Market Survey Issue

Amateur Radio

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

COMMUNICATIONS & TECHNOLOGY

FEBRUARY 2010

CQ

1945 — Our 65th Anniversary — 2010

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On the Cover: Bill Klepser, WB2AIV, stays warm and comfortable in his cozy shack in suburban Buffalo, New York. Details on page 36.

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

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7-Elements gives you the *highest average gain* of any Hy-Gain tri-bander!

Dual driven for broadband operation without compromising gain. SWR less than 2:1 on *all* bands.

Uniquely combining monoband and trapped parasitic elements give you an excellent F/B ratio.

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The broadband *five element* TH5-MK2 gives you outstanding gain.

Separate air dielectric *Hy-Q* traps let you adjust for maximum F/B ratio on each band.

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Revolutionary 4-element compact tri-bander *lets you add 40 or 30 Meters!* Has 14 foot boom and tight 17.25 feet turning radius. Fits on roof tri-pod, mast or medium duty tower.

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Compact 3-element 10, 15, 20 Meter Tri-Bander

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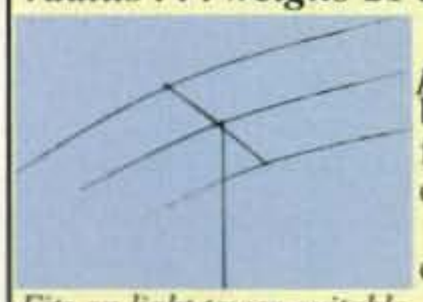

Fits on light tower, suitable guyed TV pole, roof tri-pod

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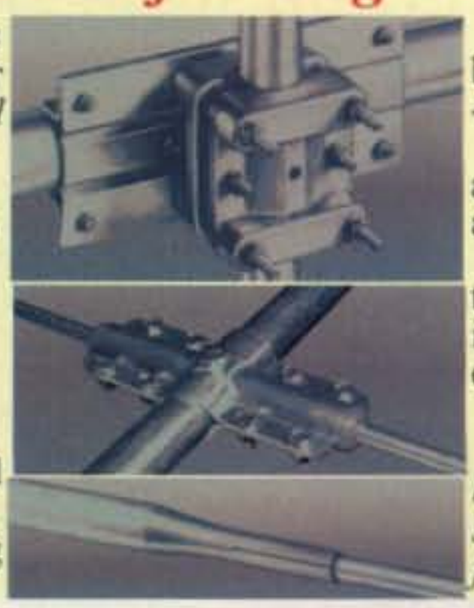
Model No.	No. of elements	avg gain dBd	avg F/B dB	MaxPwr watts PEP	Bands Covered	Wind sq.ft. area	Wind (mph) Survival	boom feet	Longest Elem. (ft)	Turning radius(ft)	Weight (lbs.)	Mast dia O.D.(in.)	Recom. Rotator	Sugg. Retail
TH-11DX	11	*For Gain and F/B ratio--See...* • www.hy-gain.com • Hy-Gain catalog • Call toll-free 800-973-6572		4000	10,12,15,17,20	12.5	100	24	37	22	88	1.9-2.5	T2X	$1159.95
TH-7DX	**7**			**1500**	**10, 15, 20**	**9.4**	**100**	**24**	**31**	**20**	**75**	**1.5-2.5**	**HAM-IV**	**$869.95**
TH-5MK2	5			1500	10, 15, 20	7.4	100	19	31.5	18.42	57	1.5-2.5	HAM-IV	$759.95
TH-3MK4	**3**			**1500**	**10, 15, 20**	**4.6**	**95**	**14**	**27.42**	**15.33**	**35**	**1.9-2.5**	**CD-45II**	**$469.95**
TH-3JRS	3			600	10, 15, 20	3.35	80	12	27.25	14.75	21	1.25-2.0	CD-45II	$359.95
TH-2MK3	**2**			**1500**	**10, 15, 20**	**3.25**	**80**	**6**	**27.3**	**14.25**	**20**	**1.9-2.5**	**CD-45II**	**$369.95**
EXP-14	4			1500	10,15,20 (20M 30/40)	7.5	100	14	31.5	17.25	45	1.9-2.5	HAM IV	$599.95

Tooled Manufacturing . . . Highest Quality Materials

1. Hy-Gain's famous super strong *tooled* die cast *Boom-to-Mast Clamp*

2. *Tooled* *Boom-to-Element Clamp*

3. Thick-wall *swaged* aluminum tubing



***Tooled** manufacturing* is the difference between Hy-Gain antennas and the others -- they just don't have it (it's expensive!).

Die-cast aluminum boom-to-mast bracket and element-to-boom compression clamps are made with specially *tooled* machinery.

Hy-Gain antennas feature *tooled* swaged tubing that is easily and securedly clamped in place. All tubing is deburred and cleaned for smooth and easy assembly.

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W5BIG Patents New Impedance Measuring Technique

Bob Clunn, W5BIG, an engineer for Array Solutions, Inc., has received a patent for a new way of measuring antenna system impedance. Array Solutions owner Jay Terleski, WXØB, explains that the system uses digital circuits to generate an RF test signal and a local oscillator in a manner similar to a direct-conversion receiver. The measurements for current, voltage, and phase are then heterodyned down to a baseband of 2 kHz, where the data are then sent through a bandpass filter, like the IF of a radio. The signals are then digitized and sent to a personal computer, which can display a wide variety of graphical information and save data for later recall. Those interested in the technical details may do a web search on U.S. Patent number 7,629,795.

Senate Passes Ham Radio Bill

A bill to force a federal government study of amateur radio's importance as an emergency communications tool has been passed by the U.S. Senate and sent to the House of Representatives. S. 1755, the Amateur Radio Emergency Communications Enhancement Act of 2009, is co-sponsored by Senators Joseph Lieberman of Connecticut and Susan Collins of Maine, the Chairman and Ranking Minority Member, respectively, of the Homeland Security and Governmental Affairs Committee. According to the ARRL, the bill was approved by the committee on December 10 and passed by the full Senate by unanimous consent on December 14. It calls on the Department of Homeland Security to perform a study on "the uses and capabilities of Amateur Radio Service communications in emergencies and disaster relief," and to report back to Congress within six months with recommendations for action to clear what it identifies as "impediments" to ham radio, including unreasonable private land use regulations. The bill now awaits action in the House, where a companion measure, H.R. 2160, remains stuck in committee.

W4PA Buys Vibroplex

Well-known ham Scott Robbins, W4PA, has purchased the Vibroplex Company and is moving the code key maker's manufacturing facilities from Alabama to Tennessee. Robbins, who is best known as Ten-Tec's amateur radio product manager, left that company in mid-December to devote full time to his new venture. He bought Vibroplex from Felton "Mitch" Mitchell, W4OA, who had owned the company since 1994, and wanted to retire. Vibroplex is the oldest continually-operating business in the amateur radio industry, serving Morse code enthusiasts since Horace Martin invented the semi-automatic "Bug" key in 1904. The company's website, <www.vibroplex.com>, and its toll-free phone number, (800) 840-8873, will remain unchanged in the move.

Felton "Mitch" Mitchell, W4OA (left), hands over the Vibroplex "key" to the company's new owner, Scott Robbins, W4PA. Mitchell was the first ham to own the company, which has been in business since 1904. The key, by the way, is a Vibroplex 100th Anniversary Edition Bug. (Photo by and courtesy of Jim Buffington, K5JIM)

FCC Proposes Clarifications to Vanity Rules

The FCC has issued a Notice of Proposed Rule Making (NPRM) intended primarily to codify existing policies regarding the issuance of amateur radio "vanity" callsigns. These policies have been issued in various Public Notices, but until now have not been formally included in the Part 97 rules. One proposed change would implement a 30-day freeze on reissuing the cancelled callsign of a deceased amateur in order to provide adequate notice of its availability. See this month's "Washington Readout" column on page 54 for details.

AMSAT China Launches First Satellite

China's first amateur radio satellite is in orbit and in operation. The satellite, XW-1, and now designated Hope OSCAR 68, was designed and built by AMSAT China (CAMSAT) and was launched December 15 from the Taiyuan Satellite Launch Center. XW-1 operates in Mode V/U, with uplinks on 145 MHz and downlinks on 435 MHz. It includes an FM voice repeater, a packet bulletin board system, and an SSB/CW linear transponder, as well as a beacon on 435.790 MHz CW. For details, see this month's "VHF Plus" column on page 94.

FCC Says No, Again, Twice

The FCC has rejected two petitions for rulemaking, each on subjects that have been revisited—and rejected—by the Commission multiple times in the past. Murray Green, K3BEQ, filed a petition to have the FCC require that all repeaters be open to all hams except blatant rules offenders. The FCC *declined*, repeating its past message that while all frequencies must be shared, a repeater is a privately-owned piece of equipment and the repeater's licensee has the right to limit which other hams may use his/her equipment.

The second petition was filed by Glen Zook, K9STH, seeking to have the FCC reinstate its old rule (circa 1956) that stations must identify at the beginning of each series of transmissions as well as every 10 minutes during a contact and at the end of each contact. Zook filed a similar petition in 2006, and the FCC rejected it in 2007. It did so again in December 2009, stating that nothing had changed to justify a reconsideration of its previous decision. It also suggested that problems with stations making unidentified transmissions would be better dealt with through enforcement action based on the current rule than by changing the rule.

(Continued on page 10)

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.

TOKYO HY-POWER

HC-1.5KAT

HF 1.5kW Auto Tuner

HL-2.5KFX *Auto Band Set and QSK*

Solid-state HF 1.5kW Linear Amplifier

Photo : From 1eft HC-1.5KAT (HF 1.5kW Tuner with Auto Band Set Feature), HL-2.5KFX (HF 1.5kW MOSFET Linear) and IC-7700 Transceiver

For DXpeditioners

HL-1.1KFX

HF 600W Linear

HL-1.2KFX

HF 750W Linear

HL-1.5KFX

HF / 50MHz 1kW Linear
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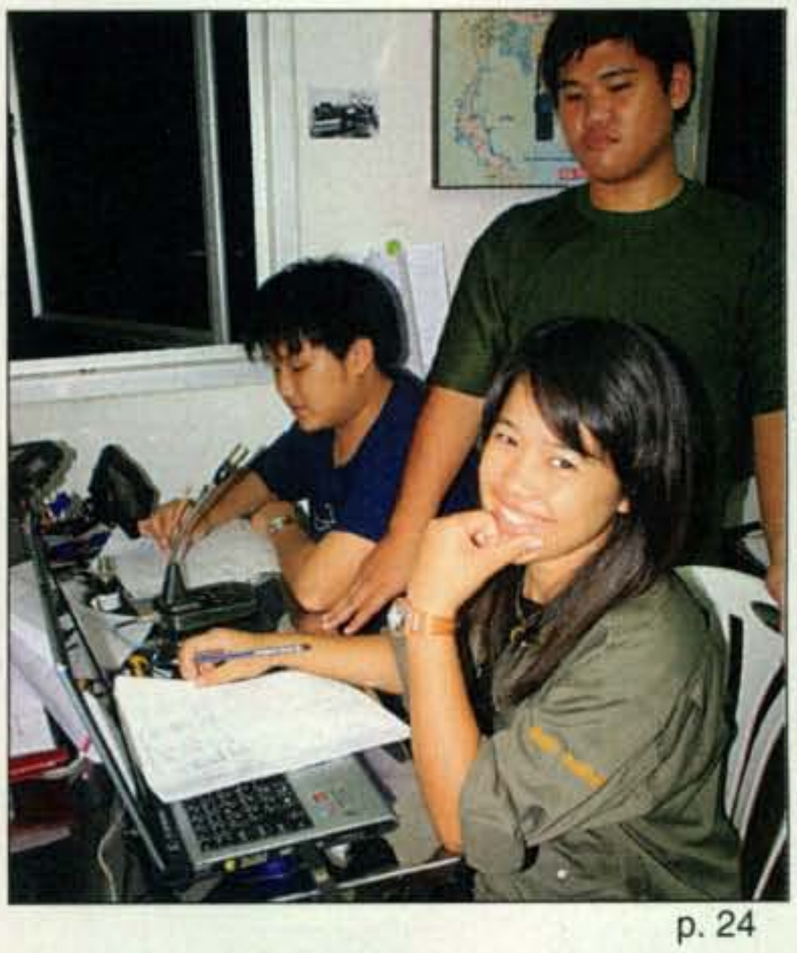

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departments

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3. $300 off a FLEX-5000A with RX2 and ATU

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FLEX-5000-VHF/UHF Upgrade

- High Performance 2M and 70cm
- Weak Signal and Satellite Ready
- 60 Watts per band
- Full duplex option
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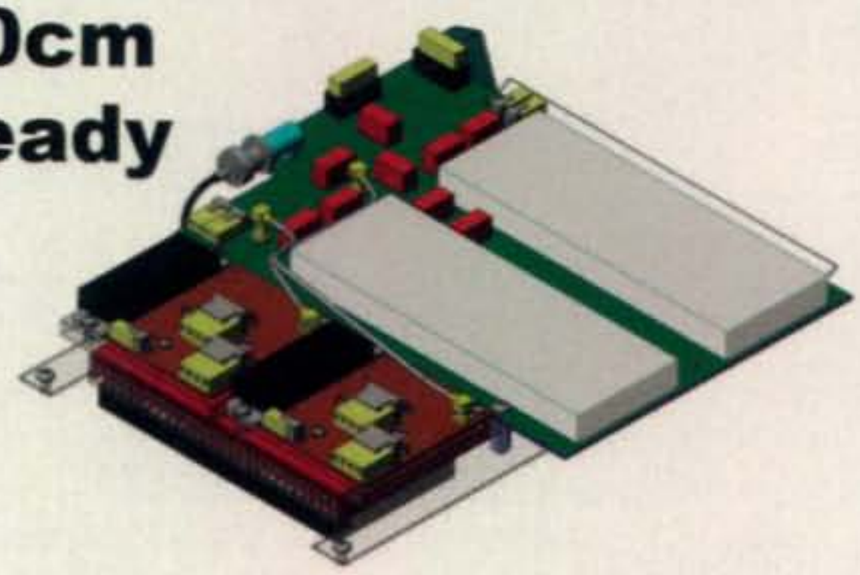

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- **The number of APRS® Message memories has increased from 20 to 30.**
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* SmartBeaconing™ from HamHUD Nichetronix

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50/144/(222)*/430 MHz
FM 5 W/AM 1 W(50 MHz) Triple Band Handheld

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*222 MHz: 1.5 W (USA version)

Actual size

Key Features of the original VX-8R include

- Full 5 watts FM 50/144/430 MHz – plus 1.5 watts on 222 MHz. 50 MHz AM included.
- Bluetooth® hands-free operation with the optional BU-1 and BH-1A or BH-2A.
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- Weather receiving with Weather Alert.
- Barometric sensor included.
- Operate Amateur radio while receiving AM/FM broadcasting.
- Dot matrix LCD display provides up to 16 character Memory tags, High-resolution Spectrum Analyzer with ±50 channels indication, Wave monitoring of received/modulated signal .
- DCS and CTCSS ENC/DEC included.

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The VX-8DR has not been approved by the FCC. This device may not be sold or leased, or offered for sale or lease, until FCC approval has been obtained.

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← New Suction Cup Mounting Bracket

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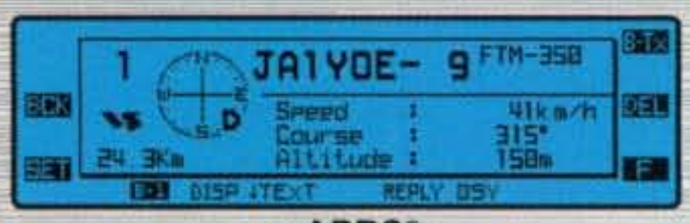
FPR-1 Monitor Unit

Screen Example

Dual Band (Spectrum Scope function)

Navigation (with GPS antenna unit attached)

Mono Band (Spectrum Scope function)



APRS®

Barometer

Timer

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CQ editorial

BY RICH MOSESON,* W2VU

"Communications on behalf of an employer" – a CQ Proposal

§97.113 Prohibited transmissions.

(a) No amateur station shall transmit:

(3) Communications in which the station licensee or control operator has a pecuniary interest, including communications on behalf of an employer.

...

(5) Communications, on a regular basis, which could reasonably be furnished alternatively through other radio services.

Over the past year or so, there has been quite a bit of confusion over exactly what constitutes appropriate and inappropriate use of amateur radio, particularly with regard to emergency communications and "communications on behalf of an employer." It started after a ham who works for a hospital posted information on the internet about the ham station he had built there for emergency use and how he had used it effectively in a disaster drill. FCC Special Counsel Laura Smith e-mailed him that the provisions of Section 97.113(a)(3) of the FCC rules (see above) were very specific in prohibiting communications on behalf of an employer and made no exceptions for whether an employee was on the clock or regularly involved in providing communication services for the employer. In other words, his use of the station that he had built, as a hospital employee representing the hospital in a drill, was not permitted.

The fallout from this e-mail has been widespread and perhaps greater than anticipated. The goal—quite legitimately—is to prevent "served agencies," those organizations for which hams provide volunteer public service and emergency communications, from taking advantage of us and our spectrum for their own internal use. Unfortunately, there have been growing reports of this happening in different parts of the country. But the net result of the FCC's "no exceptions, no excuses" interpretation of this rule has been an abundance of caution, with emergency service agencies barring their employees who are licensed hams from participating in disaster drills to some agencies severing long-standing relationships with amateur radio groups in order to prevent any possibility of violating the law. It got to be so significant that the FCC adopted a "some exceptions, sometimes" policy, saying it would consider granting waivers on a case-by-case basis, but only for specific requests from government agencies and only for disaster drills.

Hams inquiring about the application of this rule have been told that if they disagree with the current interpretation, they should file a petition for rule making to change it. At least one group so far, which includes *CQ* Contributing Editor Gordon West, WB6NOA, has done so. That petition asks the FCC to codify an exception to permit hams to participate in emergency and disaster communications and training "without regard to whether the amateur operator has related employment" (see Gordon's "Op Ed" on this topic, on page 48 of this issue). This would, for example, permit National Weather Service meteorologists who are also hams (see this month's "Public Service" column) to directly participate in SKYWARN communications and training when necessary.

We have no problem with this petition, but we feel that it does not go far enough to really solve the problem, because the problem extends beyond the narrow scope of emergency communications. This rule applies to all amateur communications, and broad application of this very strict interpretation could have far-reaching impact on the Amateur Radio Service in ways that the FCC perhaps did not anticipate.

For starters, employees of amateur radio publications could no longer conduct equipment reviews, since any transmissions made for the purpose of evaluating a piece of gear could be considered "communications on behalf of an employer" and would therefore be prohibited. Take it a step further and I should probably just sell my ham gear, since people have a tendency to recognize me on the air and occasionally make a comment regarding *CQ*. Any response other than rudely ignoring them could be considered "communication on behalf of an employer," even if all I say is "call me or send an e-mail."

The greatest impact could be on a program that is universally recognized as beneficial for everyone concerned—the Amateur Radio on the International Space Station (ARISS) program. NASA considers ARISS to be part of its educational outreach program, and it has helped countless young people worldwide to consider careers in science and technology. NASA astronauts participating in ARISS by making school contacts (during their personal time, on a voluntary basis) are clearly speaking in their roles as NASA astronauts and are therefore transmitting "communications on behalf of an employer."

Since we do not believe that it is the FCC's intent to shut down ARISS or prevent ham magazines from conducting equipment reviews, we have filed our own petition for rule making, seeking a broader clarification to the rule. Our proposal is to add the following to section 97.113:

(e) Communications on behalf of an employer may be transmitted on an occasional basis, provided that:

(Continued on page 114)

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

Zero bias – a CQ editorial

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

TAILTWISTER Rotator Specifications	
Wind load capacity (inside tower)	20 square feet
Wind Load (w/ mast adapter)	**10 square feet**
Turning Power	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.**

CD-45II

CD-45II
$449.95

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

CD-45II Rotator Specifications	
Wind load capacity (inside tower)	8.5 square feet
Wind Load (w/ mast adapter)	**5.0 square feet**
Turning Power	600 in.-lbs.
Brake Power	**800 in.-lbs.**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/48 ball brings**
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
$1099.95
with DCU-1

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

ROTATOR OPTIONS

MSHD, $109.95. Heavy duty mast support for T2X, HAM-IV and HAM-V.
MSLD, $49.95. Light duty mast support for CD-45II and AR-40.
TSP-1, $34.95. Lower spacer plate for HAM-IV and HAM-V.

AR-40

AR-40
$349.95

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

AR-40 Rotator Specifications	
Wind load capacity (inside tower)	3.0 square feet
Wind Load (w/ mast adapter)	**1.5 square feet**
Turning Power	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

HDR-300A
$1499.95

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

HDR-300A Rotator Specifications	
Wind load capacity (inside tower)	25 square feet
Wind Load (w/ mast adapter)	**not applicable**
Turning Power	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.**

Digital Automatic Controller

DCU-1
$749.95

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.

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AR-35
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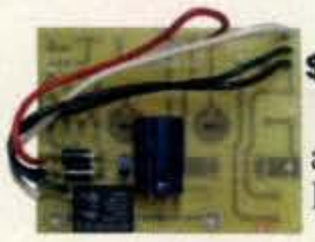

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announcements

• These Special Event stations are scheduled for Feb.:

W3C, from Pennsylvania Sportsmen Show, Washington Amateur Communications, Washington, PA; 1900–1900Z Feb. 1 Feb. 8, on 21.285, 14.280, 7.260 MHz. QSL via Ed Oelschlager, 60 Carl Ave. B2, Eighty Four, PA 15330. <wa3com @gmail.com> or <http://www.wacomarc.org/>

W7G, from commemoration of George Washington's birthday, George, Washington State; 2200Z Feb. 19 through 2359Z Feb. 22 on 14.250, 18.135, 7.225, 3.880 MHz. QSL via W7BJN.

W7Z, from the Third Annual Snowbird Field Day, Mesa, Arizona; Sunlife/Venture Out ARCs; 1600–2200Z Feb. 24 on 21.225, 18.125, 14.325, 7.125. QSL via Paulette Thompson, c/o Venture Out ARA, 5001 E. Main St. #1368, Mesa, AZ 85205.

K8BF, from 5th Annual Freeze Your Acorns Off QRP Special Event, Kent, Ohio; Portage County ARS; 1500–2300Z Feb. 27 in the General areas of 15, 20, 40, and 80 meters CW and SSB, plus EchoLink through the KC8RKV EchoLink node. For 8 × 10 certificate send QSL annd SASE to Al Atkins, KB8VJL, 12433 Chamberlain Rd., Aurora, OH 44202.

W9BSP/W9UA, from 1930s W9UA Transmitter built by M. H. Ensor, W9BSP; Kansas City, Kansas; Marshall Ensor Memorial Organization; 0100–0500Z Feb. 21 on CW 1.896 MHz, alternate 1.9045 MHz. For QSL send QSL and SASE to Marshall Ensor Memorial Organization, c/o Joe Krout, WØPWJ, 514 N. 83rd Place, Kansas City, KS 66112; on the web <www.ensorparkandmuseum.org>.

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

Feb. 6, **Charleston Hamfest & ARRL SC State Convention**, Exchange Park Fairground, Ladson, South Carolina. Contact Jenny Myers, e-mail: <brycemyers@aol.com>, 843-747-2324; (Talk-in 146.790–, 145.250–, 147.045+ PL103.5; exams 1 PM)

Feb. 13, **St. Cloud ARC Cabin Fever Reliever Hamfest**, National Guard Armory, St. Cloud, Minnesota. Details at <w0sv.org>. (Exams)

Feb. 19, **New Providence ARC Auction**, New Providence Munnicipal Building, New Providence, New Jersey. Contact James Kern, KB2FCV, e-mail: <james1787@aol.com>, phone 908-2199-4016, <www.nparc.org>. (Sellers 5:30 PM, buyers 6:30 PM, auction starts 7 PM; Talk-in 147.255 [141.3 Hz])

Feb. 27, **20th Annual Central Dakota ARC Hamfest**, St. Mary's Grade School gym, Bismarck, North Dakota. Contact Dick Veal, KAØETO, e-mail: <georgerv@bis.midco.net>, phone 701-223-7481. (Exams)

Feb. 27, **HAM-CON**, Hampton Inn Convention Center, Colchester, Vermont. Conntact W1SJ, e-mail: <w1sj@arrl.net>, phone 802-879-6589; <http:/www.ranv.org>. (Talk-in 145.15, 146.67; exams)

Ham Radio News *(from page 2)*

Another Satellite Returns from the Dead

If you've been following ham radio news over the past several years, you may be aware of OSCAR-7, the long-dead amateur satellite that mysteriously returned to the air and has been operating ever since. Now, OSCAR-11 (UO-11), which had gone silent just before its 25th anniversary in orbit last year, has come back on the air as well, the AMSAT News Service (ANS) reports. It appears that its batteries can no longer hold a charge but everything else works as long as the solar panels are receiving enough sunlight. More information is available at <www.users.zetnet.co.uk/clivew>.

Meanwhile, UO-11's designer, University of Surrey (England) Professor Sir Martin Sweeting, G3YJO, has been awarded the Faraday Medal by the U.K.'s Institute of Engineering and Technology for his development of small satellites, of which UO-11 was the second. It was designed, built, and launched in a six-month period a quarter century ago. According to ANS, Sweeting was scheduled to deliver the 2010 Appleton Lecture, titled "Small Satellites—Big Future," at IET's London headquarters in mid-January.

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6 antennas to one feedline. Need a simple remote antenna switch to go out on the tower or be placed into a matrix of your antenna system? This may be the answer you're looking for. High power, using the proven, reliable relays that we have been using for years. Very ruggedly built.

SixPak 6X2 RF Matrix Antenna Switch

The SixPak is designed to switch 6 antennas to radios. It can be mounted inside the shack or outside up on the tower. Electro-mechanical fail-safe interlocking ensures that neither radio can feed power into the other.

TenPak Shack-LAN 2x10 Matrix Antenna Switch

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• D-STAR & GPS upgradeable 2M/70CM • 50/15/5W RF output levels • RX: 118-173.995, 375-549.995, 810-999.99 MHz** • Analog/digital voice with GPS (optional UT-123) • 500 alphanumeric memories

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IC-7600 All Mode Transceiver

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IC-7700 Transceiver. The Contester's Rig

• HF + 6m operation • +40dBm ultra high intercept point • IF DSP, user defined filters • 200W output power full duty cycle • Digital voice recorder

D-STAR UPGRADEABLE

IC-2200H 2M Mobile Transceiver

• 65W Output • Optional D-STAR format digital operation & NEMA compatible GPS interface • CTCSS/DTCS encode/decode w/tone scan • 207 alphanumeric memories • Weather alert

D-STAR READY

IC-92AD Analog + Digital Dual Bander

• 2M/70CM @ 5W • Wide-band RX 495 kHz - 999.9 MHz** • 1304 alphanumeric memories • Dualwatch capability • IPX7 Submersible*** • Optional GPS speaker Mic HM-175GPS

IC-746PRO All Mode 160M-2M

• 160-2M* @ 100W • 32 bit IF-DSP+ 24 bit AD/DA converter • Selectable IF filter shapes for SSB & CW • Enhanced Rx performance

IC-7200 HF Transceiver

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IC-880H 3rd Generation D-STAR Dual Bander

• D-STAR DV mode operation • DR (D-STAR repeator) mode • Free software download • GPS A mode for easy D-PRS operation • One touch reply button (DV mode) • Wideband receiver

IC-V80 2M Handheld Transceiver New!

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D-STAR READY

IC-80AD 3G D-STAR Dual Bander

• D-STAR DV mode operation • DR (D-STAR repeater) mode • Free software download • GPS A mode for easy D-PRS operation

D-STAR UPGRADEABLE

IC-V82 2M Transceiver

2M @ 7W • CTCSS/DTCS encode/decode w/tone scan • Also available in a sport version and a 70CM version (IC-U82)

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Our annual market survey looks this year at VHF/UHF FM mobile rigs for use in your car or at home. Contributing Editor WB6NOA reports that overall, prices have remained steady while features and power levels have both increased.

VHF/UHF FM Mobile Transceivers

BY GORDON WEST,* WB6NOA

Every February, *CQ* features the *CQ* Market Survey. Last year, we presented an in-depth review of VHF/UHF handheld transceivers. Two years ago, our market survey covered high-frequency (HF) base and mobile stations. This year, we explore several new VHF/UHF mobile transceivers, plus review some current VHF/UHF mobile radio upgrades.

Alinco stays steady with its existing line of five individual transceivers. ICOM America offers six transceivers, two of which have been dramatically upgraded. A new manufacturer joins us this year, Jetstream, with a 50-watt, 222-MHz mobile. Also, Kenwood presents three VHF/UHF transceivers, two major upgrades to its line, and an APRS head display.

Yaesu adds two fresh transceivers to its product line, fine-tunes two others, and brings in three new upgrades, totaling seven VHF/UHF mobiles! "We listen to our customers, and continuously apply their suggestions and technical recommendations to our mobile FM product line," comments Dennis Motschenbacher, K7BV, Yaesu's Executive Vice President of Amateur Radio Sales and Marketing. "Our off-road hams wanted more power output, louder audio, with that same big, bold LCD display, so we upgraded three models that are range and rough-road tested tough." Yaesu also brought in a brand-new dual-band mobile with full APRS capability and a GPS input.

"Kenwood continues to refine the deluxe dual-band market with the TM-D710A," says Phil Parton, N4DRO, National Sales Manager for Kenwood, pointing out the Kenwood TM-D710A's advantage of having more than just APRS, but EchoLink and Winlink compatibility as well, all in one radio!

ICOM's Ray Novak, N9JA, Amateur Radio Division Manager, is all smiles about the repeated D-STAR success stories, not just here in the USA, but around the world. "D-STAR has been a real success story as we see more systems go on the air," notes Ray, "and to support this growth, this year ICOM leads the way with the latest D-STAR offerings with complementary radios! While the goal was a more economical solution for D-STAR, the IC-80AD and ID-880H do not cut corners on features. The IC-80AD is a 2m/70cm portable with an optional GPS speaker microphone, while the ID-880H is a compact 2m/70cm sporting a remoteable front panel with a magnetic mounting system similar to that of the IC-2820H. In addition to these radios being available for under $500, the programming software is common to both radios and is a free download from the ICOM site!"

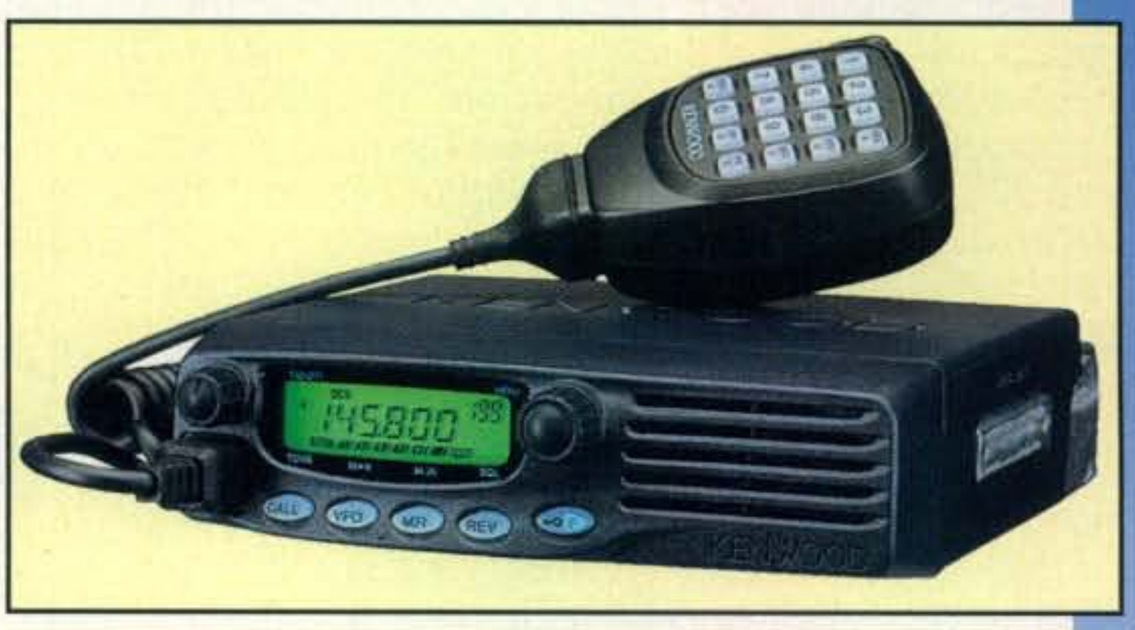
Jetstream antennas, and now its 222 MHz FM transceiver, are represented by Evelyn Garrison, WS7A, who has been involved with the ham radio industry for over 30 years. Alinco has a new USA representative, Ham Distributors, out of Conroe, Texas, and continues to show up at hamfests with Eric Lowry, the Alinco Sales Manager, waving the flag. Of course, MFJ continues to dazzle the ham radio marketplace with a new product every couple of weeks, and a nearly annual purchasing of a major ham radio product company!

How Shall We Call 'Em?

Before we look at individual VHF/UHF FM radios, let's get our terminology straight. All the possibilities may need some explaining.

Single Band: This is a mobile FM radio that transmits and receives on a single ham band. While the receiver may encompass a lot more than just the ham single band, we call it a single-band transceiver because it transmits on just one ham band.

Two Band: This equipment will transmit and receive on two different ham bands, but the display and reception only give you one band at a time. For new hams, this is a great way to go. There is no mistaking which



Kenwood's TM-271A is a workhorse 2-meter rig, pumping out 60 watts for added coverage in repeater fringe areas. (Photos courtesy of respective manufacturers unless otherwise noted.)

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

band you are listening to and which band you are transmitting on! Likely, this gear will also *receive* well beyond the normal ham bands.

Dual Band: Here begins the confusion. A dual-band radio will display two different ham bands and give you simultaneous reception on both. Many dual-banders may also give you simultaneous receive on two frequencies on the same band as well. To qualify in our buyers' guide as a true dual-bander, it must play and display two bands simultaneously.

Tri-Band and Quad Band: Gone are the ICOM and Kenwood tribanders, so only Yaesu qualifies with its new FTM-350R and its quad-band FT-8900. You get either three or four possible bands, respectively, but only a dual-band display.

Digital: ICOM America has pioneered the D-STAR open protocol for digital equipment and repeaters. ICOM is our digital voice and data internet leader. While other equipment may offer a digital board for digital voice, packet, or APRS, that is much different from the true ICOM digital communications system.

APRS: This is the Automatic Position Reporting System®. Many mobiles can take an APRS input from an external accessory terminal node controller (some now small enough to build in), but only Kenwood for the last couple of years and now Yaesu have a built-in TNC and the capability for a full on-screen APRS display. Check the specification listing on capabilities of a simple APRS encode upgrade. So far, only Kenwood offers bi-directional APRS mapping without the need for a laptop computer.

OK, got the terminology down pat? Let's look at prices, bands, and features. The good news is prices remain nearly the same as three years ago!

Single Band

The lowest priced mobile is the Yaesu FT-1900R, an upgrade of the original FT-1802M. "We increased the power output from 50 watts to 55 watts without the need of a cooling fan," comments Dennis at Yaesu. "We also increased audio output to 3 watts, a request from off-road users." It has a backlit mic, 200 memory channels, and that big, bold amber LCD for excellent visibility. If ever we all go narrow band, a menu selects narrow-band deviation. "Street price" for the 1900 is $134.

Kenwood comes in at $139 with its TM-271A, 60 watts out, 200 memory channels, automatic repeater offset, and built to mil-spec 810C/D/E/F standards which its land-mobile equipment must meet. Actually, I think this radio is from its land-mobile division! You can download the free memory control program, too. This radio is also menu selectable for wide- and narrow-band FM.

For just under $150, the 2-meter single-band Yaesu FT-2900R upgrades the FT-2800R, and offers 75 watts of power output, no cooling fan needed! If you need an extra 10 watts, that extra $20 gives you the most powerful 2-meter single-band transceiver on the market.

Also at $150 is the ICOM 2200H, with its selectable green or amber display. This radio has the option to work ICOM D-STAR digital modulation and data communication at 4.8 kbps. Just add the D-STAR board. When connected to an external GPS receiver, position information may be exchanged with other ICOM D-STAR stations. The microphone is backlit, and this single-bander requires only the UT-118 digital unit to work it into D-STAR.

Alinco comes in at $179 with the DR-135T MkII, a 50-watt single bander for 2 meters, and for a few more dollars, a 222-MHz mobile (the DR-235T MkIII), a 6-meter FM mobile (DR-06T), and the DR-435T MkIII single-bander for the 440 FM mobile market. All of these Alinco single-banders can take an optional internal board for packet and APRS, and even a digital board that allows Alinco users to transmit an open protocol, proprietary digital voice communications, too, although *not* compatible with ICOM D-STAR. Each features 100 memory channels and good, solid Alinco construction.

MFJ has a 2-meter packet-only transceiver, the MFJ-8621, built exclusively for data rates from 1200 to 9600 baud, right out of the box, continuous 24-hour duty, 5 watts, and ultra-fast pin diode switching between transmit and receive. It sells for about $179. There is also a companion data transceiver for 1.25 centimeters, crystalled for 223.70 MHz. It's in the

The Alinco DR-06 is one of the few 6-meter FM rigs on the market today. Alinco also has single-banders for 2 meters, 222 MHz, and 70 centimeters.

The MFJ-8621 is a data-only transceiver for 2 meters, great for a dedicated APRS station or for getting you into the resurgence of packet in emergency communications.

The JT-220 from Jetstream is a new rig from a new manufacturer in the ham transceiver market. It's a single-bander for 222 MHz.

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same price category. Plus, if you are into kits, MFJ has a 5-watt, 2-meter *transmitter* kit for both voice and data (the Vectronics VEC-1202), for under $99. Experts only, as the kit is difficult. However, best of all, MFJ brainstorms hundreds, if not thousands, of accessories to make your VHF and UHF single-bander play!

At $250, the new 50-watt, 222-MHz JT-220 mobile from Jetstream offers 99 memory channels, is computer programmable with free software, and has an LCD screen so bold and bright you'll need to wear dark glasses at night. (I am told they now have an improved dimmer for this great daylight viewing display!)

Rounding out our single-banders is the under $1000 ID-1, 1200-MHz D-STAR transceiver from ICOM. It can exchange various data files such as graphics and images at a whopping 128 kbps, taking advantage of the wide bandwidth available on 1200 MHz. You could even access the internet, e-mail, text messages, and multimedia messages up on 1.2 GHz with this equipment. The ID-1 can transfer data with another ID-1 without the use of a repeater, and controller software is supplied with the ID-1 when it is connected to a PC via a USB cable. And if you have 1.2-GHz analog repeaters in your area, the ID-1 also operates in analog mode.

Two-Band Tranceivers

One band at a time, but two bands in one nice neat box! Around $260, Yaesu offers the FT-7900R, 50 watts out on VHF, and 45 watts on UHF, with 1000 memory channels. This unit will also receive the aircraft band and all the way up to 520 MHz, plus military 700 MHz through 999 MHz. The front panel may be remoted, too. The best part of this equipment is less confusion than with a dual-bander as to which band is calling you!

At $289, ICOM America offers the two-band IC-208H, 55 watts output on VHF and 50 watts output on UHF, along with a wideband receiver for aviation, marine, weather, and legacy public safety communications. Yes, the front panel is detachable, and 500 memory channels hold alphanumerics, too. One band at a time, so you always know which band is active.

New from Yaesu, especially for you motorcycle enthusiasts, is its $310 two-band FTM-10R with a submersible remote head, so on your motorcycle or in my open dune buggy, rain or snow won't ruin the IPS-7 rated submersible

The new FTM-10R from Yaesu is a two-band radio (one band at a time showing on the display) for 2 meters and 440 MHz, designed especially for use on motorcycles or other open-cab vehicles.

FM Mobile Transceivers – 1

	Alinco DR-235T	Alinco DR-435T	Alinco DR135T MKII	Alinco DR-06	Alinco DR-635T	ICOM IC-208H	ICOM IC-2200H	ICOM ID-1	ICOM ID-880H	ICOM V8000	ICOM IC-2820H	Jetstream JT-220	Kenwood TM-V71A	Kenwood TM-D710A	Kenwood TM-271A
No. of Bands	single	single	single	single	dual	2	single	single	2	single	dual	single	dual	dual	single
Freq. Coverage	220	450	2m	6m	2m/440	2m440	2m	1.2GHz	2m/440	2m	2m/440	1.25/6m	2m/440	2m/440	2m
6 m	—	—	—	TX/RX*	88-108RX	—	—	—	No	—	—	TX/RX	—	—	—
Air	—	—	RX	—	RX	RX	—	—	RX	No	RX	—	Yes	RX	No
2m	—	—	TX/RX	—	TX/RX	TX/RX	TX/RX	—	TX/RX	TX/RX	TX/RX	—	TX/RX	TX/RX	TX/RX
148–174 MHz	—	—	RX	—	RX	RX	RX	—	RX	136+WX alert	Yes+WX alrt	—	RX	RX	Yes
220 MHz	TX/RX	—	—	—	—	—	—	—	RX	No	RX	TX/RX	RX	RX	No
440 MHz	—	TX/RX	—	—	TX/RX	TX/RX	—	—	TX/RX	No	TX/RX	—	TX/RX	TX/RX	No
450–470 MHz	—	RX	—	—	335-470	RX	—	—	RX	No	RX	—	RX	RX	No
800–900 MHz	—	—	—	—	—	RX	—	—	—	No	RX	—	RX	RX	No
1270 cm		—	—	—	—	—	—	TX/RX,ana/dig	—	No	No	—	RX	RX	No
Power Out		35	35	50	50V/35U	50V/45U	65	10	55V/50U	75	50V/50U	50	50V/50U	50V50U	60
Display Bands	1	1	1	1	2	1	1	1	1	1	2	1	2	2	1
Memories	100	100	100	100	200	500	207	105	500	200	800	99	1000	1000	200
Alphanumeric	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LCD Color	red	red	amber/red	amber	three	both†	two	computer	amber	both†	both†	blue	two	two	green
Remote Head	No	No	No	No	opt	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	No
Band Scope	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	Yes	No
CTCSS															
encode	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
decode	Yes	Yes	Yes	opt	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DCS	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Auto Repeater Shift	No	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Attenuator	No	No	No	No	Yes	variable	Yes	Yes	Yes	variable	variable	noise	Yes	Yes	No
DTMF Memories	10	10	10	—	10	16	24	—	16	8	14	8	10	10	12
Mic Direct Freq. Input	Yes	Yes	No	No	Yes	Yes	Yes	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Backlit Mic Keypad	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Packet Compatible	DB9,1200/9600	1200/9600	DB9,1200/9600	No	1200/9600	1200/9600	D Star	Yes	D Star	1200	1200/9600	opt	EchoLink	1200/9600	No
APRS Ready	opt	opt	opt	No	opt	No	D Star	—	D Star	No	No	No	opt	Full	No
Software Programming	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cloning	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Crossband Repeat	—	n/a	n/a	n/a	Yes	No	—	—	No	No	Yes	—	Yes	Full	—
Dual In-Band RX	—	n/a	n/a	n/a	Yes	No	—	—	No	No	Yes	—	Yes	All	—
Built-in Duplexer	—	—	—	—	Yes	Yes	—	—	Yes	—	Yes	—	Yes	Yes	—
Size	small	small	small	medium	medium	small	small	medium	compact	small	small	medium	medium	medium	medium
Weight (lbs.)	2	2	2	2	3	3	2	2	3	2	3	2	3	3	2.2
Lowest "Street" $$ Seen	$249	$259	$179	$259	$379	$289	$149	$929	$499	$199	$569	$249	$359	$539	$139

* RX 47-60MHz

† Amber & Green

(Continued on p. 22)

ICOM's two-band ID-880H will let you operate both standard analog and digital D-STAR repeaters on 144 and 440 MHz. D-STAR capability is standard, right out of the box.

50-watt transceiver. The display is a blue, trans-reflective LCD, just as visible in direct sunlight as it is at night. A unique pivoting head allows for nearly any type of installation, if you plan to run the head directly on the equipment. However, I really see its calling for motorcycle operation, including hands-free operation, external stereo audio output, intercom function between driver and passenger, Bluetooth-ready, and plenty of accessories for the headset. You could also have the lower power version for those planning bicycle-mobile to the extreme! Look up this one and see all that the FTM-10R can do for those of you on two wheels. AM radio, FM radio, air band, ham—it has the works!

Rounding out our two-banders, you can operate D-STAR with the $500 ID-880H from ICOM America. It comes D-STAR ready, out of the box! The head separates and can display green, yellow, or amber backlighting. Its 50 watts out on both VHF and UHF, and cloning software, can allow you to join a D-STAR system in minutes. It has a total of a thousand-plus memory channels with eight-character channel names. You could even add a NMEA 8183 output and operate as a position sender and receiver, independent of normal APRS comms. Again, with this $500 mobile, it *is* digital and analog ready for *any* ICOM system.

Dual Band, Twin Readouts

At $359, Kenwood offers the TM-V71A, an EchoLink-ready radio for SYSOP-mode operation. Connect to your PC via the optional cable kit, and you are now ready for EchoLink. It includes dual readouts, detachable head, and a large dual color amber or green 13-segment LCD. But here's the interesting thing: Kenwood has the RC-D710 which upgrades the TM-V71A to a D710A. Just remove the V71 faceplate and replace it with the RC-D710. If you have an older Kenwood product with a TNC jack, get the PG5J interface kit, and the RC-D710 will function as an external TNC with display and APRS firmware.

For a couple of hundred dollars more, you can step into the new Kenwood D-710A, which replaces the D-700. It has a huge display! The major-size D-710A display ties into AvMap G-5 mapping, and can serve as an auxiliary wireless control point for the now-legal Kenwood Sky Command HF base capability. Now you can drive around town with your dual-band TM-D710, turn on your home Kenwood TS-2000, and dial in to 20 meters or any HF band.

The Kenwood APRS equipment, along with the AvMap G-5 receiver, requires no computer to give you on-screen, full-color USA maps, all the way down to dirt-road levels. Best of

Kenwood's new TM-D710A is not only a true dual-bander (two simultaneous frequency displays) for 2 meters and 70 centimeters, but comes APRS-ready and can team with the AVMap G5 receiver to give you full mapping on the big display screen. Plus, it can be used to remotely operate a Kenwood TS-2000 HF rig via the company's Sky Command system.

Alinco's dual-band entry is the DR-635, which offers your choice of three colors on the display and a remoteable head.

all, you can spot other APRS stations around you, right on the AvMap color screen, with the new TM-D710's ability to lead you to any station you target on your equipment!

At $375, Alinco presents the DR-635 dual-band VHF/UHF transceiver with 200 memory channels and 50 watts VHF/35 watts UHF. A large, six-character alphanumeric display may be illuminated blue, violet, or amber. The head may be remoted, and if you want the FM music band, this has it, too, as well as 1200- and 9600-bps packet operation with an optional Alinco board.

Over at Yaesu, its dual-bander is the current model FT-8800, seen selling for under $400. This is an intentionally small-size transceiver, with small knobs and buttons. However, it offers 50 watts on high power and over 1000 memory channels. It has been in the line for many years and is considered a workhorse. Also, if you absolutely have to have four bands, with two showing at the same time, *only* Yaesu offers 10 meters, 6 meters, 2 meters, and 70 cm—all FM—in one radio with the FT-8900R. It has 50 watts out, more than 800 memory channels, crossband repeat, and remote-head capability. But best of all, you have four FM bands all in one nice, neat small unit. It also sells for under $400.

The ICOM D-STAR capable, dual-band, top-of-the-line transceiver is the IC-2820H. While it may have some her-

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COMET **CP-5M** SO-239 / PL-259
COMET **CP-5NMO** NMO / PL-259
Footprint: 3.4" x 1.25"
Max Antenna: 60"

For Tall or Multi-band HF Antennas

MODEL / ANT CONN / COAX CONN

COMET **HD-5M** SO-239 / PL-259
COMET **HD- 5 3/8-24** 3/8-24 / PL-259
Footprint: 3.75" x 1.1"
Max antenna: 80"

COMET **BNC-24** **DUAL-BAND 2M/70CM HT ANTENNA** RX range: 100-1200MHz
• Gain: 2.15/3.5dBi • Length: 17" • Conn: BNC Super flexible featherweight whip

COMET **SMA-24** **DUAL-BAND 2M/70CM HT ANTENNA** RX range: 100-1200MHz
• Gain: 2.15/3.5dBi • Length: 17" • Conn: SMA Super flexible featherweight whip

COMET **SMA-503** **DUAL-BAND 2M/70CM HT ANTENNA** RX range: 100-1200MHz
• Length: 8.75" • Conn: SMA

Maldol **MH-209** *(BNC Conn)* **MH-209SMA** *(SMA Conn)* **2M/70CM DUAL-BAND HT ANTENNAS**
3" length, soft rubber cover. Good performance in a small package!

COMET **NEW! CSB750A** **DUAL-BAND 2M/440MHZ W/FOLD-OVER**
Gain & Wave: 146MHz 3.6dBi 1/2 wave, 446MHz 6.1dBi, 5/8 wave x 2 • VSWR: 1.5:1 or less • Length: 42"
• Conn: PL-259 • Max Pwr: 150W

COMET **NEW! CSB770A** **DUAL-BAND 2M/440MHZ W/FOLD-OVER**
Gain & Wave: 146MHz 4.4dBi 5/8 wave center load, 446MHz 6.9dBi 5/8 wave x 2 center load • VSWR: 1.5:1 or less • Length: 51" • Conn: PL-259 • Max Pwr: 150W

COMET **NEW! CSB790A** **DUAL-BAND 2M/440MHZ W/FOLD-OVER**
Gain & Wave: 146MHz 5.1dBi 7/8 wave center load, 446MHz 7.7dBi 5/8 wave x 3 center load • VSWR: 1.5:1 or less • Length: 62" • Conn: PL-259 • Max Pwr: 150W

Maldol **AX-50** **DUAL-BAND 2M/440MHz**
Gain & Wave: 2M 1/4 wave • 70cm 5.0dBi 9/8 wave • Length: 21" • Conn: PL-259 • Max Power: 60W

Maldol **AX-75** **DUAL-BAND 2M/440MHz W/FOLD-OVER**
Gain & Wave: 2M 1/2 wave center load 3.2dBi • 70cm 5/8 wave x 2 5.7dBi • Length: 30" • Conn: PL-259 • Max

Maldol **AX-95** **DUAL-BAND 2M/440MHz W/FOLD-OVER**
Gain & Wave: 2M 1/2 wave center load 3.3dBi • 70cm 5/8 wave x 2 5.8dBi • Length: 38" • Conn: PL-259 • Max

COMET **B-10 / B-10NMO** **DUAL-BAND 2M/440MHz**
Gain & Wave: 146MHz 0dBi 1/4 wave • 446MHz 2.15dBi 1/2 wave • Length: 12"
• Conn: B-10 PL-259 ,B-10NMO - NMO style • Max Pwr: 50W

COMET **SBB-2 / SBB-2NMO** **DUAL-BAND 2M/440MHz**
Gain & Wave: 146MHz 2.15dBi 1/4 wave • 446MHz 3.8dBi 5/8 wave center load • VSWR: 1.5:1 or less • Length
• Conn: SBB-2 PL-259 • SBB-2NMO NMO style • Max Pwr: 60W

Maldol **EX-107RB / EX-107RBNMO** **DUAL-BAND 2M/440MHz**
Gain & Wave: 146MHz 2.6dBi 1/2 wave • 446MHz 4.9dBi 5/8 wave x 2 • VSWR: 1.5:1 or less • Length:29"
• Conn: EX-107RB PL-259 • EX-107RBNMO NMO style • Max Pwr: 100W

COMET **SBB-5 / SBB-5NMO** **DUAL-BAND 2M/440MHz W/FOLD-OVER**
Gain and wave: 146MHz 3dBi 1/2 wave • 446MHz 5.5dBi 5/8 wave x 2 • Length: 39"
• Conn: SBB-5 PL-259, SBB-5NMO - NMO style • Max Pwr: 120W

COMET **SBB-7 / SBB-7NMO** **DUAL-BAND 2M/440MHz W/FOLD-OVER**
Gain & Wave: 146MHz 4.5dBi 6/8 wave • 446MHz 7.2dBi 5/8 wave x 3 • Length: 58"
• Conn: SBB-7 PL-259, SBB-7NMO - NMO style • Max Pwr: 70W

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ICOM's top-of-the-line dual-bander is the IC-2820H, which not only offers a huge frequency display and built-in D-STAR capability, but built-in diversity receive if you' have two antennas and set both VFOs to the same frequency!

The brand-new FTM-350R from Yaesu is a tri-bander, operating on 2 meters, 222 MHz, and 70 centimeters (only two frequencies at a time on the display). Plus, it's APRS-ready and compatible with an outboard GPS receiver.

itage to the former IC 2720, the IC 2820H incorporates an ultra selective intermod-free VHF/UHF receiver, giving you sparkling FM on 2 meters and the entire 440-MHz band. The receiver tunes 118 through 550 MHz, and 810 MHz through 999 MHz, and both bands display on an absolutely *huge* green to amber variable color panel. Sure, the head easily remotes, too. You can monitor two separate frequencies within the same band as well, with a twist: If you have two separate antennas, dial in the same frequency on both sides of the display, and a unique diversity receive ability allows the receivers to compare signal strengths from each antenna and choose the better signal to maintain good sound and receive quality. This is handy in a downtown area where multipath may sometimes scramble the polarization of an incoming signal. The 2820 features 50 watts out on both 2 meters and 70 cm, and 522 memory channels, along with a band-scope function that allows you to see who is transmitting above and below your chosen frequency.

Now, here's the great part: the optional ICOM UT-123 can be plugged in to provide D-STAR data and digital voice transmissions. The UT-123 also includes a powerful GPS receiver and antenna unit, so you don't need to fiddle with an external GPS receiver; it's all in the ICOM plug-in board. The GPS alarm alerts you by beeping when a preprogrammed point is within 500 meters or 1 kilometer of your location, or when any one of the preprogrammed points is within a preset square range. Of course, full mapping is achieved by adding your laptop.

The radio sells for under $570, and you add a couple hundred bucks when you add the digital/GPS UT-123 D-STAR board, and maybe the data communication cable that goes between the ICOM 2820H and your laptop running your favorite mapping program. This is one of my favorites to explore some of the DX capabilities on D-STAR.

Digital and APRS

For digital D-STAR, it's the ID 880H and the 2820 and 2200 from ICOM America! Check them out on ICOM's website.

For APRS, Kenwood, with its V71 and TM-D710, is the undisputed leader, but competition is just around the corner...

The just-announced Yaesu FTM-350R is a true 50-watt, three-band FM transceiver—2 meters, 222 MHz, and 440 MHz—with two bands showing at the same time. Now added is APRS, where all *you* need to add (as with Kenwood) is a GPS input to the equipment. The large screen will show

Red Radios from China?

A bright-red VHF handheld, along with a bright-red two-band mobile? I had to do a double take. Last time I saw a non-black transceiver was a clear-case handheld.

However, these bright-red ham radios didn't carry any of our traditional industry-recognizable names. They looked like imitations of the real thing and were imported directly from China or ordered through the internet.

These Chinese handhelds, seen selling around $60, are beginning to flood the internet with little promise of ever getting them fixed when they go bad. "Throw it away and buy a new one" seems to be the most common response.

Now, though, we see no-name, two-band mobile radios on the internet coming in at a price that looks tempting. Be careful, as some of these mobiles and handhelds come programmed wide open, and with an offset that could put you well out of band and into deep trouble if tracked down by the FCC. The instruction manual may not read in clear English, and you likely won't receive the heavy-duty construction you would in a regular-issue mobile ham set.

The amateur radio industry has always resisted forming an alliance of manufacturers to deal with these matters. The FCC is likely too understaffed to look at every incoming shipment for proper certification, or whether these cheap imports are locked down to specific radio bands or wide open to transmit anywhere. (One model is FCC-certified for Part 90 land-mobile use, but not for Part 97 amateur bands. Be careful!)

Let's keep our ham service clean of imposter radios, and help support the manufacturers mentioned in my article, which spend hundreds of thousands of dollars supporting the Amateur Radio Service. Stay with those manufacturers that you recognize in print, see at the various ham radio conventions, read about in magazine ads, and where you can actually place a phone call for technical support when you need some assistance in coming up on the air with new gear. If you really want a red radio, get out the spray paint. Stick with ones you know, and let's hope the wide distribution of these knock-off radios won't be purchased by hunters and fishermen, ending up in the middle of the 2-meter or the 70-cm band. Worse yet, some of this imported gear comes with scramblers, and this feature alone is illegal and against all that ham radio *is*.

Support our industry which supports all of us as amateur radio operators.

ALPHA AMPLIFIERS

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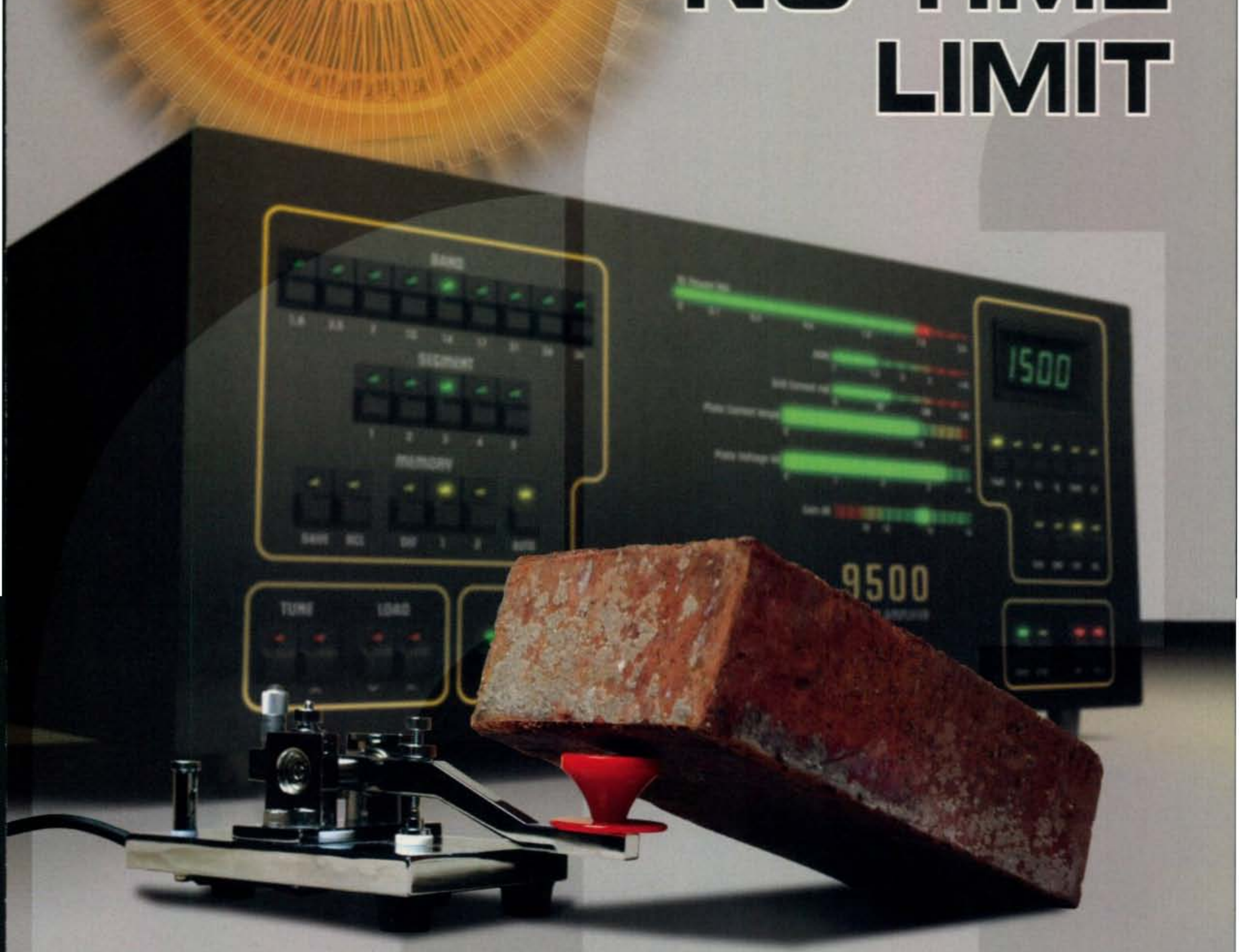

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APRS information and functions, such as receiving weather from other APRS weather stations, exchanging messages, and seeing directions to the other station (sorry, no maps). The large display control head separates and offers wide-band reception, including the AM broadcast band, stereo FM band, plus everything from 108 MHz on up. Yaesu also has an FRP-1 monitor unit which will receive your transmission out to about 1000 feet, allowing others to listen in on your every word.

There are 500 independent memory channels with the new Yaesu GPS/ APRS equipment, likely using the same GPS engine as in its new APRS handheld speaker microphone. We haven't seen the price on this new Yaesu product yet, but it likely will be close to what the Kenwood D-710 is, plus an extra $100 for the GPS input. Remember, Kenwood also requires GPS input from an external device, so with GPS running on both units, price will be relatively close, around $600–$700.

Summary

Give this gear a test drive down at your local dealer before you decide if it is the right mobile radio for you. Each radio has its own "feel" for volume and squelch, for programming, volume output, and a large or small display. You need to see it "live" to best understand how it operates, and if it's going to be the right mobile unit for *you*. For safety, the remote head up high on the dash keeps your attention out the windshield, not down at the floorboard. If you mount a mobile unit low, you create a safety hazard when you are glancing down at the display.

FM Mobile Transceivers – 2

	MFJ	Yaesu	Yaesu	Yaesu	Yaesu	Yaesu	Yaesu	Yaesu
	2 models (data only)	FTM-10R	FT-1900R	FT-2900R	FT-7900R	FT-8800R	FT-8900R	FTM-350R
No. of Bands	single	2	single	single	2	dual	quad	tri/dual
Freq. Coverage	—	2m/440	2m	2m	2m/440	2m/440	29/50/2m/440	2m/222/440
6 m	—	—	—	—	—	—	TX/RX	No
Air	—	Yes	No	No	RX	RX	RX	Yes
2m	Mod 8621	TX/RX	TX/RX	TX/RX	TX/RX	TX/RX	TX/RX	TX/RX
148–174 MHz	—	RX	RX	RX+WX alrt	RX+WX alrt	RX	RX	RX
220 MHz	Mod 8631	RX	WX Alert	—	RX	RX	—	RX
440 MHz	—	TX/RX	—	—	TX/RX	TX/RX	TX/RXTX/RX	
450–470 MHz	—	RX	—	—	RX	RX	RX	RX
800–900 MHz	—	RX	—	—	RX	RX	RX	RX
1270 cm		—	—	—	No	No	No	RX
Power Out	5	50V/45U	55	75	50V/45U	50V/35U	50V/35U	50V/50U
Display Bands	1	1	1	1	1	2	2	2
Memories	0	1000	221	221	1000	1000	800	1000
Alphanumeric	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LCD Color	none	blue	amber	orange	orange**	orange**	orange**	8
Remote Head	No	Yes	No	No	Yes	Yes	Yes	Yes
Band Scope	No	No	No	No	No	No	No	Yes
CTCSS								
encode	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
decode	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DCS	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Auto Repeater Shift	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Attenuator	No	No	No	No	Yes	Yes	Yes	Yes
DTMF Memories	No	10	8	8	16	16	16	8
Mic Direct Freq. Input	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Backlit Mic Keypad	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Packet Compatible	1200/9600	1200/9600	1200/9600	1200/9600	1200/9600	1200/9600	1200/9600	full APRS
APRS Ready	opt	No	No	No	wires no	wires no	wires no	Yes
Software Programming	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cloning	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Crossband Repeat	No	—	—	n/a	No	Yes	Yes	Yes
Dual In-Band RX	—	—	—	n/a	No	Yes	Yes	Yes
Built-in Duplexer	No	Yes	—	—	Yes	Yes	Yes	Yes
Size	micro	tiny	small	small	medium	medium	medium	medium
Weight (lbs.)	1	1	1	3	2.2	2.2	2.2	2
Lowest "Street" $$ Seen	$179	$309	$139	$149	$259	$399	$394	TBA

* RX 47–60 MHz

† Amber & green

** Omni-glow orange

Don't even think about running this off the accessory receptacle. At 50 watts these radios pull far more continuous current than most accessory sockets could offer. You need to do some battery-direct wiring.

If you wear polarized glasses, see how the display looks in bright sunlight. Some polarized lenses enhance the display, yet others cause the display to look dark. Check it out before you buy.

Let your fingers do the twiddling. Are the knobs too big or too small? You really can't tell by just looking at the photos. You need to actually play with the equipment's buttons and knobs in order to better understand if you will enjoy operating the radios on the move.

If you plan to run the equipment in a convertible or a dune buggy or on a motorcycle, check the audio output. Is it loud enough?

One-hundred-plus memories has become the benchmark of new VHF/UHF mobile radios. Do members of your club have similar equipment, and will your group have cloning sessions?

Also, a little word of caution about alphanumerics: Know how to switch over to the actual frequency at the push of a button. If you are working an event and someone asks you to switch to 144.330 MHz, is it already in memory as an alpha channel but with a name different from "Gordo simplex"? If another station has you switch to 146.520, do you remember that your alpha may simply call it NTL SMPX? Know the frequencies for the many different alphas you may program. If someone asks you if the BOZO repeater encode tone is 79.5 or 103.5, can you quickly go there and see the frequency and tone readout?

How is your vision? Some of the LCD displays are relatively small because the radio is relatively small. Will the display be too small to see on the move? Will the LCD display dim dark enough for nighttime viewing? And again, can you see the LCD display with polarized dark glasses? The Yaesu FTM-10R trans-reflective display is great in sunlight as well as at night. All the manufacturers have gone back to conventional daylight-viewable LCD displays, and this is good.

Some gear allows for head separation. Others do not. Check this out on the spec sheet. I would hate for you to get your new rig home only to discover the head won't come off. And what a deal with the Kenwood TNC remote head! Good work to be able to add GPS to older model gear.

A band scope is useful but not absolutely necessary. Most band scopes mute the audio while they do their sweep thing, and this is a bit distracting. To me, I can get by without a band scope.

Here is something to look for—automatic repeater shift. With this feature you never need to figure out if it's a plus or minus offset.

A backlit microphone is handy. And how does the microphone feel? Heavy enough for you? Or do you want a lightweight one? Can the microphone be detached, and is there an accessory headset to comply with some of the new state laws? Check the accessories before you break out the checkbook!

A very useful feature is cross-band repeat. Most full dual-banders allow for this, and no longer is it a secret menu item. Cross-band repeat is functional, but you must select your frequencies carefully, always run low power, and never consider running cross-band repeat on a big base-station system. Stick with the band plan and make sure your cross-band repeat doesn't end up on an occupied frequency. Use it cautiously, infrequently, and always identify at each end of the radio circuit.

Finally, take advantage of all the software available for computer loading channels. You'll spend just seconds loading 100 channels, and hours doing it by hand!

Enjoy your new single-, two-, or dual-/multi-band mobile!

Results of the 2009 CQ WW VHF Contest

BY JOHN LINDHOLM,* W1XX

A two-band VHF contest such as the CQ WW VHF Contest always sits on the edge of a precipice of poor conditions. For many, if not most participants, the 2009 contest fell over the edge. What's a reporter to do when the contest he's reviewing was not up to par by most standards? For openers, he can focus on a few brief gems of brightness such as: "It was a fun contest even though it got off to a slow start on dead bands. But 6 meters opened up on Sunday, adding to the excitement." . . . *K4RW*. Or: "My first VHF contest in 45 years of hamming. What a thrill to work NP4A in Puerto Rico on Sunday morning." . . . *K8EG*. CQ VHF Contest stalwart, KG6IYN, can offer a U.S. West Coast positive outlook with: "Conditions this year from Mt. Los Pinos in east San Diego county were much like 2007 with short band openings on 6 meters to the Pacific Northwest and then on Sunday a relatively long run to Texas, Louisiana, and the Gulf region. This was followed by Qs with several rovers heading north into northern California and a rover duo heading back home to California from Las Vegas through several grid squares otherwise dead."

Perhaps the DX can offer some solace as well: "Some single-hop DX on 6 meters was welcomed." . . . *GØLGS*. Or: "My best new grid square was ZC4LI, country #77." . . . *SM6WET*. Meanwhile, GW8ZRE took advantage of the simultaneous RSGB backpackers contest in the U.K. Also combining activities were HA4BF, HA5CQZ, HA6VV, HA7UL, and OE1CWA, who took advantage of the Summits On The Air (SOTA) program to work the contest. More bright spots are highlighted in the "Scatter" comments. Thus, all things considered, it was far from a dreadful contest.

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e-mail: <w1xx@cq-amateur-radio.com>

Expanded CQ WW VHF Contest Results

For a listing of the ops and grids activated by the rover stations in the 2009 contest, plus the operators of the multi stations, go to <www.cq-amateur-radio.com>, to the Contests section, to "Expanded Results of the 2009 CQ WW VHF Contest."

As faithful followers of the CQ VHF WW Contest know, these results usually focus on the inane ramblings of the Contest Quahogs of Rhode Island (CQRI). They are a crotchety bunch. At the fall meeting at the local Grange hall, CQRI dismissed the usual aftermath discussion of the contest with a motion to table, which passed unanimously (with one abstention by the Old Timer). It was a sad commentary on the 2009 contest as perceived in Quahog-city. The saddest part is it leaves this reporter with no thread on which to proceed with this commentary.

The only solution to this predicament seems to be to resort to a *deus ex machina*—a sort of "Wag The Dog"—to redirect attention to an important contest subject, namely recruitment. So here goes.

Recruitment

To date, VHF contests have not attracted the same kind of numbers as do the CQ WW DX or ARRL Sweepstakes contests. There are significant numbers on HF. Not so on VHF, and even less so on UHF. The bottom of the sunspot cycle has seen record numbers of participants in HF contests. Even a solar flare will not wipe out an HF contest entirely. On VHF, lack of *E*-skip on 6 meters or tropo on 2 meters does have a significant effect on participation. What is the solution? Simple: more numbers. A greater number of stations active on VHF essentially can make their own conditions. This is more easily said than done, but let's explore a few ideas to increase our numbers.

The CQ WW VHF Contest has become very popular in the Ukraine. This large group of UT hams gathered in Donetsk City on June 13, prior to the 2009 contest, to receive their 2008 certificates and plan for the 2009 contest. CQ VHF Contest activity is spearheaded by coordinator Yuri Yakovenko, UT1IC.

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 feedline 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
$209.95

A 1:1 *current* balun is placed on the low impedance 50 Ohm input side to convert the balanced T-Net-work 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
$189.95

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
$499.95

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 between 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 . . .

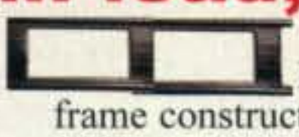
Super-strong fiberglass 450 Ohm ladder line insulators

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

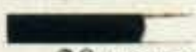
MFJ-16E01, $9.95. Feedpoint *End* Insulator. Double weave ladder line stress relief. Built-in SO-239 connector.

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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The VHF roving bug can even bite HF contesters and DXers. Shown here is John, K4BAI/PJ4A, who operated with KU8E from the state park on St. George Island, FL (IOTA NA-085). John shows it doesn't take much to slap together a rover station for the CQ VHF Contest.

EmComm: Let's first look at a red, white, and blue phenomenon. At first blush, it may be hard to draw any parallel between emergency communications (EmComm) and VHF contest operating. The common denominator is operating skill and experience. This reporter is active in EmComm activities and notes that many newcomers and even many licensed decades ago are finding a welcome mat at the door of the local Red Cross or Emergency Management Agency (EMA). The 21st century demise of traditional 2-meter FM repeater chit-chat has left a vacuum to be filled by the more important EmComm needs. This has also attracted many newcomers to the hobby. What better way to learn good operating technique than in a contest? Good contest operators make good emergency communicators in drills, nets, and the real thing. Since EmComm is conducted on the local level, channelized 2-meter FM is the band/mode of choice. It's not a big stretch to use these radios on simplex to call "CQ Contest." It will take an Elmer to do the job. How about you?

The CTRI Contest Group has done this with its sponsorship the past two years of the very local "Ocean State 2-Meter FM Simplex Challenge," conducted simultaneously with the CQ VHF Contest. Success was modest in 2009, but over 40 stations in the Rhode Island environs were reported active—some crossing over to the "big" fray. For ideas that can be adapted to your local situation, details such as rules, log sheets, past reports, etc., can be obtained with an e-mail request to me. The relationship between EmComm and contesting can be symbiotic.

Rip Van Winkle Effect: How many of you have had an extended hiatus from ham radio to raise a family, have lost interest, have a lack of real estate, etc., etc., only to wake up from a radio-free slumber? There is a wealth of retreads out there who have rediscovered today's sophisticated radios and that you no longer need to be an electrical engineer to be QRV on 6 or 2 meters. These are potential VHF contesters that may need your encouragement.

Rover-mania: Rovers are a great vehicle (catch the pun?) for creating your own conditions. On a dead band they still dispense more Qs and often rare locators. How did they do in last July's contest? In the U.S., rover contacts were up 25% with a 52% increase in the number of rover stations. Rovers were also active in Canada and the Ukraine, and eight entered the contest from Thailand (see sidebar). For those in the U.S. living under restric-

TOP SCORES
WORLD

All Band
OK1DOL.....32,627
OK1DC.....15,872
VE1SKY 13,500

6 Meters
E70T.....32,940
EI9FBB.....18,090
VE3NNQ 16,240
C4M.....15,456

2 Meters
HS2ZMU 7,618
HS4DDQ 4,720
UW5W.....3,300
YU2DX 3,000

Hilltopper
HA2VR/P.....3,550
HA2UL/P 2,992
HS8GLR/P 2,208
HA4BF/P 1,620
G8HXE/P.....1,482
HA5CQZ/P 1,260

Multi-Op
OK1KIM.....150,535
UR7D 106,095
UV6I 11,040
HS1AXC.....9,600
HS3QCT.....8,200

USA

All Band
K2DRH.....104,470
K1TEO 85,684
WA2FGK.....64,148
W4RX 44,239
W2DAN.....29,670
W3EP.....29,580
N8RA 25,704
W4WA.....21,758
KG6IYN... 21,540
K3OO.....20,930

6 Meters
K1TOL 61,770
W2MMD... 15,872
N4BP 10,024
N4CW/1 8,296
W5WVO.....7,638
W4MAY.....7,285
K1DAT 5,712
KC2HZW.....4,815
K5TR... 4,578
N4WW.....3,960

2 Meters
KØKP 1,040

Hilltopper
W9SZ.....1,210
HA5AZC/P.....1,088

QRP
HA6VV/P 4,760
EB1EHO.....2,992
RU3GX.....1,440
FØFEK.....1,216
RU6YY 1,054

Rover
E22YS.....20,944
VE3CRU.....13,072
E22HMR.....7,056
HS2WPJ.....6,930
HS9WQE.....5,280
US3ITU 4,692

QRP
W3RGA.....1,134
W1QK 1,118
K1ZE.....1,095

QRP
KA1LMR 11,650
WB2SIH 9,231
K9AKS 7,920
N8XA 6,500
KO9A 4,050

Rover
WB3BEL 33,553
WB8BZK 28,684
N9WU 27,612
K5RNT 20,516
K1DS 20,262
AE5P.....16,376
W4VHF 15,714
AE5BN 12,874
WAØVPJ 11,592

Multi-Op
K1WHS 126,880
K5QE 96,117
KB1DFB.....79,488
KA2LIM 76,962
W3SO 56,368
W4MW 45,162

tive covenants, what a great way to have contesting fun. For the CQ VHF Contest, a two-band rover station doesn't have to look like it's ready to traverse the moon's landscape. Longtime HF contester John, K4BAI, shows how it's done from a conventional sedan (see photo). Likewise, single-band QRP rover station E22YS, assisted by E22YT, posted the top all-around score from Thailand with 374 QSOs from six LOC (see photo in sidebar). Even your esteemed reporter had a blast "going rove" in the aforementioned Ocean State Challenge. Conclusion: If your home QTH has serious limitations, consider operating in the rover class. It's not hard to do.

DX Coordinators: Coordination of DX activity by country has had a dramatic effect on DX participation. The concept involves an individual in each country or region promoting activity in the contest from announcements in print, on websites, and on reflectors to post contest submission of logs. The template has been Champ, E21EIC, whose efforts in Thailand are legendary (see photo in sidebar). That approach has been duplicated with great success by Yuri Yakovenko, UT1IC, in the Ukraine. His boundless energy resulted in 68 UT log submissions (see photo). Yuri's enthusiasm has been contagious across the border into Russia where Vlad, RA6HLF (with Cabrillo e-logs from Victor, UA6EM), coordinated activity resulting in 27 log submissions. With urging from Flavio, PY2ZX, South American contest activity in Brazil and Argentina has been launched. It's a formula for success that brings more stations into VHF contesting. In the U.S. and Canada it could be adapted on a lesser scale within individual clubs, which segues nicely to this: Since most logs already specify club credit, a club competition will be initiated for the 2010 contest. Thus, individual clubs would do well to promote intra-club activity. It's a win-win situation for everyone.

Contest Highlights

Despite the overall flat conditions experienced by most, there were many positive occurrences:

• In the U.S., K1WHS came back from winning two years ago to recapture 1st place multi.

• K2DRH, K1TOL, KA1LMR, and WB3BEL repeated victories in their respective categories.

• OK1KIM was again the high DX multi score, but not without a strong challenge from UR7D with 2-meter QSOs making the difference.

• E70T, VE3NNQ, and EI9FBB all topped 200 QSOs in the SOSB6 (single op single band 6 meters) category.

• DX participation was up 14% over 2008.

• In Thailand, the CQ WW VHF Contest is *the* contesting event of the year.

• The Ukraine topped all DX countries with number of logs submitted.

• With just 2 watts, M1DUD worked LA9Z in rare grid square JO38.

• KX9X operating portable made 101 Qs from rare northeast U.S. grid FN45.

• OK1DOL put in a nice score from EU with 32K points.

• Welcome to these first timers in the contest: 9A7T, DJ6TK, G3TXF, HS4NOR, K5WPN, K6WSC, and no doubt more.

It's a Wrap

ZC4LI is one of the most consistent contesters on the planet—both HF and VHF. The nice thing about Steve is that he never forgets to pass along his "thanks to all concerned in running the contest." Thanks to you, Steve, for all the Qs, but there are kudos to give in running this worldwide contest.

Foremost among them is Steve, N8BJQ, a world-class contester himself who produces all the scores and statistics from the log-checking program. Trey, N5KO, makes sure the submissions robot is well oiled. Jon, K9JK, again converted the paper logs to e-submissions using the WA7BNM CabForms. We receive many logs utilizing this on-line post entry service thanks to Bruce. Certificates from the 2008 contest were produced by K9JK and mailed prior to the 2009 contest. Curt, K9AKS, updates all the records for posting on the contest website (www.cqww-vhf.com). We welcome Ed, W1PN, who now does the updates on the website. Gail, K2RED, at *CQ*, somehow gets all this into print for all to see. Thanks to all. It's a great crew.

Thanks especially to the 594 station operators who submitted logs, up 12% from the previous year. More stats: total number of stations active was 9444; total of 41,767 QSOs claimed; total number of grids activated 873. This represents an overall activity increase of 4% over 2008—even with sluggish conditions.

With 100% of received logs checked, the following error rates were evidenced: invalid or "not in log" 1.5%; "busted calls" 1.2%; dupes claimed as valid 0.3% ; overall error rate 3.2%. This is an overall 11% improvement in log keeping over the year previous. This is truly outstanding operating shown by contest participants!

We look ahead to the second decade of the CQ WW VHF Contest, July 17–18, 2010, when we will do it all over again. The full announcement will appear in the June issue of *CQ*, on the *CQ* website (www.cq-amateur-radio.com), and on the CQ WW VHF Contest website (www. cqww-vhf.com). A multi-lingual summary of the rules also will appear on many DX contesting websites.

A nice close to these proceedings is offered by N1BCL, who noted in his log: "The gods of propagation do not always smile on us, but fun is always available to all." With that, it's a wrap. See you all in the 2010 contest.

73, John, W1XX

Scatter

No real activity here but managed 53 QSOs. Pleased to take part. Have entered as M3RCV in the past … **2EØRCV.** Conditions weren't very good, but the FT-450 sure makes a nice roving radio for 6 meters … **AA5JG.** I operated from Mt. Kearsarge, NH, in FN43 alongside N1JHJ who operated a separate station. We managed to catch some 6-meter *E*-skip … **AF1T.** I really enjoyed this contest. Congratulations to E22YS who showed true ham spirit in operating rover station. I will join next year's contest for sure and operate as a rover. Thanks for organizing this great event … **E22KNY.** Only managed one quick *E*-skip contact but highlight was working several other rovers and having two beautiful days of sunshine and clear weath-

The 2009 CQ WW VHF Contest in Thailand

By Champ C. Muangamphun, E21EIC

Each year after the results of the previous year's CQ WW VHF Contest are announced, awards are presented to the Thailand winners at a national gathering. New hams are encouraged to participate through the University Amateur Radio Club system where they are "Elmered" by senior hams. An official website created by Jaycie, E20NKB, provides all the details of the next CQ VHF Contest event. Thus, many newer hams are QRV for it.

In 2009 the rover class especially grew in popularity. YL op Chu, E22YS, loaded up her car with equipment and homebrew antenna to make a good score. Also operating rover with homebrew antennas were HS1KZH, HS8JYX, and HS9WQE. The true spirit of VHF contesting was exemplified by Thiti, HS8VZW, who, despite a handicap, operated his three-wheel motorcycle as a rover in the contest.

Thanks to HS8KGG who assisted in keyboarding the many paper logs to Cabrillo-formatted e-log entries.

73 from Thailand, where VHF contesting is alive and well!

Hilltopper E20YLM/P.

Rover E22YS.

Multi-op E22KNY.

QSO LEADERS BY BAND
WORLD

Single-Op
50 MHz

E70T 270
VE3NNQ 203
EI9FBB.....201
VE1SKY 178
C4M 161

144 MHz

HS4DDQ 295
HS2ZMU 293
HS8LUR.....284
HS8TAB 282
E22HUV 232

Multi-Op
50 MHz

UR7D 187
OK1KIM 151

144 MHz

HS1AXC.....480
E21LXK.....414
HS3QCT 410
OK1KIM 392
E29KRM.....373
HS1EFA 338

USA

Single-Op
50 MHz

K1TOL 435
K1TEO 313
K2DRH.....302
WA2FGK.....283
W3EP.....278
W2DAN.....263
W2MMD.....248
W4RX.....219

144 MHz

K1TEO 189
K2DRH.....186
W4RX.....157
WA2FGK.....135
KA3ZLS 101

Multi-Op
50 MHz

K1WHS 485
KB1DFB.....341
KA2LIM 272
W3SO 218
W4MW 213
K5QE 171
K4SME.....167
NE1B 154

144 MHz

K5QE 213
W4MW 183
KA2LIM 167
W3SO 162
K1WHS 154
KB1DFB.....140

er ... **K1DS.** Sunday morning I worked VE1SKY in FN74 then the band opened to New England for a couple of hours. Then I worked WA4PGM who sent FM72 which seemed odd. Then I heard him sign VP9/WA4PGM. Woo-hoo! ... **K1LT (in Ohio).** First time trying the Hilltopper category. I pared down and went with a simple rig, portable antennas, Armstrong rotation, and paper logs. Mistake! What I thought was simple turned out needing brain surgery precision to set up in the wind on top of a hill ... **K2QO.** First time working this contest and first time roving. From EM73 atop Pine Mtn., GA, on Sunday there was very little 6-meter *Es*, but lots of long-distance ground wave. Heard K1TOL and K1WHS off and on for most of the 18 hours I was on, but never worked them ... **K4ESA.** Fun contest as usual. Activated rare grid DN02, Lake County, OR, same as last year. 6-meter propagation was not as good as last year ... **KB7ME.** A few dozen new calls in the WI and IL area really helped. The local and semi-local activity was really needed because prop was mostly flat. Very enjoyable CQ WW VHF Contest from EN63ao ... **KC9BQA.** It was a fun contest and I'm looking forward to doing it again. Mike, NØEXE, and I made it a camping trip and set up on top of Decorah Peak in EN44. Most of the time we were at 1W powered by a gel cell and solar panel, as we were limited to what we could carry over the rough terrain. Still, it was fun ... **KC9ECI.** Conditions were spotty, but there were a couple of double-hop openings to the East Coast and Midwest ... **KI7JA.** Just a last-minute opening to NA here in the US Virgin Islands working only W4WA who was loud ... **KP2DX.** Operated Hilltopper on a hill near El Dorado, KS Sunday morning with some *Es* to Montana and Washington. KB7ME was the best DX ... **NØJK.** Great weather and a lot of fun. A short-lived 6-meter opening to the Midwest on Sunday morning made things a little exciting for a while ... **N1KPW/R.** Very few contacts overall but still one of the most enjoyable VHF contests. Keep up the great work! ... **N1LF/R.** *Es* for only two hours Sunday morning, working six skip grids mostly in Florida plus the mostly water grid FM02. Since there was so little action on 6, I had my best 2-meter score and the chance to chat with lots of friends and other contest ops ... **N3UM.** It's fun just being back on 6 after being off for over 55 years ... **N4PN.** My first rover operation ... **VE2PIJ.** Glad there were several 6-meter *Es* openings on Sunday ... **WØETT.** I operated from home and got into a very good *E*-skip opening to Florida on Sunday. I really enjoyed the contest ... **W1MKY.** Even though conditions were flat, our new locations, strategies, and planning resulted in a significant improvement overall. It was win-win, as the food was great at the new diners we got to explore! ... **W3BC/R.** Thanks to the rovers who helped out ... **W2UDT.** Operated Hilltopper in FN10kr at 2100 feet with a single loop for each band. Only DX was VO1KVT ... **W3RGA.** There was no really good 6-meter opening, just some Caribbean, Florida, and Midwest short openings. On 2 meters we got as far west as Indiana. Once again, thanks to the rovers ... **W3SO.** Saturday was a complete skunk here in New Mexico but Sunday morning produced a good opening to the Midwest and double hop to New England and the Canadian Maritimes ... **W5WVO.** I did some EME during the night and picked up some nice grids in Europe. Right before the end of the contest, I went to the low end on 50.095 MHz, called CQ, and worked CT1HZE and CN8KD with a minute to spare. Don't ever quit! ... **WA2FGK.** The band opened up late Sunday morning and we managed to get a moderate run going on CW ... **WB2AMU.** This contest is always a lot of fun. When roving you always get a chance to explain ham radio. I met K2RAY and his son on the Skyline Drive. CT1HZE called me right near the end of the contest ... **WB3BEL.**

GRID MULTIPLIER LEADERS BY BAND
WORLD

Single-Op
50 MHz

E70T.....122
C4M.....96
EI9FBB.....90

144 MHz

OK1DOL.....47
UW5W.....30
HA6VV/P 28
EA2TO/1 25
YU2DX 25

Multi-Op
50 MHz

UR7D 105
OK1KIM.....78

144 MHz

OK1KIM.....83
UR7D 60

USA

Single-Op
50 MHz

K1TOL 142
K2DRH 100
W3EP 97
K1TEO.....89
W2DAN.....78

144 MHz

K2DRH 55
WA2FGK 50

Multi-Op
50 MHz

K1WHS.....133
KB1DFB.....103

144 MHz

K5QE 90
W3SO 47
KA2LIM.....46
W4MW.....28
K1WHS.....27

Number/letter groups after call letters denote the following: Class (A = all band, 6 = 6 meters, 2 = 2 meters, Q = QRP, Q* = QRP portable hilltopper, R = rover, M = multi-operator), Final Score, Number of QSOs, Number of grid locators, State/Province (USA/Canada only), Grid Locator or Number of grids activated (rover only). Rover scores for USA are listed separately. Certificate winners are listed in boldface.

2009 VHF RESULTS
NORTH AMERICA
UNITED STATES

K1TEO	**A**	**85,684**	**502**	**124**	**CT**	**FN31**
W2DAN	**A**	**29,670**	**304**	**86**	**RI**	**FN41**
W3EP	**A**	**29,580**	**284**	**102**	**CT**	**FN31**
N8RA	**A**	**25,704**	**232**	**84**	**CT**	**FN31**
K1IIG	A	21,016	226	74	CT	FN31
K1TR	**A**	**14,807**	**171**	**67**	**NH**	**FN42**
K1EM	A	13,338	204	54	CT	FN31
N1JEZ	**A**	**12,960**	**156**	**72**	**VT**	**FN44**
KA1R	**A**	**8,448**	**120**	**64**	**MA**	**FN42**
W1XX	A	8,364	139	51	RI	FN41
N1SV	A	7,840	139	56	MA	FN42
KC1MA	**A**	**7,112**	**113**	**56**	**MA**	**FN51**
AF1T	A	6,688	130	38	NH	FN43
W1RZF	A	6,510	108	42	MA	FN42
N1JHJ	A	5,092	103	38	NH	FN43
KX9X/1	A	5,088	101	48	NH	FN45
W1MKY	A	4,352	98	34	NH	FN43
W1DYJ	A	3,666	77	39	MA	FN42
N1ZN	A	1,764	60	21	CT	FN31
NZ1I	A	1,449	45	23	CT	FN41
KA1C	A	620	26	20	ME	FN54
W1DMM	A	248	26	8	CT	FN31
KB1JDY	A	180	18	9	CT	FN41
K1TOL	**6**	**51,770**	**435**	**142**	**ME**	**FN44**
N4CW/1	**6**	**8,296**	**122**	**68**	**ME**	**FN53**
K1DAT	**6**	**5,712**	**119**	**48**	**MA**	**FN42**
N1IW	**6**	**2,016**	**63**	**32**	**NH**	**FN42**
W1FJ	6	630	30	21	MA	FN42
N1BCL	6	352	22	16	VT	FN34
K1VU	6	180	15	12	MA	FN42
KA1RI	2	174	29	3	RI	FN41
						(Op: W1XX)
KB1MAD	2	64	16	2	RI	FN41
K1NPT	2	56	14	2	RI	FN41
N1EYE	2	56	14	2	RI	FN41
W1JPZ	2	18	9	1	RI	FN41
W1QK	**Q***	**1,118**	**43**	**13**	**CT**	**FN31**
K1ZE	**Q***	**1,095**	**49**	**15**	**CT**	**FN31**
W1QH	Q*	374	34	11	CT	FN31
KA1LMR	**Q**	**11,650**	**174**	**50**	**NH**	**FN43**
N1QLM	Q	760	32	19	MA	FN32
K1WHS	**M**	**126,880**	**639**	**160**	**ME**	**FN43**
KB1DFB	**M**	**79,488**	**481**	**128**	**CT**	**FN41**
NE1B	**M**	**17,040**	**197**	**71**	**NH**	**FN42**
K2OAK	**M**	**10,272**	**160**	**48**	**MA**	**FN32**
W1WBB	M	140	35	2	RI	FN41
WA2VYA	**A**	**7,526**	**118**	**53**	**NJ**	**FN20**
N2NF	**A**	**5,967**	**97**	**39**	**NJ**	**FM29**
N2SLO	**A**	**3,774**	**70**	**37**	**NY**	**FN30**
W2KV	A	3,105	69	23	NJ	FN20
KA2CYN	A	2,914	76	31	NY	FN31
W2BVH	A	2,240	59	28	NJ	FN20
WA2PNI	A	1,998	60	27	NJ	FN20
N1IBM	A	1,984	55	32	NJ	FM29
W2UDT	A	1,840	53	23	NJ	FN20
KC2COB	A	1,675	57	25	NJ	FM29
KA2OON	A	1,449	48	21	NJ	FN20
W2JTM	A	851	32	23	NY	FN31
K2RET	A	288	17	12	NJ	FM29
N2GKM	A	200	18	10	NY	FN31
KA2MCU	A	60	8	6	NY	FN32
K2HVE	A	28	6	4	NJ	FN20
W2MMD	**6**	**15,872**	**248**	**64**	**NJ**	**FM29**
						(Op: N2NRD)
KC2HZW	**6**	**4,815**	**107**	**45**	**NY**	**FN30**
WA2ETU	6	2,405	65	37	NY	FN02
WB2AMU	6	1,472	46	32	NY	FN30
W2JCN	6	576	32	18	NY	FN21
N2RHL	**2**	**340**	**34**	**5**	**NY**	**FN02**
WB2SIH	**Q**	**9,231**	**129**	**51**	**NY**	**FN31**
K2QO	**Q**	**1,564**	**57**	**17**	**NY**	**FN02**
W2JEK	Q	168	21	8	NJ	FN20
KC2JRQ	Q	2	1	1	NY	FN30
KA2LIM	**M**	**76,962**	**439**	**127**	**NY**	**FN12**
W2YR	**M**	**2,774**	**58**	**38**	**NJ**	**FN20**
WA2BAH	M	2,380	59	34	NY	FN32
W2SN	M	1,794	49	26	NY	FN20
WA2FGK	**A**	**64,148**	**418**	**116**	**PA**	**FN21**
						(Op: K2LNS)
K3QO	**A**	**20,930**	**249**	**78**	**PA**	**FN20**
K2PLF	**A**	**16,665**	**237**	**55**	**MD**	**FM19**
KA3ZLS	**A**	**14,758**	**213**	**47**	**MD**	**FM19**
W3PAW	A	10,608	162	48	MD	FM19
K3ISH	A	8,736	140	56	PA	FN21
K3ZO	A	8,640	164	48	MD	FM18
K3TUF	A	7,912	136	46	PA	FN10
N3UM	A	4,590	101	34	MD	FM18
K3TC	A	3,740	82	34	MD	FM19
WB3IGR	A	2,430	57	30	MD	FM18
AF3I	A	1,325	39	25	PA	FN10
KM3G	A	616	34	14	PA	FM19
N3EMF	A	260	17	13	PA	FN01
K3OQ	A	171	14	9	MD	FM19
N3JNX	A	70	7	7	PA	FN11
K3TW	A	18	5	3	MD	FM18
K3WW	**6**	**1,564**	**68**	**23**	**PA**	**FN20**
N1SZ	**6**	**1,420**	**71**	**20**	**MD**	**FM19**
W3TEF	6	798	38	21	PA	FN00
N3TEE	6	299	23	13	DE	FM29
K3YG	6	36	6	6	PA	FN10
4U1WB	6	10	5	2	DC	FM18
						(Op: AJ3M)
W3RGA	**Q***	**1,134**	**45**	**18**	**PA**	**FN10**
K3NG	Q*	817	32	19	PA	FN20
K3TW	Q	18	8	3	MD	FM18
W3SO	**M**	**56,368**	**380**	**104**	**PA**	**FN00**
N3JDQ	M	1,752	73	24	PA	FM19
W4RX	**A**	**44,239**	**376**	**83**	**VA**	**FM19**
W4WA	**A**	**21,758**	**207**	**86**	**GA**	**EM84**
N4QWZ	**A**	**14,756**	**175**	**68**	**TN**	**EM66**
W4MYA	**A**	**10,716**	**157**	**57**	**VA**	**FM07**
K4QI	**A**	**10,620**	**143**	**59**	**NC**	**EM85**
KN4SM	A	8,478	115	54	VA	FM16
N3LL	**A**	**6,681**	**119**	**51**	**FL**	**EL86**
K4RW	**A**	**5,439**	**103**	**49**	**SC**	**EM92**
W4BO	A	3,318	60	42	NC	FM06
N8PR	A	2,436	83	29	FL	EL96
NJ2F	A	2,322	85	27	FL	EL96
K4FJW	A	2,064	62	24	VA	EM86
WA4QYK	A	1,702	50	23	TN	EM86
K4FTO	A	1,520	60	19	VA	FM18
WF4Q	A	1,127	44	23	TN	EM55
						(Op: AI4DB)
W4PK	A	651	28	21	VA	FM07
KS4X	A	608	31	19	TN	EM75
W8KHP	A	608	33	16	KY	EM79
WA4ZKO	A	561	23	17	KY	EM78
KI3O	A	528	34	11	VA	FM18
K4DJV	A	525	34	15	GA	EM74
W4AMP	A	468	25	13	GA	EM74
N4BCO	A	351	26	13	AL	EM64
W4FRA	A	315	19	15	NC	FM15
W2OO	A	308	20	14	TN	EM85
WB4IXU	A	296	22	8	TN	EM86
K2EVW	A	231	17	11	VA	EM96
N3KKM	A	192	14	12	NC	FM25
AC2N	A	140	13	10	FL	EL88
NV4A	A	136	14	8	NC	EM95
NE4W	A	96	10	8	NC	EM96
AI4GR	A	48	7	6	NC	EM85
KH6TA	A	48	7	6	TN	EM66
KF4ZS	A	24	5	4	NC	EM96
N4BP	**6**	**18,824**	**179**	**56**	**FL**	**EL96**
W4MAY	**6**	**7,285**	**155**	**47**	**FL**	**EL97**
N4WW	**6**	**3,960**	**110**	**36**	**FL**	**EL98**
N4PN	**6**	**2,176**	**64**	**34**	**GA**	**EM82**
N4MJ	**6**	**1,701**	**63**	**27**	**TN**	**EM56**
K4SN	6	1,541	67	23	FL	EL96
K3KO	**6**	**1,456**	**52**	**28**	**NC**	**FM06**
K9IL	6	966	42	23	TN	EM56
W3UCE	6	920	40	23	NC	FM06
K4WI	6	860	43	20	AL	EM62
K4ZW	6	690	46	15	VA	FM18
KW7R	6	560	35	16	FL	EL87
KR4F	6	525	35	15	AL	EM64
AA4CF	6	425	25	17	GA	EM74
N4MM	6	384	32	12	VA	FM09
KN4Y	6	330	30	11	FL	EM70
K4JEB	6	182	14	13	SC	FM02
K4ECP	6	160	16	10	VA	FM17
KE4RGH	6	63	9	7	FL	EL88
N1ADY	6	45	9	5	FL	EL88
KC8KSK	6	42	7	6	SC	FM03
W2WAS	6	36	6	6	NC	FM05
AI4G	6	16	4	4	KY	EM86
N4TZH	**Q**	**525**	**30**	**15**	**FL**	**EL96**
NZ1D	Q	442	26	17	FL	EL98
KI4FW	Q	66	22	3	VA	FM18
W4MW	**M**	**45,162**	**396**	**78**	**NC**	**EM96**
K4SME	**M**	**15,910**	**191**	**74**	**FL**	**EM80**
W4NH	**M**	**11,529**	**154**	**61**	**GA**	**EM84**
W4YCC	**M**	**6,624**	**117**	**48**	**SC**	**EM94**
W4APP	**M**	**4,032**	**103**	**36**	**KY**	**EM87**
WA5LFD	**A**	**4,624**	**84**	**34**	**TX**	**EM12**
K5WPN	**A**	**3,232**	**57**	**32**	**OK**	**EM14**
WN2E	A	180	16	10	MS	EM50
NM5M	A	160	11	8	TX	EM13
N5UWY	A	104	9	8	OK	EM15
WK5F	A	66	8	6	TX	EM21
K3TD	A	50	7	5	TX	EM10
KC5MVV	A	24	5	4	TX	DM93
W5WVO	**6**	**7,638**	**134**	**57**	**NM**	**DM65**
K5TR	**6**	**4,578**	**109**	**42**	**TX**	**EM00**
						(Op: WM5R)
WD5K	**6**	**3,230**	**85**	**38**	**TX**	**EM12**
AA5AM	6	288	24	12	TX	EM13
N5XTR	6	260	20	13	TX	DM83
KD5J	6	252	18	14	AR	EM45
NA4M	6	238	17	14	TX	EM10
W0VX	6	204	17	12	TX	EM12
W5ODD	6	20	5	4	TX	EL09
W5KI	6	4	2	2	AR	EM36
K5QE	**M**	**96,117**	**384**	**161**	**TX**	**EM31**
K0XXX	M	943	37	23	AR	EM46
KC5MVZ	M	220	18	11	TX	DM93
KG6IYN	**A**	**21,540**	**266**	**60**	**CA**	**DM12**
W6YX	**A**	**2,616**	**78**	**24**	**CA**	**CM87**
						(Op: KC6SXC)
KC6ZWT	**A**	**2,136**	**63**	**24**	**CA**	**CM98**
K6EL	**A**	**1,944**	**54**	**24**	**CA**	**CM99**
AJ6T	A	1,292	57	17	CA	CM87
KE6EEZ	A	324	23	9	CA	DM06
KF6I	A	297	32	9	CA	DM13
N6ORB	**6**	**495**	**33**	**15**	**CA**	**CM87**
NT6X	**6**	**270**	**30**	**9**	**CA**	**DM04**
K6MM	6	50	10	5	CA	CM87
N6QQ	6	50	10	5	CA	DM03
K6WSC	6	48	8	6	CA	DM13
N6ZE	6	4	2	2	CA	DM04
KG6ZHC	6	2	2	1	CA	CM87
KG6HSQ	**2**	**108**	**9**	**6**	**CA**	**DM13**
K6MI	**Q**	**550**	**31**	**11**	**CA**	**DM06**
W7CE	**A**	**19,536**	**221**	**74**	**WA**	**CN87**
N7EPD	**A**	**9,552**	**157**	**48**	**WA**	**CN87**
KB7ME	**A**	**8,556**	**102**	**62**	**OR**	**DN02**
K7TOP	**A**	**5,376**	**105**	**42**	**AZ**	**DM34**
KI7JA	**A**	**3,458**	**68**	**38**	**OR**	**CN83**
K7ULS	**A**	**3,358**	**67**	**46**	**UT**	**DN41**
KD7UO	A	1,978	60	23	WA	CN87
W7SUR	A	1,785	50	35	UT	DM39
KG7P	A	1,620	58	20	WA	CN87
N7NT	A	507	32	13	AZ	DM43
K7CW	**6**	**3,850**	**110**	**35**	**WA**	**CN87**
K7AWB	6	442	26	17	WA	DN17
N7IR	6	189	21	9	AZ	DM43
KG0AL	6	30	6	5	MT	DN76
AD7ND	6	21	7	3	AZ	DM33
KØVIZ	**2**	**88**	**11**	**4**	**OR**	**CN85**
N7AT	**Q**	**20**	**5**	**4**	**AZ**	**DM43**
						(Op: K8IA)
W7RV	**M**	**4,048**	**75**	**46**	**AZ**	**DM35**
K8CC	**A**	**13,440**	**167**	**60**	**MI**	**EN82**
N8LIQ	**A**	**7,750**	**90**	**62**	**MI**	**EN56**
K8MR	**A**	**7,392**	**116**	**48**	**OH**	**EN91**
WN8R	**A**	**4,704**	**90**	**42**	**OH**	**EN91**
WZ8T	A	3,026	59	34	MI	EN72
KB8DDZ	A	2,000	66	25	OH	EM79
KG9Z	A	1,404	48	26	OH	EN90
K8DXR	A	836	30	19	OH	EN90
AD8I	A	594	26	18	MI	EN82
WB2DFC	A	256	25	8	OH	EN91
WA8WV	A	165	11	11	WV	EM98
NX8G	A	140	12	10	OH	EN90
W8RU	A	138	15	6	MI	EN82
N8QE	A	136	15	8	OH	EN91
K8JWT	A	48	6	6	WV	FM09
N8ZGQ	A	48	7	6	OH	EM79
W8KNO	A	44	7	4	OH	EN91
KB8UUZ	**6**	**1,425**	**57**	**25**	**OH**	**EN91**
WA8BCA	6	480	30	16	OH	EN90
						(Op: K8WW)
K1LT	6	448	28	16	OH	EM89
W8KEN	6	429	33	13	OH	EN91
K8EG	6	221	17	13	OH	EN70
NF8M	6	28	7	4	MI	EN82
N8XA	**Q**	**6,500**	**106**	**52**	**OH**	**EM89**
K9CT	**M**	**4,550**	**65**	**50**	**MI**	**EN67**
K2DRH	**A**	**104,470**	**488**	**155**	**IL**	**EN41**
KC9BQA	**A**	**19,944**	**198**	**72**	**WI**	**EN63**
W9GA	**A**	**13,124**	**137**	**68**	**WI**	**EN53**
WO9S	**A**	**12,272**	**170**	**52**	**IL**	**EN61**
W9THD	**A**	**2,738**	**61**	**37**	**IN**	**EN71**
N9YLZ	A	1,898	53	26	IL	EN42
N7MB	A	1,860	53	30	IL	EN50
ND9Z	A	800	26	20	WI	EN54
KA9BYN	A	667	23	23	IN	EN60
N9UX	A	576	26	16	WI	EN52
N9NDP	A	408	19	12	WI	EN62
N9LYE	A	250	17	10	IL	EN51
KG9N	A	180	17	9	IL	EN50
W9ZB	A	154	11	11	IN	EM69
W9RVG	A	84	12	6	IL	EM57
W9SE	**6**	**1,881**	**57**	**33**	**IL**	**EN50**
W9VA	6	800	40	20	IL	EN62
K9OM	6	522	29	18	WI	EN65
ND9E	6	260	20	13	IL	EN50
AJ9C	6	168	14	12	IN	EN70
NS9I	6	144	12	12	WI	EN54
WI9WI	6	12	4	3	WI	EN53
W9HT	6	9	3	3	IN	EN71
W9SZ	**Q***	**1,210**	**37**	**22**	**IL**	**EN50**
K9AKS	**Q**	**7,920**	**101**	**55**	**IL**	**EN41**
KO9A	**Q**	**4,050**	**93**	**30**	**IL**	**EN52**
KK9V	Q	1	1	1	IN	EM69
KC9ECI	M	310	18	10	WI	EN44
KØSIX	**A**	**20,915**	**187**	**89**	**MN**	**EN35**
WØEEA	**A**	**16,093**	**182**	**77**	**CO**	**DM79**
WØETT	**A**	**9,774**	**144**	**54**	**CO**	**DM79**
NØKE	A	8,174	125	61	CO	DM69
KØTPP	**A**	**6,674**	**110**	**47**	**MO**	**EM48**
KØAWU	**A**	**4,048**	**75**	**44**	**MN**	**EN37**
WØGHZ	A	3,471	66	39	MN	EN34
NØUNL	**A**	**3,450**	**64**	**46**	**NE**	**EN10**
						(Op: WBØBGZ)
NØPOH	A	3,366	78	33	CO	DM79
NØHF	A	1,971	60	27	CO	DM79
WØHBH	A	1,736	56	28	MO	EM48
WVØH	A	1,275	54	17	CO	DM79
KCØVFP	A	960	33	24	MN	EN35
KCØTDJ	A	608	25	19	IA	EN40
KIØSK	A	125	17	5	CO	DM79
KØDAN	A	6	2	2	MO	EM28
KBØYH	**6**	**1,836**	**68**	**27**	**CO**	**DM79**
W6GMT	6	782	34	23	MN	EN37
N5AW/Ø	6	425	25	17	CO	DM67
WBØTSR	6	12	4	3	SD	EN14
KØKP	**2**	**1,040**	**26**	**20**	**MN**	**EN36**
NØØJK	**Q***	**9**	**3**	**3**	**KS**	**EM17**
KCØRQH	**Q**	**308**	**19**	**11**	**MN**	**EN35**
KØNR	Q	55	7	5	CO	DM79
KCØZZQ	**M**	**1,456**	**43**	**28**	**NE**	**EN26**

Rover

W83BEL	**33,553**	**274**	**89**		**4**
W88BZK	**28,684**	**193**	**101**		**6**
N9WU	**27,612**	**153**	**117**		**8**
K5RNT	**20,516**	**128**	**92**		**16**
K1DS	**20,252**	**155**	**83**		**4**
AE5P	**16,376**	**119**	**89**		**12**
W4VHF	**15,714**	**145**	**81**		**4**
AE5BN	**12,874**	**105**	**82**		**12**
WA8VPJ	**11,592**	**109**	**69**		**6**
W3DHJ	**4,704**	**75**	**48**		**6**
N3XUD	**3,450**	**80**	**30**		**2**
KH6TY	**3,298**	**69**	**34**		**2**
N2SLN	**3,168**	**54**	**44**		**3**
K4ESA	**2,790**	**57**	**30**		**2**
W3BC	**2,688**	**60**	**32**		**5**
K9JK	**2,622**	**45**	**38**		**6**
KB3STA	**2,444**	**68**	**25**		**2**
K6JRA	**2,322**	**62**	**27**		**2**
N1LF	**2,183**	**45**	**37**		**3**
NV6C	**1,881**	**46**	**33**		**5**
K8DOG	1,269	35	27		4
N1KPW	**1,152**	**37**	**24**		**3**
WD9EXD	1,107	27	27		7
AB0YM	615	23	15		8
KB8O	578	24	17		3
W4AN	459	27	17		2
AA5JG	140	14	10		4
NQ7R	117	9	9		4
KD5IKG	112	10	8		2
NE8I	77	7	7		2
W9ILY	36	6	6		2
KA3KSP	32	4	4		2

CANADA

VE1SKY	**A**	**13,500**	**179**	**75**	**NS**	**FN74**
VA2WDQ	**A**	**5,850**	**110**	**50**	**QC**	**FN35**
VE3KZ	**A**	**2,904**	**63**	**33**	**ON**	**FN03**
VE2JCW	**A**	**2,144**	**65**	**32**	**QC**	**FN35**
VE2HAY	**A**	**2,106**	**71**	**26**	**QC**	**FN35**
VA6AN	**A**	**1,785**	**46**	**35**	**AB**	**DO33**
VA3KA	**A**	**1,710**	**46**	**30**	**ON**	**FN15**
VE2DC	A	1,144	38	26	QC	FN35
VA2BN	A	612	28	18	QC	FN36
VA2BS/P	A	522	26	18	QC	FN36
VE3RCN	A	190	14	10	ON	FN03
VE3NNQ	**6**	**16,240**	**203**	**80**	**ON**	**FN14**
VE9ZX	**6**	**8,122**	**131**	**62**	**NB**	**FN65**
VO1KVT	**6**	**2,940**	**84**	**35**	**NL**	**GN29**
VE9MY	**6**	**1,989**	**51**	**39**	**NB**	**FN75**
VO1DJT	**6**	**684**	**36**	**19**	**NL**	**GN29**
VE6CPP	**6**	**72**	**9**	**8**	**AB**	**DN39**
VA3XQ	**2**	**308**	**14**	**11**	**ON**	**EN93**
VE3TLT	**Q**	**484**	**30**	**11**	**ON**	**EN92**
VE3HHT	Q	264	15	11	ON	FN03
VE3SMA	**M**	**5,247**	**78**	**53**	**ON**	**FN05**
VE3CRU	**R**	**13,072**	**108**	**86**		**7**
VE2PU	R	154	14	11		2

BERMUDA

VP9/WA4PGM	**6**	**6,048**	**108**	**56**	**FM72**

MONTSERRAT

VP2MSJ	**6**	**132**	**12**	**11**	**FK86**
					(Op: W5SJ)

PUERTO RICO

NP3CW	**A**	**456**	**29**	**12**	**FK68**

ST. LUCIA

J6/WB4WXE	**A**	**84**	**10**	**7**	**FK93**

US VIRGIN ISLANDS

KP2DX	**6**	**18**	**9**	**2**	**FK77**

AFRICA
CANARY IS.

EA8CQW	**A**	**580**	**25**	**20**	**IL18**
EA8AQV	**6**	**780**	**30**	**26**	**IL28**

MADEIRA IS.

CT3FQ	**6**	**1,008**	**36**	**28**	**IM12**

ASIA
CYPRUS

C4M	**6**	**15,456**	**161**	**96**	**KM64**
					(Op: 5B4AGM)

CYPRUS – UK SOV. BASE AREAS

ZC4LI	**6**	**9,088**	**128**	**71**	**KM64**

JAPAN

JA6WFM	**6**	**1,664**	**64**	**26**	**PM52**
JA2MWV	**Q**	**15**	**4**	**3**	**PM84**

THAILAND

HS2ZMU	**2**	**7,618**	**293**	**13**	**OK04**
HS4DDQ	**2**	**4,720**	**295**	**8**	**OK03**
HS8LUR	**2**	**2,840**	**284**	**5**	**NJ99**
E22HUV	**2**	**2,320**	**232**	**5**	**OK03**
HS8TAB	**2**	**2,256**	**282**	**4**	**NJ99**
HS3ANP	**2**	**2,060**	**103**	**10**	**OK14**
E20MWE	**2**	**1,130**	**113**	**5**	**OK03**
HS4NOR	**2**	**1,044**	**58**	**9**	**OK16**
E22TV	**2**	**820**	**82**	**5**	**OJ07**
E22ICQ	2	714	119	3	OK03
HS7WYN	2	636	106	3	OK03
E20WGQ	2	224	28	4	OK03
HS8VZW	**2**	**184**	**23**	**4**	**OJ08**
HS3NWD	**2**	**160**	**20**	**4**	**OK14**
E21YDP	2	72	18	2	OK03
HS8KGG	2	22	11	1	OK03
HS8GLR/P	**Q***	**2,208**	**184**	**6**	**OJ07**
E20YLM/P	**Q***	**584**	**73**	**4**	**OK16**
HS7WHB/P	**Q***	**108**	**27**	**2**	**NK91**
E20XMG/P	**Q***	**72**	**12**	**3**	**OK13**
HS1AXC	**M**	**9,600**	**480**	**10**	**OK03**
HS3QCT	**M**	**8,200**	**410**	**10**	**OK03**
HS4PRL	**M**	**6,144**	**256**	**12**	**OK16**
E21LXX	**M**	**5,796**	**414**	**7**	**OK03**
HS1EFA	**M**	**5,408**	**338**	**8**	**OK03**
E29KRM	**M**	**5,222**	**373**	**7**	**OJ07**
HS6SAJ	**M**	**3,220**	**230**	**7**	**OK03**
E22KNY	**M**	**2,232**	**279**	**4**	**OK03**
HS9PSU	**M**	**1,592**	**199**	**4**	**OJ07**
E21EIC	M	968	121	4	OK03
E27BGU	M	504	126	2	OK03
E22YS	**R**	**20,944**	**374**	**28**	**6**
E22HMR	**R**	**7,056**	**196**	**18**	**6**
HS2WPJ	**R**	**6,930**	**231**	**15**	**3**
HS9WQE	**R**	**5,280**	**176**	**15**	**3**
HS5OMY	**R**	**4,176**	**116**	**18**	**6**
E22JJJ	**R**	**3,768**	**157**	**12**	**2**
HS1KZH	**R**	**2,320**	**116**	**10**	**2**
HS8JYX	**R**	**2,080**	**80**	**13**	**5**

EUROPE
AUSTRIA

OE4VIE	**6**	**660**	**30**	**22**	**JN87**
OE1SOW	**2**	**288**	**12**	**12**	**JN88**
OE1CWA	**Q***	**600**	**25**	**12**	**JN88**

BOSNIA-HERZEGOVINA

E70T	**6**	**32,940**	**270**	**122**	**JN84**

CROATIA

9A5AIB	**A**	**324**	**28**	**6**	**JN85**
9A2TN	**6**	**4,664**	**88**	**53**	**JN95**
9A7T	**M**	**6,290**	**99**	**37**	**JN75**

CZECH REPUBLIC

OK1DOL	**A**	**32,627**	**232**	**79**	**JN69**
OK1DC	**A**	**15,872**	**156**	**64**	**JN69**
OK1KZ	**2**	**260**	**26**	**5**	**JO70**
OK1KIM	**M**	**150,535**	**543**	**161**	**JO60**
OK1KFB	**M**	**6,868**	**101**	**34**	**JN79**

ENGLAND

2EØRCV	A	2,322	52	27	JO01
GØLGS	A	1,802	43	34	IO81
G3TXF	6	1,189	41	29	IO91
G8HXE/P	Q*	1,482	57	13	IO83
M1DUD	Q	621	27	23	JO02
G4JSR	Q	480	22	16	IO82

EUROPEAN RUSSIA

RW3XL	2	320	16	10	KO84
RA6DA	2	182	13	7	KN96
RV2FW/1	2	50	5	5	KO59
RU3GX	Q	1,440	36	20	KO92
RV6YY	Q	1,054	31	17	LN04
RW6AG	Q	572	26	11	KN96
UA6DX/P	Q	378	21	9	LN04
RW6CT	Q	324	18	9	KN95
UA6HRX	Q	288	16	9	LN04
RV6HO	Q	256	16	8	LN14
RN6BL	Q	210	15	7	KN95
RU6HL	Q	196	14	7	LN04
RX6AH	Q	196	14	7	KN95
RN6CG	Q	156	13	6	KN95
RV6BU	Q	144	12	6	KN94
RX6DX	Q	120	12	5	KN95
UA6AVQ	Q	108	9	6	KN96
RA6HLF	Q	100	10	5	LN04
RA6FQR	Q	96	12	4	LN05
RN6HAP	Q	64	8	4	LN04
UA6HFI	Q	60	10	3	LN04
RX6CW	Q	56	7	4	KN95
UA6EC	Q	56	7	4	LN14
RA6FQO	Q	48	8	3	LN04
RN6HBI	Q	42	7	3	LN04
UA6LNS	Q	20	5	2	LN07
RK6ARD	M	384	24	8	LN05

EUROPEAN TURKEY

TA1HZ	2	20	5	2	KN41

FRANCE

FØFEK	Q	1,216	38	16	JN19

GERMANY

DJ6TK	6	546	26	21	JO44
DL1ET	6	414	23	18	JO31
DL7DZ	6	63	9	7	JO43
DH5MM	Q	378	21	18	JO52

GREECE

SY8KF	M	5,712	89	56	KM08

GUERNSEY

MUØGSY	6	1,036	37	28	IN89
MUØFAL	6	323	19	17	IN89

HUNGARY

HA7LW	6	182	14	13	JN97
HA2VR/P	Q*	3,550	76	25	JN87
HA7UL/P	Q*	2,992	68	22	JN97
HA4BF/P	Q*	1,620	45	18	JN97
HA5CQZ/P	Q*	1,260	42	15	JN97
HA5AZC/P	Q*	1,088	36	17	JN97
HG4UK/P	Q*	792	33	12	JN97
HA5TI/P	Q*	462	21	11	JN97
HA6VV/P	Q	4,760	85	28	JN97
HA4YF	Q	825	33	25	JN97

IRELAND

EI9FBB	6	18,090	201	90	IO51

LATVIA

YL3DR	6	2,124	59	36	KO26

LITHUANIA

LY2BUU	6	1,175	47	25	KO15

LUXEMBOURG

LX1NO	A	40	6	5	JN39

MACEDONIA

Z37M	M	4,560	80	57	KN11

NORWAY

LA9Z	6	4,560	80	57	JO38 (Op: LB1G)
LA3BO	6	1,976	52	38	JO59

POLAND

SQ9IDE	6	1,144	52	22	JN99
SP2DNI	Q	270	18	15	JO94
SN50RS/7	M	132	12	11	JO91

PORTUGAL

CT1DZY	6	20	5	4	IN51

ROMANIA

YQ6A	6	456	24	19	KN25 (Op: YO6BHN)
YO5CBX	6	182	14	13	KN27
YO5CRQ	6	132	12	11	KN17
YO5QAW	6	90	10	9	KN17
YO6ADW	6	56	8	7	KN36
YO3DDZ	2	1,160	29	20	KN34
YO3FOU	2	340	17	10	KN34

SERBIA

YU2DX	2	3,000	60	25	KN04

SWEDEN

SM5ARL	6	144	12	12	JO79
SM6WET	6	140	14	10	JO68
SM7LQV	6	9	3	3	JO77

SPAIN

EA2TO/1	A	8,778	91	66	IN83
EB1YK	A	6	2	2	IN73
EA2ARD	6	3,750	75	50	IN93
EA5DIT	6	1,802	53	34	IM99
EA1KY	6	1,680	56	30	IN71
EB5CNK	6	64	8	8	IN90
EA1WX	6	20	5	4	IN63
EB1LA	2	1,794	39	23	IN63
EB1EHO	Q	2,992	68	44	IN73
EA3FHP	Q	16	4	4	JN11

THE NETHERLANDS

PE7T	6	90	10	9	JO32
PA1W	6	48	8	6	JO21

UKRAINE

UT5EZ	A	980	38	14	KN78
US7IA	A	549	32	9	KN88
UT7EJ	A	92	15	4	KN78
UT5EW	A	84	15	3	KN78
UT4EU	A	72	13	3	KN78
UT5URW	6	1,530	45	34	KO50
UT5ERP	6	1,302	42	31	KN77
UY5ZZ/A	6	888	37	24	KO50
USØKW	6	667	29	23	KO30
UR5FAV	6	400	20	20	KN45
UY5QO	6	154	14	11	KN77
UZ5Q	6	30	6	5	KN78
UW5W	2	3,300	55	30	KN29
UR6EC	2	1,258	37	17	KN78
UR5QU	2	1,056	33	16	KN77
UT5ER	2	928	29	16	KN78
USØGB	2	870	29	15	KN67
UR5UI	2	784	28	14	KN59
US8ZAL	2	750	25	15	KN66
UT5JCW	2	570	19	15	KN64
UT3EK	2	560	28	10	KN78
UR4EYA	2	558	31	9	KN78
UT1EA	2	540	27	10	KN68
UY5ON	2	460	23	10	KN89
UTØEG	2	432	27	8	KN67
US5EY	2	294	21	7	KN67
UT3EW	2	180	18	5	KN78
UR4UAR	2	140	14	5	KN59
UR5EAZ	2	112	14	4	KN78
UT4EK	2	88	11	4	KN67
UT1HT	2	64	8	4	KN69
UT5EDT	2	56	7	4	KN67
UR5WDQ	2	24	4	3	KN19
UR5FFC	2	8	2	2	KN56
UY7IQ/P	Q*	216	27	4	KN88
US5ID/P	Q*	208	26	4	KN98
US5IHF/P	Q*	192	24	4	KN97
US7IIZ	Q	340	34	5	KN98
UT3IK	Q	300	30	5	KN98
UR4IEI	Q	256	32	4	KN98
UY2IJ	Q	238	17	7	KN98
UR4QX	Q	224	16	7	KN86
UR2IFN	Q	216	27	4	KN88
US3ITD	Q	216	27	4	KN98
UY9IT	Q	208	26	4	KN98
US5IVL	Q	200	25	4	KN88
US7IGN	Q	200	25	4	KN88
US7IL	Q	192	24	4	KN98
US5IW	Q	176	22	4	KN88
US3IAK	Q	168	21	4	KN88
UT2II	Q	168	21	4	KN88
UY2IW	Q	168	21	4	KN98
UR7INK	Q	128	16	4	KN88
UR4ISL	Q	120	15	4	KN88
US2IHW	Q	78	13	3	KN98
UXØUW	Q	9	3	3	KO50
UT5UUV/P	Q	2	2	1	KN76
UR7D	M	106,095	415	165	KN18
UV6I	M	11,040	138	46	KN98
UT7E	M	6,164	97	46	KN78
UU9A	M	6,032	80	58	KN64
UX4E	M	2,002	47	26	KN78
UR3IWI	M	138	23	3	KN98
UW2I	M	44	11	2	KN88
US4IYY	M	14	7	1	KN97
US3ITU	R	4,692	102	23	6
US3IQO	R	256	16	8	2

WALES

GW8ZRE/P	Q*	1,200	50	12	IO83

SOUTH AMERICA

ARGENTINA

LU1BJW	6	2	2	1	GF05
LU2UF	2	28	7	2	FF73
LU2ECP/U	2	8	2	2	FF73
LU1UAB	2	4	2	1	FF73
LU3UBJ	2	4	2	1	FF84
LU5UBI	Q*	4	2	1	FF73
LU2UPD	Q	2	1	1	FF73
LU6UOL	Q	2	1	1	FF73

BRAZIL

PV8AZ	6	12	6	2	FJ92
PV8DR	6	4	4	1	FJ92
PV8ADI	6	2	2	1	FJ92
PV8RF	6	2	2	1	FJ92
PU8TEP	Q	8	4	2	FJ92

CHECK LOGS

The following submitted check logs: HA7PL, K8YC, KG4QEN, LU2UE, PAØWLB, PV8DX, UX8IR, W9IIX, YO3APJ.

Here is a shielded shortwave receiver you can build that has good sensitivity, selectivity, and stability. It also has a very wide frequency range and excellent sound quality.

A High-Performance Regenerative Receiver

BY CHARLES KITCHIN,* N1TEV

The regenerative (regen) receiver has always been a good choice for amateur home construction. The knowledge gained, and the *fun* of home construction, easily justify the time and effort of building your own equipment.

An important advantage of the regen is that it is basically a user-controlled RF oscillator: Once the circuit is oscillating correctly, you can just tune around and check your reception frequencies. Neither fancy test equipment nor alignment is necessary.

A regen will often "function" (receive stations) even with bad design, serious wiring errors, or wrong component values. However, for high performance, careful design, construction, and testing are absolutely essential.

Fig. 1 shows the circuit for a modern regenerative radio. It has a very wide tuning range, from 480 kHz to over 18 MHz, which can be extended even further down into the long-wave frequencies with only slight modifications. This features a JFET[1] RF stage and a JFET regenerative detector. It also uses a JFET op-amp preamp, with adjustable low- and high-pass filtering, for low-distortion audio. It also sports a 2-watt IC audio power amplifier for driving a speaker or headphones. For maximum stability on CW and SSB, this circuit uses a "throttle capacitor" regeneration control, a regulated detector supply voltage, audio extraction via the JFET source, and a grounded metal chassis and front panel. All parts are readily available (see sidebar "Locating Parts").

In operation, the positive RF feedback provided by a regenerative detector greatly increases both the sensitivity and selectivity of a single tuned RF stage, allowing it to equal that of many stages. The feedback is user adjusted as the radio is tuned. The fig. 1 circuit operates like a very good DC receiver when oscillating strongly and is a true hi-fi circuit for AM operation, when operated below oscillation. The audio clarity on 80- and 40-meter AM phone signals and commercial AM broadcast stations is unmatched by superheterodyne circuits. (*Note: TRF, or tuned RF, receivers were once used for hi-fi AM broadcast reception for just this reason. I suspect that the mixer and IF stages of a normal superheterodyne circuit introduce large amounts of intermodulation distortion with AM reception, but not with FM).*)

N1TEV's high-performance regenerative receiver will cover 480 kHz to 18.5 MHz, depending on which coils you plug in.

The RF Stage

The gain and isolation of this untuned, grounded-gate RF stage permit very minimal loading of the detector (Q2), which is absolutely essential for high selectivity. The antenna input signal connects through RF level control capacitor C3 to the source of JFET Q1. C3 is two sections of an AM broadcast tuning capacitor in parallel (132 pF and 365 pF plus trimmers). C3 increases selectivity by reducing the RF input level and by preventing the full antenna capacitance from shunting R1, which would lower the output impedance of Q1. Resistor R1 provides protective DC bias for Q1. The high-impedance output from Q1's drain connects to L1; power-supply current flows through this RF choke (RFC), while the signal is loosely coupled to Q2 through capacitor C4. A 10-pF value for C4 is a good compromise; however, those who desire the highest possible selectivity should use the smallest C4 value that still gives good sensitivity. (*Note: C4 can also be made part an L2/L3 plug-in coil assembly.*)

The Regenerative Detector

The regenerative detector, Q2, is operated as a modified Hartley oscillator. Input winding L2 transfers maximum signal with minimum detector loading. Coil L3 is tapped, which ensures that Q2 will oscillate reliably without experimenta-

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e-mail: <chuckk22@comcast.net>

tion. The top of coil L3 runs to the gate of Q2. Capacitors C5 and C6, along with coil L3, tune the RF input signal. Their values are not critical and a wide variety of air variable capacitors may be used here. A varactor diode may also be substituted, if desired, although selectivity may be reduced.

The tap on L3 runs through bias resistor R2, bypassed by capacitor C9, to the JFET source. R2 and C9 provide AM detection, as this RC time constant is short enough that RF signals pass through, while any audio (AM) variations in the signal do not; this changes the bias level (and gain) of Q2 at an audio rate, providing AM detection.

C7 is a "throttle" capacitor regeneration control. Developed during the 1920s, the "throttle" allows very smooth control of feedback through the oscillation threshold and provides very- low-drift CW and SSB reception (similar to a DC receiver). C7 directs RF energy from Q2's drain to ground and therefore couples RF to the (grounded) bottom of L3. RF feedback in a regenerative circuit effectively "Q multiplies" both gain and selectivity. When adjusted to the threshold of oscillation, the RF gain of this stage is close to 20,000. The selectivity of the LC tuned circuit is determined by the circuit's "Q," the amount of RF feedback, the degree of detector loading (both input and output), and by the strength of the RF input signal.

RFC L4 "backs-up" the RF signal at Q2's drain, not allowing RF energy to return to ground via the power supply. RFCs L1 and L4 need to be hi-Q wire wound (not molded) varieties. The value of L4 is not critical but needs to be a large enough inductance to prevent detector oscillation with the regen control at minimum across all bands. For most bands, a 2.5-milliHenry RFC will suffice (for L1 as well). For AM broadcast band or long-wave frequencies, a larger value such as 3.3 mH is

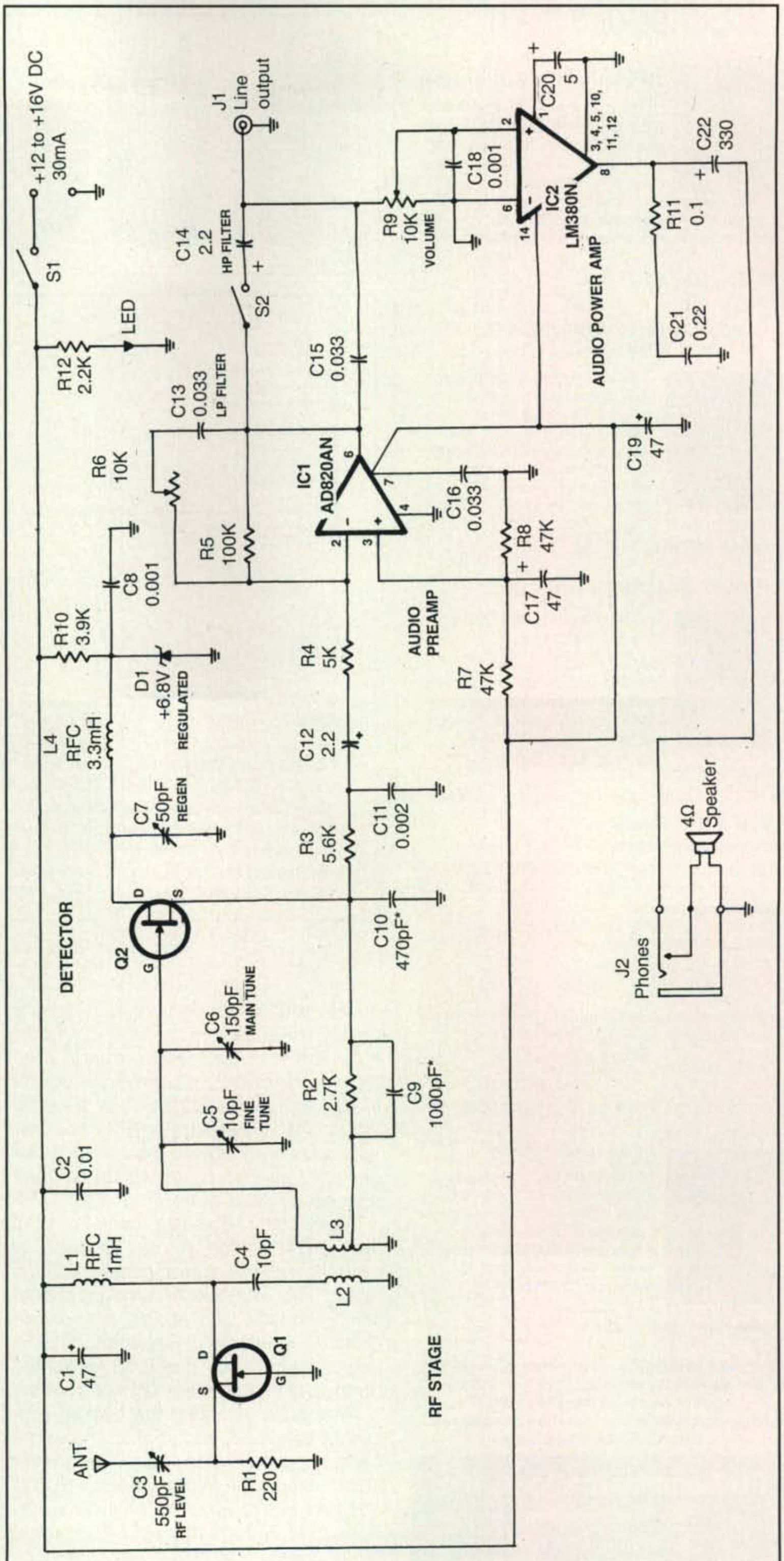
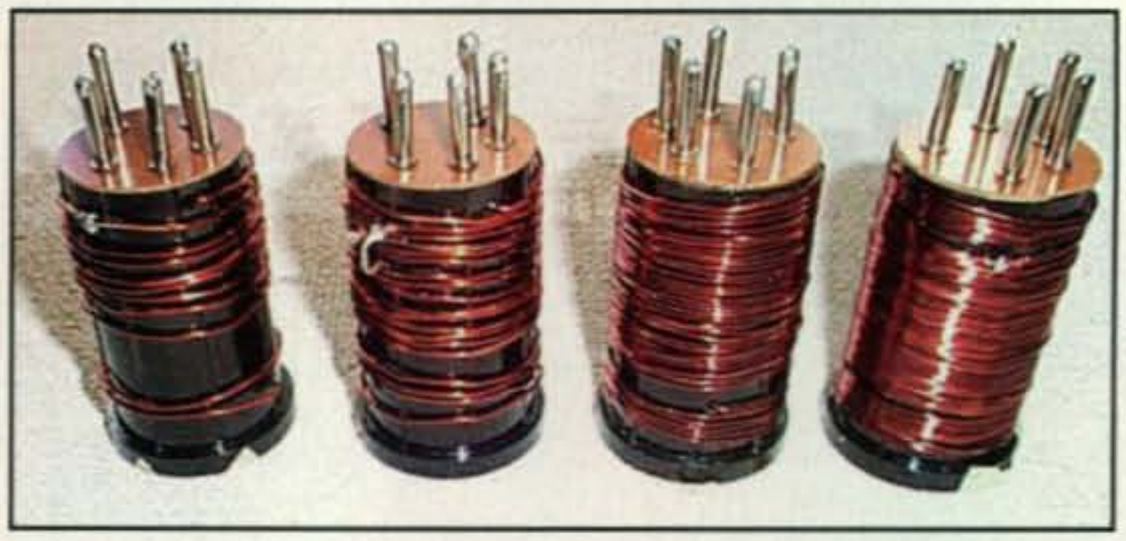
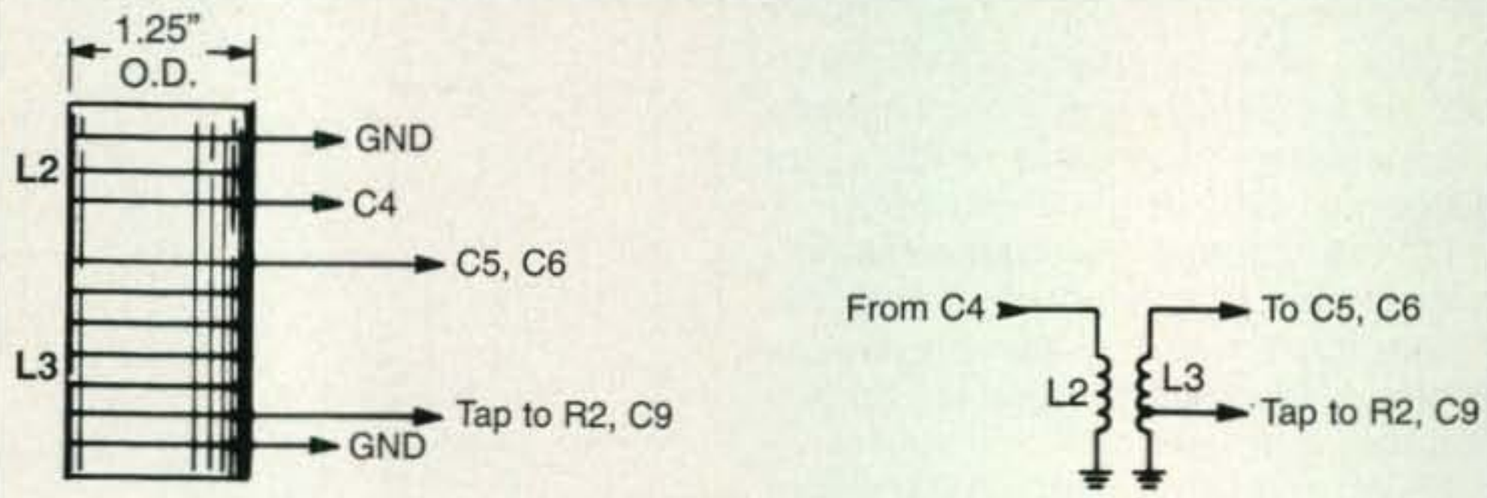


Fig. 1– Schematic of the N1TEV high-performance regenerative receiver.

Notes:
Q1, Q2: J310, 2N4416, MPF102, or similar
D1: 1N4736, 6.8v Zener
IC1: AD820AN JFET op-amp
IC2: LM380N 2-watt audio amplifier
C10: Value is nominal, select while testing
Capacitor values are in µF unless otherwise noted on schematic. Capacitors marked with a * are NPO ceramic or silver mica. Polarized capacitors are electrolytic 22V or higher. All other capacitors are ceramic or ceramic disc.
All resistors are 1/8W 5% carbon or 1% metal film.



Close-up of the coils. See text, fig. 2, and table for details.



Turns Data

Band	L2	L3	Tap	Wire
0.7–1.5 MHz*	30T	128T	15T	#30
1.4–3.2 MHz	12T	64T	8T	#24
2.7–6.2 MHz	6T	32T	4T	#20
5.1–12.2 MHz	4T	16T	1.8T	#20
8.5–18.5 MHz	1.8T	8T	0.8T	#18

Notes: Approximate frequency range using a 10–150 pF air-variable capacitor. Coil forms are 1.25-inch O.D. PVC (pill bottle or plug-in coil form). Other coil diameters may be substituted with corresponding change in tuning range. Use enameled copper wire. Leave approximately 1/8-inch spacing between turns. L3 is stretched out or compressed as needed so that it is approximately 1.25 inches long. The value of C4 may need to be increased for operation below 1 MHz.

*Use 20–300 pF capacitor (C6) for 480–700 kHz operation.

Fig. 2– Coil details; see accompanying table for turns data.

usually required to prevent oscillation at minimum regen control setting. *(Note: If the set oscillates continuously at all regen control settings, the usual cure is to use a larger value RFC, or a larger value C10. Otherwise, a C7 capacitor with a lower minimum capacitance will be needed. The tap point on L3 may also be lowered closer to ground.)*

Capacitor C10 allows some RF from the JFET source to be shunted to ground, rather than traveling to the tap on L3. This reduces the amount of positive feedback and allows very stable detector operation. Capacitor C10 is user selected and needs to be added during the testing stage of construction. A resistance shunting the bottom portion of L3 would accomplish the same thing but would also load the coil and lower selectivity. *(Note: This is a high Q solution to the problem of wide variations in [C7] capacitance values used by builders. Some air variable caps have minimum capacitance values that can be a large percentage of their total value. If minimum cap value is 10 pF or less, C10 normally is not needed. Resistor shunting between L3's tap and ground will do the same thing but will cause resistive loading, which lowers Q. Since a single LC network sets the selectivity of this regenerative detector, it is most important to minimize ANY type of loading.)*

Zener diode D1 regulates the power supply voltage powering Q2, reducing the frequency drift of the oscillating detector when receiving CW and SSB. D1 also drops Q2's drain voltage to a level where its gain is lower. This is important, as too much gain inside a regenerative loop causes unstable, hard-to-control operation. *(Note: This same "trick" has been used since the beginning of regenerative receiver construction. In the 1920s and 30s, it was quite common to power the detector tube at a much lower voltage than the audio stage.)*

The audio is extracted via the JFET source, rather than the drain. This prevents the need for an additional inductance or resistance in the drain circuit (to extract audio), which would cause a signal-variable voltage drop in the detector (causing drift on CW and SSB reception). *(Note: There is a further benefit here: Any resistance in the source provides local negative DC feedback, while any resistance in the drain "deregulates" the detector supply voltage, causing drift. The higher the source resistance, the less JFET drift and gain. A 2.7K ohm value is a good compromise (drift vs. gain) for the J310.)* Resistor R3 and capacitor C11 filter out most of the RF and pass on the audio to the preamp stage.

The Audio Preamp and LP/HP Filters

IC1 is an op-amp preamp which provides a gain of 20 via resistors R4 and R5. Capacitor C12 AC-couples the stage. Resistors R7 and R8 bias the op-amp's "+" input at mid supply. This allows maximum output voltage swing without distortion. C17 keeps this point at AC ground. *(Note: Without C17, there would be no power-supply rejection for this stage. I see many published circuits that use too small a bypass or NO bypass for op-amp single-supply biasing. This is a very common cause of "motor boating," usually cured by the crude expedient of adding an RC network in the op-amp's positive supply, which deregulates the supply voltage.)*

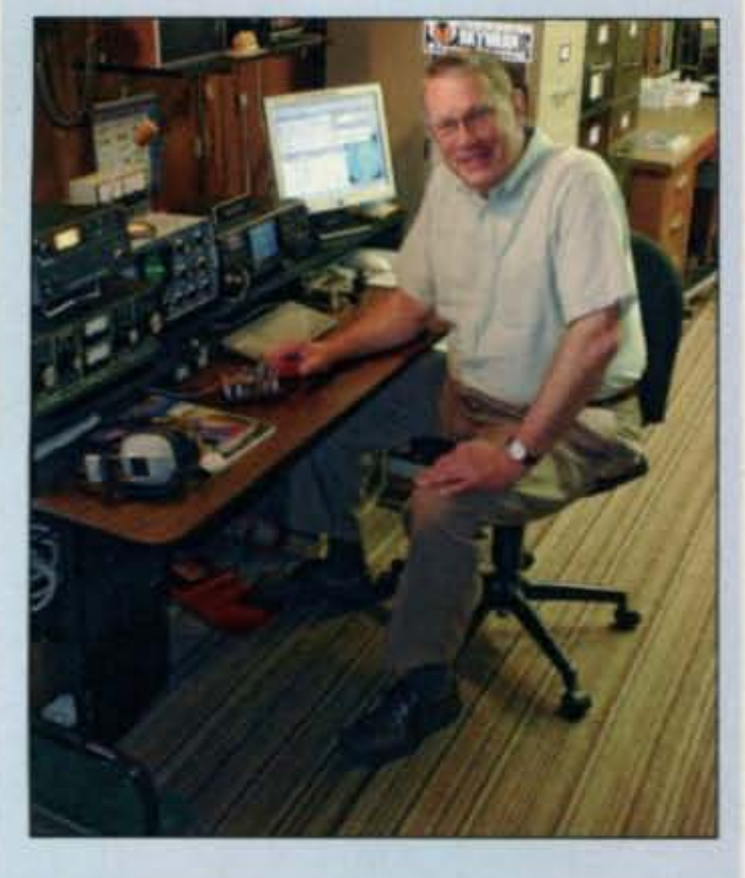
R6 and C13 provide a variable low-pass (LP) filter. Capacitors C14 and C15 and switch SW2 form a switchable high-pass (HP) filter. Together, these reduce the audio bandwidth for added selectivity on SSB or CW.

Audio Power Amplifier

Volume control R9 drives IC2, an LM380N. This 2-watt IC audio amplifier operates at a gain of 50. Resistor R11 and capacitor C21 help prevent parasitic oscillation. Capacitor C22 AC-couples the output. An efficient 4-ohm speaker, or two parallel-connected 8-ohm speakers, should be used for maximum audio volume. Alternatively, Walkman style headphones will provide excellent hi-fi sound quality.

Coil Winding

L2 and L3 can be wound on a variety of plastic forms, including pill bottles. Best of all are plug-in coil forms, which still can be purchased either new or used

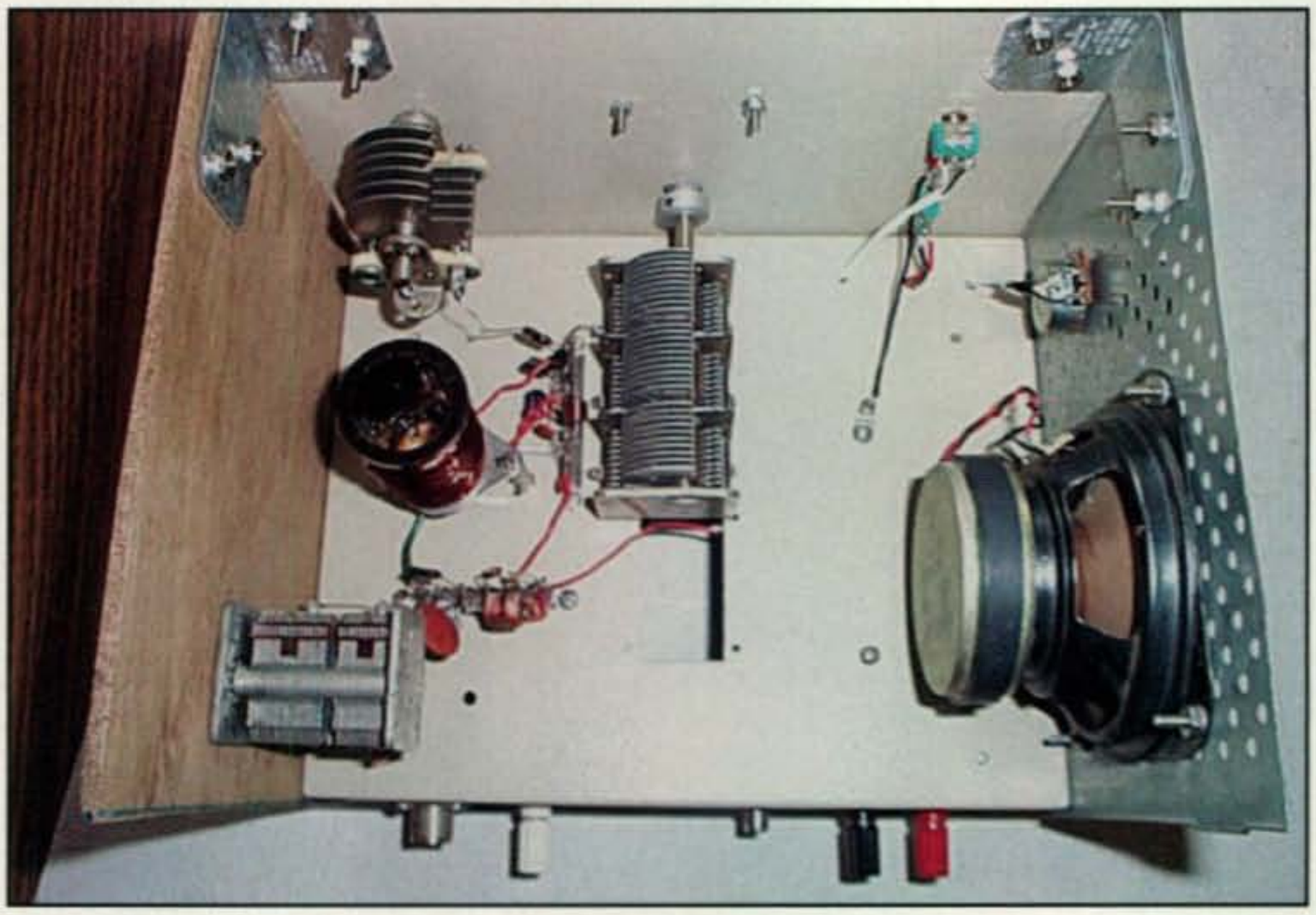


On the Cover

Warm and comfortable. Just what most of us are looking for in February, and that's what struck us about this month's cover photo. Bill Klepser, WB2AIV, shares his warm and comfortable shack in Snyder, New York (a suburb of Buffalo) with his wife, Eleanore, KC2LRF, who graces the March 2010 page of our 2009–10 CQ Amateur Radio Calendar. Bill has been a ham since 1962, and WB2AIV is his original Technician call (he started out as a Novice with WN2AIV), which he reclaimed through the vanity system after moving several times in the '70s and '80s and holding a half dozen different calls.

Bill's ham radio interests have varied over the years. He says he used to be interested in radio-control and flew airplanes using the ham-only 6-meter R/C frequencies, then got active on repeaters in Connecticut in the 1970s. He was inactive for quite some time while life's other demands took priority, but is now active in DXing, public service communications, and volunteer examining. Bill is secretary/treasurer of the Western New York DX Association and VE session coordinator for the Amateur Radio Association of the Tonawandas. He is also active in Skywarn and serves as one of the base operators who gets on the air from the National Weather Service's Buffalo Forecast Office during "weather events" (see this month's "Public Service" column for more on Skywarn).

The shack that Bill and Eleanore share contains a mix of old and new gear. The centerpiece is an ICOM IC-756 ProII transceiver, along with an IC-2KL 500-watt solid-state amplifier. There's also a Heathkit monitor scope and a Dentron 3000A tuner, which feeds signals to either a Butternut HF9V vertical or an 80-meter Windom antenna. We hope that you're staying warm and comfortable—and on the air—this February as well. *(Cover photo by Larry Mulvehill, WB2ZPI)*



Parts layout looking down from the top. The front of radio is at the top of photo. See text for the reason behind the wooden side panel.

(see "Locating Parts"). Variations in coil-form diameter, wire size, spacing between L2/L3, and the capacitance values of C5 and C6 all will change the receiver's tuning range. However, you only need to try out the receiver, and then add turns (tune lower) or subtract turns (tune higher) from L3. You can also use a multi-gang tuning capacitor for C6 and either permanently connect or switch-in additional sections to achieve the desired tuning range.

In all cases, the tap on L3 needs to be located near the ground end of this winding. To wind coils, simply drill two small holes, close together, at the bottom side of the coil form. Then run the wire into and out of these holes and start winding turns around the form, counting as you go. For the tap on L3, sand and solder a new wire at the tap point. At the end of L3, drill two more holes, running the wire through them. Larger sizes of copper wire (#18 or 20) usually will stay put on the form, but for smaller wire, knots can be added at the begin-

Locating Parts

Air variable capacitors, vernier reduction drives, plug-in coil forms, and RF chokes are still readily available. Some possible sources are listed below:

Circuit Boards
FAR Circuits: <http://www.farcircuits.net>

Air Variable Capacitors
National RF, Inc: <http://www.NationalRF.com>
Fair Radio Sales: <http://www.fairradio.com/catalog.php?mode=view&categoryid=954>
Antique Electronics Supply: <http://www.tubesandmore.com/>
Midnight Science: <http://www.midnightscience.com/catalog5.html
Surplus Sales: http://www.surplussales.com/Variables/AirVariables/AirVar2.html>

New Reduction Drives (similar to Jackson):
National RF, Inc: <http://www.nationalrf.com/reduction.html>

Plug-in Coil Forms, 1.25 inch O.D.:
Peebles Originals: <http://www.peeblesoriginals.com/radio-parts.html>
Ocean State Electronics: <http://www.oselectronics.com/ose_p86.htm>
part number CF-6
National RF, Inc: <http://www.nationalrf.com/plugin_coil.htm>

RF Chokes
Hammond 2.5-mH RF choke, part number P-C1535B: Antique Electronics Supply:
<http://www.tubesandmore.com/>
A wide variety of RF chokes: Digikey Corp: <http://www.digikey.com>

ning and at the end of the winding to hold the turns in place. Plug-in coil forms do not need knots, and one drilled hole is normally adequate.

As shown in fig. 2, each coil of the prototype was wound on a 1.25-inch O.D. plug-in plastic form. Note that none of these dimensions is critical: The turns and spacing mainly affect the exact tuning range and this can be easily modified by the builder.

Optimizing the Receiver for Ham or SWL Use

The prototype was configured as a general-coverage receiver. The 150-pF main tuning capacitor was centered on the front panel close to the detector circuit and uses a large vernier dial; a large knob can be substituted here. The smaller fine-tuning capacitor was mounted on the top right side of the front panel, also very close to the detector circuit.

For ham band use, reverse this order: Mount the fine-tuning ("bandspread") control and large vernier in the center of the front panel and use the 150-pF main capacitor as a "bandset" control on the side, using a small knob. "Bandspread" resolution can be set to almost anything desired simply by adding a small capacitor in series with the fine-tuning capacitor. The prototype used a 50-pF variable capacitor in series with a 10-pF mica capacitor.

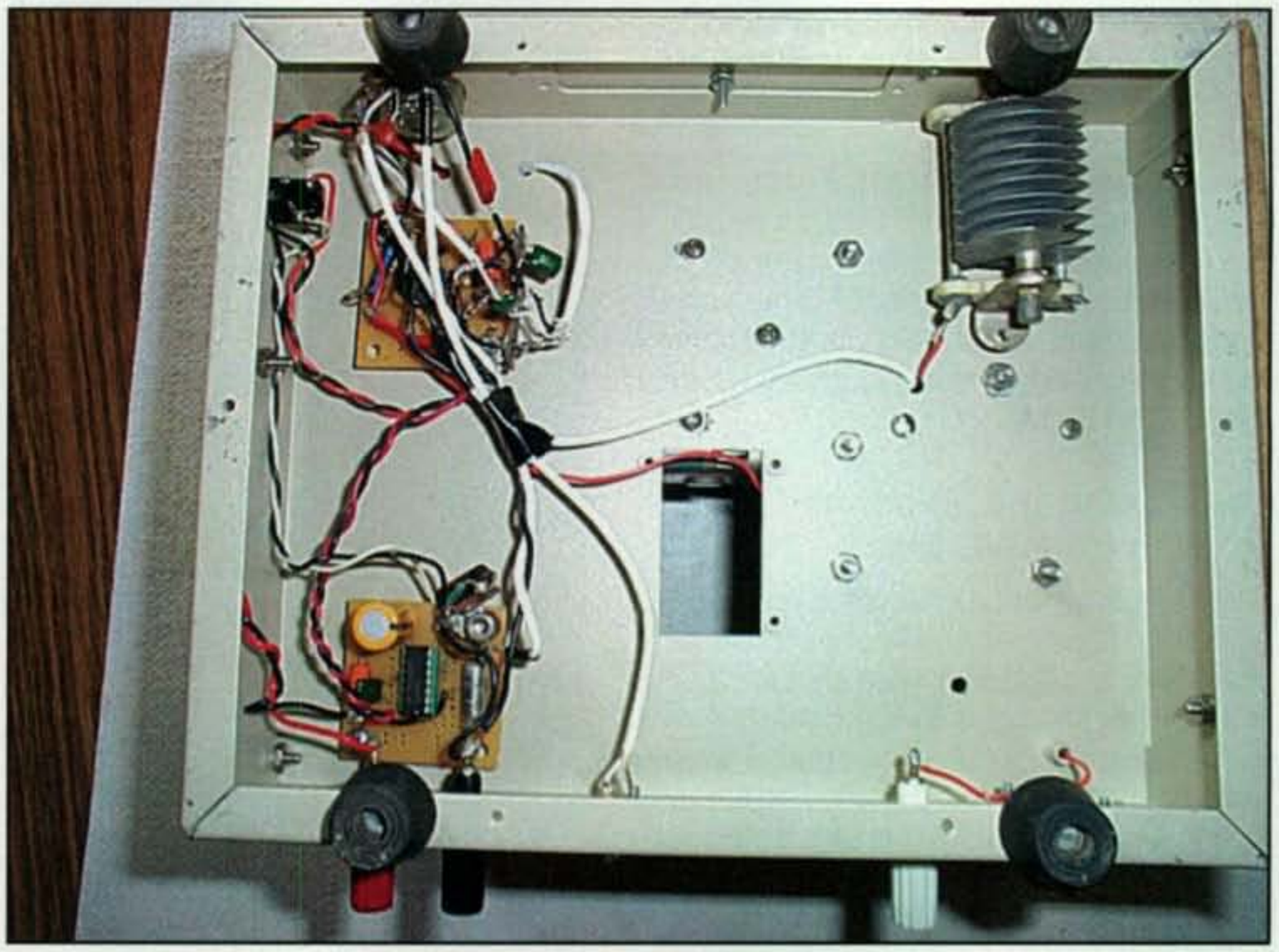
Component Mounting

The prototype was built inside a 9.75-inch long by 2.5-inch high by 8-inch deep metal chassis. A 9.75-inch long by 8-inch high metal front panel was attached, using small screws and nuts. *(Note: I simply used an extra cabinet bottom plate for the metal front panel, as this was just the right size.)* A metal side panel was attached in a similar manner to the left side of the chassis, whereas a wooden panel, using 1/8-inch mahogany plywood was used for the right side panel. The wooden side panel allows the RF input level control capacitor, C3, to be mounted so that it is isolated from ground. In addition, the tuning coil is located on this side of the receiver and its close proximity to the (nonmetallic) wood does not cause loading or reduced selectivity.

Most of the RF components are located on the top of the chassis; the audio sections are placed inside. This helps prevent RF from feeding into the audio and causing "motorboating." In the prototype, the detector circuit and the RF stage were each mounted on a six-terminal strip. The main tuning coil was

mounted on 3/4-inch spacers that raise it above the metal chassis, further helping to prevent loading. Locate the coil as close as possible to both detector and RF stage components; in the prototype, they are about 1/2 inch away on either side.

Although a three-gang tuning capacitor was used in the prototype, only a single section was connected. *(Note: It is quite easy to mount a very small toggle switch directly between the solder lugs [gangs] to produce a multiband receiver. It is most important when doing this to support the switch itself using VERY SHORT connecting wires, rather than mounting it on the front panel using longer wires. Front-panel wiring invariably will cause detector loading with subsequent detuning, as regeneration is increased. The idea here is that the user can reach in from the top and throw the switch, which is wired directly between the solder lugs of the tuning capacitor, using heavy enough wire to support the switch. Lead length with this should be less than 1/2 inch, as the capacitor's lugs are about 1 inch apart. As silly as this may seem, performance is greatly improved over the usual method of mounting a band switch directly onto the front panel. A rotary switch that has its switch wafer spaced a few inches behind the panel [allowing short, direct leads] will also work okay, but is a lot more effort than the simple expedient described here.)*



The bulk of the circuitry is built onto the two small circuit boards mounted on the underside of the receiver.

A 5-inch loudspeaker was mounted to the metal left-hand side panel, as was the LP filter control, R6. A small SPST toggle switch, for the HP filter, is mounted on the left top of the front panel. The LED power indicator light with 2.2k-ohm resistor was mounted right below this, and the SPST on/off power switch right below that.

The RF input control is located near the back of the wooden side panel, very close to the terminal strip containing the RF stage components. The audio volume control was located on the left front panel, near the audio preamp. The headphone jack was mounted on the bottom side of the chassis, close to the same board. The prototype used two small audio PC boards mounted on the inside of the chassis. Both were RadioShack universal breadboards. However, you won't need to breadboard it. FAR Circuits[2] is offering a two-PC board set for this receiver—one for RF and the other for mounting the two audio ICs.

The regeneration control capacitor was located on the bottom right-hand side of the front panel. Drill a hole close to the capacitor to pass a *very short* piece of insulated hookup wire between the capacitor stator (nonrotating portion) and the detector circuit directly above.

Mount the two antenna input connectors, a UHF-type (SO-239) and a five-way binding post, to the rear panel of the chassis. Do the same with the two power-supply connectors and the RCA-type audio output jack; this can drive a

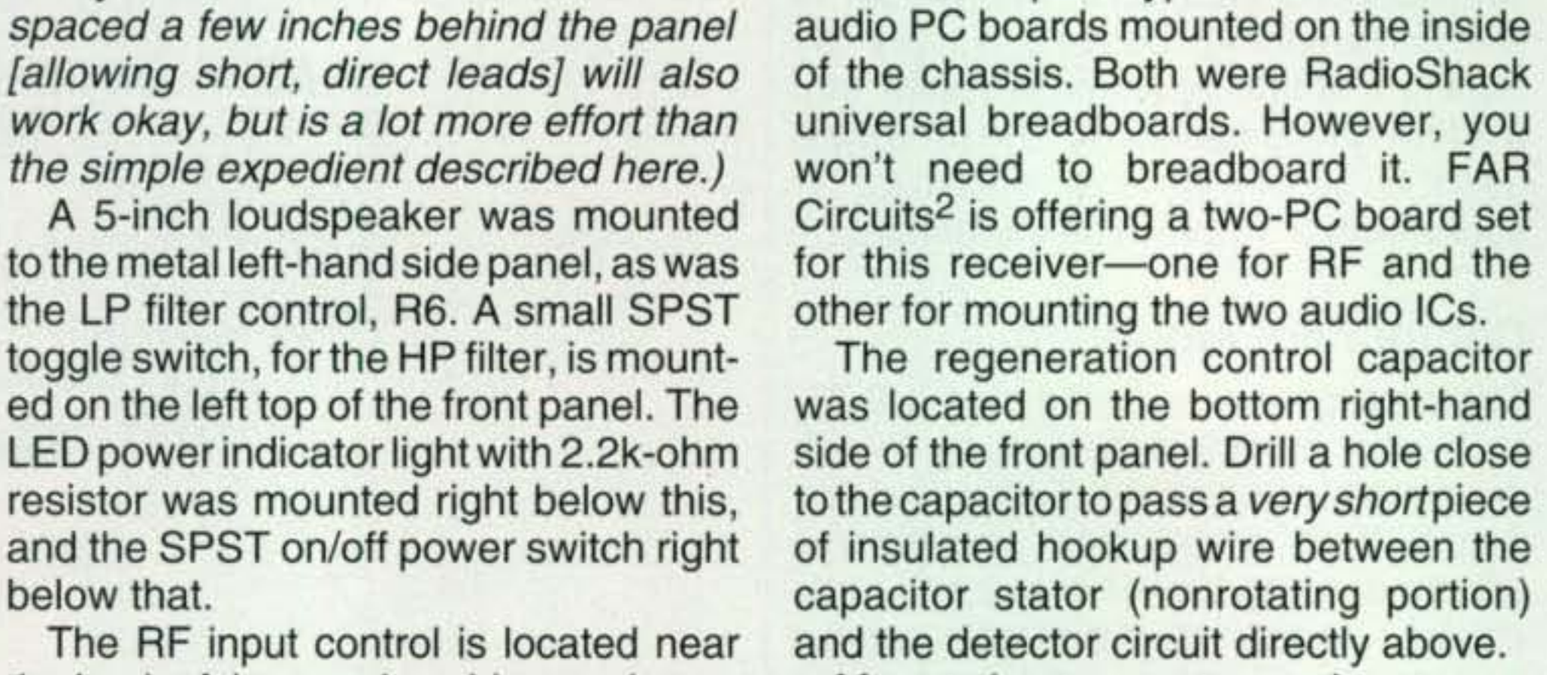
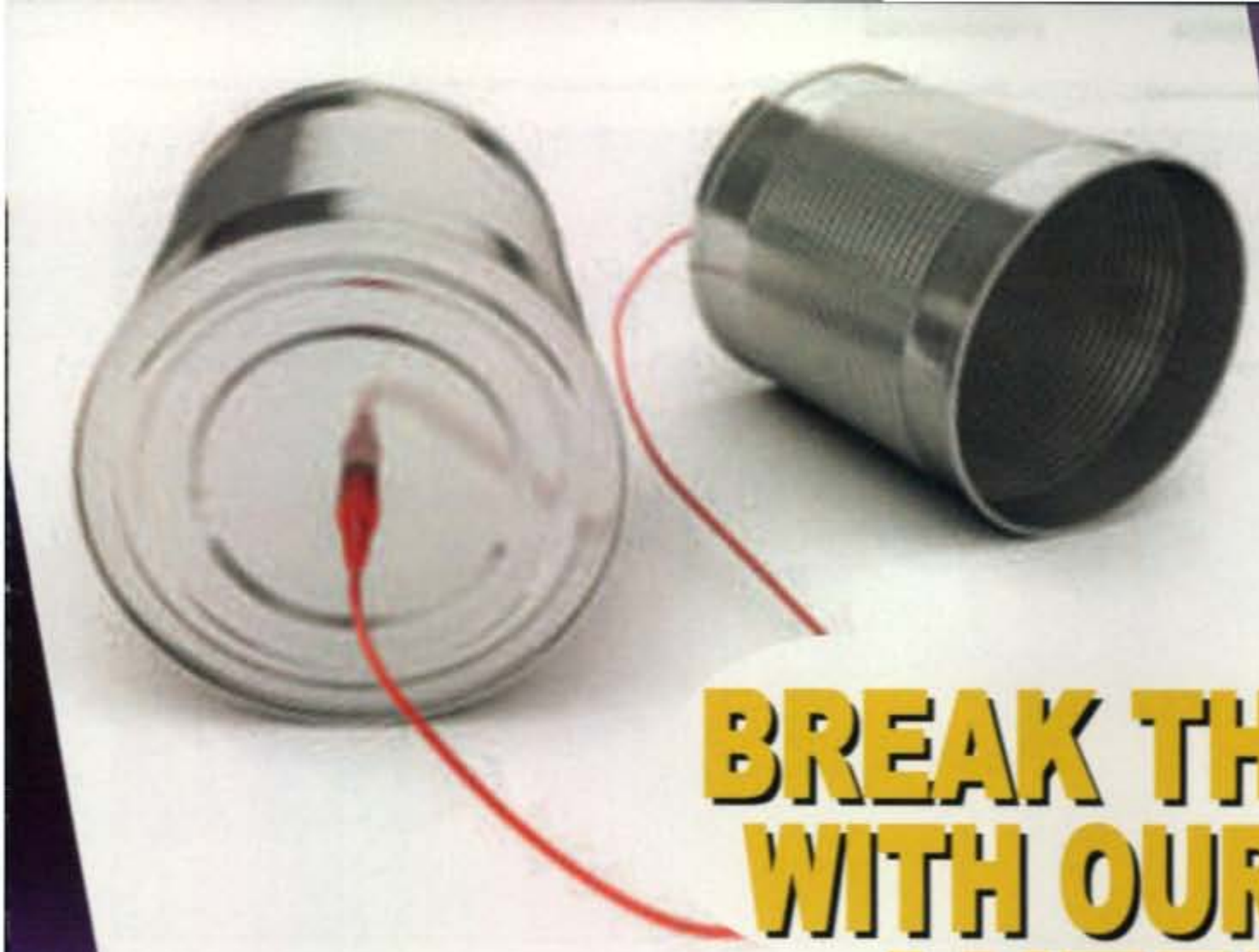


Fig. 3– Device pinouts.



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tape recorder or an external audio amplifier.

Wiring Guidelines

Power-supply wiring for both boards used hand-twisted wire. You should use shielded wire for all of the audio-stage connections (preamp, LP and HP filters, audio power amplifier), connecting only one side of the shield to ground. Short lengths of wire then can be used to connect the grounds of each board and the volume control together and to chassis ground.

All wiring should be as short and direct as possible. General rule: If it can be made shorter, it's too long! The coil wiring and the regeneration capacitor wiring are the most critical. Long wire lengths will often produce a regen receiver that "works" but suffers from bad effects. Fig. 3 shows device pinouts.

Operating this radio is a two-handed job. One hand spins the tuning dial while the other controls the regeneration level, as the two controls work in tandem.

Power Supply

Batteries are always the best power supply to use with a regenerative set. The measured quiescent supply current for this receiver is 28 mA. Two 6-volt, 12-amp-hour lantern batteries in series will power this receiver intermittently for many months. It can also be operated at 18 volts, using two 9V batteries in series. If you do this, power Q1 off the bottom 9V battery (+9V) and the rest of the set off +18V. Increase R10 to 6.2K ohms and R12 to 3.3K ohms. There will be slightly less RF gain through Q1, but IC2 will now provide more audio output power. If an AC power supply is desired, be sure that it is well filtered and that it uses a three-prong AC plug so that "AC ground" and your antenna ground are at the same potential.

Testing

Build and test each section individually, starting with the final audio output stage. Connect a speaker or headphones to this, and then test using an external audio input signal via the line output jack, or just place your finger on the "hot" side of the volume control and listen for a buzz. Repeat this procedure with a signal applied to the preamp. Then test the regenerative detector. Use a DVM to check the Zener voltage (+6.8V) and detector source (approximately +1V to +1.5V). If these look reasonable, temporarily connect a short length of wire (a few feet) to the L2 side of C4, or you can use a long wire antenna connected to the other side. Turn up the volume control part way, then slowly advance the regeneration control. You should hear a "live" sound (background static) or stations as you adjust the receiver tuning. If no oscillation occurs, carefully recheck the wiring. Common mistakes include wiring the JFET source and drain backwards, locating the tap on the wrong side of L3, or using a regeneration control capacitor with shorted plates. Also common is the use of RFCs that are microHenry rather than milliHenry. The RFCs should be wire-wound types, approximately 3/8 to 3/4 inch long.

Next test the RF stage. There should be near full supply voltage at the drain of Q1 and *about* +1V DC at the source. Slight variations here are normal. (*Note: This stage should operate at about 5 ma. Operating current is set by R1 and by the JFET characteristics, which vary. R1 can be increased to more fully protect Q1 against overload, with a consequent reduction in stage gain. Also, if R1 is made too large, AM detection of strong local broadcast stations [reverse biasing of Q1] may occur, although this is rare in a grounded -gate JFET RF stage.*)

With the receiver completed, ensure that regeneration control is effective throughout the entire tuning range. If regeneration turns on or off abruptly, or if the oscillation point on the control is consistently too close to the minimum setting of C7, then capacitor C10 should be installed or increased. The greater this capacitance, the less regeneration there will be for the same setting of C7. Another important test is to ensure that the detector goes through the oscillation point very smoothly, without receiver detuning or parasitic (super regenerative) oscillations. Detuning can occur when a strong RF signal is feeding the detector, or if there is detector loading; both are controlled by C3.

Operation

When finding a station, it's best to use two hands—one for tuning and the other for controlling regeneration. Adjusting the RF input level control, C3, will always be a compromise between sensitivity and selectivity. Begin by setting C3 to mid capacitance, and then tune the receiver with the regen control set slightly above oscillation. When a band of stations is found, reduce the regen level below oscillation for AM signals or above oscillation for CW and SSB. If more sensitivity is needed, increase C3; if better separation between stations (selectivity) is needed, reduce C3. Blocking may occur when receiving very strong CW or SSB stations. Blocking prevents you from detuning to the side of the carrier to get the desired "beat note." Reducing C3 will prevent blocking. Increasing the regen level will also prevent blocking and at the same time operate the detector at a higher level, which will reduce frequency drift considerably. Use the audio filters to further improve selectivity.

Notes

1. Junction Field Effect Transistor.
2. See "Locating Parts" sidebar.

What You've Told Us...

Our September survey asked for your views on amateur radio's status at the FCC. Nearly half of you who responded (48%) feel that the five FCC commissioners are slightly knowledgeable about amateur radio, while 26% say "somewhat," 20% say "not at all" and 4% think they are very knowledgeable about our hobby. The majority of you (52%) feel that amateur radio has a lower priority than many other services in the views of the five commissioners, while 20% feel it has a very low priority, 17% feel it is treated equally with other services and only 4% believe ham radio has a higher priority.

Moving to the FCC staff level, 40% of you feel the Wireless Telecommunications Bureau staff is somewhat knowledgeable about the amateur service, while 35% feel the staff's knowledge is only slight, 12% say very knowledgeable, and 9% say the staff knows nothing about amateur radio.

As a group, you don't have a very positive impression of how the WTB feels about amateur radio, with 38% of you saying the bureau staff has the best interests of amateur radio at heart only some of the time and 36% of you answered the question with a flat-out "no." In addition, 8% didn't know, and only 3% of you feel the WTB staff has our back most or all of the time.

The majority of you (53%) feel that the FCC commissioners rely on a combination of staff advice and filed comments when deciding a ham-related issue; 23% think they rely entirely on staff recommendations, 20% don't know and 5% think they rely entirely on comments received. A small majority (51%) believe comments from organizations carry more weight than those from individuals, while 19% don't know, 15% feel only the ARRL's comments carry more weight and 14% feel all comments are treated equally.

Finally, opinions were split on *whether* organizational comments should carry more weight, with 38% of you saying comments should be considered only based on their content, while 32% said organizations' comments reflect the views of many hams and should carry more weight. In addition, 19% said ARRL's comments should be given priority since it is ham radio's main voice, but 11% felt organizations' comments tend to promote their own interests more than those of hams as a group.

This month's free subscription winner is John Thompson, K6OHM (great call!) of Tustin, California.

Reader Survey February 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 find out about your use of VHF/UHF FM (including D-STAR and APRS) mobile rigs, which are the focus of our annual Market Survey article in this month's issue.

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

1. Do you own one or more VHF/UHF FM mobile transceivers or plan to purchase one in the next 12 months?

Own and do not plan to buy 29
Own and plan to buy 30
Don't own but plan to buy 31
No to both 32

3. Are you currently considering purchasing any of the following (circle all that apply)?

Single-band 2-meter mobile rig 33
Single-band rig for other VHF/UHF band 34
Dual/multiband VHF/UHF rig 35
None 36

4. Have you used or do you plan to use our annual Market Survey articles to help you decide which radio to buy?

Yes, have used 37
Yes, plan to use 38
Don't remember 39
No 40

5. Where do you most frequently use your VHF/UHF FM mobile rig(s)? (Choose all that apply for multiple radios.)

In a car/minivan/SUV/pickup 41
On a motorcycle 42
On a boat 43
In a different type of vehicle (e.g., bus, plane, bicycle) 44
In a home station 45

6. For what activities do you generally use your VHF/UHF FM mobile radio(s)? (Choose all that apply.)

General ragchewing on repeaters 46
Simplex communications 47
Public service and emergency communications 48
Nets 49
APRS 50
Other (non-APRS) packet 51
D-STAR 52
Long-distance Echolink/IRLP contacts 53

7. Which of the following VHF/UHF FM bands do you regularly use?

6 meters (52 MHz) 54
2 meters (144 MHz) 55
1.25 meters (222 MHz) 56
70 centimeters (440 MHz) 57
902 MHz 58
1.2 GHz 59
None 60

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

Announcing:

The 2010 CQ World-Wide WPX Contest

SSB: March 27–28, 2010 CW: May 29–30, 2010

Starts: 0000 GMT Saturday Ends: 2359 GMT Sunday

(**Note changes to the Multi-Operator Single Transmitter Rule**)

I. Objective: For amateurs worldwide to contact as many amateurs and prefixes as possible during the contest period.

II. Period of Operation: 48 hours. Single Operator stations may operate 36 of the 48 hours—*off times must be a minimum of 60 minutes* during which no QSO is logged. Multi-operator stations may operate the full 48 hours.

III. Bands: Only the 1.8, 3.5, 7, 14, 21, and 28 MHz bands may be used. *Observance of established band plans is strongly encouraged.*

IV. Terms of Competition for All Categories:

(a) All entrants must operate within the limits of their chosen category when performing any activity that could affect their submitted score. Only the entrant's callsign may be used to aid the entrant's score.

(b) A different callsign must be used for each entry.

(c) All entrants must not exceed 1500 watts total output power, or the maximum output power of their country, or the power limit of their entry category, whichever is less, on any band.

(d) Self-spotting or asking other stations to spot you is not allowed.

(e) Use of QSO alerting assistance is limited to the Single Operator Assisted and Multi-Operator categories. QSO alerting assistance is the use of any technology or outside method that provides callsign and frequency information regarding any other station to the operator. It includes, but is not limited to, use of DX cluster, packet, local or remote call and frequency decoding technology (e.g., Skimmer), Internet chat rooms or websites, and operating arrangements involving other individuals.

(f) All operation must take place from one operating site. Transmitters and receivers must be located within a 500-meter diameter circle or within the property limits of the station licensee, whichever is greater. All antennas must be physically connected by wires to the transmitters and receivers used by the entrant.

(g) The entry location of a remote station is determined by the physical location of the transmitters, receivers, and antennas. A remote station must obey all station and category limitations.

V. Entry Categories:

A. Single Operator Categories: Only one person (the operator) can contribute to the final score during the official contest period. Only one transmitted signal is permitted at any time. QSO alerting assistance of any kind places the entrant in the Single Operator Assisted category (see subsection B below).

(a) Single Operator High (All Band or Single Band): One person performs all of the operating and logging functions. QSO alerting assistance is not permitted. Total output power must not exceed **1500 watts.**

(b) Single Operator Low (All Band or Single Band): One person performs all of the operating and logging functions. QSO alerting assistance is not permitted. Total output power must not exceed **100 watts.**

(c) Single Operator QRP (All Band or Single Band): One person performs all of the operating and logging functions. QSO alerting assistance is not permitted. Total output power must not exceed **5 watts.**

B. Single Operator Assisted Categories: All operating and logging functions are performed by one person (the operator). Only one transmitted signal is permitted at any time. Entrants in this category may use QSO alerting assistance.

(a) Single Operator ASSISTED High (All Band or Single Band): Total output power must not exceed **1500 watts.**

(b) Single Operator ASSISTED Low (All Band or Single Band): Total output power must not exceed **100 watts.**

C. Single Operator Overlay Categories: Single Operator entrants may **also** submit their log for **one** of the categories shown below by adding an additional line in the Cabrillo log file header called CATEGORY-OVERLAY.

(a) Tribander/Single Element (TB-WIRES): During the contest an entrant shall use only one (1) tribander (any type, with a single feed line from the transmitter to the antenna) for 10, 15, and 20 meters and single-element antennas on 40, 80, and 160 meters.

(b) Rookie (ROOKIE): To enter this category the operator must have been licensed as a radio amateur three (3) years or less on the date of the contest. Indicate the date first licensed in the SOAPBOX field.

D. Multi-Operator Categories (All Band, High power only): More than one person can contribute to the final score during the official contest period. Select category based on number of transmitted signals. **Total output power of each transmitted signal must not exceed 1500 watts.**

(a) Single-Transmitter (MULTI-ONE): Only one transmitted signal is permitted at any time. A maximum of ten (10) band changes may be made in any clock hour (00 through 59 minutes). For example, a change from 20 meters to 40 meters and then back to 20 meters counts as two band changes. Use a single serial number sequence for the entire log.

(b) Two-Transmitter (MULTI-TWO): A maximum of two transmitted signals is permitted at any time on different bands. Either transmitter may work any and all stations. A station may only be worked once per band regardless of which transmitter is used. **The log must indicate which transmitter made each QSO** (column 81 of CABRILLO QSO template for CQ contests). Each transmitter may make a maximum of eight (8) band changes in any clock hour (00 through 59 minutes). For example, a change from 20 meters to 40 meters and then back to 20 meters counts as two band changes. Use a separate serial number sequence for each band.

(c) Multi-Transmitter (MULTI-UNLIMITED): No limit to transmitters, but only one transmitted signal (and running station) allowed per band at any time. Use a separate serial number sequence for each band.

VI. Exchange: RS(T) report plus a progressive contact serial number starting with 001 for the first contact. *Note:* Multi-Two and Multi-Multi entrants use separate serial number sequences on each band starting with serial number 001.

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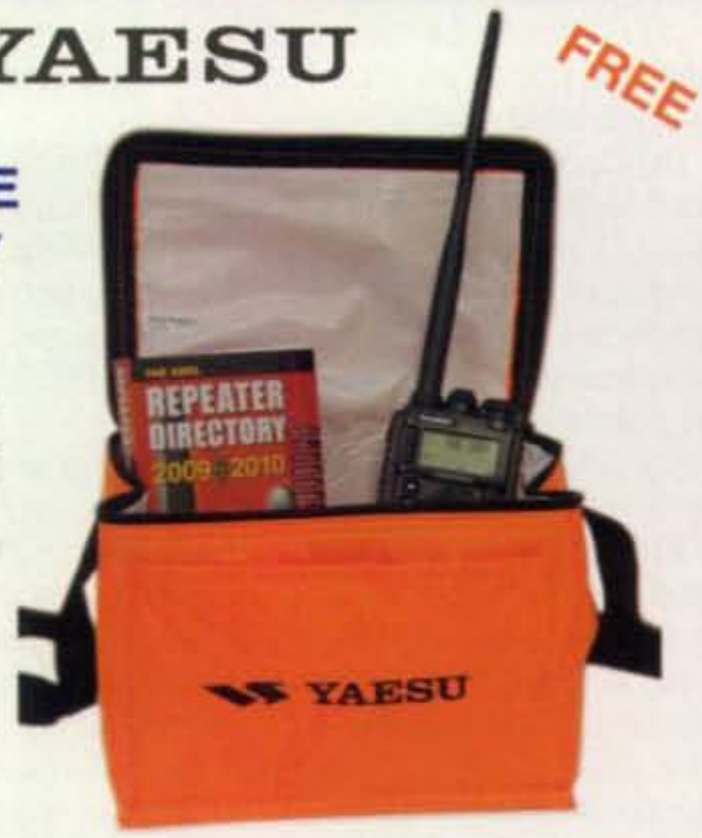

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VII. Contact Points:

(a) Contacts between stations on different continents are worth three (3) points on 28, 21, and 14 MHz and six (6) points on 7, 3.5, and 1.8 MHz.

(b) Contacts between stations on the same continent, but different countries, are worth one (1) point on 28, 21, and 14 MHz and two (2) points on 7, 3.5, and 1.8 MHz. *Exception:* For North American stations only—contacts between stations within the North American boundaries (both stations must be located in North America) are worth two (2) points on 28, 21, and 14 MHz and four (4) points on 7, 3.5, and 1.8 MHz.

(c) Contacts between stations in the same country are worth 1 point regardless of band.

VIII. Prefix Multipliers: The prefix multiplier is the number of valid prefixes worked. Each PREFIX is counted only once regardless of the band or number of times the same prefix is worked.

(a) A PREFIX is the letter/numeral combination which forms the first part of the amateur call. Examples: N8, W8, WD8, HG1, HG19, KC2, OE2, OE25, LY1000, etc. Any difference in the numbering, lettering, or order of same shall count as a separate prefix. A station operating from a DXCC country different from that indicated by its callsign is required to sign portable. The portable prefix must be an authorized prefix of the country/call area of operation. In cases of portable operation, the portable designator will then become the prefix. Example: N8BJQ operating from Wake Island would sign N8BJQ/KH9 or N8BJQ/NH9. KH6XXX operating from Ohio must use an authorized prefix for the U.S. 8th district (/W8, /AD8, etc.). Portable designators without numbers will be assigned a zero (Ø) after the second letter of the portable designator to form the prefix. Example: PA/N8BJQ would become PAØ. All calls without numbers will be assigned a zero (Ø) after the first two letters to form the prefix. Example: XEFTJW would count as XEØ. Maritime mobile, mobile, /A, /E, /J, /P, or interim license class identifiers do not count as prefixes.

(b) Special event, commemorative, and other unique prefix stations are encouraged to participate. Prefixes must be assigned by the licensing authority of the country of operation.

IX. Scoring: A station may be worked once on each band for QSO point credit. Prefix credit may be taken only once.

(a) Single-Operator:

(i) All-Band score is total contact points from all bands multiplied by the number of different prefixes worked.

(ii) Single-Band score is total contact points on the band entered multiplied by the number of different prefixes worked on that band only.

(b) Multi-Operator: Scoring is the same as Single-Operator, All-Band.

X. Awards: Only logs submitted in electronic format are eligible for awards. A single-band log will be eligible for a single-band award only.

(a) Plaques are awarded to recognize top performance in a number of categories. View the current list of plaques and sponsors at <http://www.cqwpx.com/plaques.htm>.

A station winning a World plaque will not be considered for a subarea award. That award will be given to the runner-up for that area if the number of entries justifies the award.

(b) Certificates will be awarded to the highest scoring station in each category listed under Section V . . .

(i) In every participating country.

(ii) In each call area of the United States, Canada, Australia, European Russia, Asiatic Russia, Spain, and Japan.

(iii) At the discretion of the contest director second- and third-place awards may be made.

XI. Club Competition: A plaque will be awarded each year to the club that has the highest aggregate score from logs submitted by its members. To be listed in the results, a minimum of three logs must be received from a club.

(a) The club must be a local group and not a national organization (e.g., ARRL or DARC).

(b) Participation is limited to members residing in or operating from a local geographic area defined as within a 275 km radius from center of club area (except for DXpeditions specially organized for operation in the contest).

(c) Single-operator entries can only contribute to one club. Multi-operator scores may be allocated to multiple clubs as indicated with the entry. Please spell out the full club name in your entry.

XII. Instructions for Submission of Logs: We would appreciate receiving all logs in electronic format. Electronic submission of logs is **required** for anyone competing for an award and for all who use a computer to log the contest or prepare contest logs.

(a) The log MUST show the following for each contact: correct time in GMT, frequency (or band), call, serial number sent, and serial number received. A log without all required information may be reclassified to checklog.

(b) Single band entrants are required to include all contacts made during the contest period, even if on other bands. Only contacts made on the band specified in the Cabrillo header or summary sheet will be considered for scoring purposes.

(c) The CABRILLO file format is the standard for logs. For detailed instructions on filling out the CABRILLO file header, see the WPX Contest Web site <www.cqwpx.com>. Failure to fill out the header correctly may result in your entry being placed in the wrong category or reclassified as a checklog. Note: U.S. stations must indicate the ARRL Section of where you operated from in the CABRILLO header (e.g., ARRL-SECTION: OH).

(d) E-mail is the expected method of log submission. SSB logs in CABRILLO format should be sent to <ssb@cqwpx.com>. CW logs in CABRILLO format should be sent to <cw@cqwpx.com>. Include only your call sign in the "Subject:" line of your e-mail. All logs received via e-mail will be confirmed via e-mail. A listing of logs received can be found on the CQ WPX website at <www.cqwpx.com>.

(e) Instructions for NON-CABRILLO electronic logs: If you are not able to submit a CABRILLO format log, please contact the Contest Director for assistance with submitting another format.

(f) Instructions for paper logs: Paper logs may be mailed to CQ Communications, Inc., 25 Newbridge Road, Hicksville, NY 11801 USA. Each paper log entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, and the entrant's name and mailing address in BLOCK LETTERS. Indicate SSB or CW on your envelope.

XIII. Disqualification: Violation of amateur radio regulations in the country of the contestant, or the rules of the contest; unsportsmanlike conduct; taking credit for excessive unverifiable QSOs or unverifiable multipliers will be deemed sufficient cause for disqualification. Incorrectly logged calls will be counted as unverifiable contacts.

ANY use by an entrant of any non-amateur means including, but not limited to, telephones, email, Internet, Instant Messenger, chat rooms, VoIP, or the use of DX cluster to SOLICIT, ARRANGE, or CONFIRM any contacts during the contest is unsportsmanlike and the entry is subject to disqualification.

An entrant whose log is deemed by the Contest Committee to contain a large number of discrepancies may be disqualified from eligibility for an award, both as a participant operator or station, for one year. Disqualification of an entrant in any CQ contest will lead to checklog status in all CQ contests for a period of one year. If an operator is disqualified a second time within five years, he/she will be ineligible for any CQ contest awards for three years.

XIII. Declaration: By submitting an entry in the CQ WPX Contest you agree that: (1) you have read and understood the rules of the contest and agree to be bound by them, (2) you have operated according to all rules and regulations of your country that pertain to amateur radio, (3) your log entry may be made open to the public, and (4) all actions and decisions of the WPX Contest Committee are official and final.

XIV. Deadline: All entries must be emailed or postmarked NO LATER than 28 days after the contest (April 25, 2010 for SSB section and June 27, 2010 for the CW section). All logs, including e-mail entries, are subject to these deadlines. Logs postmarked after the deadline may be ineligible for any awards.

Questions pertaining to the CQ WW WPX Contest may be e-mailed to the WPX Contest Director, Randy Thompson, K5ZD, at <k5zd@cqwpx.com>.

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op ed

BY GORDON WEST, WB6NOA

Emergency Communicators to FCC: "Read the Rules"

The following commentary, on an important ham radio issue of the day, represents only the views of the author and does not necessarily reflect the views of CQ *magazine or its publisher, CQ Communications, Inc. A different perspective on the same issue may be found in the "Emergency Communications" column of the January 2010 issue of* WorldRadio Online.

As fellow Em Comm volunteers, we know the value of a ham radio advisor within a served agency. That agency could be the American Red Cross, the National Weather Service, Search and Rescue, or as innocuous as the local animal shelter which volunteers to take in dogs and cats after a big flood.

However, FCC Attorney Laura Smith, in a harsh statement, says hams who work for emergency response agencies may not participate in amateur radio drills on behalf of their agencies: "If they are (an) … employee, they may not use the radio on behalf of their employer—period." She further details that even if the amateur operator is off duty or on his (or her) lunch hour, and even though his job description does not include the so-called operation of the amateur radio, and even though he may not be getting paid specifically to take part in a drill, "there are no machinations you come up with, there is no loophole in the rule."

This deals specifically with "pecuniary interest," and the illegal use of ham radio to specifically benefit your employer. It makes sense to me, but shouldn't we be more concerned with the content of the actual drill or exercise in ham communications than a blanket statement of illegality to work a drill if you are employed in any agency that has *anything* remotely to do with disaster preparation?

The animal shelter ham vet can't take part in an evacuation scenario drill? The hospital ham receptionist can't check in on the local weekly ARES net? The local TV weatherman can't work a simulated tornado drill?

Retired FCC enforcer Riley Hollingsworth once wrote, "…it is ok so long as the station is being used for amateur purposes and not for county or agency business. To say otherwise would result in a situation where a licensee could not use the system at the county building merely because they are on the payroll. …a ham operator is not barred from using an amateur station in an agency or county building just because he happens to work for the agency or county." (The full transcript of that message may be requested by e-mail from <decision @sbcglobal.net>.)

Emergency agencies throughout the country are directing their staffs to have no on-air part of any ham radio activity that has anything remotely to do with the function of their agency. All the hard work we have put in to support our local served agencies has been undone by one view of rule interpretation.

Under current interpretation of FCC rules, the ham station at the National Weather Service's Juneau, Alaska, forecast office is off limits to any ham who happens to work for the weather service. (Photo by Larry Mulvehill, WB2ZPI)

Should we not judge the pecuniary interest potential rule violation by the content of the communication? If the vet indicates his shelter can take stray animals at $20 a pop, no good. An NGO (non-governmental organization) using ham Pactor airmail to bring in daily supplies to their shelter, no good. A for-profit ocean weather routing service guiding ham buddies around the Pacific high, no good.

It's the content, not the employee contract, that should spell what we as employees might offer in disaster preparedness. The fact of employment should not prevent us from fulfilling one of the fundamental purposes of amateur radio, Part 97.1 (a), recognition and enhancement of the value of the amateur service to the public as a voluntary, non-commercial communications service, *particularly* with respect to providing emergency communications.

As one of the three authors of a petition for rule making that adds a single paragraph, and the words "… without regard to whether the amateur operator has related employment … ," I hope you will carefully study all views on this issue and support your own beliefs with comments that you may direct to me (or go direct) and I will forward them to the Commission within the comment period.

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

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math's notes

BY IRWIN MATH,* WA2NDM

An Experimental Transmission Project

In reply to many inquiries we have received regarding your interest in optical communications, this month we decided to revisit the transmission system scheme we described a few years ago in an effort to "stimulate" you to get involved with other unusual technologies. Although the original system was intended to be used to experiment with optical communications, you will see how a slight modification can be used with other forms of "carriers" in addition to optical and can therefore be the basis of a system for the curious experimenter.

Fig. 1 is a block diagram of the original system.

*c/o CQ magazine

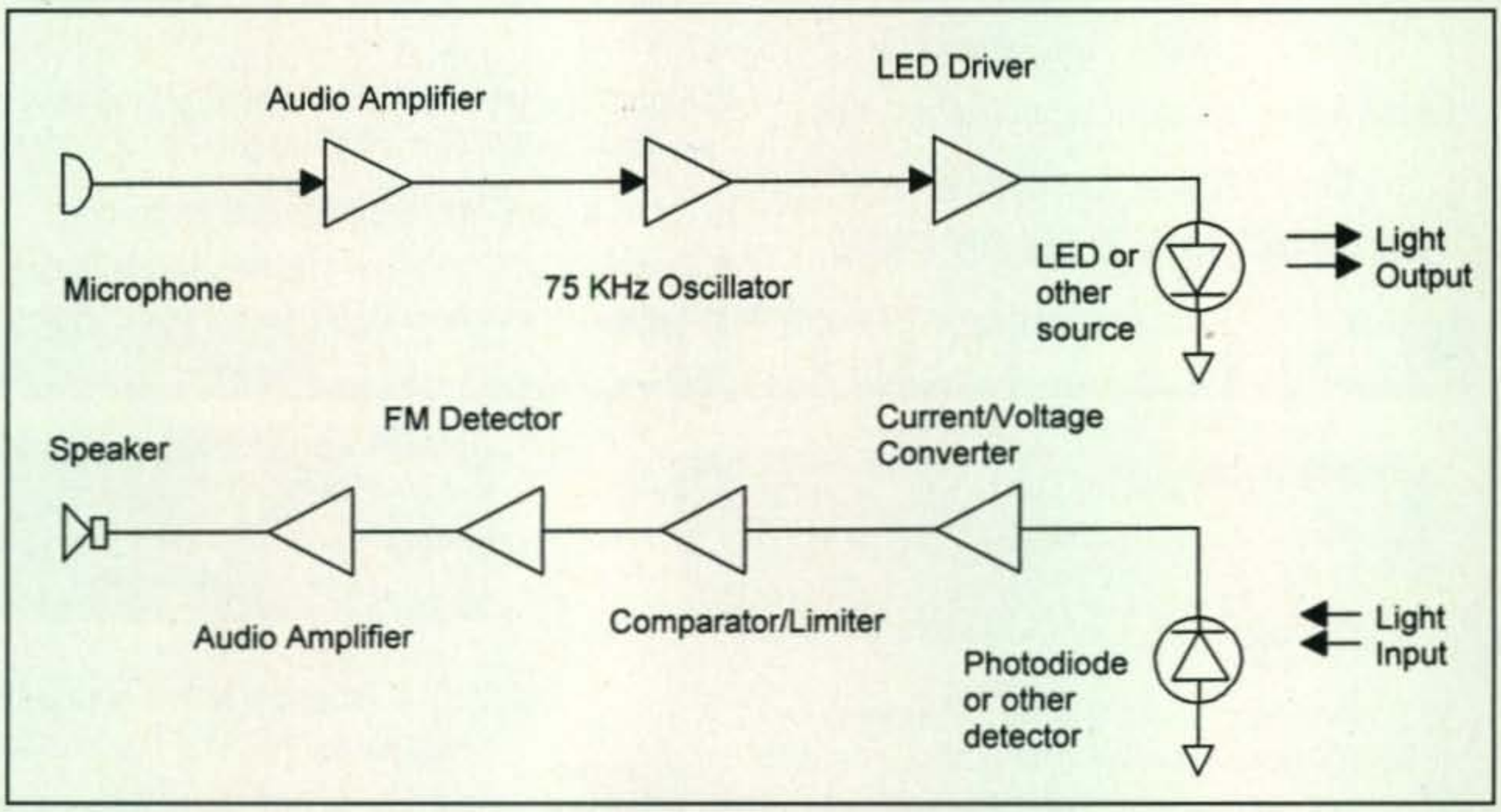
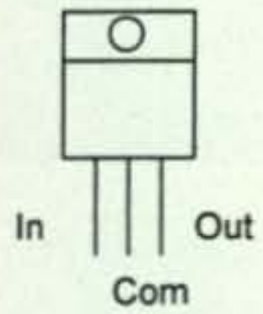


Fig. 1– Block diagram of the FM transmitter/receiver.

Fig. 2– Regulated 8-volt power supply. Note: You might wish to screw the tab of the 7808 to a 2 × 2 inch metal plate for heat-sinking purposes. Also note that the circuit within the dotted lines may be replaced by a suitable wall-type plug-in power supply.



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Boost battery voltage as low as 9 Volts back up to 13.8 VDC! Keeps your transceiver at full power output, provides full performance/efficiency, prevents output signal distortion and transceiver shutdown. Compensates for run-down battery, wiring voltage drop or when car is off. Provides up to 25 Amps peak with 90% efficiency. Selectable 9/10/11 Volts minimum input voltage prevents battery damage from over-discharging. RF sense turns MFJ-4416B off during receive to save power and increase efficiency. Adjustable 12 to 13.8 VDC output pass-through voltage improves efficiency and lets transceiver run cooler. Has output over-voltage crowbar protection. *Anderson PowerPoles*® and high-current 5-way binding posts for DC input, regulated output. 7¾Wx4Hx2⅛D inches.

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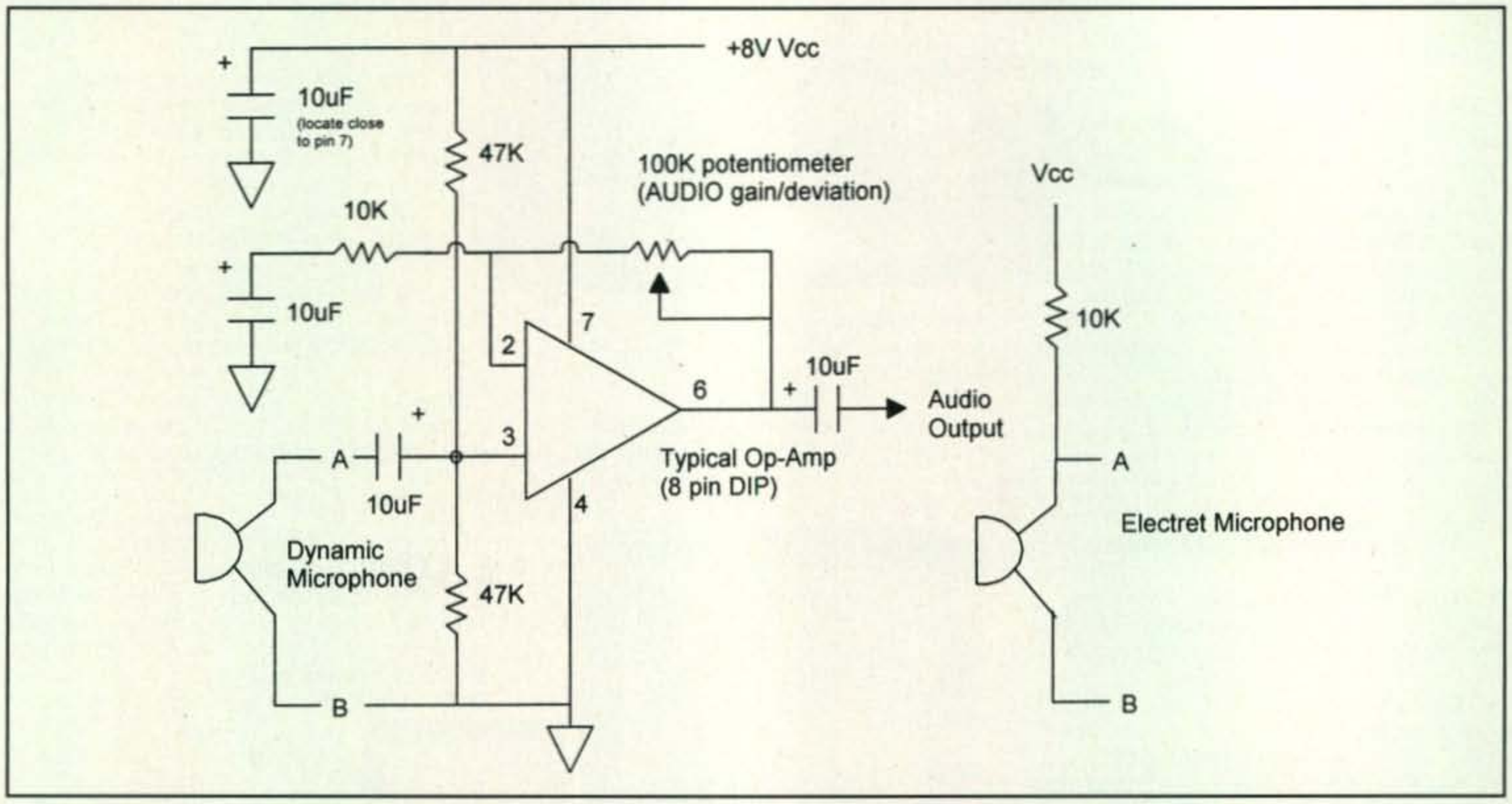

Fig. 3– Microphone pre-amplifier stage. Note that the points marked "A" and "B" can also be an audio connector.

The transmitter accepts audio from a microphone, amplifies it, and then drives a 75-kHz (nominal) voltage-controlled oscillator. The oscillator is configured from an LMC555 timer chip and produces a 0- to 5-volt logic level output pulse stream that is FM modulated by the incoming audio. The resulting output is then applied to a driver stage which drives an LED light source (or other load as we will discuss later). At the receiver a photodiode (or other detector) converts the received light pulses into small current pulses. A current-to-voltage preamplifier stage then amplifies these pluses and converts them into voltage pulses that are subsequently applied to a comparator. The comparator produces 0- to 5-volt logic levels and acts as a sort of digital limiter. The output of this stage is at a level that is adequate to operate the LM568 FM detector. In this stage the FM modulated pulse stream is converted back into audio. The resulting audio is then amplified and applied to a speaker. The circuitry is simple enough for the average amateur to build, and this month and next we will take you through building such a system one step at a time.

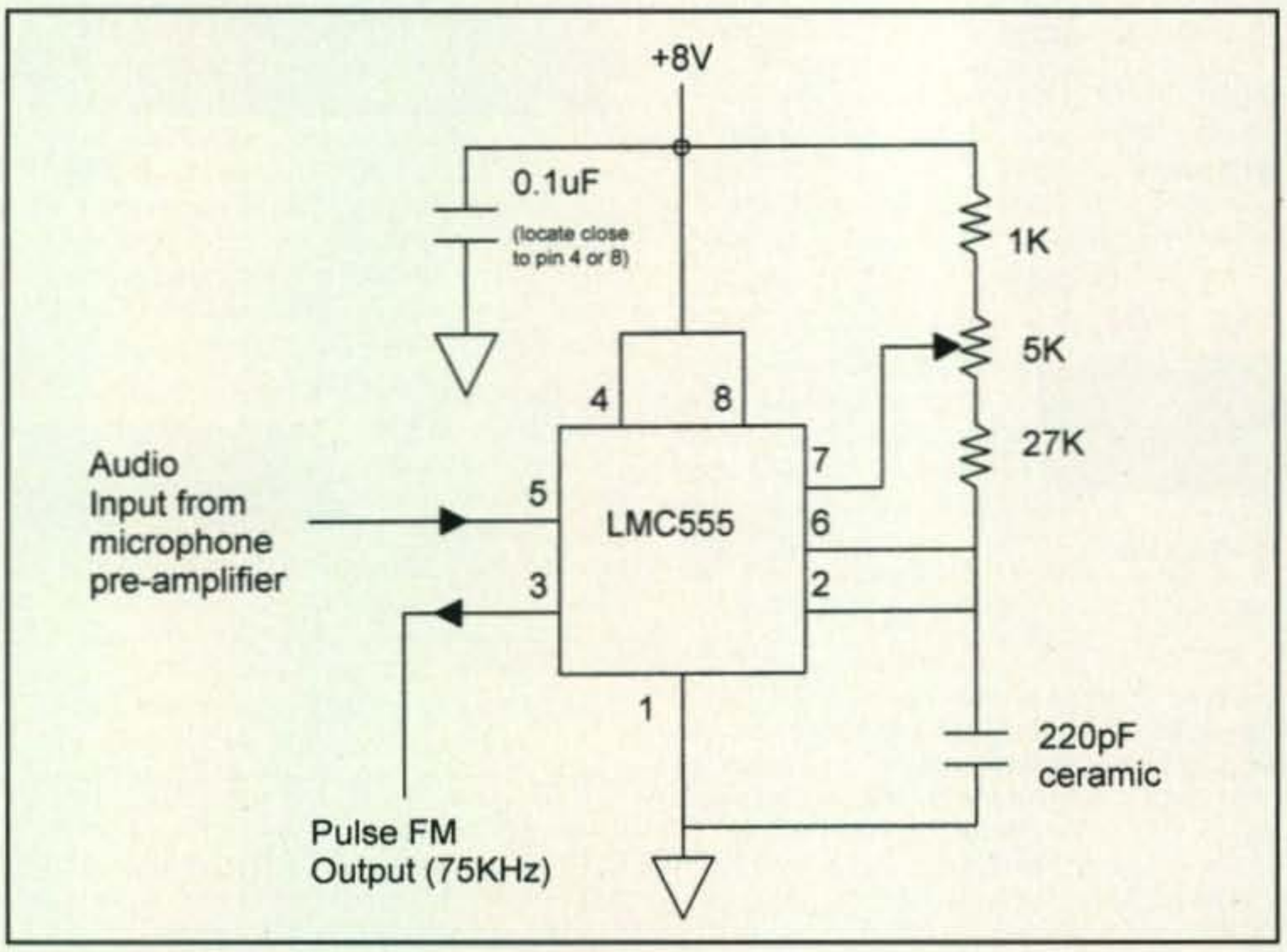

Fig. 4– The FM modulator stage.

Start construction by first building the power supply as shown in fig. 2. The technique you use is not particularly critical, since the frequencies involved are fairly low. You can either build everything shown or use a common 12-VDC wall-wart for the circuit in the dotted area. You should try to be neat, however, to aid in troubleshooting if necessary. When you are finished, connect the wall-wart or AC line and measure the voltage at the output pin of the LM7808. It should be within a tenth of a volt or so around 8.0 volts. If this is achieved, proceed to the next step.

Turn off power and now build the microphone and op-amp stage as shown in fig. 3. Reconnect the power-supply section and connect a scope to pin 6 of the op-amp. When you speak into the microphone, you should be able to adjust the 100K pot for about 1 volt pp of audio.

Turn off power again and now build the modulator and output driver stage as shown in fig. 4. Reconnect power and connect a frequency counter to pin 3 of

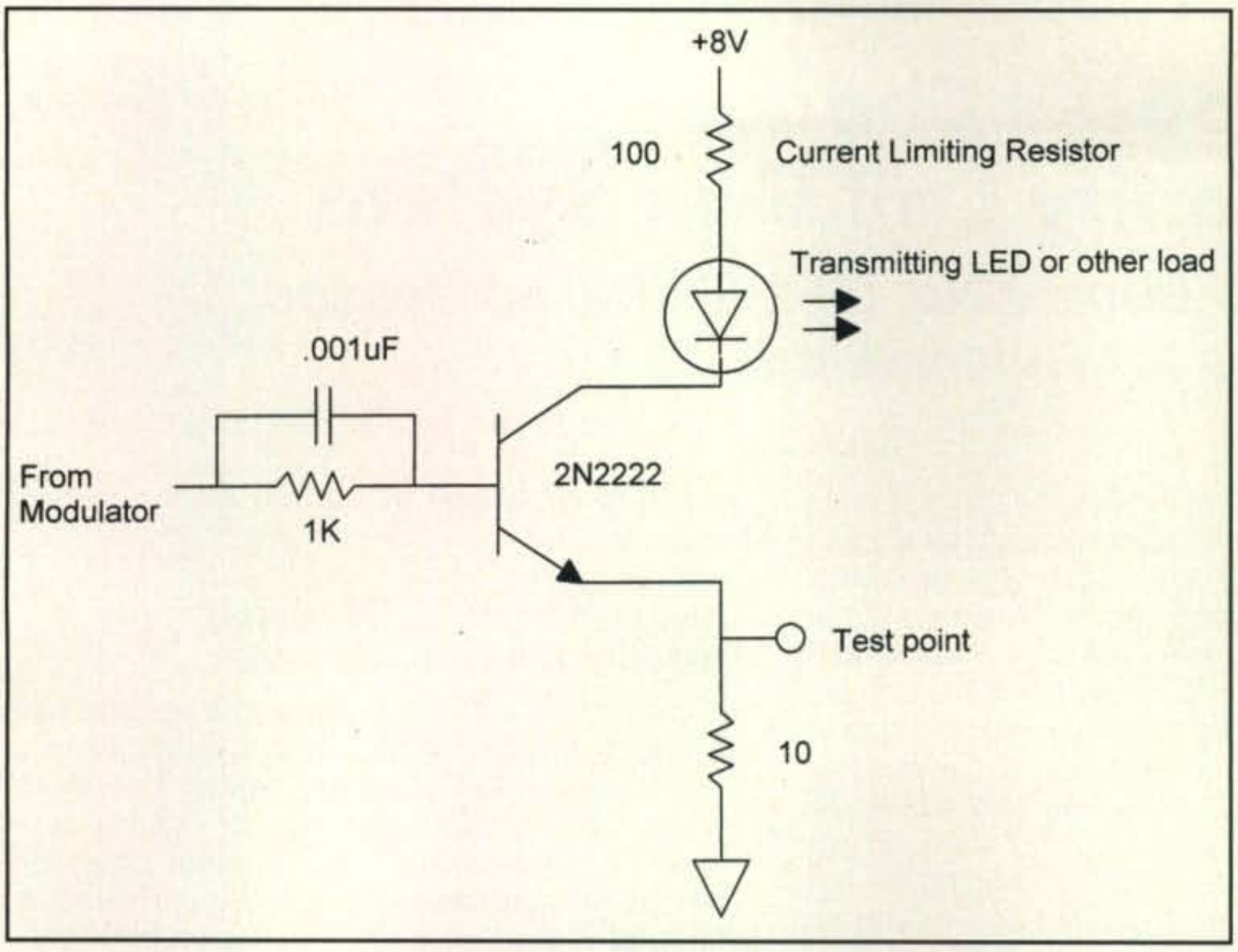

Fig. 5– LED driver stage.

the LMC555. Temporarily disconnect one of the microphone's leads and adjust the 5K pot for an output of approximately 75 kHz. If you cannot obtain 75 kHz, you might have to "play" with the values of the 1K and 27K resistors. When you do achieve 75 kHz, reconnect the microphone, connect your scope to pin 3 of the LMC555, and talk into the microphone in a normal voice. You should now see the waveshape "jiggle" in step with the audio.

Finally, build the driver according to fig. 5 and connect a load from the collector of the 2N2222 to the 8-volt Vcc line. For testing purposes this can be a common red LED in series with a 100 - ohm resistor as shown. The LED should light, and when you speak into or tap the microphone it may flicker. Regardless, if you connect your scope to the 10-ohm test point in the emitter of the 2N2222, you should see the same waveshape as at pin 3 of the LMC555.

You have now completed the transmitter portion of the system. The final "load" will be determined by the device with which you wish to transmit. Keep in mind that the 2N2222 is turned on and off by the modulated pulses applied to its base. If you wish to experiment with optical communications, you would use one or more LEDs in series and/or parallel with the proper limiting resistors. If you wish to use other devices such as an ultra-sonic transducer, you would choose the proper limiting resistor to prevent damage to the transducer, or to the transistor for that matter. If you need to use a device requiring more current or a higher voltage than a 2N2222 normally can handle, simply use a higher power transistor or Darlington configuration. For ultra-sonic applications you might consider reducing the frequency of the LMC555 to the 40-kHz region to match the common transducer devices available. If you do so, you may have to experiment with the modulation levels to minimize distortion. One application actually used a horn tweeter as a driver.

Whatever you finally choose, don't be afraid to experiment. You will have a lot of fun and may actually come up with something. Next month we will look at the receiver. 73, Irwin, WA2NDM

Correction

In the December 2009 column we described the use of a three-color LED to produce light that might be tunable over the visible range for experimental optical transmission experiments. Many readers have written to point out that the various possible colors were really only interpretations by the human eye, since the LED mentioned could only produce different levels of red, blue, or green. This is true. To use such a system, therefore, one would have to provide three photodiodes at the receiving end, each with a separate optical filter (red, blue, and green) and then determine the actual color by the percentage of light received by each detector. Possibly the same LED could be used as a detector.

My thanks to all who wrote and pointed this out.—*WA2NDM*

BY FREDERICK O. MAIA,* W5YI

FCC Proposes Changes to the Vanity Call Sign System

NPRM in WT Docket No. 09-209 also addresses two Petitions for Rulemaking

The Federal Communications Commission surprised the amateur radio community just before Thanksgiving with a 14-page Notice of Proposed Rulemaking entitled "Amendment of the Amateur Service Rules Governing Vanity and Club Station Call Signs." The NPRM proposes some major changes to the vanity and club station call sign programs. In addition, many current policies would remain basically unchanged, but would be specifically added to the Part 97 rules. Previously, notification was through a posting on the FCC's website of previously issued Public Notices.

Station Call Signs of Deceased Licensees

The station call sign previously held by a deceased radio amateur generally becomes available for reassignment two years plus one day following license expiration or cancellation, whichever is sooner. The FCC is proposing to change when these call signs become available for reassignment.

In order for a vanity call sign to be assigned to an amateur station, the call sign must be available at the time the application is processed. Even if a licensee is deceased, the call sign is not available if the license is still active in the FCC's database because the Commission has not been informed of the licensee's death. A station call sign is active for a 12-year period—the 10-year term plus the two-year grace period.

The FCC cancels a deceased amateur's call sign as of the date of death when it receives proper evidence of death. Three types of supporting documentation that the FCC accepts are: a copy of the death certificate, an obituary from a newspaper, or information from the Social Security Death Index (SSDI) that shows the date of death. The SSDI is an online database of millions of deceased individuals with U.S. Social Security Numbers whose deaths have been reported to the Social Security Administration. It is located on the web at <http://ssdi.rootsweb.ancestry.com>. Sometimes the FCC also cancels a call sign on its own without this data when it learns of the licensee's death through other sources.

While the procedure for canceling and applying for a license due to death of the licensee is shown on the FCC website, it is not actually stated in the Part 97 rules. The FCC wants to change that by amending Section 97.19 and adding a new Section 97.21.

When Call Signs of Deceased Amateurs Become Available

The call sign of a deceased radio amateur is not available to the Vanity Call Sign System for two years following the person's death. The FCC believes this practice can create an unfair situation, since an unrelated radio amateur often requests to have the call sign of a deceased licensee (who died two years earlier) canceled and then immediately applies for that call sign.

Because the cancellation request is not processed before the application requesting the call sign is received, the applicant has an unfair advantage in obtaining the deceased amateur's call sign since the applicant knows that the deceased's call sign is about to be available for reassignment and has already applied for it.

To make the knowledge and availability of deceased amateurs' call signs more readily available to the general amateur community, the FCC is proposing to amend its rules to provide that in the case of an amateur who has died more than two years previously, his/her call sign will still be canceled as of the date of death, but an additional 30-day hold will be placed on reissuing the call, starting on the date the FCC staff cancels the license.

Since call sign cancellations are generally publicized within the amateur community, this 30-day period would provide advance notification that a call sign is about to become available. This would provide an opportunity for others to also apply for the deceased amateur's call sign and would reduce the possibility of erroneous cancellations. The FCC awards call signs by lottery when more than one application is received for the same call sign on the same day. (If the license is canceled less than two years following the date of death, then the two-year rule still applies, with the clock starting on the date of death.)

The exceptions to the two-year waiting period for former call sign holders, close relatives, and club stations requesting the call sign of a deceased licensee remains unchanged. The FCC, however, wants to specifically state these exceptions in the Part 97 rules.

The FCC previously defined "close relatives" to include "in-laws" of the deceased former holder. In order to avoid any confusion, the FCC wants to amend Section 97.3 to define the term "in-law" to

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

include only a parent or stepparent of a licensee's spouse; a licensee's spouse's sibling (brother or sister); the spouse of a licensee's spouse's sibling; or the spouse of a licensee's sibling, child, or stepchild.

The FCC believes that "...these changes will make the cancellation process more equitable and transparent, and will facilitate the availability of desirable call signs."

Ineligible Applicants

Sometimes a vanity call sign application is granted to an ineligible applicant who erroneously or fraudulently indicated that he/she fell within an exception to the two-year waiting period. After the situation is brought to the applicant's attention, the applicant frequently applies for and is assigned another call sign, thereby surrendering the improperly obtained call sign.

Under the usual procedure, the improperly obtained call sign would not be available again to the Vanity Call Sign System for another two years, resulting in an unfair additional delay for prospective applicants who expected the call sign would become assignable after the end of the original two-year period.

The Commission wants the rules to specifically state, "Where a vanity call sign for which the most recent recipient was ineligible is surrendered, cancelled, revoked or voided, the two year requirement does not apply." The FCC added that it takes the misrepresentation of call sign eligibility very seriously and that filing a fraudulent application reflects on a licensee's character and, therefore, qualifications to remain a Commission licensee.

Information regarding the acknowledgement or determination of ineligibility will be posted to the FCC record in the Commission's Universal Licensing System (ULS) so that other licensees will be able to recognize that the surrender did not commence a new two-year waiting period.

Club Station Licensing Issues

Disputes regarding the identity of a club's trustee sometimes come to the FCC's attention when a contested application is filed to change the trustee. The application must be presented in document form to a Club Station Call Sign Administrator. A CSCSA is a tax-exempt amateur radio organization that has agreed to provide voluntary, uncompensated, and unreimbursed services for processing applications for club and military recreation station licenses.

The CSCSA then submits the information to the FCC in an electronic batch file. There is currently no Part 97 rule requirement, however, that the document submitted to the CSCSA demonstrate that the new trustee has been so designated by an officer of the club.

In order to avoid Commission involvement in what are essentially internal club matters, and to ensure that an application changing the trustee of a club station reflects the intent of the club, the FCC wants the rules to specifically state that applications requesting a change in trustee include documentation signed by a club officer when the application is submitted to the Club Station Call Sign Administrator. Additionally, the Commission believes that by accepting applications only from the licensee, the CSCSA can minimize the number of disputed applications that are filed.

The FCC rules limit individuals to holding only one operator/primary station license and one call sign. There is currently no similar limit on how many licenses and call signs a club may hold. This gives club stations a distinct advantage over individuals seeking desirable call signs, reduces the pool of vanity call signs available to individuals and other club stations, and increases the possibility of conflict over particular call signs. To remedy this, the FCC wants to limit club stations to holding only one license and one station call sign. Clubs that currently hold more than one call sign would not be allowed to obtain any more call signs, but could renew or modify their existing station licenses.

Finally, the FCC proposes to permit Novice Class licensees to serve as club station trustees. Novices were originally precluded from being trustees because many years ago, Novice licenses could not be renewed. "Because such licenses now may be renewed on the same basis as any other amateur

service license, we believe that this prohibition is no longer necessary," the FCC said.

Filing Comments on WT 09-209

The FCC wants comments from the amateur community on all of these proposed rule changes. You can find the NPRM on the web at: <http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-09-102A1.pdf>. In addition, the Commission invites commenters to suggest any other amendments to the rules impacting the Vanity Call Sign System and club station licensing.

Radio amateurs may file comments electronically over the internet using the Commission's Electronic Comment Filing System (ECFS), or by filing paper copies. Commenters who choose to file paper comments must file an original and four copies. Send to: FCC, Office of the Secretary, Federal Communications Commission, 445 12th St., SW, Room TW-A325, Washington, D.C. 20554.

Comments close 60 days after publication of the NPRM in the *Federal Register*; reply comments 15 days later. The comment close date for this proceeding should be about mid-February.

73, Fred, W5YI

NCVEC Releases New Technician Class Question Pool

New Element 2 questions must be used beginning July 1, 2010.

The Question Pool Committee (QPC) of the National Conference of Volunteer Examiner Coordinators (NCVEC) released a new Technician Class (Element 2) question pool to the public in January. Each question pool for the three Amateur Radio license classes—Technician, General, and Amateur Extra—is reviewed and revised on a four-year rotation. This new Technician Class pool will become effective on July 1, 2010.

The Question Pool Committee has been authorized by the FCC to determine the appropriate mix of written examination topics and individual question content that appear in the three question pools, under the general guidance of Section §97.503 of the rules which specify only that all examinations "... must be such as to prove that the examinee possesses the operational and technical qualifications required to perform properly the duties of an amateur service licensee." The Element 2 (Technician) and Element 3 (General) examinations must each contain 35 questions (26 correct to pass); Element 4 (Extra) contains 50 questions (37 correct to pass). Section §97.523 requires that "Each question pool must contain at least 10 times the number of questions required for a single examination."

The QPC reviews the three question pools every four years to ensure that the questions are kept current with the latest amateur practices and technology, as well as addressing information relevant to that particular license class. Members of the QPC are elected by the NCVEC at its annual meeting. The current committee chairman is Roland Anders, K3RA, of the Laurel VEC. The other members are Larry Pollock, NB5X (W5YI-VEC), Perry Green, WY1O (ARRL-VEC), Jim Wiley, KL7CC (Anchorage VEC), and Tom Fuszard, KF9PU (Milwaukee VEC).

The Technician question pool and exam are intended to be the beginning of the amateur radio journey and serve as an outline for ham radio license classes conducted by individuals and clubs. The goal of the new Element 2 question set is to enable the new Technician licensee to be able to establish his/her station and operate it legally, courteously, and safely. Element 2 also prepares an applicant for the enjoyment of operating, and serves as the beginning of learning electronics, the cornerstone of the education needed to advance to the higher amateur radio license classes.

Earlier this year, the QPC solicited comment from the amateur radio community relative to the new Element 2 question pool, accepting input for new question topics and new questions, as well as suggestions for changes or deletions.

The new question pool will become effective for all examinations administered on or after July 1, 2010, and will remain valid until June 30, 2014. Study manuals will be available from the ARRL and W5YI Group and on the shelves at ham radio outlets and bookstores about April 2010. The current Technician question pool that began being used in Element 2 examinations on July 1, 2006 will be discontinued as of June 30, 2010.

The new Technician pool contains approximately 400 questions. Each 35-question Element 2 examination is constructed by VECs or VE teams selecting two to eight questions from each of ten topics. There are 35 different sub-elements, each having ten or more questions. The new Element 2 Technician question pool will contain graphics and diagrams, something new for this element. The topics and sub-elements are:

T1 – FCC Rules (8 exam questions). One each on: amateur radio licensing, authorized frequencies, call signs and international regulations, station license, permissible and prohibited communications, control operator, identification requirements, and station operations.

T2 – Operating Procedures (3 exam questions). One each on: station operation, operating practices, and public service.

T3 – Radio Wave Propagation (3 exam questions). One each on: radio wave characteristics, radio and electromagnetic wave properties, and propagation modes.

T4 – Amateur Radio Practices and Station Set Up (2 exam questions). One each on: station setup and operating controls.

T5 – Electrical and Radio Principles (3 exam questions). One each on: electrical principles, mathematics for electronics, and electronic principles.

T6 – Circuit Components and Practical Circuits (3 exam questions). One each on: electrical components, semiconductors, and circuit diagrams.

T7 – Practical Circuits and Testing (4 exam questions). One each on: station radios, common transmitter and receiver problems, antenna measurements and troubleshooting, and basic repair and testing.

T8 – Amateur Radio Modes, Methods, and Operations (4 exam questions). One each on: modulation modes, satellite operation, operating activities, and non-voice communications.

T9 – Antennas and Feed lines (2 exam questions). One each on: antennas and feed lines.

T10 – Electrical and RF Safety (3 exam questions). One each on: electrical safety, antenna safety, and RF safety.

Next year the Question Pool Committee will be updating the General Class (Element 3) questions. The current General Class question pool (effective July 1, 2007) is valid through June 30, 2011. The current Amateur Extra Class pool (effective July 1, 2008) remains valid until June 30, 2012.

CQ — Our 65th Anniversary — 1945 2010 — CQ

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 1951–1956:

1951–1956: Restructuring and the Cold War

1951: George Jacobs, W2PAJ (now W3ASK), begins 50+ year tenure as *CQ* Propagation Editor. FCC restructures amateur radio, replacing Class A, B, and C licenses with Advanced, General, and Conditional, respectively, and creating new Amateur Extra, Technician, and Novice Classes.

1952: FCC allows use of phone on 40 meters. RACES (Radio Amateur Civil Emergency Service) established. Chiefs of Army and Air Force MARS issue joint appeal for members in *CQ* guest editorial.

1953: Ross Bateman, W4AO, and Bill Smith, W3KGP, hear echoes of their 2-meter signals off the moon—first amateur radio EME (one-way only). CQ publishes *The Radio Amateur's Mobile Handbook*. At the height of the Cold War, Senator Wiley (R-Wisc.) questions loyalty of hams, suggests ham radio poses a security risk, and proposes restrictions. FCC proposes CONELRAD rules (see 1955), requiring hams to listen for broadcast stations going off the air before transmitting in case of aerial attack.

1954: 6-meter privileges proposed for Technicians. Hams lose top 50 kc of 20 meters (14350–14400 kc). *[Frequencies were still referred to then in kilocycles and megacycles, not kilohertz and megahertz.]*

1955: Hams get access to 160 meters on a limited basis. Heathkit enters amateur market. Gonset introduces 6 and 2-meter Communicators. CONELRAD rules take effect: hams must monitor broadcast stations before transmitting and every 10 minutes to make sure we're not under attack. Several circuits published for automated CONELRAD monitors.

1956: National NC-300 receiver and Eldico SSB-100 SSB transmitter introduced. *CQ* runs first project articles using transistors.

Next month, we'll look at 1957 through 1961, the dawn of the Space Age and the peak of the biggest sunspot cycle to date.

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NEW! KT-100

LDG's first dedicated autotuner for Kenwood Amateur transceivers. Easy to use - just right for an AT-300 compatible Kenwood transceiver. 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 of 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***

NEW! 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

AT-200Pro

The AT-200 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. All cables included.

Suggested Price $249

NEW! 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 induced for fast hook up. ***Suggested Price $129.99.***

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. All cables included. ***Suggested Price $179***

FREE Balun with purchase any new LDG tuner!

*Purchase any new LDG tuner between Oct 15, 2009 and March 15, 2010 and receive a Free balun from LDG Electronics. Simply fill out form (available at www.ldgelectronics.com or via mail - write to 1445 Parran Rd., St. Leonard, MD 20685) and send to LDG along with a copy of your dated sales receipt and LDG will send you a Free RBA-1:1 or RBA-4:1. All forms must be received before March 31, 2010. Limit one free balun per household. Not Transferable.

Free Balun with Autotuner Purchase!*

AT-100Pro

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, allowing you to switch instantly between two antennas. The AT-100Pro requires just 1 watt for operation, but will handle up to 125 watts. All cables included. ***Suggested Price $219***

radio not included

NEW! 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-897 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***

radio not included

FTL 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***

NEW 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. ***Suggested Price $79.99***

NEW! 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. All cables included. ***Suggested Price $599***

NEW! 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***

NEW! 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. ***Suggested Price $159.99***

LDG recommends the S9v 31' Vertical from S9 Antennas!

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public service

BY RICHARD FISHER,* KI6SN

A Bright and Sunny SKYWARN Recognition Day

Things were looking up, both figuratively and literally, for hundreds of weather-wise radio amateurs who operated from National Weather Service offices across the country—or got in line on the air to have a QSO with them—during the 11th annual SKYWARN Recognition Day on December 5, 2009. It's an event that highlights some of the greatest attributes and values of amateur radio public service.

Dave Floyd, N5DBZ, an NWS Warning Coordination Meteorologist based in Goodland, Kansas, said SRD 2009, co-sponsored by the agency and the American Radio Relay League, "is a way to recognize the commitment made by amateur radio operators in helping keep their communities safe."

Over the years, amateur radio has been playing an increasing role in supporting the NWS through SKYWARN by providing real-time weather reporting on everything from hail size, rainfall amounts and tornado activity, to snowfall amounts, ice accumulation, and damage assessment during major storms. However, Recognition Day is a time for more relaxed operations. Not only does it give SKYWARN volunteers an opportunity to gather for a fun, on-the-air activity, it is also a chance to fine-tune operating skills and test gear and antennas.

N5DBZ said 108 NWS offices participated in the 2009 event, "including the National Hurricane Center in Miami, where amateur radio has traditionally played a significant role during tropical storm and hurricane events."

Although the SRD '09 data had not been fully tabulated at press time, "early feedback indicated everyone enjoyed participating once again. Haven't heard of any big equipment problems or other issues."

"Looking back over the years, though, traditionally the log files indicate between 16,000 and 18,000 QSOs are completed during the 24-hour period," Dave said. "Not too shabby."

Radio amateurs from around the world were encouraged to contact SRD '09 stations and relay their local weather conditions. Many of the NWS stations featured WX callsign prefixes. Here are thumbnail sketches of SRD '09 operations from several locations around the country:

Snapshot: WX4NHC Miami's National Hurricane Center

Miami's National Hurricane Center, WX4NHC, "had a very successful SKYWARN Recognition Day event," according to Julio Ripoll, WD4R, who has been a volunteer operator since 1980.

"We made over 200 contacts, including 24 NWS stations, using multiple modes and bands: HF, VHF, UHF, EchoLink, IRLP, and APRS," he said. "Our contacts ranged from our own back yard to as far as Switzerland, where HBØCC, Imo, reported –7° centigrade and moderate snow from his mountain location at 550 meters.

*1940 Wetherly Way, Riverside, CA 92506
e-mail: <ki6sn@cq-amateur-radio.com>

Operating WX4NHC from the National Hurricane Center in Miami during the SKYWARN event were, from left, Mike Davis, AF4VJ; Louis Cruz, N4LDG; and Julio Ripoll, WD4R. (Courtesy of WX4NHC)

Joining the WX4NC team for the '09 SKYWARN event in Raleigh, NC were, from left, Kevin Smith, K4BGM; Courtney Enzor, KI4HOS; and Cassie Mentha, KJ4GKP. (Courtesy of WX4NC)

"Our local weather began as a typical South Florida day, with (the) temperature about 76 degrees and humidity at 94 percent," he said. "Very different from the majority of the stateside (weather) reports we heard from our colleagues up north, with reports as low as 19 degrees in Wyoming and snow in Maryland. However, our balmy weather changed quickly as a cold front was moving over us during the early afternoon and we were then placed under tornado watch. Thankfully, no tornados were reported and later we enjoyed a cool evening of 63 degrees."

WD4R said NWS SRD "is a great exercise not just to practice our own skills, but also to increase the awareness of NWS staff of amateur radio's proven capabilities to report real-time weather events and the ability to connect NWS offices to each other should severe weather disrupt their conventional means of communications."

Snapshot: WX4NC, Raleigh, NC

At WX4NC, in the NWS office on the Centennial Campus in Raleigh, North Carolina, Central Carolina SKYWARN (CCS) Emergency Coordinator Virginia Enzor, NC4VA, a crew of officials, and several weather spotters managed to contact 32 other NWS offices, "which earned us the 'Whole Gale Certificate,'" and worked 32 states during the event.

In addition to NC4VA, participants included Warning Coordination Meteorologist Jeff Orrock, KI4KKX; CCS Assistant Emergency Coordinator Bob Woodson, WX4MMM; CCS Assistant Emergency Coordinator (Wayne County) Dave Roy, W4DNA; CCS Net Control Scott Lewis, KJ4BPV; CCS Net Control Kevin Smith, K4BGM; and weather spotters Randy Stark, WN4RSS, Ken Stark, W4KJS, Chris Benson, KJ4LKE, Courtney Enzor, KI4HOS, and Cassie Mentha, KJ4GKP. Christine Benson, a non-ham, "proved to be an excellent logger," NC4VA said.

The team operated from 9 AM to 5 PM on a range of frequencies and modes. W4DNA "headed up the antenna crew who put up two HF antennas in the early morning hours during rain and temperatures in the 40s. That's dedication!"

WX4NC's equipment included "two permanently installed dual-band Kenwood TMD7 radios with Diamond dual-band vertical antennas mounted on the roof of the building housing the NWS office. "For HF we pulled the NWS's brand new Kenwood TS-570S out of the box and set it up. It performed beautifully," NC4VA said. "We also used (W4DNA's) Yaesu FT-897 radio. We alternated a Windom and a 20-meter inverted-V antenna with both radios."

The team logged 160 contacts among HF (primarily 20 meters), VHF, UHF, and ILRP.

Snapshot: WX7LKN, Elko, NV

Out west at WX7LKN, a team of 25 to 30 operators made more than 700 SRD '09 contacts in "48 states, 6 Canadian provinces, Brazil, and Mexico," according to Dave Hough, W7GK. The Elko, Nevada group logged contacts with 48 other NWS stations.

"We set up three operating positions consisting of a (Yaesu) FT-100D, a Kenwood 440S, and another Kenwood mated to an Ameritron 500 watt linear," Dave said. "Antennas were a Cushcraft A4S mounted on a portable light plant (a self-contained lighting system, including power source) that was used

At WX7LKN in Elko, NV were, seated from left, Doug Nicola, KD7ZDD; Pete Johnsen, W7TKO; and Jim Moore, KF7EBI. Standing, from left are Joe Giraudo, N7JEH; Dave Hough, W7GK; Don Carlson, KQ6FM; Justin Gleason, KF7DLW; James Callaway, KD7ATL; and Mike Fitzsimmons, KB1ELT. (Courtesy of Kathy Stich, W7BDY)

mainly on 20 meters, a Butternut vertical, and a skeleton cone primarily used on 40 meters. Dunestar bandpass filters were used in the feedlines. Logging was done using N3FJP's North American QSO Party software."

W7GK said the group "mainly concentrated our effort on 40 and 20 meters given band conditions and population distribution in this part of the country. The lack of sunspot activity was noticeable. ... Friday evening we managed to make perhaps 20 contacts on 75 meters plus another 10 on 15 meters, but for the most part these two bands were unproductive in northeastern Nevada."

Radio amateurs "from as far as Reno and Winnemucca, NV," converged on Elko to support the event. Over the weekend dozens of people "came by to help us put up antennas, operate, log, and breakdown. Anyone wishing to operate had his/her chance. There were more than enough Extra Class hams so the Technicians could sit down and gain HF experience working pile-ups."

W7GK said that 2009 "was the seventh time the Elko ARC has participated in SKYWARN Recognition Day. Kevin Baker and the staff of the Elko NWS have always provided extraordinary support for our club's SKYWARN effort."

Snapshot: WX1BOX Taunton, MA

Among the SRD stations representing the Northeast was WX1BOX at the NWS Forecast Office at Taunton, Massachusetts. The '09 event "was very successful and coincided with the twice-per-year SKYWARN Coordinators meeting," according to Rob Macedo, KD1CY, who is ARES SKYWARN Coordinator for NWS in Taunton, Eastern Massachusetts ARES Section Emergency Coordinator, and director of operations for the VoIP Hurricane Net.

Fifteen radio amateurs teamed up for the WX1BOX effort. A total of 309 QSOs were logged, "with 271 unique contacts made to 41 different NWS Forecast offices, earning the operation the 'Nor'easter Certificate,'" KD1CY said. "These numbers were slightly lower than 2008, but we did not have our SKYWARN Coordinators meeting during SRD last year like we did this year, and this likely led to a lower count of stations.

"We had a Ten-Tec Orion HF rig brought into the weather office for SRD operations through the efforts of Bill Boyes, KB1G, and this radio was used in lieu of the Alinco DX-70TH radio that is installed at the weather office," Rob added.

Rob Macedo, KD1CY, ARES SKYWARN Coordinator for NWS Taunton (MA), talks on VHF/UHF while Jeremy Breef-Pilz, KB1REQ, monitors EchoLink during SRD '09. (Courtesy of WX1BOX)

Radio amateurs in the NWS Taunton Warning Area "are responsible for over 90 percent of the damage reports received and half to two-thirds of the rainfall and snowfall reports received into the weather forecast office.

"We have a very active group that handles SKYWARN Activations from the NWS Forecast Office working with nets and net control stations that handle approximately two dozen nets across four states," he said. "We also use Echolink/IRLP through the New England reflector system 'NEW-ENG' conference system node 9123/IRLP reflector 9123."

According to KD1CY, "band conditions on HF were a bit weaker than 2008, but we still managed a several-hour pile-up on HF on 20 meters that was managed by 15-year-old Jeremy Breef-Pilz, KB1REQ.

"Jeremy has participated in several SKYWARN Activations, including two activations for tornadoes in our County Warning Area over the summer. We also had a number of contacts via EchoLink/IRLP on the 'WX_TALK' EchoLink conference Node: 7203/IRLP 9219 system, and the New England Reflector system."

WX1BOX "also managed (EchoLink) net control for WX4NHC . . . and fielded check-ins for two hours," KD1CY said.

Snapshot: N5CCW Corpus Christi, TX

Steve Hampton, NØWZH, a SKYWARN Ham Radio Coordinator, reported that SRD '09 activities at N5CCW in Corpus Christi, Texas began with setup on Friday afternoon of the recognition weekend. Klint Mann, KE5FMN, "brought out his non-resonant wire antenna, along with LDG antenna tuner, LDG 1-to-1 balun, and his U.S. Marine surplus push-up pole for our second HF station, which was located in the NWS conference room." Steve Pituch, W2MY; Albert DeMeulle, KF5ARJ; and Marki Shedd, KF5DZS; along with NØWZH, helped put up the antenna.

"Earlier in the day, we were concerned whether or not we were going to be able to set up the second HF antenna," NØWZH said. "The Coastal Bend was receiving rain, snow, and sleet with the temperature hovering just above freezing. However, about 3 PM the weather cleared, but it was still cold." He supplied a second HF station which was set up in the NWS conference room. "This consisted of an ICOM 746, Astron VS-35M power supply, Rigexpert

Taking a quick break for lunch at N5CCW in Corpus Christi during SRD '09 were (clockwise from left) Albert DeMeulle, KF5ARJ; Steve Pituch, W2MY; participant and ham-to-be Dianna; Gary MacGregor, KF5DZQ; Mike Scherger, KC8YSR; Gil Gibbs, WA5YKK; and James Ermis, AD5TC. (Courtesy of N5CCW)

sound-card interface, laptop, and ICOM SP3 speaker."

The NWS permanent installation "includes a multi-wire/multi-band dipole antenna connected to a Kenwood TS-2000. We also have a Kenwood dual-band VHF/UHF radio with a Cushcraft 2m/440MHz vertical."

At 6 PM the team was on the air making contacts. They closed down for the day at about midnight. "Band conditions were tough. . . . Contacts were made on 40-meter and 80-meter voice, 40-meter and 80-meter PSK, and IRLP via the W5DCH IRLP node located on the top of the Driscoll Children's Hospital," NØWZH said.

At 7 AM Saturday the team was back on the air. W2MY brought an Elecraft K3 for the team to use. "During the day we swapped the (temporary) antenna between the K3 and the ICOM 746, depending on if we wanted to run SSB or PSK-31."

John Metz, KD5WIV, Warning Coordination Meteorologist, "gave a short presentation on the drought conditions in south Texas and the effect of El Nino on our weather patterns. We also had a brief discussion on the different types of droughts—meteorological, agricultural, hydrological. John then gave a presentation concerning the W88D radar and the effects of the power-generating wind turbines recently installed in the area. He described effects on the radar and the difficulties it is causing for them," NØWZH said.

"During the event, we had 18 hams come to operate the stations" or just to visit and hear the presentations by the NWS office, NØWZH said.

"After reviewing the logs and removing any dupes, we contacted 70 stations; 37 of those stations were other NWS offices. Not as good as last year, but everyone had a great time and said they would be back again next year."

CQ Public Service On the Web

Each month we seem to have more material for *CQ*'s Public Service column than space available to publish it.

This month is no exception. To handle the overflow, and as a vehicle for updates and breaking public service news, we've launched CQ Public Service On the Web, an internet page that we hope you'll add to your "favorites" list. It's free and easy to find at: <http://www.CQPublicService.blogspot.com>.

To kick things off there, you'll find many more photographs, links, and information from SKYWARN Recognition Day 2009.

73, Richard, KI6SN

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From QST Magazine, March, 2005

". . . the ampifier faulted only when it was supposed to. It protected itself from our boneheaded, sleep-deprived band changing manuevers . . . "

"I found myself not worrying about damaging this amplifier. It seems quite capable of looking out for itself. . . . Kudos to Ameritron."

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ALS-500RC, $49, Remote head for ALS-500M (for serial # above 13049).
ARF-500K, $179.95, Remote kit for ALS-500M serial # lower than 13049. Includes AL-500RC Remote Head, filter/relay board for ALS-500M, cables, hardware, instructions.

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Replace **5** coax with 1! 1.2 SWR at 250 MHz. Useable to 450 MHz.<.1 dB loss, 1kW@150MHz.

RCS-10 Remote Coax Switch. . . $179.95

Replace **8** coax with 1! SWR<1.3 to 60 MHz.**RCS-10L, $219.95** with lightning arrestors.

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Band data from transceiver auto selects antennas. Antenna memories. No hotswitching. Rig-to-amp interface. For 3/4 BCD, 1 of 8 relay boxes. **RCS-12, $309.95**, auto controller with 8 coax relay box, to 60 MHz. **RCS-12L, $349.95**, with lightning arrestors.

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Active circuit gives *true* peak/average readings on lighted cross-needle meter.3000/ 300 Watt ranges, Remote sensor.

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ADL-1500 Dummy Load with oil . . . $74.95

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world of ideas

BY DAVE INGRAM,* K4TWJ

Our International Side(s)

As we know, amateur radio is a world-class interest/pursuit that includes people of all lands and nationalities. Newer amateurs, particularly those only active on our VHF/UHF bands, may not realize the far-reaching impact of that statement, however, so this month's column takes a closer look at what I call "our global community." I have also included a list of associated international websites you can place by your computer for easy reference when needed.

Similarities and Differences

It is interesting to note how radio amateurs in other lands are influenced by different backgrounds and band/frequency allocations. The U.K. and most other European areas, for example, use different VHF/UHF frequencies and repeater "pairs" than we do in the U.S. (that's why some manufacturers include E/Europe or A/America in equipment model numbers). Also, amateurs in Central and South America (plus many other areas) may operate SSB in what we in the U.S. consider the CW subband areas of 40 and 20 meters.

Newfoundland's long-time interest in CW is another interesting study. This country is the home of Cabot Tower (photos A and B), where Marconi made the first transatlantic spark communications with Europe, and it is also home of the Heart's Content Cable Station which was a major telegraphic hub during the heyday of undersea cables. Additionally, Sweden is also the home of many top-notch CW keys such as the legendary leaf-spring-equipped "Swedish Hand Key."

When considering similarities, we find radio amateurs of most all lands (included the U.S.) tend to be more technically inclined than chat oriented. Possibly that explains why we like DXing, as it allows us to experiment, enjoy operating our rigs (especially new transceivers!), and flex our "electronic muscles" without committing to serious conversations. Radio amateurs worldwide are also keen on emergency preparedness and serving their communities and countries during times of need. Indeed, our ability to "get through when all else fails" is a global amateur radio tradition that will surely live forever.

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e-mail: <k4twj@cq-amateur-radio.com>

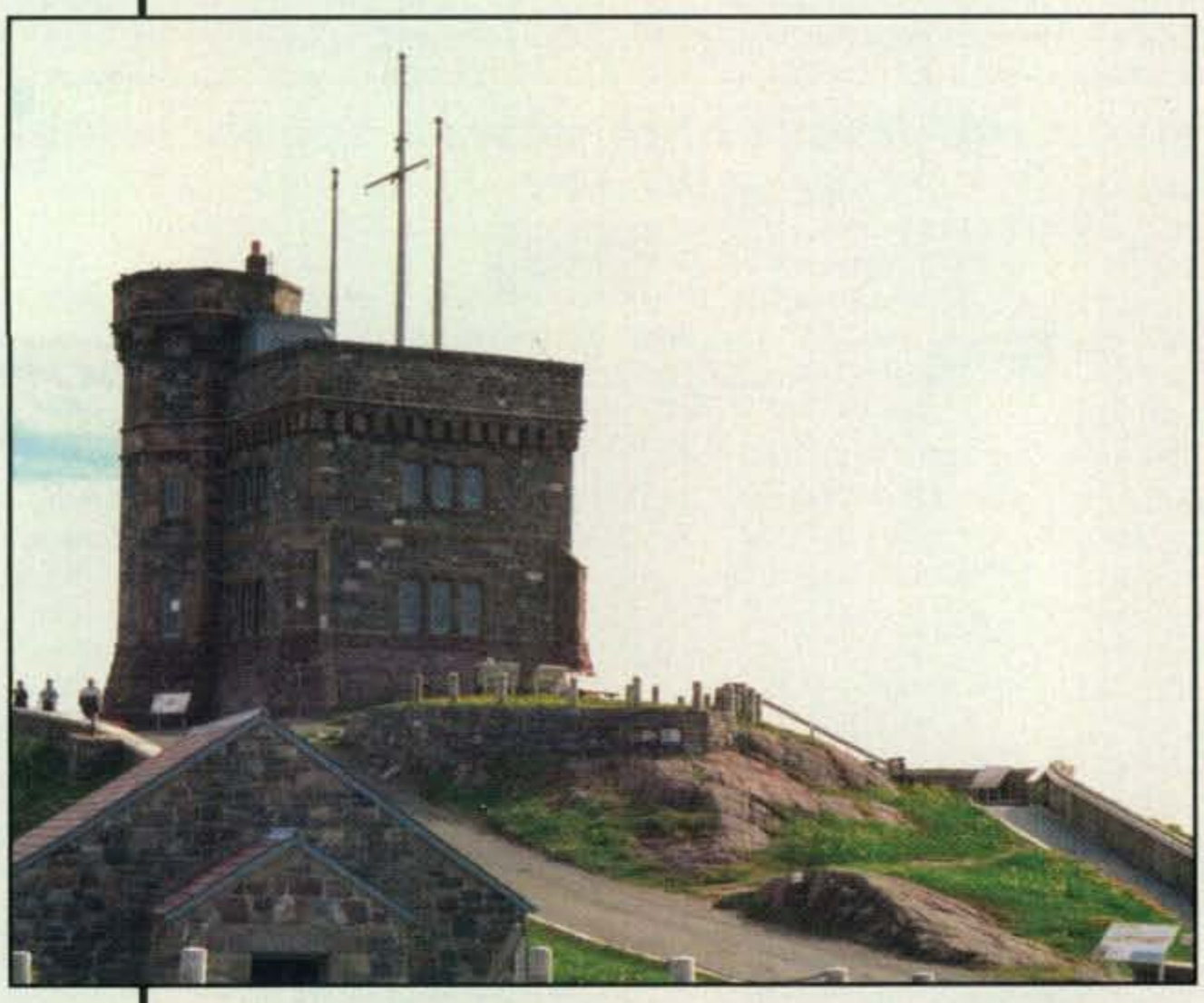

Photo A– Like many areas in the world, Newfoundland is rich in communications history. Shown here is Cabot Tower, a present-day tourist attraction from which Marconi first successfully exchanged spark signals with Europe. Note the large antenna atop the tower. The facilities are overseen by The Society of Newfoundland Radio Amateurs (SONRA).

IARU

There is power in numbers, so most countries around the world have their own central amateur radio group or society, and those societies, in turn, are also members of the International Amateur Radio Union. The IARU was founded in 1925 and has faithfully stood as the world spokesman for amateur radio since that time. Indeed, a visit to <www.iaru.org> is an eye-opening experience.

First, the IARU separates the world into Region 1, Europe and Africa; Region 2, North and South America; and Region 3, Asia and Oceania. A mouse click on "Bandplans" shows modes and frequency allocations for each region. Another mouse click on individual countries shows IARU-affiliated societies complete with specific frequency allocations and websites in all countries from Albania to Zimbabwe. Planning to visit a foreign land or vacation on a Caribbean island? Mouse click on that country's member society, and then click on "Licensing" for legal details on hamming during your stay. One must actually browse the IARU website to fully appreciate its outstanding work.

Major Conventions

If you have been in amateur radio more than one or two years, you surely have heard of (or visited!) the United States' largest ham radio convention, the Dayton (Ohio) Hamvention® held during mid-May

Photo B– Looking back (and down) from Cabot Tower gives us a "sky view" of St. John's, a modern, progressive city complete with high-rise buildings, very cold temperatures, and more.

each year. Slightly more than 20,000 people from all corners of the U.S. and the world in general converge on Dayton while known (and previously unknown) producers of equipment and accessories display their wares at convention headquarters, Hara Arena. New transceivers, antennas, and design trends debut each year at Dayton, and associated forums are incredible. Every radio amateur surely will benefit from visiting this massive convention at least once.

Europe's comparable convention is held annually in Friedrichshafen,

International Websites of Interest

Society/Group	Website
International Amateur Radio Union	www.iaru.org
Society of Newfoundland Radio Amateurs	www.sonra.ca
New Zealand Assn. of Radio Transmitters	www.nzart.org.nz
Wireless Institute of Australia	www.wia.org.au
Radio Society of Great Britain	www.rsgb.org.uk
South African Radio League	www.sarl.org.za
Radio Amateur Society of Thailand	www.qsl.net/rast/
Sweden Amateur Radio Society	www.ssa.se

Convention	Website
Dayton Hamvention	www.hamvention.org
Japan Ham Fair	www.onjapan.net/hamfair/index/html
Seanet (Asia)	www.sabah.net/my/seanet/seanet_2007.htm
Friedrichshafen (Germany)	www.hamradio-friedrichshafen.de

Company	Website
Telefunken (Germany)	www.telefunkin.de
RPF Communications (UK)	www.rpf-comms.com
Falcon Electronics (UK)	www.falconelec.com
Acom Linear Amplifiers (Bulgaria)	www.hfpower.com/acom2000A.htm
Moonraker Antennas (UK)	www.moonrakerukltd.com
Luso Towers (JA)	www.lusotowers.com, www.luso.eu
OM Power (Slovenia)	www.ompower.com
GHD Keys (Japan)	www.ghdkey.com; www.MorseX.com
100 Watts Magazine(Thailand)	www.100watts.com

Fig. 1– Websites of interest to radio amateurs. Notice how many countries have their own trailing designators (UK, AU, etc.).

Germany, and it also attracts a massive crowd. Over 200 manufacturers and dealers such as Telefunken, RPF, Falcon, Acom, Moonraker, plus more familiar names such as Kenwood, Yaesu, and ICOM typically attend the Friedrichshafen convention. Two attention-grabbing items displayed at Friedrichshafen 2009 were Luso's monster tower and OM Power's new auto-tuning linear amplifier which calmly pumps out 3800 watts continuous key-down style! Also noticeable and encouraging was the large number of younger amateurs at Friedrichshafen, a sign that amateur radio is alive, growing, and will continue to flourish in the capable hands of next-generation amateurs.

Ham Fair held in Japan and Seanet held in or near Thailand are two more world-famous conventions of international interest. A boatload of new products and accessories always debut at Ham Fair (naturally, as Japan is the epicenter of modern amateur radio gear). Japan's interest in CW and classic gear is also apparent in Ham Fair exhibits featuring Collins rigs and GHD keys (Japan's counterpart to our own Vibroplex Company). I am unsure how long videos may remain on file with YouTube, but check <www.youtube.com> and type W6GPS in the search box to view a fascinating video of Ham Fair taken by globe-trotting photographer Don Arnold, W6GPS. We especially like the peek at a JA amateur standing/dancing beside a booth sending CW with a dot contactor in one hand and a dash contactor in the other hand.

Seanet is both an amateur radio convention and a social event like no other, and is well worth traveling halfway around the world to attend. Where else could one learn about customs, cultures, and amateur radio in the Far East, plus witness highly esteemed weddings on elephants at the same time?

Photo C– The Radio Society of Great Britain (RSGB) and its associated magazine, RadCom, *are recognized around the world for their pacesetting trends in all areas of amateur radio. Many details of cutting-edge technology appear first in* RadCom.

Photo E– The South African Radio League (SARL) is another progressive member of the IARU and its related magazine, Radio ZS, *often carries some thought-expanding articles on space communications and explorations.*

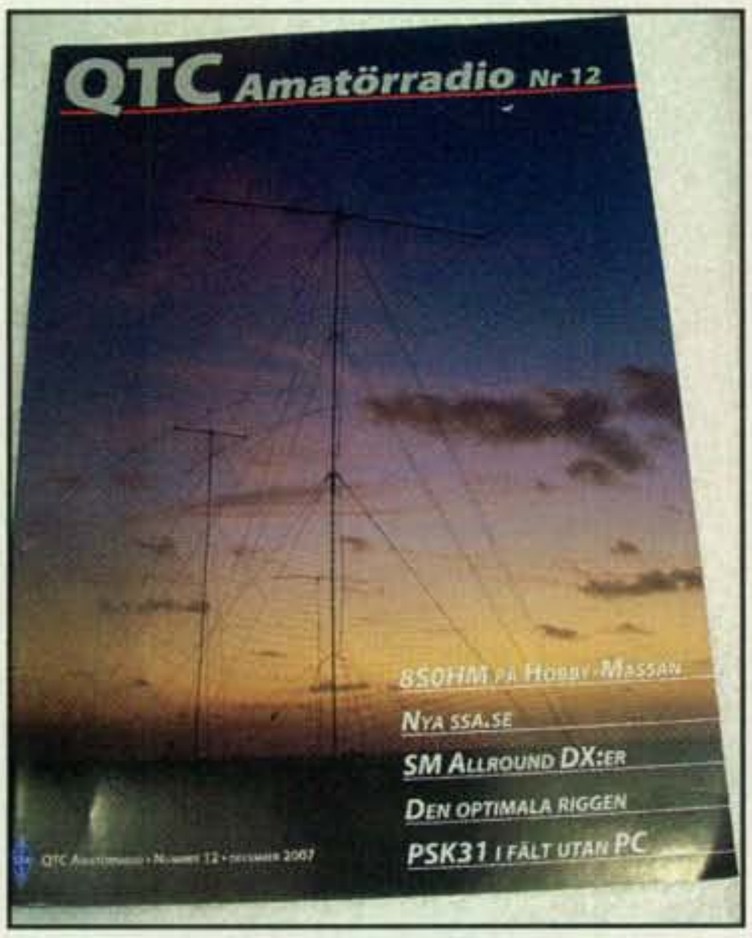

Photo D– Sweden's equivalent to the ARRL is SSA, and its associated magazine is QTC. *Its pictures, circuit diagrams, advertisements, and so forth, are fascinating.*

Photo F– The top circulation amateur radio magazine in Thailand and nearby countries is 100 Watts, *published in Bangkok. It is published in Thai interspersed with some English, loaded with pictures, circuit diagrams, and advertisements, and it is captivating reading.*

Societies, Magazines, and Awards Programs

As previously mentioned, member societies of the IARU are active in almost every country worldwide. The ARRL is our society in the U.S., The Wireless Institute of Australia (WIA) and the New Zealand Association of Radio Transmitters (NZART) are similar societies "down under," etc. Most of the larger societies also publish their own magazines (such as *QST* in the U.S., *Amateur Radio* inVK, and *Break-In* in ZL).

One of the most widely recognized and progressive magazines in amateur radio today is *RadCom* (photo C) published by the Radio Society of Great Britain (RSGB). Each month's issue is packed with articles and columns covering everything from emerging new technologies such as laser-projected TV from cell phones to super capacitors, LF, EME, microwaves, QRP, and more. It is always, as the Brits say, a good read. The RSGB also has an elaborate bookstore and an extensive awards program, including its famous Islands On The Air (IOTA).

Sweden's equivalent to our own ARRL is SSA, and its associated magazine is *QTC* (photo D) It is published/printed in Swedish, but the included pictures, circuit diagrams, advertisements, etc., are fascinating and useful studies.

Radio amateurs keen on space communications and emerging astrophysics

Photo G– 100 Watts' illustrious editor, Thida, HS1AST, is also a major player in Asia's big Seanet convention, an artist, and a poet. Check her website (http://thida.100watts.com) for more details.

will find the South African Radio League (SARL) lighting the path for future developments/studies in these areas. Indeed, almost every issue of the SARL's associated magazine, *Radio ZS* (photo E), carries at least one article on colonization of the moon and/or Mars, applying electronics to space communications, etc.

The Radio Society of Thailand (RAST) is another noted member of the IARU, but it does not publish its own magazine. *100 Watts* (photo F), published in busy Bangkok, fills the vacancy quite admirably, and Editor Thida D, HS1AST (photo G, <www.100watts.com>, <http://thida.100watts.com>) is also a very active figure in Asia's big Seanet convention. Like several other foreign magazines, *100 Watts* is mainly printed in the area's native language, but it is also sprinkled with English. That, plus the combination of photos and circuit diagrams, makes it surprisingly easy to understand. Another fact one notices in *100 Watts* is Thailand also has an auxiliary (and well-used!) Citizen Band service on 245 MHz. Transceivers for this band are easy to spot; they have red cabinets and knobs.

Conclusion

This month's column was only a quick peek at the far-reaching extent of our great hobby, but I included a fair number of international websites and "searchable leads" for you to continue the study via the internet (see fig. 1). Just be sure you have a good firewall and virus protection when searching unknown sites. I feel confident you will discover how each licensed radio amateur fills a specific need and purpose and stands 10 dB above the crowd in an endless number of ways.

73, Dave, K4TWJ

kit-building

BY JOE EISENBERG,* KØNEB

A New Generation of Regen Kits

When looking for a fun and relatively easy kit to build, the simple regenerative receiver is one that comes to mind. When I was a Novice, there were many of these kits made by companies such as Knight and Lafayette. Some were transistorized and some had tubes back in the 1960s, but both shared the fun of these quirky, but very simple receivers. The detector part of a regen is not the normal diode detector, but instead uses an oscillator circuit to mix with the received signal to produce the differential signal and detect the modulation. The fun of this idea is that if you turn up the level of regenerative feedback, it can act as a BFO and allow you to receive SSB and CW. The regenerative detector also gives it some selectivity, as it only allows signals to pass through to the audio circuits that are close enough to the detector's frequency. Enough of the theory behind them. …Here is the fun part!

There are now several regenerative receiver kits available to hams to learn this fascinating aspect of early radio design, but with modern technology. There are no more high voltages and tubes, as we use high-sensitivity transistors and ICs. I recently put together two inexpensive regenerative receiver kits and had fun doing it while learning different ways to go about this very simple idea. These kits use slightly different ways to do the same thing and have different advantages and disadvantages, but they are both fun to make and a great way to show a beginner how to build a kit.

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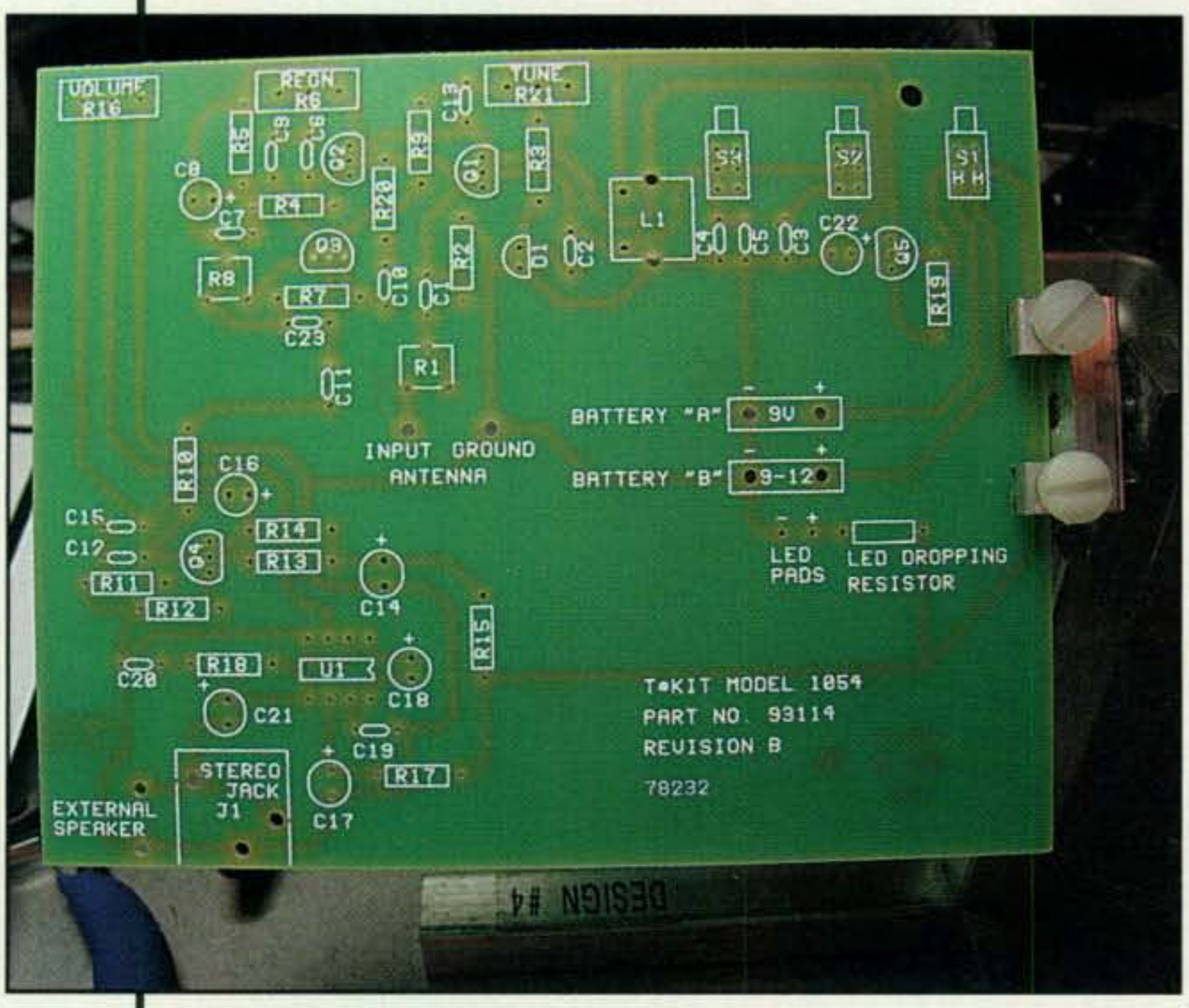

Photo A– The Ten-Tec Model 1054 regenerative receiver kit uses a single-sided PC board with extra wide spacing for the parts placement.

First, don't expect these to be stellar performers. Regenerative receivers by their very nature tend to be a bit unstable and make lots of funny noises, yet bring in amazing quality sound, especially when listening to relatively strong shortwave broadcasters. Their big advantage is a much lower parts count, which makes for some very low-cost and easy-to-assemble kits.

For this month's column I chose two similar regen kits, the #1054 made by Ten-Tec ($39) <http://www.tentec.com>, and the Scout Regen by Hendricks Kits ($40) <http://www.qrpkits.com>. Each kit takes about 2 1/2 to 3 hours to assemble. To assemble these kits I used a tackle box to store the partially completed kits and parts trays so that I could come back to them and easily pick up where I left off. To build either one, a good low-wattage soldering iron and good-quality solder are musts, as well as having 9-volt batteries handy and wire for an antenna. The wire really needs to be only about 10 feet or longer to be able to hear a lot of interesting signals.

You also need a set of stereo headphones, similar to those used with MP3 players or portable radios. For this type of radio the cheap stereo earbuds that you can find in many stores are of more than sufficient quality and provide plenty of volume. The reason stereo headphones are used is that these kits come with the common three-circuit 1/8-inch jack used on most consumer-electronics devices. You will find this type of audio output jack popular with most kits on the market. The left and right channels are simply bridged to produce mono sound.

The Ten-Tec #1054 uses a single-sided PC board (photo A), which means that there are copper traces on only one side of the board. On the top of the board are silk-screened parts numbers and locations to make the assembly process much easier. The parts are spaced a lot farther apart to make it easier to place them on the board for a first-time builder (photo B). The instructions are packaged with the kit.

The Hendricks Scout Regen has a smaller double-sided, plated-through board (photo C), which means there are copper traces on both sides and the holes have plating going through them to assist in soldering, making it less likely to have a problem. The top is also silk-screened for easy parts location (photo D). The instructions for the Scout Regen are available online and can be printed on your own printer if you need to. Both kits' PC boards are pre-tinned, making for easy soldering.

If you use a cupcake pan for parts sorting, you can get away with only a six-cup size for either one. Be sure to carefully sort and check your parts and use the right values. A meter helps when testing resistors and pots. Using a magnifying glass will help, especially when identifying the values on the capacitors and the transistor part numbers. Having a regular general-coverage receiver handy helps when you are wondering if the regen is working or

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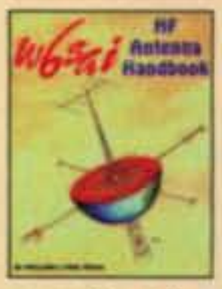

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By Juergen A. Weigl, OE5CWL

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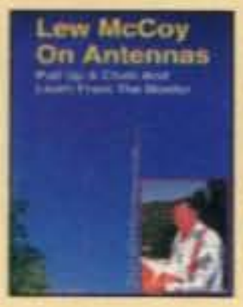
McCoy on Antennas



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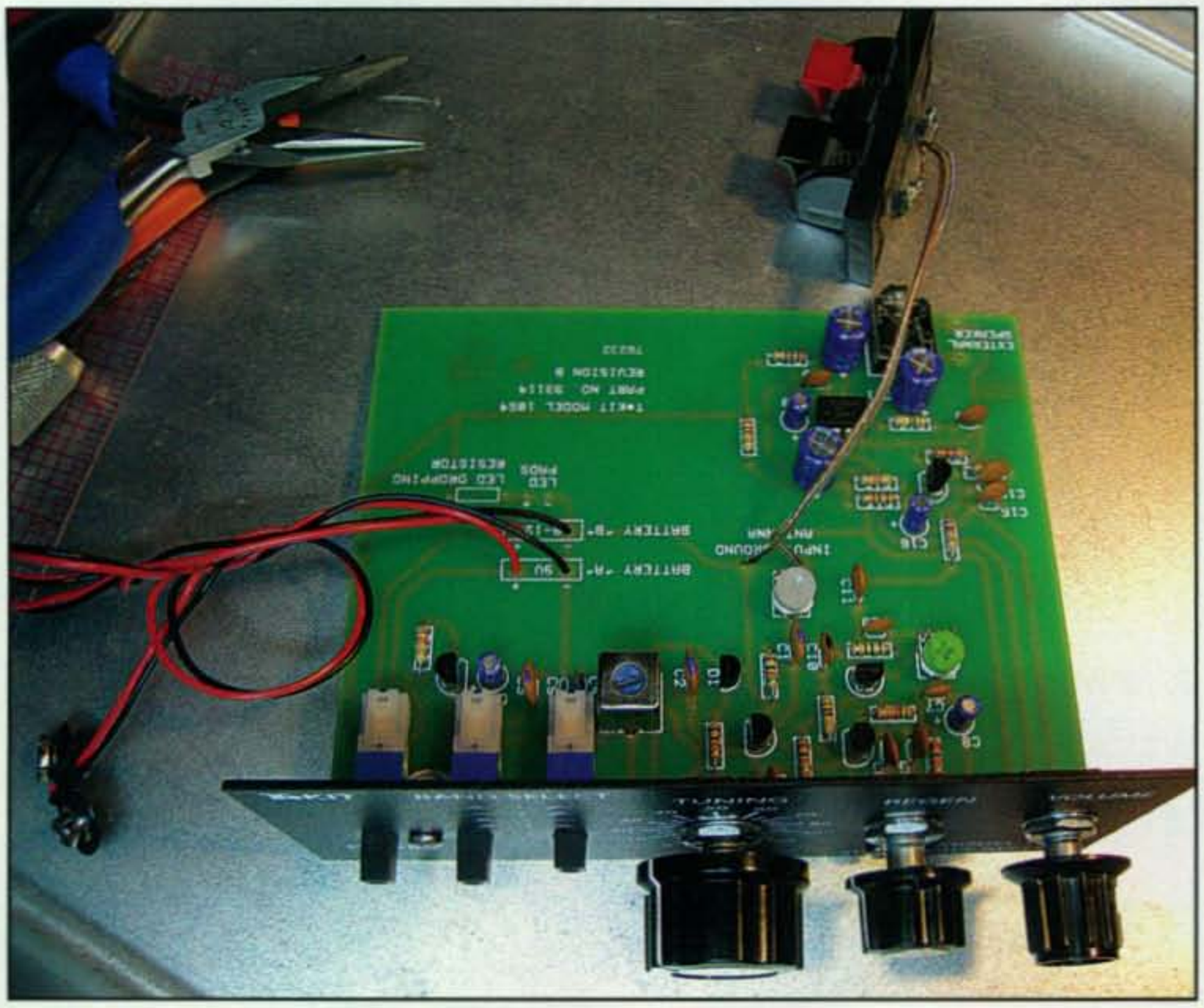

Photo B– Completed Ten-Tec receiver. Notice one slug-tuned coil to adjust (silver can) as well as RF-gain/attenuator and regen coarse tuning pots (with Phillips-head slots) on main board.

the bands are just bad. It can also be used to help in setting the frequency range. You can often hear the regenerative receiver's oscillator on a nearby receiver.

When assembling a regenerative receiver, there is something a builder needs to be aware of: In regenerative circuits, small physical changes in parts position can cause "microphonics," or audio produced from things on the radio moving. If the coil on the Scout Regen is allowed to move freely, any movement of the radio or the coil can cause loud sounds to be heard, as though the radio is acting like a microphone. That is caused by the oscillators shifting in frequency as the parts are moved from their original position. It doesn't take a lot of motion; even a small finger tap can be loud if certain parts are not well secured. In the Scout Regen, that means using a little glue to secure the coil to the board. In the Ten-Tec, it means being sure to attach the ground lug to the front panel and solder it to the PC board to make them physically and electrically secure.

The Ten-Tec uses a pre-made coil you simply adjust with a screwdriver to set the main dial frequency range. It covers 5.9–16.5 MHz in four switchable tuning ranges, and the instructions mention that the setting of the coil also allows you to adjust the frequency ranges a bit. The Scout Regen uses a three-section coil which needs to be wound. It is actually quite easy to do if you follow the directions and drill the little PVC core using a small drill and the cut-out template in the detailed instructions. This coil assembly is great practice for dealing with inductors!

The Scout Regen covers 3.5–11 MHz in two tuning ranges with a fine-tuning control. Neither kit uses toroids, but the Scout Regen does have this special

Photo C– The PC board for the Hendricks Scout Regen kit is a double-sided board with plated-through holes for easy soldering.

coil. Both cover a number of international SW broadcast bands as well as ham bands. You will find the sound quality of the shortwave broadcasts to be exceptional, as this type of receiver does not have sharp filtering. In exchange for hearing some adjacent signals, the desired signal sounds better in frequency response than with most conventional receivers.

The fun of a regen kit for a beginner is learning what the parts are called and where they go and how it all works. For those of us who already know how to build, regens are still fun to do, working with simple circuits and learning the fundamentals of radio. When using a regen, you need to be aware of many things that can affect how the received signals sound. If regeneration is turned up too high, it can squeal and make noises. If turned only a little too much on an AM signal, it might sound like SSB. Turning it down until it sounds just right is the key to adjusting the regeneration control.

Both kits have a way of controlling the input signal strength. The Ten-Tec uses an RF-gain pot on the main board that simply attenuates the antenna input. The Scout Regen uses a 50-ohm resistor switched across the antenna input to shunt away excess RF if needed. If a signal is too strong, it can sound distorted and require extra adjustment of the regeneration control. Remember when tuning in the ham bands, turning regen up allows you to hear SSB and CW. As signals fade in and out, changing in signal strength, you might find yourself constantly adjusting the regeneration control, or RF-gain/attenuator switch, or both. This is just part of the fun of using a regenerative receiver!

I plan on devoting some future columns to soldering and desoldering tools and techniques, finding kits that are not as easily available, and making inexpensive test equipment from kits to help you build kits even better. I enjoy hearing from those of you who have e-mailed me since I began my monthly columns or commented to me on the air. Thanks for making this column a fun thing to do! 73 de KØNEB

Rolling Your Own

If you're interested in building a regenerative receiver and want the extra challenge of building it from scratch, be sure to check out N1TEV's project article, "A High-Performance Regenerative Receiver," elsewhere in this issue. (N1TEV also designed the circuit used in the Hendricks Scout receiver kit described here.)

Photo D– Completed Hendricks Scout Regen receiver. Notice the three-section coil along with band-range switch and RF attenuator (all on the left in photo) on the board.

BY DON ROTOLO,* N2IRZ

Networking (of a Social Kind)

As I write this column, on December 7, the 40th anniversary of the internet, tens or hundreds of thousands of people are looking for red balloons. The weather here in New Jersey is freezing rain, and I should be up the tower working on my antennas, but no: I have to suffer the indignity of sitting in front of a cozy fireplace, vicariously watching via the internet a lot of people seeking out ten very special red balloons.

Our friendly DARPA (Defense Advanced Research Projects Agency), the central R&D organization for the US Dept. of Defense, issued a challenge this day: Find ten 8-foot red weather balloons, tethered throughout the United States, and win $40,000. They're supposed to be located where they will be readily accessible and visible to thousands of people. But what's the point?

DARPA is running this "Network Challenge" to "explore the roles the internet and social networking play in the timely communication, wide-area team-building, and urgent mobilization required to solve broad-scope, time-critical problems." In other words, will Twitter or Facebook help lots of people work together? This is a fascinating challenge, one with problems to be solved that may not be readily apparent.

The first problem to be solved is finding enough people looking for those balloons to cover the whole United States. There's clearly not enough money to split up the prize money among all the participants, but several groups have promised cash to those who are first to report a validated balloon sighting.

The problem goes deeper than simply finding a sufficiently large group. You need to be able to communicate with them in advance of the event, to make them aware of what they are supposed to be looking for, and then train and equip them to provide the correct information. A central point of contact needs to be established, one which everyone in the group can remember. Also, there needs to be some system equipped to handle the potentially thousands of reports that may be received.

Ham radio operators are a sufficiently large group. Communications shouldn't be a big problem. After all, what are we if not good communicators? However, there's a glitch: Part 97 says something about not having any pecuniary interest, and if there's prize money to be divvied up, it could become an issue. Okay, so no communications using amateur frequencies.

Communicating the details of all this takes time and resources. Many hams know when the CQ WW DX Contest is run and the basics of how to "win." However, these dates and rules are established months or years in advance. This DARPA challenge (there have been several others in different subject areas) was announced at the end of October. Even if ham magazines such as *CQ* and *QST* used the power of the press to bring this about, it would have been a few weeks past the editorial deadline for the December issue, and even that's cutting it a bit close.

Photo A– DARPA Network Challenge balloon number 10. This 8-foot red weather balloon (and nine more just like it) was displayed in a public place in the United States in an effort to see who could find all of them the fastest and win a $40,000 prize. The winning team, from MIT, used the internet and promised a cut of the prize money to entice participants. (Photo courtesy of DARPA <http://www.darpa.gov/>)

Assuming one could find a good way to contact all (or almost all) the hams in the USA, the problem of informing them what to do and how to report are relatively easy. Anyone with a license has proven they can read and follow instructions. The Network Challenge rules call for a latitude and longitude report of each balloon's location, within 1 mile. Many of us have GPSes or maps that can

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e-mail: <n2irz@cq-amateur-radio.com>

provide this; even Google Maps gives that information. But how to filter out the noise?

I mentioned that anyone with a license has the ability to follow instructions, but how many of us have encountered a "Lid," a radio operator who (how shall I say it?) leaves those assumed abilities in question? Therefore, how do we filter out those reports that are simply incorrect, giving locations that are inadequate in some way? Or worse still, malicious reports that are purposely meant to deceive.

Then, there's the challenge of taking in all those reports, logging them, and somehow following up to verify each one. I can imagine that the receiving end of those reports will encounter conditions much like the pile-ups encountered by DXpeditions, and checking for dupes (which in this case would be good) as any competitive contester would do.

So, you may ask, what does this digital DARPA competition have to do with amateur radio?

Let's think about some of the more important things we do with the spectrum entrusted to us, for example Emergency Communications (EmComm). We need to perform a stated task (such as "find people needing help"), often with little advance notice, accurately report locations, keep a list of information received, and again filter out any "noise" (unintentional or otherwise). Actually, we're pretty good at stuff like that, but once the dust settles on this challenge perhaps we can learn something from the participating teams.

Fast-forward to later in the day: Of the more than 4000 registered to take part, the Red Balloon Challenge Team from MIT (Massachusetts Institute of Technology) needed less than *nine hours* to correctly locate and report all ten balloons. They handed out most of the prize money to those who first reported each location (and smaller amounts to folks who referred those finders to MIT, and even smaller amounts to those who referred *those* referring folks, and so on), with the remainder going to charity. It seems that their recursive awarding of the prize money attracted a sufficient number of people to provide good data, and the "open source" teams (that proposed awarding all the money to charity) did not fare nearly so well. Well, money *is* often a good motivator…

It is still far too early to get any news about the methods tried and lessons learned, but a Google search reveals some interesting facts: Several teams show up as sponsored links from a

Photo B– After the MIT Red Balloon Challenge Team reported the location of all ten balloons in just under nine hours to win the challenge, this map of their locations was released. Despite dealing with misinformation (both unintentional and malicious), the team's plan for gathering and verifying reports was ultimately a winner. (Image courtesy of DARPA)

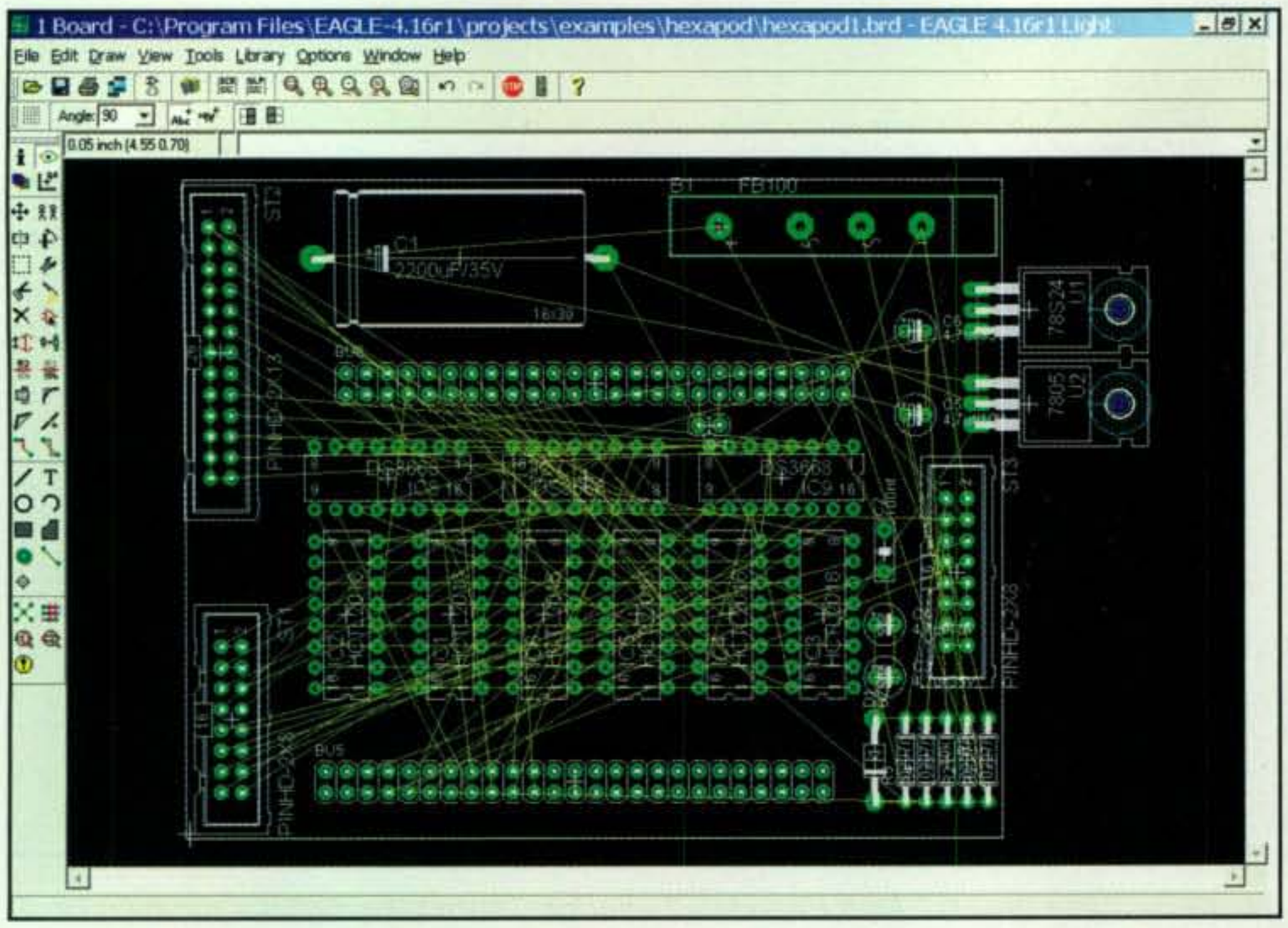

Photo C– An EAGLE Rat's Nest before the autorouter was started. The components were placed manually on the board and the electrical connections were created to automatically match the schematic. A light version of EAGLE is available as freeware; visit <http://www.cadsoftusa.com>.

search of "red balloon," each one offering some cash for good reports. On Twitter, there were several tweets that were intentionally deceitful, mostly worded like "red balloon spotted in Seattle" but without any details, or the exact same text coming from several different user names. Even DARPA reported there were "multiple entries of spoof balloons submitted," since several people decided it would be a good day to fly an 8-foot red weather balloon in their neighborhood. Also, "red balloon" was *not* one of the top 40 Google searches in the United States this day.

By the time you get to read this, it should be easy enough to get the white papers on these efforts, so consider this a reminder to look them up and see if we can use any of their methods. Certainly we can learn some good lessons from the challenge. What surprised me—I guess—was the large amount of "interference" from fake balloons, fake reports, and other "noise" sources. This type of information, if not validated, can impact an entire operation, which is a good lesson to keep in mind. With some effort, perhaps we can organize and win the next DARPA challenge?

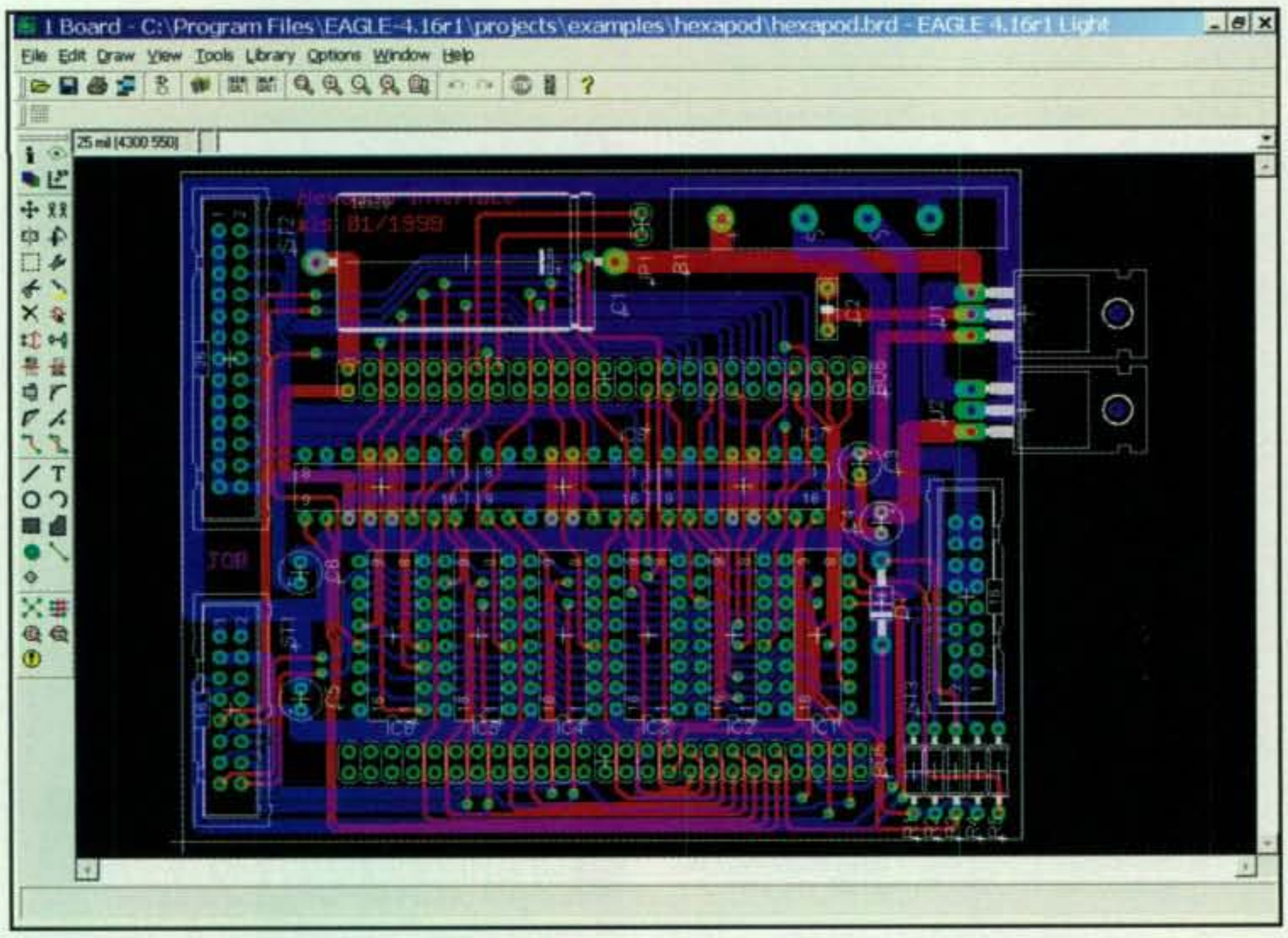

Photo D– The same board after autorouting for a two-layer PC board and some manual tweaking, especially for the wide ground and power paths, as well as moving a few components around for a better fit. This is one of the sample boards that comes with EAGLE.

Printed Circuit Boards

To fill in the rest of this month's column, I have a few comments about printed circuit boards, or PCBs. I hope you're familiar with PC boards, considering that point-to-point wiring essentially disappeared in the early 1970s. Just in case you are not, though, a PC board is a piece of fiberglass or other material maybe a millimeter thick with a thin layer of copper laid out in a pattern to interconnect several electronic components.

When building a very simple circuit, I might opt for point-to-point or maybe dead-bug wiring (Google those terms if they are unfamiliar), but more often than not I'll make a PC board. They are very easy to make, provide good support for components, and really help when making more than one or two of something.

The process works like this: You buy some raw PC board material, which has a thin layer of copper on one or both sides, cover the parts of the copper you want to keep, and chemically etch away the uncovered copper. Drill some holes for through-mount components, solder it all up, and you're done. You can cover the copper with etch-resist tape (kind of like masking tape, but narrower), rub-on transfers, or even certain inks (such as from a Sharpie® marker), but all of these methods take the same effort for each board, a problem when you're making more than one.

For a few boards, you can use a photographic process using specially treated PC board material and ultraviolet light, and for production quantities a silkscreen method is economical.

All of these methods depend on some kind of plan for the layout of the copper lines. Small and simple circuits can be laid out by hand, but for larger and more complex circuits we use software.

My first PC board designs were made in PC Paintbrush, an application that came with Windows® 3.0 (and still is found on the All Programs/Accessories menu) on a scale of 300 pixels to the inch. Later I bought Easy-PC® for DOS from Number One Systems in the UK; I

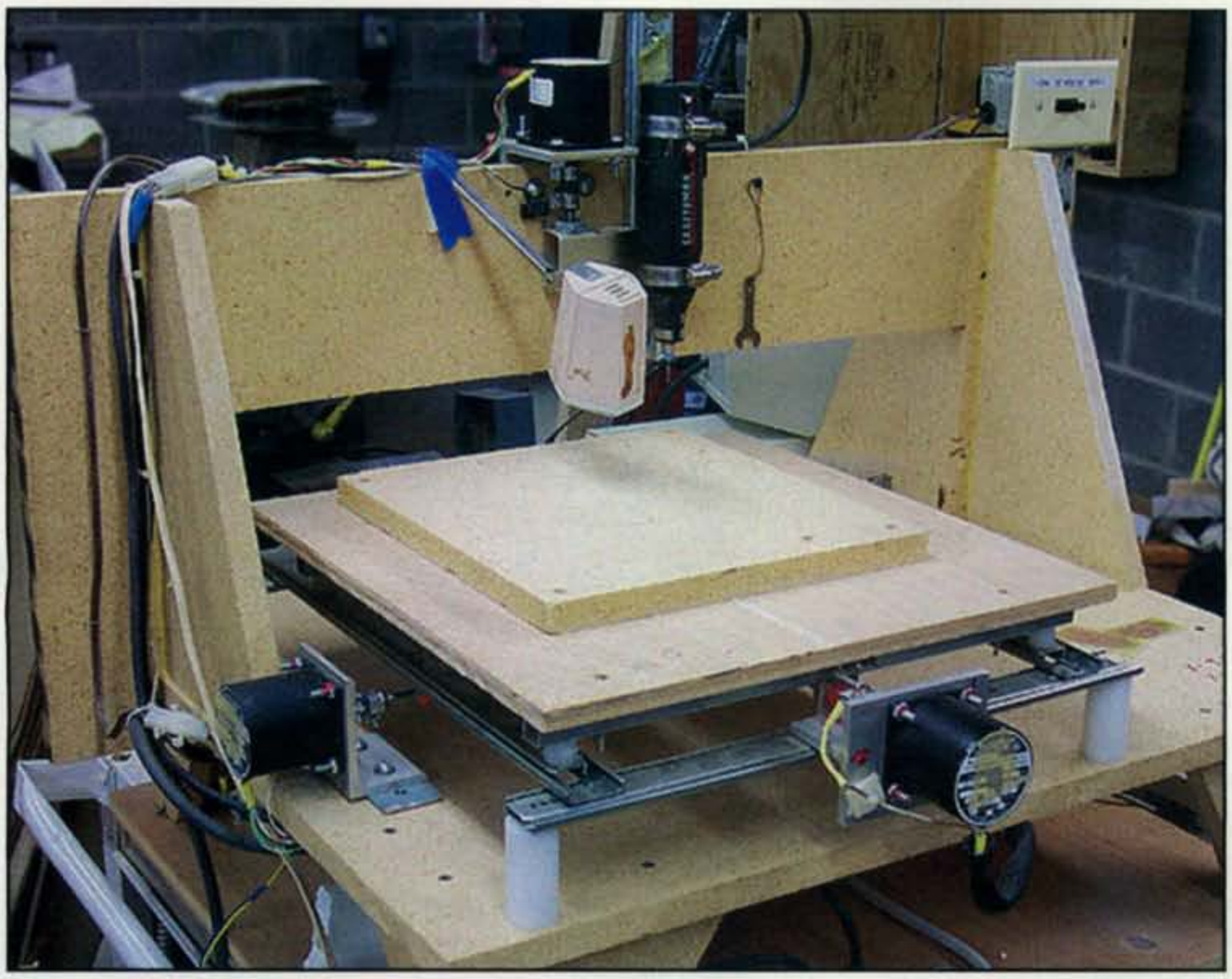

Photo E– My PC board drilling machine built from plans I saw in a magazine. It is controlled through the parallel printer port of an ancient IBM PS/2 Model 30 computer running at 4.77 MHz booting off the floppy drive. The DOS 6 operating system, CAD/CAM control program, and several drill data files all fit on a 720-kb 3.5-inch floppy with plenty of room to spare, more proof that old computers still have value.

think I paid about $100. This was a huge leap forward at the time, since professional software was still in the thousand-dollar or more range.

EAGLE Layout Editor from CADsoft <http://www.cadsoftusa.com> is what I use today. There are several versions available, from a "light" version with size and layer limitations, all the way up to the full-blown professional version for about $1500. Unless you're in the business, you won't need to spend nearly that much.

My old Easy-PC software was little more than a highly specialized drafting system. I could draw a PC board layout, or a schematic, but it was all completely manual—locating the components and drawing all the circuit connections. EAGLE has Schematic Capture and an autorouter, which really automate and simplify the whole process.

Schematic Capture is a fancy way of saying that it can read the circuit schematic and, if you tell it a little about the components you plan to use, will produce a PC board that has all the connections in the right places. The result is called a "rat's nest," since the connecting lines are just drawn straight, directly from point to point, and need to be reworked so they don't cross over each other. However, moving them is easier and less prone to error than manually making the connections.

An autorouter takes that concept one step further, taking all those connections in the rat's nest and redrawing them so they don't cross over each other, producing a complete and ready-to-etch PC board pattern. In some cases the autorouter can't make a few connections, so you'll have to manually route a few traces using a jumper wire, and in other cases the result is a little less than optimal, so you might want to nudge some of the lines around. But overall, the process takes a fraction of the time—minutes instead of hours—and accurately follows the schematic to avoid errors.

Rather than give you a tutorial on setting up and using EAGLE, I just wanted to introduce you to the software and urge you to download it and try it out. The autorouter is fascinating to watch in action, and the results are pretty darn good.

Maybe some time in the future I'll write about the CNC PC board drilling machine I built. Let me know if you're interested. Until next time . . .

73 de N2IRZ

mobiling

BY JEFF REINHARDT,* AA6JR

Traveling "First Class"

This mobiling adventure comes courtesy of Robert W. Perkins, WØJEE. Robert responded to our perennial call to share mobiling ideas and photos. Quite frankly, I was blown away with the quality and planning that went into his installation, so much so that I'll keep the words to a minimum to maximize the amount of space we can devote to his photos. Here is the description in Robert's own words-

"Hide Away" Mobile

About three years ago I purchased a 2007 GMC 3/4-ton diesel pickup truck. It's an after-market custom model called the Remington Limited. This vehicle had to fill a lot of needs. It had to be able to haul anything and everything our ranch requires. It had to be our second car and haul our cattle trailer with loads up to 15,000 lbs.—and it had to be home for my mobile rig.

Having been on the air for over 60 years and married for 53 years, I'm very concerned about my wife's creature comforts. I decided to do a hide-away installation. As the pictures show, the only visible components are the IC-7000 face mounted in the vehicle's center dash and the noise-cancelling speaker on the dash. Again, the pictures show how I used the center console compartment to house the VSWR/power meter, the automatic screw-driver control, and the switch for turning the 500-watt amplifier on and off.

The picture of the back seat shows a plastic tool tray which contains the IC-7000 transceiver, the

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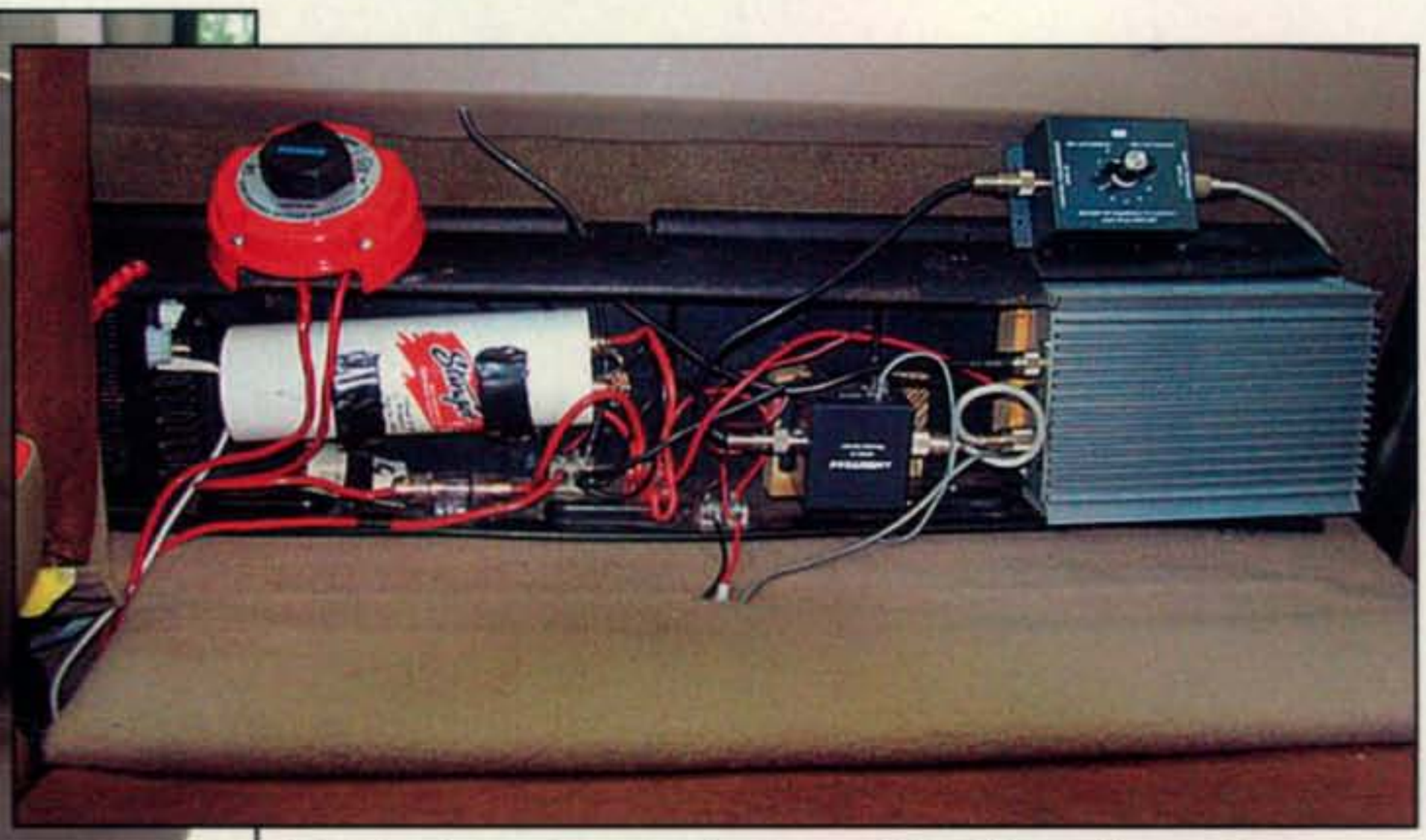
Note the "hidden" armrest installation that places controls at the operator's fingertips.

WØJEE did a "top shelf" job integrating ham radio with his GMC pickup.

The visor display is well-designed and folds neatly out of sight.



The back seat conceals some of the "heavy" gear that puts out big signals on HF.

500-watt amp, all control systems, and the 1-mFd stiffing capacitor that I use to help hold the 12-VDC system to nearly alternator output.

The antenna is the Ameritron SDA-100 Screwdriver, with automatic control for band switching and excellent repeatable tuning. Probably the neatest thing about the installation is the visor-mounted video monitor. The IC-7000 has a video display just like the IC-7800. What's neat about that is whether I'm mobile or operating fixed station, I'm looking at similar displays.

The best thing that can be said for the video monitor is its location on the visor. By adjusting the visor so that you never take your eyes off the road, full transmit and receive info is available with very little eye movement. In the age of cell phones, GPSes, On Star, and mobile radio systems, I feel like the visor-mounted video monitor is the first major improvement in driver operator

The "office" presents a clean array of gear that's away from airbag-deployment zones, with no stray wires to detract from the quality appearance of the installation.

safety on our well-traveled highways in some time.

The finished package has been a payback for hard work and good old ham ingenuity. We have almost a total absence of noise. We have copied S1 signals while scooting down the highway at 70 mph! Credit goes to good grounding, good bonding, and good isolation. Add the great handling of noise by the IC-7000, and the result is a mobile station with as good a signal-to-noise ratio as most fixed stations.

This installation was done in 2007 in preparation for a trip to the Dayton Hamvention®. I stopped in the Dallas area and picked up my long-time friend and co-driver Bud Hammers, W5RPU. We completed another trip to Dayton in 2009. We enjoyed working mobile to and back from Dayton.

73's & Happy Mobiling!

—Bob Perkins, WOJEE

"The antenna is the Ameritron SDA-100 Screwdriver, with automatic control for band switching and excellent repeatable tuning."

Thanks, Bob, and ditto on the "happy mobiling." I can't imagine a better setup. Can anyone out there equal or surpass WØJEE? Send along your photos and describe how you did it.

73, Jeff, AA6JR

Getting "Current" on Batteries and

Introducing a New "Beginner's Corner" columnist

BY RICH ARLAND,* K7SZ

Hello, and welcome to a new chapter in *CQ*'s Beginner's Corner. My name is Rich Arland, callsign, K7SZ, and I will be sharing the column with your current Beginner's editor, Wayne Yoshida, KH6WZ, on an every-other-month basis. As for me, I have been an active radio amateur for almost 50 years and a QRPer (power 5 watts or less) since 1965. I am the Beginner's column editor for *CQ VHF*, *CQ*'s sister magazine. I have authored six books, including the ARRL's *Low Power Communications, the Art and Science of QRP* (all three editions); was QRP editor for *QST* for four years (2000–2003), am the author of a whole bunch of articles published in various radio and electronics journals, am an active DXer and contester, and also enjoy satellite communications.

I've been married to my best friend, Patricia, KB3MCT, for 28 years, and we have four children and six grandchildren. Pat and I are both actively involved with Amateur Radio Emergency Service (ARES) and public service. We both firmly believe that our amateur radio licenses require us to provide our community with our communications expertise in times of emergency and disaster.

In late 2008 we moved from northeast Pennsylvania to Dacula, Georgia, about 30 miles east-northeast of Atlanta to take advantage of the warm weather and the great southern hospitality offered in the deep south. The new house has plenty of room for antennas (thank God), and I have a whole bunch of very understanding neighbors who don't mind watching me string wires and erect towers! Life is good!

The direction I intend to go with my portion of "Beginner's Corner" is to take a very simple approach to the technical side of the ham radio hobby. My basic theory is that since ham radio is a technical hobby, in order to fully enjoy and appreciate the hobby you must become technically involved in it. Now don't get too over-excited! I promise that our technical exploration of the radio hobby will be relatively painless . . . relatively. There will be some math, but nothing that you can't conquer with a simple calculator, slide rule (yes, I still have my Kruffle & Esser Log-Log Duplex Deci-trig slide rule from the 1960s, and I can still use it!), or pencil and paper.

Mathematics can be troublesome for some people. However, it is an essential part of the hobby, especially when dealing with antennas. Understanding the math behind the antenna design can go a long way toward making sure that you are successful with your design and have fun and success using it.

Now on to the topic of this month's column . . .

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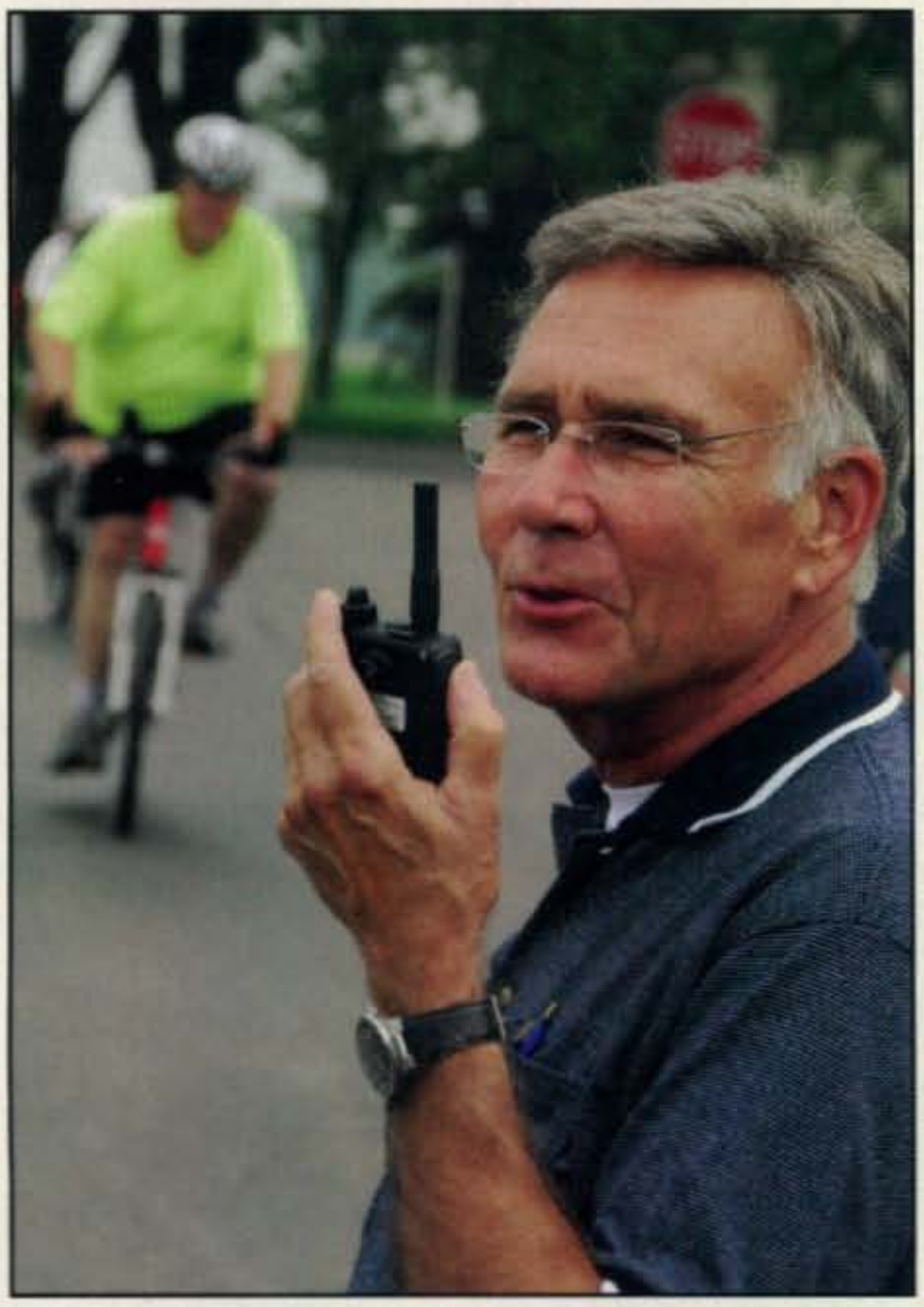

If you use a handheld—as Ray Baker, N2DAY, is doing to help with this bike race—it's important to know what type of battery your HT uses and how to properly recharge it. (Photo by Larry Mulvehill, WB2ZPI)

Batteries

Since this column is dedicated to the technically inexperienced and/or new hams, let's start with something relatively mundane—the humble battery. About 99% of us who are active in the hobby have some form of radio that requires the use of batteries. Most likely it is a hand-held transceiver, or HT. With the newer HTs there seems to be a trend toward "A-shack-on-the-belt" type of radio. To be sure, the marvels of miniaturization coupled with advanced microprocessor technology have given us some really cool radios. The one thing they all have in common is that they use batteries for power. With that in mind, let's explore how batteries work, the various types currently available, and the proper care and feeding of same.

Batteries: What are They?

Batteries are power storage devices—nothing more, nothing less. They have the ability to store electrons for use at a given time and place. To be

sure, there are various types of batteries, some well-suited to our needs and some not. Here we will explore several of the most common batteries used in our portable gear.

Nickel-Cadmium (Ni-Cd)

Until the last few years the most common batteries used in portable radio gear were nickel-cadmium or Ni-Cd. These batteries are rechargeable many, many times, and they are relatively compact, fitting nicely into a battery box attached to the bottom of your HT. Each Ni-Cd cell has an open-circuit voltage of 1.2 volts DC. Ni-Cds are handy, as long as you remember to properly recharge them and especially *not* to over-charge them! One thing many folks don't realize is that Ni-Cd s are subject to a daily discharge rate of about 1% of the total charge per day. That means that your 12-volt Ni-Cd pack will lose approximately 30% of its total charge in one month! That is a *lot* of discharge! Ergo the need to perform a regular charging ritual every month for *each* Ni-Cd battery pack you have. Now this might sound like a lot of extra work, but if you mark your calendar at the start of each month, you'll be on top of your game.

Another thing about Ni-Cds is that they are very sensitive to fluctuations in charging current and are susceptible to over-charging. Charging current must be controlled, and it is *not* a good idea to leave your battery pack on the charger for more than the recommended time—in most cases 12–14 hours. If in doubt, consult your rig's manual for the exact details on charging the battery pack. After all, they did write the instructions for a reason!! Another item regarding charging Ni-Cds: *Use the charger that the manufacturer recommends for your gear!* That way you are assured of providing the proper charging current and voltage to your pack, which will greatly extend its life.

One final note about Ni-Cd batteries: You might have heard or actually experienced the dreaded "memory effect" in which the battery pack only discharges part way and then immediately goes flat (as in non-usable), only to be recharged and then very quickly go flat again. There is some debate regarding the memory effect of Ni-Cds; I certainly have experienced something similar over the years with several of my HTs. Whether or not this memory effect actually exists is a matter of opinion. However, should something like this happen to your gear, it's time to buy a new battery pack, plain and simple. There is no magic method, as some maintain, to rejuvenate a battery pack by pulsing a very high DC voltage at a fairly high current (14–15 volts at 1 amp) into the pack, or shorting out the pack (which *really* can be dangerous, as in fire and/or explosion!) and then recharging.

Nickel-Metal Hydride (Ni-MH)

Nickel-Metal Hydride (Ni-MH) batteries are the big favorite among HT manufacturers today, as they offer a huge increase in battery capacity in the same size case. It is not uncommon to see Ni-MH batteries in the 2400–2700 amp/hour (A/H) rating, which is almost twice the capacity of similar-size Ni-Cds. This extended capacity means that you can run your gear longer without having to recharge the battery pack. Nice, especially when you are deployed on an ARES/RACES exercise or real-world emergency event. The more capacity your HT batteries pack, the better off you are in the long run. Like Ni-Cds, the Ni-MH cells have an open-circuit voltage of about 1.2 VDC and take some special handling when it comes to charging. Again, use only the approved charger for your battery packs. Ni-MH cells also exhibit about a 1% loss of capacity per day, meaning that you need to set up a fixed battery charging rotation on a monthly basis to ensure that your packs are topped off and ready for instant use. I have two sets of Ni-MH battery packs for each of my four HTs. This allows me the luxury of having lots of power to run my radios when in the field. Ni-MH cells do not seem to exhibit any "memory effect," which is a good thing. While various manufacturers claim different recharging cycles, it is standard to expect that Ni-MH battery packs can be recharged about 400–500 times before replacement. Just be sure to avoid deep-discharge cycles (letting the packs sit and not recharging them for months on end) and don't over-charge them. Again, a monthly battery recharging schedule will go a long way toward making your battery packs last.

Lithium-Ion (Li-Ion)

Lithium-Ion battery packs have come on the HT scene during the last few years and they are gaining ground on the Ni-MH batteries. The reason—more capacity and smaller overall form factor. Li-Ion packs are expensive. They take a

SUCH A HAM

I remember when my portable station was portable.

special charger that precisely regulates their charge voltage and current. They have a larger A/H capacity than a Ni-MH pack and they can be recharged in about one-third the time! This is a great thing for ARES/RACES operators, since it permits emergency communications (EmComm) volunteers to have lots of power readily available for their gear.

Non-Rechargeable Alkaline

Now a word about alkaline non-rechargeable batteries. In addition to my two Ni-MH battery packs per HT, I also have a separate battery tray for each HT that will accept the humble "AA"-size alkaline non-rechargeable cells. Why? For one thing "AA"-size cells are prevalent. As a matter of fact, you can find them just about anywhere on the planet, making them indispensable for the EmComm operator. Secondly, they offer a quick replacement for a spent rechargeable battery pack that can be changed on the fly. Finally, they typically have a longer discharge curve than any of the rechargeable batteries, which means you can use them longer at reduced power output.

"AA" alkaline cells have an open-circuit voltage of 1.5 VDC as opposed to 1.24 and 1.2 VDC for Ni-Cd and Ni-MH cells, respectively. If you need a 12-volt battery pack, it will only take eight alkaline cells in series to yield a 12-volt output, whereas it will take ten Ni-Cd or Ni-MH cells to derive the same 12 VDC output. Interesting, huh?

Discharge Curves

Although I didn't cover discharge curves with reference to the rechargeable battery packs, suffice it to say that most rechargeable packs have a fairly stable (as in flat or "linear") mode of discharge, ultimately ending in a rapid fall off at the end of their discharge cycle. Obviously, the larger the capacity (A/H) number on the cells the longer that discharge cycle is, meaning the longer you can operate your gear without recharging or changing packs. With the rechargeable packs this discharge curve drops off quickly near the end of the battery pack's usefulness. The non-rechargeable alkaline packs have a much steadier decline over time, which allows you to squeeze extra operating time (at reduced power/ efficiency) before replacing them.

There is no "right" battery pack for a given radio. It is entirely predicated on your operating characteristics and the uses to which your are subjecting your gear. Personally, I would shy away from Ni-Cd packs, as they are rapidly becoming outdated, being replaced by Ni-MH and Li-Ion packs. Of course, the major drawback to Li-Ion is cost. True, you get a lot of battery for the price, but do you need to incur the extra expense when purchasing Li-Ion packs (plus special charger) when cheaper Ni-MH batteries will do just fine? The choice is yours. One thing for sure, I would not lightly dismiss the lowly "AA" alkaline cells in this brave new world of radio communications. Alkaline cells have a place in the EmComm tool bag for sure.

One final note regarding batteries: *Do not* just throw them away at the end of their life. Most batteries contain some really nasty chemicals that don't belong in a landfill. Take your spent battery packs to a battery recycler for proper disposal. Green is good!

Until next time, have fun with our ham radio hobby.

73, Rich, K7SZ

qrp

BY DAVE INGRAM,* K4TWJ

Hoot'n in a Can . . . and More!

Every area of special interest in amateur radio today has its own unique aspects and rewards, but few hold the widespread appeal and high enjoyment-per-investment value of QRP. This month's topics are good examples of that fact. Ham group "buildathons" are increasing in popularity, and several top QRPers are helping them along the way with easy-brew kits. Meanwhile, Mike Rainey, AA1TJ, continues to devise his wild "minimalist projects," and the Arizona ScQRPions are pumping out yet another good QRP kit. That flash-peek at "what's hot and happening" is only a tip of the proverbial iceberg, however, so I will forego additional encouragement to try QRP in your own shack and proceed to squeeze in as much QRP news and views as column space permits.

Rishworth Buildathon

Jolly old England, home of QRP guru Reverend George Dobbs, G3RJV, and his famous NE612/LM-386 "Sudden" receiver, experienced a blowout good buildathon session at the recent (October 2009) Rishworth combination hamfest and QRP convention (photos A, B, and C). The star subject was, appropriately enough, the dear little Sudden receiver that participants built "Aided Manhattan" style with kits from W1REX of <QRPme.com>.

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What is a buildathon and what is Aided Manhattan? Simply explained, a group of hams assembling a preselected project or mini rig is a buildathon. A newcomer and a more skilled assistant typically work together in a "learn by doing" manner while solder-slinging old pros quickly assemble their own projects and help others test and troubleshoot their projects.

For this event, the Sudden receiver kits had their two IC sockets with eight solder pads each prewired and glued down to the main copper-clad boards, a 9-volt buss line also glued to the board, and a pictorial layout guide. That "Aided Manhattan" arrangement reduced layout and assembly time from five or six hours to one or two hours so buildathon participants stayed focused and interested. We understand the buildathon was a rollicking success and folks are enthusiastically looking forward to future buildathons. Splendid!

If you are not familiar with the G3RJV-designed Sudden receiver, it consists of an NE602/NE612 mixer/oscillator IC that direct-converts incoming signals to audio so they can be amplified by a popular LM-386. A small number of support parts (resistors, capacitors, etc.) complete the receiver, and overall performance is quite good for such simplicity. In fact, I often leave one running in my shack to keep an ear on band activities. The Sudden receiver has been integrated into several QRP rigs such as the 49er from NorCal and the MRX from K8IDN, and is presently available as the "Sudden

Photo A– QRP goodies of all types were available in the main hall of the Rishworth Convention held in England during late October 2009. It was a homebrewer's dream. (Rishworth photos courtesy John Vinters, G7NSN, of the U.K.)

Photo B– Rex Harper, W1REX, QRP's kid-at-heart and project kitter supreme discussing the Pic Axe microprocessor and its many applications for QRP with attendees at the Rishworth G-QRP Convention. Watch for kits of Pic Axe beacons, QRSS keyers, code-practice units, digital thermometers, and more to surface during coming months.

Storm" kit from <www.qrpme.com>. It is hard to beat a storm, you might say.

Hoot'n in a Can

Just when you think you have seen it all, along comes another unbelievable transmitter project you can't resist replicating. Such is the latest brainchild from Mike Rainey, AA1TJ—a voice-powered CW transmitter he named "The New England Code Talker" (photos D, E, and fig. 1). Simply described, this mad marvel consists of a crystal-controlled RF oscillator with a speaker doing "reverse duty" as a sound-to-electric energy gen-

Photo C– Rev. George Dobbs, G3RJV, looks on as Agnes, M3XYF, and Clive, M5CHH, work as a team begin assembling a Sudden receiver during the buildathon at the Rishworth Convention in England. Note the two IC sockets preinstalled on the board and easy-to-duplicate layout guide, both included in convention kits supplied by W1REX of <www.qrpme.com>.

Photo D– Can and cardboard speaker baffle portion of the AA1TJ Code Talker transmitter designed by Michael Rainey, AA1TJ. Look carefully and you can see the circuit assembled "Manhattan Style" in the background. (Photo courtesy of W1REX)

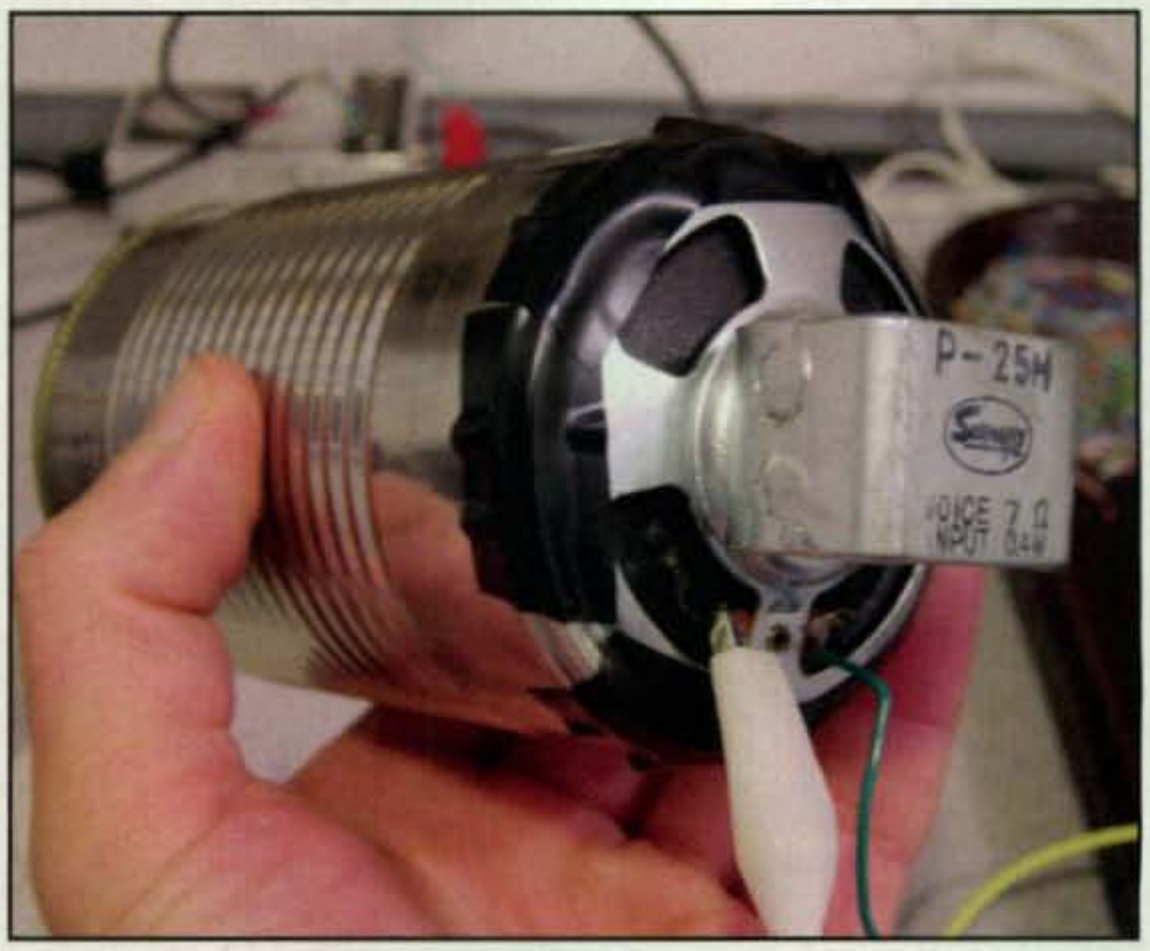
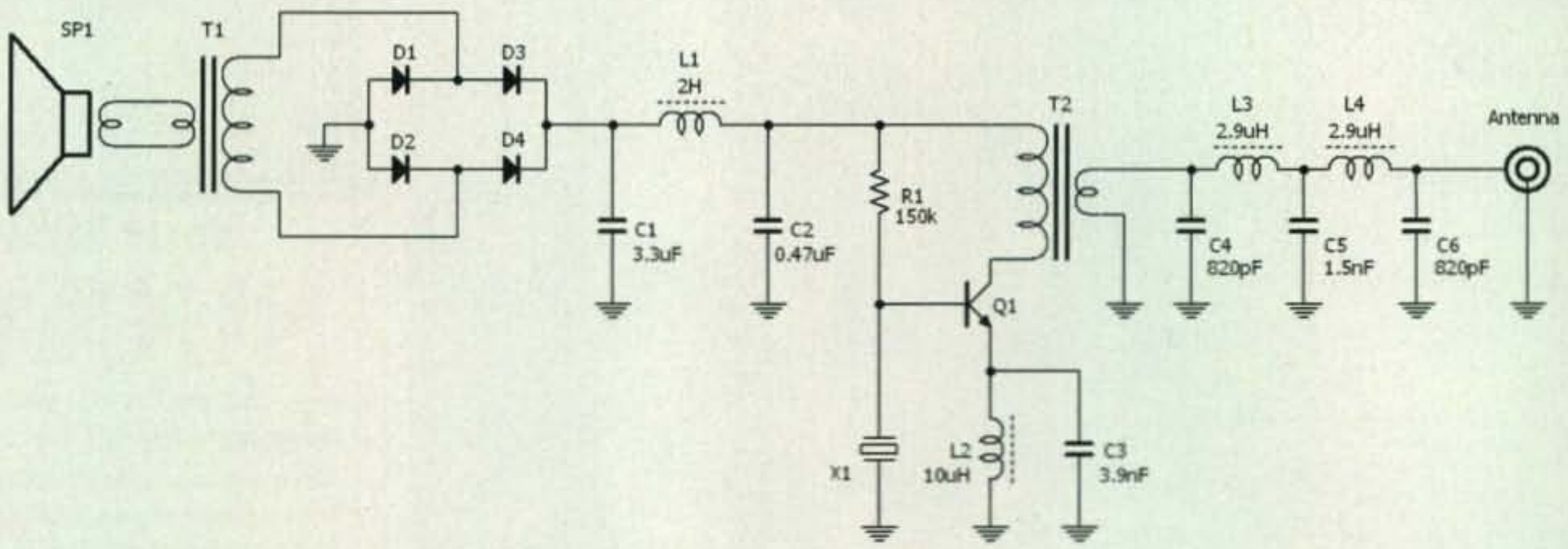


Photo E– An inside peek at the speaker end of the Code Talker transmitter. Note the gaps in the tape coverage for sound to pass through and the large voice-coil/magnet area for maximum-attainable output voltage.

erator. You talk (or shout for maximum attainable power) short dits and l-o-o-n-g d-a-a-s-hes into a can funneling sound waves into the speaker. The resultant AC voltage from the speaker's voice coil is then stepped up by a small output transformer, rectified, filtered, and applied as collector voltage to the transmitter's single 2N3904 transistor. Output is 15 to 20 milliwatts on 80 or 20 meters, according to selected components. Don't snicker, as Mike has worked over a half-dozen states with this wild and wacky thing.



SP1: Junkbox PM loudspeaker; 7 Ohm, 400mW
T1: Audio transformer; 8 to 1200 Ohms
D1-D4; Germanium signal diodes (1N34a, etc.)
L1, Select for < 25 to 50 Ohm DC resistance
X1: 80m quartz crystal
Q1: 2N3904
T2: 16 turn primary/4 turn secondary on T50-43 ferrite core

Fig. 1– Circuit diagram of the AA1TJ Code Talker transmitter. Discussion plus suggestions on parts substitutions, etc., in text. (Circuit courtesy of AA1TJ)

Photo F– One of the new Tuthill 80 mini transceiver kits available from <www.azscqrpions.org>. This beauty was built and mounted in a neat blue enclosure by W5JH.

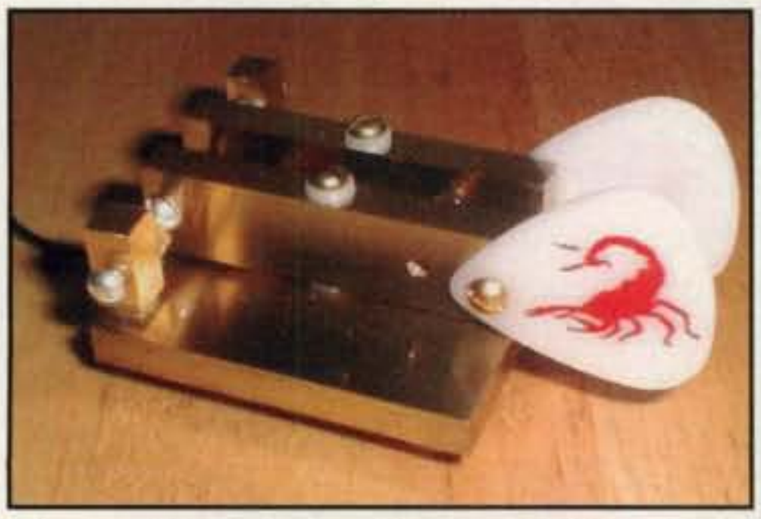


Photo G– This familiar ScQRPion CW paddle kit was designed by Jerry Haigwood, W5JH, and moved the Arizona ScQRPions into the QRP limelight in the past. (Photo courtesy of W5JH)

During early November, Mike, AA1TJ, Rex, W1REX, and Jim, W1PID, met at a Maine shoreline and attempted to work Europe from a waterfront cottage with the 15-mw Code Talker (sort of reminds you of Marconi's first transatlantic test from Cabot Tower in Newfoundland, doesn't it?). It was truly a "boys with toys" venture with Mike using the can, Jim keeping watch for visitors with white coats, and Rex consoling neighbors curious about the strange "toot toot howls" from the house (AFI?). The boys went strong right to the closing wire, with Rex running two hours late to pick up his daughter from school and Mike, hoarse and lacking a cell phone, rushing to the airport to pick up his XYL (watch for flying shoes, Mike!). Hopefully the 20-second video of Mike hooting into the can will still be available on YouTube when this article appears in print (<www.YouTube.com> and enter AA1TJ in the Search window).

Word of the Code Talker seems to have spread like wildfire, and, like several folks who heard about it only days after Mike built it, I too became anxious to quick-brew a copy. Night dinking required numerous parts substitutions, but some good notes worth sharing evolved in the process.

First, you must use a large speaker with a big voice coil and magnet (like a good old Quam speaker). Don't make the mistake I made of trying to use a 10:1 mic transformer. Use an audio-output transformer with 8-ohm primary winding. Be sure to include the 2-Hy choke. That sounds difficult, but you can substitute a small power transformer; use only the secondary winding. It should have a DC resistance between 25 and 50 ohms (which typically corresponds to a 200- or 300-volt winding). Output from the speaker (with code shouts in the can and T1 disconnected) should be approximately 0.8 VAC. Output voltage from the bridge rectifier should be approximately 7.5 volts D.C. Use germanium diodes with a low voltage drop, specifically 1N34s. Do not substitute silicones, as their voltage drop is too high. Capacitors C1 and C2 must discharge completely between dot and dash or the transmitter will stay keyed until they discharge. Stay close to 3.3- and 0.47-mFd values here.

Bear in mind that sound waves must pass through the can and speaker, so cut out the can's top and bottom and leave an air gap (or two) when taping/mounting the speaker in place. Adding a shield of plastic wrap inside the can/over the speaker will help protect it from moisture during hoots (blindfolds for curious neighbors are optional).

Now looking at Mike's transmitter circuit (everything on the right side of L1 and C2), coils L3 and L4 probably can be replaced with T-50-2 toroids wound to comparable values. If 20 meters is your preference, change L2 to 4 µH, C3 to 270 pFd, C4 and C6 to 304 pFd, C5 to 530 pFd, L3 and L4 to .07 µHy, R1 to 100k, T2 to roughly 10 and two turns, and change to a 20-meter crystal.

Since five to seven volts (DC) are available at the junction of L1 and C2 (with CW hoots), other low-current/low-power one-transistor transmitters (such as my popular "Hamfest Buddy") should work fine in this "Code Talker" setup.

Now answer truthfully, friends. Where but in QRP could you have so much dinking fun at such little cost?

Newbies from the ScQRPions

Now shifting focus to the west of the U.S., we find the Arizona ScQRPions having a ball, planning for CactusCon 2010 coming in July and excited over

Photo H– Here is the new Baby Black Widow CW paddle kit from W5JH attached to the front of a popular PFR-3 QRP transceiver for stand-alone field use. The paddle can also be removed and used stand-alone style with any other transceiver. (Details in text.)

their recently revealed "Tuthill 80" mini-transceiver kit. The ScQRPions, as you may recall, have produced some neat kits during recent times, plus sponsored the popular FYBO Contest traditionally held each year during the first or second weekend of February. This "Freeze Your B... Off" event centers around folks operating outdoors Field Day style with portable gear until their teeth chatter or their CW paddles freeze in action. Indoors or sunny beach operations are also permitted, but there are extra multipliers for braving cold temperatures. It's a good way to prove on-the-air performance of a new rig, accessory, or paddle. Check out <www.azscqrpions.org> for full details and join the fun.

The Tuthill 80 transceiver kit is a new 80-meter CW transceiver kit from the ScQRPions (photo F). It is designed by Dan Tayloe, N7VE, and sponsored by Doug Hendricks, KI6DS, of <www.qrpkits.com>. The mini-rig features a capacitor tuned VFO, a direct-conversion receiver using a Tayloe mixer, and a 2.5-watt transmitter. While building the transceiver you decide which 50–80 kHz segment of 80 meters the little rig should cover. The Tuthill 80 kit includes the PC board and all parts. You furnish the cabinet, knobs, paint, wire, etc. Instructions for home-assembling three different types of enclosures are included. The optional digital display comes from <www.qrpkits.com>.

Another, and probably the most well-known, item offered by the Arizona ScQRPions was their CW paddle kit (photo G). The paddle was designed by Jerry Haigwood, W5JH. Almost one-thousand kits were sold, and they also inspired several other similar-design paddles. Today Jerry has progressed to producing his own paddle kits called the Black Widow (full-size, 3×3 inches) and the Baby Black Widow (2×3 inches) as shown in photo H.

The Baby Widow paddle sports a black anodized aluminum base, lightweight arms riding on ball-bearing movements, and silver-plated contacts. All parts are cut and machined for a perfect fit, so assembly is narrowed down to finishing, polishing brass parts, and soldering two wires (and maybe adding a few personal touches for flavor). The Baby Widow is supplied with one of two front brackets to mate with a PFR-3 or a KX-1 transceiver. It can also be used stand-alone style with any other transceiver by connecting a stereo earphone extension cable to its rear plug. It is a doll of a QRP paddle and I also understand it works great on QRO. More details at <www.w5jh.net/paddles.htm>.

Conclusion

That overflows available space for this month, and we thank all of you for your continuing support and words of encouragement. Remember to send us news and photos (250k to 1-meg resolution) of your new gear, goodies, and adventures inn low-cost in QRP, along with who receives credit for photos). We will spotlight your good news in future columns and give you plenty of well-deserved credit.

73, Dave, K4TWJ

Important Announcement:

Dreams to Reality Endeavor

If you have ever dreamed of making the ultimate DX contact—of working at least one station via EME/moonbounce, your golden opportunity may soon become reality. When investigating that possibility, I noted that many youngsters—potential next-generation radio amateurs—are also quite interested in space-related activities. Brief communications with astronauts/cosmonauts aboard the International Space Station also hold high appeal to such youngsters, their schools, families, communities, and the news media.

Combining the previous facts with several additional promos, I devised a "Moon Talk 2010" plan to bring everything together in a "Dreams to Reality" manner. The plan includes Little Pistols and Big Guns alike and a monster antenna system is not mandatory (I have a special surprise or two in store).

Would you like to join the fun, make a positive impression on today's youngsters, and promote amateur radio nationwide at the same time? Send me a brief e-mail soon. This plan may be a one-time opportunity, and it may occur during the next few weeks. Follow this guideline explicitly. List your VHF and UHF gear, power levels, antennas, and location plus return e-mail address. I will reply in a group e-mail within 10–14 days. If all works as planned, additional news on this history-making event will appear in a future issue of CQ.

K4TWJ (k4twj@cq-amateur-radio.com)

Power to the Hams

BY JOHN WOOD,* WV5J

Power is the common thread in this month's "What's New" column as we examine everything from finger power from Radio Mate to solar-power systems from Powerenz, to mobile power from PowerSafe. First we'll look at the PowerLite and the UltraLite off-center-fed dipole (OCFD) wire antennas from MFJ.

OCFD Wire Antennas from MFJ

MFJ Enterprises continues its foray into new ham territories by adding three new OCFD designs to its line of ready-to-operate wire antennas that make it easier for hams to concentrate on the fun stuff—operating and making contacts. These are Powerlite and UltraLite antennas (photo A).

The least expensive of the three is the MFJ-2010 priced at $59.95. MFJ tells us it used computer-assisted design to give this multi-band, low-profile antenna a unique combination of low SWR, wide bandwidth, high efficiency, and frequency agility on the 40-, 20-, 10- and 6-meter bands without the operator having to worry about retuning after changing bands or frequency. That capability alone gives MFJ OCFD designs a noticeable advantage over the roll-your-own wire antennas typically constructed by many veteran hams and those new to the hobby. Made with a built-in current choke balun to counter stray noise and feedline radiation, the MFJ-2010 weighs less than two pounds and comes cut to length, pre-assembled, and pull-tested to 200 pounds.

Next on the OCFD introductory price ladder at $79.95 is the MFJ-2012 which combines the remarkable, no-tuning-needed attributes of the multi-band MFJ-2010 with a reported power-handling capability of up to 1500 watts PEP on SSB and CW. The MFJ-2012 is said to be built with a tough UV-resistant marine-ABS feed block, thick-walled network enclosure, 14-gauge stranded copper wire, all stainless-steel hardware, and porcelain end insulators. Like the MFJ-2010, it also comes cut to length and preassembled so it's ready to connect to your coax and go on the air.

Number three on this MFJ OCFD antenna hit parade is the MFJ-2014 priced at $99.95 and offering wide bandwidths on the 40-meter and 75-meter ham bands that MFJ says eliminate the need for

Photo B– bhi Ltd. has improved its popular Radio Mate Compact Keypad designed for use with the Yaesu FT-817, FT-857, and FT-897 ham radios. The new version increases the total number of memories available to 40 and adds a direct frequency nudge function for fine-tuning displayed frequencies in selected increments.

*1870 Alder Branch Lane, Germantown, TN 38139
e-mail: <wv5j@cq-amateur-radio.com>

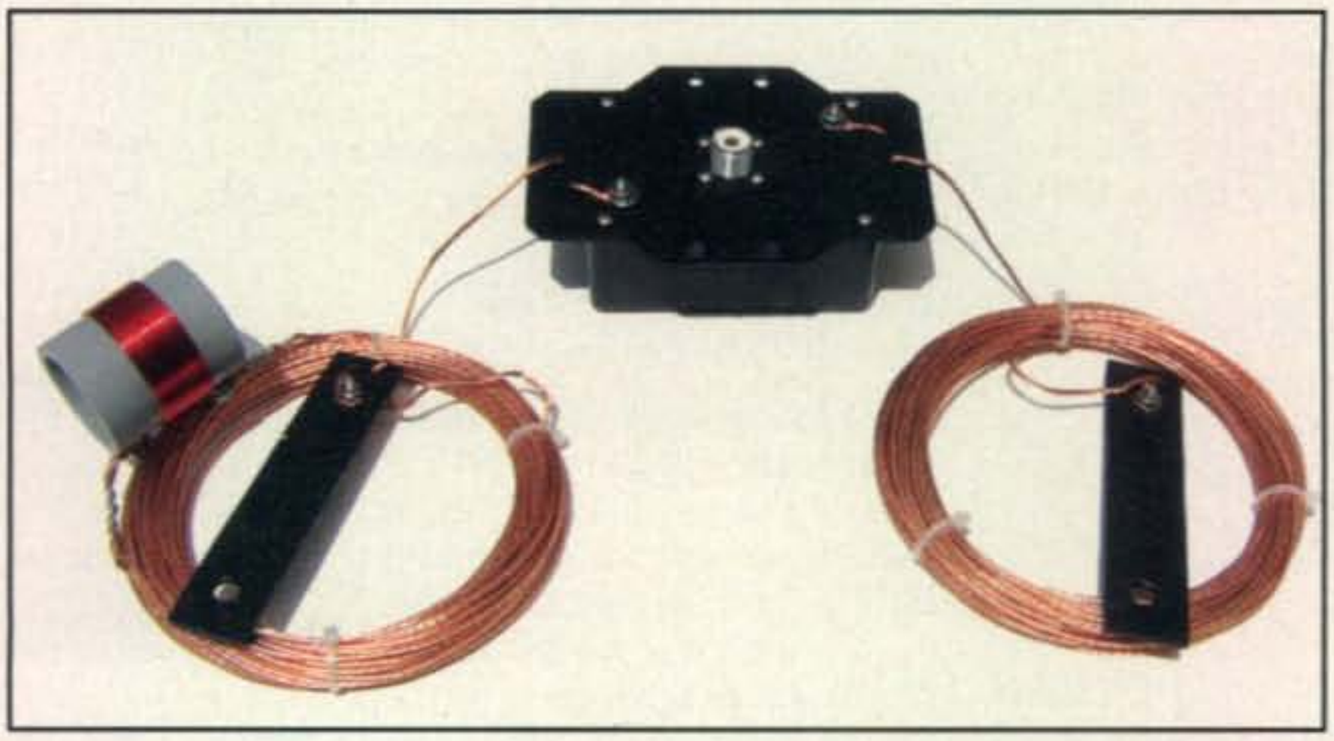


Photo A– MFJ Ultralite and Powerlite ready-to-go, off-center-fed dipole antennas are available in multi-band versions to make getting on the air quick and easy. All of the new antennas are lightweight, they come cut to length and preassembled. and never need a tuner. MFJ says all you have to do to get on the air is connect the coax and raise the antenna.

Photo C– W4RT Electronics is now marketing two new DSP noise-canceling speakers from bhi Ltd.—a 4-inch unit that can be used in the car or at home, and a dual-speaker version primarily designed for base operation. Both units feature selectable noise-filter levels and a built-in audio amplifier.

a tuner. Built with the same tough components of the MFJ-2012, the MFJ-2014 can be considered an alternative for DX-hungry hams who are turning to the 40- and 75-meter bands seeking long-distance contacts despite having to live through the low point of the sunspot cycle.

All three antennas are covered under MFJ's one-year warranty and are available at <www.mfjenterprises.com> or by calling 1-800-647-1800.

bhi Ltd. Radio Mate Compact Keypad

Radio Mate has amplified finger power with the addition of some new features to its Compact Keypad (photo B) designed to work with Yaesu's FT-817, FT-857, and FT-897 multi-mode amateur radio rigs.

Radio Mate's Compact Keypad now provides access to 40 memories—20 pre-programmed memories and 20 to store random frequencies—along with a new "nudge" function to change displayed frequencies up or down in the following increments: 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, and 1 MHz. Many of Compact Keypad's previous shortcuts are incorporated into the newer version, such as direct frequency input, easy band change, direct modulation-mode selection, and a one-touch memory function.

Manufactured in the United Kingdom by bhi Ltd. (www.bhi-ltd.com), the Radio Mate Compact Keypad is priced at $159 and distributed in the U.S. by W4RT Electronics. Visit <www.W4RT.com> for ordering and additional information.

bhi Ltd. DSPKR DSP Noise-Cancelling Speakers

bhi Ltd. is now manufacturing DSP noise-cancelling speakers (photo C) for use in mobile and base applications in two sizes with both featuring a built-in bhi DSP noise-canceling filter.

The largest of the two is the Desk Top Noise Away speaker which contains a 4-inch base driver and a 1-inch tweeter, accepts wide audio input levels from 50 to 500 mW, and offers eight selectable filter levels. The smaller 4-inch version of the DSP speaker, which can be used at home and in the car, provides for seven noise-filter levels, contains a 10-watt RMS audio amplifier, and has a separate volume control and three LED indicators that convey on/off condition, status, and audio level. For more details on both units, visit <bhi-ltd.com> or <www.W4RT.com>. They are available from W4RT Electronics.

Photo D– Powerenz has a number of solar-powered systems that can make great power sources for amateur radio communication equipment, including the Communication Radio 1 and Communication Radio 2 packages. Both kits include solar panels, a battery, charge controller, inverter, wiring, and all needed accessories.

Powerenz Solar-Powered Battery Systems

If you are seeking a solar-power system that can provide up to a maximum of 180 watts of power at 12 volts DC, then Powerenz has a system for you. Labeled the Communication Radio 1 by Powerenz (photo D), it comes with everything you need to pull power from the sun, including solar cells, battery, charge controller, inverter, wiring, and accessories—all housed in a durable bag that can be carried by a handle or shoulder strap. Powerenz designed this product specifically for communications application, so it should be perfect for use with radios of all kinds, while also being lightweight and easy to use.

Specifically, the Communication Radio 1 comes with a black padded cam-

Photo E– Your handheld or mobile units combined with the PowerPort Emergency Communications Box gives emergency responders everything they need to maximize the transmit and receive capabilities of amateur radios in field operations. The First Response Kit includes a rechargeable battery, RF amplifier, antenna, a 400-watt power inverter, and even a pen, flashlight, notebook, and rain poncho.

era bag; an 18 amp-hour, 216 watt-hours AGM sealed lead-acid battery; a 15-amp charge controller that has a digital LED display showing battery voltage, solar input current, and load output current that is protected by a 15-amp circuit breaker; a continuous 150-watt, 12-VDC to 120-VAC/60-Hz modified sine-wave power inverter; and a 60-watt foldable solar panel that will require 3 1/2 to 4 hours of peak sunlight to totally recharge a completely depleted battery. According to Powerenz, the complete power unit is priced at $1200, weighs approximately 18 pounds, and fits in the supplied bag. The solar panel weighs an additional 3.19 pounds.

Powerenz also tells us that if the power draw of your electronic device is 40 watts, the battery will last approximately four hours in the absence of incoming solar power before it needs to be recharged, and longer if the power draw is less.

Powerenz's also has its Communication Radio 2 (photo D) which comes with a 33 amp-hour, 396 watt-hour sealed lead-acid battery, a 7-amp charge controller, a continuous 150-watt modified sine-wave power inverter, and a foldable 48-watt solar panel, all for $1300.

To see about ordering a custom portable solar power system or just to get more information about Powerenz products, call 770-239-2244.

Powerport's Emergency Communication Box

For hams who don't have to rely on the sun for power and have easy access to 120 volts, Cutting Edge Enterprises has created a line of ready-to-go communication power providers (photo E) designed to aid ham operators who are also emergency responders. According to Powerport, the kits are designed to provide all of the parts and pieces in one compact, waterproof box to provide a stand-alone station for vital communications needs, with the addition of a ham's 5-watt handheld or mobile radio. This kit overcomes the two main limitations of a hand held—limited power and limited antenna range—while also turning a ham's mobile rig into a portable radio that can be set up anywhere.

Powerport offers six different models that provide a broad range of power, amplification, and charging options, from the fully equipped First Response Kit to the Bare Bones Basics Kit.

The First Response Kit comes with a 12-amp AMG sealed battery, a two-outlet 400-watt AC power inverter, a three-port DC power outlet, Anderson PowerPole connectors, 35-watt RF amplifier, a 2-meter magnetic-mount 1/2-wave antenna with coax cable for extended range, and both 6-amp, 3-stage fast charger and 25-watt solar recharging options.

Powerport's Bare Bones Basic Kit includes an 8amp-hour AMG battery, automatic charger, 30-amp PowerPole connectors, and a three-port DC outlet box.

Powerport also offers the PowerSafe 2002 which can provide 1000 watts of mobile AC power and up to 200 amps of DC power with the simple addition of a 12-volt automotive or deep-cycle marine battery. The package includes a three-port cigarette outlet with battery-level indicator for DC connections, a 1000-watt power inverter with two AC outlets, an automatic circuit breaker, and a fully automatic 3-amp wall charger to keep your supplied battery topped off and ready for extended use. All components fit inside a compact, fully-vented enclosure that measures 18" × 10.5" × 9.5" and is constructed of rigid polypropylene to resist acid. Hold-down straps and mounting hardware are included to keep the battery securely in place. The PowerSafe 2002 fits neatly under a desk, or in a vehicle for operations on the move, or in the field. The PowerSafe 2002 is an independent power station for any field operations where plug-in power is not available. With the optional solar-cell recharger, this system can be a fully self-supported source of power for your needs up to 1000 watts (2000-watt surge) AC, or 200 amps DC.

All kits are housed in waterproof, high-impact boxes with an easy-carry handle. Included with every Emergency Communications Box is a complimentary support kit, including notebook, pen, LED flashlight, amateur radio message forms, nylon cord, laminated ITU phonetic alphabet card, suction-cup microphone hook, wire ties, and a rain poncho—the little things that, if forgotten in an emergency, could become essential.

For more information and pricing on these kits visit <www.powerportstore.com> or contact Cutting Edge Enterprises by e-mailing <rhall@powerportstore.com>.

Wrap-up

That's it for this month's "What's New" column. Remember, I check my e-mail box constantly, so please feel free to send me your comments, questions, and feedback. If you have a new product you would like to tell us about, send it along to <wv5j@cq-amateur-radio.com>.

73, John, WV5J

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

BY JOE LYNCH,* N6CL

EME: Do It Now! (Again)

Those of you who regularly read my column may remember that for the March 2001 issue I led with this headline: "EME: Do it now!" If you did read that column, you will have learned that during February and March 2001 the Moon was at its closest perigee in its nine-year lunar cycle. In that column I also recounted how Arnie Coro, CO2KK, and Gary Crabtree, KB8RQ, completed the first-ever Cuba –U.S. EME QSO on January 21, 1992, nine years earlier.

On January 30, 2010 the Moon will again be full and at perigee. Derwin King, W5LUU, predicts that it will be an excellent day for EME operations, with the 144-MHz degradation at 0.4 dB, the 432-MHz degradation at 0.1 dB, and the sky noise a reasonably quiet 183° Kelvin. With these excellent conditions, I repeat my headline of nine years ago: "EME: Do it now!"

The end of January will not be the only excellent time to operate EME this year. Other great weekends will begin on: February 28, March 28, and October 31. Very good weekends include those beginning on: April 25, October 3, November 28, and December 26.

As often comes with good news, there is also the accompanying not-so-good news. As we pass through this year, we also pass through the peak of the nearly nine-year lunar cycle. For the next approximate 4 1/2 years we will move toward progressively worse EME conditions, with the worst occurring during 2014–2015. Therefore, if ever you wanted to get started on EME, now is the time.

*e-mail: <n6cl@sbcglobal.net>

VHF Plus Calendar

Jan. 30	Moon perigee
Jan. 30	Full Moon
Jan. 31	Excellent EME conditions
Feb. 5	Moon last quarter
Feb. 7	Poor EME conditions
Feb. 13	Moon apogee
Feb. 14	New Moon; Poor EME conditions
Feb. 21	Moderate EME conditions
Feb. 22	Moon first quarter
Feb. 27	Moon perigee
Feb. 28	Full Moon; Excellent EME conditions

—EME conditions courtesy W5LUU

EME at TCC and More

A way in which one ham is getting others started on EME is as his students' professor. Tommy Henderson, WD5AGO, who is known by many in the EME community—particularly for his pre-amps and other EME products—is also a professor in the electronics department at Tulsa Community College (TCC). During this past year, in the run up to last December's ARRL EME contests, Tommy had been educating his students about amateur radio, specifically EME communications. His hard work has paid off with three of his ten students earning their amateur radio licenses.

The highlight of the reward, however, was on the night of December 5, 2009 (December 6, 2009 UTC). After gathering his students together and feeding them pizza earlier in the day, Tommy put them to work completing the hanging of phase lines and splitters on the sixteen 10-element K5GW EME array (photo 1), as well as mounting the 432-MHz, 110-watt solid-state amplifier on the array's base.

With everything put together and Murphy-proofed, it became a waiting game. Finally, after the Moon rose over the top of a storage shed, Tommy had a clear shot for some EME communications. Having alerted Joe Demaso, K1RQG, that he was running QRP from his classroom, Tommy hoped that Joe would be listening.

Sure enough, at around 10:15 PM Tommy heard Joe calling CQ. Tommy answered him, and at the end of the 2 1/2-minute sequence Joe came right back to Tommy, to the delight of everyone present (photo 2). Tommy went on to work DL9KR, DL7APV, OK1CA, SM2CEW, and OZ4MM during the next couple of hours before shutting down the station for the night.

Tommy's class consists of ten men who are interested in wireless communications. Tommy uses amateur radio as a teaching tool for the course. As

Photo 1– Brian Kettler, KE5WZA (center with brown slacks), and Robert Hanna, KF5EAF (right), working with two other Tulsa Community College Students in preparing the 432-MHz EME array for their evening QSOs. (All photos by N6CL)

an incentive, Tommy grants a one-level grade increase to any student who earns an amateur radio license or an FCC general radio commercial license.

After more than seven years of keeping his amateur radio activities closeted in a pantry off the kitchen, this past summer Tommy had a loft built above his garage. Photo 3 shows his well-designed ham radio room which gets him upstairs and away from the garage door where his kids would constantly run into him on their way into the kitchen. Photo 4 shows his 3.1-meter dish and the watertight enclosure for his 200-watt, 13-cm solid-state amplifier.

China Launches Amateur Satellite

AMSAT China (CAMSAT) reported that on December 15, 2009 at 0230 UTC its first amateur satellite was launched. Shortly after launch the beacon was received in Sanya.

The satellite, XW-1, also known as CAS-1, was a secondary payload aboard the CZ-4C rocket from Taiyuan

Photo 2– Members of the Tulsa Community College's Wireless Communications class observe Tommy Henderson, WD5AGO, as he works Joe Demaso, K1RQG, during last December's ARRL EME contest.

Photo 3– Tommy, WD5AGO, at his home station.

Satellite Launch Center. It was inserted into a sun-synchronous orbit about 1200 kilometers high. The primary payload for the launch was the Yaogen-8 Remote Sensing satellite.

The XW-1 communications payload included a beacon and three cross-band transponders operating in FM, linear, and digital modes. The frequency information includes the following:

Mode V/U (J) FM Voice Repeater (30 dBm [1 w]): Uplink 145.8250 MHz FM, PL 67.0 Hz; Downlink 435.6750 MHz FM.

Mode V/U (J) Linear Transponder (Inverting) (30 dBm [1 w]): Uplink 145.9250–145.9750 MHz SSB/CW; Downlink 435.7650–435.7150 MHz SSB/CW.

Mode V/U (J) PacSat BBS (30 dBm [1 w]): Uplink 145.8250 MHz AFSK 1200 BPS; Downlink 435.6750 MHz AFSK 1200 BPS.

Mode Beacon (23 dBm [200 mw]): Downlink 435.7900 MHz CW.

For more information on the telemetry format, see: <http://www.amsat.org/amsat-new/satellites/documents/XW-1_Telemetry_Format.pdf>. For more information on CAMSAT and its new satellite, see: <http://www.camsat.cn/index.php?option=com_content&view=article&id=56&Itemid=67>.

Photo 4– WD5AGO points to the watertight cabinet that houses his 200-watt solid-state amplifier for 13 cm, which is mounted just below his 3.1-meter dish.

Students and Teachers invited to "Fly a file" on ARISSat-1

The following announcement is from ARISS Chairman Gaston Bertels, ON4WF:

On 3 February 2006, cosmonaut Valery Ivanovich Tokarev hand launched the Amateur Radio satellite SuitSat-1 from the International Space Station during an EVA (Extra Vehicular Activity = Spacewalk).

SuitSat-1 was a very special Amateur Radio satellite. A discarded Russian ORLAN Space Suit (in Russian a "Skafander") was equipped with an Amateur Radio transmitter, which transmitted telemetry and greetings from youngsters to the youth of the world in several languages.

Sometime this year an Amateur Radio satellite will once again be hand launched from the International Space Station. It will be called ARISSat-1.

ARISSat-1 will again transmit messages recorded by students. Moreover, teachers and students are invited to fly a file aboard this amateur radio satellite.

The ARISSat-1 Team wishes to include on our new satellite a memory stick of files prepared by students. This should be a .jpg or .pdf file of things the student has prepared, such as a paper or a study done on a STEM (science, technology, engineering, math) topic, a drawing of spacecraft or a schematic, a journal kept on a STEM topic, a story or news article about a STEM subject, a photo of the class doing a hands-on STEM activity—that type of thing.

Having a student's work be a part of ARISSat-1 means the student is a part of the satellite project and along for the spacewalk and deployment of ARISSat-1.

Readers of this announcement are invited to approach teachers and students and draw their attention to this opportunity to participate directly with a space flight for the honor of being part of space activities.

Dave Jordan, AA4KN, will take delivery of these files and copy them onto a memory stick, plus make them available on the web for anyone to see. The quantity of files and the size of a file are unlimited, since memory sticks provide for a very large amount of file space.

Again, files should be either .jpg or .pdf. No Word® documents, please. Please send files to Dave Jordan's address: <aa4kn @amsat.org>. He will look at all of them for content appropriate to students. Files can be in any language as long as an English translation is also included as a text file.

Current Convention

Orlando HamCation & Computer Show: The 64th Orlando HamCation & Computer Show will be held February 12–14, 2010, at the Central Florida Fairgrounds, 4603 West Colonial Drive, Orlando, Florida. For details, see the website: <http://hamcation.com>.

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 conference organizers have announced calls for papers for their forthcoming conferences:

Southeastern VHF Society Conference: Technical papers are solicited for the 14th annual Southeastern VHF Society Conference to be held in Morehead, Kentucky on April 2324, 2010. Papers and presentations are solicited on the technical and operational aspects of VHF, UHF, and microwave weak-signal amateur radio. In general, papers and presentations on non-weak-signal related topics such as FM repeaters and packet will not be accepted, but exceptions may be made if the topic is related to weak signal.

The deadline for the submission of papers and presentations is February 5, 2010. All submissions should be in Microsoft Word® (.doc) or alternatively Adobe Acrobat (.pdf) files. All text, drawings, photos, etc., should be black and white only (no color). Submissions for presentation at the conference should be in PowerPoint (.ppt) format, and delivered on either a USB memory stick or CDROM or posted for download on a website of your choice.

Please indicate when you submit your paper or presentation if you plan to attend the conference and present there, or if you are submitting just for publication. Papers and presentations will be published in the conference *Proceedings*. Send all questions, comments, and submissions to the program chair, Robin Midgett, K4IDC, via <K4IDC@comcast. net>. For further information about the conference see the society's website: <http://www.svhfs.org>.

Central States VHF Society Conference: Technical papers are solicited for the 44th annual Central States VHF Society Conference to be held in St. Louis, Missouri on July 22–24, 2010. Papers, presentations, and posters on all aspects of weak-signal VHF and above amateur radio are requested. You do not need to attend the conference, nor present your paper, to have it published in the *Proceedings*. Posters will be displayed during the two days of the conference. Non-weak-signal topics such as FM, repeaters, packet radio, etc., generally are not considered acceptable. However, there are always exceptions. Please contact the folks below if you have any questions about the suitability of a topic. Strong editorial preference will be given to those papers that are written and formatted specifically for publication, rather than as visual presentation aids. Submissions may be made via the following: electronic formats (preferred); via e-mail; uploaded to a website for subsequent downloading; on media (3.5-inch floppy, CD, USB stick/thumb drive). Deadline for submissions is May 1, 2010. For more information, please contact CSVHFS President Ron Ocho, KOØZ, at <ko0z@arrl.net>.

And Finally . . .

Again, I have focused on student involvement in this column. Next month I will include information on the proposed student involvement with the new Chinese amateur satellite.

Students and young people in general are the future of amateur radio. If you know of student projects or other activities by youngsters that invole amateur radio, please pass the information to me so that I can give it publicity.

Until next month...

73 de Joe, N6CL

awards

BY TED MELINOSKY,* K1BV

N8RLJ's Special Accomplishment plus Awards from Around the World

Of special note this month is Jaclyn Woody, N8RLJ's USA-CA All Counties accomplishment (see adjacent Special Honor Roll box), since it was endorsed for "All 2-meters FM, all QSOs made with N8KIE." Jaclyn is the XYL of N8KIE who recently completed *operating* from all 3077 counties. Jaclyn used a 2-meter handheld to make the short-range contacts in all counties. Our records don't reveal if this is a first-time accomplishment, but it certainly requires a round of applause.

DX Awards

Germany's Worked DIG Members. The German Diplom-Interessen-Grupe (DIG) is the world's largest club whose members are largely devoted to award hunting. It was formed in 1969 and currently has about 6200 members around the world, although most are found in Germany. The group offers an extensive array of awards that are available to everyone, not just its members. DIG also sponsors its own QSO Party, held the second weekend in March, which is a great way to work the club's members for the principal award featured here this month. DIG members are very good at displaying their member numbers on their QSL cards. The average DXer or contester will have no trouble finding 50 cards for this award's highest level.

A large DIG information packet with all details of the DIG, including membership application, can be obtained by airmail for $US17 or 13 IRCs and one self-addressed label. Send your request to: Eberhard Warnecke, DJ8OT, P.O. Box 101244, D-42512 Velbert, Germany. *(Note: Don't be shocked at the cost, which is primarily for postage, as Germany has one of the highest mailing costs in the world.)*

The Worked DIG Members award is available for having contacted DIG members as follows:

Class 3
- DX stations work 15 DIG members
- EU stations work 50 DIG members

Class 2
- DX stations work 30 DIG members
- EU stations work 75 DIG members

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

The German Diplom-Interessen-Grupe (DIG) is the world's largest club whose members are largely devoted to award hunting. The Worked DIG Members award is available for having contacted DIG members on various levels.

USA-CA Special Honor Roll

Jaclyn M. Woody, N8RLJ
USA-CA All Counties #1189
October 26, 2009

David L. Burk, K9AAA
USA-CA All Counties #1190
October 26, 2009

Patricia Mitchell, NØDXE
USA-CA All Counties #1191
November 19, 2009

USA-CA Honor Roll

500

N8RLJ	3484
WØRIC	3485
NØDXE	3486
UA3AGW	3487
UA9FAR	3488

1000

N8RLJ	1785
NØDXE	1786
UA3AGW	1787
UA9FAR	1788

1500

N8RLJ	1501
NØDXE	1502

2000

N8RLJ	1387
NØDXE	1388

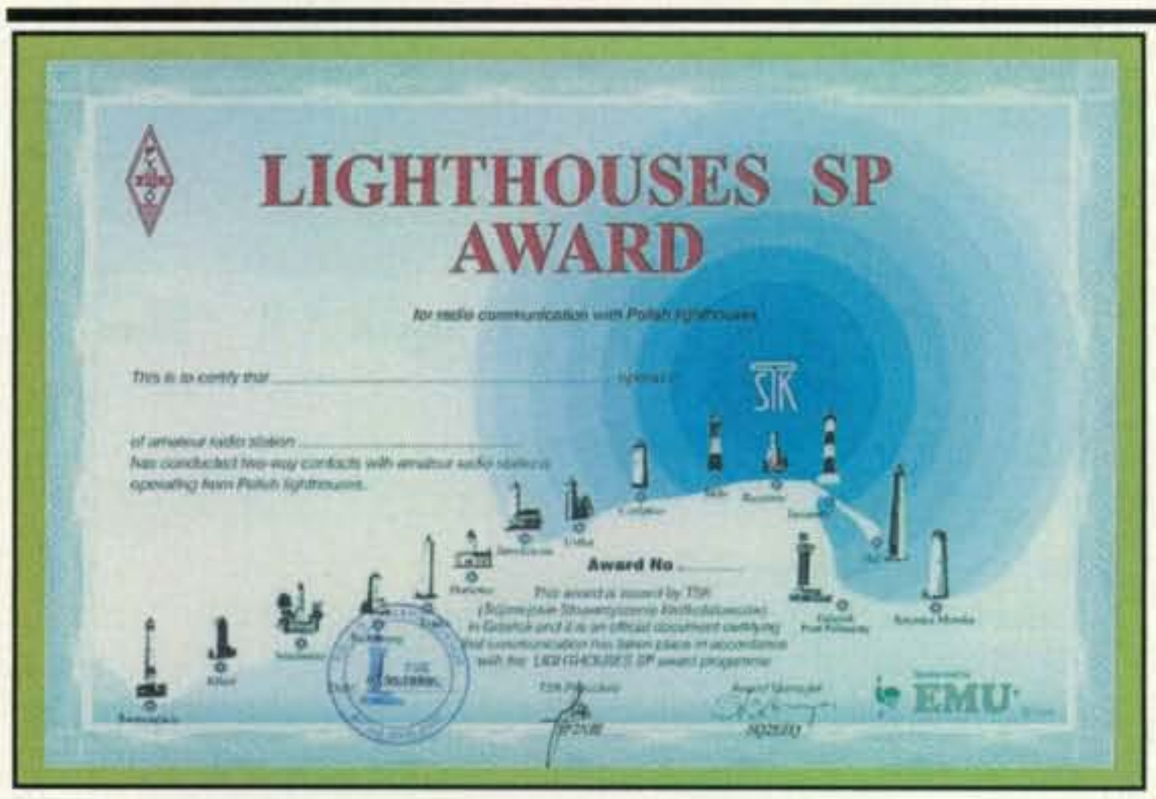
2500

N8RLJ	1305
NØDXE	1306

3000

N8RLJ	1215
K9AAA	1216
NØDXE	1217

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.



The Lighthouses SP Award is issued for contacts with lighthouses located in Polish territory.

Class 1
DX stations work 50 DIG members
EU stations work 100 DIG members

The award is available for all HF bands and modes, or for contacts on CW only, or for contacts on the VHF/UHF bands only. There are endorsement stickers for each additional 100 members up to 2000. Send GCR list and fee of 5 Euros or $US7 to Werner Theis, DH1PAL, Luxemburger Strasse 59, D-53881 Euskirchen, Germany.

Poland's Lighthouses SP Award. Poland's northern border is a 120-mile strip of land along the Baltic Sea. This shallow and protected body of water serves commercial vessels traveling to ports in Denmark, Germany, Sweden, Finland, Kaliningrad, and the Baltic nations of Estonia, Latvia, and Lithuania. The heavy ship traffic, restricted space to maneuver, and occasional nasty winter weather require accurate knowledge of a ship's location; hence the historical importance of lighthouses in this area.

You can look for lighthouse activations during the summer and on various Lighthouse Weekends when special efforts are made to operate on lighthouse premises, or within sight of these often life-saving and historical structures.

The Lighthouses SP Award is issued for contacts with lighthouses located in Polish territory. Here is the list of SP lighthouses that are valid for the award, number followed by location of the lighthouse: SPL 01 Gdansk Port Pólnocny, SPL 02 Krynica Morska, SPL 03 Hel, SPL 04 Jastarnia, SPL 05 Rozewie, SPL 06 Stilo, SPL 07 Czolpino, SPL 08 Ustka, SPL 09 Jaroslawiec, SPL 10 Darlowo, SPL 11 Gaski, SPL 12 Kolobrzeg, SPL 13 Niechorze, SPL 14 Kikut, and SPL 15 Swinoujscie. Lighthouses not on this list are not valid for the award. All bands and modes okay. Cross-band or contacts via repeaters are not valid.

The award is issued in four classes:

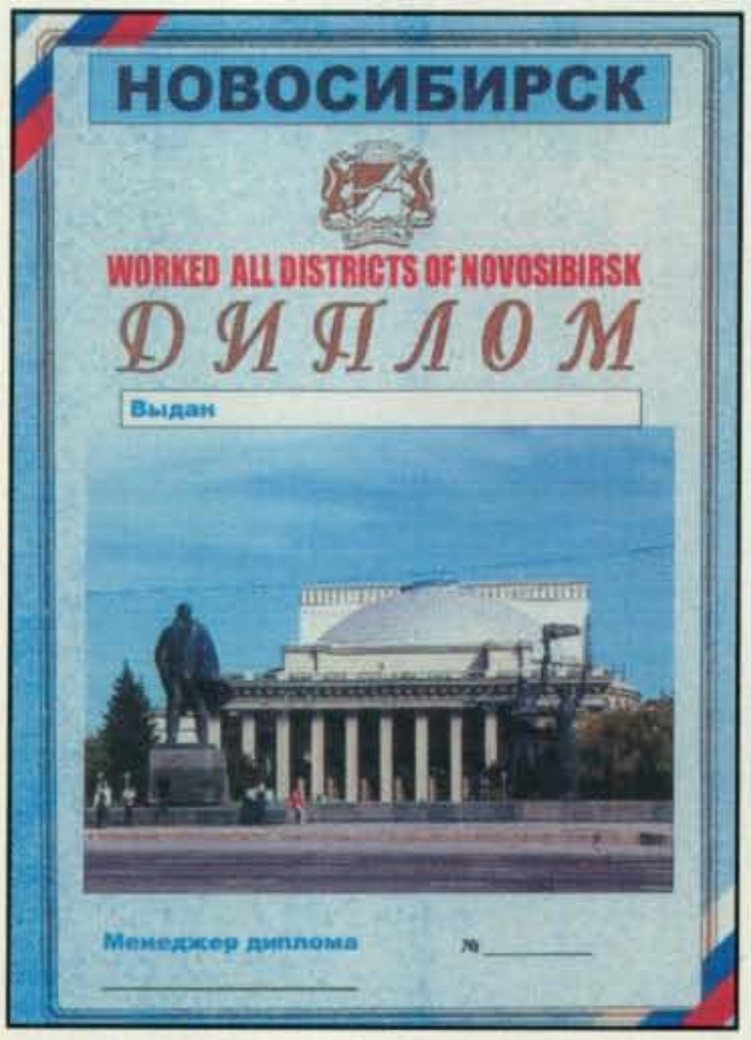
Top Class—for CW contacts with all SP lighthouses

Master—contacts on any mode with all SP lighthouses

Medium—contacts on any mode with at least eight SP lighthouses

Standard—contacts using any mode with at least three SP lighthouses.

The Standard class is obligatory and must be worked prior to any other levels. GCR list accepted. Endorsements are available for higher classes. Fee for EU and DX stations is 7



Contact stations in the Regions of Novosibirsk, Russia to earn this districts award.

IRCs; for SP, fee is 10zl. Endorsement fee is 2 IRCs for EU and DX; 5zl for SP. Apply to: Awards Manager SQ2EEQ, Stanislaw Leszczyna, ul. Ogrodowa 1/5, 83-110 Tczew, Poland.

Russia's Radio-Prim. Novosibirsk. Just as many U.S. states offer an all counties award complementing the USA-CA award, the popularity of the Russian Districts Award has encouraged local clubs in that country to offer their own certificates honoring those who contact different numbers of districts in their areas. Russia has *lots* of districts—2747 at last count! Here's a typical award offered by Novosibirsk.

Contact stations in the Regions of Novosibirsk (RDA) of Novosibirsk. All bands and modes okay. SWL okay.

Award levels, Regions of Novosibirsk:
Diploma "R-P.N" Iron = 1 region
Diploma "R-P.N" Copper = 3 regions
Diploma "R-P.N" Bronze = 5 regions
Diploma "R-P.N" Silver = 7 regions
Diploma "R-P.N" Gold = all 10 regions

Regions of Novosibirsk: NS-01 Dzerzhinsky, NS-06 Leninsky, NS-02 Zheleznodorozhny, NS-07 Oktyabrsky, NS-03 Zayeltsovsky, NS-08 Pervomaysky, NS-04 Kalininsky, NS-09 Sovetsky, NS-05 Kirovsky, NS-10 Tsentralny.

Except for the basic level Iron award, the certificates are issued in sequence, one after the other.

Send log extract, verified by two licensed hams with fee of 100 rubles or 5 IRCs for Russians, and $US8 or 5 IRCs for all others to: Vladimir Volosozhar (RZ9OW), P.O. Box 17, Novosibirsk, 630089, Russia.

Singapore's Lion City Award. Singapore is the smallest nation in Southeast Asia, actually classified as a microstate on the order of Monaco and Vatican City, although larger and economically more powerful than those tiny countries. The modern skyscrapers that form downtown Singapore are featured on the Lion City Award. 9V1 stations aren't exactly common, but only five contacts are needed for this colorful award certificate.

The Singapore Amateur Radio Transmitting Society offers the Lion City Award to any radio amateur outside CQ Zone 28 who submits an application for five confirmed contacts with 9V1's. For CQ Zone 28 stations, the requirement is ten confirmed contacts. Send GCR list including dates, modes, and signal reports sent and received, plus award fee of $US2 or 3 IRCs to: Awards Manager, Singapore Amateur Radio Transmitting Society, Robinson Road, P.O .Box 2728, Singapore 904728. Internet: <http://www.sarts.org.sg/>.

We'd like to hear from any groups or individuals who sponsor awards. Please contact me at the e-mail address shown on the first page of this column.

73, Ted, K1BV

The Singapore Amateur Radio Transmitting Society offers the Lion City Award to radio amateurs outside CQ Zone 28.

Here's to a Better Year

BY CARL SMITH,* N4AA

Time marches on. We have a whole year to look forward to and let's hope that things will be better than they were in 2009 . . . and I'm not entirely referring to DX.

During the past year I have reported on long-time manufacturers/suppliers being sold or just going out of business. Cushcraft, a very old supplier of antennas, was purchased by MFJ, and all of the materials moved to Mississippi; Scientific Solutions, producer of the logging program DXbase, announced that it was discontinuing sale of the program; Tom, N3EQF, creator of another logging program, Log-EQF, announced there would be no further sales of the program, although he would continue to provide technical support for at least one year. Alpha Power became RF Concepts, although it has continued to function under new management from the same facilities in Colorado. One of the oldest operating businesses in the amateur radio industry, in continuous service to the hobby since 1904, Vibroplex was purchased by a well-known personality Scott Robbins, W4PA. The business was being moved from Mobile, Alabama to Knoxville, Tennessee in late December and expected to "re-open" there shortly after the first of the year.

The amateur radio companies mentioned above probably are not alone, either. They just

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

How long do you have to wait for a QSL? Francis, F5QF, happened to mention to Rick, NE8Z, that he had never received a card for his contacts with VS9ASP. Rick quietly made a few inquiries and found that the original operator of VS9ASP was Roy, G3KDY. Further checking by Rick found that Roy is now living in Spain and licensed as EA7HGH. Rick sent an e-mail to Roy and a quick reply confirmed that he was VS9ASP, had logs/cards, and would be happy to confirm those old contacts for Francis. An interesting sideline here is that Francis had actually worked Roy on 160 recently and didn't realize at that time he was really working VS9ASP. Francis was very pleased to finally receive the cards—43 years after the contacts were made. (Photo courtesy of Rick, NE8Z)

CQ DX Awards Program

SSB

2538.....N4GOA

CW

1097.....NS7K

SSB Endorsements

330.....K7OW/338
330.....K1UO/337
330.....JA7XBG/336
330.....K3LC/335

CW Endorsements

330.....K9OW/337
330.....JA7XBG/332
275.....WA2VQV/275
200.....NS7K/222

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.

Yet another of those log-periodic antennas going up. This one belongs to Tom, N4XP, in northern Georgia. His friends Dan, W5DNT, and Alan, K5AB, came over from Texas to help him assemble and put the monster in the air. (Photo courtesy of Dan, W5DNT)

The WPX Program

SSB

3061 .....S55SL 3062 .....WM3L

Mixed

2082 .....K5AR 2083 .....N2EIK

Digital

40.....JA1EJY

CW: 2400 IØNNY. 2800 W8IQ. 5550 K2VV.
SSB: 600 EA3FYD. 800 WM3L. 1400 S55SL. 4800 K2VV.
Mixed: 450 K5AR. 39900 WA5VGI. 6350 K2VV.

160 Meters: S55SL
80 Meters: S55SL
40 Meters: S55SL, WM3L
20 Meters: S55SL, WM3L
15 Meters: S55SL
10 Meters: S55SL

Asia: S55SL
Africa: S55SL, WM3L
Europe: S55SL
Oceania: S55SL, KWØU
North America: S55SL, WM3L
South America: S55SL

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, N3XX, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBF, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, KØDEQ, DKØPM, SV1EOS, UAØFAI, N4GG, UA4RZ, 7K3QPL, EW1CQ., UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZ.

160 Meter Endorsements: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, NN3XX, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, KØDEQ, DKØPM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UR5FEO, N3RC, UT3IZ.

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 are $6.50 each.

happen to be the ones I have heard about. I have no doubt that there are others, or will be soon. Many small companies are struggling, and even the big names are not immune to the world's economic woes.

What does this have to do with DX? By itself, perhaps nothing, but looking at the "big picture" one can envision less DXpeditioning, simply because money is not available. I've heard of a number of folks who have had to sell their equipment, so they won't be on the air to work those DXpeditions. Many may be "forced" to use older equipment, subject to breakdown, thus potentially less time on the air. And, what happens to those multi-multi setups? Will they have enough "spares" to keep going in the heat of battle?

Let's hope this year brings a better economic trend for the world in general and amateur radio in particular. Keep on operating and be positive!

Learning the Hard Way

Something happened on my way to . . . Remember that old joke? Well, it was no joke at my house on December 9th. If you can remember that far back, there was a pretty bad storm which moved across the country with winds upwards of 45 to 60 or more mph. I was working on this very column that afternoon, when at 2 PM the lights went out. It's

QSL Information

9M2QQ via DF5UG
9M2TI via EA4ATI
9M6/JJ2CJB via JJ2CJB
9M6/KMØO via KMØO
9M6DXX/P via MØURX
9M6QQ via DF5UG
9M6XRO/P via MØURX
9M8QQ via DF5UG
A35A via A35RK
A52FJJ via JA1FJJ
A65BB via S57DX
AA4VK/CYØ via AA4VK
AO5WSP via EA5RKB
AY4D via EA5KB
B7P via BD7IXG
BD4QH via BH4QAK
C37URE via EA5BZ
C6AAA via N4AA
C6APR via K3IXD
C6AQO via K3IXD
C6AXD via K3IXD
C6DX via AA4NN
C91VM via IK1RAE
CEØY/SQ8X via SQ8X
CEØY/SV2KBS via SV2KBS
CN8QY via I8LWL
CO8LY via EA7ADH
CP6/DF9GR via DF9GR
CR3E via CT1BOH
CR3L via DJ6QT
CT7/G3ZAY via G3ZAY
CT7/MØBLF via MØBLF
CT7/MØHSW via MØHSW
CT7/MØRLM via MØRLM
CT7/MØTJH via MØTJH

(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/>.)

5 Band WAZ

As of December 1, 2009, 795 stations have attained the 200 zone level and 1663 stations have attained the 150 zone level.

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

DJ4PT

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

S51U, 199 (27)
N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
IK1AOD, 199 (1)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
RU3FM, 199 (1)
N3UN, 199 (18)
W1JZ, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
N4NX, 199 (26)
N4MM, 199 (26)
EA7GF, 199 (1)
N6HR/7, 199 (37)
JA5IU, 199 (2)
RU3DX, 199 (6)
N4XR, 199 (27)
HA5AGS, 199 (1)
VE3XN, 199 (26)
YU7GMN, 199 (10)
K7LJ, 199 (37)
RA6AX, 199 (6 on 10m)
RX4HZ, 199 (13)
KØGM, 199 (17)
S58Q, 199 (31)
KQØB, 199 (2 on 10)
K9OW, 199 (34 on 10)
N5AW, 199 (17)
JH7CFX, 199 (2)
IN3ZNR, 199 (1)
G3VKW, 199 (31)
EA5BCX, 198 (27, 39)
G3KDB, 198 (1, 12)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K4CN, 198 (23, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
F5NBU, 198 (19, 31)
OE2LCM, 198 (1, 31)
WK3N, 198 (23, 24)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)
W7VJ, 198 (34, 37)
K9MIE, 198 (18, 21)
W9RN, 198 (26, 19on40)
W5CWQ,198 (17, 18)
I5KKW, 198 (31&23 on 20)
IV3MUC, 198 (1&31 on 40)
UA4LY, 198 (6&2 on 10)
JA7XBG, 198 (2 on 80&10)

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

W7/DL1UF (170 zones)

5 Band WAZ updates:

N5HPT (196 zones)
AB4IQ (185 zones)
K9UP (197 zones)
HB9ALO (197 zones)
RZ3AM (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, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

The WAZ Program

6 Meters

90.....JHØBBE (36 zones)

17 Meter SSB

48 .....K9EU

20 Meter SSB

1186.....VE2BR

80 Meter SSB

93.....SM3NRY 94.....VK3PA

17 Meter CW

72 .....K9EU

30 Meter CW

92.....LA5YF 93.....VO1FB

80 Meter CW

79.....SM3NRY

160 Meters

323 .....RZ3EM (40 zones)
324.....DL1DUL (40 zones)
325.....JHØBBE (39 zones)
326.....IKØIOL (33 zones)
327.....HA9PP (31 zones)
328 .....S58Q (38 zones)

All Band WAZ

Diamond Jubilee

001 .....NØFW
002 .....WK3N
003.....N4NX
004 .....N8OO

Mixed

8633.....LA9H
8634 .....UAØLDW
8635.....AI8P
8636 .....IZ4MJP
8637.....DJ6JH
8638 .....OH6JKW

SSB

5122.....DJ4PT 5123 .....IZ7EVZ

CW

580.....JH4CHV
581 .....JI1BHO
582.....TF3DC

EME

004.....W5UN (#1 All via 2 meters EME)

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

happened before, so I wasn't overly concerned. The computers are all on UPSes. I had been in the shack earlier, so my faithful FT-1000MP was turned on, but it went off along with the lights. I didn't bother to call the power company. I was pretty sure it already knew they had some work to do. Time went on . . . 3 PM, 4 PM, 4:30 PM. Finally at just about 5 PM the lights came back on. Good, now I could get back to work.

Whoa! What happened to my computer? Trying various things, I finally concluded that the monitor had "died" for some reason. Luckily I had a spare and was able to get back to computing. A bit later I walked into the shack and discovered that my MP was not on. I never turn it off, but it now was off. Hmmm . . . power to the radio, fuse good, but absolutely *nothing*. My old faithful radio had done the unfaithful thing and just quit. Luckily I had a spare radio to plug in that space. Now to find someone to have a look at the MP. Is this an insurance claim job? We'll see how that goes after I find out the damage to the radio.

I've had power failures before without this sort of thing happening, which just proves the point: Don't trust things to be

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

NØFW 338	K2FL 338	N4MM 337	PY2YP 337	K3JGJ 336	G3KMQ 334	K6CU 329	CT1YH 320	N2LM 297
WB4UBD 338	K4MQG 338	W7OM 337	K9OW 337	HB9DDZ 335	K6LEB 333	W1DF 329	W9IL 319	HA5LQ 287
K3UA 338	W8XD 338	W7CNL 337	K2OWE 336	K2JLA 334	K5RT 332	KA3S 328	EA3ALV 319	N2VW 283
K9MM 338	K2TQC 338	WØJLC 337	K8LJG 336	F3AT 334	JA7XBG 332	K1FK 328	RA1AOB 317	XE1MD 280
W4OEL 338	N7RO 338	K4CN 337	K9IW 336	PA5PQ 334	K8SIX 331	IKØADY 328	W6YQ 316	4Z5SG 279
EA2IA 338	F3TH 338	VE3XN 337	W4MPY 336	NC9T 334	W4UW 331	F6HMJ 328	WA4DOU 316	W2JLK 277
OK1MP 338	DL3DXX 338	K4JLD 337	K5UO 336	G4BWP 334	W7IIT 331	WG5G/QRPp 322	ON4CAS 314	WA2VQV 275
N7FU 338	WK3N 338	N5ZM 337	K7LAY 336	W1JR 334	N7WO 330	IKØTUG 321	KØKG 306	
N4JF 338	N5FG 338	N4AH 337	N6AW 336	I4LCK 334	W6OUL 329	W3II 320	WD9DZV 304	
K4IQJ 338	K9BWQ 337	N4CH 337	KA7T 336	YU1AB 334	KE3A 329	OZ5UR 320	KT2C 304	

SSB

K4JLD 339	K5OVC 339	K4IQJ 339	VE2GHZ 338	W7BJN 337	K5UO 335	K4DXA 328	N8SHZ 316	K7ZM 300
EA2IA 339	K4MQG 339	WK3N 339	AA4S 338	AB4IQ 337	K3LC 335	SV3AQR 328	W6NW 314	XE1MEX 300
XE1AE 339	N4MM 339	N5FG 339	PY2YP 338	W4UNP 337	WØYDB 334	VE7EDZ 328	KA1LMR 312	W4EJG 295
IN3DEI 339	K9MM 339	K5TVC 338	K9OW 338	W4UW 337	K5RT 334	XE1MD 327	RA1AOB 312	W9ACE 294
NØFW 339	OZ5EV 339	KZ2P 338	VE3MR 338	K1UO 337	WA4WTG 334	YV4VN 326	N2LM 312	WD9DZV 292
DU9RG 339	VE2PJ 339	W6BCQ 338	VE3MRS 338	K8SIX 336	ZL1BOQ 334	KD5ZD 326	G3KMQ 312	W6MAC 292
K3UA 339	K3JGJ 339	W6EUF 338	XE1L 337	KE3A 336	HB9DDZ 334	W1DF 326	KD2GC 311	AD7J 291
K6YRA 339	N5ZM 339	W7OM 338	OE3WWB 337	K9IW 336	VE4ACY 333	PY2DBU 325	RW9SG 310	AE9DX 289
IK1GPG 339	N7RO 339	K9BWQ 338	N6AW 337	N2VW 336	K9PP 333	KE4SCY 325	IØYKN 310	W5PVE 288
DJ9ZB 339	KE5K 339	W8AXI 338	IK8CNT 337	W2CC 336	YV1KZ 333	W4MPY 325	KU4BP 310	HB9DQD 285
N7BK 339	IØZV 339	W9SS 338	EA4DO 337	N7WR 336	W9IL 333	K6GFJ 324	XE1MW 309	VE7HAM 285
4Z4DX 339	OE2EGL 339	VK4LC 338	CT3BM 337	JA7XBG 336	F6HMJ 333	TI8II 324	AA1VX 308	N8LIQ 284
WB4UBD 339	W4ABW 339	K7LAY 338	YU1AB 337	PA5PQ 335	YV1AJ 332	W6OUL 322	4Z5FL/M 306	N3RC 280
OZ3SK 339	DL3DXX 339	WS9V 338	K8LJG 337	XE1VIC 335	KSØZ 332	XE1RBV 321	K7SAM 305	HSØ/EA4BKA 276
OK1MP 339	I8KCI 339	W6DPD 338	W3AZD 337	NC9T 335	VE4ROY 332	XE2NLD 321	I3ZSX 304	K9DXR 275
K2TQC 339	VE1YX 339	K4CN 338	KØKG 337	CT1EEB 335	YV1JV 331	VE7SMP 320	JR4NUN 303	
K4MZU 339	N4CH 339	VE3XN 338	W2FKF 337	W1JR 335	K7HG 331	WØROB 320	W4PGC 302	
N4JF 339	EA3BMT 339	K9HQM 338	W7FP 337	I4LCK 335	N5YY 331	ON4CAS 319	EA8AYV 302	
W4WX 339	IKØAZG 339	K2FL 338	YU3AA 337	ZL1HY 335	N1ALR 330	LU3HBO 317	4X6DK 301	

RTTY

WB4UBD 337	N5FG 335	K3UA 332	G4BWP 320	K4CN 303
NI4H 336	N5ZM 333	OK1MP 329	PA5PQ 311	K8SIX 300

"OK." If I had merely pulled the plugs on that monitor and the radio, I would not be writing about them now. The cost of replacing the monitor is not a huge amount ($200 or so), but it's the inconvenience of having to swap things around. The radio is another story. That damage could be expensive or the cause of declaring it non-repairable, and that would mean lots of expense. Time will tell.

My point here is just to caution you not to depend on things being OK just because there is no lightning, etc. In my case, the damage was caused by severe windy conditions causing trees to fall on the lines, and apparently the resulting pulses coming down the line, from the power system trying to reconnect, got my monitor and my radio. Why didn't it get other things? Who knows. These things don't abide by any "rules." They just happen and we have to live with them. It reminds me of the "weak link" story. Seems I had two of those links on December 9th.

Paper or Electronic QSLs?

Chasing DX has changed in recent years as more and more DXers achieve their goals, typically the DX Honor Roll and then the ultimate, the #1 Honor Roll plaque. Once reaching that lofty goal, things slow down, at least they did for me. One starts looking at what other wallpaper is available and then

Last month I gave you a sneak peek at The DX Magazine*'s 2009 Most Wanted Survey results. Since it has been published and the 100 overall Most Wanted posted on the web, here's a further sampling. The top 20 overall are shown above with the ranking for 2008.* →

2009	DXCC	COUNTRY	2008
1	P5	NORTH KOREA	1
2	KP1	NAVASSA	3
3	ZS8	MARION ISLAND	5
4	3Y-B	BOUVET	7
5	7O	YEMEN	2
6	VKØ-H	HEARD ISLAND	8
7	FT5W	CROZET	9
8	FR-G	GLORIOSO	4
9	FT5Z	AMSTERDAM	10
10	VP8-S	SOUTH SANDWICH	12
11	BS7	SCARBOROUGH	19
12	VP8-O	SOUTH ORKNEY	11
13	SV-A	MT ATHOS	13
14	HKØ-M	MALPELO	16
15	VKØ-M	MACQUARIE	15
16	FR-T	TROMELIN	18
17	ZL9	AUCKLAND & CAMPBELL	14
18	KH5K	KINGMAN REEF	21
19	PYØS	ST PETER & ST PAUL	17
20	KH5	PALMYRA	20

what does it take to get there? QSLing becomes important again as one "reaches for the stars" to meet the goal. Band and mode cards from those "not too rare" places become as important as that QSO with North Korea you needed to hit the Honor Roll. Then there's that Challenge award, which takes more QSLing. The more you look, the more "paper" you find to apply for, but they all take confirmations.

Not all will require that "hard-card," though, if you can do it by using the ARRL's Logbook of The World (or eQSL). Have you tried it? Well, you really should look into it. It's easy and it's cheap too. Cheap is relative, of course. You could spend a quarter for an LoTW confirmation, or you could have a card printed for that quarter; spend another 20 cents for envelopes that "nest" to send the request, once you find the address. If that address happens to be in a country other than your own, you will need to put in at least one IRC with your card (that's another $1.50 or so, depending on where you buy yours). If you don't want to use an IRC, you'll need to put at least a few US dollars in that envelope and hope some postal clerk doesn't steal it. Oh, don't forget that there are some countries to which you just cannot send currency. In some places the government takes a very dim view of their citizens having US dollars in their possession. Now, let's see what that "hard-card" will cost . . . 25¢ + 20¢ + $1.50 = $1.95. And that's only a guess on my part; it could be more or less.

There is another way to get that paper card, though, and that is by using postage stamps from the country to which you are sending your request. That will cost you some amount, depending on the exchange rate with that country. For example, as of December 1st, the UK and Japan would cost you $1.20 each for their stamp to get your envelope returned from those countries. A German stamp would cost you $2.75—the reason why German QSL Managers ask you for $3.00 if you're sending US dollars to them. Cost of stamps for other countries will vary, and you need to check with the suppliers to see the current cost for what you want/need. These stamps are available from a couple of sources I am aware of, and there may be others. Check with James E. Mackey in Connecticut (www.net1plus.com/users/ryoung/index.htm) or William Plum in New Jersey (plumdx@msn.com).

Hmm . . . any of those ways will cost a whole lot more than the quarter for the LoTW confirmation. If it is one of those "last one" cards to hang on your wall, maybe it's worth it to get the "hard-card," but for all those band/mode confirmations, perhaps you should be using the LoTW. What do you say?

Upcoming DXpeditions

As for future DX, an operation from Aves Island, YVØ, is planned for sometime in early 2010, but the group is dependent on the Navy for transportation. Thus, no firm date had been given as of early December.

January 18 to February 5 the Austral Islands are expected to be on the air.

January 19 to February 2 you can listen for CEØZ from Juan Fernandez.

We can look forward to more contesting in February and March with the ARRL DX contests, CQ WPX RTTY Contest, CQ WPX SSB Contest, and others to keep us busy. So enjoy the chase, but always remember to Have Fun!

73, Carl, N4AA

BY JOHN DORR,* K1AR

Have You Been Running Lately?

February's Contest Tip

In the end, if you're operating a contest for any other reason than to have fun, you've missed the point. The real winners in contesting are the ones who operate for the enjoyment of the sport and personal satisfaction (as they define it), not necessarily those with the highest scores. Remember, too, that contesting is really about people and friendships. The business of sending and receiving 59-001 on selected weekends simply comes along for the ride!

Calendar of Events

All year	**CQ DX Marathon**
Jan. 29–31	**CQ 160M CW Contest**
Jan. 30–31	REF CW Contest
Jan. 30-31	UBA SSB DX Contest
Feb. 6–7	Vermont QSO Party
Feb. 6	Minnesota QSO Party
Feb. 6–7	Mexico RTTY Int'l Contest
Feb. 6–7	Delaware QSO Party
Feb. 7	North American CW Sprint
Feb. 13–14	**CQ WW RTTY WPX Contest**
Feb. 13–14	Dutch PACC Contest
Feb. 14	North American SSB Sprint
Feb. 20–21	ARRL CW DX Contest
Feb. 26–28	**CQ 160M SSB Contest**
Feb. 27–28	REF SSB Contest
Feb. 27–28	UBA CW DX Contest
Feb. 27–28	North American RTTY QSO Party
Mar. 6–7	ARRL SSB Contest
Mar. 27–28	**CQ WW WPX SSB Contest**

Regardless of what you may be thinking about the title of this month's column right now, you haven't picked up the wrong magazine this month. However, ironically, running in the athletic sense has many similarities to that of running in contest operating. This month, we're going to take a detailed look at this aspect of contesting.

What Does Running Actually Mean?

At the risk of being overly presumptuous for some of you, the concept of running is an operating tactic in contesting in which one focuses on "calling CQ" and working one station after another by having the stations calling you for a QSO. It is an operating method that is in sharp contrast to the alternate approach called "search and pounce," where one tunes the bands looking for new QSOs and multipliers.

The act of running in contests, while seemingly simple on the surface, is actually quite a skill in and of itself. In fact, it's much more than simply calling CQ and answering the stations that call, although that is the ultimate end game of the strategy. Running stations in contests requires you to consider several factors, including:

- Understanding the strengths and limitations of the station you're using;
- Assessing whether or not the timing is right to run vs. search and pounce and knowing when to keep trying or not;
- Evaluating the proper place in the band to initiate your run;
- Always being aware of how fast you are working stations and whether or not your actions are truly maximizing your score.

Thus, before we delve into the considerations above, let's talk about contest running from a mechanical perspective. When operating in a normal, mid-week fashion, most operating styles tend to be casual and laid back. There's nothing like a good old-fashioned 30-second CQ to bring us back to our roots in ham radio operating. In the contest realm, however, everything changes. There's nothing casual about serious contest operating. Rather, it's a sport that demands operating efficiency. For that reason, while running you are tasked to say (SSB) or send (CW) the least amount of information possible to secure a QSO. What that means in practical terms is the following:

- Call short, brief CQs.
- Use your callsign often; that's the single, most important piece of unknown information that someone tuning by your signal doesn't know.
- There's no cookbook method to calling CQ. Many operators rarely say the word "CQ" and tend to simply send their callsign over and over with an occasional CQ thrown in to indicate their operating intention.
- Be aware of the potential QRM around you. It's perfectly acceptable to move your VFO around a "run frequency" a bit with the idea of maintaining a clear frequency to either hear better on your end or to be heard on the other. Remember, crystal-based frequency control left us decades ago.
- Running requires an extended level of aggressiveness in operating style. That means you have to be very focused on holding on to a frequency that you've staked out. Most people who are told a frequency is in use will move if told within the first few seconds of an encounter. This action is critical to maintaining a quality run.

Now that You Know How, What's Next?

There are several factors to consider before deciding to throw your hat into the running operation ring. I've outlined them above. Having defined them, let's get into a little more detail with each:

- **Strengths and weaknesses of your station.** The fact is that not all stations are capable of supporting running, no matter now good band conditions are, and contest stations, regardless of size, can rarely support the ability to run stations at *all* times.This means that you need to know where and when your station plays to assess when the best times to run are. For example, if you have a tribander at 45 feet, you're probably not going to open 20 meters as one of the first stations to run guys. However, a tribander can certainly support the running of stations when the band opens up and the propagation angle of the stations you're trying to work elevates through the opening. In any

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event, always be aware of how quickly you are working stations when you try to run and evaluate how well you could be doing if you were simply cruising around the bands calling stations instead. Remember that search and pounce is not a statement about our manhood, but is simply another very effective operating tactic.

• **Is it time to run now?** Ah, one of the biggest debates in operating strategy: When to run? Well, as you might expect, there's no set answer. The key is flexibility. For example, I've had runs that only lasted 5 minutes. There have been other times where I've spent 5 minutes calling CQ, barely working anyone to have the frequency magically open up and have a run begin in earnest. What plays here more than anything is experience, gut feeling, and some common sense. If you have 100 watts and a dipole, you probably won't run many DX stations on the low bands. However, if you look at the low-power scores in most contests, the results can be impressive, so clearly running is part of the game for all stations, big and small. The most important consideration is to be practical in your operating approach and never be afraid to be aggressive. If you don't try to run stations, it's certain that you won't, right?

• **Am I in the right part of the band?** Well, just listen to those big stations running guys like mad on the low end of 15 meters. I guess that's the only place someone can do that, right? Wrong! Most of the major contests have such impressive activity that the key is to find a clear frequency, not necessarily one in any particular part of the band. A good rule of thumb may be that the more modest your station is, the higher in the band you should consider operating. Sure, operating on a band edge is a desirable spot to be, but it's not the "keys to the kingdom" when it comes to being able to effectively run stations. Some of the recent high single-band scores have proven that when one looks at their primary frequencies of operation.

• **Am I maximizing my score?** This question is ultimately the gauge for deciding whether you should be running or not in any contest. Most popular logging programs will let you know about QSO rates (i.e., the number contacts you are averaging per hour) or even how much a QSO is worth in contrast to working a multiplier. Put another way, while you don't need a math degree to operate contests, it's always a good idea to know whether or not your operating approach is, in fact, maximizing the opportunity in front of you. Remember that just because you've possibly decided to search and pounce doesn't mean that you've exclusively relegated your operating to looking for multipliers. You can generate an impressive overall QSO rate simply by calling stations one by one as you tune up the band. For your situation, 50 or 60 QSOs in one hour may be perfectly acceptable and something to be proud of when compared to others.

Speaking of Skill...

This is always one of those difficult areas to cover. Is contest operating in general and running skill in particular something that can be taught or is it simply a natural talent? Well, opinions vary on this, but in my opinion, it's really both. Experience only improves contest scores and the ability to be savvier in your operating decisions and style. That being said, some people are simply blessed with the ability to "process" more information than others.

I'm sure you can relate to some of your experiences on the telephone in this context. How many times have you placed a telephone order for a product and ended the call saying, "That person would be a great contest operator!" Why is that? In part it's because these order takers exhibit a natural ability to rapidly process information. For example, when they collect your telephone number, they don't read it back to you one group at a time as you say it. They just "copy the callsign" and move on. Therefore, from my perspective there's hope for anyone to improve. However, we have to be realistic in that not everyone has the God-given ability to work guys at 450 QSOs/hour, even when operating from one of the best stations in the world.

Running is one the most exhilarating aspects of contest operating. A little common sense and application of the principles described above can go a long way toward adding this operating method to your "bag of tricks."

Final Comments

Well, that's it for this month. As I consider the past 20-plus years of my writing this column, I've been blessed with tremendous support from my readers. Your input has been invaluable, often resulting in the development of content and insight that would otherwise have never made it onto these pages. A heartfelt thank you to everyone who has taken the time to help make these words come to life each and every month.

See you in the next contest!

73, John, K1AR

CQ WW DX CW Contest 2009 Conditions Better Than Predicted

BY TOMAS HOOD,* NW7US

A Quick Look at Current Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, November 2009: 4
Twelve-month smoothed, May 2009: 2.3

10.7 cm Flux
Observed Monthly, November 2009: 74
Twelve-month smoothed, May 2009: 70

***Ap* Index**
Observed Monthly, November 2009: 3
Twelve-month smoothed, May 2009: 4

One Year Ago: A Quick Look at Cycle 23 Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, November 2008: 4
Twelve-month smoothed, May 2008: 4

10.7 cm Flux
Observed Monthly, November 2008: 69
Twelve-month smoothed, May 2008: 70

***Ap* Index**
Observed Monthly, November 2008: 3
Twelve-month smoothed, May 2008: 7

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for February 2010

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 1-6, 8-10, 13, 17, 19-24, 26-28	A	A	B	C
High Normal: 7, 12, 15, 18, 25	A	B	C	C-D
Low Normal: 11, 14, 16	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) Feb. 1st through the 6th, fair (C) on the 7th, 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.

As you may remember, I predicted good conditions for both days of the 2009 CQ WW DX CW Contest starting at 0000 UTC, Saturday, November 28 and continuing until 2400 UTC, Sunday, November 29. I postulated that the planetary *A*-index (*Ap*) would remain at about 5 for both days.

The contest weekend was much better than predicted. On the first day the planetary *Ap* was a mere three, falling to a very quiet one by the second day of the contest. The high-latitude *A*-index was zero and one, respectively, making over-the-pole propagation paths very quiet and reliable. The planetary *K*-index did not get above one, except during one period when measured at a high-latitude station. With such quiet geomagnetic conditions, weaker signals are more likely to be heard on those bands where openings are weak yet present. Stable ionospheric conditions allow weak signals to propagate reliably.

The 10.7-cm radio flux was 73 and 72 on both days, respectively, and the observed sunspot count on both days was zero. However, the typical CW signal can be received much farther along a given circuit than a SSB signal using the same power on the same circuit. The conditions resulted in reasonable propagation on many of the contest bands. These conditions fit pretty well with the forecast.

How did you fare in 2009 compared to 2008? I am interested in hearing from you regarding the differences and how you did overall this time.

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February Propagation

From the middle of February through early April, typical equinoctial propagation conditions can be expected on the HF frequencies. This usually means a noticeable improvement in conditions between the Northern and Southern Hemispheres. Look for improvements between the United States and South America, Africa, Australasia, Antarctica, and parts of Asia. Equinoctial propagation occurs during the spring and fall months, when the Sun is most directly overhead at the equator, producing similar ionospheric characteristics over large areas of the world. It tends to maximize during sunrise and sunset periods and over both short- and long-path openings.

We continue to see sunspot activity, so little by little we'll see improvements in the propagation at higher frequencies over long-distance paths. It is always a surprise to the casual amateur radio operator when he or she gets on a band such as 10 meters during the solar minimum and discovers

Fig. 1– The Extreme-ultraviolet Imaging Telescope (EIT) image on November 11, 2009 at 0743 UTC, produced by the emission of ultraviolet light by helium in the solar atmosphere of the Sun's chromosphere. Helium emits this sort of light at a temperature of around 80,000 degrees. Bright regions on the main body of the Sun are called active regions, while wispy structures that protrude from the edges of the solar disk indicates cool, dense chromospheric material (80,000 degrees) suspended in the hotter, more diffuse corona (2-million degrees). These structures are known as prominences. The pock-marked appearance of the Sun at this temperature is due to the distribution of magnetic field across the solar surface and its effect on heating the solar gas above it. The official sunspot count on November 11 was 7, involving the active regions seen here. (Source: SOHO [Solar and Heliospheric Observatory])

Fig. 2– The EIT image on December 15, 2009 at 1919 UTC at a wavelength of 304 Angstroms. The official sunspot count on December 15 was 38, driving the 10.7-cm flux to 83. As you can see in the bright active regions, there are two sunspot groups. These are the largest yet in the new sunspot cycle, Cycle 24. (Source: SOHO)

that there is still some life on the band, beyond short-skip distances, especially during periods when sunspots occur and the daily 10.7-cm flux levels increase enough to wake up the higher frequencies. However, the currently weak solar activity still does not support worldwide DXing on the highest HF bands for any significant length of time.

During the daylight hours, optimum DX propagation conditions are expected on 20 meters. The band is forecast to open to all areas of the world sometime during this period, although often with moderate to strong fading. Conditions on 17 and 15 meters may be good, too, but usually for far shorter distances than during peak solar cycle years. Conditions are expected to become optimal for an hour or two after sunrise and again during the late afternoon. For short-range paths (regional), 40 meters should be usable during most of the daylight hours. With increasing hours of daylight during February, expect the HF bands to remain open for an hour or so longer into the early evening than during the winter months.

Daytime conditions on 10 and 12 meters will be less exciting. Openings will be possible for stations in low-latitudes using north-south paths, with no openings expected into Europe and the Far East.

During the early evening hours and to as late as midnight, seven bands should be available for DX openings; 15, 17, 20, 30, 40, 80, and 160 meters. Fifteen and 17 meters should hold up for openings toward Central and South America and the Caribbean, the Pacific area, the Far East, and parts of Asia. Better openings into many areas of the world may be possible on 20 meters during this period, with the strongest signals from southerly and westerly directions. Good DX conditions are also forecast for 30, 40, and 80 meters for openings toward the east and the south. Openings in the same direction, but with higher noise levels and weaker signals, should also be possible on 160 meters.

Between midnight and sunrise it should be a toss-up among 20, 30, and 40 meters for DX paths. These bands should open to many areas of the world, with conditions favoring openings toward the south and the west. Expect similar conditions on 80 meters, but with weaker signals and higher noise levels. Be sure to check 160 for some unusual DX openings toward the south and the west during this period. Conditions on the bands between 160 and 20 meters are expected to peak at local sunrise.

VHF Conditions

Trans-equatorial (TE) scatter propagation tends to increase during the equinoctial period, and some 6-meter openings may be possible between 7 and 10 PM local time. The best bet for such openings is between the southern tier states and South America for paths approximately at right angles to the equator. An occasional TE opening may also be possible on 2 meters. Unlike *F2*-layer or sporadic-*E* openings on 6 meters, TE openings are characterized by very weak signals with considerable flutter fading.

Fig. 3– This "intensity-gram" from the SOHO Michelson Doppler Imager clearly shows the very large (to the naked eye) sunspot regions on December 15, 2009. With the sunspot count of 38, and the 10.7-cm flux at 82, ionospheric propagation came alive on the high-frequencies, even up on 10 meters. (Source: SOHO)

Fig. 4– This "magnetogram" from the SOHO Michelson Doppler Imager shows the magnetic polarity of the two active regions on December 15, 2009, confirming that these belong to the new sunspot Cycle 24. Solar activity is consistently improving on our local star. (Source: SOHO)

Expect moderate coronal-hole activity on occasion. With the influence of coronal mass ejections or elevated solar wind streams, the geomagnetic field may reach minor storm levels. While most days will see quiet conditions, there is a fair chance that geomagnetic storms will trigger modest auroral activity. Auroral activity tends to occur more frequently during the equinoctial period.

Current Solar Cycle Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 73.6 for November 2009, up from October's 72.3, continuing a slow but steady monthly rise. The 12-month smoothed 10.7-cm flux centered on May 2009 is 69.7. The predicted smoothed 10.7-cm solar flux for February 2010 is about 77, give or take about 7 points.

The Royal Observatory of Belgium reports that the mean monthly observed sunspot number for November 2009 is 4.2. The lowest daily sunspot value during November 2009 was zero, occurring on November 1–4, 7, 8, 12, 17, and 23–30. The highest daily sunspot count for November was 17 on November 19. The 12-month running smoothed sunspot number centered on May 2009 is 2.3. A smoothed sunspot count of 18 is expected for February 2010, give or take about 9 points.

The observed monthly mean planetary *A*-index (*Ap*) for November 2009 is 3. The 12-month smoothed *Ap* index centered on May 2009 is 4.1. Expect the overall geomagnetic activity to be quiet during most days in February. At the time of this writing in mid-December, the forecast holds that February will be a quiet month with occasional geomagnetic storminess due to recurring coronal holes and possible coronal mass ejections (if flaring occurs from possible sunspot activity). Refer to the Last-Minute Forecast for the outlook on what days this might occur.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me, write me a letter, or catch me on the HF amateur bands. Please come and participate in my online propagation discussion forum at <http://hfradio.org/forums/>. See you on the air!

73, Tomas, NW7US

Five years ago, on CQ's 60th anniversary, we ran a feature throughout the year titled "60 Great Things About Ham Radio," in which we listed five "great things" each month. The series was quite popular and we have continued to receive requests to reprint it. So now, in honor of our 65th anniversary, we're repeating the list—with a few updates as well as five more "Great Things About Ham Radio."

65 Great Things About Ham Radio

1. It works when nothing else does
2. It makes you part of a worldwide community
3. The opportunity to help neighbors by providing public service and emergency communications
4. Some of the nicest people you'll ever meet
5. Some of the smartest people you'll ever meet
6. Some of the most interesting people you'll ever meet
7. Some of the most generous people you'll ever meet (along with some of the cheapest!)
8. Lifelong friendships
9. Friends around the world (including those you haven't met yet)
10. The opportunity to go interesting places you might not otherwise go to
11. The opportunity to do interesting things you might not otherwise get to do
12. The opportunity to expand your knowledge of geography
13. The opportunity to expand your knowledge of earth and space science
14. Practical uses for high school math
15. Practical uses for high school physics
16. A good way to practice a foreign language
17. A good way to keep in touch with faraway friends and relatives
18. A good way to get driving directions when visiting someplace new *(with or without GPS)*
19. A good way to find the best places to eat when visiting someplace new *(with or without GPS)*
20. Finding "non-touristy" off-the-beaten-path places to stay, eat, visit, etc.
21. A good way to learn about virtually any topic
22. A good way to bridge the generation gap
23. A good way to keep tabs on elderly/infirm people
24. People named Joe (Walsh, Rudi, Taylor)
25. How many of your non-ham friends have actually *talked* to someone in some remote place such as Cape Verde or the Seychelles?
26. How many of your non-ham friends might have talked to an astronaut aboard the space station?
27. How many of your non-ham neighbors might have a satellite uplink station in their basements—*or in the palms of their hands*?
28. How many of your non-ham neighbors might have a TV studio in their garage?
29. What other hobby group has designed, built, and had launched its own fleet of communication satellites?
30. Where else can you play with meteors?
31. Moonbounce
32. Informal way to improve technical skills
33. Informal way to improve communication skills
34. Introduces a variety of career paths
35. Offers unparalleled opportunities for career networking
36. Opportunities for competition in contesting and foxhunting
37. A good way to collect really cool postcards from around the world *(despite the growth of electronic confirmations)*
38. Nearly endless variety of different things to do, on and off the air
39. Hamfests
40. Dayton
41. Field Day
42. Working DX
43. Being DX
44. DXpeditions
45. Contesting
46. Award-chasing
47. Double-hop sporadic-*E*
48. Worldwide DX on 6 meters (once or twice every 11 years) *[The current extended sunspot minimum has shown that mechanisms other than F2 propagation can offer intercontinental DX on the "magic band" at any point in the solar cycle.]*
49. Tropospheric ducting
50. Gray-line propagation
51. TEP, chordal hops, etc.
52. Getting through on CW when nothing else will
53. Unexpected band openings
54. Building your own gear
55. Using gear you've built yourself
56. Operating QRP from some remote location
57. Experimenting with antennas
58. Working DX while mobile or while hiking
59. Experimenting with new modes and new technology
60. The opportunity to help build an internet that doesn't rely on the internet
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our readers say

Vietnam POW Radios

(The following are in response to Bill Donnelly's letter in December CQ, trying to confirm reports he keeps hearing about prisoners of war in Vietnam communicating with short-range CW rigs. Nothing definitive so far...)

Editor, *CQ*:

I can't speak to the POW portion, but it is feasible. Many of us built radios using a Blue Blade in the detector when I was a kid. One such implementation is described at <http://bizarrelabs.com/foxhole.htm>. Cheers,

Dan Zeitlin, K2YWE

Editor, *CQ*:

Back in '63 there was a company in KC that built some small xcvrs for the Vietnam war effort. The company was called "Radio Industries" (I think!). They built a 5-watt, 15-watt, and a 25–30 watt unit. They were small CW units that could be sealed up, stomped into the mud, and later dug up and used for communications. They were battery powered and totally self-contained. The 5-watt unit was about the size of a small shoebox. They also had a small SSB unit. Don't know if this will shed some light on your question about the Vietnam era radios, but maybe this might shed some light on the question at hand..

Bert Voth, WØUTS

K1JT Interview

Editor, *CQ*:

Your interview with K1JT (October *CQ*) is a great article (including your web supplement)! Moreover, your timing couldn't have been better, since I've been trying to explain, to CC&R supporters and others, the value of ham radio to science and the community, etc. (and why outdoor antennas are important, etc.).

Also, it's nice to be able to show people that a ham can be awarded the Nobel Prize and can become a respected Princeton professor. Thanks and 73,

Fred Kruger, K2LDC

Contest Scoring Issues

Editor, *CQ*:

I read with interest K1AR's November column on contesting and the hard work that goes into compiling the scores for the CQ WW DX contests. For the most part I agree with John and the way the logs are scrutinized, although I do have a couple of concerns.

First of all, I am concerned about the penalty for busted calls (call plus three times the value of the claimed QSO) ... The 3× the claimed QSO does not make me think of being a more accurate operator. My own integrity does. I believe that if it is not an outright attempt at logging all possibilities to cover yourself, the removal of the call is sufficient. The punishment lies with the point(s) lost for the QSO and the possible loss of a multiplier if it was the only one you worked.

Next, I am concerned about the "your own country worked" rule. In most cases, you can work your own country for a multiplier and in many cases a zone ... I have lost both the country, "USA," and the zone "05" because the contester that I worked failed to log me ... I would like to see the "your own country" rule reviewed and a possible credit of 1 country and one zone base given to all entrants.

Again thanks to John for many thought-provoking articles.

Al Kaiser, N1API

Friendship and Fellowship

Editor, *CQ*:

Just a quick thank you for the editorial in the December issue. I have been elected president of the Stockton Delta Amateur Radio Club ... I stole your idea of Friendship and Fellowship as the basis for my acceptance speech. My hope for the coming year is to expand the club and reach out to more of the community and be more inclusive and diverse.

Also let's hope that the wives hear about the human contact and friendship and see that instead of the geeky toys.

Paul Engelman, N6KZW

Editor, *CQ*:

I couldn't wait to send you this note thanking you and *CQ* for the December cover of Bill and Ruby (O'Kain, K4LTA/K4UPS). Bill and Ruby are what we call "the salt of the Earth." They represent so many things I consider in the make up of a good human being. They are, first, strong in faith, which sets the stage for life. Therefore, their faith frames amateur radio, making it representative in everything good about the hobby. Same goes for their fellowship with others.

I work on their antennas/tower and will as long as I can put a foot before the other. This is what I feel for Bill and Ruby. Ruby is incredible in what she does for her family and especifically ham radio ... Bill is one of the best CW operators on the planet. (He) is challenged but few would ever know since he can perform with anyone on the bands in *any* way. I admire him and Ruby and am very pleased to call them my dear friends.

Lynn Lamb, W4NL

zero bias *(from page 8)*

(1) Such communications are incidental to the employee's normal job responsibilities and are conducted voluntarily;

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Essentially, these are the guidelines that we have traditionally followed. We feel that this change would give hams the necessary flexibility to keep doing what we have always done, while still protecting the Amateur Radio Service from being used inappropriately for purposes that would violate paragraph 5 of 97.113(a), as seen at the beginning of this column.

The ARRL Board of Directors will also be discussing this issue at its January meeting (which will have been held by the time you read this), and the League may file its own petition as well.

The only unacceptable option is to do nothing. The current confusion will only hurt amateur radio and its relationships with served agencies and other groups. The FCC needs to find a way to restore the balance that has been lost between providing amateurs with needed flexibility and protecting the service from being abused. Our suggestion is but one possibility. More important than having any one petition adopted is having clear guidelines from the FCC.

Staff Additions

I'd like to close this month by welcoming two new people to our staff. Rich Arland, K7SZ, will be sharing the "Beginner's Corner" column with Wayne Yoshida, KH6WZ. Rich will be focusing on nitty-gritty new-ham topics, while Wayne will continue to write about activities that may be new to hams of any vintage. Plus, over on the business side of CQ Communications, we welcome Don Parrish, KA5OXN, who has joined our staff as Director of Marketing and New Business.

73, W2VU

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The New Premium HF/50 MHz Transceiver

The radio YAESU...

FT DX 5000MP

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300 Hz Roofing filters
Dynamic Range 112 dB
IP3 +40 dBm
Two Independent Receivers Included

HF/50 MHz 200 W Transceiver NEW

FT DX 5000MP

±0.05ppm OCXO, 300 Hz Roofing Filter, Station Monitor SM-5000 included

HF/50 MHz 200 W Transceiver NEW

FT DX 5000D

±0.5ppm TCXO, Station Monitor SM-5000 included
(300 Hz Roofing Filter optional)

HF/50 MHz 200 W Transceiver NEW

FT DX 5000

±0.5ppm TCXO
(Station Monitor SM-5000, 300 Hz Roofing Filter optional)

Dimensions: 18.5" W x 5.4" H x 15.5" D / Weight: 46.2 lbs SM-5000: 18.5" W x 1.8" HX7.2" D / Weight: 6.6 lbs

The FT DX 5000 Series has not been approved by the FCC. This device may not be sold or leased, or offered for sale or lease, until FCC approval has been obtained. Technical specifications are subject to change without notice.

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http://www.yaesu.com

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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	Method	Procedure
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High Temperature	501.4	I, II
Low Temperature	502.4-3	I, II
Temperature Shock	503.4	I
Solar Radiation	505.4	I
Rain	506.4	I, III
Humidity	507.4	–
Salt Fog	509.4	–
Dust	510.4	I
Vibration	514.5	I
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