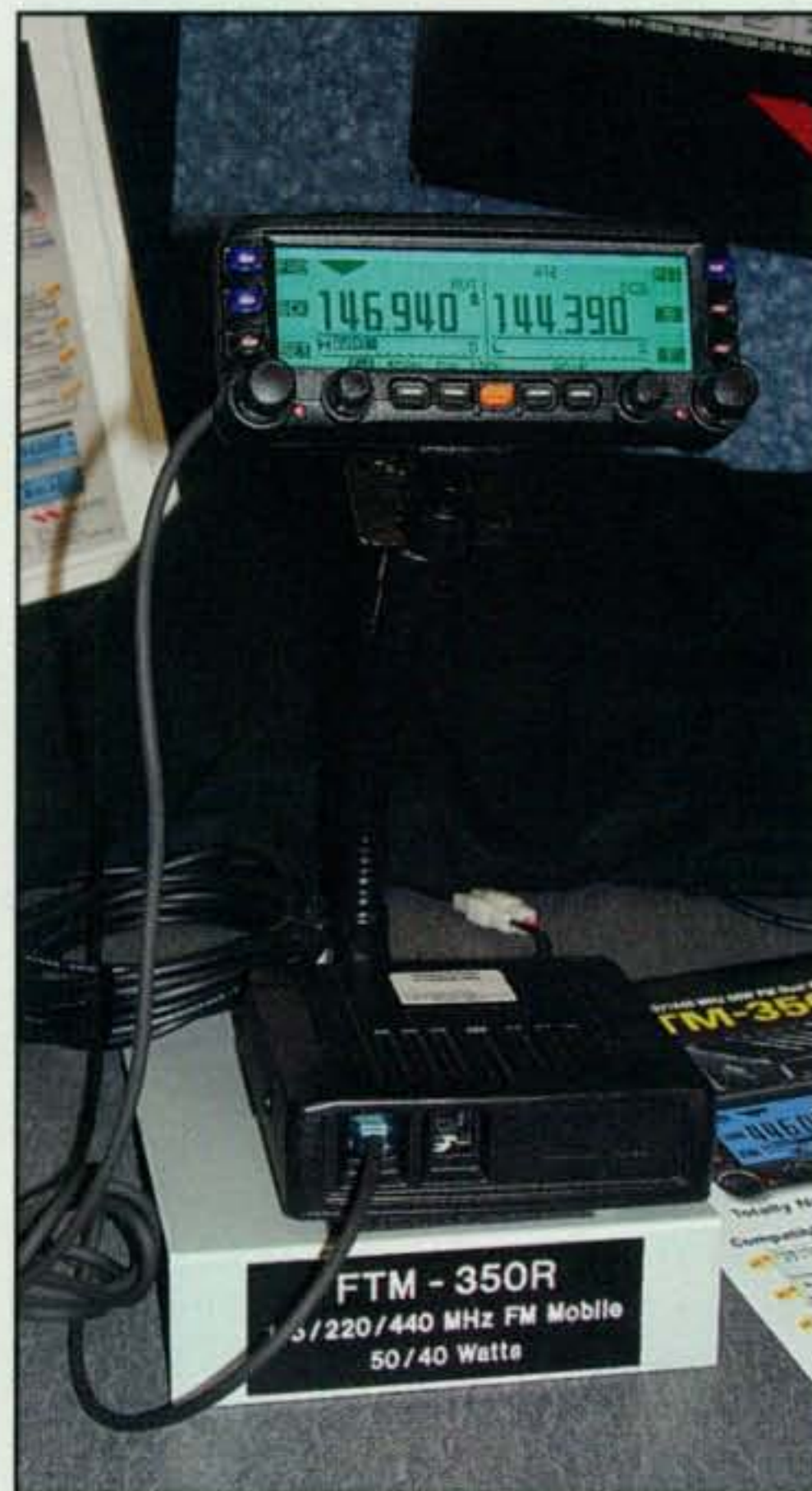
VHF/UHF Mobile

Yaesu FTM-350R. It does seem like multi-band, multi-feature ham mobile rigs just continue to be more complicated, more powerful, and more advanced technologically, doesn't it? Case in point is the Yaesu FTM-350R—the only new VHF/UHF mobile seen at this year's Hamvention®. It features a large LCD display in a detachable front panel, 50-watt power output, APRS and Bluetooth® capabilities, and a receiver with a range of 108 MHz to 1000 MHz, plus the AM and FM commercial broadcast bands. (There are even two speakers for FM stereo reception.)

The FTM-350R transmits on the VHF and UHF ham bands with your choice of 50, 20, or 5 watts plus 1 watt on the 222-MHz band, while the front panel gives you barometric-pressure readouts on command, numerous APRS displays, and a choice of eight LCD backlight colors. It also comes with a built-in mic and a PTT key in case you misplace your hand microphone. Street sale price for this Yaesu varies from \$550 to \$600. For additional information, visit <www.yaesu.com>.

Handhelds

Kenwood TH-D72 (or similar). With a promise of the rig being on the market “soon,” Kenwood reps at Dayton showed off the company's next 5-watt, dual-band (2 meter and 440 MHz) HT which has tentatively been labeled the



The Yaesu FTM-350 is only new VHF/UHF FM mobile rig introduced at this year's Hamvention®. It lets you listen to your favorite AM or FM broadcast station while simultaneously listening for activity on your favorite ham frequency.



If you really need serious power, SPE has introduced its 2-kilowatt solid-state amp for 160–6 meters, the Expert 2K-FA.



Kenwood's newest handheld for 2 meters and 70 centimeters includes a built-in TNC and APRS software as well as an integrated GPS receiver for sending out your exact location on APRS.

MFJ Balanced Line Antenna Tuner

Superb balance . . . Very wide matching range . . . Covers 1.8-54 MHz . . .
Cross-Needle SWR Wattmeter . . . Handles 300 Watts . . . Compact size . . .

The MFJ-974HB is a fully balanced true balanced line antenna tuner. It gives you superb current balance.

Johnson Matchbox

For decades, the Johnson Matchbox has been the standard of comparison for balanced line antenna tuners. But, it had a severely limited matching range and covered only 80, 40, 20, 15 and 10 Meters.

The MFJ-974HB is its successor. It meets today's needs and even surpasses the Johnson Matchbox outstanding performance.

Everything You Need

The MFJ-974HB gives you excellent current balance, very wide matching range (12-2000 Ohms) and covers 1.8 through 54 MHz continuously including all WARC bands, 160 Meters, 6 Meters and the new 60 Meter band. Handles 300 Watts SSB PEP and 150 Watts CW.

Tuning is fast and easy - just three tuning controls. You can adjust for highly efficient broadband low-Q operation or use higher Q when you encounter extreme loads.

A large three-inch lighted Cross-Needle SWR/Wattmeter lets you read SWR, peak or average forward and reflected power all at a glance on 300/60 or 30/6 Watt ranges.

A ground post is provided to ground one output terminal so you can also tune random wires and coax fed antennas.

Compact 7½Wx6Hx8D in. fits anywhere.



Tunes any Balanced Line

The MFJ-974HB tunes any balanced lines including 600 Ohm open wire line, 450/300 Ohm ladder lines, 300/72 Ohm twin lead - - shielded or unshielded.

Superb current balance minimizes feed-line radiation that can cause troublesome TVI /RFI, painful RF bites, mysterious RF feedback problems and radiation pattern distortion.

Excellent Balance, Excellent Design

The MFJ-974HB is a fully balanced wide range T-Network. Four 1000 Volt air variable capacitors are gear driven. A high-Q air wound tapped inductor is used for 80-10 Meters with separate inductors for 6 and 160 Meters. The tuning components are mounted symmetrically to insure electrical balance.

MFJ-974HB
\$209⁹⁵

A 1:1 current balun is placed on the low impedance 50 Ohm input side to convert the balanced T-

Network to un-balanced operation. An efficient balun is made of 50 ferrite beads on RG-303 Teflon™ coax to give very high isolation. It stays cool even at max power.

Balanced Line = Extremely Low Loss

Balanced lines give extremely low loss. Doublet, horizontal loop, vertical loop, quad, double extended Zepp, Lazy H, W8JK antennas all give efficient multi-band operation when fed with balanced lines.

6-80 Meter Balanced Line Tuner

MFJ-974B
\$189⁹⁵

MFJ-974B, \$189.95. Same as MFJ-974H but for 6-80 Meter operation (no 160 Meters).



160-6 Meters All Band Doublet Antenna

MFJ-1777, \$59.95.

102 feet doublet antenna covers 160-6 Meters with balanced line tuner. Super strong custom fiberglass center insulator provides stress relief for 450 Ohm ladder line (100 feet included). Authentic glazed ceramic end insulators. Handles 1500 Watts.



MFJ 1500 Watt Fully Balanced Antenna Tuner

Fully balanced MFJ-976 handles 1500 Watts legal limit . . . Extra-wide 12-2000 Ohms matching range . . . continuous 1.8 to 30 MHz coverage including all WARC bands . . . Four separate 500 pF in two gangs gives you a total of 2000 pF capacitance . . . Heavy duty 1:1 current balun . . . more!



MFJ-976
\$499⁹⁵

The MFJ-976 is a 1500 Watt Legal Limit fully balanced antenna tuner.

You get superb current balance, very wide matching range (12-2000 Ohms) and continuous 1.8-30 MHz coverage including all WARC bands. Handles full 1500 Watts SSB and CW.

You can tune any balanced lines including 600 Ohm open wire line, 450/300 Ohm ladder lines, 300/72 Ohm twin lead - - shielded or unshielded. Also tunes random wires and coax fed antennas.

MFJ's fully balanced extremely wide-range T-network gives you simple, fast three knob tuning. No complicated switching be-

tween high and low impedance and switching in additional capacitance of L-networks.

Four separate 500 pF in two gangs gives you a total of 2000 pF for highly efficient low loss operation on 160 Meters.

You get superb 10 Meter performance due to MFJ's low minimum capacitance and exclusive Self-Resonance Killer™ high-Q AirCore™ roller inductor with silver plated contacts.

Heavy duty 1:1 current balun gives you superb balance and stays cool even at 1.5kW.

True active peak reading lighted Cross-Needle SWR/Wattmeter lets you read SWR, true peak or average forward and reflected power all at a glance on 300/3000 Watt ranges. 12Wx6Hx15¾D inches.

Ladder line, Twin lead, Insulators, Copper wire . . .

Super-strong fiberglass 450 Ohm ladder line insulators

MFJ-16D01, \$8.95. Center insulator. Double weave ladder line stress-relief. Strong wire tie points. Hang hole.

MFJ-16E01, \$9.95. Feedpoint End Insulator. Double weave ladder line stress relief. Built-in SO-239 connector.

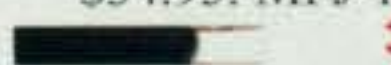
MFJ-16F01, \$8.95. Middle insulator. High-strength coax connection at mid-point with SO-239, quadruple weave-through ladder line stress relief.

MFJ-16C06, \$4.56. Authentic glazed ceramic Insulator, 6-pack.



450 Ohm Ladder Line

Extremely low loss, open-frame construction. Heavy duty black polyethylene. Solid 18 gauge wire. MFJ-18H050, 50 Ft., \$19.95. MFJ-18H100, 100 Ft., \$34.95. MFJ-18H250, 250 Ft., \$89.95.



300 Ohm Twin-Lead

20 gauge stranded copper wire. Black polyethylene. MFJ-18T050, 50 Ft., \$24.95. MFJ-18T100, 100 Ft., \$44.95. MFJ-18T250, 250 Ft., \$99.95.



Copper Antenna Wire

Flexible, 7-strand, 14 gauge, hard solid-copper wire. Strong/long-lasting.

MFJ-18G100, 100 Ft., \$24.95. MFJ-18G250, 250 Ft., \$59.95.

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MFJ . . . The World Leader in Ham Radio Accessories

Kenwood TH-D72 Data Communicator. Looking a lot like its predecessor, the TH-D7A, with a 16-button keypad and a similar multi-function disk control on the front, the radio Kenwood showed us comes with a built-in TNC (1200/9600) and has APRS capabilities, but this one also comes with an integrated GPS receiver. Again, like the TH-D7A, this new unit works with Kenwood's Skycommand System II+ when used with the TS-2000 series. The TH-D72 also offers EchoLink memory compatibility and comes with a mini-USB connector for enhanced computer connectivity. No price points were hinted at, but additional information should show up soon at www.kenwoodusa.com.

Yaesu VX-8DR, VX-8GR. Yaesu was also showing its 5-watt APRS-capable HTs at this year's Hamvention® with the latest derivatives of the VX-8R—the VX-8DR and VX-8GR. The VX-8DR was recently announced as an improved APRS version of the now discontinued four-band VX-8R, while the VX-8GR is a 2-meter and 440-MHz FM APRS-capable dual-bander that also comes with a built-in GPS unit.

The VX-8DR transmits on the 6-meter, 2-meter, and 224 and 440-MHz ham bands and can monitor two ham frequencies simultaneously via two independent receivers while it also lets you listen to commercial AM and FM broadcasts. Along with APRS capability (optional GPS antenna required), the VX-8DR also has a general-coverage receiver, Bluetooth® capabilities, and is advertised as waterproof, submersible to 3 feet for 30 minutes.

The VX-8GR also comes with a general-coverage receiver with a range from 108 to 899 MHz and proclaims the waterproof label like its VX-8DR brother. The manufacturer's suggested retail price for the VX-8GR (two bands, plus GPS) is \$540; MSRP for the VX-8DR (four bands plus GPS and APRS) is \$566. Dealer prices generally are lower. For full specs and additional information, visit www.yaesu.com. To order, visit your favorite Yaesu dealer (see our review in last month's CQ).

ICOM IC-T70A, IC-V80. Rugged and basic with lots of audio is the image ICOM chose to convey about two of its newest HTs on display during Hamvention® 2010—the IC-V80 VHF handheld and the IC-T70 dual-bander.

The two radios are almost exactly the same size, while other specs vary slightly: The 2-meter IC-V80 is touted to have 5.5 watts output, 750 mW of audio, and weighs 12.7 ounces with the BP-264 NiMH battery pack and antenna, while the IC-T70 transmits 5 watts of RF, weighed in at 13.4 ounces with BP-264 Ni-MH battery pack and antenna,



The IC-T70A is one of two new HTs introduced by ICOM. It covers 144 and 440 MHz, while the IC-V80A is a single-band rig for 2 meters.

and produced 700 mW of audio out on both the VHF and UHF bands. Both handhelds have credentials for sporting the rugged label by meeting IP54 standards for dust protection and water resistance while also passing Mil-Std. 810 environmental tests.

Other common features for both radios include: WX channel and WX alert

functions, direct keypad frequency entry, PC programmability, internal VOX function, auto power off, an LCD backlight, and automatic repeater function.

Approximate street price for the IC-T70 dualbander is \$220, while the IC-V80 goes for around \$140. For more information, visit www.icomamerica.com.

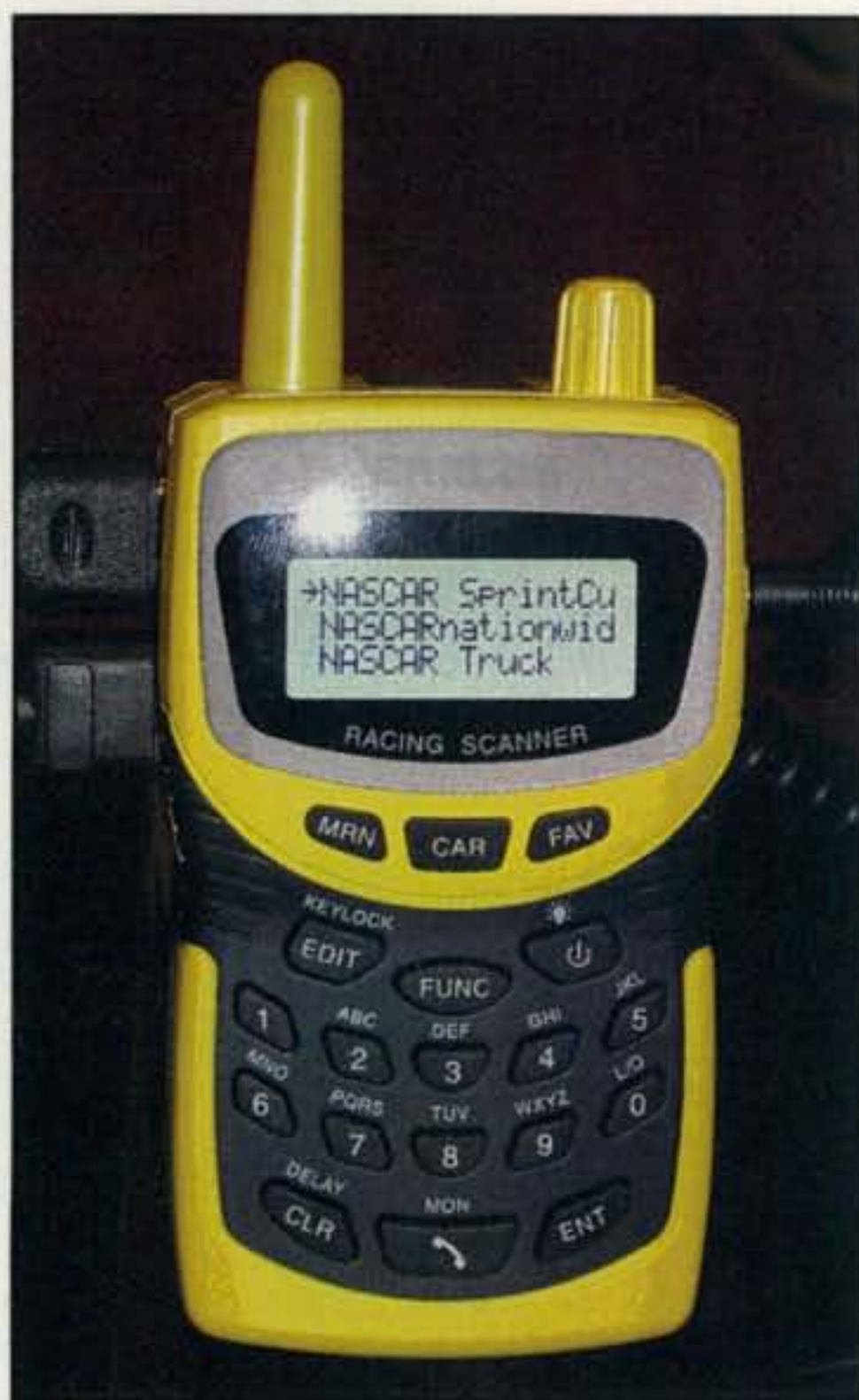
Receivers and Scanners

Alinco DJ-X11 Portable Receiver. With a main band coverage of .05 to 1,299.99995 MHz and the capability to receive AM, FM, WFM, CW, and SSB modes, Alinco's new DJ-X11 portable receiver lives up to its tag line that says buyers will be "getting the power of a desktop in a handheld radio."

Pocket-size at 2.4 inches wide, 4.17 inches tall, 1.5 inches deep and weighing in at a scant 8.29 ounces, this radio is big in features, including two VFOs, preset, programmed, memory, VFO and tone scanning modes, a PC interface for cloning and real-time control software (available free at alinco.com), selectable tuning steps, a large illuminated keypad and LCD display screen, an optional wire remote control, and an 1800-mAh rechargeable Li-Ion battery pack that provides approximately 15 hours of operation. The DJ-X11 also comes with ChannelScope, which checks signals on nearby frequencies for both receivers and also a feature that Alinco calls "Bug Detector," which searches for hidden transmitters. The basic DJ-X11 is street priced at around \$400, but with it in the box you'll find a whip antenna, instruction manual, belt



MFJ has entered the scanner market with two models, the MFJ-8310 desk scanner and the MFJ-8322 handheld analog trunking scanner.



Racing fans will enjoy the GRE PSR-110 race scanner, which comes pre-programmed with the frequencies most commonly used in major auto races around the U.S.

clip, drop-in charger, hand strap and an AA power case. For more information visit <www.alinco.com>.

ICOM IC-R6 Portable Receiver. ICOM updates its portable receiver line with the addition of the IC-R6, another pocket-size package that picks up AM, FM, and WFM signals from .1 to 1309.995 MHz. Small but rugged and packed with features, this 7.1-ounce package offers 100 channel-per-second high-speed scanning, 1300 memory channels in 22 banks, up to 15 hours of operation from its supplied NiMH rechargeable battery, and an innovative capability ICOM likes to call "Voice Squelch Control," which opens the squelch only when a modulated signal is detected and ignores unmodulated beat noise. Listeners who are scanning for talk, news, or music may find this feature useful to filter out unwanted data bursts and beacons. Prices on the web for the IC-R6 are in the neighborhood of \$260, and for that amount you also get NiMH cells, a belt clip, AC adapter, antenna, and handstrap. For more information, check first at <www.icom-america.com>.

MFJ-8310/8322 Scanners. Scanners also made their first appearance ever at the MFJ booth at this year's Hamvention® with two models being placed on display—a base scanner designated as the MFJ-8310 and priced

at \$99, plus a handheld trunking scanner listed as the MFJ-8322 and priced at \$199.95.

The base scanner receives ham repeaters and public-service broadcasts originating in the usual bands—29 to 54 MHz, 108 to 174 MHz, and 380 to 512 MHz—and comes with a one-touch weather information button. It can also decode digital S.A.M.E. codes so can hear a weather alert if one is issued for your area.

The handheld scanner, according to MFJ, tracks analog Motorola type I, type II and hybrid, EDACS, and LTR systems. It is PC programmable, can store up to 1000 frequencies in memory, and receives signals emanating in the 25-54 MHz band, from 108 MHz to 174 MHz, from 216.0025 MHz to 512 MHz, 764 MHz to 960 MHz, and 1240 MHz to 1300 MHz. It functions on four user-supplied AA batteries (either alkaline or NiMH) and comes with an AC adapter and flex antenna.

GRE PSR-110/700 Handheld Scanners. GRE America, which is now the U.S. distributor for Alinco, was also showing off two of its newest GRE-brand handheld scanners. The real eye-catcher was the bright yellow and gray PSR-110 Race Scanner for auto-racing fans. It covers the 450–470 MHz band and features one-touch MRN Channel Access and search, upgradeable car number, frequency and driver data, plus full dot alphanumeric, backlit display. The frequencies in use by six popular racing series are pre-programmed. All the listeners need to do (you can plug in two headsets) is pick the track at which they are and tune in. The PSR-110 Race Scanner has an MSRP of \$149.

GRE's second scanner first shown at Dayton this year was the PSR-700 EZ-Scan-SD. Sporting a six-line LCD display and only six buttons on the front panel of a 5-inch tall, 2.5-inch wide, basic black case, its appearance is deceptive for the capabilities it offers. What is inside is a 2-GB SD card that comes pre-programmed with the entire U.S. database for all known analog trunking systems and conventional frequencies used by public-safety agencies, businesses, and governments. To monitor the frequencies in use in your area, all you need to do is scroll through the library, select your city or county, and tell the radio to scan. MSRP for the PSR-700 is \$229. For more information, visit <www.gre-america.com>.

Looking Ahead

In part two of our 2010 Dayton Safari, we'll look at the newest offerings among antennas and accessories for your ham shack. Stay tuned...

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Timeline of Ham Radio History 1945–2010

To help celebrate CQ's 65th anniversary, we've put together a timeline of significant events in ham radio history from 1945 to the present. Each month this year, we'll present five or six years' worth, and then put the whole list on our website when we're done. (Since this is a timeline and not a textbook, we had to be selective. We apologize in advance if we leave out something of importance to you.)

This month, we'll cover the years 1985–1990:

1985: FCC adopts policy, known as PRB-1, requiring "minimum practicable regulation" of amateur antenna towers and that municipalities "reasonably accommodate" amateur operation. Ruling does not apply to private land use reg-

ulations, including CC&Rs, and these restrictions continue to pose a major threat to ham radio operation in many areas; Tony England, W0ORE, has first SSTV QSO from space, aboard shuttle Challenger; 12 meters and 902 MHz opened for ham use.

1986: Japan launches its first amateur satellite, Fuji OSCAR-12; in the U.S., 3500 hams participate in Hands Across America event; CQ establishes Contest Hall of Fame.

1987: FCC adopts Novice Enhancement, giving Novices (as well as Technicians) some voice privileges on 10 meters; Novices also get access to 220 and 1296 MHz; FCC splits Tech/General theory exams, pre-1987 Techs retain credit for General Class theory; FCC proposes reallocating 220–222 MHz to Land Mobile Service.

1988: OSCAR-13 launched; it was second, and to date, last, successful high-orbit ham satellite (OSCAR-40, launched in 2000, suffered an explosion in orbit and became disabled).

1989: 17 meters—last of the so-called WARC bands approved a decade earlier—opened to hams; ARRL celebrates 75th anniversary; ARRL, QCWA, and others petition FCC for a code-free entry-level ham license.

1990: ham radio magazine ceases publication and is purchased by CQ; *Communications Quarterly* launched by CQ as "spiritual successor" to ham radio; first WRTC (World Radio Teamspirit Championship) held in Seattle, won by K1AR & K1DG.

Next month, we'll look at 1991 through 1995, featuring the code-free Technician license, the "pizza rule," and CQ's 50th anniversary.

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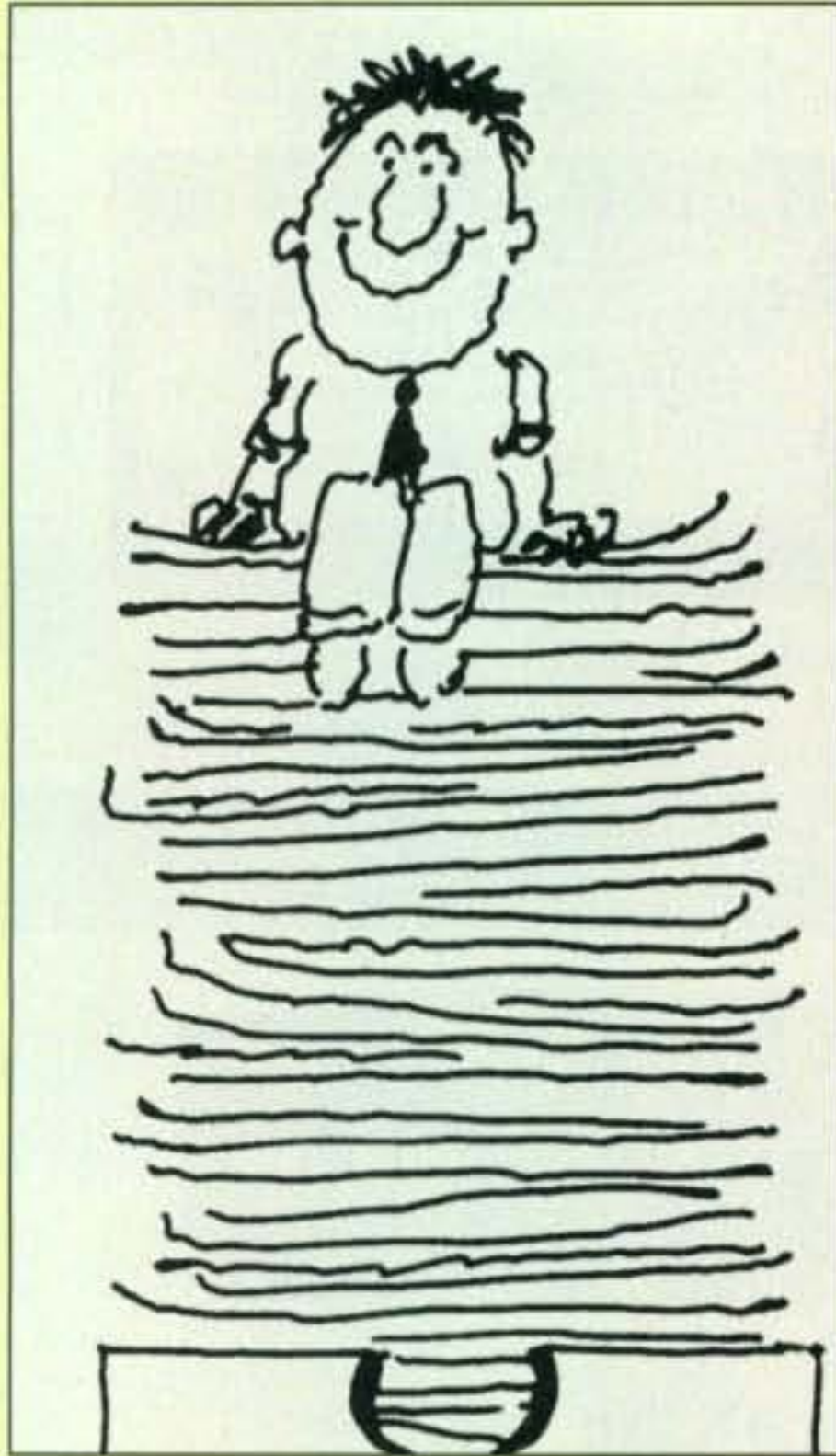
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What You've Told Us...

Our May survey asked about your use of social networking sites on the internet (while fully recognizing that ham radio is the *original* social networking "site"). To start with, 92% of the readers who replied have internet access, and a surprisingly high 37% belong to at least one social networking site. Of that group, 87% belong to Facebook, 22% each have accounts on LinkedIn and Twitter, 15% are on MySpace, and 16% belong to another networking site.

Among the social network members, 28% log in "just here and there," while 19% check in about once a day, 18% each log in either more than once a day or a few times a month, and 16% check in a few times a week. The bulk of you have a variety of acquaintances on these sites, with 27% saying you contact mostly family, 13% mostly non-ham friends, 10% mostly ham friends, 6% mostly people from work, and 45% reporting a combination of those groups.

On the question of your main motivation in using these sites, 52% of you say it's to keep in touch with family and friends, 8% each for meeting and networking with fellow hams and networking for work, 28% a combination of those groups, and 5% have other, non-specified, reasons. Finally, 22% of the social networking readers are registered as fans of the *CQ* magazine page on Facebook (25% of those identifying themselves as Facebook members).

Thank you for your responses. This month's free subscription winner is J.E. Palmer, KA5UUN, of Mt. Ida, Arkansas.

Reader Survey August 2010

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 incentive, we'll pick one respondent each month and give that person a complimentary one-year subscription (or subscription extension) to *CQ*.

This month, we'd like to know more about your views on *CQ*-sponsored contests and results reporting.

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

1. Do you operate in *CQ*-sponsored contests?
 - Yes, regularly32
 - Yes, occasionally.....33
 - No.....34
2. What is your main motivation for operating in *CQ*-sponsored contests?
 - Competition with other hams35
 - Competition with my own past performances.....36
 - Building up DX totals37
 - Fun and camaraderie38
 - Other39
 - Do not operate in *CQ*-sponsored contests40
3. Do you submit a log in *CQ*-sponsored contests?
 - Yes, always41
 - Yes, sometimes.....42
 - No, even though I operate in them43
 - No, I do not operate in *CQ* contests44
4. Do you read the contest result articles published in *CQ*?
 - Yes, always45
 - Yes, sometimes.....46
 - Only if I have submitted a log47
 - No.....48
5. Do you read the expanded contest results on the *CQ* website?
 - Yes, always.....49
 - Yes, sometimes50
 - Only if I have submitted a log51
 - No52
6. Which portion of contest reports published in *CQ* is *most* important to you? (Choose one)
 - Main contest article53
 - Trophies box.....54
 - Top Scores boxes55
 - QRM (participant comments)56
 - Individual station scores (line scores)57
 - MY score58
 - All are equally important.....59
 - Do not read contest reports.....60

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

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What If?

I am a fan of science fiction, especially sci-fi that is not too ridiculous. Several years ago I was really taken in by the first "Back to the Future" film, and more recently by a scene in the movie "Night at the Museum" in which a young man in the 1940s accidentally acquires a modern Motorola cell phone. This got me wondering what we, as technically adept amateurs, could actually accomplish if we

were to somehow get transported back in time at or close to the turn of the 20th century with the knowledge we have now. Before going on, let me say that I know all about the paradoxes involved with time travel, so please don't write to me about that. This column is simply a "what if" exercise.

Before 1900 (and radio as we know it), telegraphy was very widespread. In fact, there was so much traffic that ways to send more than one message over a single wire were highly desirable. Fig.

*c/o CQ magazine

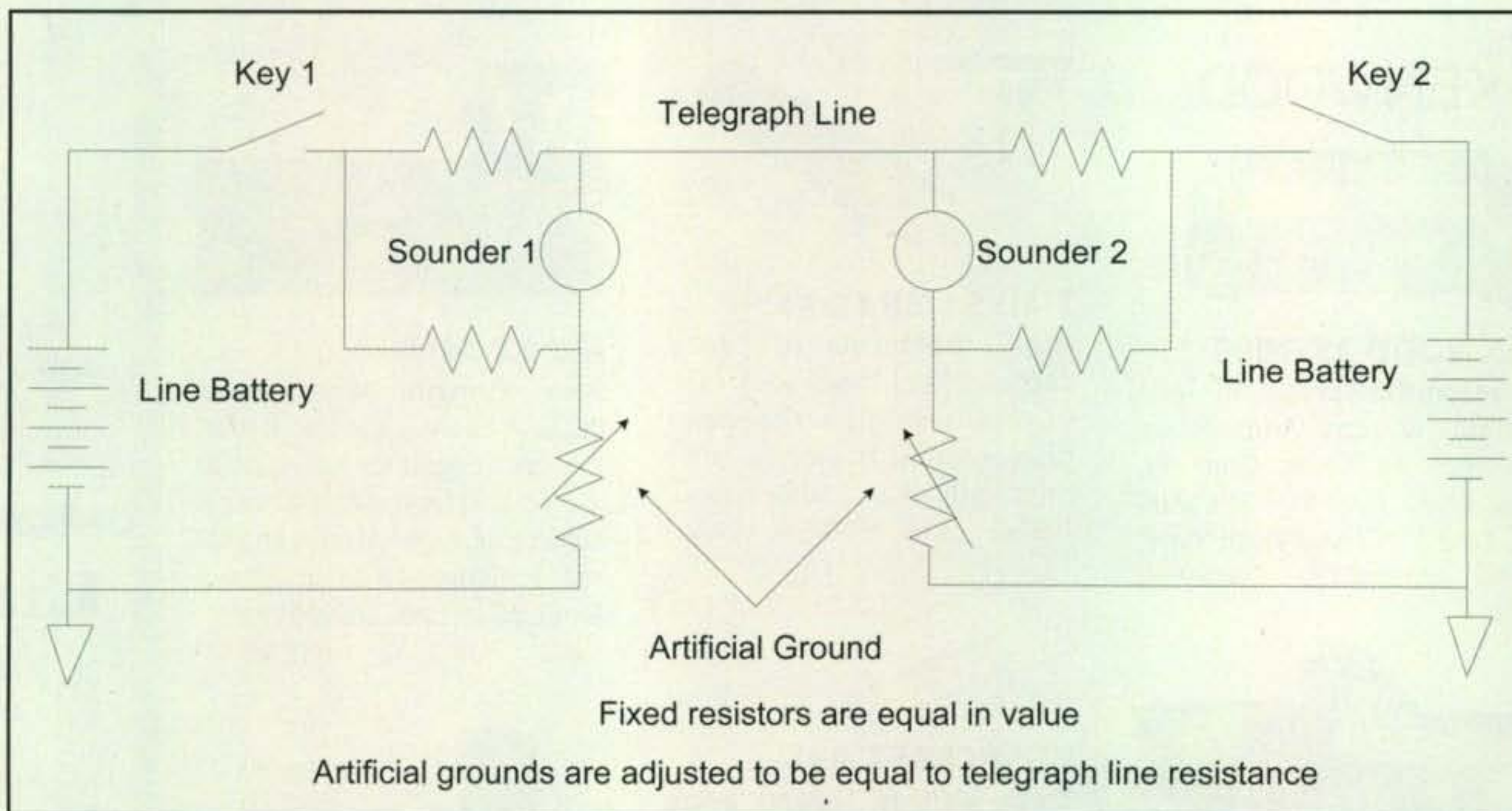


Fig. 1— Multiplexed telegraph system.

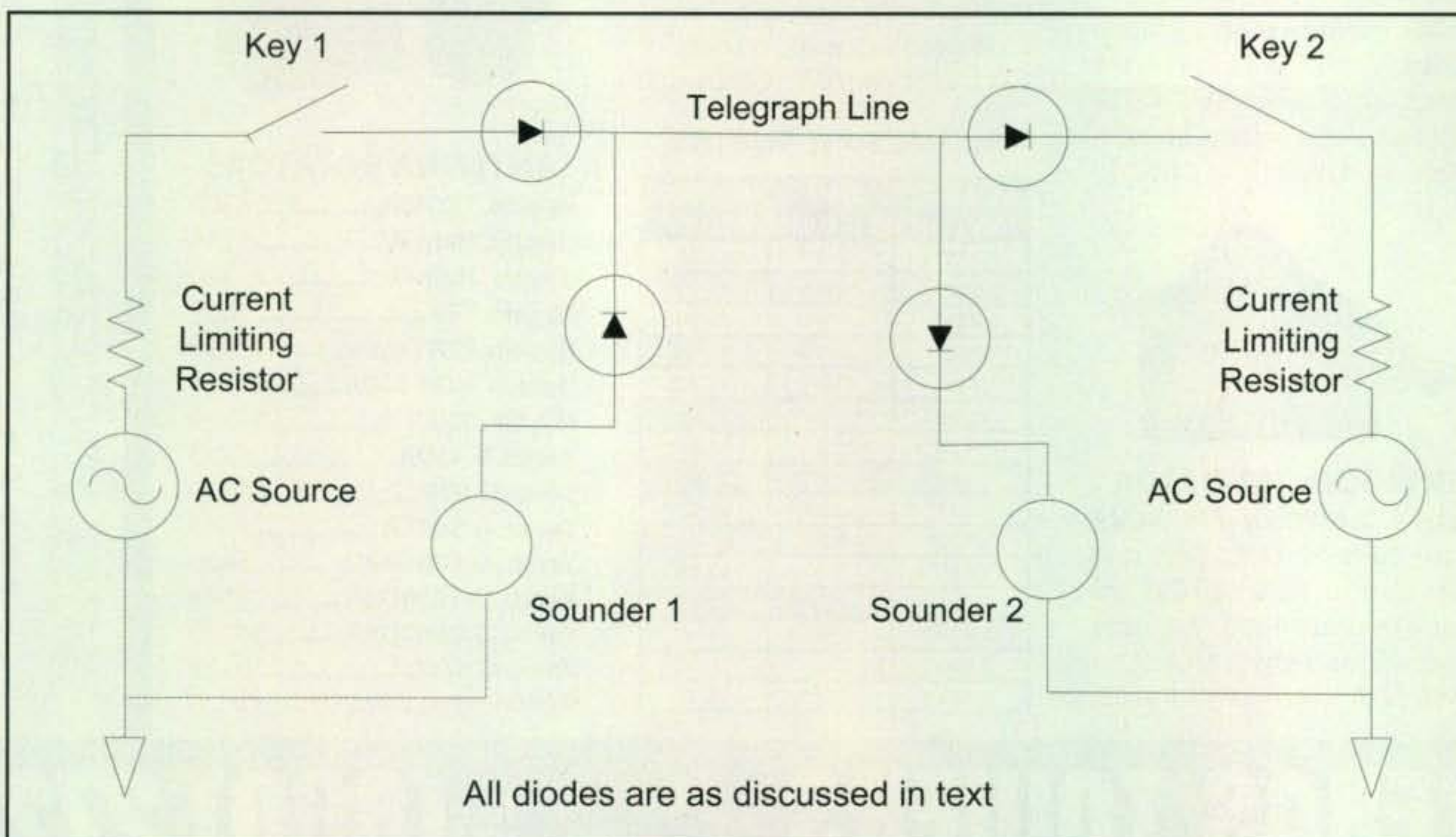


Fig. 2— Diode-based multiplex system.

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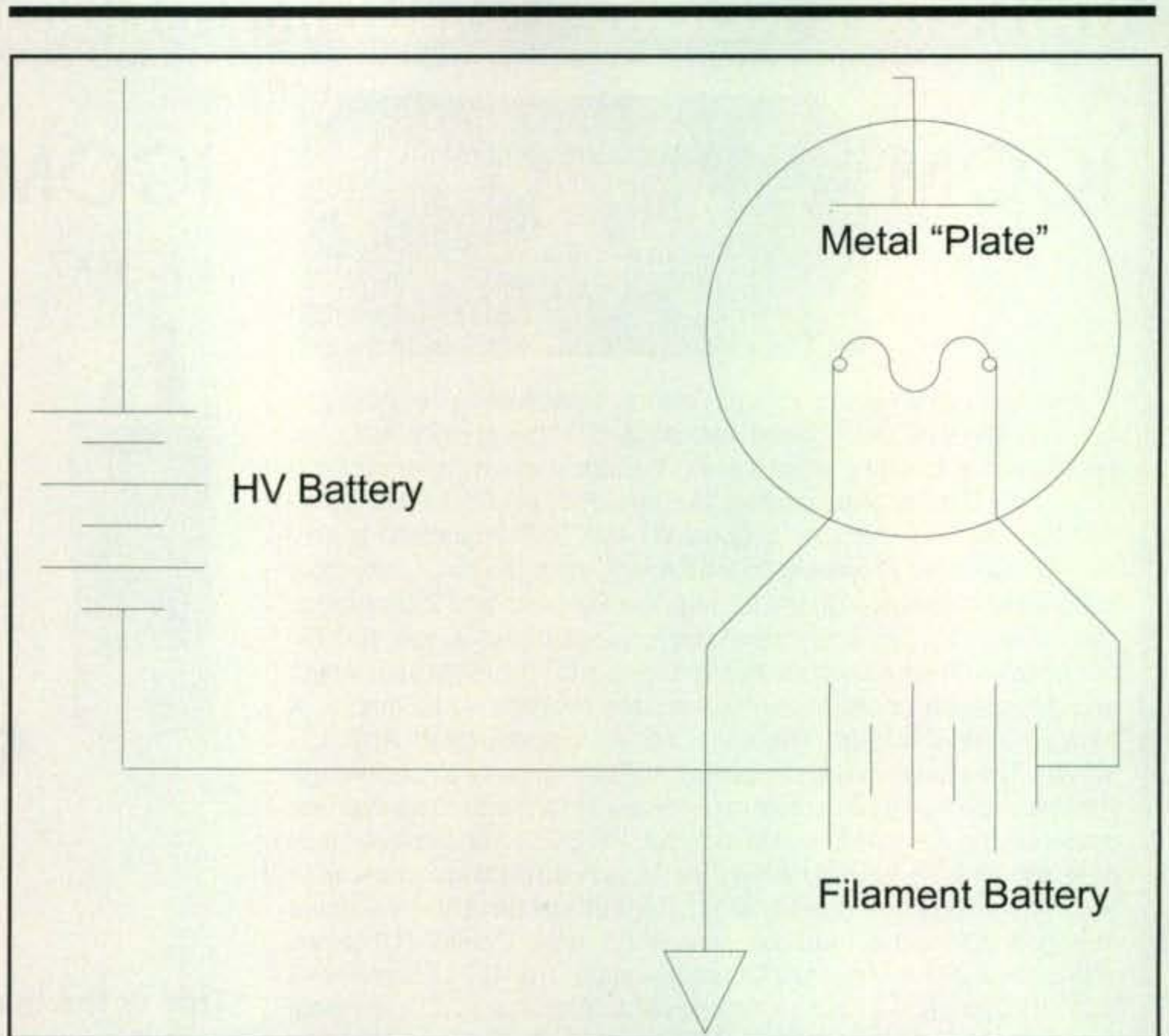


Fig. 3- "Edison's Effect" to prevent incandescent lamp blackening.

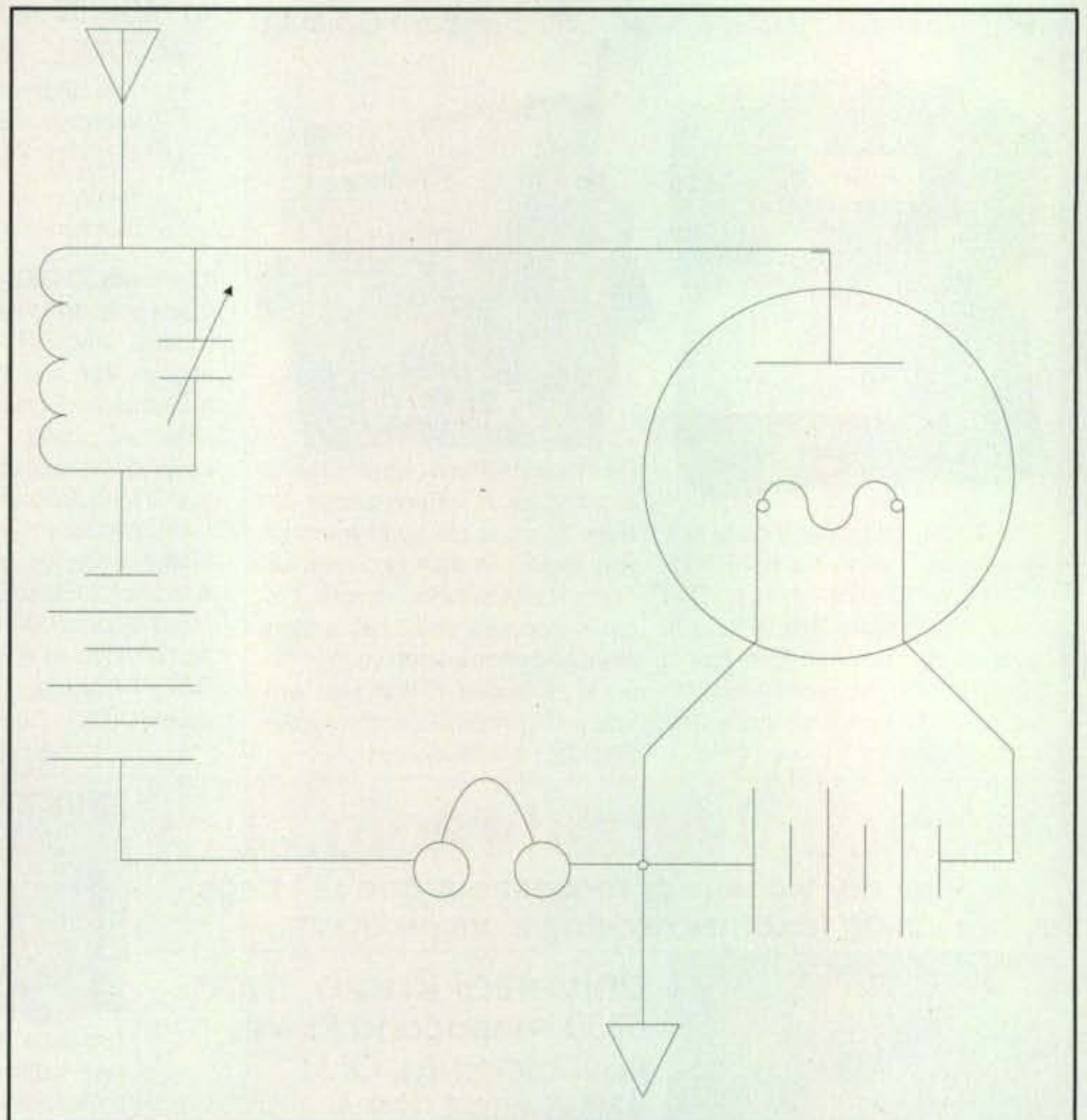


Fig. 4- "Edison Effect" pseudo crystal set circuit.

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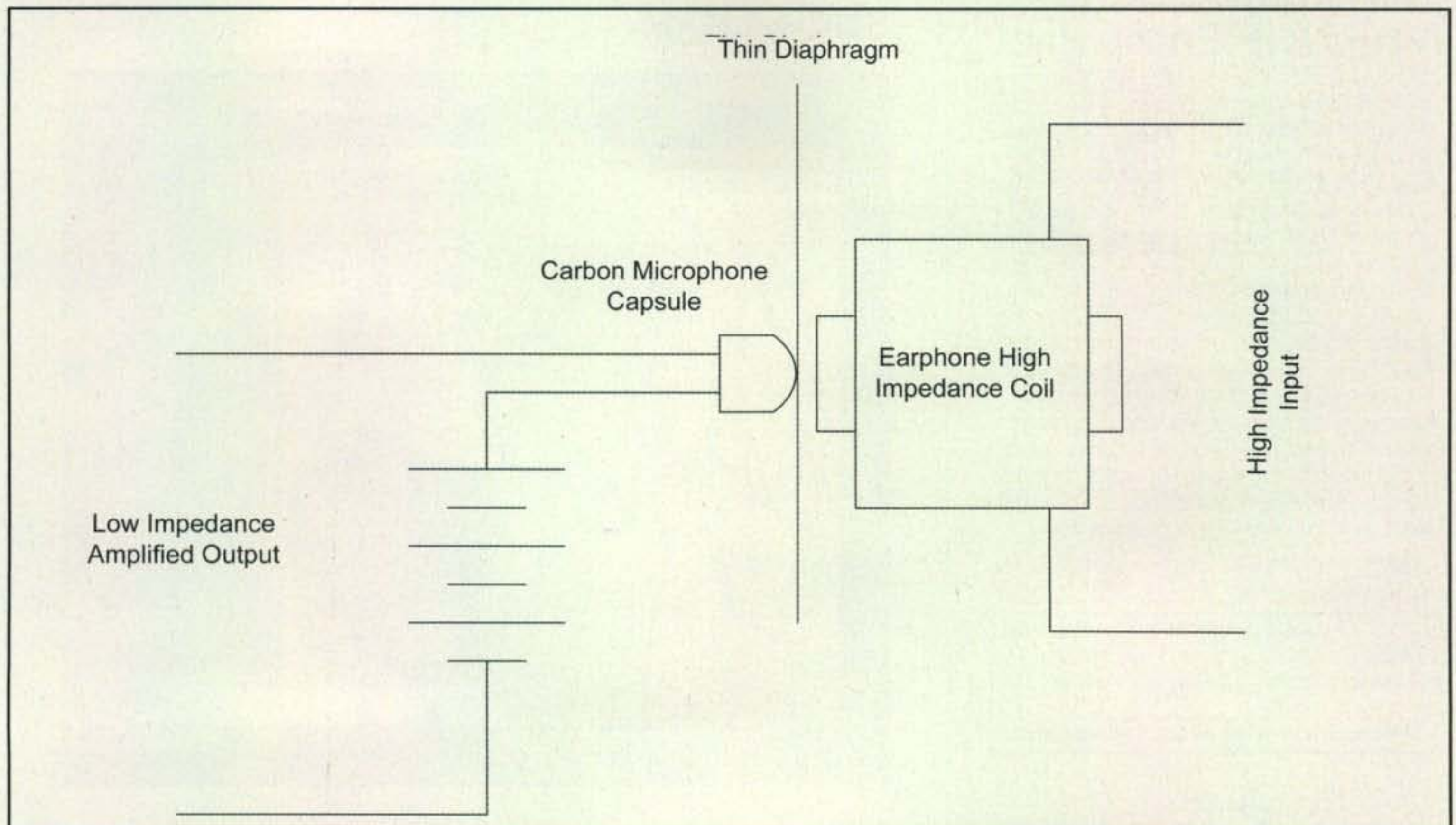


Fig. 5— Mechanical amplifier.

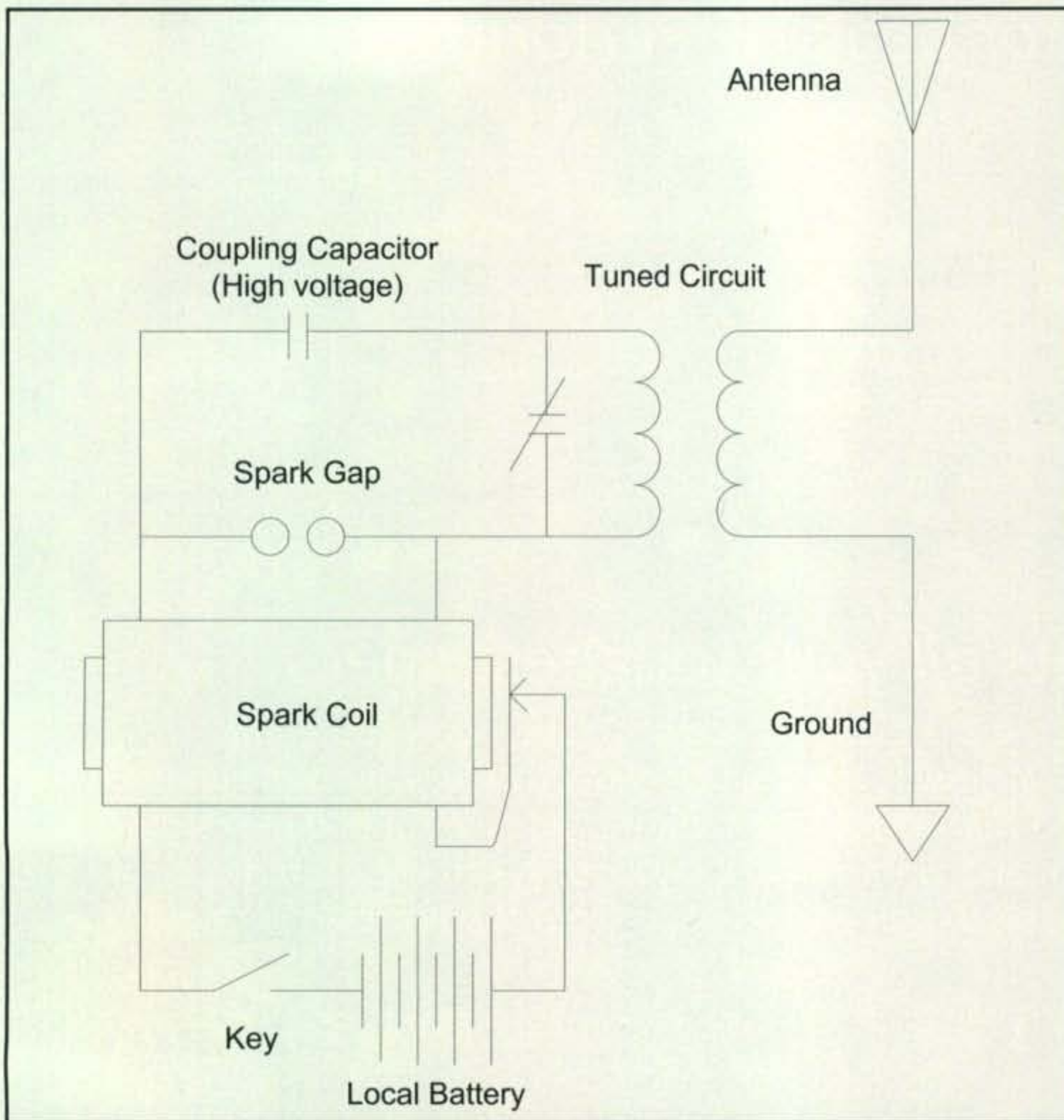


Fig. 6— Spark-coil-based amateur transmitter.

1 shows one of many methods that were developed to accomplish this. In this particular scheme the telegraph sounder is basically connected in a Wheatstone bridge configuration so that the local key at each end applies equal voltage to both sides of the local sounder, and as a result it is silent. The sounder on the other side of the system is connected between the incoming line and ground, however, so it responds to the incoming signal. Note that the artificial grounds had to be very carefully adjusted (at each end of the link) to assure correct bridge balance, but this was "standard operating procedure."

Some other systems used special polarized relays and a host of other clever, but delicate mechanical mechanisms. When we arrive on the scene our knowledge of diodes could lead to the circuit of fig. 2. While it is true that 1N4002 or 1N4148 devices had not yet been invented, galena (lead sulfide) and carborundum (silicon carbide) were readily available (as early "wireless" detectors), and by careful selection one might be able to fabricate simple diodes that would work well enough, not

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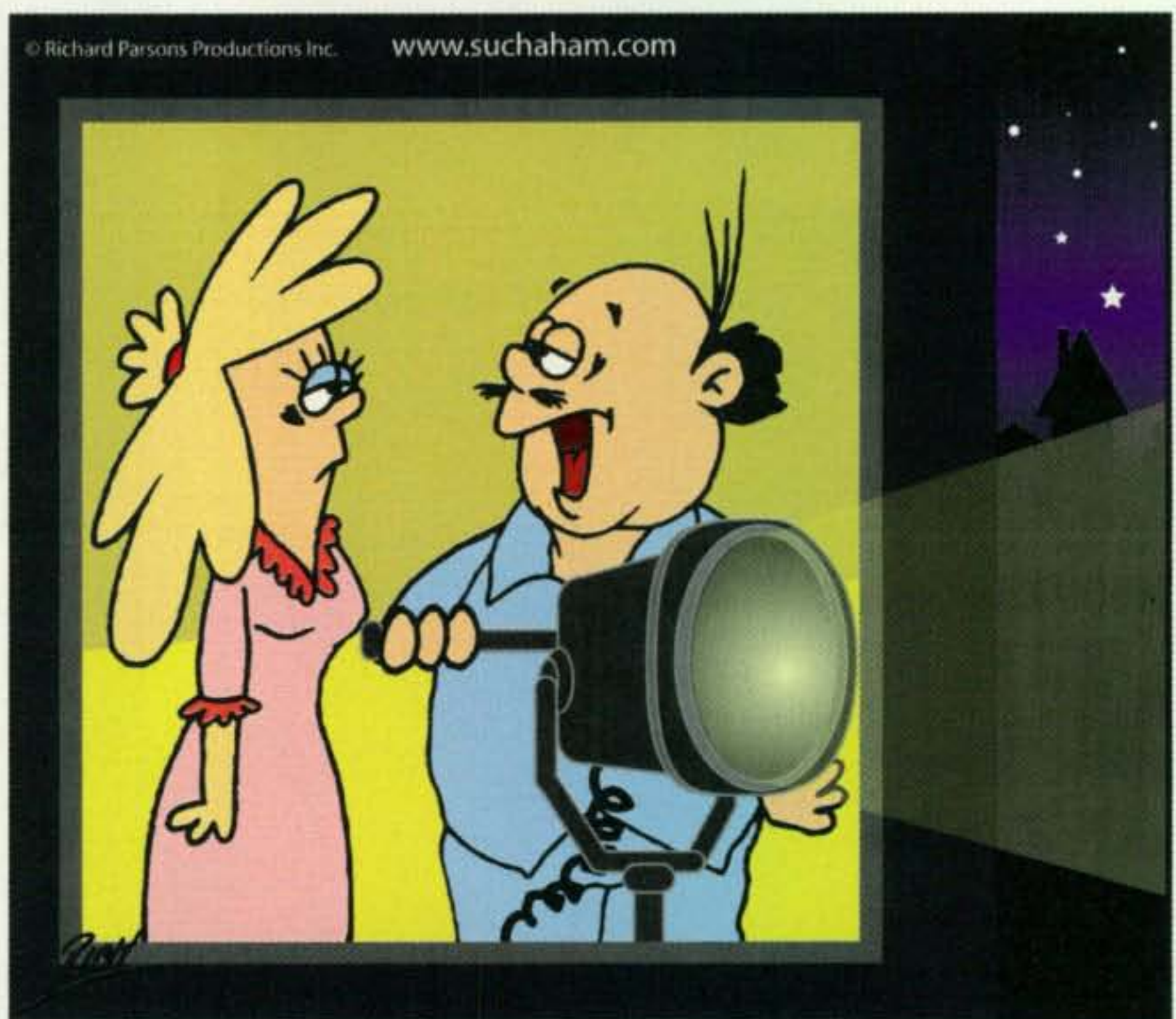
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require system rebalancing, and be a lot more robust than the techniques in use at the time.

Fig. 3 is a diagram of Thomas Edison's 1882 attempt to prevent the premature blackening of his newly invented incandescent lamps. He believed that something was boiling off the filament and being deposited on the glass, so he added a small metal plate adjacent to the filament and reasoned that by polarizing this plate it would attract this material and extend the life of his lamps. Unfortunately, this did not work as Edison hoped, but he did notice that current would only flow from the filament to the plate, not the other way. He recorded this fact as "interesting but of no practical value" and did not realize that he had actually made a vacuum diode.

Any amateur "worth his salt" would immediately take one of these "Edison Effect" lamps and hook up the circuit of fig. 4. This would result in a "pseudo crystal set" that would be much more sensitive than the coherer, galena, or carborundum detectors that were in common use at the time due to the almost zero voltage drop across the diode. Note that fig. 4 is derived from an actual schematic in *Hawkins Electrical Guide* published in 1917. It would not be much of a "leap of faith" to then add a grid (which could certainly be done easily with the equipment and techniques available at the time), which would then result in a crude but operational triode and probably advance electronic technology by at least 20 years!

Before the invention of the triode, there was really no means of amplifying the weak signals of the early radio receivers. In fact, the only way was to use a headphone with a very-high-resistance coil (impedance) and an ultra-thin diaphragm to allow the feeble currents available to produce enough movement of the diaphragm to provide usable volume. Even without the triode a "mechanical amplifier" that was developed many years later could easily have been built at the time by a clever amateur and would probably work quite well, since carbon microphone "capsules" also existed. Fig. 5 shows the basics of this device.

A carbon microphone capsule was simply mechanically attached to the diaphragm of a high-impedance earphone. Any slight movement of the diaphragm would then produce a much greater current flow through the carbon microphone circuit. Whether such a device could be turned into an oscillator remains to be seen, but the gain was surly more than one! You will also note

that such a device did not require a high-voltage "B" battery.

With regard to our hobby, we, of course, would immediately realize that the "useless" wavelengths below 200 meters are the place to be and probably achieve "solid" transatlantic communications before Marconi—even with spark transmitters. This would be done simply by shock-exciting a tuned circuit (at 80, 40, or 20 meters?) as per fig. 6. For a receiver, another tuned circuit and perhaps an "Edison Effect" incandescent-lamp diode would do the

trick. As far as components are concerned plenty of wire would be available for coils, and a couple of glass plates with some tin foil would easily suffice for reasonable capacitors.

In conclusion, even reasonably technically inclined amateurs could perhaps do wonders given the opportunity to go back in time with the knowledge they have today. I wonder, therefore, how much of tomorrow's technology could actually be made today if one simply thinks "outside of the box."

73, Irwin, WA2NDM

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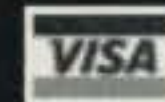
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Where Things Stand: A Roundup of Pending Amateur Radio Rulemaking

The Federal Communications Commission makes a presentation every year at the Dayton Hamvention® during which one or more representatives discuss the status of amateur radio regulatory affairs. The primary speaker this year was William Cross, W3TN, an official in the Mobility Division of the FCC's Wireless Telecommunications Bureau (WTB). This is the FCC office responsible for overseeing the Amateur Radio Service. The Wireless bureau regulates all U.S. domestic non-government radio-based telecommunications.

Bill started by saying that the FCC "...has an unusually large number of amateur radio proposed rule changes out for comment," adding that "...there are a couple of other matters open also."

"What I'm going to do is talk about a number of rulemaking proceedings that we have opened in the past year, a couple of Public Notices that have come out, and the Commission's National Broadband Plan, or NBP as it is affectionately known, and how it may affect your service."

Changes to the 60-Meter Band

The first item Cross discussed was the recently released Notice of Proposed Rulemaking in ET Docket No. 10-98. This NPRM was issued in response to a 2006 Petition for Rulemaking filed by the ARRL. This proceeding concerns the five channels that make up the 60-meter ham band.

Since May 2003, the FCC has allowed hams secondary access to five discrete 2.8-kHz-wide channels on a non-interference basis to (primary) federal government users at 5332, 5348, 5368, 5373, and 5405 kHz. The allocation was made after the FCC agreed that 5-MHz frequencies could be useful for disaster communications when 80, 75, and 40 meters are not available due to ionospheric conditions. Amateurs may use only USB (upper sideband) with a maximum effective radiated power (ERP) of 50 watts on 60 meters.

One of the channels, 5368 kHz, is seldom available because of occupancy by the primary user. The proposal is to substitute another channel at 5358.5 kHz. The NPRM also looks toward increasing the allowed ERP from 50 to 100 watts and permitting certain digital modes. CW, PSK-31, and PACTOR-III emissions would be allowed "...with conditions to ensure that these operations are compatible with other users of the channel." Those conditions could include using Voice-Operated Transmit (VOX) while in the single sideband emission mode and limiting the duration of data transmissions.

In the United States, regulatory responsibility for the radio spectrum is divided between the FCC,

which administers spectrum for non-federal use, and the National Telecommunications and Information Administration, which regulates government frequencies. The request for these 60-meter band changes was coordinated with and has been approved by the NTIA.

"The idea here is to make the 60-meter band more useful to you all," Cross explained, "while making sure the primary users can also use the channels."

Power Limit on Spread Spectrum

The second Notice of Proposed Rule Making currently under consideration is WT Docket No. 10-62. This NPRM concerns the power limit for stations transmitting a Spread Spectrum (SS) emission.

Spread-spectrum techniques are methods in which a signal is deliberately spread across several frequencies, resulting in a signal that is considerably wider than the frequency content of the original information. The receiver decodes the received signals to retrieve the original communications.

This NPRM responds to a 2006 ARRL Petition proposing to amend Part 97 to facilitate the use of spread spectrum technologies by eliminating the requirement that amateur stations use automatic power control (APC) to reduce transmitter power when transmitting SS emissions. The League called the APC provision "virtually impossible" to implement. The NPRM also proposes to reduce the power level of stations transmitting spread spectrum from 100 watts to a peak of 10 watts.

Housekeeping Changes

The spread-spectrum NPRM also includes an FCC ruling (Order) on several minor points that do not require a full rulemaking procedure. "The Order part of this docket also makes many conforming rule changes to your Part 97 rules," Cross said. "Most of these come out of changes to Part 2 rules; other changes conform your rules with decisions in other dockets." FCC Part 2 covers Frequency Allocations and General FCC Rules and Regulations.

In addition, the FCC proposes to move the 60-meter transmitter power limit information contained in Section 97.303(s) to Section 97.313, the section concerning transmitter power standards. The comment period closed on this proceeding June 5; reply comments on July 5.

Vanity and Club Call Signs

On November 24, 2009 the Commission released a NPRM in WT Docket No. 09-209. This docket concerns the rules applicable to Vanity and Club Station Call Signs. The vanity call sign system has been available since 1996 and over 80,000 radio

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amateurs have received them. The comment period has already closed for this docket.

The proposal clarifies certain rules and codifies existing procedures that apply to the vanity call sign system. Some of these include putting into the rules the exception to the two-year hold period for former holders and codifying the procedures used for canceling a license when a licensee dies.

The FCC also proposed that the call sign shown on a license that is canceled due to the death of a licensee more than two years earlier remains unavailable to the vanity call sign system for 30 days after the staff cancels the license. This would allow the assignability of a desirable call sign to become known and would provide an opportunity for other licensees to apply for the call sign.

The FCC also wants to specify exactly who is an "in-law" for purposes of determining the eligibility of a relative of a former holder now deceased exception to the two-year hold period. Right now, the term "in-law" could apply to more relatives than originally intended.

The proposal of limiting clubs to holding only one call sign has proved to be very controversial. The FCC wants ham radio clubs that currently hold more than one call sign not to be allowed to obtain any more call signs. But clubs could renew or modify their existing station license grants. "This proposal generated a lot of comments, both pro and con."

"The idea in this docket," Bill Cross said, "is to make the vanity call sign system more equitable and efficient."

Emergency Communications

Cross then turned to the issue of emergency communications training. "As you are probably aware, there have been a number of items out of the Commission over the past few months that expand what you can do to help out with emergency communication tests and drills. There have been a proposed rule change and two Public Notices. I want to mention these so you all know where we are on this topic."

On October 20, 2009 the Commission released a Public Notice concerning amateur service communications during government disaster drills. The PN noted that "...transmissions by amateur stations participating in government disaster drills must comply with all applicable amateur service rules and that the amateur service is not an emergency radio service."

The PN also noted that the Commission's Rules specifically prohibit ama-



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teur stations from transmitting communications "...in which the station licensee or control operator has a pecuniary interest, including communications on behalf of an employer."

"You may recall that I said the same thing at this forum last year," Cross noted. "Contrary to what some licensees claimed in letters to their congressional representative and in other forums, my statement was not 'a new interpretation.' It is what the rule says, and has said since 1993."

The PN also set up a process that allowed the government entity conducting the drill to request a waiver so that employees could transmit messages on behalf of an employer if certain information was provided.

"We have received about 25 requests for a waiver since October 20. Most have been granted. Many of the requests have been for weekend-type events; a few have been for only a few hours. There is no requirement that the grantee report back to us whether they used the waiver, so we have no idea as to whether the waiver was needed, used, or what happened during the event."

"This process is still available today and we occasionally receive requests, but it seems that most government entities, when they look at their communications needs, find they can satisfy them without needing employees to transmit messages on behalf of their employer. Note that this process is available only to the government entity conducting the drill and only for government-sponsored emergency preparedness and disaster drills."

Prohibited Communications

The October 20 Public Notice was followed by an NPRM in WP Docket No. 10-72. This was released on March 24, and proposes to add another exception to Section 97.113—Prohibited Communications. The proposal is to allow a station control operator to participate on behalf of an employer in a government-sponsored emergency preparedness or disaster readiness test or drill.

The comment and reply comment period on this proceeding has closed. "We have received a great many comments on the proposal so far. To say the views expressed are miles apart would be an understatement," Cross commented. The staff of the Public Safety Bureau will be handling this docket.

"Some of you may be aware that a petition on this topic was filed by Tom Blackwell, N5GAR; David Coursey, N5FDL; and Gordon West, WB6NOA,

on Oct. 15, 2009." Their petition sought to amend the rules to permit amateur transmissions "...necessary for disaster relief or emergency response, including training exercises, planning, drills, or tests, without regard to whether the amateur operator has related employment, where the transmissions are for the exclusive use of amateur radio operators for noncommercial purposes."

"The Commission incorporated the Blackwell, Coursey, and West Petition into this proceeding. It did not give the proposal a rulemaking number; propose what Blackwell, Coursey, and West asked be proposed; or seek comment on their proposal but rather proposed a much simpler rule change."

American Hospital Association Waiver Request

"After the October Public Notice was released and people had a chance to see how it applied to their situation, certain groups noticed that they are not eligible for waivers because they are not government entities or they wanted to conduct emergency preparedness and disaster drills which were not part of a government-sponsored test or drill. Yet they, too, wanted their employees to be allowed to transmit business messages for them on amateur service frequencies."

One of those groups is hospitals, and on February 17, 2010 the American Hospital Association filed a request for a blanket waiver of Section 97.113(a)(3). "It wants us to permit hospitals seeking accreditation to use amateur radio operators who are hospital employees to transmit communications on behalf of the hospital they work for." The reason is that hospitals need to have backup emergency communications systems in place to meet certification requirements.

On April 19, the FCC requested comment on the waiver request and several hundred comments were received in response to the Public Notice. The comments are from amateur radio operators who oppose and support the waiver request, and hospitals supporting the waiver request. "The waiver request will be addressed in a future Order or other Commission decision," Cross said. "Stay tuned for further developments."

As of now, amateur radio operators who are employees of a hospital may be included in the waiver request from a government entity conducting a government-sponsored emergency preparedness and disaster drill," Cross added.

National Broadband Plan

The Commission recently adopted what is called the NBP, or National Broadband Plan. Congress and the White House have expressed support for this plan, although many details are still to be worked out. The NBP calls for re-allocating 500 MHz of spectrum to mobile broadband over the next 10 years.

"Re-allocating" means moving spectrum from one service to another. As part of this process, a Congressionally mandated inventory of both federal and non-government spectrum is in the works. The Radio Spectrum Inventory Act, HR-3125, requires the FCC and the NTIA to inventory all RF bands from 225 MHz through 3.7 GHz.

The inventory would include all radio services authorized in each band (except sensitive national security, proprietary commercial, and classified services), the licensed users, the activities and missions supported by the users, and information on the percentage of spectrum licensed and the degree of usage broken down geographically.

The inventory must be completed within one year, and the FCC and NTIA would report to Congress within two years on their findings with recommendations for reallocation where appropriate. The goal is to find spectrum that can be used for the NBP; 300 MHz is sought in the next five years. Bill Cross noted that "What is being looked for is primarily under 3 GHz and in large blocks. The plan is to auction it off and it would be used for a commercial [mobile broadband] service, probably something similar to the cellular service today, but at greater bandwidths."

Since nearly 90 percent of all television is not received over the air by the public, the FCC is looking at a possible reallocation of TV spectrum. Broadcasters have already said, "Not us," and federal agencies are examining their spectrum to see if it is being used as efficiently as possible.

"Your bands below 225 MHz do not appear to be of much interest for the NBP because they are narrow—4 MHz or less—and the propagation is 'too long'," Cross noted. "902–928 has a lot of consumer devices in it which may cause interference to mobile devices, particularly hand-held devices."

"But you have other bands that may be of use for the NBP. The 9-cm band is 200 MHz wide. The 13-cm band, although split, covers 150 MHz. The 5-cm band is 275 MHz wide. These bands are possibilities, especially if paired with other spectrum." They could be in jeop-

ardy. Amateur radio has access to these bands on a secondary basis.

Cross mentioned that the 70-cm ham band could also be impacted. He said "...commercial interests, particularly the land mobile community, are looking for an additional 30 MHz of spectrum. Land mobile already is allocated 450–470 MHz."

"You have 420–450 MHz, on a secondary basis; 30 MHz right next to an existing land mobile band. Although not 'pure' due to government radars like the Pave-Paws systems and other uses, I would not be surprised if the land mobile community says we can make more efficient use of that spectrum than the hams do and our use will create jobs."

RACES

The FCC representative reminded everyone that "...the Radio Amateur Civil Emergency Service is managed by FEMA—the Federal Emergency Management Agency—and not the FCC. We have the rules for RACES in Part 97 because it uses amateur stations."

All FCC-issued RACES station licenses have now expired. The service, however, continues to exist and "...it is used by some emergency management agencies in some places for whatever purpose they have for it. In other places, hams seem to organize themselves under the ARES program to provide communications during emergencies." ARES is the ARRL-sponsored Amateur Radio Emergency Service.

"There are a lot of clubs with RACES in the name. If a club wants to call itself a RACES club, there is no rule against that. But the license we issue is a club station license, and the rules that apply to club stations are the same for all clubs."

Amateur Radio Emergency Communications Enhancement Act

The last topic Bill Cross mentioned is the legislation that the ARRL had introduced into Congress, HR 2160. The Amateur Radio Emergency Communications Enhancement Act of 2009 "...directs the Department of Homeland Security to undertake a study to identify unreasonable or unnecessary impediments to Amateur Radio communications, such as the effects of private land use regulations on residential antenna installations, among other things."

The bill presently is assigned to a House committee. It has a number of co-sponsors. A similar bill has already passed the Senate. 73, Fred, W5YI

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In the Darkness, Ohio EmComm Operators Face Tornado Terror

Nighttime tornadoes are Bob Schumann, W8NYY's biggest fear. "Not only are they difficult to spot, but they also put our members at risk during their attempts to track their paths," said the Wood County (Ohio) ARES® Emergency Coordinator.

That was precisely the situation radio amateurs faced on June 5 in the state's northwestern region when a deadly EF4-intensity tornado touched down in late-night darkness.

National Weather Service meteorologists determined the twister, with winds of 170–175 mph, hit the ground "near I-80 and Oregon Rd. (east of Perrysburg) at 11:20 PM EDT, moved across the south side of Moline, near Metcalf Airport, across the northwest side of Millbury, into Ottawa county following Trowbridge Rd., and finally lifted at 11:35 PM just west of Clay Center."

It was 300–400 yards wide on a path 8–10 miles long. The storm left five people dead and numer-

ous others injured in its wake. Tornado details and a map by the NWS Office in Cleveland can be seen on the internet at: <<http://bit.ly/9Qtd0u>>.

Operators supporting SKYWARN and ARES® in Wood, Erie, Huron, and Sandusky counties of the region activated nets as early as 10:30 PM. As a net control during the event, "I learned quickly that it's my job . . . to remain as calm as I possibly can, and the more calm I can remain, the more likely my amateurs are going to be able to calm down and give accurate reports," Schumann said.

According to American Radio Relay League Ohio Section Manager Frank J. Piper, KI8GW, "traffic on the nets was filled with reports of severe weather damage, flooding, and downed power lines."

"Safety before, during, and after an activation is one of my greatest goals," Schumann stressed. "We're fortunate that one of our (Assistant Emergency Coordinators) Ed Brown, K8ZCS, is one of the (firefighters) with the Lake Township fire department." He was also one of the first responders on the scene.

Brown's first responsibility was to do his job as a firefighter, W8NYY said, "but besides giving us the critical report of the severe damage to Lake High School (in Millbury), he was able to make the assessment that the area was too dangerous to deploy additional ARES® members."

Schumann noted that the severity of the damage quickly showed itself with the number of reports coming in during a 15-minute span just before midnight.

Tony Everhardt, N8WAC, reported the funnel cloud was visible only when exploding electrical transformers lit up the sky.

Brown gave updates on severed natural gas lines and downed wires, "requiring Schumann to recall weather spotters from the area for their own safety. Hams relayed continuous reports on the net of telephone poles and power lines down blocking roads; live electrical wires were an immediate danger," according to ARRL reports.

Schumann said one of the most important lessons learned from the activation "was that the safety of our members (must be kept) high on the list of priorities at all times. The number of hazards in an area impacted by an EF4 tornado are too long to list."

He also stressed that "the time and effort we put into building and maintaining an excellent relationship with our county Sheriff Mark Wasylshyn, EMA Director Brad Gilbert, and our Red Cross Director Ken Robinson made communications with them much easier and more efficient during the initial response period. If that relationship does not exist, (our) chances of making that important

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The Millbury, Ohio home of Alwin "Fritz" Welling, W8HCQ, was destroyed in the EF4 tornado on June 5. Welling "sustained injuries while hiding in his basement during the storm and is currently recovering," said Bob Schumann, W8NYY, Emergency Coordinator, Wood County ARES®. (Courtesy of W8NYY)

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AL-80B, \$1495. Gives you full kilowatt SSB PEP output (85 Watts in) from a whisper quiet compact desk-top linear. 14Wx8 1/2 H x 15 1/2 D inches. Plugs into 120 VAC outlet. Graphite plate genuine 3-500G tube. Nearly 70% efficiency. Weighs 48 lbs.

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ALS-500M, \$849. 500 Watts PEP/400W CW output, 1.5-22 MHz, instant bandswitching, no tuning, no warm-up. SWR, load fault, thermal overload protected. Remote on/off control. DC amp meter. Extremely quiet fan. 13.8 VDC. 9W x 3 1/2 H x 15 D in., 7 lbs. ALS-500RC, \$49, Remote Head.

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contact while they are faced with the pressures of responding to events is nearly zero."

Wood County Sheriff Wasylyshyn advised Schumann he was setting up a temporary command center adjacent to the Lake Township Police Department building, which had been heavily damaged by the tornado. "The sheriff and Schumann decided to deploy the Wood County ARES® trailer" equipped with police-band radios, as well as a generator and amateur radio equipment, the League reported.

By early Sunday morning communications had been restored to Lake Township using temporary equipment. However, "many Wood County ARES® members remained on standby in case they were needed at a later time. The nets stood down at approximately 4:30 AM."

District Emergency Coordinator George Henzler, WB8HHZ, kept in contact through the incident with Ohio Section Emergency Coordinator Jack Sovik, KB8WPZ, as directed in the Ohio Section Emergency Response Plan, the League report said.

Sovik said, "the professionalism of the ARES® members, working in conjunction with the National Weather



Bob Schumann, W8NYY, Emergency Coordinator, Wood County ARES® Emergency Coordinator, handles EmComm traffic in the late hours of June 5 when a deadly tornado ripped through the northwestern Ohio region. (Courtesy of W8NYY)

Service and their SKYWARN program, as per the written *Memorandum of Understanding*, saved lives and kept the National Weather Service and the public apprised of the situation that was developing in the immediate affected areas," the League noted.

"As a result of yearly SKYWARN training I'm very confident when spotting during severe weather," Everhardt said. "I've attended these training courses almost every year since 1992. And it seems that I pick (up) something new each year I attend. During emergency situations when lives are at stake it is very important to know what and when to report."

Everhardt praised net controls in Wood County, "and all counties under the district's jurisdiction," as well as District 1 of Northwest Ohio. They "do a fabulous job. Here in northwest Ohio reports are (made) to net controls in each county."

The various counties report directly to the District at the Lucas County 911 Building. "The District then reports directly to the Cleveland National Weather Service (office) and vice versa," Everhardt said. "This is very efficient and very effective. There are also monthly meetings with net controls and spotters year round to discuss how and where improvements can be made. This has been many years in the making, which makes a top notch team in northwest Ohio, and I'm proud to be part of it."

Everhardt said that if he had to choose one way to improve EmComm

activations, "I would have to say we need to get more hams involved. During severe weather or any other unforeseen emergency there are never enough amateurs to help out. . . . If anything good comes out of bad situation like the tornados in northwest Ohio it is to promote amateur radio," he said.

"I am very proud of the work (the radio amateurs) did in the middle of darkness," said Ohio Section Manager Piper. "All I have been hearing is how professional(ly) the net was run, and how calm everyone remained." Continue the great work, he encouraged the operators. "You are an example to all the hams in the Ohio Section."

Wanted: Your EmComm Stories

The experience of others can sometimes be the best teacher when it comes to radio amateurs' emergency communications. For evidence, you need look no further than the Ohio EmComm operators' excellent response chronicled in this month's column.

Has your response team played a role in an emergency situation? Have you implemented an EmComm training program with positive results? Have incidents provided lessons learned from which radio amateurs everywhere might benefit?

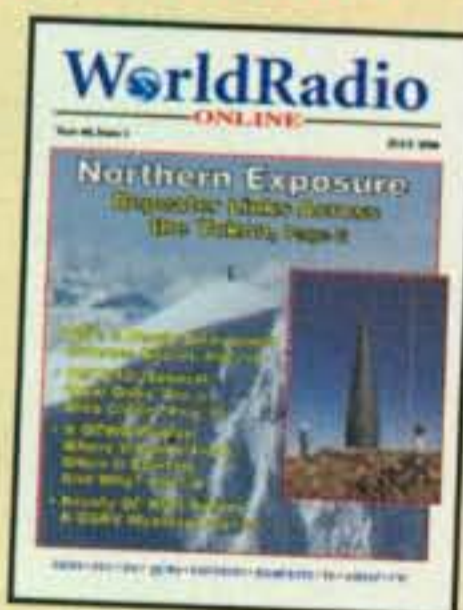
Please let us know by dropping an e-mail to Richard Fisher, KI6SN: <ki6sn@cq-amateur-radio.com>.

73, Richard, KI6SN

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The LDG AT-600Pro will handle up to 600 watts SSB and CW, 300 on RTTY (1.8 – 30 MHz), and 250 watts on 54 MHz. It will match virtually any kind of coax-fed antenna and will typically match a 10:1 SWR down to 1.5:1 in just a few seconds. You can also use the AT-600Pro with longwires, random wires and antennas fed with ladder line just by adding a balun. It has two antenna ports with a front-panel indicator, and separate memory banks for each antenna. Easy to read LED bar-graph meters showing RF power, SWR and tuner status, tactile feedback control buttons and an LED bypass indicator. Operates from 11 – 16 volts DC at 750 mA. Includes Icom interface cable, DC power cable and coax jumper. **Suggested Price \$359.99**



radio not included

Z-817

The ultimate autotuner for QRP radios including the Yaesu FT-817(D). Tuning is simple; one button push on the tuner is all that is needed - the Z-817 takes care of the rest. It will switch to PKT mode, transmit a carrier, tune the tuner, then restore the radio to the previous mode! 2000 memories cover 160 through 6 meters. The Z-817 will also function as a general purpose antenna tuner with other QRP radios. Just transmit a carrier and press the tune button on the tuner. Powered by four AA internal Alkaline batteries (not included), so there are no additional cables required. A coax jumper cable is also included for fast hook up. **Suggested Price \$129.99.**



KT-100

LDG's first dedicated autotuner for Kenwood Amateur transceivers. Easy to use - just right for an AT-300 compatible Kenwood transceiver (except TS-480HX). The KT-100 actually allows you to use the Tune button on the radio. The LEDs on the front panel indicate tuning status, and will show a match in seconds, or even less if you've tuned on or near that frequency before. Has 2,000 memories for instant recall of the tuning parameters for your favorite bands and frequencies. If you have an AT-300 compatible Kenwood radio, you can simply plug the KT-100 into your transceiver with the provided cable; the interface powers the tuner, and the Tune button on the radio begins a tuning cycle. The supplied interface cable makes the KT-100 a dedicated tuner for most modern Kenwood transceivers. **Suggested Price \$199.99**



AT-200Pro

The AT-200Pro features LDG's new "3-D memory system" allowing up to eight antenna settings to be stored for each frequency. Handles up to 250 watts SSB or CW on 1.8 – 30 MHz, and 100 watts on 54 MHz (including 6 meters). Rugged and easy-to-read LED bar graphs show power and SWR, and a function key on the front panel allows you to access data such as mode and status. Includes Icom interface cable, DC power cable and coax jumper. **Suggested Price \$249**



NEW! Z-11Proll

Meet the Z-11Proll, everything you always wanted in a small, portable tuner. Designed from the ground up for battery operation. Only 5" x 7.7" x 1.5", and weighing only 1.5 pounds, it handles 0.1 to 125 watts, making it ideal for both QRP and standard 100 watt transceivers from 160 - 6 meters. The Z-11Proll uses LDG's state-of-the-art processor-controlled Switched-L tuning network. It will match dipoles, verticals, inverted-Vs or virtually any coax-fed antenna. With an optional LDG balun, it will also match longwires or antennas fed with ladder-line. Includes Icom interface cable, DC power cable and coax jumper. **Suggested Price \$179.99**

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The #1 Line of Autotuners!



NEW! AT-100Proll

This desktop tuner covers all frequencies from 1.8 – 54 MHz (including 6 meters), and will automatically match your antenna in no time. It features a two-position antenna switch with LEDs, allowing you to switch instantly between two antennas. The AT-100Proll requires just 1 watt for operation, but will handle up to 125 watts. Includes Icom interface cable, DC power cable and coax jumper. **Suggested Price \$229.99**



radio not included

AT-897Plus for the Yaesu FT-897

If you own a Yaesu FT-897 and want a broad range automatic antenna tuner, look no further! The AT-897Plus Autotuner mounts on the side of your FT-897 just like the original equipment and takes power directly from the CAT port of the FT-897 and provides a second CAT port on the back of the tuner so hooking up another CAT device couldn't be easier. **Suggested Price \$199.99**



radio not included

FT Meter 2.5" face with calibrated scales for signal strength, discriminator reading on receive, and power output, SWR, modulation, ALC action and supply voltage on transmit, all selectable from the radio's menu.

Still Only \$49



FTL Meter For Yaesu FT-857(D) and FT-897(D). 4.5" face with calibrated scales for signal strength, discriminator reading on receive, and power output, SWR, modulation, ALC action and supply voltage on transmit, all selectable from the radio's menu.

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NEW! M-7600 For IC-7600. It will display S-meter on receive, or power out, SWR, ALC level or supply voltages, all selectable from the radio's menu. What's more, the M-7700 and the virtual meter on your radio can work together. **Suggested Price \$79.99**



M-7700 For IC-7700. It will display S-meter on receive, or power out, SWR, ALC level or supply voltages, all selectable from the radio's menu. What's more, the M-7700 and the virtual meter on your radio can work together. **Suggested Price \$79.99**



See

**AT-1000Pro Review
in Nov. '08 CQ**

AT-1000Pro

The AT-1000Pro has an Automode that automatically starts a tuning cycle when the SWR exceeds a limit you set. Operates at any power level between 5 and 1,000 watts peak. RF Relay protection software prevents tuning at greater than 125 watts. Tunes from 1.8 to 54.0 MHz (inc. 6 meters), with tuning time usually under 4 seconds, transmitting near a frequency with stored tuning parameters, under 0.2 seconds. 2000 memories. 2 Antenna connections. Includes Icom interface cable, DC power cable and coax jumper. **Suggested Price \$599**



YT-100

An autotuner for several popular Yaesu Radios. An included cable interfaces with your FT-857, FT-897 and FT-100 (and all D models) making it an integrated tuner, powered by the interface. Just press the tune button on the tuner, and everything else happens automatically: mode and power are set, a tune cycle runs, and the radio is returned to its original settings. It's the perfect complement to your Yaesu radio. **Suggested Price \$199.99**



Z-100Plus

Small and simple to use, the Z-100Plus sports 2000 memories that store both frequency and tuning parameters. It will run on any voltage source from 7 to 18 volts; six AA batteries will run it for a year of normal use. Current draw while tuning is less than 100ma. The Z-100Plus now includes an internal frequency counter so the operating frequency is stored with tuning parameters to make memory tunes a blazingly fast 0.1 seconds; full tunes take an average of only 6 seconds. Includes Icom interface cable, DC power cable and coax jumper. **Suggested Price \$159.99**



IT-100

Matched in size to the IC-7000 and IC-706, the new IT-100 sports a front panel push-button for either manual or automatic tunes, and status LEDs so you'll know what's going on inside. You can control the IT-100 and its 2000 memories from either its own button or the Tune button on your IC-7000 or other Icom rigs. It's the perfect complement to your Icom radio that is AH3 or AH-4 compatible. **Suggested Price \$179.99**

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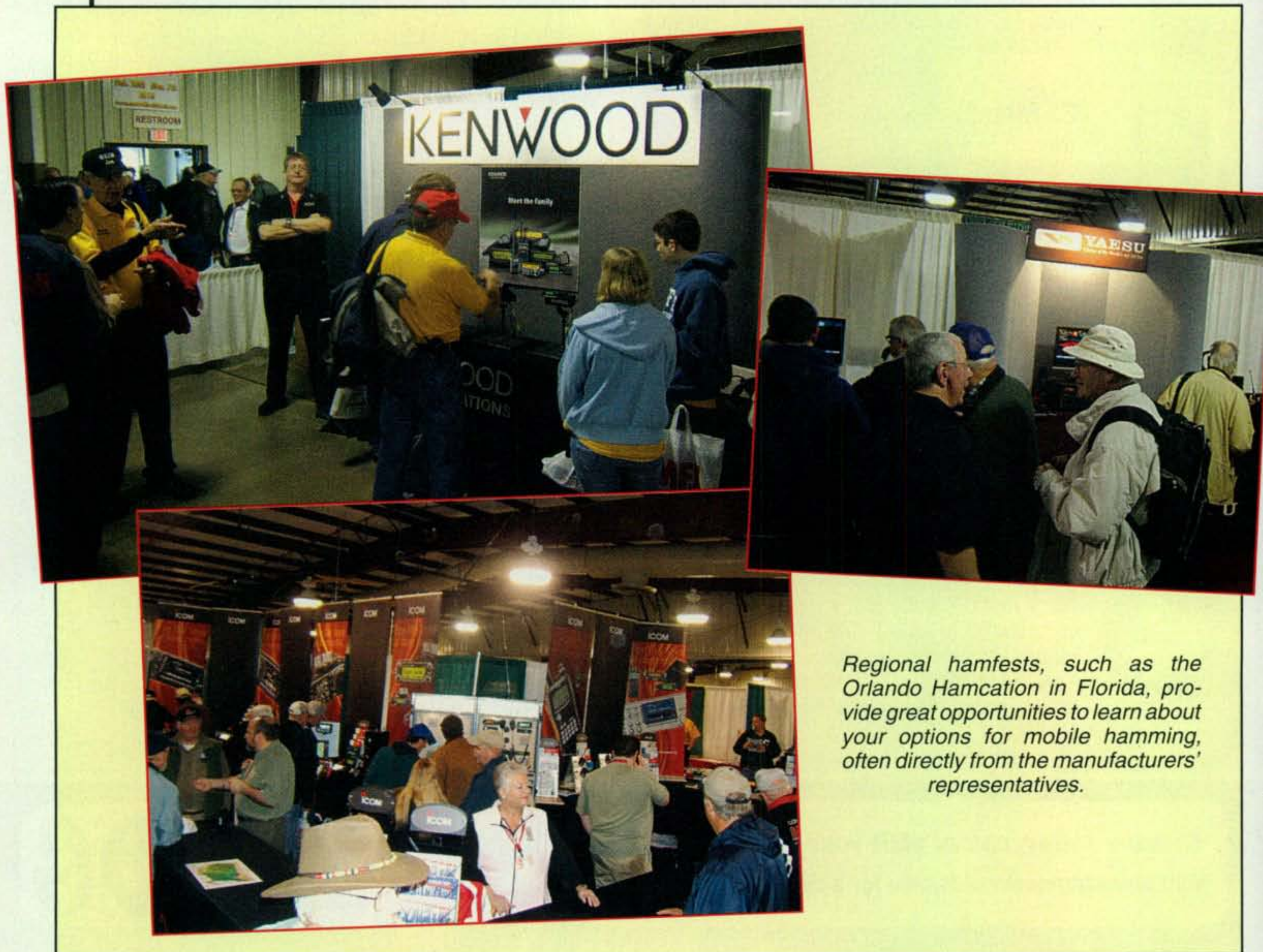
The period just before and just after the Dayton Hamvention® provides a treasure trove of information on new products, advancements in technology and opportunities to interact with other hams and swap information, either at Dayton itself (*see the article "The 2010 Dayton Hamvention® Safari, Part I, by John Wood, WV5J elsewhere in this issue—ed."*) or at any of the numerous hamfests held in practically every region of the country. There are also the infinite resources of the internet to learn even more about products and tips. Each of these items offers value, especially if take a few moments to drill down for information that can enhance your ability to operate mobile.

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Let's Go Shopping!

I'm sometimes asked for recommendations on which radio to buy. Now I do try to be a neutral third party, but it's also my genuine opinion that each of the major manufacturers makes fine equipment. The durability and reliability of modern mobile rigs is terrific, so the choice then comes down to small differences among the available gear. Some of those considerations might be physical dimensions, secondary features, the size of the display, ease in operating, or some difference in price—but be careful about that last one, because a small difference in price can also mean the difference between having a desired feature or not.

Nevertheless, there are some cool new products to consider, even if you have an "old reliable" already installed in your car or truck. After all, my XYL can buy new shoes, even if the pair she's



Regional hamfests, such as the Orlando Hamcation in Florida, provide great opportunities to learn about your options for mobile hamming, often directly from the manufacturers' representatives.

MFJ Speech Intelligibility Enhancer

... makes barely understandable speech highly understandable!



to understand speech, you must: **First**, drastically increase the speech energy above 500 Hz, where 83% of the speech intelligibility is concentrated.

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A balance control and separate 2 1/2 Watt amplifiers let you equalize perceived loudness to each ear so both ears help.

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Here's what QST for April, 2001 said ... "I expected a subtle effect at best, but I was astonished ... The result was remarkably clean, understandable speech without hissing, ringing or other strange effects ... made a dramatic improvement ..."

Immuned to RFI. Has phone jack, on/off speaker switch, 2 inputs, bypass switch. 10Wx2 1/2 Hx6D". Needs 12 VDC.

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Research shows that nearly half the speech intelligibility is contained in 1000 to 4000 Hz range, but contains a miniscule 4% of total speech energy.

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Record and playback 5 natural sounding messages in a total of 75 seconds. Uses eeprom -- no battery backup needed. Use your mic or its built-in mic for recording.

You can repeat messages continuously and vary the repeat delay from 3 to 500 seconds. Makes a great voice beacon and calling CQ is so easy.

You can also record and play back off-the-air signals -- great help if you didn't get it right the first time! No more "Please repeat".

A playing message can be

MFJ-434B halted by the **\$199⁹⁵** Stop Button, your microphone's PTT/VOX, remote control or computer.

Has jack for remote or computer control (using CT, NA or other program). Lets you select, play and cancel messages.

Your mic's audio characteristics do not change when your MFJ-434B is installed.

All audio lines are RF filtered to eliminate RFI, audio feedback and distortion. An audio isolation transformer totally eliminates hum and distortion caused by ground loops.

New! It's easy to use -- just plug in your 8 pin round or modular mic plug, set the internal jumpers for your transceiver and plug in the appropriate (included) cable for your rig.

Built-in speaker-amplifier. Speaker/phone jack. Use 9 Volt battery, 9-15 VDC or 110 VAC with optional MFJ-1312D, \$15.95. 6 1/2 Wx2 1/2 Hx6 1/2 D in.

MFJ-73, \$34.95. MFJ-434B Remote Control with cable.

60 dB Null wipes out noise and interference



Wipe out noise and interference before it gets into your receiver with a 60 dB null!

Eliminate all types of noise - severe power line noise from arcing transformers and insulators, fluorescent lamps, light dimmers, touch controlled lamps, computers, TV birdies, lightning crashes from distant thunderstorms, electric drills, motors, industrial processes ...

It's more effective than a noise blanker! Interference much stronger than your desired signal can be completely removed without affecting your signal.

It works on all modes -- SSB, AM, CW, FM -- and frequencies from BCB to lower VHF.

You can null out strong QRM on top of weak rare DX and then work him! You can null

out a strong local ham or AM broadcast station to prevent your receiver from overloading.

Use the MFJ-1026 as an adjustable phasing network. You can combine two antennas to give you various directional patterns. Null out a strong interfering signal or peak a weak signal at a push of a button.

Easy-to-use! Plugs between transmitting antenna and transceiver. To null, adjust amplitude and phase controls for minimum S-meter reading or lowest noise. To peak, push reverse button. Use built-in active antenna or an external one. MFJ's exclusive Constant Amplitude Phase Control™ makes nulling easy.

RF sense T/R switch automatically bypasses your transceiver when you transmit. Adjustable delay time. Uses 12 VDC or 110 VAC with MFJ-1312D, \$15.95. 6 1/2 X 1 1/2 X 6 1/4 in.

MFJ-1025, \$179.95. Like MFJ-1026 less built-in active antenna, use external noise antenna.

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Packet Radio Primer

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wearing is perfectly functional. Therefore, I think we hams can invoke the occasional "cuz I wanted a new one" reason to pick up a new rig. (Use that reason for purchase at your own risk, however!)

Kicking the Tires

Browsing the new offerings begins to raise all kinds of possibilities. In no particular order, here are a few:

The new Yaesu FTM-350R dual-bander has a large, eye-catching dot-matrix display along with Bluetooth® GPS and APRS® capabilities, and with a detachable face.

Kenwood's DM-710A dual-band offers a whopping 1000 memory channels, which would come in handy for a long-distance driver who programs repeaters for multiple cities. The clever design also allows for inverting the front panel, providing added flexibility for installation and operation.

The ICOM IC-2820H dual-band transceiver also offers expanded reception tuning ranges and the ability to upgrade to GPS and D-STAR digital, along with analog communications. You can also store up to 500 alphanumeric memory channels to keep all the information neatly sorted.

In addition to the conventional dual-band mode, the Alinco DR-635T offers crossband operation capability which can come in handy when used in conjunction with an HT. However, when operating in the USA, you must be sure to properly ID in that mode. Another nice feature of this unit is the ability to select from different display colors (amber, blue violet), which may provide a closer match to the dash lighting in your car or truck.

I've highlighted these rigs because the dual-band transceiver seems to be the most popular choice for mobile operators, offering great flexibility and the capability to put you in the middle of more action, which can be important if you're an emergency responder.

Of course, there are many more choices in monoband models, which can also come with a lower price tag. At the other end of the price spectrum are the multiband HF mobile rigs that often come with 6 meters. Some models also have VHF and UHF included in the same tidy package, something that was unthinkable not all that long ago.

Which rig is right for you? All I can recommend is "do your homework" first. There are so many choices right now, and there's a lot of value to be found in mobile rigs. Read the ads in *CQ* and other ham publications, visit the websites, but also ask your fellow hams for their experiences with a rig you may be considering. Also, don't be afraid to ask your favorite ham dealer for his/her thoughts on various rigs. The dealers see a lot of them, and often have some idea of user experiences with certain brands and models. One tip, though: In my humble opinion, it's not classy to get information from one dealer and then buy from another just to save a dollar or two. Treat your sales contact with respect and you'll get the same in return. The nice news regarding mobile rigs is prices are currently reasonable, yet the menu of features and capabilities seems to continually be expanding.

Corvette Redux

I received several e-mails following our last column which featured a nifty installation in a newer Corvette, probably one of the most difficult cars in which to install a ham transceiver. Apparently, there are quite a few readers who have taken the challenge! One writer, Tim, N8NQH, referred me to his website for a sequence of photos on his unique approach to

combining "light speed" communications with his ride, which is nearly as quick. Unfortunately, I don't have enough space for all his photos, but if you'd like to see what an antenna looks like hanging inside a car, take a look at <<http://tim-yvonne.com/mikemercury/hamradio.htm>>. Fortunately, Tim knows to keep the output power setting at "low."

From the Mailbag

From just north of San Francisco, Donald Burr, AJ6X, writes to share some memories of a mobile skyhook from "those thrilling days of yesteryear":

Here is an idea for a really efficient mobile antenna for your car.

In the 1950s there were no 2-meter repeaters and not much use of FM radio. The Fresno Amateur Radio Club in central California had a mobile frequency using AM at 3995 kc in the 80-meter band.

I wanted a really efficient antenna for my Nash Rambler station wagon. I bought a military-surplus whip antenna 1 meter long (39 inches). It was on a large base insulator. I mounted the insulator on a strap hinge. The other end of the hinge was bolted under the edge of the hood. (No visible holes in the body of the car.) It was located at the lower center of the windshield.

I knew that a base loading coil was not efficient because it was at the high current point on a vertical whip antenna, with lots of loss heating the coil. The antenna above the coil had a lower current, with not much radiation. I put a solid plastic coil form at the top of the whip with a dozen or so turns of wire on it. A top-loading coil only works with a lot of capacity to ground above it.

I put two short whips on the rear gate, which was hinged at the top. From the top of the loading coil I ran two wires in a V pattern to insulators on each of the rear whips. The loading wires were really made from the braided covers of an old piece of coax. These were more flexible than wire and had more capacity to ground than wire. When I put the car in the garage, I lifted the rear gate. This allowed the whole antenna to tilt forward and be lower.

I don't know what the input impedance of the antenna was. My transmitter was a small home-brew rig loaned to me. It had some receiver-type vacuum tubes with a pi-network final, so it could match almost any antenna impedance. If you have a modern transmitter with 50 ohms output, you will need an antenna tuner to match this antenna.

I know this antenna was efficient! After sunset, I worked some DX with only 3 or 4 watts from the transmitter. One evening I talked to a ham in Seattle. He said my signal was exactly the same strength as a 50-watt mobile in the San Francisco area.

Thanks, Don. Like the Corvette with the inverted antenna, your story illustrates the value of "try it to see if it works," which sometimes reveals surprising results. It's also in the best spirit of experimentation. However, a modern solid-state rig might not be as friendly to strange impedances as some of the older "hollow-state" tube-powered rigs.

We Need Photos!

Once again, we'd love to share photos and the story behind your mobile installation, including any obstacles you had to overcome putting everything together. Please send them to the address shown at the beginning of this column.

Enjoy the remainder of the summer driving season with safe driving and great mobiling. Hopefully, I'll catch you on the air!

73, Jeff, AA6JR

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Dayton 2010

This month "Learning Curve" will focus on my personal experiences at the Dayton Hamvention® 2010. This is a break in the action from hard-core electronics and operating modes and strategies. It was a fun column to write, as I have great respect for the people showcased in this column. I hope you enjoy this little detour in our ongoing attempt to demystify the ham radio hobby.

Although I *hate* crowds, Dayton 2010 was a great place to be in mid-May. This was my seventh time attending the Hamvention®. This fantastic event has become an annual pilgrimage for thousands of radio amateurs worldwide. It's a place where you meet old friends, make new ones, and can see the latest offerings from the various advertisers that grace the pages of *CQ* magazine. It is a well-established fact that during the Dayton

*770 William St. SE, Dacula, GA 30019
e-mail: <k7sz@arrl.net>



K7SZ doesn't like crowds, but crowds of fellow hams at Dayton are another story! (W2VU photo)

Hamvention® weekend local businesses take in a tremendous amount of money, something on the order of \$10 million! That ain't chump-change, bro! Although this year's attendance was down from the peak years of the 1980s and '90s, the Hamvention® folks told a local TV station that there were over 20,000 radio aficionados present for the weekend. That's almost a small city!

Manufacturers often debut new gear during Dayton, allowing us to twist the knobs and flip the switches on their newest offerings (see "The 2010 Dayton Hamvention Safari" elsewhere in this issue). The Hamvention® is also a place where you might end up face-to-face with a legend. This year's Dayton topped even my expectations. I met not one, not two, but *three* real-life legends in the world of amateur radio!

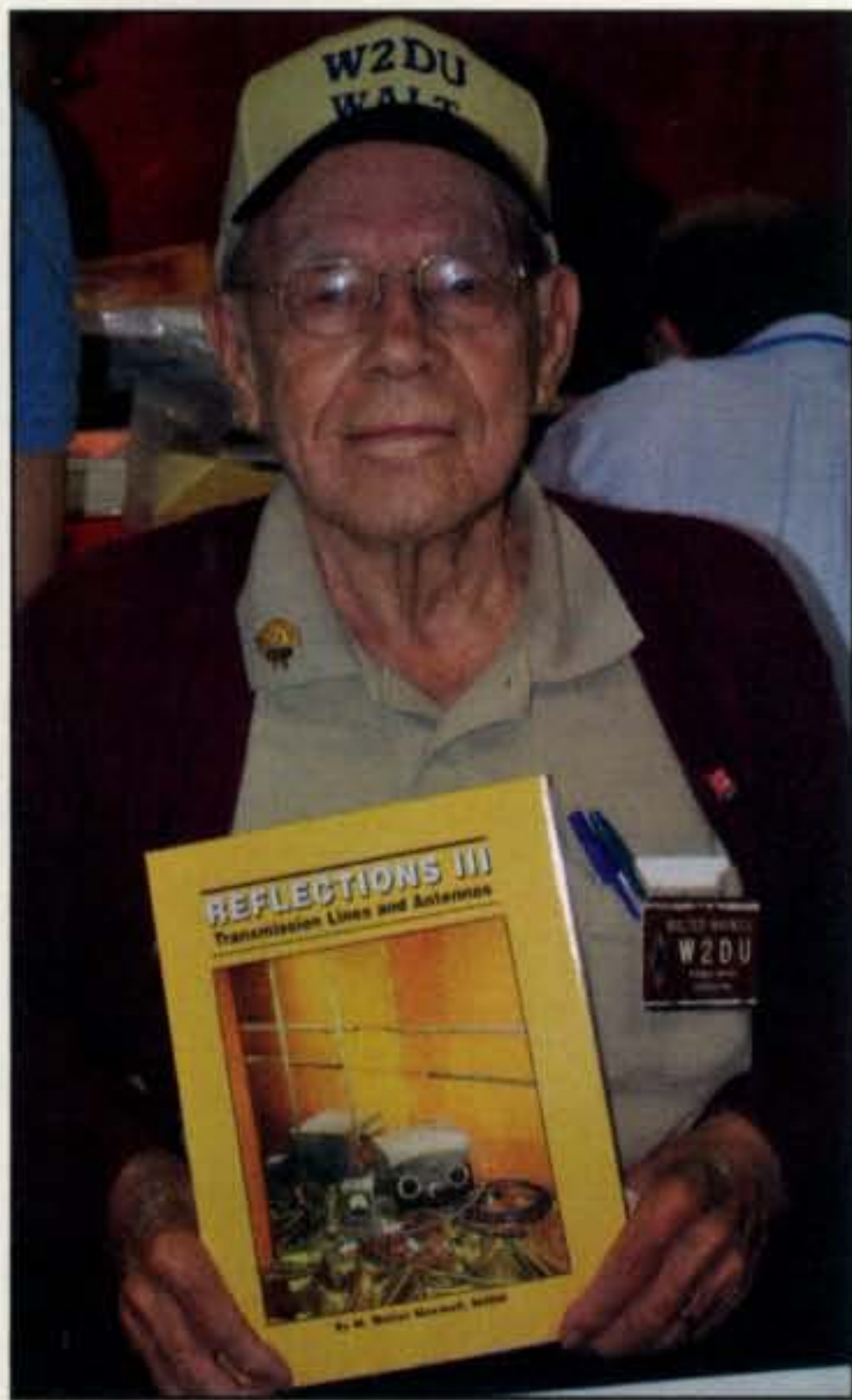
Meeting a Legend I: W2DU

Walt Maxwell, W2DU, is a living legend among hams. Born in Daytona, Florida in 1919, Walt's specialty is antennas and transmission lines. I have lost count of the times that I have referred to W2DU's various published articles, books, and papers. He is a true master of his craft. When you quote Walt Maxwell, virtually no one questions your source of information. Walt has saved my bacon more times than I can recall.

My wife, Patricia, KB3MCT, and I were cruzin' the Hara Arena venue on Saturday afternoon. She had been studying for her General Class ticket and I ended up dropping her off at the testing center. I continued on toward the main display area with the idea I would stop by the *CQ* booth before continuing on to take in the entire show. As I rounded the main entrance to the exhibit floor, I almost ran over an elderly gentleman in his battery-powered scooter. I looked down and spotted his call-sign on his baseball cap—"W2DU." I stopped in my tracks and introduced myself.

Walt is the epitome of an "Elmer." He certainly has my vote for "Elmer of the Year." We chatted for about ten minutes and, sensing Walter needed to be someplace other than the middle of the entrance to the Hamvention®'s main area, I shook his hand and we said our goodbyes.

W2DU's new book is out: *Reflections III* (available at the *CQ* Bookstore) is chock-full of much-needed information and history regarding antennas and transmission lines. Walt has been diligent in turning out three books on the subject and probably has a couple more in the back of his mind. Walt's newest book came at the most opportune time for me. I was in the middle of working on a series of articles for this column on antennas, feed lines, and matching networks. Several of Walt's articles in past issues of *QST*'s "Technical Correspondence" column served as the basis for my column on transmatches, or "antenna tuners" as they are mistakenly referred to. Thanks to W2DU's expertise and his extremely readable writing style, I was able to lay down a good column



Author, antenna authority, and "Ham Radio Legend" Walt Maxwell, W2DU, with his latest book, *Reflections III*, at the Dayton Hamvention®. (Rachel Moseson photo)

from which even I learned something. Wow! Walt Maxwell! How could I ever top that?

Meeting a Legend II: W9KNI

Turning the corner into the main venue I wandered to the CQ booth, picked up a couple of books, including my autographed copy of W2DU's *Reflections III*. After a brief exchange with CQ Editor, Rich Moseson, W2VU, I did an about-face and stood nose-to-nose with another living legend in the world of ham radio, Bob Locher, W9KNI.

Over the last 30–35 years, I had read Bob's articles in *CQ*, *Ham Radio*, and *Ham Radio Horizons* magazines, not to mention his outstanding book *The Complete DXer*. "TCDXr" is the most definitive source of info on DXing ever published, and is one of the most influential and informative ham radio manuscripts I have ever read. "TCDXr" taught me a lot, so much so that I have all three editions and often pick up the latest offering and read it over, yet again. I always glean something (or more likely several "somethings") every time I read it.

I shook hands with Bob, and told him how much I appreciated his efforts to acquaint the world with the art of working DX via his writings. He shocked me

by returning the compliment! We stood there with the throng of attendees gently jostling us as they walked by, discussing the state of DXing and contesting on today's extremely crowded bands. Bob was also promoting his latest book, *A Year of DX*, his first-person account of nearly winning the CQ DX Marathon in 2008 (*He did win in 2009!*—ed). I quickly procured a copy, which he personalized with his autograph. We parted, with me aimlessly wandering around with my head in the clouds! This is such a *great* hobby!

Regarding Bob's two books, let me just state this: They are both "must haves" for any serious amateur radio operator. His unique writing style places you at his elbow while he works the world. I like Bob's writing style. It is very effective in getting his various points across to those not familiar with the nuances of working DX and contesting. Not only that, Bob is a one-man cheer-leading squad for living the DX dream. He goes into antennas, their effectiveness and what to expect on good and bad days of propagation. W9KNI delves into the minute details of how to get that rare one into your log. What bands to operate and when. How to properly use the various DX spotting tools on the internet. How to understand propagation (prop) forecasts, find out where the DX lives, and what to do about "Slim."

I remember cutting out W9KNI's articles in the pages of *Ham Radio Horizons* in order to have a handy DXer's reference at my elbow while prowling the HF bands; that's how valuable I viewed

Bob's thoughts and writings. His newest book, *A Year of DX*, is also a great read. I'm about five chapters into the book and I'm already trying to figure out how to put up a set of SteppIRs on a 120-foot tower. (Yeah, like that'll ever happen!)

Meeting a Legend III: W7EL

Roy Lewallen, W7EL, is a Godsend to all of us who experiment with antennas. Roy's world-class contribution to our hobby is a little 'ole program called "EZ-NEC," an antenna-modeling program for the rest of us. I have used several versions of EZ-NEC over the years with outstanding results. All of us antenna-geeks love to put up antennas and experiment with them to increase our station's efficiency. Antennas, especially for QRP (under 5 watts) operators, are where we can make up for a 13-dB disparity between our 5-watt signals and the majority of the rest of the world's 100-watt signals. True, QRP with its 13-dB disparity will be weaker than the average 100-watt station, but that 13 dB translates into only slightly more than two S-units. Thus, to level the playing field QRPers have become some of the most prolific antenna experimenters in the hobby. Guess what? Roy Lewallen is also a QRPer! Imagine that!

Do not let the title of this fantastic software, EZ-NEC, fool you. It is a full-blown piece of antenna-modeling software that allows the user to build an antenna and check out its performance on the computer screen *before* spending the time, effort, energy, and money to build



2010 CQ DX Hall of Fame inductees (and K7SZ's heroes) Lynn Lamb, W4NL (left), and Bob Locher, W9KNI (right), with CQ Editor Rich Moseson, W2VU, at Dayton. (Rachel Moseson photo)

and hang same. In short, EZ-NEC can greatly simplify your amateur radio life when you want to upgrade your antenna farm.

How well does EZ-NEC perform? Let me put it this way: At the Bent Dipole Ranch here in Dacula, Georgia, I use this modeling software in all my antenna projects. Since I am acrophobic (one who is afraid of heights) and really, *really* don't like climbing roofs, tall ladders, and especially antenna towers, EZ-NEC provides me a way to check out my new antenna designs without ever leaving the shack.

Roy, a soft-spoken radio amateur, is a tremendous asset to the radio hobby. Being an avid homebrewer of QRP radio gear and station accessories and, of course, antennas, Roy is a true master of his craft. His EZ-NEC creation was used by the ARRL in its antenna modeling course and that's quite an endorsement.

An active QRPer and hiker, Roy savors the times he can dash into the bush, radio in hand, and operate from a primitive site. Being an outstanding CW operator, Roy prefers the ARRL's annual Field Day emergency communications (EmComm) exercise at the end of June to pack in and operate from the field. All of his gear is homebrew (home-built) and Roy gets a chance to display not only his operating but his building talents during exercises such as Field Day.

Adding #IV: W4NL

Right on the heels of Dayton and the associated "Four Days In May" QRP gathering, I attended a meeting of the Southeastern DX Club (SEDXC) in Atlanta. The guest speaker was Lynn Lamb, W4NL, who used near-QRP power levels to achieve over 300 countries worked on HF. He did it using wire antennas for the most part!



Roy Lewallen, W7EL, developer of the EZ-NEC antenna modeling program and a member of K7SZ's personal ham radio hall of fame. (Photo courtesy W7EL)

Lynn and his wife are both ardent DXers and both of them are on the Honor Roll, which means that they've worked just about every country currently on the DXCC country list! Talk about a family hobby. Wow!

Lynn's presentation came four days after he and Bob Locher, W9KNI, were inducted into the CQ DX Hall of Fame at the Dayton Hamvention®. To be considered for the DX HoF is, by itself, a major milestone in a ham radio operator's life. Induction into this prestigious group is only awarded to those who've provided years upon years of service to the radio hobby in general and the DXing facet in particular.

Lynn and Bob have both used their Elecraft K2 transceivers to show the rest of us how it's done. That's right, two world-class DXers powered down their

linear amplifiers, rolled their output power down into the single digits, and then proceeded to work just about anything they heard on the bands! In Lynn's case, he worked enough DXCC entities to qualify for the Honor Roll. Both Lynn and Bob admit that they were not at "true" QRP power levels, but were running about 9–12 watts output rather than the universally accepted 5 watts QRP output.

Throughout Lynn's presentation at the SEDXC, he referred to using 9–12 watts as "a challenge." For Lynn, it was the ultimate challenge of his skills. He kept telling the audience that he is a much better operator for the low power experience. While some hard-core QRPer would whine about them not "really being QRP," I tend to look upon their accomplishments as a guideline for the rest of us as to what can be accomplished using minimal power output. These guys are two of my heroes, that's for sure.

That is a wrap for this month. The summer can produce some extremely dangerous weather, so please be careful as you venture outside with your radio gear. Mid-summer "pop-up" storms are something we have to contend with. Thunderstorms are an ever-present threat, so watch the weather and take a weather radio with you into the bush. In the next column we'll have some new ideas for you to mull over.

73 Rich, K7SZ

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It Just Followed Me Home from Dayton!

By now Dayton and FDIM (Four Days In May) 2010 are old news, but the sights and impressions still pop up in my thoughts. What a blast! The last time I went was in 1994, and my lasting memory of that event was rain followed by a cold wind. This year I felt a need to go back to meet and greet both old friends and new acquaintances. The sheer volume of technical input (new gear, new kits, new modes) was overwhelming, but it is the people who made the biggest impression. What a great family to be a part of!

I'd like to thank all of you who took the time to e-mail or write to me after the appearance of my first column. I appreciate your words of encouragement, praise, or criticism. I especially appreciate those of you who took the time to make suggestions for subjects you'd like me to cover in these pages. Please keep those ideas coming. I tend to have tunnel vision, so please do give me a nudge if you notice an area of interest that's fallen off my QRP radar.

NS-40 and the Mothers of Invention

In his June 2009 column, Dave Ingram, K4TWJ, reviewed the NS-40 transmitter, which is offered by the Four State QRP Group <<http://www.4sqrp.com/>>. Lately, one of the more interesting designs to bubble up out of the QRP pond, this little green

board is about the size of a QSL card and looks vaguely like your mother's electric stovetop, the one with those spiral burners. Only in this little transmitter, the spirals are the inductors, etched onto the board so you don't have to wind toroids. When you open the box and empty the plastic bag, only 14 parts tumble out. About ten minutes of solder time later and you're on the air with a clean 5 watts.

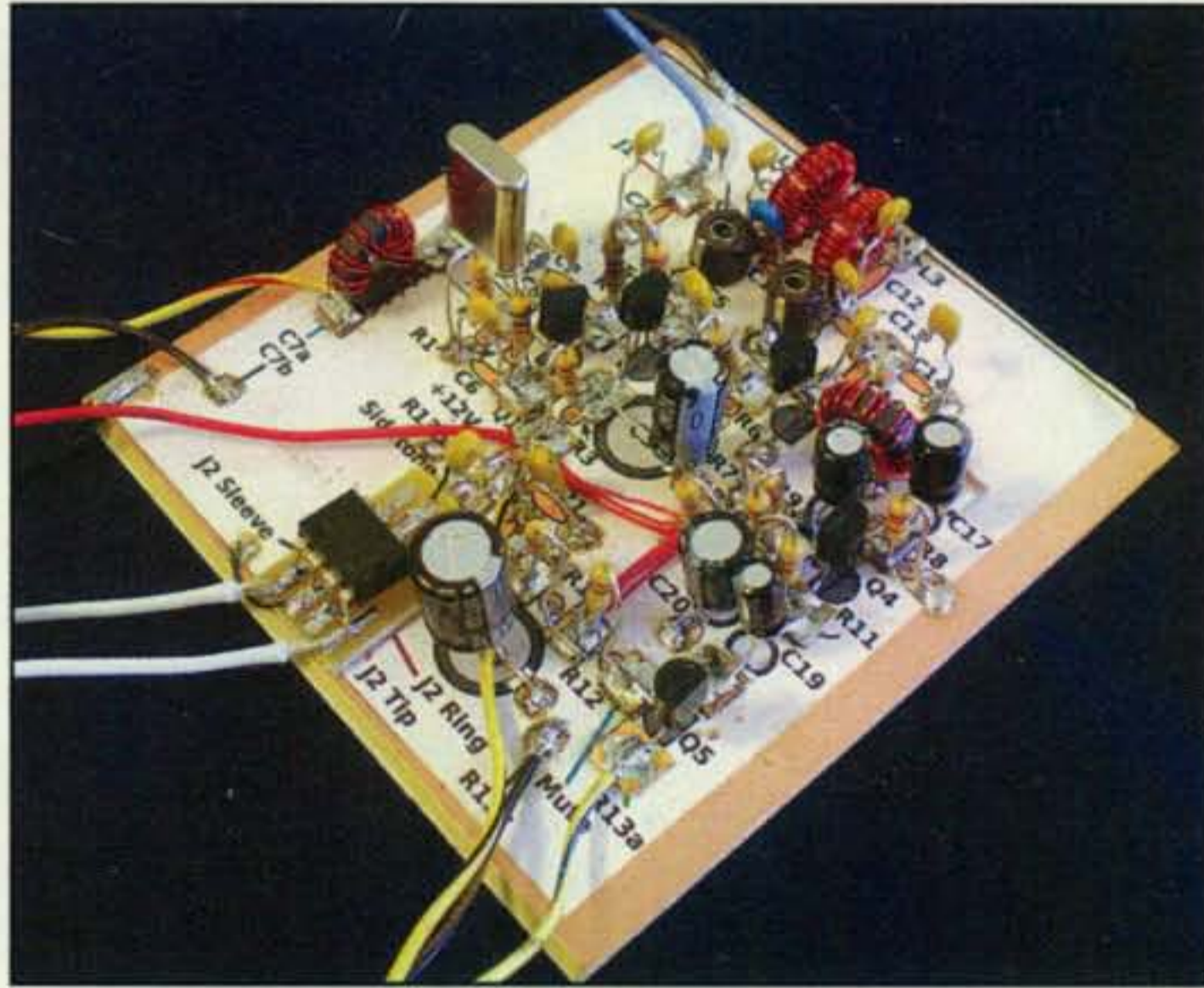


Photo A— The VRX-1 (versatile receiver) can be built for any band from 160 through 10 meters, comes with a parts layout diagram, and is a good kit for first-time Manhattan builders.

*1959 Bridgeport Ave., Claremont, CA 91711
e-mail: <qrp@cq-amateur-radio.com>



Photo B— Ian Maxwell, MMØMXW's portable setup, which he uses for hilltopping. See the text for a description of all the parts.

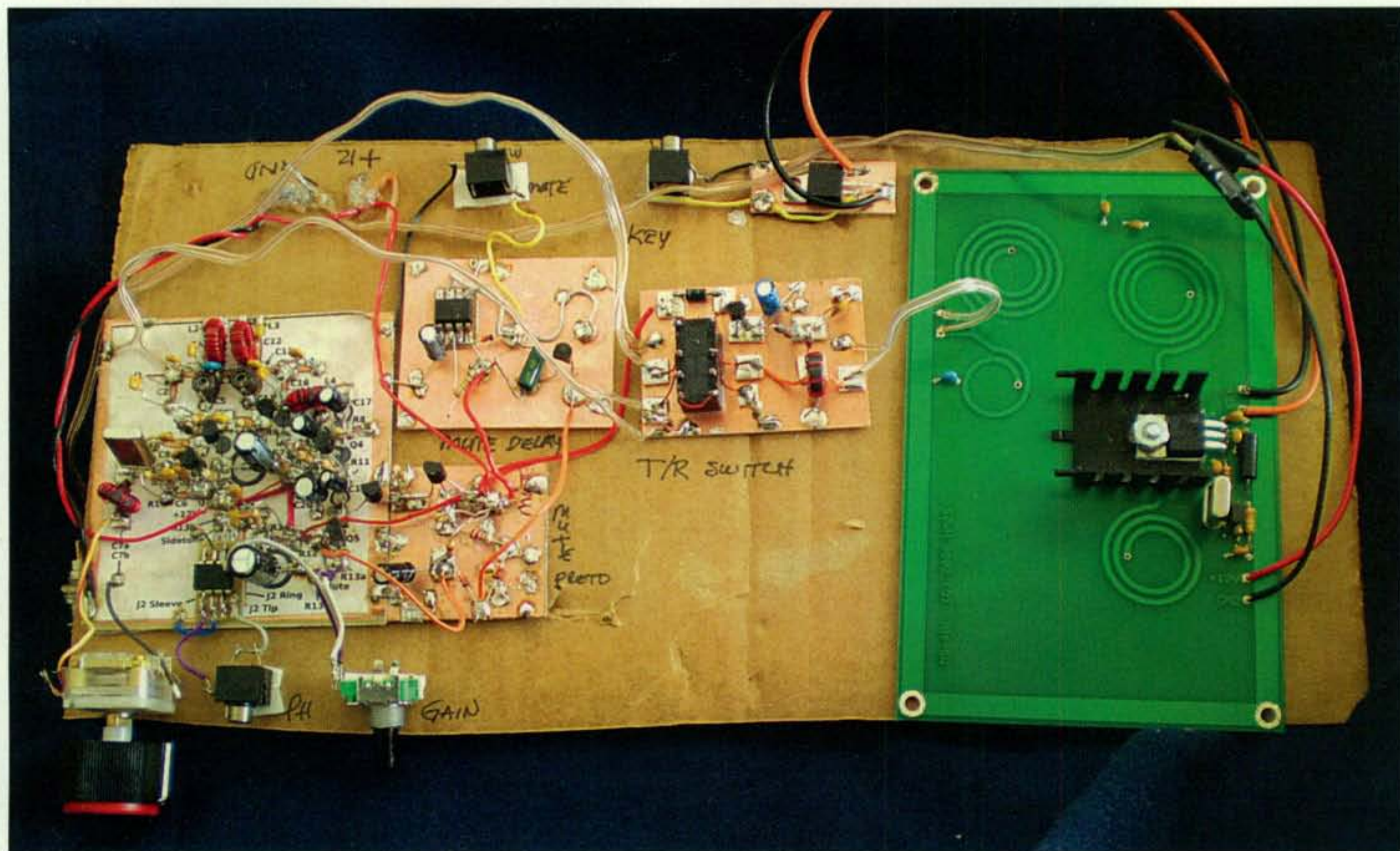


Photo C— This Cardboard Breadboard was cobbled by Terry, WA0ITP. A guy has to have a place to put the parts while in the midst of a creative spasm!

It's about this time that most NS-40 builders stop to ask themselves the question, "What do I do for a receiver now that I have a transmitter?" In the world of QRP kit building we've become so used to making little transceivers that when a transmitter comes along it throws us for a collective loop. To find the answer, I logged on to the Yahoo group dedicated to the NS-40 transmitter <<http://groups.yahoo.com/group/NS-40/>> to eavesdrop on the crowd. The subject of what receiver to use with the transmitter surfaced regularly. It seemed that several of the group members were able to reach into a drawer and pull out a Ten-Tec 1056 receiver kit. Other receivers mentioned ran from the elderly (Drake 2B) to the new wave (Softrock Lite), to an updated version of KK7B's R1.

Meanwhile, the powers that be at the Four State QRP Group had also seen the need and set about designing their own answer to the question, the VRX-1. Jason Mildrum, NT7S, was called upon to do the design, and he came up with a nifty little DC receiver kit that can be built for any band from 160 through 10 meters (photo A). This receiver is built Manhattan style, and for those unfamiliar with or fearful of Manhattan construction, Jason's excellent assembly instructions include a tutorial that brings the whole process into clear focus. You can download the assembly instructions from the Four State website at <<http://www.wa0itp.com/vrx1assembly.html>>. (Also see KØNEB's "Kit-Building" column in this issue; it's all about Manhattan-style construction.—ed.)

Here comes the next collective head-slap from the NS-40 builders: "Now that I have a transmitter and a receiver, how do I control them?" That's right; a new set of needs has surfaced. How do you switch from transmit to receive? How do you switch the antenna? What do you do for a sidetone? Old timers had to deal with these dilemmas, because boatanchors mostly came in two flavors—transmitters and

receivers. Antenna switching was usually accomplished with a coax or open-framed relay. These were big clanky things with 110-VAC relay coils that certainly outweighed an NS-40 and VRX-1 combined. That is not to mention some kind of switch the operator had to throw to make the changeover. If you were lucky, the relay had a second set of contacts that served to switch the transmitter on and mute the receiver. If you weren't lucky, you had to throw these switches by hand. Also, as for the sidetone, we didn't need no stinkin' sidetones!

Meanwhile, back in this century, another item on the NS-40 Yahoo group led me to an e-mail correspondence with Ian Maxwell, MMØMXW. I quizzed him about what peripherals he was using with his NS-40 and he replied as follows, "I used the NS-40 with Rick Campbell, KK7B's Modular Direct Conversion Receiver (sect. 8.5 of EMRFD). I've been using it for about five years now, working around Europe (as far as Asiatic Russia...)." The EMRFD Ian refers to is the common abbreviation of Rick's book, *Experimental Methods in RF Design*, published by the ARRL. This particular design of KK7B's results from lessons learned over the ten years since he first published the design of the R1 and applies them to an even better receiver, but that's fodder for another column or three. Ian sent along a photo of his portable setup (photo B), and you readily can see that he adheres to the KISS principle! His explanation follows:

"As to the T-R switching, my own aim was to keep it as simple as possible with three switches. The antenna comes into the TX and runs through to a SPDT switch, which connects the antenna either to the TX or the RX. Switch 1 is the SPDT switch. Switch 2 (SPST) is in the RX to isolate the other end of the cable as a precautionary measure. Switch 3 mutes the RX (this is in the circuit diagram of the DC receiver). On transmit, all three switches are up, isolating and muting the

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Photo D— Jim Kortge, K8IQY's Magic Box will do the heavy lifting when you need to interface a separate transmitter and receiver.

RX. On receive all three switches are down, reconnecting the RX to the antenna. There is no sidetone as such; the tone heard in the RX is the stray RF being picked up."

Not exactly QSK, yet it bears a closer resemblance to the Armstrong method. However, it's simple and it works.

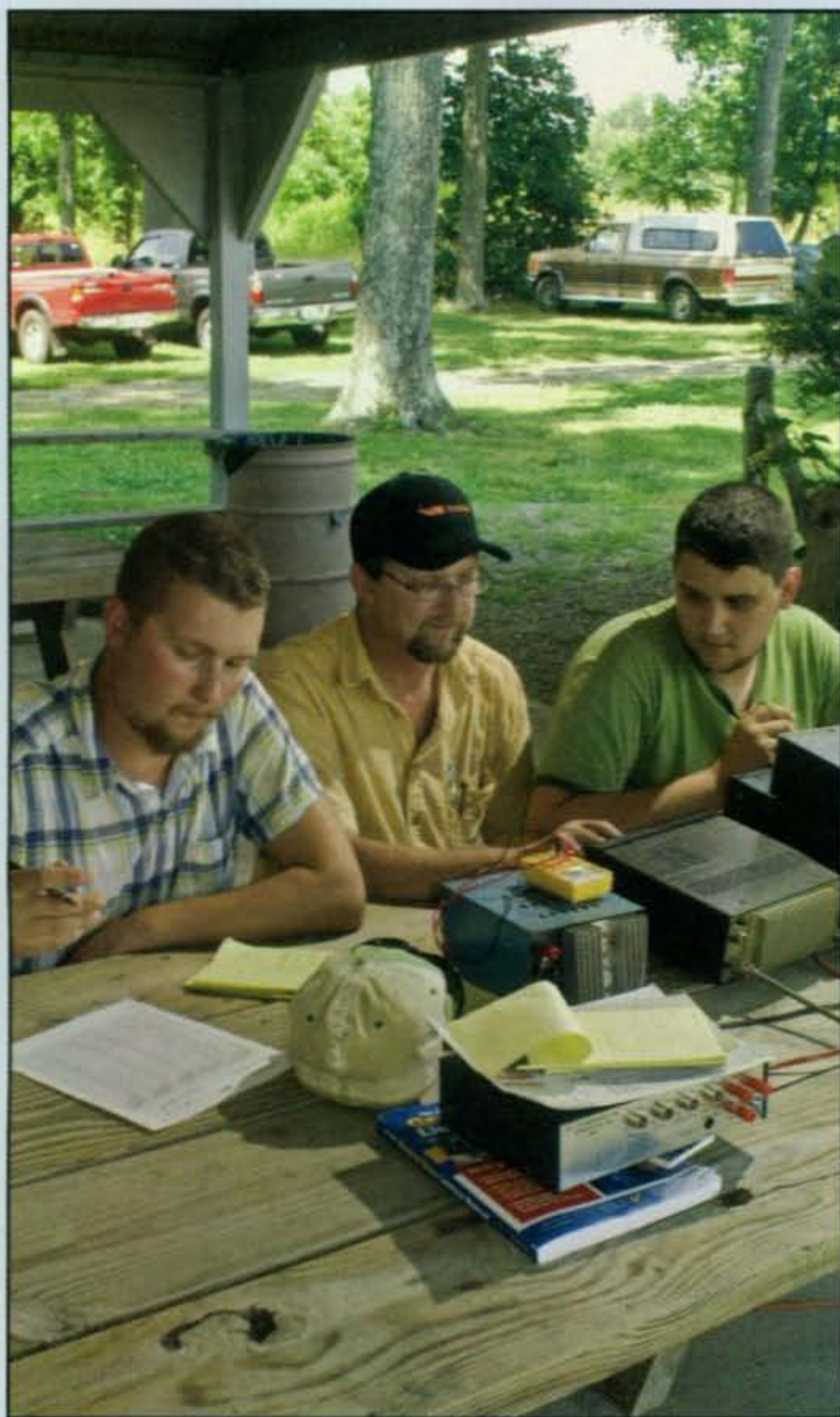
Back on this side of the pond, Terry Fletcher, WAØITP, started researching the circuits needed to come up with a more automated means of TR control. You can see some of these circuits in the photos section of the Yahoo group. It's the item portrayed in photo C, though, that really clarified the creative process for me. This is known as the "Cardboard Breadboard." You just need a place to bring all your ideas together. It may not be pretty, but it serves the purpose.

Now take a look at photo D. Terry had it in the back of his mind all along that this collection of T-R control circuits needed to be gathered together and sold as a kit by the FSQRP group. It would make life much easier for all the hams who had separate transmitters and receivers. For this job the FSQRP Group turned to Jim Kortge, K8IQY, who was asked to make a formalized kitable version of Terry's Cardboard Breadboard. The first thing Jim did was jettison the cardboard. Then he proceeded to design a microprocessor-based T/R switch which provides full- or semi-QSK, sequenced T/R switching, 80-dB isolation between RX and TX, and an easy-on-the-ears 700-Hz sine-wave sidetone. The FSQRP Group introduced this kit at OzarkCon in April and calls it the "Magic Box." It should be on sale on the website by the time this column is published. (See more on the Magic Box in this month's Kit-Building column.—ed.)

NUE-PSK Continues to Grow

Smokey the Bear celebrated his 66th birthday in May. I'm not offering this tidbit because I think there are many Smokey fans in the ranks of QRPers. It got my attention because it came to me via PSK-31. Special-event station K5S was celebrating Smokey the Bear Days in Capitan, New Mexico, and I ran into them on 20 meters PSK-31 using an NUE-PSK modem (see photo E). This digital modem is offered by George Heron, N2APB, and Milt Cram, W8NUE. You can access their extensive and very informative website at <http://www.nue-psk.com>.

By now most hams have either heard of or used PSK-31. When I first tried it out, the software was running in DOS and my computer was a 386. Things have changed. Now the soft-



On the Cover

The Grider family of Tennessee is just full of hams ... three of whom are seen on this month's cover. In the center is dad Terry, KQ4LS, flanked by sons Jeff, KJ4MCL (left), and Jason, KJ4MCK (right), as they operate a portable station at the Hyder Burks picnic shelter on the campus of Tennessee Tech University outside Cookeville. Other licensed family members include a son-in-law and Jason's wife, Jenny, KJ4MCJ. Jason, Jenny, and Jeff all took their license exams at the same time last May and received sequential callsigns.

Terry has been licensed since the 1980s and concentrates most of his operating today on 2 meters, working with ARES (the Amateur Radio Emergency Service) and as a storm spotter. During the last sunspot cycle, Terry says, he also did quite a bit of operating on 10 meters and confirmed more than 80 countries on the band. He has worked for the past 22 years as an industrial maintenance technician for Cummins Filtration, a division of Cummins Engine Corp.

Jeff, who is 26, is also an electrician, and is also active in public service communications. Jason, 23, has recently upgraded to General Class, but does not yet have an HF radio. He is also active on 2 meters, and recently devoted time to talking over the air with a group of Boy Scouts working on Radio Merit Badge at scout summer camp. All three are active with the Cookeville Repeater Association. (Cover photo by Larry Mulvehill, WB2ZPI)



Photo E—"Only you can prevent wildfires," says Smokey.

were actually runs in color (!) and there are macro brag sheets and all sorts of automated bells and whistles. However, the mode itself is unchanged and it remains very QRP friendly. It works well at low-power levels and requires very little bandwidth.

My Field Day compatriot, Bill Phinzy, K6WHP, brought along one of these modems last June and ran up an impressive number of Qs with it. I wanted to get some hands-on evaluation time, so Bill very generously lent me his unit so I could use it at my leisure. This little paperback-book-size box literally screams "Take me to the woods!" However, since I had no trips to boonies planned, the back patio would have to be pressed into service (photo F).

Getting the NUE-PSK modem on the air was quite easy. Bill uses his unit with an FT-817, but I wanted to use it with my K2. Fortunately, he had kept the unterminated cable which came with the modem, so all I had to do was solder on a K2-compatible microphone connector. After that, hooking up the station was a breeze: connect keyboard to modem, connect modem to radio, connect the radio to the antenna. A 7-AH 12-volt battery provided power for everything. After wiring and powering up the station, little signal pips started dancing across the miniature spectrum display. PSK stations were readily identifiable by their tiny train tracks which showed up at the beginning and end of each transmission. All you have to do is center the station over the cursor and away you go.

More NUE-PSK

At Dayton I shared a room with Dave Wilcox, K8WPE. "Doc" Dave resides in Traverse City, Michigan (The Cherry Capital of the World, don't ya know!) and was looking forward to opening up his summer cottage, throwing up a piece of wire and working some DX. He picked up an NUE-PSK modem at Dayton, and a week after we returned home I got the following e-mail from him: "What a hoot! I hook it up and hear a guy in the Canary Islands. . . . Give him a call and he comes back! Scared me half to death . . . just like my first CW QSO 50 years ago. I was just fooling around using my 817 and a Z-11 pro tuner, balun, and 125-foot long wire. . . . I don't even know how much power I was using. I think 1 watt because I am using the internal battery. . . . Tonight all of Europe was booming in as well as the Azores and some other IOTA stations. . . . This is the way to go to get started. No extra computer, just a modem and a rig."

Meanwhile, George and Milt have been busy finding new things to cram into their little black box. To an old brass pounder like me, it seems like magic to be able to include



Photo F— The PSK-NUE digital modem set up with keyboard, K2, and battery makes a compact, portable digital station.

more stuff. Case in point: The units they now are shipping can do RTTY as well as PSK-31, and by the time this column is published they will be able to do CW as well. That's not all, though. George said that after some discussions on the group's e-mail list, the next mode they are going to implement will be MT63. Development for support of this mode is in progress, and they hope to have it complete and available this summer. The next mode to be added, he said, would be Olivia.

All the software development notwithstanding, you still have to plumb this modem to a radio to tune in the signal you want to decode. As Doc Dave said above, all you need is the modem and a rig. Or do you? Another item George and Milt are working on developing is a

Softrock-style transceiver that would live in a similar-size box attached to the back of the modem. All you would need to be able to get on the digital airwaves is the modem/transceiver combo, keyboard, battery, and antenna. On the NUE-PSK webpage, about one quarter of the way down the page, look for the NUE-SDR in the "Modem News" section. You can bet I'll be watching this item closely for further developments!

Back to the Fort

I managed a short eyeball QSO with Doug Hendricks, KI6DS, while in Dayton. He was busy selling his Hendricks QRP Kits products, which you can find on his website at <http://www.qrpkits.com/index.html> (also (209) 704-3522). When I first

became aware of the Ft. Tuthill 80 transceiver kit, the plan was that The AZ ScQRPions were going to kit the 80-meter version and Doug was going to kit the other bands, starting with 160 meters and 40 meters. However, the recent surge in sunspots made him change course. Doug thought it would be best to get some products ready for the higher bands before the spots came and went, so at Dayton he was selling the 15-meter version (photo G).

Holding the schematics of the two radios side by side reveals that Dan Tayloe, N6VE, the rig's designer, had to do some major redesign work. In the 80-meter version, the VFO ran at 1.18 MHz and then was tripled up to 3.5 MHz. In the 15-meter version, Dan ran the VFO at 6 MHz and mixed that with a 15-MHz crystal oscillator to produce the needed 21 MHz. Thus, the entire VFO architecture has been changed. Dan also added a third BS170 FET to the final amplifier, so it puts out a solid 5 watts, and he made some other changes such as rise/fall shaping for the finals B+.

I brought home a Tut 15 from Dayton, eager to get it built and playing. Fifteen meters is my favorite band, and I wanted to see how much of the goodness built into the Tut 80 carried over into the Tut 15. I monitored 15 meters as I soldered, and, of course, the band was deader than a doornail.

I hit a few bumps along the road but managed to get the rig in its box and playing just in time for the start of the CQ WW WPX CW Contest. I'd heard stations tuning and testing, so there would probably be some action. Indeed, the bell rang at 0000Z and the band lit up. I dove in with 5 watts flying and bailed out an hour later, full in the knowledge that a direct-conversion receiver isn't the preferred weapon of choice for major contesting. The band wasn't too crowded, though, and I was able to isolate enough lonely stations to make a fun run of it. I managed 20 Qs, including stations on the East Coast, Hawaii, and New Zealand. 15 meters was in the best shape it's been for a long time, and I know I'll be having fun on it with this little rig for at least the next sunspot cycle or two.

Signing Off

This column leaned toward the hardware side of the hobby, since some items that caught my eye at Dayton/FDIM just begged to be discussed. Back to our regularly scheduled programming next time, and please keep those ideas coming!

72/73, Cam, N6GA



Photo G— The second in the Ft. Tuthill dynasty, a 15-meter version, now selling in the hopes that the sun hasn't forgotten its spots.

Manhattan-Style Construction

It was great to see so many of my readers at Dayton this year! I hope to bring you more articles that kit builders want to read. I got lots of suggestions about future topics, so I know my work is cut out for me! This month I want to talk about a construction technique that is growing in popularity among builders. This technique is called "Manhattan" construction due to the finished product's resemblance to the big city and its densely-packed high-rise buildings (see photo A).

Many kit builders are familiar with regular printed-circuit-board construction, but a lot fewer have ever seen or tried Manhattan-style construction. That is because most major kit suppliers do not make any in this style, but the number of Manhattan kits is growing. Manhattan has advantages and disadvantages. It is not as neat as a pre-made board, but is a lot lower in cost and has an advantage of providing a solid ground plane, often lacking on some PC boards. There are a lot of homebrew projects made this way as well.

The basics of Manhattan construction are simply using a blank sheet of double-sided PC board cut to the size desired for the project and a number of round pieces of the same board punched and then glued to the surface of that blank board (see photo B). In most Manhattan kits, a pattern template is provided to allow you to put dots on the board to

locate where the Manhattan pads will be glued. By printing the template and placing it over the blank board, you can poke holes in the paper and then use a felt-tip pen to mark the spots. Most often, some type of cyanoacrylate glue, often called "super glue," is used to attach the pads to the board. Some epoxy glues work well, too. Some builders have used solder paste, as is used for surface-mount construction, and then heat the board with a low-airflow heat gun or bake it in a small toaster oven to melt the solder. Keep in mind during construction that heating glued or soldered pads too much can loosen their bond to the main board.

A proven method to easily make the round pads is to use a scrap from your main board material after you cut your main board to size. There are a few metal punch tools on the market that work for this purpose. Two available from Harbor Freight include its #44060 and #91510 hand punches for \$20 to \$25. The resulting round pads are used on your main board. These punches can also be used to punch nice holes in Altoids® or similar tins, making for very neat cases. There is also a new source for pre-made Manhattan pads, from Rex, W1REX, at <<http://www.qrpme.com>>. These pads are square and come on a board that is scored so the pads snap off in rows and can then easily be separated by carefully breaking them apart. The pads come pre-tinned and ready to go. Rex calls them "MePads" and "MeSquares." The MePads are designed for mounting ICs and other similar com-

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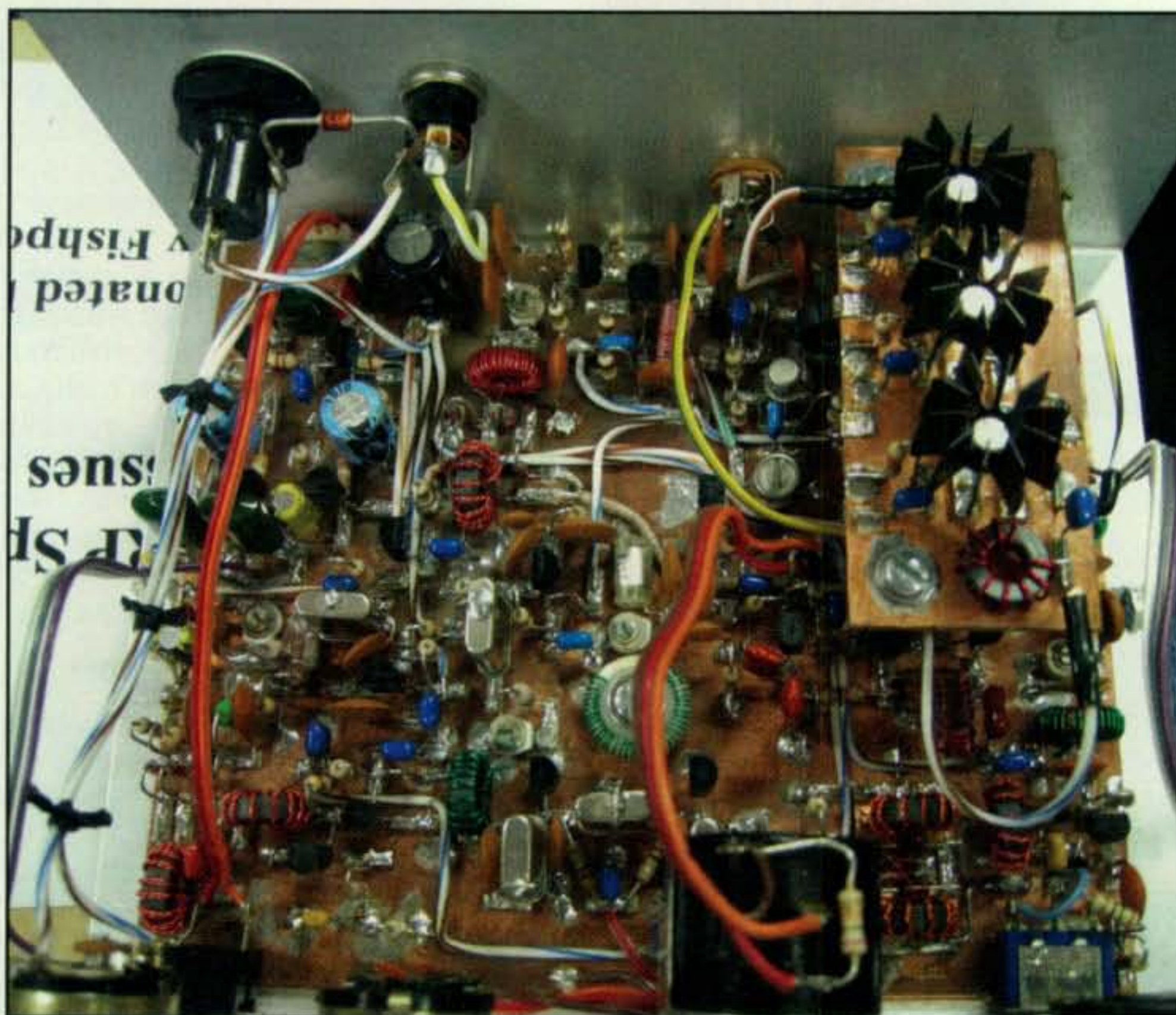


Photo A— A 2N2222-based CW transceiver built using Manhattan techniques.

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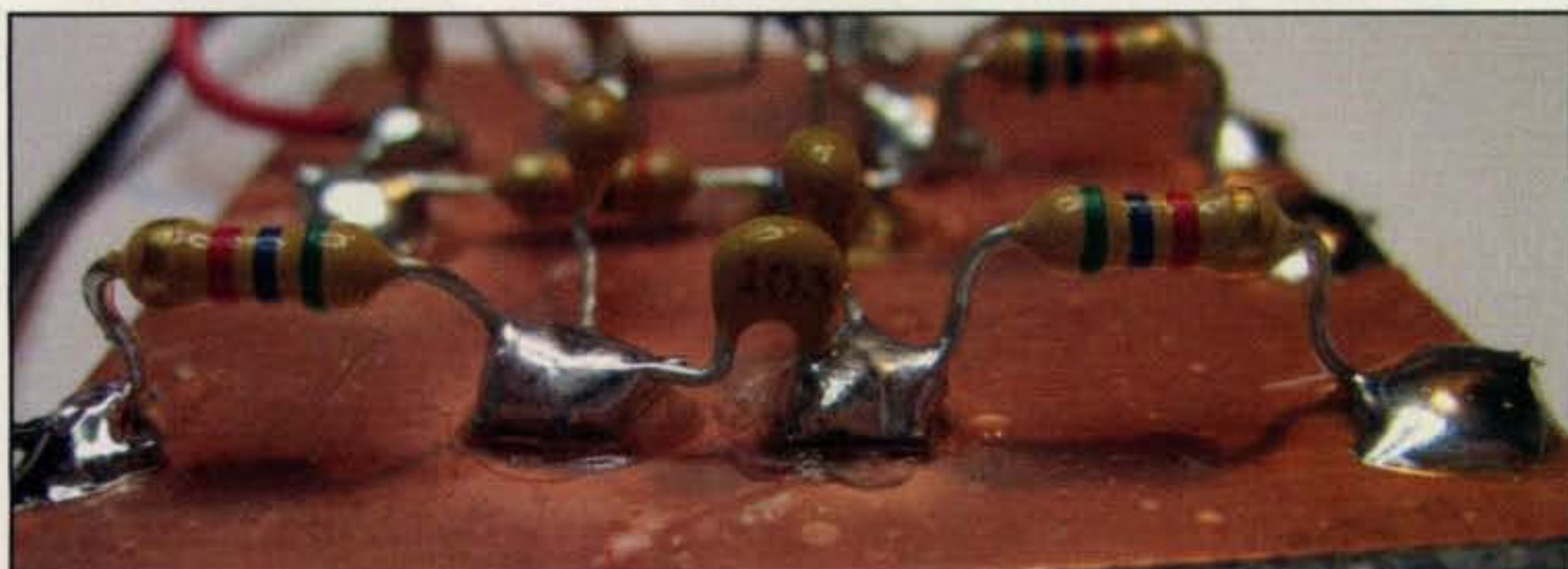


Photo B— Close-up of Manhattan component mounting.

ponents that have closely spaced pins and include pads designed for regular DIP ICs as well as surface-mount ICs. Both types of Rex's pre-made Manhattan pad sheets sell for \$10 apiece. These pads are also not double-sided, so they will need to be glued in place.

Installing the Parts

Allow plenty of time for the glue to set before beginning to place components on the board (photo C). When placing the parts on the board and pads, you will find that trimming the length of the leads and then bending them to form a kind of

right-angle "foot" works the best. Be sure to make the legs that solder to a pad shorter than the leads that solder directly to the board to keep the parts standing upright. Also, it is a good idea to not have the components standing too tall above the board, as there can be problems with some RF circuits if too much lead is exposed. Since ground is the most common connection in most circuits, connecting to ground is the easiest thing to do in the Manhattan style. Simply solder the ground lead to the main board. The pads serve as insulated junction points for interconnecting parts. A good photograph and diagram are essential to success in making a

Manhattan kit. Most of these kits come with a good-quality photo and diagram you often download to print out, along with templates for the pad locations.

A good example of a Manhattan kit available for purchase is the Four-State QRP Group's VRX-1 receiver kit. It is designed for first-time Manhattan builders and includes a template you can glue to the board permanently to mark the parts locations and pad sites. You can view the kit and order it from the Four-State QRP Group at <http://www.wa0itp.com/vrx1.html>.

An exciting new kit that is available is made with a PC board that has Manhattan pads already etched onto it. It is a new version of the popular "Sudden" receiver circuit designed by G3RJV and sold by Rex, W1REX, at <http://www.qrpme.com> (photo D). This kit uses the same PC-board material to make up the front and back panels as well, making it a one-of-a-kind Manhattan kit. The black PC-board material also adds to the unique style and look of the kit and makes for an attractive housing. Eliminating the two different levels of board material allows the builder to bend the component leads evenly and trim to fit the spacing between pads. In addition, Rex sells a

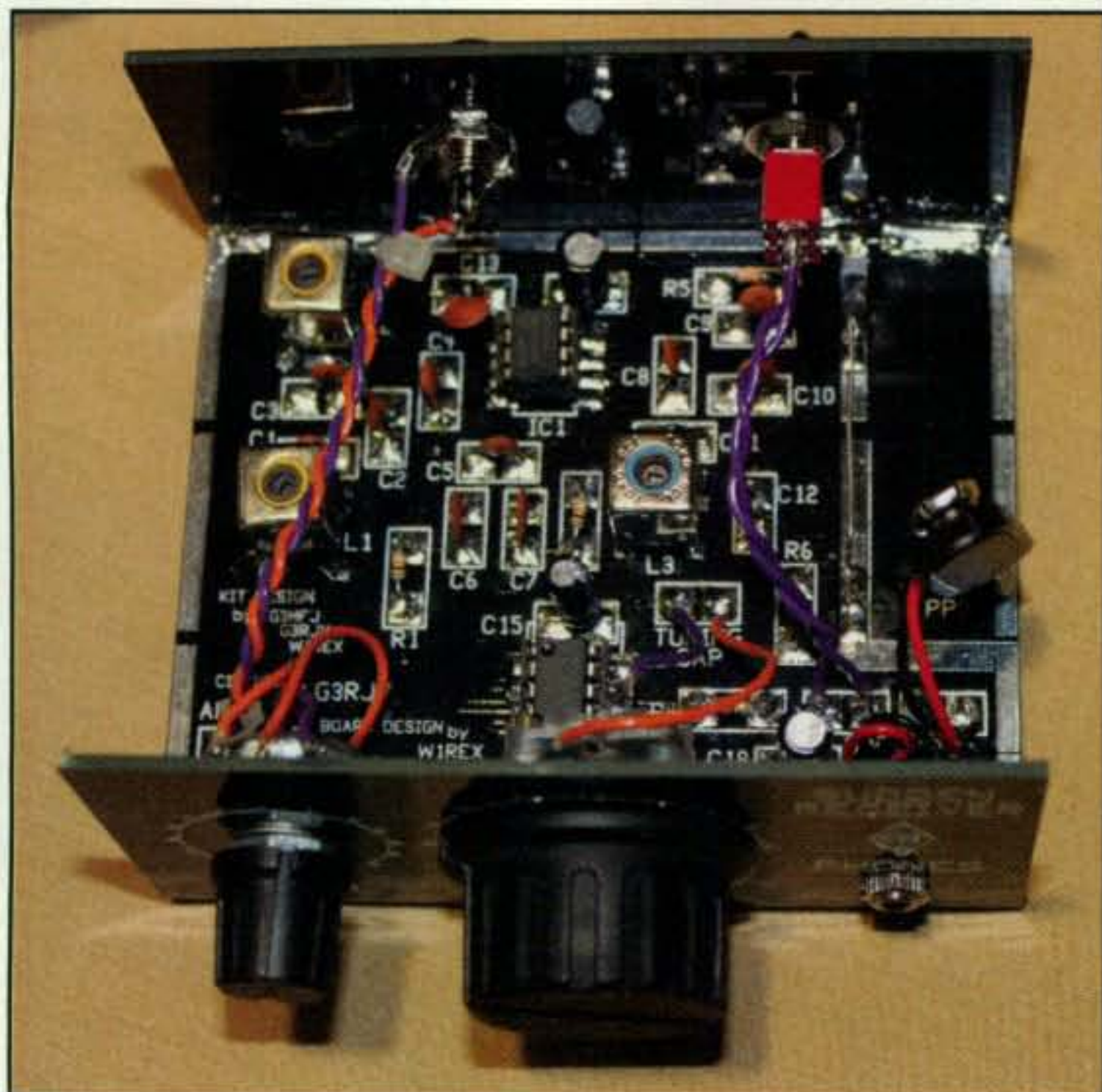


Photo C— A simple audio oscillator board.

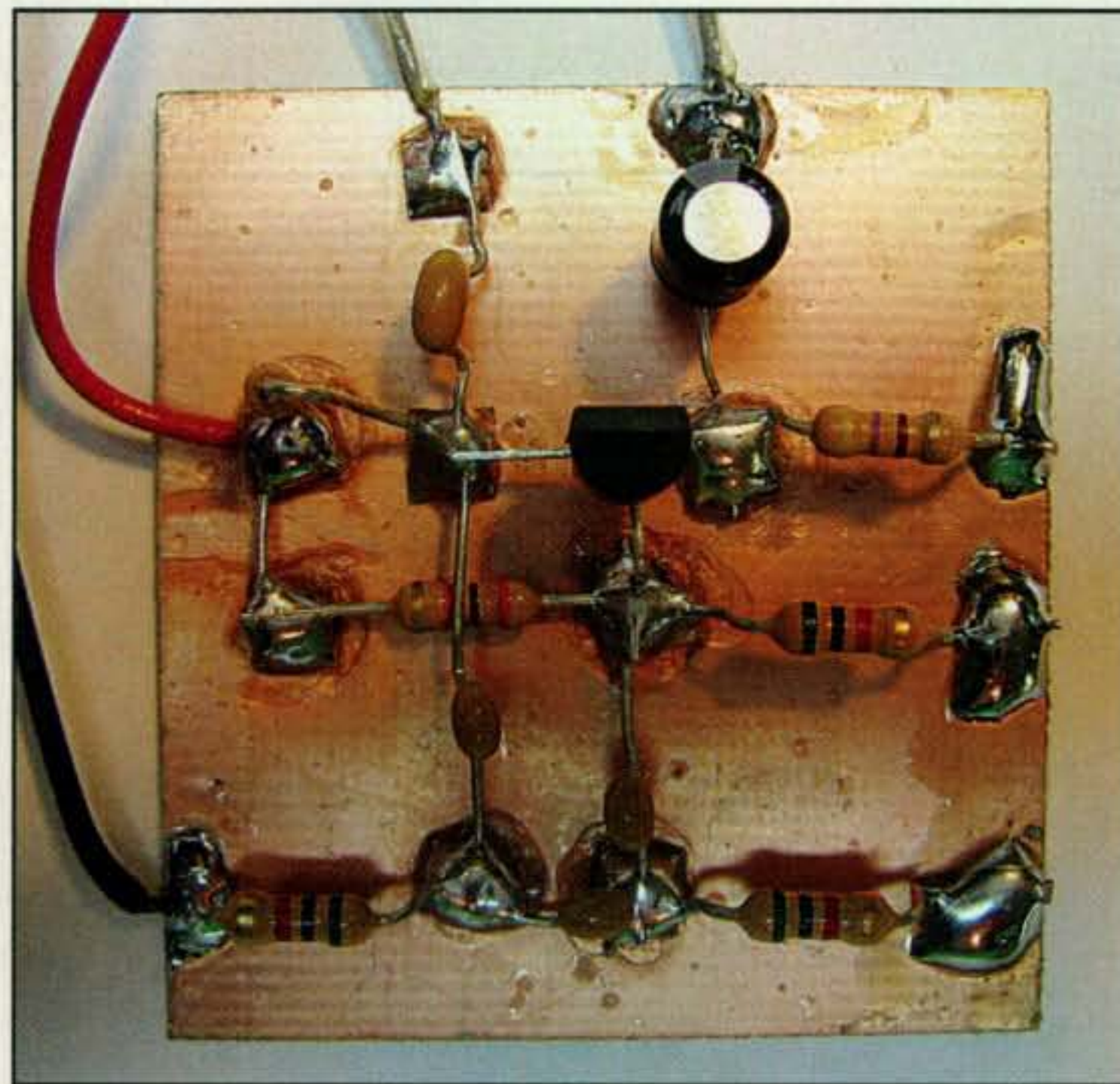


Photo D— G-QRP club "Sudden" receiver kit utilizing Manhattan-style pre-etched board.

"Reggie2" kit designed by Michael Rainey, AA1TJ. It is also a Manhattan-style board, but was renamed "Limerick" by Rex, as he developed the pre-etched Manhattan pad boards with the pads all on one level.

New Kits at Dayton

Many more new kits were introduced at the Dayton Hamvention® this past May. Some of them include Hendricks Kits'

new Tuthill 15, a 15-meter CW transceiver with digital dial, a new surface mount or thru-hole mount dummy load kit, a 40-meter CW transceiver with a digital dial option, and a CW keyer/audio amp kit. Hendricks Kits is online at <<http://www.qrpkits.com>>. In addition to its Sienna HF transceiver kit, DZ Kits also showed a handheld 40-meter AM transceiver kit. DZ Kits is at <<http://www.dzkit.com>>. Kanga US showed its R2Pro receiver, designed for

use in a microwave CW/SSB receiver or on HF. Kanga US is at <<http://www.kangaus.com>> .

Pacific Antennas introduced its compact 40/20-meter trap dipole kit that looks easy to put together and enjoy. The antenna is available at <<http://www.pacificantenna.com>>. The 4-State QRP Group introduced its newest kit, a very unique automatic electronic T/R switch kit called the MagicBox. Designed by Jim Kortge, K8IQY, the MagicBox allows the user to connect any receiver and a low-power transmitter, allows for full break-in keying, and eliminates clumsy and slow toggle switching between transmitter and receiver. It also provides over 80 dB of isolation between transmitter and receiver. This kit is a breakthrough for those interested in combining different receivers and low-power transmitters without worrying about T/R delay and how to make them work together. Watch for announcements of availability at <<http://www.wa0itp.com/mbmagicbox.html>>. I ordered one at Dayton, and am sure it will be handy when building and evaluating kits.

Don't let the summer hamfest season go by without looking over the latest in kits and parts and tools for the builder. I have been busy as well, and will be bringing more construction reviews and tips on new kits. Remember to say hi if you see me at the Huntsville Hamfest (without my Dayton hat!) or any other hamfest. 73 de Joe, KØNEB

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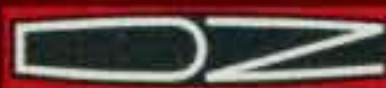
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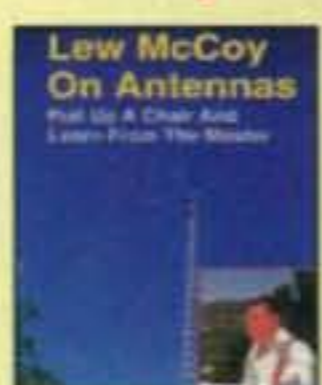
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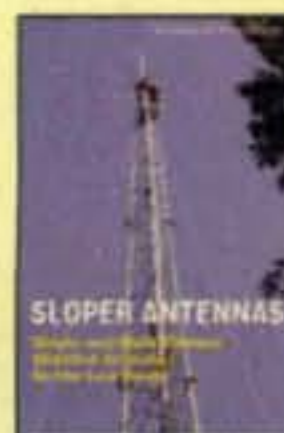
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Computer Numerical Control

Back in December, I mentioned in passing that I had a CNC (Computer Numerical Control) PCB (printed circuit board) drilling machine that I had made from plans I found in a magazine. The level of interest from readers surprised me. I guess you're tired of drilling PCBs by hand, like I was, so that's what we'll examine this month.

What I built (photo A) was designed by Dan Mauch and published as a series of articles in *Nuts & Volts* back in the early '90s. Basically, it's a wooden table that moves on drawer slides, under a gantry holding a Dremel tool, which comes down and pops holes in my PC boards. Software commands the table to a precise X and Y coordinate, and then moves the Dremel down to drill a hole through the PCB, which I have taped down to the wooden table. This repeats for each hole, about one every second or two.

The details of its construction are not that important, since you can get plans for similar machines from several places on the web (see the "Resources" box). Let's talk instead about what is important, because once you understand the basics (and they really are pretty basic), you'll be able to build one yourself.

Motors

The first thing you'll need for any CNC project are some motors to move things. My CNC drill uses

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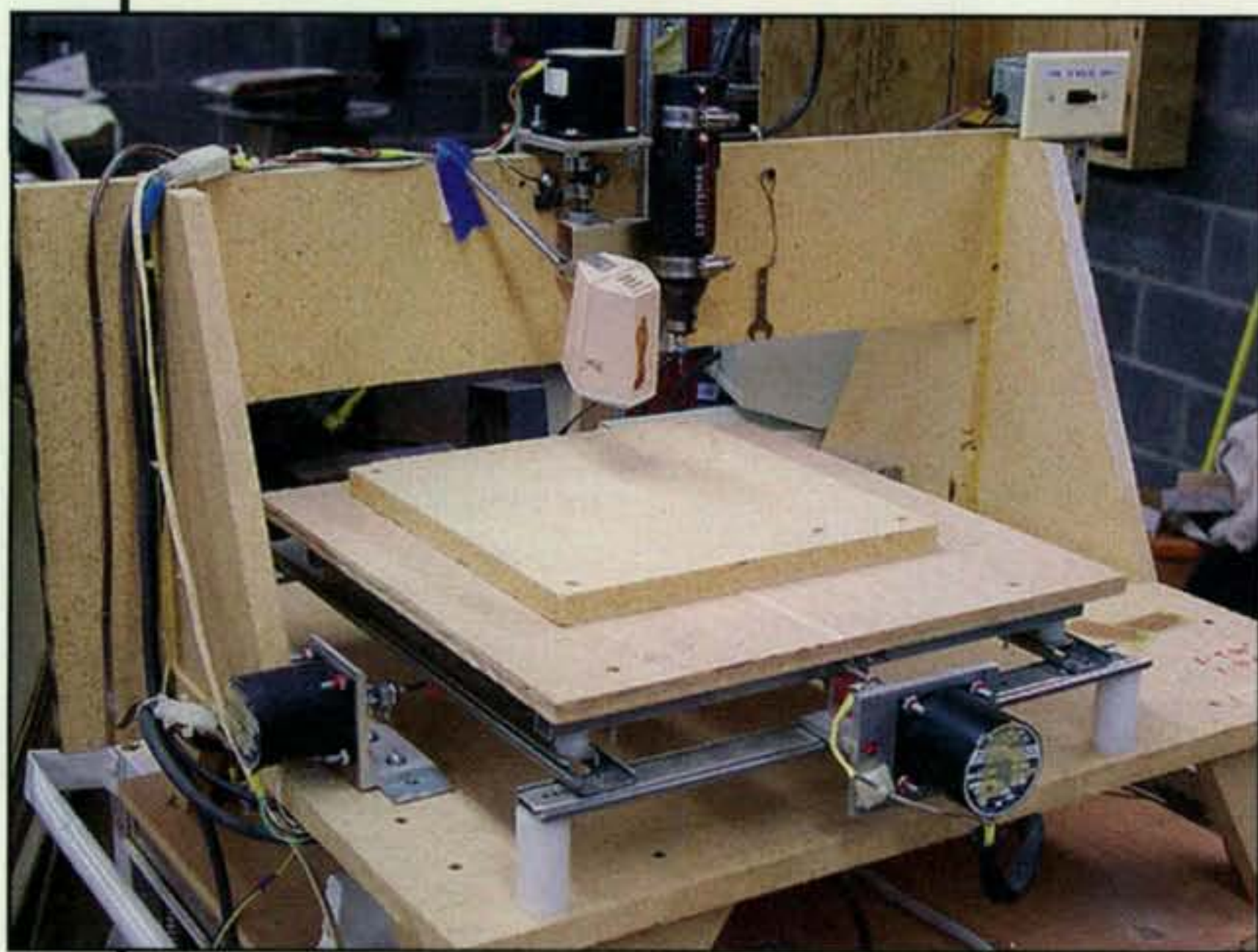


Photo A— My CNC printed-circuit-board drilling machine. The X and Y stepper motors are the black cylinders visible in front. These are connected to precision Acme lead screws. The Z axis motor and the Dremel tool used to turn the drills are visible near the top. At the upper right is the emergency cut-off switch.

stepper motors, while some larger machines sometimes use servo motors.

Stepper motors are special motors that can be moved one "step" at a time, typically around 200 steps per revolution. That means that with my 20-threads-per-inch lead screw (more on that in a moment) I can move my table by 1/200 of a turn, or 1/4000 of an inch (0.00025) at a time if I so desire.

The downside of stepper motors is that there is no feedback to the controller as to whether the motor moved the table to the correct spot or not. This is known as "open loop control"—send the signal and hope everything goes where it's supposed to. It sounds haphazard, but it actually works quite reliably if you stay within the performance limits of the motor.

In contrast, *servo motors* have built-in feedback systems which tell the controller exactly where they are. They also come in larger sizes, for those really huge machines, but can be overkill for a very small machine. They generally cost more than stepper motors.

Motion

Translating rotary motor motion into linear X or Y coordinate motion is the job of the *lead screw* (pronounced "lead"). This is merely a threaded rod with a nut (see photo B): Turn the rod, and the nut (attached to the table) moves towards or away from the motor. For any kind of accuracy, you can't use hardware-store threaded rod. What I have instead is precision lead screw stock with 0.003-inch-per-foot accuracy and a special zero-backlash nut. It's a bit expensive; 3 feet of 1/4-20 (1/4 inch diameter, 20 threads per inch) precision acme-thread lead screw costs about \$30, and precision plastic nut about the same. Three feet of 1/2-10 material is about the same price.

Some systems, particularly large ones, use a toothed belt or chain and sprockets to move things. It's somewhat more challenging to maintain low backlash with these. *Backlash* is how much "play" is in the system—if you reverse directions, how long until the "play" or "slop" in the system is negated and things start to move again. My old Atlas lathe has about 0.010-inch backlash in the cross slide, pretty much normal for a machine of its age, meaning when I reverse directions, the indicator changes by about 0.010 inch before the mechanism actually moves.

Rails

OK, so now we have motors and linear motion. Next we need the three axes of motion (X, Y, and Z) to not only move smoothly, but accurately (90° to each other) and with no vibration or "chatter." What you need here is some kind of rail system. My machine uses special drawer slides (photo C), designed to have no "wiggle" in them, welded together at exactly 90 degrees. I have heard that hardware-store drawer slides can be found with

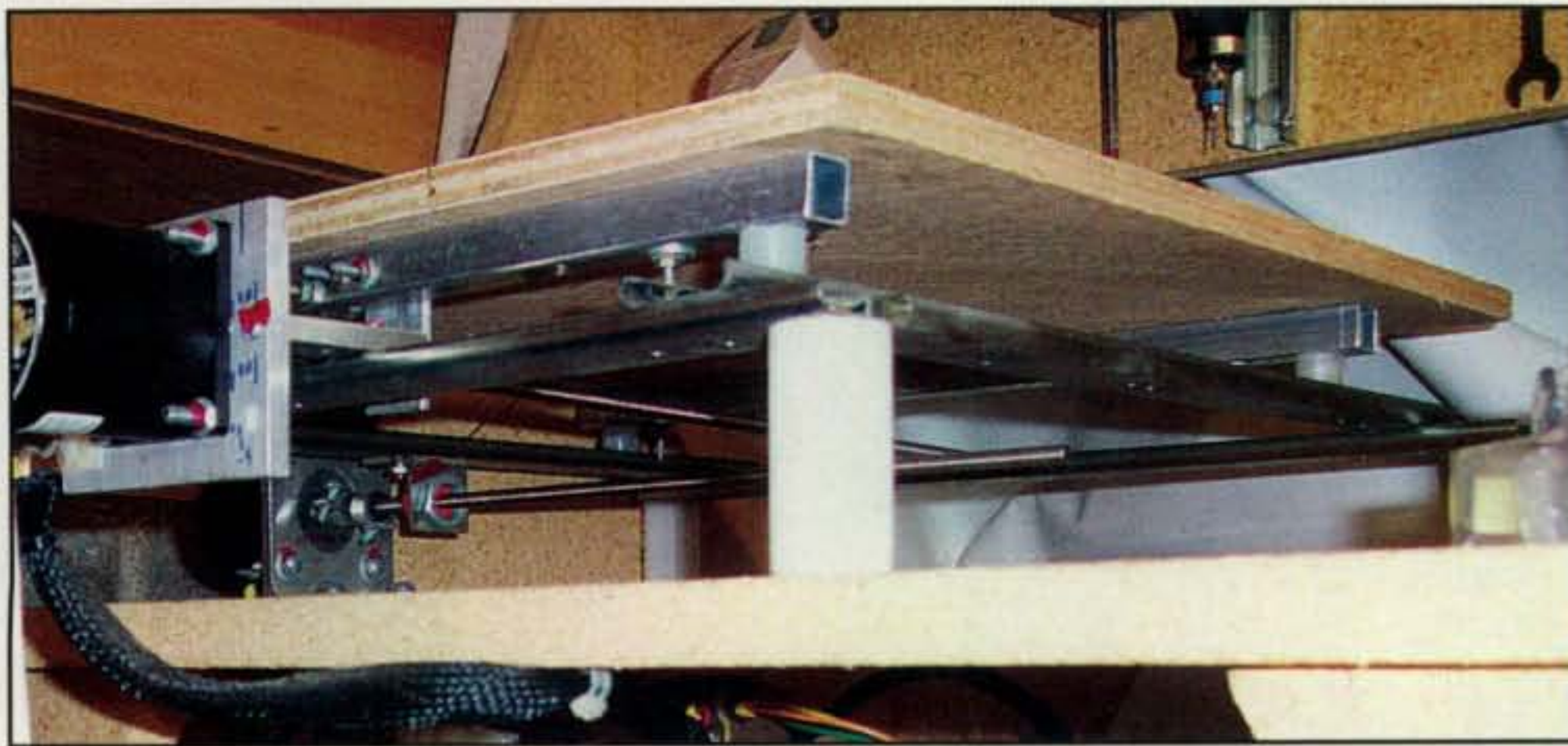


Photo B— The PC-board machine from underneath. Just under the table you can see the lead screws and red zero-backlash nut for the Y axis, attached to an aluminum bracket.

virtually zero wiggle, but I've never looked. This light-duty system is perfectly adequate for a PC drill.

If you plan on machining metal, you'll want something more rigid. Many machines use *ground steel rod* and either *V-groove* or *linear bearings*. These can be somewhat expensive—\$20 a foot, plus \$10 each bearing—but are rigid and precise. There are many other types of precision motion-control systems, such as one using angle extrusion. Pick one that fits your budget and need for precision.

What is absolutely critical is aligning the rods or tracks for each axis to be parallel with one another, and the machine axes need to be exactly 90

degrees to one another. This takes care and time to achieve, but it is essential. A difference of a thousandth of an inch in three feet is about the maximum tolerable error.

Tools

The last piece of hardware for your CNC machine is the tool that will turn the cutting bit. In my machine, I use a single-speed Dremel tool, spinning at about 12,000 RPM. This is almost the right speed for carbide CNC PC-board drills. You can't use a carbide drill even in a manual drill press, as the drill will be spinning far too slowly, and even the slightest horizontal movement while drilling will break the bit. Carbide is hard, but brittle.

For a larger machine, perhaps one designed to cut metal, you could use a Roto-Zip type tool, or even a wood router. They spin plenty fast and have sufficient power. Variable speed would be handy for certain materials.

Tooling

For drilling PC boards, it shouldn't be surprising that the best tool is a *carbide PC-board drill* (photo D). You can buy these in surplus, usually as "resharps," resharpened bits that might not work in production but are fine for hobbyists. You can get away with High-Speed Steel (HSS) bits, assuming your tool can grab onto them (those carbide bits have a uniform 1/8-inch shank, perfect for a Dremel), but they won't last very long, since fiberglass-epoxy PC-board material is very abrasive.

For *machining* (as opposed to drilling), the tooling of choice is an *end mill*. It is similar to a drill bit, but instead of the tip doing all the work, a mill is designed to cut sideways using the flutes along the sides. End mills come

in dozens of different styles, each with a specific purpose. Explaining all of them would take far more space than I have in this column, so take a look at the "Resources" box.

Safety

Just a short note about safety: A computer-operated machine tool will happily and reliably follow the instructions given, even if those instructions will result in self-destruction, flinging large chunks of metal at high speed across the room, or severe damage to expensive materials and equipment. A misplaced decimal point is all it takes. Humans, on the other hand, can generally recognize hazards and avoid them.

This means that you, as the human in the system, need to check and watch over the machine constantly. We can add some features to the system to help prevent many basic problems, but not every failure mode can be foreseen or detected.

Two mandatory features are a big ECO (*emergency cut-off*) switch and several *limit switches*. The ECO switch usually operates one or more relays or contactors, shutting off power to the motors and tool immediately and completely. The limit switches are placed to detect when the system has moved to the limits of its travel, signaling the software to stop all movement and sound an alarm. In my system the ECO is an ordinary light switch mounted to the front of the table, which turns off the motor power, and I've used it several times. Each axis also has a limit switch at each end. The ones at the "zero" position serve double-duty as "home" switches, so the software has a consistent physical starting point for any operation.

A cover is always a good idea. I never did install one, but I've been thinking of adding a clear plastic cover to help reduce noise (the Dremel is loud enough that I use ear plugs.).

Last but not least, real *safety glasses* are a must-have whenever the machine is on. I've been satisfied with a \$5 pair from Harbor Freight. Make sure you get a pair that are both comfortable enough to wear all day and don't distort your vision (causing a headache). If they are comfortable enough that you don't mind wearing them, you'll use them more often.

Controlling

OK, so now we have all the mechanical parts out of the way, leaving the last bit of hardware—the interface between the computer and the motors, known as a

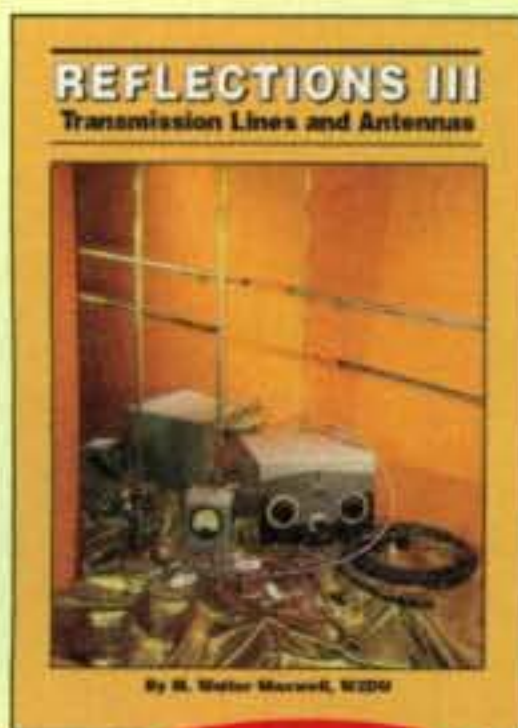


Photo C— A special drawer slide which uses a roller with a rubber O-ring to eliminate any play or wiggle in the system. This type is used for relatively light loads. Even the slightest amount of play in the rail will harm the machine's accuracy.

REFLECTIONS III

by Walter Maxwell, W2DU

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Photo D— An assortment of carbide PC-board drills. Carbide is very hard, allowing thousands of holes to be drilled in highly-abrasive glass-epoxy PC boards, but it is also very brittle, breaking easily if used in a manual drill press

controller. While anyone even mildly handy with electronics can buy a stepper or servo motor driver IC and assemble it (with a power supply) into what's needed, I recommend just buying what you need. For example, a four-axis controller with four larger stepper motors can be had for under \$500. (Why four axes? Hey, you never know; maybe you'll want to add a rotary table or something in the future). If you're really going to build one yourself, Google "stepper motor driver" to get some ideas. Make sure you get the right kind of motors for the driver!

Computer

A 1-GHz Pentium will be more than enough to run the motor controller. You might consider using the same computer to design your PC boards (or 3D parts); if so, a somewhat faster CPU might be worth it. My local computer store sells a refurbished desktop PC that's overkill for under \$300. Consider

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Photo E— Some printed circuit boards that I drilled with my CNC machine. Despite having only a few dozen holes, it's still faster and more precise to let the machine do it.

that (and a nice \$99 flat screen) as part of the cost for your machine.

Software

You need software for two distinct tasks: controlling your CNC machine (CAM software), and designing your parts (CAD software). There are literally hundreds of different CAM (Computer Aided Machining) and CAD (Computer Aided Design) programs available, some better than others, ranging in price from freeware to over \$10,000 per license. It can be a difficult choice.

The main task for the CAM software is to import and interpret "G Code," the universal language for CNC machines, and move the axis motors as necessary. I have been using DanCAM from Dan Hudgins because that's what was recommended all those years ago, but it's getting outdated. It only runs under DOS (I use an old IBM PS2 at 4.77 MHz to run it).

These days, many hobbyists use Mach3 software (which runs under Windows™), and although I don't have much experience with it, I've downloaded an evaluation copy and so far I like it. You can buy it direct, but some sites offer it at a small discount, for example at Dan Mauch's website. It can import several file types and even convert them into G Code.

As for design software, I use Eagle from CadSoft, which generates an Excellon drill file (a type of G Code for drilling). I run the Excellon file through "Optimizer," a nifty program from Dan Mauch which optimizes the drill path to minimize the distance the X Y table has to travel (thus saving time), and drop that file directly into DanCAM. I have yet to try this with Mach3, but Dan has assured me that it works fine.

Putting it All Together

First decide what you want to do with your machine. Then figure out how large and powerful it needs to be while considering your budget. Browse through on-line designs to get some ideas—fixed table, moving table with one or two axis motion, full gantry, or whatever. Select motors, controllers, and rails and fit them all together (very carefully and accurately!) into a CNC machine. Wire up the controller, switches, power supply, tool, and safety systems. Fire up and configure the software, calibrate your machine, run a few test samples (photo E), and start production!

Don't let the bewildering wealth of online information befuddle you. Take it slowly, learn about each part of the whole system (much as I've outlined here), and write down your choices. Once you think you're ready, start collecting materials and get started.

Figure on at least half a year and \$1000 if you buy most of the components and assemble it yourself. If you don't have

any familiarity with precision machining and measuring, get help from an online forum for getting the axes right. You'll need some basic tools—saws, drills and the like. Finally, start small and basic, working your way up to a bigger machine only after you have some experience.

I hope this has helped you at least start thinking about automating some aspect of your hobby. Next time, we'll swing back towards radio and operating, so until then . . . 73 de Don, N2IRZ

Resources

I have used all of these websites for supplies or information of one type or another. All are worth a visit if you're considering building a CNC machine. Don't be afraid to use your favorite search engine to find additional resources on your own.

Dan Mauch's Camtronics website, a good assortment of bits and pieces for building a CNC machine: <<http://www.camtronics-cnc.com>>.

Probably the largest online CNC forum, with many helpful and patient members, is <<http://www.cnczone.com/>>. Also look for the "JGRO Router Table" plans, a nice machine.

Xylotex sells CNC parts and kits. I recommend its four-axis controller and motor kit, which will simplify the construction of any CNC system: <<http://www.xylotex.com>>.

McMaster is *the* source for all things mechanical. While not necessarily the least expensive supplier, it has everything you can imagine. The website is very easy to use, and the explanations are an education in themselves <<http://www.mcmaster.com/>>.

These websites show different kinds of CNC machines that have been built, along with plans of varying detail. Use these to get ideas: <<http://home.comcast.net/~bowzacnc/>>, <<http://dpgeorge.net/cnc/>>, <<http://www.volunteerlabrat.com/default.html?goto=cnc.html>>, <<http://buildyourcnc.com>>.

Depiction equips ARES public service

Cuyahoga Falls, OH - Summit County ARES has supported the American Diabetes Association's "Tour de Cure" bike ride for several years. With nearly 500 riders on five courses simultaneously, the event is a logistical challenge for the 45 ARES volunteers who run communications.

Responsible for overall situational awareness for the event, this year Assistant Emergency Coordinator Dennis Conklin, AI8P, used Depiction mapping software for planning and operations.

Conklin used Depiction to quickly combine spreadsheets

of stations, rest stops and shelters with street maps, topo maps and aerial imagery. He took his "depiction" into the field where it

"Depiction provided terrific situational awareness."

Dennis Conklin, AI8P

enabled him to keep track of events as they happened—visually, and without Internet access.

"In past years, I never felt I had the level of situational awareness I desired. This year, with everything mapped in Depiction, I was much more aware of exactly what was going on and what the implications were," said Conklin. "Depiction provided terrific situational awareness."



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Correction

In my June column on Universal Serial Bus, I trusted an online source too much and made a mis-statement of fact. Thanks to Peter Viscarola, K1PGV, for his excellent letter that helped me understand the fine nuances of this complex subject.

I stated that the root hub in the computer assigns a distinct address to each function in a composite USB device, such as a webcam with microphone. In fact, this kind of device is more commonly implemented as its own USB hub, which then communicates to the various functions within the device. Another variation uses a single address but assigns different "endpoints" to control different functions.

Also, just to clarify: I tended to describe the root hub and USB host controller as if they were different pieces of hardware. In fact, the root hub is an integral part of the controller and is not itself a separate device.

EME: The Future of Weak-Signal VHF?

BY JOE LYNCH, N6CL

Vhf plus

The title of this column asks a rhetorical question. It can be answered both in the affirmative and in the negative, depending on one's perspective of weak-signal VHF. On the positive side, I have chosen to highlight some of the movers and shakers of today's EME communications.

Joe Taylor, K1JT: Perhaps no one has done more to advance the ability of the ham with a marginal station to make EME QSOs than Joe Taylor, K1JT. Joe's development of WSJT, which stands for Weak Signal Communications by K1JT, has made it possible for hams running 100 watts and a long-boom Yagi to make digital-mode contacts with many moderate- to high-power stations. In opening this opportunity to marginally equipped hams, Joe has advanced the interest in EME communications, as well as weak-signal communications in general. Adding software defined radios to the mix has only served to further enhance one's ability to make extraordinary contacts once thought impossible to accomplish. For more information on Joe's many software developments, see his website: <<http://physics.princeton.edu/pulsar/K1JT/index.html>>.

Dave Blaschke, W5UN: For those of us who are in the business world, MBA stands for Master of Business Administration. For those of us in the EME world, MBA stands for Mighty-Big Antenna. The owner of that MBA is Dave Blaschke, W5UN. Dave's mighty-big 2-meter array consists of thirty-two 17-element horizontally polarized Yagis and thirty-two 11-element vertically polarized Yagis. Dave has made over 11,000 2-meter EME QSOs. He has achieved WAS, DXCC, and the world's first WAZ award on 2 meters.

With his MBA, Dave has been the first QSO for many aspiring EME operators. He has encouraged the activation of many countries on 2 meters. He has been a mentor to many new EME operators. For more information on Dave's MBA and other items in his station, see his website: <<http://www.w5un.net>>.

Al Katz, K2UYH: The mentorship that Al Katz, K2UYH, has provided to the 432-MHz and above EME operator is incalculable. If his efforts were to be measured by his monthly newsletter alone (the *432 MHz and Above EME News*) you would not be able to count the number of operators who have been encouraged to get on the air on EME on the UHF and above frequencies. Concerning that newsletter, if you want to know who is doing what during a particular month, you can go to: <<http://www.nitehawk.com/rasmit/em70cm.html>>.

Al's mentoring is not limited to his amateur radio activities. As a professor of engineering science at The College of New Jersey, Al regularly mentors three to four students on projects that he is working on at any given moment. One of his protégés is **Marc Franco, N2UO**. Marc has gone on to assist in designing and developing weak-signal and satellite projects, as well as translating WSJT documentation into Spanish.

e-mail: <n6cl@sbcglobal.net>

VHF Plus Calendar

August 3	Last quarter Moon
August 10	New Moon
August 10	Moon perigee
August 12	Perseids meteor shower
August 16	First quarter Moon
August 24	Full Moon
August 25	Moon apogee.

—EME conditions courtesy W5LUU

Michael and Monika Kohla, DL1YMK: Michael and Monika are a DXpedition team that travels to exotic locations and gets them on the air. This year it was to Kaliningrad, where Michael operated as R2/DL1YMK. Here, from the July 2010 issue of the *432 MHz and Above EME News* is part of their story:

Since the former military restricted area of Kaliningrad was opened in 1991, to our knowledge there had been no guest licenses issued by the Russian authorities for UHF/SHF operation, not to mention any moonbounce activities. It was a very lengthy procedure taking many months to get all the necessary legal permits, starting with the special moonbounce license with a special event callsign issued by the General Radio Frequency Center in Moscow and ending with the allowance to temporarily import all the radio equipment by the Russian customs and border control.

By far the job of logistics management was the toughest ever encountered to make this event become a reality. Monika spent many nights on the computer with endless correspondence, and the heap of documents finally reached some 6 cm in height. We are sincerely obliged to the Russian authorities for the extremely professional handling of our license application and also to the German embassies in Moscow and Kaliningrad for their support whenever things seemed to slow down. After two days travel by car and ferry we passed the Russian/Lithuanian border near Nida on 11 May without any problems due to the perfect preparation by Monika.

We were cordially welcomed by our hosts, who proved to be very tolerant people, allowing us to set up the dish amidst a strawberry field. The next day the stressed dish was installed, which by then was a routine matter. Although its location was very close to a concrete fence running around the farm ground, we had only some tolerable obstructions to the east (below about 7° EL there was a chicken shack) and to the extreme west (a farm house).

On Thursday night (13 May), R2/DL1YMK started the first-ever moonbounce operation from Kaliningrad on 23 cm. After the first CQ, at 0324 OK1DFC was the first to enter the log (569/559), immediately followed by at 0329 OK1CA (569/559), 0337 VK3UM (559/559), and went on to QSO on this first moonpass 42 different stations including very enjoyable sideband QSOs with DF3RU, F2TU, and LX1DB. Because the sun was close to the moon on Friday, 14 May, we were on 13 cm, hoping for some QSOs due to the narrower beam of the dish.

Despite the generally unfavourable condx, we worked 19 different stations, including sideband QSOs at 0742 F2TU (54/53), 0841 LX1DB (55/54), and 0847 G3LTF (54/54). On Sunday, 16 May, we activated 70 cm for the first time with a slightly modified rig compared to OHØ. The feed was down-gauged to just a linear polarized 1-wl short backfire loop, running the risk of possible Faraday lock-out, but saving one coax relay with its inevitable losses. Also the DB6NT LNA was upgraded in

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terms of NF in order to compensate for the lower power of 500 W, imposed by the license conditions.

When firing up the amp, we could hear echoes for the first time despite the relatively low output. The line was started at 0603 by VK3UM (559/559) with one third of the dish still obstructed by the chicken refuge and ended on Sunday at 1720 by G4YTL (O/O). The trade-off rig-wise seemed to pay off, as on the first 70 cm shot we were able to log 23 initials, not to forget K2UYH at 1516 (O/O) for his 98 DXCC.

A significant improvement of the portable setup in terms of moontracking was the implementation of a brand-new OE5JFL controller (produced by HB9DRI) together with cheap 12-bit magnetic absolute encoders, which were incorporated in the SPID rotator. For the first time on a DXpedition we never lost the moon. This was very essential, as we only had a visible moon for half a night; the second op really appreciated this technical improvement, as the nights were quite chilly in R2-land!

On the following days we subsequently reactivated all three bands again. We also ran some JT QSOs on 70 and 23 cm after the hard disk of our laptop came back to life after some problems, although it was extremely slow on decode operation. During the 23-cm *DUBUS* Contest we gave out the R2 multiplier to 49 stations, which is a quite respectable result for a portable setup. Un-

fortunately the activity from the U.S. was low on all three bands compared to previous DXpeditions.

When the dish was dismantled on Monday, 24 May, the total score was 201 moonbounce QSOs, which split up as follows: on 70 cm 34 QSOs with 31 initials in 19 DXCCs; on 23 cm 130 QSOs (3 SSB and 12 JT) with 79 initials in 35 DXCCs; and finally on 13 cm 37 QSOs (4 SSB) with 28 initials in 20 DXCCs.

The return trip was again somewhat exciting, as we feared possibly getting stuck in customs, but all went smoothly and the rig was returned home safely. So there is a good chance for hearing us off the rock from another very sought after DXCC in the future. Thanks to all QSO partners.

For more details on the R2/ DL1YMK DXpedition, see: <<http://www.ok1dfc.com/peditions/ymk10/ymk10.htm>>.

Zdenek Samek, OK1DFC: If you look closely at the R2/DL1YMK URL, you will see the callsign OK1DFC as part of the address. The reason that Zdenek's callsign is part of the address is the tremendous support that he gives to the European EME community. He hosts all of Michael and Monika's DXpedition URLs. He actively operates in and promotes VHF and above contests and DXpeditions. His callsign is a promotion of his second hobby, World

War II airplane and air history. Hence, the callsign signifies Distinguish Flying Cross. The DFC is awarded in the United Kingdom for an act or acts of valour, courage, or devotion to duty while flying in active operations against the enemy. The U.S. has a similar award that is also available to instructors and to civilians for valor related to flying.

DUBUS: There is no better source of worldwide technical papers than the little quarterly magazine *DUBUS*. Published in English and German, it is distributed around the world. Subscriptions are handled by agents in major countries. Here in the U.S. the agent is Janet and Ed Cole, KL7UW, who can be e-mailed at: <dubususa@hotmail.com>. Their snail-mail address is P.O. Box 8672, Nikiski, AK 99635-8672.

Here is a list of feature articles for the second quarter 2010 issue:

- "High-Power Directional Couplers with Excellent Performance —That You Can Build," by Paul Wade, W1GHZ
- "A Bistatic Backscatter Chirp Radar for Amateur Radio Use," by Andrew Martin, VK3OE
- "Applied Conversion of Segmented Wires from NEC2 to 144-MHz Yagi Elements" and

- "for Semi-Insulated Mounting above the Boom using Standard Insulators— Part 1," by Hartmut Klüver, DG7YBN
- "Sporadic-E Summary 2009—144 MHz," by Joachim Kraft, DL8HCZ/CT1HZE
- "Experimental Mixer Head for 47 GHz with Circular WG," by Wolfgang Demmer, DD8BD
- "Idea for a simple multi-function transverter for X-Band," by Konstantinos Giannopoulos, SW3ORA
- "Comparison of ROS and JT65," by Rex Moncur, VK7MO

For more information on *DUBUS*, see its website: <<http://www.dubus.org/>>.

I have only scratched the surface of the many mentors in EME communications. I am sure you can see that my answer to my opening rhetorical question is that with these mentors furthering the technology envelope for EME communications, I find a resounding positive for the future of weak-signal VHF. In future columns I will highlight others.

Current Contests

There are two important contests this month: The **ARRL UHF and Above Contest** is scheduled for August 7–8. Complete rules can be found in the July issue of *QST*. The first weekend of the **ARRL 10 GHz** and above cumulative contest is scheduled for August 21–22. The second weekend is September 18–19. Complete rules for this contest also can be found in the July issue of *QST*.

Current Events

The **14th International EME Conference** will be held this year in Irving, Texas, August 12–14, at the Westin at the DFW airport. This conference will be an excellent opportunity to meet a number of international EME enthusiasts. For more information and registration, see: <<http://www.ntms.org/eme/>>.

The annual **Huntsville, Alabama, Hamfest** will be August 21–22 in the South Hall of the Von Braun Convention Center. There are several VHF-related forums scheduled. For more information, see: <<http://www.hamfest.org/>>.

Calls for Papers

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

Technical papers are solicited for presentation at the **29th Annual ARRL and TAPR Digital Communications Conference** to be held September 24–26 in Portland, Oregon and publication in the conference *Proceedings*. Presentation at the conference is not required for publication. Submission of papers is due by July 31, 2010 and should be submitted to: Maty Weinberg, KB1EIB, ARRL, 225 Main Street, Newington, CT 06111, or via the internet to <maty@arrl.org>. For suitable topics and submission guidelines also contact Maty via e-mail and check <<http://www.arrl.org/>>.

This year's **Microwave Update** conference will be held in Cerritos, California the weekend of October 21–24, at the Sheraton Cerritos. This is a call for papers and talks. They are looking for presentations on all aspects of microwave equipment and antenna construction, theory, propagation, operating, and design modes, just to name a few. Frequency range is 900 MHz through LASER. They have already had

quite a few early volunteers, which they always appreciate, but they are looking for more presenters. If you are interested in presenting, please contact Frank Kelly, WB6CWN, via the website link. They are also looking for papers for the *Proceedings*. You do not have to be a presenter to have your paper included in the *Proceedings*. Papers for the *Proceedings* can also just be short topics on anything microwave related. If you are interested in making a contribution to the *Proceedings*, please contact Frank Kelly, WB6CWN, at the website link on the conference website at: <<http://www.microwaveupdate.org/>>. The deadline for papers is Monday, August 31. The *Proceedings* Style Guidelines page can also be found on a link on the conference website.

Eastern VHF/UHF Conference Proceedings Available

Proceedings for the Eastern VHF/UHF Conference are available on CD at a cost of \$7.00. To order, go to: <<http://www.newsvhf.com/confcd.html>> and follow the directions on the website.

Meteor Showers

Beginning around July 17 and lasting until approximately August 24, you will see activity tied to the *Perseids* meteor shower. Its predicted peak is between August 12 at 2330 UTC and August 13 at 0200 UTC. The *κ-Cygnids* meteor shower is expected to peak on August 18. The visually-impossible *γ-Leonids* is expected to peak August 25, around 1600 UTC. However, this shower may have gone dormant. The *α-Aurigids* is expected to peak around September 1.

For more information on the above meteor-shower predictions see Tomas Hood, NW7US's propagation column in this issue. Also visit the International Meteor Organization's website: <<http://www.imo.net/calendar/2008>>.

Propagation and Tee-Shirts

As usual, hamfests are a place where T-shirt vendors sell their products. Ham-Com in Dallas in June was true to form. However, what was an exceptional T-shirt that caught my attention was the one that read: "On the Fourth Day ... God Created Sunspots—Genesis 1:14." I think that if you read this month's propagation column you might become a believer, because concerning the long-awaited sunspots, there is good news coming—at least from NASA, which predicts that the sunspot slumber will end in 2013. For more information on this vendor's creative products, see: <<http://www.HamApparel.com>>.

And Finally . . .

Education Partnerships with Public Schools: The ominous headlines this past April warned of massive layoffs of teachers and staff of public schools. Secretary of Education Arne Duncan warned that between 100,000 and 300,000 public school jobs could be lost due to budget cuts.

While the public school situation is dire, I believe that this is a tremendous opportunity for small religious congregations, and other groups, to respond to the immediate needs of local public schools. My wife, Carol, and I have been involved as education partners through our church with a local public school for more than six years.

Our involvement began during a local economic crisis for Tulsa Public Schools. The crisis was met by a local philanthropist's \$1-million matching grant challenge. My congrega-

tion's lay leadership decided to give \$200 to the matching grant. Additionally, we became education partners with Hamilton Middle School, which is near our church.

Education partners in Tulsa Public Schools include banks, faith-based organizations, the local Bar Association, the local medical association, museums, universities, Tulsa Air and Space Museum, and the Oklahoma Air National Guard.

We began our involvement by contacting the principal and asking what supplies the school needed. He gave us a list and we went to work, providing over \$200 worth of pencils, paper, and other school supplies. Over the years we have given other supplies, furnished volunteers for testing, and filled a unique opportunity for a couple of seasons as a football-game announcer. The football-game announcer job came about because of Carol being blind. At one of the football games I went about my usual activity of describing the game to Carol. My descriptions to Carol caught the attention of the principal and assistant principal. The assistant principal approached me with a job offer. He said to me, "I hear you doing such a good job in describing the game to Carol that I wonder if you would not mind doing them for the school from the press box." Thus began my short career of announcing the local football games.

Ironically, Carol became my spotter. I converted the list of players and their jersey numbers into Braille so that when I called out the jersey number to her, she would give me the player's name. Then, I could announce, "Touchdown! Jeremy Smith, number 34, ran for 11 yards to pick up 6 points for the Falcons." Unfortunately, my announcing career ended a couple of years ago when my schedule conflicted with the school's game schedule.

Because Carol and I are both amateur radio operators, one way in which our hobby has played a role in our education partnership with Hamilton occurred a few years ago in connection with the International Space Station (ISS) and the ARISS program.

In December 2004, Keith Pugh, W5IU, the satellite columnist for *CQ VHF* magazine, notified me that the nearby Tulsa Air and Space Museum was scheduled to be in contact with the ISS later that month. Several students were already scheduled to ask questions during the 10-minute contact. I got the okay from Keith about the possibility of some of the Hamilton students being observers of the contact. Then I

contacted Ms. Rita Balleu, one of the science teachers, to see if she could arrange for a few students to go to the museum despite the school being on winter break. She got four students to be observers during the contact.

Following the contact, Keith wrote an article for the Winter 2005 issue of *CQ VHF*. As its editor, I made sure that Ms. Balleu and her four students' photos were in the article.

Most recently, the Oklahoma Air National Guard piloted an after-school program at Hamilton. Known as Starbase 2, the program is sponsored by the Office of the Assistant Secretary of Defense for Reserve Affairs (see: <<http://www.starbasedod.com/index.php>>). Hamilton was one of five pilot sites for the new program which included STEM and social skills instructions for the students.

Carol and I became mentors. For two hours during several Wednesday afternoons last spring we and others from the Air National Guard, Tulsa Technology Center, Langston University, and classroom instructors mentored Hamilton students. Nationally the program has been deemed such a success that it will be expanded to ten schools across the country next fall and will include a return to Hamilton.

Just before we left for Dayton this past May we learned that another Starbase 2 pilot site was in Dayton and is sponsored by Wright-Patterson AFB. Therefore, we visited that site a couple of days before the Hamvention® began. It was very interesting to compare the two sites.

My encouragement is this: The dire times for public schools can be huge opportunities for amateur radio clubs. Club members can be volunteers. Club sites can be locations for after-school programs. Your club's involvement is only limited by your imagination. Incidentally, the ARRL has lots of resources for amateur radio in the classroom. For more information, see: <<http://www.arrl.org/amateur-radio-in-the-classroom>>.

Our involvement with Hamilton began through an established education partner program. Even though there may not be a program in your area, I am sure that your local school officials will be appreciative of your offer of assistance.

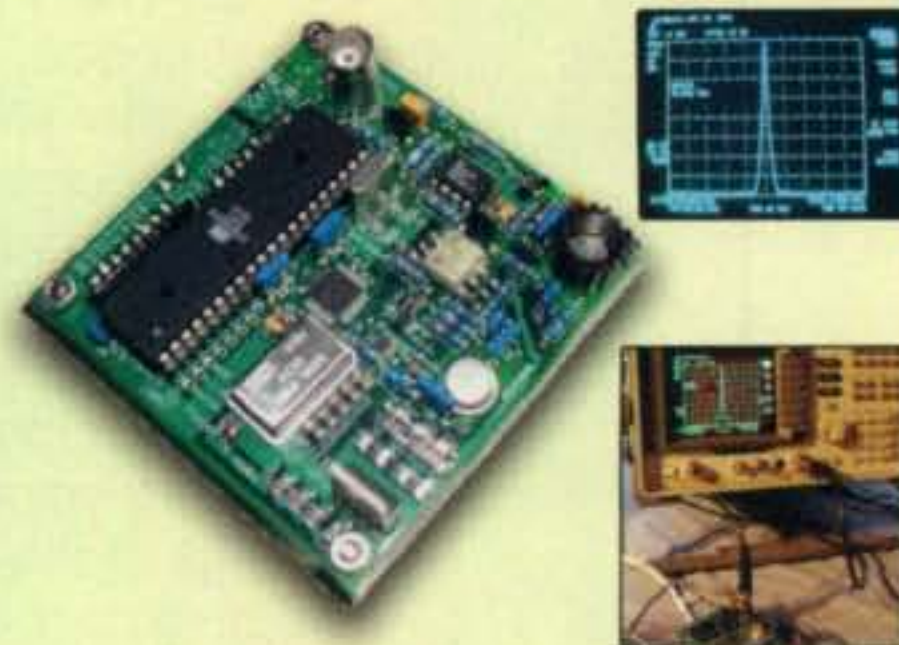
This month I expect to be at the Huntsville Hamfest. I hope to see you there. If you have a story to tell related to the wonderful world of VHF-Plus, please look me up at the hamfest or e-mail me at: <n6cl@sbcglobal.net>.

Until next month . . .

73 de Joe, N6CL

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Publicizing Your Awards

The rules, design, and fee for your brand-new award have been developed and approved. Your work is just beginning, however, because nobody knows it exists. You have to catch the attention of people who are interested in earning your award and displaying the certificate of achievement. Publicity, or advertising your "product," is the key to your success. Here are some hints that may help you:

1. Use the club/group website. Dedicate at least one separate page showing the rules and a good-size image of the award certificate.

2. Club/group QSLs. Add a brief description/image on groups' cards. At least encourage participation by adding the words "Good For The XXXXX Award."

3. Send rules and a sample certificate to those with award-oriented websites: K1BV, SM6DEC, QRZ.RU, etc.

4. Tie-in with State QSO Parties and other appropriate contests.

5. Notify your ARRL Section Manager.

6. Tell online DX newsletters such as QRZ.DX, the Ohio/Penn DX Bulletin, and 425 DX.

7. Notify the Yahoo Group, Ham Radio Awards Reflector.

8. Provide labels/stickers with award rules to the club or group's members for their outgoing QSLs.

If you follow all of these steps, you may get a brief flurry of activity, followed by one or two applications a month; if you are lucky. However, it's often said that you make your own luck, and continual promotion plays a big part of that luck. The principal benefit is the publicity you bring to the event or activity and the challenge you offer to your fellow amateurs. Consider the awards that follow in this column, and in each month's column. Look at the value of the publicity they bring to their group or locality.

Germany: DARC 60th Anniversary Diploma

It took five years to recover after the end of WW II, but the German Amateur Radio Club (DARC) was re-established in 1950 and now celebrates 60 years of service to German amateurs. The requirements of the 60th Anniversary Diploma are challenging, although German amateurs are numerous and quite active.

This short-term award is available to all amateurs and SWLs for contacting stations as noted below from January 1, 2010 to July 24, 2011. Applications will be processed up to December 31, 2011.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@cq-amateur-radio.com>

USA-CA Honor Roll

500
LU5OM3504

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.

Earn a total of 60 points for this award by working the following:

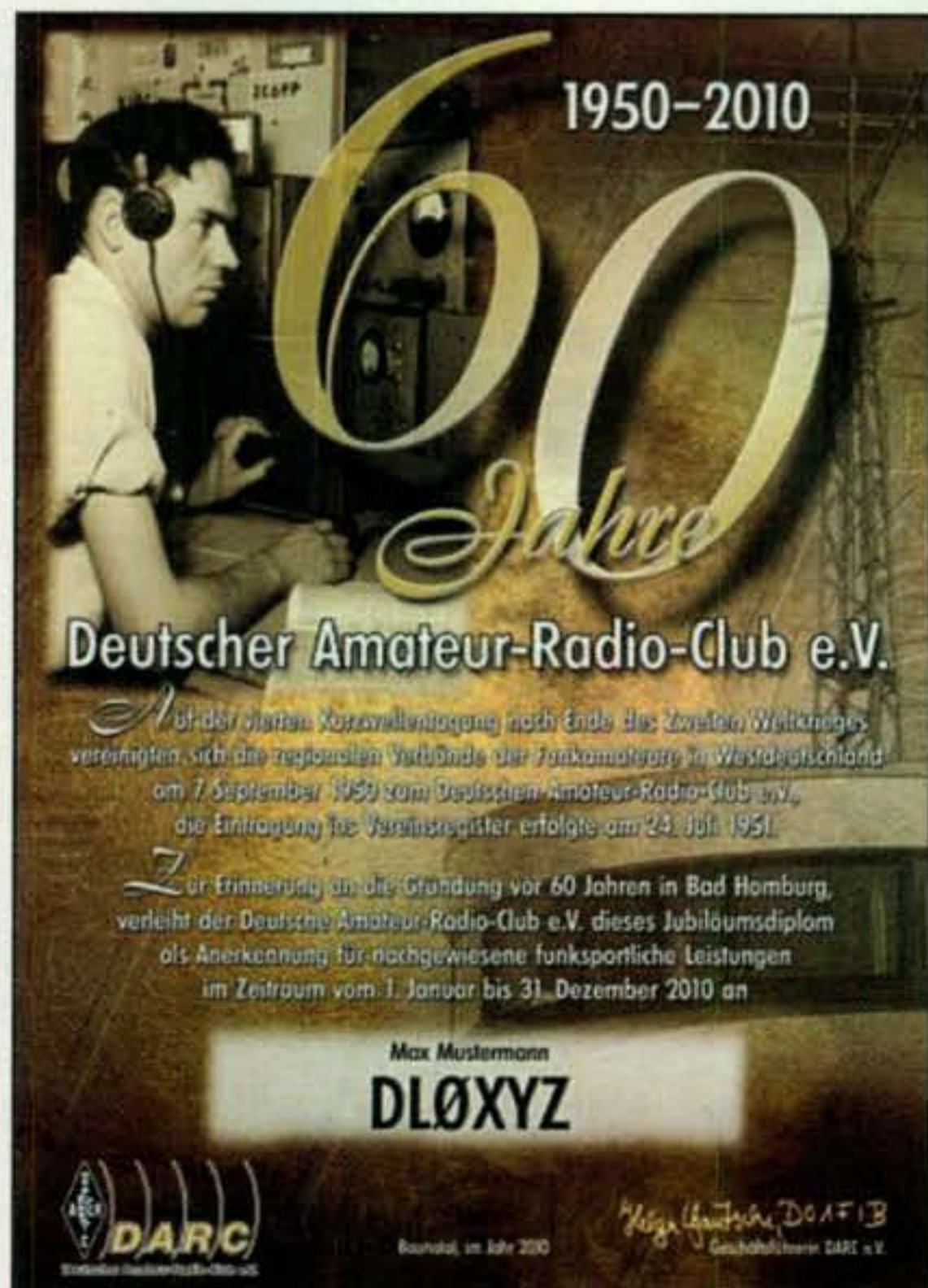
a. 1 point for a contact with a club station of each of the 24 DARC districts.

b. 1 point for a contact with an OM, or 2 points for a contact with a YL of each of the 24 districts. A missing station in a district may be substituted by "joker," 1 point, by working the district chairman (e.g., special DOK "DVA") or directors ("DARCVO").

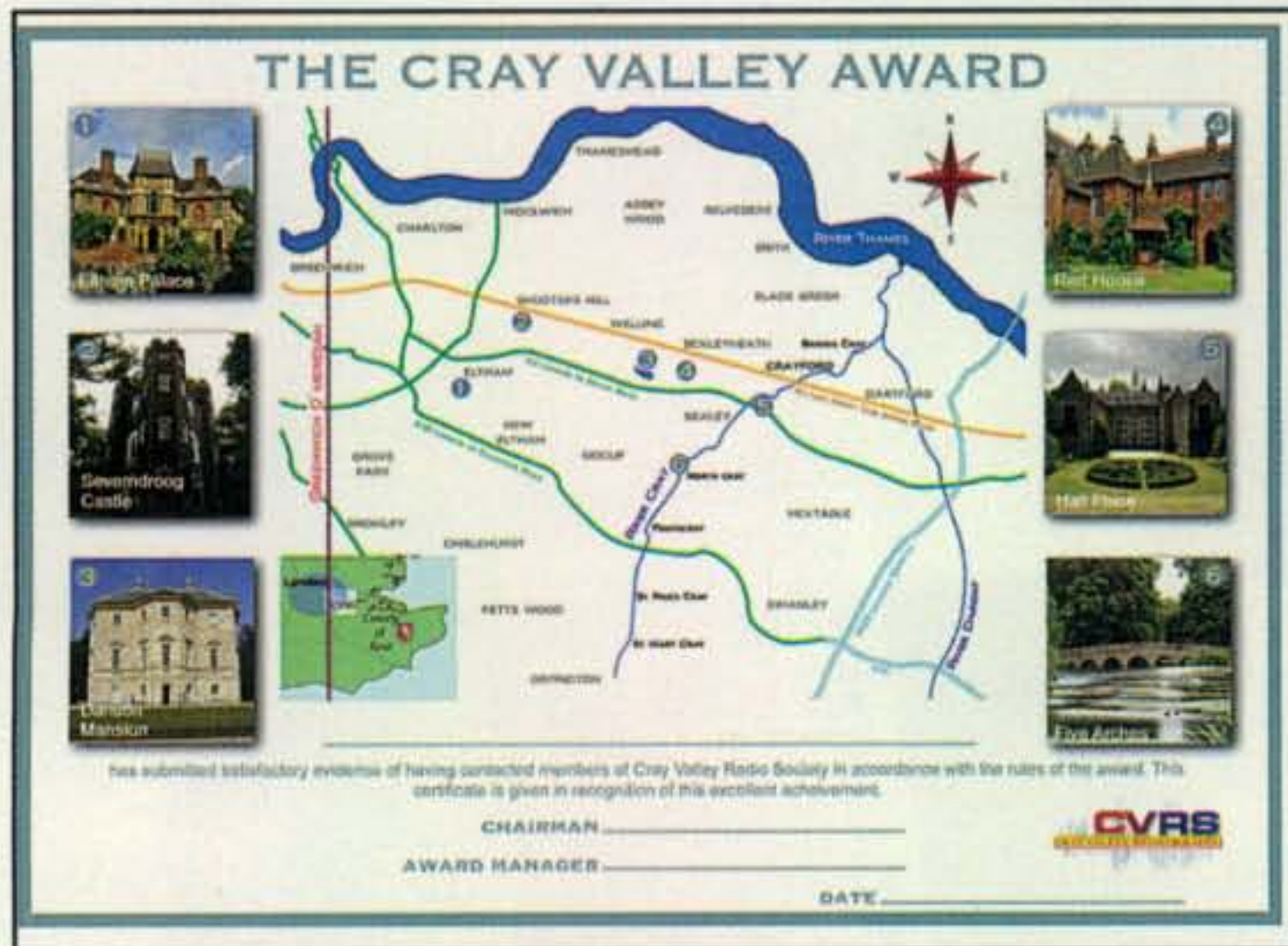
c. 2 points for contacts with tDARC-specific stations DAØRC, DBØHQ, DFØAFZ, DLØDL, and DAØHQ.

d. 3 points for DL6ØDARC.

The application should be sent with a log extract and the fee of 10 Euros to: Martin Koehler, DL1DCT,



The DARC 60th Anniversary Diploma, a short-term award, is available to all amateurs and SWLs for contacting stations as noted in the text from January 1, 2010 to July 24, 2011.



Contact members of the Cray Valley Radio Society on or after January 1, 2000 to earn this award from England.

Wideystr. 1b, 59174 Kamen-Heeren, Germany. Internet: <<http://www.darc.de/referate/dx/diplome/darc-60/darc-60-award/>>.

England: Cray Valley Award

This award is issued by a club that provides both a small-scale and a large-scale map to depict its unique location, which lies astride the Greenwich Meridian and the Thames River, not too far from London. Once you have a good idea of the location, you can view the six small images of the castles and mansions, now mostly owned by the National Trust, which are found nearby.

Contact members of the Cray Valley Radio Society on or after January 1, 2000. All QSOs must be made from the same country. All bands and modes. Endorsements for all one band or mode. No use of internet links or repeaters allowed. SWL OK.

Each contact with a member = 1 point. Special stations G3RCV, GX3RCV, G1RCV, GX1RCV, M8C, or a special event station operated by the Cray Valley society = 3 points.

Point requirements and fees for each of the five classes of the award are as follows:

	Basic	Bronze	Silver	Gold	Diamond
G Stations	20	45	60	75	100
EU Stations inc. GD, GI, GM, etc.	10	30	40	50	60
All others	5	15	20	25	30
Max. of 3 point QSOs	1	3	4	5	6

Award fee:

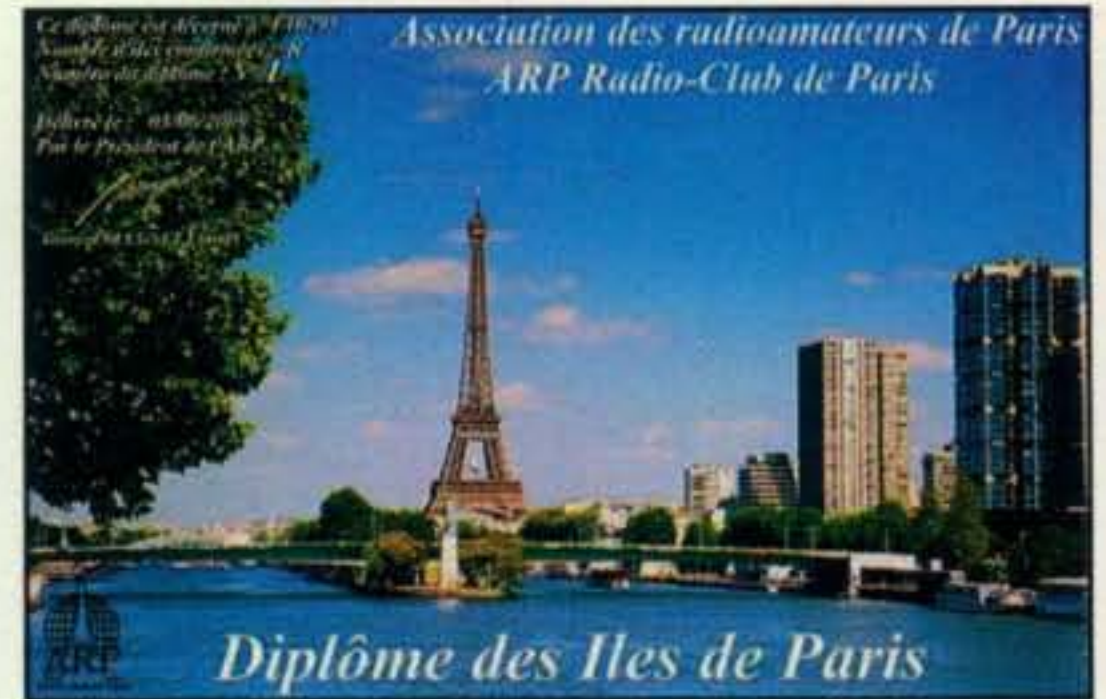
Basic Award: £5, 8 Euros, \$US10, or 12 IRCs
Other Levels: £1, 2 Euros, \$US2, or 3 IRCs

The award is free to registered blind or disabled persons. To apply, send GCR list and fee as noted above to: Cray Valley Award Manager, 93 Elibank Road, Eltham, London SE9 1QJ, England. Internet (member list is on the website): <<http://www.cvrs.org>>. E-mail: <awardmanager@cvrs.org>

France: Association of the Radio Amateurs of Paris Series

The following award is just one of a series offered by the

The Diplôme des Iles de Paris DIP. is just one of the awards offered by the Association of the Radio Amateurs of Paris.



Association of the Radio Amateurs of Paris (ARP). All of the awards require contacts with location specific monuments, grid locators, quarters, communes, arrondissements, and other somewhat obscure (to us) political subdivisions used in this most famous and beautiful city. The award listed below may be the easiest to earn, although it will require waiting for a mobile or portable operation from a station located on one of the little fresh-water islands on the designated Parisian rivers. Check with the various DX bulletins, especially during the summer months.

General Requirements: All bands and modes OK. No date limitations. SWL OK. Contacts with mobile stations (for the other awards) or via relay, a repeater, or a transponder are not valid. A contact with the "joker" station F6KVP or F6KVP/p or any other station operating for the Association des Radioamateurs de Paris counts once per band.

Cost of each award delivered by e-mail is 5 Euros, and 10 Euros by regular mail (paper). Apply to: Diplômes de l'ARP, Jean Pierre Duthiel, 138 rue du Faubourg Saint Antoine, F-75012 Paris, France.

Diplôme des Iles de Paris DIP. Contact two stations on islands in the Seine, Bois de Boulogne, and Vincennes Rivers. DIP #1 is issued for all the islands of Paris.

A list of islands is at: <<http://arp75.free.fr/PortailARP/plugins/getfilehtml/getfilehtml.php?lng=fr&id=12>>.

Japan: Worked All Okayama Wards Award

The term "ward" refers to the smallest unit of governmental subdivision found in Japan. Basically, wards are local governmental entities involved with health and property taxes. The title of the award is somewhat misleading, since the award requirement only calls for contacts in Okayama City. Look in your JA4, JG4, JH4 card collection. This is a handsome award that is not terribly difficult to attain and also will attract attention hanging on your wall.

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www.vbhamfest.com



Contact four stations in Okayama City plus one Japan Awards Group (JAG) member to earn the Worked All Okayama Wards Award.

Contact four stations in Okayama City plus one Japan Awards Group (JAG) member on or after April 1, 2009. If the JAG member contact is one of the four in Okayama City, the fifth contact is not necessary. Send the completed application form, which can be found on the website, plus the fee of 2 IRCs or \$US2 to: Ms. Kurosaki Yuriko, JR4IKP, 12-6, Handa-cho, Kita-ku Okayama City, 700-0003 Japan. Internet: <http://oag.rakurakuhp.net/i_541445.htm>

We're always interested in hearing from clubs, special interest groups, and individuals who sponsor an award. Please contact me at the e-mail address shown on the first page of this column.
73, Ted, K1BV

Duane A. Puro, K8AO USA-CA All Counties #1197, March 27, 2010

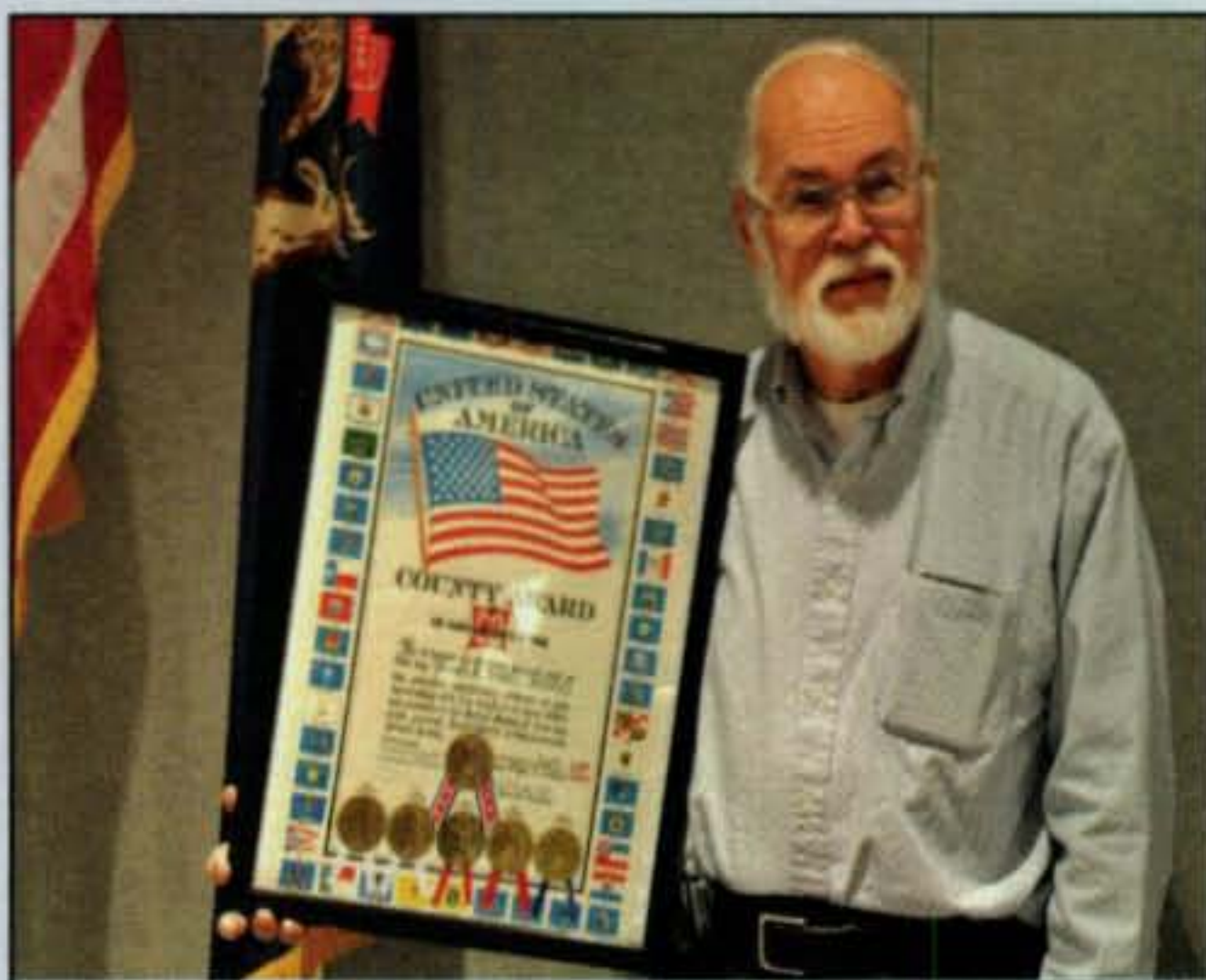
I was first licensed as a Novice in 1961 while in high school. Four of my best friends in school were also licensed. I was bitten by the contest bug early on. I participated in the Novice Roundup and several Sweepstakes. Also, hunting DX was a primary activity. County hunting was a natural extension of DX for me, always searching for that "new" one, either country or county.

I discovered county hunting while tuning around the 80-meter phone band. Back then there was an active 80-meter county hunting net.

I started consciously collecting county confirmations in 1976 just after starting my career with the federal government. By 1979 I had achieved the 500 county level, but with family and work I did not really get serious about county hunting until I retired during the summer of 2006. It took me 34 years to achieve USA-CA #1197, but I did it.

I went mobile for the first time in 1987. Having no idea what 100 watts in a mobile rig could do, I was shocked when my first contact on the net was with Eddie, G4KHG, from his home in England. My next contact was with Hollis, KC3X. There have been thousands since then.

My biggest challenge in county hunting was becoming comfortable with the CW mode. I had thought I would work them all on SSB, but it was taking so long I bit the bullet and jumped in on CW. Five percent of the 3077 counties were on CW. I may even try CW from the mobile someday. The next challenge was working the "close in" counties. It seems like few mobiles carry 80-meter resonators, which are needed for those close-in



Duane A. Puro, K8AO, USA-CA All Counties #1197.

counties. I worked most of the close ones during contests.

Finishing all counties would not have been possible without the mobiles. Eighty percent of my confirmations were from mobiles. I want to also thank the net controls for all the hours they devote to helping us all achieve our goals.

I have attended three National Conventions of the Mobile Amateur Radio Awards Club (MARAC) and several of the Michigan Mini-conventions. It really makes a difference being able to put a face with a call. Friendships are made and strengthened at the conventions. I encourage everyone to attend one at some point.

I would like to thank the mobiles who gave me my last two counties. Jack, N7ID, went the extra mile for my second to last in Camas, Idaho, in the winter no less. The last county for the "whole ball of wax" was Manistee, Michigan put out by the mobile team of W8TVT and K8ZZ. The last county came via Joe, W8TVT. Thank you all very much!

—73, Duane, K8AO

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A DXer's Success Story

We had some solar activity, and then we didn't. We got a blast of solar wind and a lot of aurora lights. However, we're still waiting for the rise in solar activity that would give us those wall-to-wall signals on 12 and 10 meters. Hmm, for those with 6-meter capability, there has been a lot of activity on that band, including some U.S. to EU reports.

Those in the northern areas are now enjoying warm weather after a pretty cold winter season, so it's not all bad news. With not much on the radio, I personally have been enjoying going out to watch my two grandsons play baseball; one is four and the other is seven. Ah, youth and all that energy.

Defying the Odds

While I'm on the subject of solar activity, or the lack thereof, I want to mention a guy who has defied the "sun" and its erratic behavior over the last two years.

Dave Wade, W5DAW, of Saucier, Mississippi was licensed as a General Class licensee with the callsign KE5VAH on June 11, 2008. He says, "No contacts were made with that callsign." On July 12, 2008, he received a change of callsign to W5DAW, and on August 15, 2008 he passed the Extra exam. His first contact was with VE6AO on September 11, 2008. Since then he has added 2888 entries to his

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

log. He has confirmed 789 of those using LoTW (Logbook of The World) and 330 with eQSL. The interesting part of this story follows:

To date Dave has worked 202 entities on SSB and 167 on CW for an overall total of 230 individual entities. To date he has confirmed 158 on SSB and 64 on CW for a total of 172 entities. He has worked and confirmed all 50 states on SSB, and has worked 45 on CW with 35 of those confirmed. For WAZ, he has 38 confirmed on SSB and 37 on CW. For 5 Band WAZ (Worked All Zones), he has 140 worked. Floyd Gerald, N5FG, the WAZ Award Manager, issued Dave his WAZ Mixed Award on May 12, 2010. That's less than two years after his first contact on the air! For WPX his log shows 963 worked with over 300 confirmed. He has WAC (Worked All Continents) on SSB, CW, and 5 bands Mixed. He lacks one band in Asia to get a 6-band endorsement.

Considering all of the above, you might expect Dave to have a *major* station setup. Well, friends, read on. Dave tells me, "All contacts except for three or four have been made from *my* QTH using a Hustler 6BTV vertical with a 17-meter trap added later. The WAS, WAC, and DXCC numbers were made with 100 watts without a logging program or spots from a DX cluster. I didn't know about DX clusters back then. I didn't get a 2-meter radio until I had 98 countries."

Now we have to give credit where credit is due. Dave learned the code from a CW class that Randy, W5UE, taught. Dave says, "Without CW I would not be nearly as far up the ladder as I am."

DX Activity

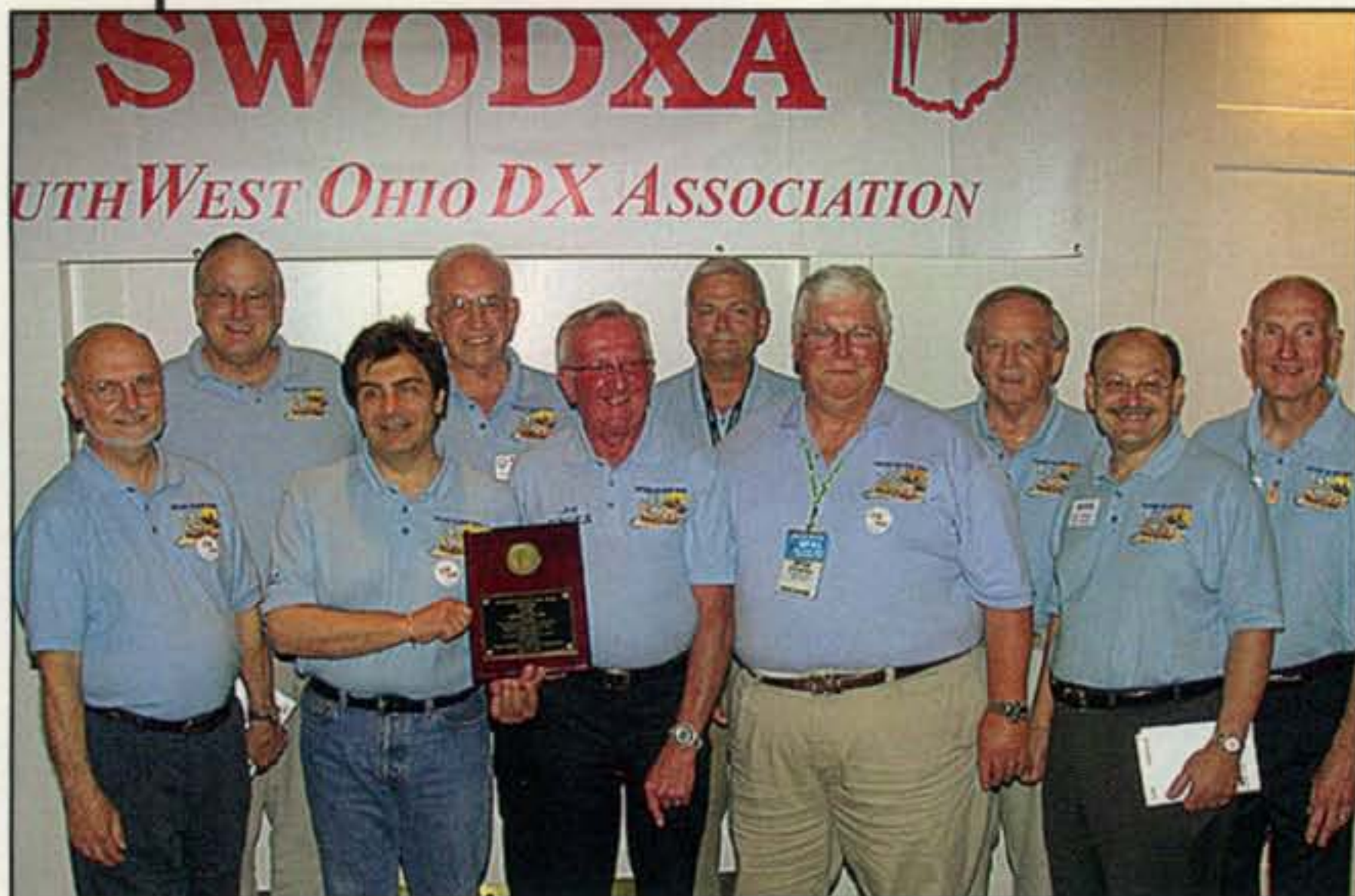
We do have some DX activity going on, and we hope those involved have good luck with their attempts to bring many of us a new one.

E4X is up and running from Palestine as of this writing in early June, and we'll have a report on how that went for them next time.

Pierre, **ZS1HF/ZS8M**, is making some noise from Marion Island and that will make a lot of folks happy. Remember he will be there until April of next year. At least he is reported on several bands, and that will help many fill in the Marion Island block on their band charts.

From the rumors I'm hearing about the Netherlands Antilles group of islands, they are going to be overflowing with DXpeditioners in the month of October. As far as I know, at least five different groups are staking their claim to one or more of the islands, which are expected to become *new ones* on October 10, 2010.

While the "t's" still have to be crossed and the "i's" still have to be dotted on the famous "dotted



SWODXA DX Dinner award for the DXpedition of the Year went to members of K4M Team. (Photo courtesy of David Bower, K4PZT)

The WPX Program

CW

3249.....V51YJ

SSB

3076.....V51YJ

Mixed

2112.....V51YJ 2114.....OK2JOW
2113.....N7QU 2115.....G4FKA

CW: 350 V51YJ, 2350 VE6BF, 4550 N4NO, 5850 WA2HZR.
SSB: 550 V51YJ, 950 VE6BF, 3750 N4NO.
Mixed: 650 WT6X, 700 N7QU, 750 G4FKA, V51YJ, 850 OK2JOW, 1400 K7UA, 2500 VE6BF, 5100 N4NO.
Digital: 6600 WT6X.

80 Meters: OK2JOW
40 Meters: V51YJ
20 Meters: V51YJ

Asia: OK2JOW
Europe: OK2JOW

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, I0JX, WA1JMP, K0JN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IC, W3ARK, LA7JO, VK4SS, I8YRK, SM0AJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UII, I4EAT, VK9NS, DE0DXM, DK4SY, UR2OD, AB9C, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, N3XX, HB9CSA, K6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YB0TK, K9QFR, 9A2NA, W4UW, NX0I, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWW, ZP5JCY, KA5RNH, I13PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DE0DAQ, IV3PVD, LU1DOW, N1IR, IK4GEM, VE9RJ, NN1N, HB9AJU, KC6X, N6IBF, W5ODD, I0RIZ, I2MQP, F6HJM, HB9DDZ, W0ULU, K9XR, JA0SU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S5E0.

DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KU0A, VE2UW, 9A9R, UA0FZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RA0FU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, K0KG, DL6ATM, VE9FX, DL2IY, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, K0DEQ, DK0PM, SV1EOS, UA0FAI, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4EC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZ, S55SL, RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE.

160 Meter Endorsements: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W1UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SM0DJZ, DK5AD, W3ARK, LA7JO, SM0AJU, N5TV, W6OUL, N4KE, I2UII, I4EAT, VK9NS, DE0DXM, DK4SY, UR2OD, AB9C, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, N3XX, HB9CSA, K6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YB0TK, K9QFR, W4UW, NX0I, WB4RUA, I1EEW, ZP5JCY, KA5RNH, I13PVD, CT1YH, ZS6EZ, YU1AB, IK4GEM, NN1N, W5ODD, I0RIZ, I2MQP, F6HJM, HB9DDZ, K9XR, JA0SU, I5ZJK, I2EOW, KS4S, KA1CLV, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53E0, S57J, DL1EY, DJ1YH, KU0A, VR2UW, UA0FZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RA0FU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, K0DEQ, DK0PM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UR5FEO, N3RC, UT3IZ RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for airmail) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls which have been confirmed by eQSL.cc. Other electronic QSL confirmation means are not accepted.

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence is \$60.50 each.

5 Band WAZ

As of June 1, 2010, 821 stations have attained the 200 zone level and 1687 stations have attained the 150 zone level.

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

G0DQS EA3ATM UA3AIO AA6G

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

N4WW, 199 (26)	KQ0B, 199 (2 on 10)
W4LI, 199 (26)	K9OW, 199 (34 on 10)
K7UR, 199 (34)	G3NKC, 199 (31 on 10)
IK8BQE, 199 (31)	IN3ZNR, 199 (1)
JA2IVK, 199 (34 on 40)	EA5BCX, 198 (27, 39)
IK1AOD, 199 (1)	G3KDB, 198 (1, 12)
VO1FB, 199 (1)	JA1SI, 198 (1, 40)
KZ4V, 199 (26)	9A5I, 198 (1, 26)
W6DN, 199 (17)	K4CN, 198 (23, 26)
W3NO, 199 (26)	G3KMQ, 198 (1, 27)
RU3FM, 199 (1)	N2QT, 198 (23, 24)
N3UN, 199 (18)	OK1DWC, 198 (6, 31)
W1JZ, 199 (24)	W4UM, 198 (18, 23)
W1FZ, 199 (26)	U57MM, 198 (2, 6)
SM7BIP, 199 (31)	K2TK, 198 (23, 24)
N4NX, 199 (26)	K3JGJ, 198 (24, 26)
N4MM, 199 (26)	W4DC, 198 (24, 26)
EA7GF, 199 (1)	F5NBU, 198 (19, 31)
N6HR7, 199 (37)	OE2LCM, 198 (1, 31)
JA5IU, 199 (2)	W9XY, 198 (22, 26)
RU3DX, 199 (6)	KZ2I, 198 (24, 26)
N4XR, 199 (27)	W7VJ, 198 (34, 37)
HA5AGS, 199 (1)	W9CW, 198 (26, 19 on 40)
VE3XN, 199 (26)	W5RWQ, 198 (17, 18)
N5AW, 199 (17)	I5KKW, 198 (31&23 on 20)
JH7CFX, 199 (2)	IV3MUC, 198 (1&31 on 40)
K7LJ, 199 (37)	UA4LY, 198 (6&2 on 10)
RA6AX, 199 (6 on 10m)	IK4CIE, 198 (1, 31)
RX4HZ, 199 (13)	JA7XBG, 198 (2 on 80&10)
K0GM, 199 (17)	K8PT, 198 (18, 26)
S58Q, 199 (31)	HB9ALO, 198 (1, 31)

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

JA3GN (159 zones) G3NKC (199 zones)

5 Band WAZ updates:

K2FF (196 zones) K2IXQ (170 zones)
GM3YOR (200 zones) K0KG (200 zones)

*Please note: Cost of the 5 Band WAZ Plaque is \$100 shipped within the U.S.; \$120 all foreign (sent airmail).

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. The processing fee for the 5BWAZ award is \$10.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$15.00 for nonsubscribers. An endorsement fee of \$2.00 for subscribers and \$5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

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lines," we can look forward to the pile-ups that will add at least two new ones to the DXCC list. I'm not going to get into the details of which island is going to be counted for what. I'm sure we will have a full accounting of all that in due time and in plenty of time for everyone to get ready for the onslaught. Gosh, that DXCC List is getting "heavy," as it appears that with two new ones it will have the total up to 340.

Dayton Recap from the DX Side

Oh, yes, the Dayton Hamvention® has come and gone yet again. Although I

could not make it this year, a lot of my friends did and I have a few photos from them this time.

One very close friend, Lynn Lamb, W4NL, was inducted into the CQ DX Hall of Fame, and I congratulate him on reaching that level of recognition. He really is a good guy.

I also would be very remiss if I didn't mention the other person inducted into the DX Hall of Fame this year, Bob Locher, W9KNI. Bob is well known in DX circles. He has written some books on the subject, he has spoken all over the country, and he is noted for selling a bunch of ham-related products, too. As a matter of fact, Bob took a look at the DX awards available these days and, according to the preface in his latest book (*A Year of DX*), "suggested to Dick Ross, K2MGA, the publisher of *CQ Magazine*, a new operating award—an annual contest to work as many CQ zones and CQ entities as possible." Bob Locher is not a man to be taken lightly. Again quoting from his new book, "I

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596RZ0AF 597VE2TZT

160 Meters

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045W8DO 047DK3GG
046K9WA

Mixed

8694N6ML	8703F6DKQ
8695HB9SLO	8704UA3AIO
8696DS4DRT	8705RA2FF
8697KF6A	8706I4MKN
8698W5DAW	8707IZ8JAI
8699N7JXS	8708AL7TC
8700KN6TC	87097N4UOJ
8701K5HGX	8710K8ESQ
8702SP2DTO	

SSB

5131IK1MDF 5134KN6TC
5132HB9/K5WDW 5135K6EGF
5133N3SMT

CW

593AB1J 595I0WOK
594GM4K GK 596WA9PIE

RTTY

207KF2O

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and \$1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. The processing fee for all CQ awards is \$6.00 for subscribers (please include your most recent CQ mailing label or a copy) and \$12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a CQ checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: n5fg@cq-amateur-radio.com.

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could use my new station to compete in the CQ Marathon and write a book about the experience." So, he did just that. Not only did he compete, but he managed to win the Unlimited class from his Oregon QTH. His winning

CQ DX Awards Program

SSB

2551.....IV3GOW 2552.....W9GD

CW

1107.....AB1J 1108.....YT1VM

SSB Endorsements

330.....K4CN/339 310.....W5GT/308
330.....HB9DDZ/337 300.....AD7J/300
320.....W9GD/329 275.....WA5UA/278
310.....IV3GOW/316 3.5/7 MHz.....K8ZEE

CW Endorsements

330.....K4CN/338 330.....W1FK/331
330.....HB9DDZ/336 250.....YT1VM/263

RTTY Endorsements

330.....OK1MP/330 310.....K4CN/316

The basic award fee for subscribers to CQ is \$6. For non-subscribers, it is \$12. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 339 active countries. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details.



CQ DX Hall of Fame inductees for 2010 (left to right): Lynn Lamb, W4NL, and Bob Locher, W9KNI. (Photo courtesy of David Bower, K4PZT)



Dave Anderson, K4SV, the after-dinner speaker for the Dayton DX Dinner. Dave has participated in a number of major DXpeditions—A5, 3Y0, etc. (Photo courtesy of David Bower, K4PZT)



"Wild Bill" N2WB was on his way to Iraq as part of the YI9PSE DXpedition. Enroute he stopped off to help a fellow DXer, Don, W2ZI, repair a rotor. (Photo courtesy of Don, W2ZI)

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 339 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

N8FW.....338	K4MQG.....338	K9BWQ.....337	K9OW.....337	K2JLA.....334	W4UW.....332	F6HMJ.....328	WA4DOU.....316	W2JLK.....277
WB4UBD.....338	W8XD.....338	N4MM.....337	K2OWE.....336	F3AT.....334	K8SIX.....331	YU7FW.....328	YO9HP.....316	K4EQ.....277
K3UA.....338	K2TQC.....338	W7OM.....337	K8LJG.....336	PA5PQ.....334	W7IIT.....331	WG5G/QRPP.....322	ON4CAS.....314	WA2VQV.....275
K9MM.....338	N7RO.....338	W7CNL.....337	K9IW.....336	NC9T.....334	K1FK.....331	IK0TUG.....321	WD9DZV.....312	
W4DEL.....338	F3TH.....338	W8JLC.....337	W4MPY.....336	G4BWP.....334	N7WO.....330	W9IL.....321	K0KG.....310	
EA2IA.....338	DL3DXX.....338	VE3XN.....337	K5UO.....336	W1JR.....334	W6OUL.....329	OZ5UR.....320	KT2C.....304	
OK1MP.....338	WK3N.....338	K4JLD.....337	K7LAY.....336	I4LCK.....334	KE3A.....329	CT1YH.....320	N2LM.....297	
N7FU.....338	N5FG.....338	N5ZM.....337	N6AW.....336	G3KMQ.....334	K6CU.....329	W9IL.....319	HA5LQ.....287	
N4JF.....338	YU1AB.....338	N4AH.....337	KA7T.....336	K6LEB.....333	W1DF.....329	EA3ALV.....319	N2VW.....283	
K4IQJ.....338	K4CN.....338	N4CH.....337	K3JGJ.....336	K5RT.....332	KA3S.....328	RA1AOB.....317	XE1MD.....280	
K2FL.....338	UA0MF.....338	PY2YP.....337	HB9DDZ.....336	JA7XBG.....332	IK0ADY.....328	W6YQ.....316	4Z5SG.....279	

SSB

K4JLD.....339	K4MQG.....339	N5FG.....339	AA4S.....338	W4UW.....337	K5RT.....334	KD5ZD.....326	RA1AOB.....312	AD7J.....300
EA2IA.....339	N4MM.....339	YU1AB.....339	PY2YP.....338	K1UO.....337	WA4WTG.....334	W1DF.....326	N2LM.....312	W4EJG.....295
XE1AE.....339	K9MM.....339	K4CN.....339	K9OW.....338	HB9DDZ.....337	ZL1BOQ.....334	PY2DBU.....325	G3KMQ.....312	W9ACE.....294
IN3DEI.....339	OZ5EV.....339	UA0MF.....339	VE3MR.....338	K8SIX.....336	W9IL.....334	KE4SCY.....325	KD2GC.....311	AE9DX.....294
N8FW.....339	VE2PJ.....339	K5TVC.....338	VE3MRS.....338	KE3A.....336	VE4ACY.....333	W4MPY.....325	RW9SG.....310	W6MAC.....292
DU9RG.....339	K3JGJ.....339	KZ2P.....338	XE1L.....337	K9IW.....336	K9PP.....333	K6GFJ.....324	I0YKN.....310	W5PVE.....288
K3UA.....339	N5ZM.....339	W6BCQ.....338	OE3WWB.....337	N2VW.....336	YV1KZ.....333	TIBII.....324	KU4BP.....310	HB9DQD.....285
K6YRA.....339	N7RO.....339	W6EUF.....338	N6AW.....337	W2CC.....336	F6HMJ.....333	YO9HP.....324	XE1MW.....309	VE7HAM.....285
IK1GPG.....339	KE5K.....339	W7OM.....338	IK8CNT.....337	N7WR.....336	YV1AJ.....332	KW3W.....324	AA1VX.....308	N8LIQ.....284
DJ9ZB.....339	I0ZV.....339	K9BWQ.....338	EA4DO.....337	JA7XBG.....336	VE4ROY.....332	W6OUL.....322	W5GT.....308	N3RC.....280
N7BK.....339	OE2EGL.....339	W8AXI.....338	CT3BM.....337	K3LC.....336	YV1JV.....331	XE1RBV.....321	4Z5FL/M.....306	WA5UA.....278
4Z4DX.....339	W4ABW.....339	W9SS.....338	K8LJG.....337	PA5PQ.....335	K7HG.....331	XE2NLD.....321	K7SAM.....305	HS0/EA4BKA.....276
WB4UBD.....339	DL3DXX.....339	VK4LC.....338	W3AZD.....337	XE1VIC.....335	N5YY.....331	W8ROB.....321	I3ZSX.....304	K9DXR.....275
OZ3SK.....339	IBKCI.....339	K7LAY.....338	K0KG.....337	NC9T.....335	N1ALR.....330	VE7SMP.....320	JR4NUN.....303	
OK1MP.....339	VE1YX.....339	WS9V.....338	W2FKF.....337	CT1EEB.....335	W9GD.....329	ON4CAS.....319	W4PGC.....302	
K2TQC.....339	N4CH.....339	W6DPD.....338	W7FP.....337	W1JR.....335	K4DXA.....328	LU3HBO.....317	EA8AYV.....302	
K4MZU.....339	EA3BMT.....339	VE3XN.....338	YU3AA.....337	I4LCK.....335	SV3AQR.....328	N8SHZ.....316	4X6DK.....301	
N4JF.....339	IK0AZG.....339	K9HQM.....338	W7BJN.....337	ZL1HY.....335	VE7EDZ.....328	IV3GOW.....316	WD9DZV.....301	
W4WX.....339	K4IQJ.....339	K2FL.....338	AB4IQ.....337	K5UO.....335	XE1MD.....327	W6NW.....314	K7ZM.....300	
K5OVC.....339	WK3N.....339	VE2GHZ.....338	W4UNP.....337	W0YDB.....334	YV4VN.....326	KA1LMR.....312	XE1MEX.....300	

RTTY

WB4UBD.....337	N5FG.....335	K3UA.....332	UA0MF.....320	K4CN.....316	K8SIX.....300
N14H.....336	N5ZM.....333	OK1MP.....330	G4BWP.....320	PA5PQ.....311	

score of 321 points for 2009 was a total of 281 countries and 40 zones. For a bird's-eye view of his location in Oregon, check page 28 of the June 2010 issue of *CQ*. *A Year of DX* is available on Bob's website: <<http://www.idiompress.com/yearofdx.php>>. If you don't already have a copy of his other great book, *The Complete DXer*, it is still available, too.

DX Conventions

Several more DX conventions are coming up this year: the W9-DXCC, September 10-11 at the Elk Grove Holiday Inn in Chicago, followed by the SEDCO sponsored W4-DXCC in Pigeon Forge, Tennessee September 25.

The W4-DXCC convention is now ARRL sanctioned and will have some expanded features. As it has been for the past five years, The MainStay Suites in Pigeon Forge will be the site for all convention activities, including a catered buffet dinner on Saturday evening. You can call anytime for suite reservations and say "SEDCO" for the convention rate. There now is also an RV park right across the

street from the main building! The MainStay's phone number is: 865-428-8350. For the convention and dinner, call Rosie Lamb, KA4S, at 865-681-2279. She will take reservations for both the event (\$25 each) and dinner (\$25 each).

These are two great events that draw a large number of folks, not only from their "local" areas, but also from far away places, too. If you can't make it to both, try to make it to at least one. You

won't regret it. I've been a regular at both and can assure you that they are fun and educational events.

For more information about these events, see the W9-DXCC website: <<http://www.w9dxcc.com/>> and for SEDCO-W4DXCC: <<http://sedco.homestead.com/>>.

Until next time, enjoy the chase, and please do Have Fun!

73, Carl, N4AA

QSL Information

A71A via A71AN
 A71AA via DJ9ZB
 A71AD via A71AN
 A71AM via DJ9ZB
 A71AU via DJ9ZB
 A71AW via W3HNC
 A71BR via A71AN
 A71BU via NI5DX
 A71CO via EA7FTR
 A71CV via A71AN
 A71CW via A71AN
 A71EL via A71AN
 A71EQ via A71AN
 A71QND via A71CO
 A92GH via IZ8CLM
 A92GQ via NI5DX

AA4VK/CY0 via AA4VK
 AD5YS via G3SWH
 AH0/AH2Y via HL1IWD
 AH0BT via 7L1FPU
 AH0J via JA1NVF
 AH0S/KH2 via JH1DVG
 AH2R via JH7QXJ
 AH6HY/PJ5 via AH6HY
 AH900 via DJ9ZB
 AI5P/VK9N via AI5P
 AL5A/WH0 via JA7JEC
 AL7DB via NI5DX
 AL7R via K9IT
 AM1HQ via EA4URE
 AM1LE via EA4URE
 AM1M via EA1DR

AM1VIG via EA1RKV
 AM2HQ via EA4URE
 AM3GI via EA4URE
 AM3HQ via EA4URE
 AM3SSB via EA3JW
 AM4BA via EA4URE
 AM4HQ via EA4URE
 AM4URE via EA4URE

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

Practical Methods to Develop Better CW Skills

August's Contest Tip

Taking the lead from this month's topic of improving CW skills, consider using the summer contest season as a training ground for CW operating. There are many fantastic operating events including the Worked All Europe, NAQP, IOTA, and others that will be a great help in building improved skills for the prime-time fall/winter contest events! The saying goes, "practice makes perfect," and a 5-wpm increase in CW skill will make a bigger difference in your future scores than any large Yagi or new transceiver. Give it a try!

Last month we focused on improving SSB operating skills, so it only seems right to continue the discussion by taking a look at CW this time. Over the years, my experience has taught me that there are a few basic truths in ham radio, one of them being that some operators excel at CW operating and others need quite a bit of work to succeed. There are many, many theories about why this is the case. Many feel that it's "just in your genes." Others believe that competence simply reflects one's operating preference. Additional theories include ideas such as inherent musical ability, age at which Morse code is first learned, motivation, equipment, and so on.

In my case, CW always came easily to me. Like many of my contesting peers, I entered the ranks of ham radio at a relatively young age—13 years old. Unlike the training tools of today, I had to learn the code the old-fashioned way. Maybe you remember that old, red-covered ARRL Morse code training book? I lived on Long Island at the time and was in relatively close proximity to the ARRL's W1AW transmitting station. It was ideal for copying the Morse code practice sessions. I had further challenges to my learning environment in that the shortwave receiver I was using did not have a BFO. Imagine the demands of copying CW as pulsating bursts of "white noise" through a 3-inch speaker! I'm convinced that these early trials were the precursor to the contesting spirit I have today.

Today there is still serious debate in our hobby about the merits of Morse code, especially from a license requirement standpoint. While CW has disappeared as a required licensing criterion in the U.S. and elsewhere, it will always exist as a form of communication used by hams. As you might expect, too, this particularly will be the case with contesters. Can you imagine only one CQ WW each year? What would we do on Thanksgiving weekends?

Well, enough of the history lesson. Many years ago, I had the pleasure of reading a practical commentary on improving your Morse code skills originally authored by Jim Reid, AH6NB (now W6KPI). While there are probably scores of other ideas you can think of for improving your CW, Jim captured

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Calendar of Events

All year	CQ DX Marathon
July 17–18	CQ WW VHF Contest
July 17–18	North American RTTY QSO Party
July 24–25	RSGB IOTA Contest
Aug. 1	SARL HF Phone Contest
Aug. 7	European HF Championship
Aug. 7–8	ARRL UHF Contest
Aug. 7–8	North American CW QSO Party
Aug. 14–15	Worked All Europe CW Contest
Aug. 14–15	Maryland-DC QSO Party
Aug. 21–22	SARTG RTTY Contest
Aug. 21–22	North American SSB QSO Party
Aug. 21–23	New Jersey QSO Party
Aug. 28–29	YO DX Contest
Aug. 28–29	SCC RTTY Championship
Aug. 28–29	Ohio QSO Party
Aug. 29	SARL HF CW Contest
Sept. 4–5	All Asian SSB Contest
Sept. 11–12	Worked All Europe SSB Contest
Sept. 25–26	CQ WW RTTY DX Contest

the essence of the issue better than anything I've read since. What follows is his commentary:

Improving your CW Contesting Skills by Jim Reid, W6KPI

You can become a high-speed CW operator! How? Practice. What kind of practice? Read on, only if you really *want* to become a good QRQ CW operator—that is, one who is comfortable working DX at 30 to 40 words per minute and wants to try to compete in contests with the ops who whistle along at 40 to 50 wpm, and sometimes even faster. What is the best, most efficient way to achieve these sorts of operating speeds? How best should you use your available practice time?

To begin, let's assume your skill level is at least 13 wpm. With that in mind, here are some practical tips for improving CW skills and how much to practice:

1. Experience on the Air—Making QSOs

Lots of CW operating outside of contests works wonders and is the best place to start. Put the microphone away for several weeks and eliminate SSB, SSTV, digital modes from your mind for the same time period. This is to be a time of pure CW skills improvement.

2. QRQ Receiving Practice

While waiting to acquire and set up some of the practice programs (more on that later), start your adventure by engaging in on-the-air receiving practice. Find QSOs in progress at a speed you can comfortably copy with a pencil/pen. Now put the pen/pencil down and just start listening. Yes, try to recognize the letters as they come along, and group them into words on your mind's "blackboard." Not easy to do, but well worth trying anyway. It is going to take some time, maybe even three or four weeks, before you can follow these high-speed QSOs in your head without writing everything

down! Jot down the call, the op's name, QTH, and report while just listening to the rest.

While doing this, if you can find a willing friend, there is a way to augment this sort of practice completely apart from normal CW operating. Ask a friend/spouse to spell words from a story or newspaper article to you! Their assignment is to read the story to you, but not the word sounds, only by spelling the words to you. In essence, this is what is going on when one is "reading CW in his/her head"; words are being spelled to you, and you must form these spelled words into meaningful thoughts. Start at one letter/word space every second as sounded by your helper. Have a letter spoken every tick of the clock. This is a speed of 12 wpm (at the Paris standard, of 100 letters/word spaces per minute equaling 20 wpm CW speed). Tune in WWV to get exact beats every second.

When you have no trouble forming the thoughts of the story/article in your mind as the words are spelled to you at this rather slow pace, then ask your friend to double the rhythm—that is, two letters/word spaces per second spoken two per tick. This, of course, doubles your word reading rate to 24 wpm. A big jump for CW, but not for learning to read words spelled out to you in clear, plain English! When you know the story comfortably at this rate, your actual "in the head" CW reading speed should be close behind, and you may well be on your way to QRQ operation.

When using high-speed CW, you'll be receiving letters/word spaces at 3 per second at a 36-wpm CW rate or greater. Maybe your friend can get the rhythm going at 3 letters/spaces per clock tick, and you will know exactly what 36-wpm CW sounds like. This is a typical QRQ DX and contest operation speed. Of course, using a musician's metronome would allow you to exactly set the number of beats per minute, 20 wpm being 100 beats, 36, 180 per minute, 50 wpm, 250 letters/spaces, and so on. My mechanical metronome has a highest beat rate of 208 per minute, or a bit over 41 wpm.

Computer-generated CW such as that from the RUFZ program produces top scores that originate from over 450 letters/numbers/spaces per minute! Of course, only call signs are being sent, and these guys already know all the prefix CW sounds!

Computer-aided CW training programs are also available. They will send code groups, random words, text, and typical QSOs. They are advertised,

nearly monthly, in the ham magazines. Morse Academy and Codemaster V are two good examples of these products. Their "canned" CW doesn't last long at high speeds, but is very helpful for "in-the-head" CW reading practice. Using Codemaster V, for example, you can also input via the keyboard, or text (.txt) file input, kilobytes of text for very long high-speed CW listening practice runs. I have taken lots of long text files directly from various internet sites and copied them directly into a text file for this sort of high-speed practice. In my

case, I remove unusual punctuation marks from the text.

3. Using the Computer for Practice

If you have CM V or MA, or another, here is how to use it to become QRQ qualified. Remember that we're focusing on methods to read CW mentally, not writing down or typing anything as you receive it. That comes later.

With lots of CW text stored in your computer program, you are ready to begin. Once you have determined your present 100% comfortable hand copying speed using pencil or pen, set your



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computer program to send clear text at about 5 wpm faster than your hand copying speed. Begin sending text at this speed, sit back, and just listen for 30 minutes twice per day. First you will only be catching a letter every now and then. While this happens, you will miss the next several letters! But keep at it. Soon you will get all the letters of a single word, although there will still be many letters/words going on by unrecognized! But you are making progress. In a couple of weeks or so, especially if you were able to get a friend to spell the words of stories/text, you will under-

stand the text being sent. As soon as you do, raise the speed another 5 wpm. Keep it up, and in three or four months you may be up to 40 or more wpm! Try it. It works, and you'll be amazed.

At some point, you must add in the typing and contest-program practice. The RUFZ program mentioned above will send the callsigns of the world to you at ever-increasing speed. Your assignment is to enter them correctly via the keyboard to score. Another program called PED is a pile-up simulation training program. Many contest logging programs have simulator programs built in

for training in the use of the program. Current XP/VISTA versions of RUFZ can be downloaded from <<http://www.rufzxp.net/>>.

4. CW Sending Practice Helps Loads

Don't practice sending using the keyboard for these practice ideas! Use an electronic iambic keyer and paddle set-up. Unlike a bug or hand key, the electronic keyer sends "perfect" CW characters, spacing, and rhythm, a big help in your mental training activity.

Adjust the paddle to very light action. You don't want to be slapping the key all about the tabletop! Good paddle keys are heavy just for this reason. Also put it on a mouse pad to help keep it in place.

Now begin practice by attempting to send fast. This sending practice also works wonders as you begin your progress toward becoming a QRQ operator. Why? The exercise forces you to form words to express ideas in your mind, while simultaneously sending the thoughts as CW. This inverts what has been going on in your mental processes to receive CW. As you increase your speed ability, you will not even be thinking "letter to CW" translation, but will be mentally and automatically sending CW as if it were another language with which you have become quite comfortable.

Your mind will be training on CW in such a way that when it can send fast, it will use the same subconscious patterns to also receive fast. KE7V has told me he raised his QRQ speed to 55+ wpm (275 letters/word spaces per minute) using this specific practice method!

There is more to encourage you to practice. Once you are able to mentally send at QRQ speeds and type accurately into a contest logging program, you may want to also practice clear text copying to the keyboard, and copying behind many, many words. Your QRQ mental rate will increase even more, and you will be well on your way to being a competent, competitive CW contest op!

By having fun, practicing daily, engaging in frequent CW QSOs, you will get there. I am still working on it, but I am probably older than 90% or more of you reading this!—73, Jim, K6KPI

Final Comments

CW is hardly a dead mode. As amazing as it sounds, a large number within our midst actually prefer it. I firmly believe that contesters and DXers together will be the group that ultimately drives the preservation of CW in our hobby. Only time will tell.

See you in the next contest!

73, John, K1AR

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	Fits UG-21 D/U & UG-21 B/U's	1.50
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Sunspot Cycle 24: Slow but Sure

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots

Observed Monthly, May 2010: 9
Twelve-month smoothed, November 2009: 8

10.7 cm Flux

Observed Monthly, May 2010: 74
Twelve-month smoothed, November 2009: 75

Ap Index

Observed Monthly, May 2010: 8
Twelve-month smoothed, November 2009: 5

One Year Ago: A Quick Look at Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots

Observed Monthly, May 2009: 3
Twelve-month smoothed, November 2008: 2

10.7 cm Flux

Observed Monthly, May 2009: 71
Twelve-month smoothed, November 2008: 68

Ap Index

Observed Monthly, May 2009: 4
Twelve-month smoothed, November 2008: 5

You have probably heard the rumors that sunspot Cycle 24 was short-lived and that it died a horrible death. There are speculations continuing that this cycle is over, or at least will not be very energetic and that this may even trigger extreme global environment change. We may be at the doorstep of a mini-ice age.

This speculation continues to flourish because of the "odd" behavior of the sun during the last three years or so. During our lifetimes, solar cycle minimums (those periods, approximately every 11 years, when there are few if any sunspots) lasted a mere half-year to at most a year and a half. This last minimum between Cycles 23 and 24, however, lasted at least three years. Some find this very odd. However, as reported in past editions of this column, such long periods of solar quiet are not that unusual in the overall view of our observational history. There have been a number of cycles that have had such long periods without sunspots.

So far in 2010 we've seen a slow, yet steady increase in the number of sunspots observed during any given month, although we have seen these numbers swing widely from very active months to months with rather few sunspots. However, when you compare the number of sunspots observed during any of these months with the same months during 2009, it is clear that we're seeing an increase in activity.

Another measurement of solar activity, of course, is the 10.7-cm radio flux. This measure-

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for August 2010

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 1-18, 23, 26-31	A	A	B	C
High Normal: 20-22, 24-25	A	B	C	C-D
Low Normal: 19	B	C-B	C-D	D-E
Below Normal: N/A	C	C-D	D-E	E
Disturbed: N/A	C-D	D	E	E

Where expected signal quality is:

- A—Excellent opening, exceptionally strong, steady signals greater than S9.
- B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
- C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
- D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
- E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.

2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 2 will be good (B) on Aug. 1st through the 18th, fair-to-poor (C-D) on Aug. 19th, etc.

3. As an alternative, the Last-Minute Forecast may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the path is ionospherically supported.

ment is useful to the radio amateur because it provides a somewhat accurate way to assess how much energy the sun is radiating. Since long-range DX depends on the ionospheric refraction of our shortwave radio signals and since the ionosphere depends on solar energy for its existence, the more solar energy available, the better the DX.

The late Robert Brown, PhD, NM7M (see sidebar), proposed an even more accurate way to assess the level of energy available for ionization of the ionosphere on a given day (see his great introduction to radio signal propagation at: <http://www.astrosurf.com/luxorion/qs1-hf-tutorial-nm7m.htm>). He explained that the hard X-ray energy present from the wavelengths of 1 to 8 Ångströms provided the most effective ionizing energy throughout all of the ionospheric layers in our atmosphere. The GEOS satellites measure these wavelengths, and the resulting measurements are reported as the "background X-ray level" throughout the day. A daily average is reported, as well.

Just like X-ray flares, the background hard X-ray level is measured in watts per square meter (W/m²), reported using the categories A, B, C, M, and X. These letters are multipliers; each class has a peak flux ten times greater than the preceding one. Within a class there is a linear scale from 1 to 9.

Dr. Brown recorded the daily background X-ray levels for several sunspot cycles, and discovered

*e-mail: <nw7us@arrl.net>

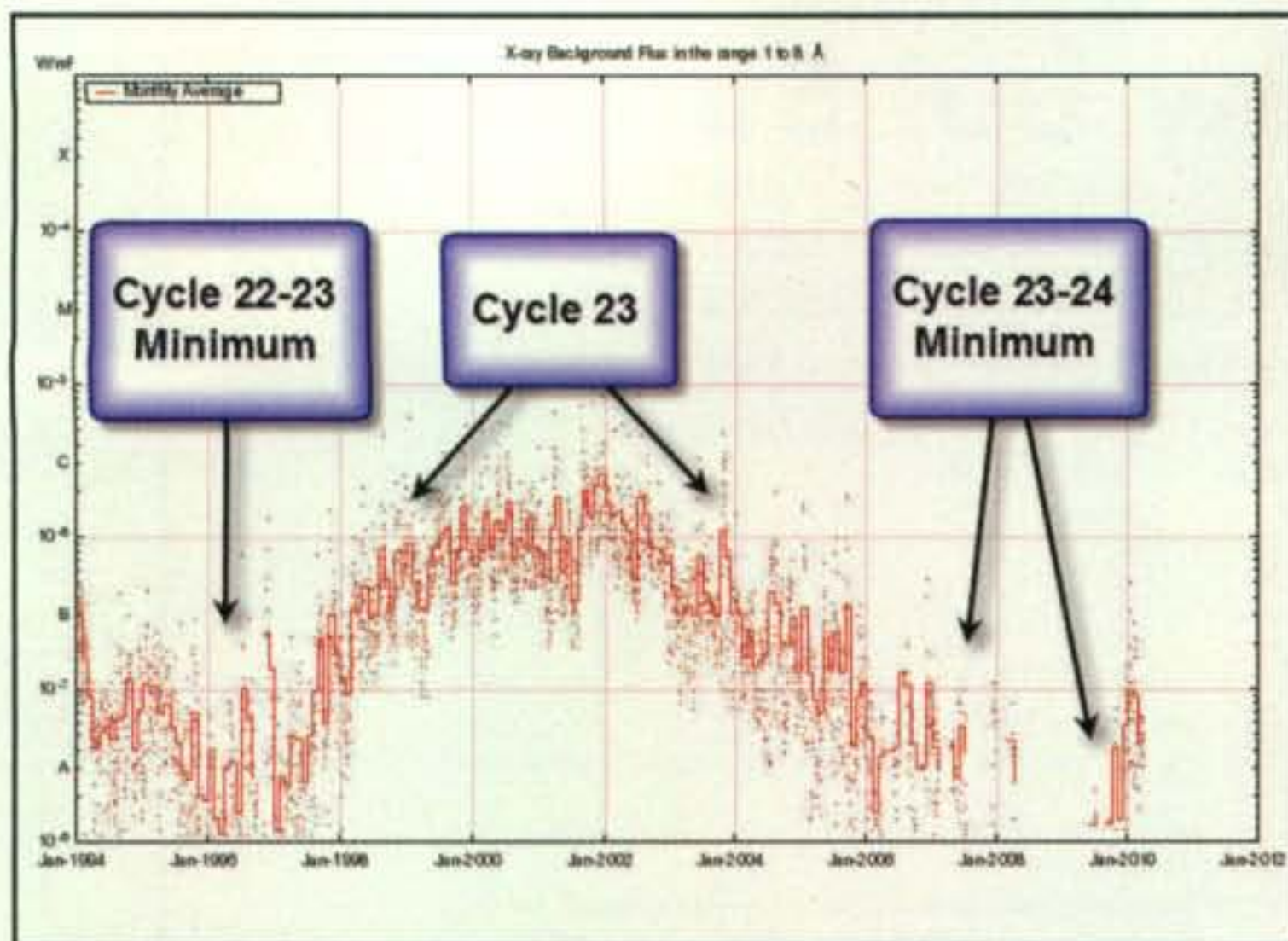


Fig 1— This graph plots the daily (red dots) and monthly (red line) average of the background “hard” X-ray energy in the 1 to 8 Ångstrom wavelengths, as measured by the GEOS satellite. It is clear from this plot that sunspot Cycle 24 energy is rising. (Source: GEOS-14 data, plotted with the gnuplot program)

that during solar cycle minimum periods the background X-ray levels remained at the A class level. During the rise and fall of a solar cycle, the background X-ray energy levels remained mostly in the B range. During peak solar cycle periods, the background energy reached the C and sometimes even M levels.

Armed with this information, can we discover any clues as to the current status of sunspot Cycle 24? Fig. 1 is a graph plotting the background hard X-ray energy reported by the GEOS satellites since the end of sunspot Cycle 22. Clearly, we see a noticeable rise in Cycle 24 activity. We’re seeing the energy rise to the B level more often as 2010 progresses, supporting the view that Cycle 24 is alive and moving along toward an eventual sunspot cycle peak in several years.

As reported last month, this is an exciting cycle to watch. With the stunning high-definition imagery being captured by the new Solar Dynamic Observatory (SDO), we can see in nearly real-time breathtaking views of the living sun. This affords us great opportunity to learn more about how the sun works, and aids in our understanding of the sun-Earth connection. As radio amateurs, having a greater understanding of this science equips us to be more effective communicators. The latest SDO images, as well as live space-weather information and commentary on current conditions, are available at my website, <<http://prop.hfradio.org>>. Each month, this column will continue to report and discuss this fascinating science.

August Propagation

The late August early September timeframe is a difficult time of year during which to make accurate band predictions, because conditions can change drastically from day to day. On many days, typical summertime conditions will continue much as they were during June and July.

On the other days conditions may sound typically fall-like, with somewhat higher daytime usable frequencies and somewhat lower nighttime usable frequencies. When you add equinoctial conditions that can begin as early as late August, we often experience optimum openings between the Northern and Southern Hemispheres on the one hand, but



Fig 2— The stunning view (at the 171 Ångstrom wavelength) of the magnetic field lines looping above a sunspot region on June 15, 2010. We can see these magnetic loops because solar plasma is captured by the magnetic fields. When these magnetic fields break, plasma is ejected out into space. (Credit: SDO/AIA [Solar Dynamics Observatory Atmospheric Imaging Assembly])

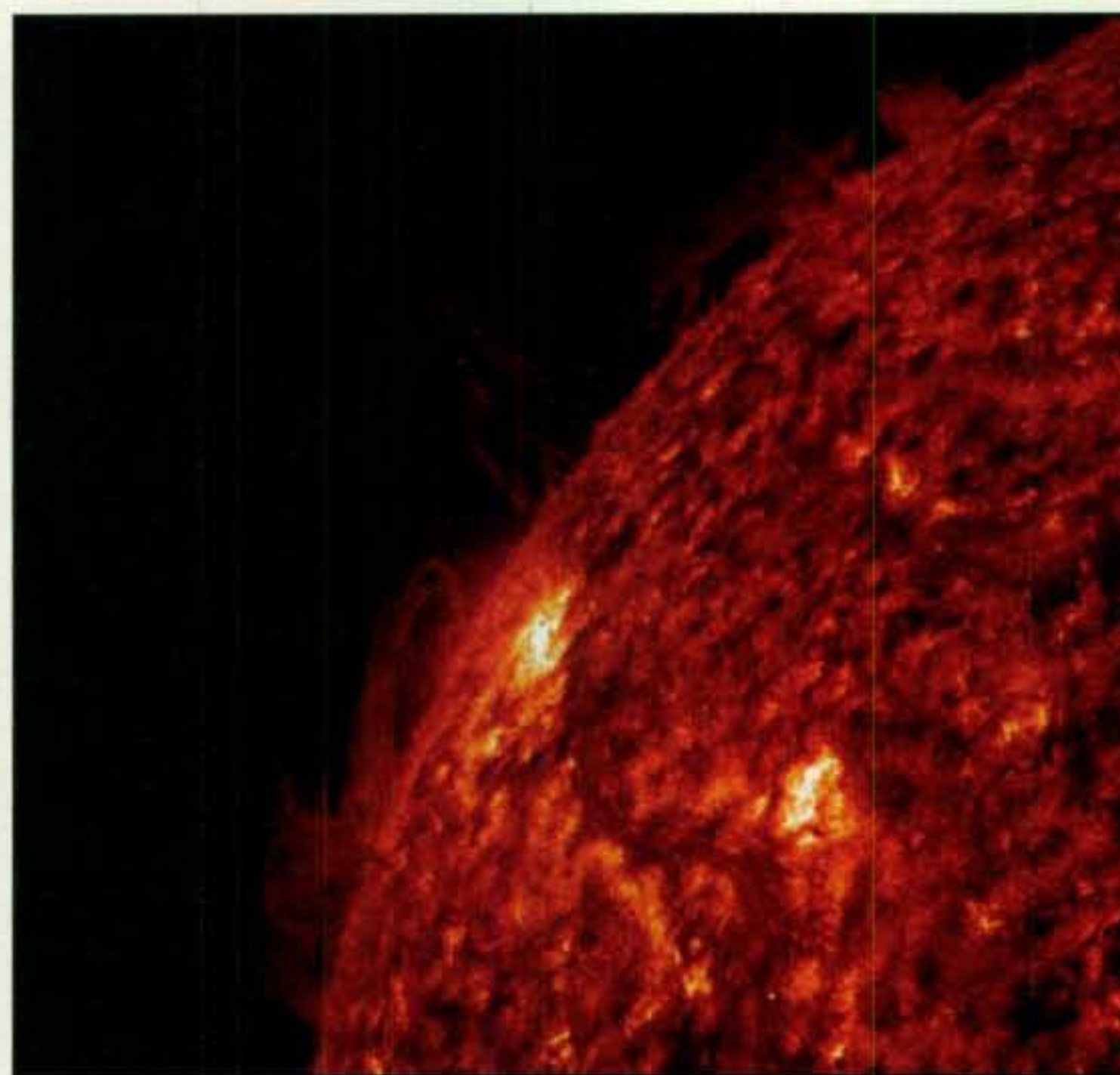


Fig. 3— Incredible view of solar plasma “clouds” and prominences above the sun’s corona, as seen at the 304 Ångstrom wavelength by the Solar Dynamics Observatory on June 15, 2010. A prominence is a large, bright feature extending outward from the sun’s surface, often in a loop shape. Prominences are anchored to the sun’s surface in the photosphere, and extend outwards into the sun’s corona. While the corona consists of extremely hot ionized gases, known as plasma, which do not emit much visible light, prominences contain much cooler plasma, similar in composition to that of the chromosphere. A prominence forms over timescales of about a day, and stable prominences may persist in the corona for several months. Some prominences break apart and give rise to coronal mass ejections. Scientists are currently researching how and why prominences are formed. The new SDO is enabling scientists to unlock the inner workings of the Sun. (Credit: SDO/AIA)

periods of active to stormy conditions on the other.

With the noticeable increase in sunspot Cycle 24 activity, good DX conditions should be possible on several bands: 15, 17, and 20 meters during daylight hours. Expect signals on the 17- and 20-meter bands to peak approximately during the two-hour window immediately following sunrise and again during the late afternoon.

Between sundown and sunrise 20 meters is expected to be the best DX band. Occasional nighttime openings are possible to many areas of the world, some with surprisingly strong signal levels. For North American stations, good DX conditions should be found for openings toward Latin America, the far Pacific, and into Asia, until midnight. You might even catch some activity on 17 or even 15. Fairly good conditions are also expected on 30, 40, 60, and 80 meters despite the high static level at times. Openings should be possible before midnight along an arc extending from northern Europe, through Africa, and into Latin America, the far Pacific, and Asia after midnight.

By late August it should be possible to work some DX on 160 meters during the hours of darkness. Conditions on this band, as well as on 40, 60, and 80 meters, will tend to peak just as the sun begins to rise on the light, or easternmost, terminal of a path.

For short-skip openings during August and early September, try 80 meters during the day for distances less than 250 miles, with 60 and 40 meters also usable. During the hours of darkness both 80 and 160 meters should provide excellent communications over this distance. For openings between 250 and 750 miles use 30 and 40 meters during the day for distances up to 500 miles, and 20 and 17 meters between 500 and 750 miles. At night, 40 and 30 meters should be the best bands for this distance until midnight, with 80 meters optimum from midnight to sunrise. Try 60 meters, as well. For openings between 750 and 1300 miles, try 20 and 17 meters, as they should provide optimum propagation during the hours of daylight. Optimum conditions should continue on these bands for this distance range after sundown and until midnight. Between mid-

Bob Brown, NM7M, SK



Vicky, AE9YL, and Bob, NM7M, in 1999 at Bob's house on Guemes Island. (Photo by Carl, K9LA)

On Sunday, May 23, Bob Brown, NM7M, of Anacortes, Washington passed away. Bob retired from the University of California at Berkeley in 1982, where he was a Professor of Physics. His early research work centered on the measurement of x-ray bursts with balloon-borne equipment (see "Over Coffee & Cognac," July CQ).

After retirement, Bob signed on as a columnist for several amateur radio publications, starting with his "Over the Horizon" column for *The Canadian Amateur*, followed by his "Propagation and DX" column for *QRP Quarterly* and his "Propagation" column in *WorldRadio* (which ran from April 1989 through December 1996). He also contributed propagation articles to most of the other amateur radio publications, including CQ.

Bob wrote five books for radio amateurs.

His first (*Long-Path Propagation*, 1992) involved a year-long study of long-path on the 20-meter band. *The Little Pistol's Guide to HF Propagation* (1996) was a general work covering the ionosphere and ionospheric HF propagation. Bob's third book for hams (*Long-Path Propagation Revisited*, 2000) dug deeper into long path, including the difficult long path on 160 meters. His fourth book (*The Big Gun's Guide to Low-Band Propagation*, 2002) addressed 160-meter propagation. His last book (*On Ion Chemistry and Propagation*, 2002) dug into the chemistry of the atmosphere and how it ties into propagation.

Bob's most recent interest was studying the impact of galactic cosmic rays on 160-meter propagation. He wrote several articles on this topic that were published in this magazine (the most recent, "On Forbush Decreases and 160-Meter Propagation," appeared this past June).

Bob was a great teacher, and his contributions to amateur radio in the field of propagation are appreciated worldwide.

—Carl Luetzelschwab, K9LA

Carl, a longtime friend and collaborator of NM7M and propagation expert in his own right, is Bob's successor as Propagation Editor of *WorldRadio*, now *WorldRadio Online*, and a frequent CQ contributor as well.

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night and sunrise the best band should be 40 meters, but check 60 meters, too. For openings between 1300 miles and the one-hop short-skip limit of approximately 2300 miles, try 20 and 17 meters during the day, with 15 meters also usable. After sundown try 30, 40, and 60 meters, with 80 meters also providing good propagation conditions for this distance range.

VHF Conditions

Sporadic-E propagation usually begins to taper off during August, but it should continue to occur fairly frequently. Some 6-meter sporadic-E openings are

expected during the month over distances of approximately 750 to 1300 miles. During periods of intense and widespread sporadic-E ionization, two-hop openings may be possible considerably beyond this range. Also check the 2-meter band for an occasional sporadic-E short-skip opening between approximately 1200 to 1400 miles. While sporadic-E short-skip openings may occur at any time, there is a tendency for them to peak between 8 AM and noon, and again between 6 PM and 9 PM local daylight time.

The *Perseids* meteor shower starts during the beginning of August and peaks the night of August 12. It is most

observable in the Northern Hemisphere. The maximum hourly visual rate should reach 80.

For the very patient, check the 6-meter band for possible transequatorial (TE) openings between 8 and 11 PM local daylight time. This type of propagation favors openings from the southern tier states into deep South America, with the signal path crossing the magnetic equator at a right angle. TE openings during August are rare, but they can occur. Very weak signals and severe flutter fading usually characterize them.

Current Solar Cycle Progress


The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 74 for May 2010. The 12-month smoothed 10.7-cm flux centered on November 2009 is 74.5. The predicted smoothed 10.7-cm solar flux for August 2010 is about 90, give or take about 7 points.

The Royal Observatory of Belgium reports that the mean monthly observed sunspot number for May 2010 is 8.8, slightly up from April's 7.9. The lowest daily sunspot value during May 2010 was zero (0) on May 9 through May 20. The highest daily sunspot count for May was 32 on May 4. The 12-month running smoothed sunspot number centered on November 2009 is 7.6. A smoothed sunspot count of 31 is expected for August 2010, give or take about 8 points.

The observed monthly mean planetary A-index (A_p) for May 2010 was 8. The 12-month smoothed A_p index centered on November 2009 is 4.5. Expect the overall geomagnetic activity to be unsettled to stormy during August. Refer to the Last-Minute Forecast at the beginning of this column for the outlook on what days that this might occur.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me or catch me on the HF amateur bands. Please come and participate in my online propagation discussion forum at <http://hfradio.org/forums/>. If you are on Facebook, check out <http://tinyurl.com/fbswx> and <http://tinyurl.com/fb-nw7us>. Speaking of Facebook, check out the *CQ Amateur Radio Magazine* fan page at <http://tinyurl.com/fb-cqm>.

Now that the new solar cycle is active, I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!
73, Tomas, NW7US



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our readers say

MREs and More

The following letters were directed to "Ham Notebook" editor Wayne Yoshida, KH6WZ.

Dear Wayne,

My wife and I have a need for emergency rations, so I read your article "Are You Ready?" (May CQ) with interest.

MREs have a day's worth of sodium, a day's worth of fat, and a day's worth of calories in each meal, sometimes more. They're made for soldiers in combat who burn up lots of calories and may not get more than a meal a day. Louise and I have found several substitutes that have more nearly normal supplies of calories and other contents. The brand we use most is Heater Meals, but we have a list of quick meals and alternatives at <<http://www.cieux.com/bm/quickMeals.html>>.

We list self-heating meals, along with emergency rations that don't have to be cooked and some meals that require boiling water. Note that some of the quick meals are kosher, vegan, gluten-free, and so on, since some people have dietary restrictions of various kinds (I can't digest milk, and I'm allergic casein, which is often used as a thickener).

On canned goods, if you're camping without refrigeration, opening a can means you have to eat the whole thing at one sitting. It would be the same after a hurricane or earthquake with no power. Therefore, we buy single-serving cans for less waste.

It was a great article, and I got a lot of new ideas from it. Many thanks.

Phil Stripling, The Civilized Explorer: <<http://www.cieux.com>>

KH6WZ replies: Thank you for your nice comments on my recent article. I took a quick look at the link you supplied and the info in there is excellent. I agree the single-serving cans are the best for emergencies because of the "no waste factor."

Dear Wayne,

Thanks for the informative article! I have been working on gathering the necessary items for a solar system that I can use mobile. I now have two solar panels, 15 watts, but I have been searching for any information on how to connect the two (up to three to match my controller) panels but have not been able to find any. Should they be connected in parallel or serial? Can you suggest any information source that provides that level of detail? Will there be a future article in CQ that provides that level of detail?

Thanks again for the great article.

Jimmy Dominguez, KE5PEQ

KH6WZ replies: If you go to an RV, camping, or marine equipment store (check West Marine, for example), you can get small panels that have built-in charge controllers. The charge controllers prevent possible over-charging, but maybe more important is what happens when it gets dark: The solar panels then take power away from the system! A simple diode can do this, but it is lots easier to use the built-in controller that comes with the panel.

The units come with instructions, but basically, you mount your panel in a sunny location, the panel has a controller built-in, and so you connect the panel positive wire to the battery positive post, and the negative from the panel to the negative post on the battery—parallel.

With multiple solar panels, those would go in parallel, but check with the solar panel instructions to see what or how much voltage and current they supply to the battery. Also check the battery you are using (small gel-cell or big car battery?) to see how much charge voltage and current it needs to take for charging. Best thing is to go to a store where you can talk to someone who can guide you in buying what you need and can afford.

A follow-up article on solar power is a great idea. I will do that in an upcoming CQ!

"Get Your Hands into That!"

The following letter is in response to W2VU's June editorial on ham radio as one of the last bastions of personal electronic experimentation.

Editor, CQ:

Your editorial makes some good points, but I would like to remind you that there is an area of experimentation in the software world, and that is Linux. It is an operating system that one *owns*, not licenses, and is open source—that is, one can get the source code for one's OS, and play with it as much as one likes, if one is literate in the language it is written in, "C" as far as I know. I do wish your article writers were more aware of it and of the plethora of "packages" (as Linux programs are called) written for ham radio operators. There is a version of Linux called "Ubuntu" that is very clean and a pleasure to use, and as always, *free*—that is, no cost. I think that we should encourage its use in the ham community as much as possible.

Bob Irwin, K6YV

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- TNC built-in, Bluetooth capable
- Band scope built-in
- 500 Memories



FTDX5000MP 200w HF + 6M Transceiver

- Station Monitor SM-5000 Included
- 0.05ppm OCXO included
- 300 Hz Roofing filter included
- 600 Hz Roofing filter included
- 3 kHz Roofing filter included



VX-7R/VX-7R Black

- 50/2M/220/440 HT
- Wideband RX - 900 Memories
- 5W TX (300mw 220Mhz)
- Li-Ion Battery
- Fully Submersible to 3 ft.
- Built-in CTCSS/DCS
- Internet WIRES compatible

Now available in Black!

VX-6R

- 2M/220/440HT
- wideband RX - 900 memories
- 5W 2/440, 1.5W 220 MHz TX
- Li-ION Battery - EAI system
- Fully submersible to 3 ft.
- CW trainer built-in

NEW Low Price!

VX-8DR/VX-8GR

- 50/144/220/440 (VX-8DR)
- 2m/440 w/ Built-in GPS (VX-8GR)
- 5w (1w 222 Mhz VX-8R/DR only)
- Bluetooth optional (VX-8DR only)
- waterproof/submersible 3 ft 30 mins
- GPS/APRS operation optional
- Li-ion Hi-capacity battery
- wide band Rx



FT-857D

- Ultra compact HF, VHF, UHF
- 100w HF/6M, 50w 2M, 20w UHF
- DSP included • 32 color display
- 200 mems • Detachable front panel (YSK-857 required)

Call for Low Price!



FT-7900R 2M/440 Mobile

- 50w 2m, 45w on 440mhz
- Weather Alert
- 1000+ Mems
- WIRES Capability
- Wideband Receiver (Cell Blocked)

Call Now For Your Low Price!



FT-2000/FT2000D HF + 6M tcvr

- 100 W w/ auto tuner • built-in Power supply
- DSP filters / Voice memory recorder
- 200W (FT-2000D)
- 3 Band Parametric Mic EQ • 3 IF roofing filters

Call For Low Pricing!



FT-450AT HF + 6M TCVR

- 100W HF/6M • Auto Tuner built-in • DSP Built-in
- 500 Memories • DNR, IF Notch, IF Shift

Call Now For Special Pricing

AZ, CA, CO, GA,
VA residents add
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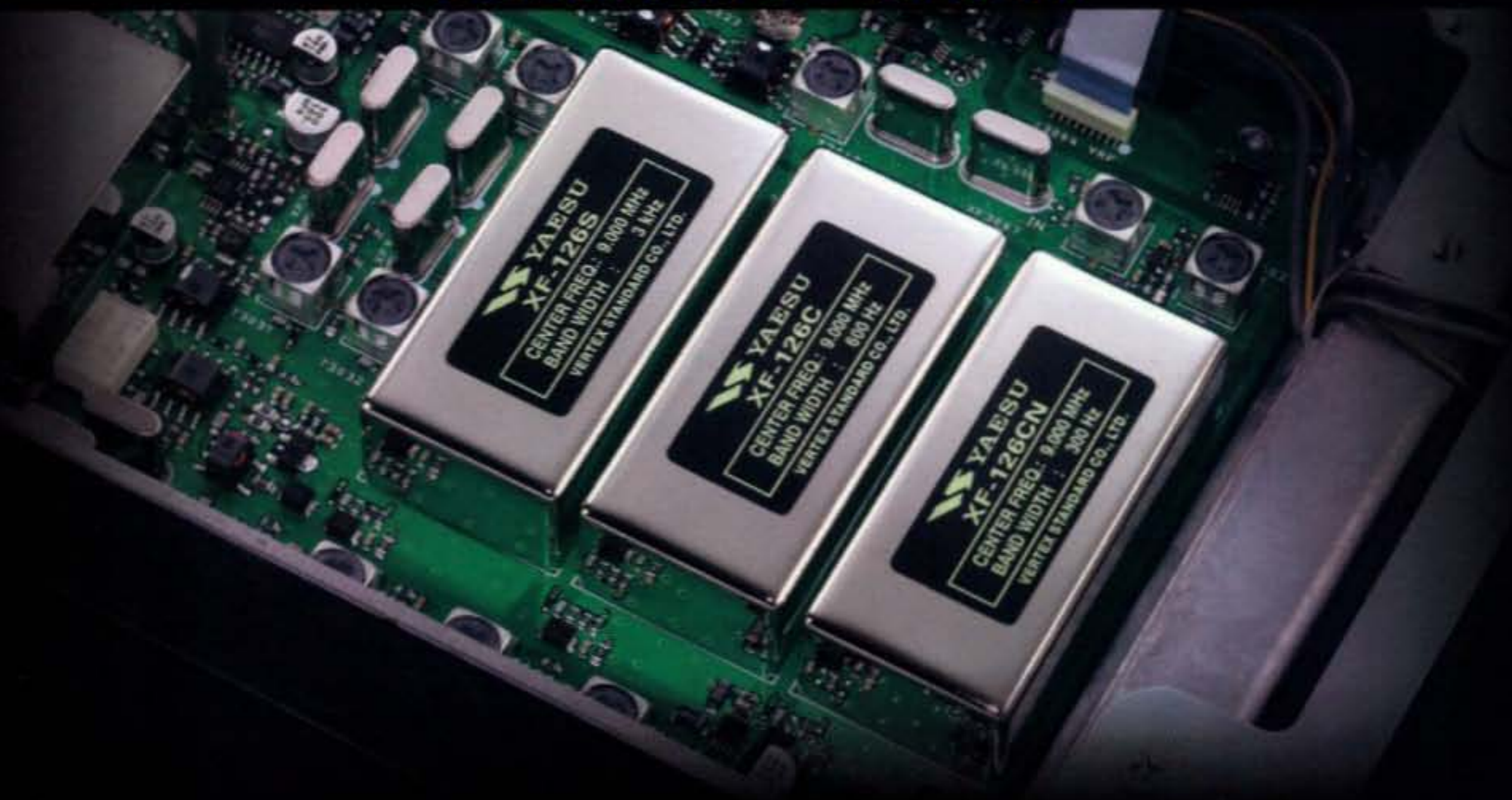
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The New Premium HF/50 MHz Transceiver
FT DX 5000 Series

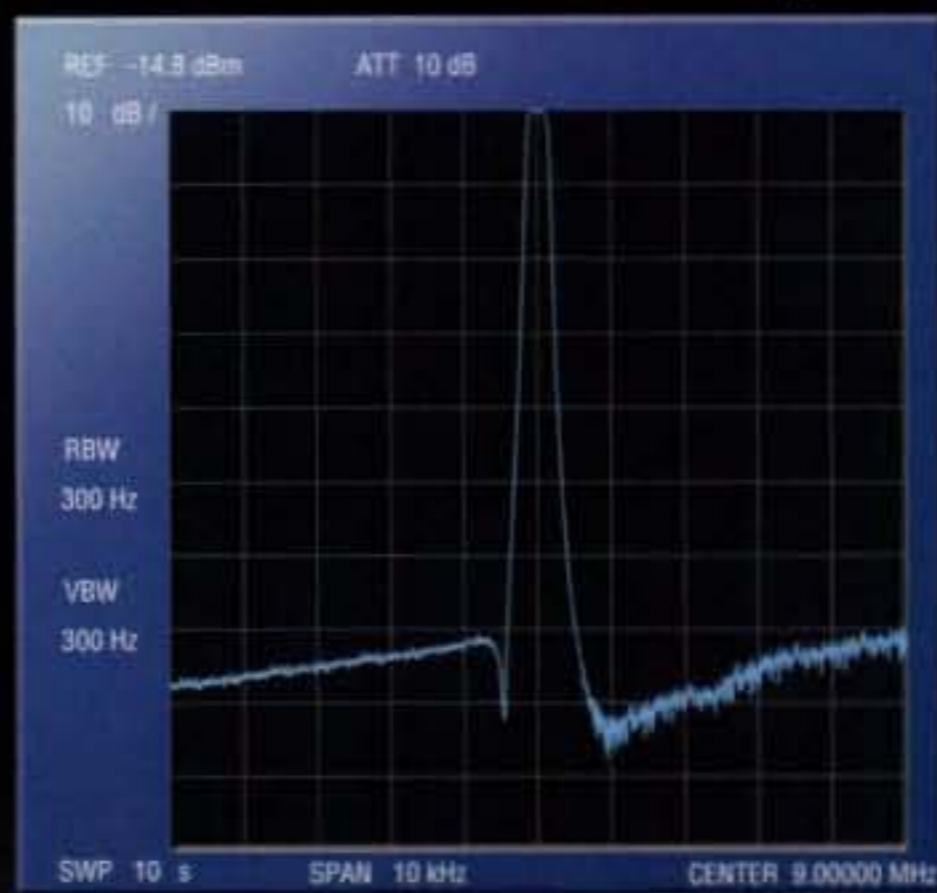
The Dawn of a New Era - Dynamic Range
112 dB / IP3 +40 dBm



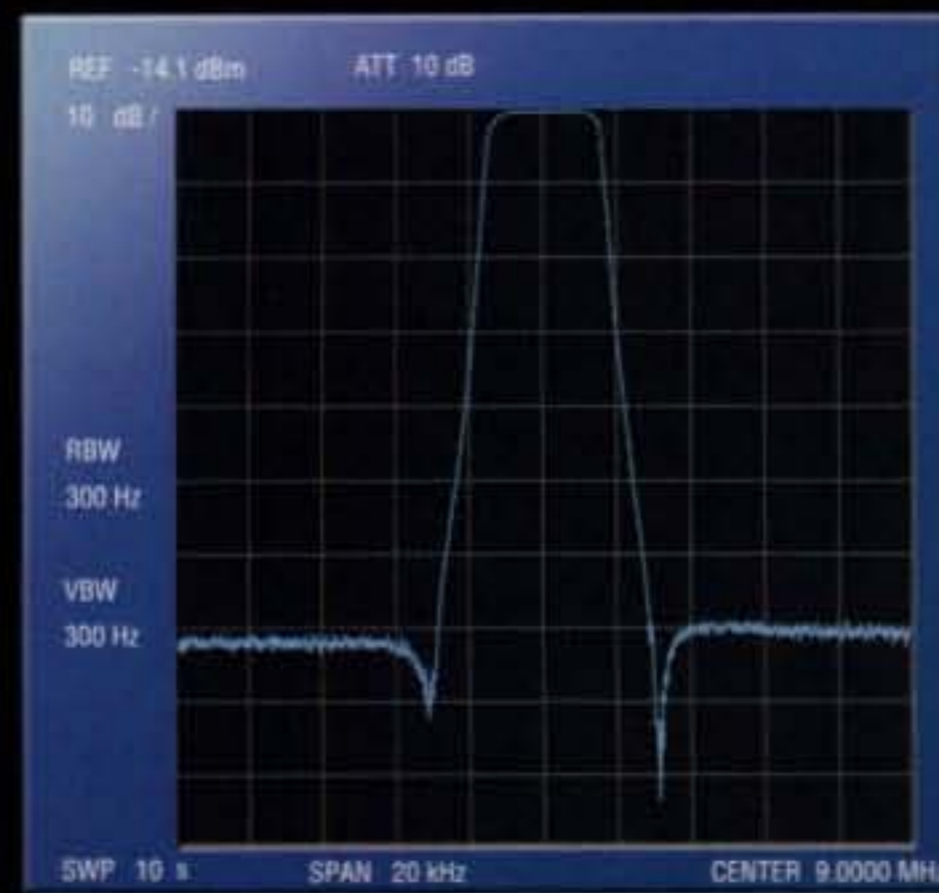
Roofing Filter Performance

Super sharp "Roofing" filters for VFO-A/Main Receiver to give you the best performance and flexibility

Newly designed sharp "Roofing" filters for VFO-A/Main Receiver, selectable between 300 Hz, (optional/included in MP), 600 Hz, 3 kHz (6-pole crystal filter), 6 kHz, 15 kHz (4-pole MCF).



300Hz



3kHz

NEW



Photography shows FT DX 5000MP

HF/50 MHz 200 W Transceiver
FT DX 5000MP

Station Monitor SM-5000 included
 ±0.05ppm OCXO included
 300 Hz Roofing Filter included
 600 Hz Roofing Filter included
 3 kHz Roofing Filter included

HF/50 MHz 200 W Transceiver
FT DX 5000D

Station Monitor SM-5000 included
 ±0.5ppm TCXO included
 600 Hz Roofing Filter included
 3 kHz Roofing Filter included

HF/50 MHz 200 W Transceiver
FT DX 5000

Station Monitor SM-5000 optional
 ±0.5ppm TCXO included
 600 Hz Roofing Filter included
 3 kHz Roofing Filter included

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Specifications subject to change without notice. Some accessories and/or options may be standard in certain areas. Frequency coverage may differ in some countries. Check with your local Yaesu Dealer for specific details.



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D-STAR MOBILES



Dual display



Diversity reception with band scope

Select your favorite display color, adjustable from green to amber

D-PRS™

D-STAR optional



IC-2820H ADVANCED D-STAR + ANALOG 2M & 70CM

- 50/15/5 Watt Output
- RX: 118–549.995, 118–173.995, 375–549.999, 810–999.990MHz*
- 522 Alphanumeric Memory Channels
- One Touch Reply Function
- Digital Voice/GPS**
- Low Speed Data**



UT-123 GPS MODULE AND ANTENNA



D-STAR ready

ID-1 GO DIGITAL ON 1.2GHZ

- 10 Watt Output on 23cm (FM, DV, DD)
- RX: 1240–1300MHz*
- 100 Alphanumeric Memory Channels
- USB Rig Control, Ethernet Plug for DD
- Black Box Operation
- Up to 128kbps Data Speed



D-STAR ready

ID-880H COMPACT, D-STAR + ANALOG 2M & 70CM

- 50 Watt Output (VHF/UHF)
- RX: 118–173.995, 230–549.995, 810–999.990MHz*
- 1052 Alphanumeric Memory Channels
- Digital, 3G/D-STAR
- Improved User Interface
- Free Downloadable Software



D-STAR optional

IC-2200H ANALOG 2M, D-STAR UPGRADEABLE

- 65 Watt Output
- RX: 118–174MHz*
- 207 Alphanumeric Memory Channels
- CTCSS & DTCS Encode/Decode with Tone Scan
- Built-in 10dB Squelch Attenuator
- Digital Voice & Data**

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*Frequency coverage may vary. Refer to owner's manual for exact frequency specs. **Optional components required.
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