45241

Amateur Radio

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COMMUNICATIONS & TECHNOLOGY

FEBRUARY 2007

CQ

FCC Ends Code Testing, Gives Techs HF Access, Page 2

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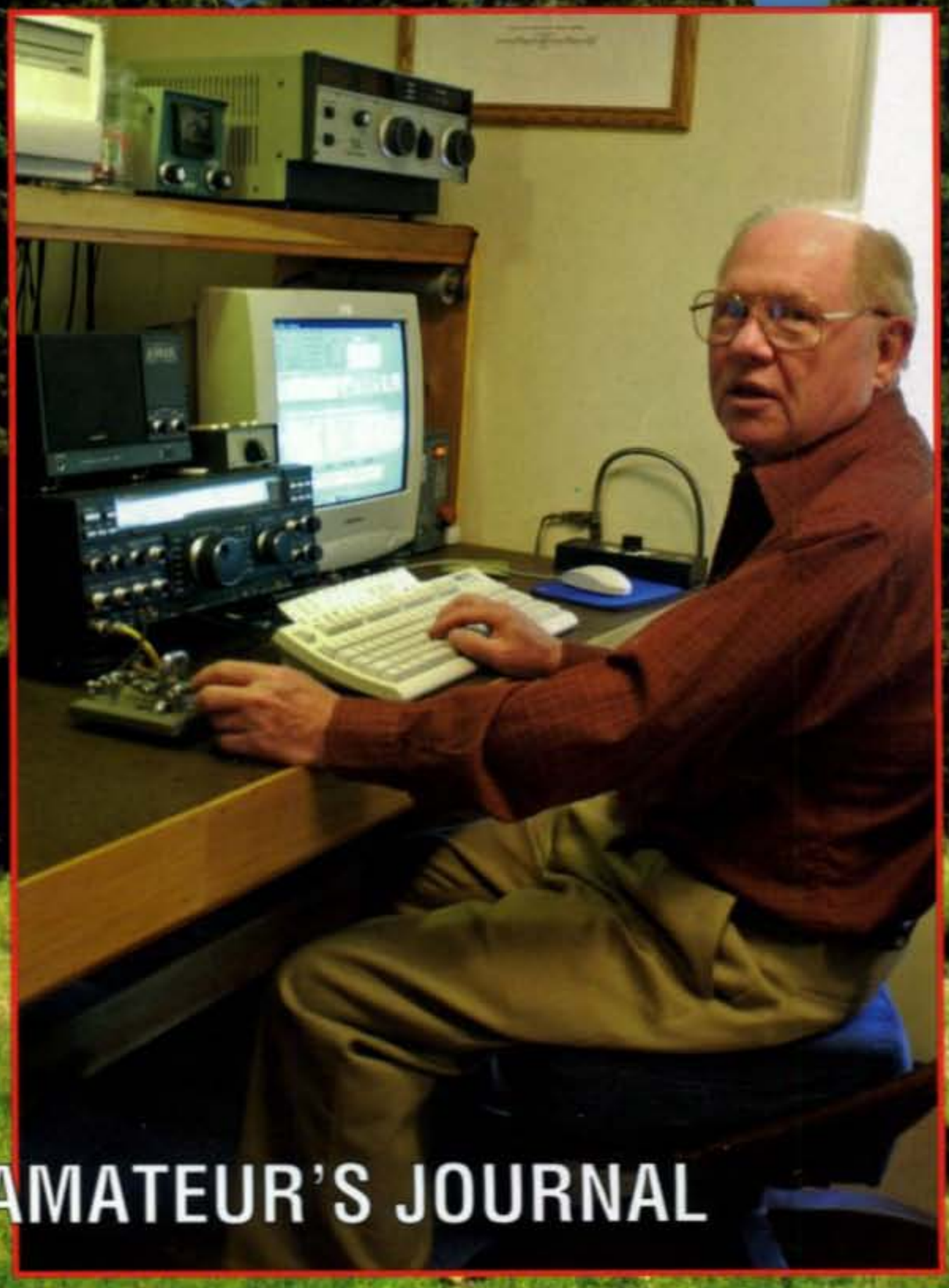
On the Cover: LaMar Ray, WA7LT, operates CW from his contest station in Spokane, Washington. Details on page 60.



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THE RADIO AMATEUR'S JOURNAL

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KENWOOD SKYCOMMAND TURN IT ON!

Kenwood SkyCommand has FCC approval.

Allows Global communication through remote operation on HF frequencies at home or in the field utilizing Kenwood's TS-2000 series transceivers.

Kenwood's TH-D7AG or TM-D700A required for remote use.

Perfect for use in hurricane or tornado zones, as well as Search and Rescue areas for Long Distance Communications when other normal modes of communications are out.

A great tool to monitor propagation while doing other things at home!

No cables or adaptors to fool with or buy!

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Step by step setup and programming taking only minutes.

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See you local dealer for details.

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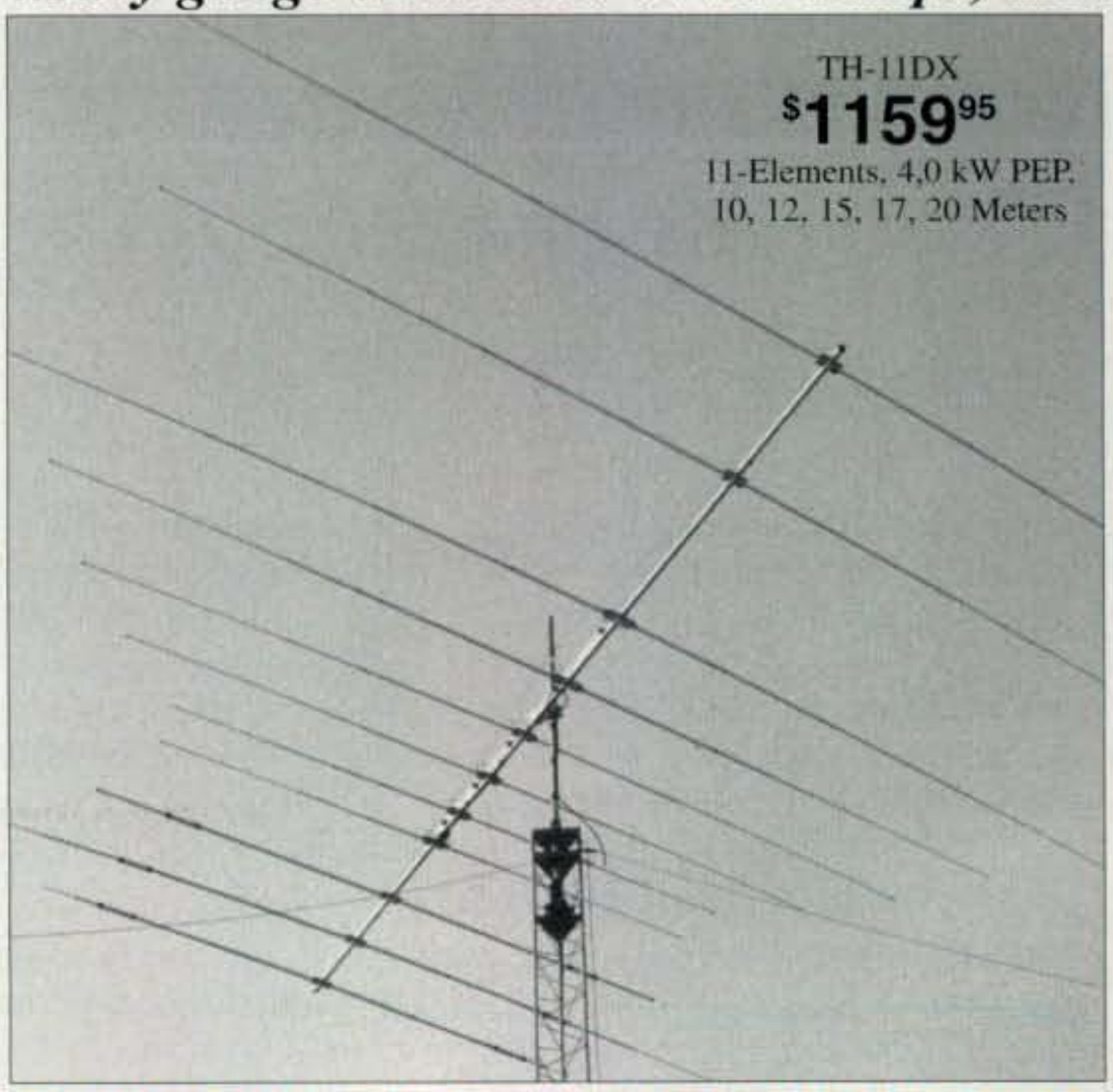
INTERNET
Kenwood News & Products

hy-gain® HF BEAMS...

. . . are stronger, lighter, have less wind surface and last years longer.
Why? Hy-Gain uses durable tooled components -- massive boom-to-mast bracket, heavy gauge element-to-boom clamps, thick-wall swaged tubing -- virtually no failures!



TH-11DX
$1159.95
11-Elements, 4,0 kW PEP.
10, 12, 15, 17, 20 Meters

TH-11DX, $1159.95. 11-element, 4.0 kW PEP, 10,12,15,17,20M

The choice of top DXers.

With 11-elements, excellent gain and 5-bands, the super rugged TH-11DX is *the "Big Daddy" of all HF beams!*

Handles 2000 Watts continuous, 4000 Watts PEP.

Every part is selected for durability and ruggedness for years of trouble-free service.

Features a low loss log-periodic driven array on all bands with monoband reflectors, BN-4000 high power balun, corrosion resistant wire boom support, hot dipped galvanized and stainless steel parts.

Stainless steel hardware and clamps are used on all electrical connections.

TH-7DX, $869.95. 7-element, 1.5 kW PEP, 10,15,20 Meters

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.

Includes *Hy-Gain's* diecast aluminum, rugged boom-to-mast clamp, heavy gauge element-to-boom brackets, BN-86 balun. For high power, upgrade to BN-4000.

TH-5MK2, $759.95. 5-element, 1.5 kW PEP, 10,15,20 Meters

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.

Also standard is *Hy-Gain's* exclusive *BetaMATCH™*, stainless steel hardware and compression clamps and BN-86 balun.

TH-3MK4, $469.95. 3-element, 1.5 kW PEP, 10,15,20 Meters

The super popular TH-3MK4 gives you the *most gain for your money* in a full-power, full-size durable Hy-Gain tri-bander!

You get an impressive average gain and a whopping average front-to-back ratio. Handles a full 1500 Watts PEP. 95 MPH wind survival.

Fits on average size lot with room to spare -- turning radius is just 15.3 feet. Four piece boom is ideal for DXpeditions. Rotates with CD-45II or HAM-IV rotator.

Features *Hy-Gain BetaMatch™* for DC ground, full power *Hy-Q™* traps, rugged boom-to-mast bracket and mounts on standard 2"O.D. mast. Stainless steel hardware. BN-86 balun recommended.

TH-2MK3, $369.95. 2-element, 1.5 kW PEP, 10,15,20 Meters

The 2-element TH-2MK3 is Hy-Gain's *most economical* full power (1.5kW PEP) full size tri-bander.

For just $339.95 you can greatly increase your effective radiated power and hear far better!

Ruggedly constructed, top-performing, compact 6 foot boom, tight 14.3 foot turning radius. Installs almost anywhere. Rotate with CD-45II or HAM-IV. BN-86 balun recommened.

EXP-14, $599.95. 4-element, 1.5 kW PEP, 10,15,20 Meters

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.

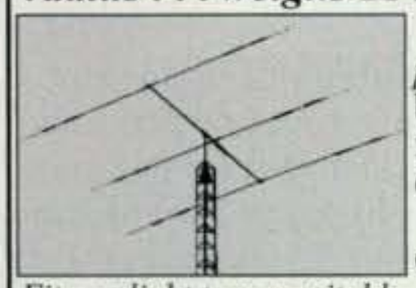
Hy-Gain's *patented* broadbanding *Para Sleeve* gives you less than 2:1 VSWR. 1.5kW PEP.

BetaMATCH™ provides DC ground to eliminate static. Includes BN-86 balun. Easily assembled.

***Truly** competitive against giant tri-banders at half the cost!*

QK-710, $179.95. 30/40 Meter option kit for EXP-14.

Compact 3-element 10, 15, 20 Meter Tri-Bander
For limited space . . . Installs anywhere . . . 14.75 ft turning radius . . . weighs 21 lbs . . . Rotate with CD-45II, HAM-IV



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

TH-3JRS, $359.95. Hy-Gain's *most popular* 3-element 10, 15, 20 Meter tri-bander fits on most lots! Same top performance as the full power TH3MK4 in a compact 600 watt PEP design.

Excellent gain and F/B ratio let *you* compete with the "big guns".

Tooled manufacturing gives you *Hy-Gain* durability with 80 MPH wind survival.

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...*		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 opt. 30/40	7.5	100	14	31.5	17.25	45	1.9-2.5	HAM IV	$599.95

- www.hy-gain.com
- Hy-Gain catalog
- Call toll-free 800-973-6572

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.

Durable precision injection molded parts.

***Hy-Gain** antennas are stronger, lighter, have less wind surface area, better wind survival, need no adjustments, look professional and last years longer.*

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BREAKING NEWS:

FCC Drops All Code Tests

Technicians to Gain Limited HF Privileges

BY CQ STAFF

In one of its most far-reaching amateur decisions in 15 years, the FCC has eliminated Morse code testing from ham radio licensing requirements and has granted limited HF operating privileges—including voice on 10 meters—to all Technician Class hams.

The decision, released on December 19, 2006, completed a process the FCC began in late 1990, when it eliminated Morse testing for the Technician license. In 2000, it reduced the number of license classes from six to three and lowered the code speed requirement for General and Extra Class from 13 and 20 words per minute, respectively, to 5 WPM for both. Last fall, it eliminated the HF Novice bands and gave General Class CW privileges on 80, 40, 15, and 10 meters to all Novices and Technicians who had passed the 5 WPM code test. This latest decision eliminates that code exam and extends the "Tech-Plus" HF privileges to all Technicians. A decision by the International Telecommunications Union in 2003 to make code proficiency for HF operating optional rather than mandatory in the international radio regulations paved the way for the FCC's December decision.

"An Unnecessary Regulatory Burden"

Calling the code test requirement "an unnecessary regulatory burden that may discourage current amateur radio operators from advancing their skills and participating more fully in the benefits of amateur radio," the FCC also said the current "disparity between the operating privileges of Technician Class licensees (VHF and UHF only) and Technician Plus Class licensees (VHF/UHF plus limited HF privileges) should not be retained. Therefore, the FCC, in today's action, afforded Technician and Technician Plus licensees identical operating privileges."

This means that, as of the effective date of the new rules, all current Techs will automatically have "Tech-Plus" privileges on HF (see table). Ironically, most of those privileges are for Morse code only, so Techs wishing to exercise them will need to learn the code anyway. However, the new privileges also include a 200-kHz voice segment on 10 meters, which is fairly quiet now because we're at the bottom of the sunspot cycle, but which will again offer worldwide DX in a few short years.

Also, as of the effective date of the new rules, upgrading from Technician to General will entail only passing the Element 3 written exam, while upgrading to Extra will require passing Element 3 plus the Element 4 written test. Technicians holding valid Certificates of Successful Completion (CSCEs) for one or both written exams will be able to take the CSCE to a Volunteer Exam (VE) session—after the new rules take effect—pay the test fee and upgrade without repeating the written exam. However, CSCEs continue to be valid for only one year (365 days). Anyone wanting to upgrade before the new rules take effect must still take the five word-per-minute code test, and anyone whose CSCE expires before he/she gets to a test session after the effective date will have to repeat the written exam.

Other Matters Decided, Too

The FCC ruling also extended Extra Class privileges to all European hams operating in the U.S. under international "CEPT" licenses, and addressed an appeal from the ARRL to the new lower limit of the Extra Class phone band on 75 meters, which dropped from 3750 kHz to 3600 kHz as of December 15. The League was worried that new phone activity would interfere with automatically controlled digital stations, which are limited by the rules to operating in the 3620–3635 kHz band segment, and asked that the lower limit of the phone band be raised above those frequencies. Instead, the FCC changed the 75-meter subband for automatically controlled digital stations to 3585–3600 kHz.

When Do the Changes Kick In?

The new rules will take effect 30 days after they are published in the *Federal Register*, but that date was uncertain at press time. The FCC's Report & Order was released on December 19, and it generally takes about a month for rule changes to be published in the *Register*. Based on that timetable, it is likely that the new rules will become effective in mid-to-late February 2007. Check our website newspage and e-mail news list for updates. We will also have a comprehensive look at the decision and its history in next month's "Washington Readout" column.

New Technician Class Operating Privileges

Effective February 2007

HF

Band	Frequency Range	Notes
80 meters	3525–3600 kHz	CW only
40 meters	7025–7125 kHz	CW only
15 meters	21,025–21,200 kHz	CW only
10 meters	28,000–28,300 kHz	CW, RTTY, Data
	28,300–28,500 kHz	CW, SSB voice only

(Maximum power 200 watts PEP on all HF band segments)

VHF/UHF

All amateur privileges above 30 MHz

TOKYO HY-POWER

Complies with New FCC Rules.

Available Now with 12m and 10m Built-in!

HL-1.5KFX

HF/50MHz Linear Power Amplifier

NEW!

Auto Band Set

This compact and lightweight 1kW desktop HF/50MHz linear power amplifier has a maximum input power of 1.75kW. Our solid-state broadband power amp technology makes it **the smallest and lightest self-contained amplifier in the industry**.

Typical output power is 1kW PEP/SSB on HF and 650W on 6m band with the drive power of 85-90W. Bands set automatically with the **built-in band decoder**. You can forget about the band setting when the amplifier is connected to your modern radio through **supplied band data cables for ICOM CI-V, DC voltage (ICOM, Yaesu), and RS-232C (Kenwood)**. Manual band setting selectable as well.

All these data cables are included with the amplifier.

Features

- Lightest and most compact 1kW HF amplifier in the industry.
- The amplifier's decoder changes bands automatically with most ICOM, Kenwood, Yaesu.
- The amp utilizes an advanced 16 bit MPU (microprocessor) to run the various high speed protection circuits such as overdrive, high antenna SWR, DC overvoltage, band miss-set etc.
- Built in power supply.
- AC 230V (200/220/240V) default and AC 115V, (100/110/120V) (selectable).
- Equipped with a control cable connection socket, for the HC-1.5KAT, auto antenna tuner by Tokyo Hy-Power Labs.
- Two antenna ports selectable from front panel.
- Great for desktop or DXpedition!

Specifications

Frequency:
1.8 ~ 28MHz all amateur bands including WARC bands and 50MHz

Mode:
SSB, CW, RTTY

RF Drive:
85W typ. (100W max.)

Output Power:
HF 1kW PEP max., 930W CW (typ.)
50MHz 650W PEP max.

Matching Transceivers for Auto Band Decoder:
Most modern ICOM, Yaesu, Kenwood

Drain Voltage:
53V (when no RF drive)

Drain Current:
40A max.

Input Impedance:
50 OHM (unbalanced)

Output Impedance:
50 OHM (unbalanced)

Final Transistor:
SD2933 x 4 (MOS FET by ST micro)

Circuit:
Class AB parallel push-pull

Cooling Method:
Forced Air Cooling

MPU:
PIC 18F452 x 2

Multi-Meter:
Output Power – Pf 1Kw
Drain Voltage – Vd 60V
Drain Current – Id 50A

Input/Output Connectors:
UHF SO-239

AC Power:
AC 230V (200/220/240V) – 10A max. (default)
AC 115V (100/110/124V) – 20A max.

AC Consumption:
1.9kVA max. when TX

Dimension:
10.7 x 5.6 x 14.3 inches (WxHxD)/272 x 142 x 363 mm

Weight:
Approx. 20kgs. or 45.5lbs.

Accessories Included:
AC Power Cord
Band Decoder Cables included for Kenwood, ICOM and Yaesu
Spare Fuses and Plugs
User Manual

Optional Items:
Auto Antenna Tuner (HC-1.5KAT)
External Cooling Fan (HXT-1.5KF for high duty cycle RTTY)

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hy-gain® ROTATORS

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

HAM-IV

HAM-IV
$559.95

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

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

TAILTWISTER SERIES II

T-2X
$649.95

T-2XD
$1029.95
with DCU-1

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

TAILTWISTER Rotator Specifications	
Wind load capacity (inside tower)	20 square feet
Wind Load (w/ mast adapter)	**10 square feet**
Turning Power	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
$389.95

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

CD-45II Rotator Specifications	
Wind load capacity (inside tower)	8.5 square feet
Wind Load (w/ mast adapter)	**5.0 square feet**
Turning Power	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
$949.95
with DCU-1

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

ROTATOR OPTIONS

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

AR-40

AR-40
$289.95

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

AR-40 Rotator Specifications	
Wind load capacity (inside tower)	3.0 square feet
Wind Load (w/ mast adapter)	**1.5 square feet**
Turning Power	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
$1379.95

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

HDR-300A Rotator Specifications	
Wind load capacity (inside tower)	25 square feet
Wind Load (w/ mast adapter)	**not applicable**
Turning Power	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
$649.95

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

AR-35 Rotator/Controller

AR-35
$69.95

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

RBD-5
$34.95

NEW! Automatic Rotator Brake Delay

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

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announcements

Long Island Radio Day 2007 – Jointly sponsored by the Long Island Wireless Historical Society and radio station WCWP (88.1 FM), this event will take place on March 3 at the Tilles Center, C.W. Post campus of Long Island University, Brookville, New York. Featured will be various aspects of radio from its earliest history, to old-time radio broadcasting, ham radio, and modern radio communications and controls. There will also be a display and sale of antique radios restored to their original finish and performance. Appropriate vendors and exhibitors are invited to participate. For more information, contact Robert Raynor, 516-623-5967, e-mail: <raynortown@juno.com>.

Special Event Station KD8CKP – Kent, Ohio; second annual Freeze Your Acorns Off QRP special event; Portage County ARS; 1500–2300Z February 24 in the General portion of 15, 20, 40 meters. For 8×10 certificate send SASE to Al Atkins, KB8VJL, 12433 Chamberlain Road, Aurora, OH 44202.

The following hamfests, etc., are scheduled for February:

Feb. 3, **28th Annual HARA Swap & Shop**, Negaunee Township Hall, Negaunee, Michigan. Contact Robert Serfas, N8PKN, 906-225-6773, e-mail: <n8pkn@aol.com>. (Talk-in 147.27, 100 Hz tone)

Feb. 9–11, **2007 Orlando HamCation^{sm}**, Central Florida Fairgrounds, Orlando, Florida. More information: <www.hamcation.com>, e-mail: <hamcation@oarc.org>; or contact Mort and Roberta Cohen, 407-814-0434, e-mail: <WA2ARS@aol.com>. (Talk-in 146.760 [-600], backup 147.015 [+600] 103.5 tone; exams Saturday, pre-registered only) ***See us at the CQ Booth.***

Feb. 10, **Cherryland ARC Swap-n-Shop**, Immaculate Conception Middle School, Traverse City, Michigan. Contact Joe Novak, W8TVT, 231-947-8555, e-mail: <jjnovak@charter.net>. (Exams, contact Hope, AA8SN)

Feb. 11, **Mansfield Mid*Winter Hamfest, Computer & Hobby Show**, Richland County Fairgrounds, Mansfield, Ohio. Contact Dean Wrasse, KB8MG, 419-589-2415, e-mail: <deanwrasse@yahoo.com>; <www.iarc.ws> or <www.w8we.org>. (Talk-in 146.94, 71.9 Hz tone; exams)

Feb. 17, **Highlands County ARC Hamfest**, Highlands Agri-Civic Center, Sebring, Florida. Contact John Bliss, KF4IZT, 863-452-9729, e-mail: <swamp@tnni.net>; <www.strato.net/~hamradio>. (Talk-in 147.045 + 600 PL 100; exams)

Feb. 24, **Central Dakota ARC Hamfest**, St. Mary's Grade School, Bismarck, North Dakota. Contact Dick Veal, KAØETO, 701-223-7481, e-mail: <georgerv@bis.midco.net>. (Talk-in 146.34/94; exams 9 AM)

Feb. 24, **Cabin Fever Hamfest**, Civic Auditorium, LaPorte, Indiana. Contact John Rozinski, N9ROH, e-mail: <N9ROH@csinet.net>. (Talk-in 146.61[–] PL 131.8)

Feb. 24, **Northern Vermont Winter Hamfest & ARRL Vermont State Convention**, Milton High School, Milton, Vermont. Contact Mitch Stern, W1SJ, 802-879-6589, e-mail: <w1sj@arrl.net>; <http://www.ranv.org>. (Talk-in 145.15; exams at noon)

Feb. 25, **VWS Winterfest**, Northern Virginia Community College, Annandale, Virginia. For vendors to book tables, contact Len, KG6ZR, phone 703-366-3979, e-mail: <tablesales2007@viennaworeless.org>; <http://www.viennawireless.org/winterfest.php>. (Talk-in 146.91; exams Feb. 24 from 9 AM to noon, contact Jorge Thevenet, KD4DGQ, 703-729-4711, e-mail: <teagle242@aol.com>)

Feb. 25, **Long Island Indoor Hamfair**, Levittown Hall, Hicksville, New York. Contact via e-mail: <hamfest@limarc.org>; <http://www.limarc.org> (Talk-in 146.85 [136.5 PL]; exams 10 AM)

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FCC Eliminates Code Testing, Opens HF to Techs

In a landmark decision in mid-December, the FCC closed a 30-year debate on the future of code tests in amateur licensing by eliminating Morse exams for General and Extra Class licenses (there has been no code test for Technician since 1991). At the same time, the Commission gave all Technicians the limited HF access that has been available for years to Techs who had passed a 5-word-per-minute code test. The changes are expected to take effect in mid-to-late February. Details are on page 2.

Phone Band Expansion Begins Without Incident

Newly expanded phone bands on 75, 40, and 15 meters became available to hams on December 15, an event noted by a variety of stations in a variety of ways. *Newsline* reported that several stations secured 1×1 special-event callsigns for the occasion and that a group of vintage radio enthusiasts got together on AM for a "band-warming party" between 3700 and 3800 kHz. The *ARRL Letter* reported on one ham operating just above the new 3600-kHz band edge, working a string of stations on CW, then as the clock turned midnight, just switched over to lower sideband and continued working stations on phone. The *Letter* said there was no massive onslaught of voice stations and that several ongoing CW contacts continued unhindered.

Meanwhile, the ARRL Executive Committee approved revised voluntary bandplans for 80, 40, and 15 meters, providing new recommended frequencies for modes (primarily RTTY and other data modes) that were displaced by the phone band expansion; and the Question Pool Committee of the National Conference of Volunteer Examiner Coordinators announced the deletion of about two dozen potential exam questions in order to bring the pools into line with the new rules. Presumably, additional questions will have to be revised or removed in light of the FCC's more recent action on code tests and Technician operating privileges.

40-Meter Realignment Threatens CHU

Canada's time and standard frequency station, CHU, may need to find a new on-the-air home for its 40-meter station on 7335 kHz or may even take it off the air permanently this April. That's when the realignment of 40 meters, approved at the last World Radiocommunication Conference to help end interference between hams and international broadcasters, starts to take effect. On April 1, the 7300–7350 kHz band segment will be reallocated from the "fixed service" to "broadcasting," according to the *ARRL Letter*. CHU operates as a fixed service station. Messages on the station say it will need "to stop operating, change frequencies or relicense." A decision had not been made by press time. CHU operations on 3330 and 14670 kHz will not be affected.

Ham Students: FAR Scholarships Available

Hams who are full-time students in college or a post-secondary technical school have until April 30 to apply for any of 56 scholarships administered by the Foundation for Amateur Radio or the 2007–08 school year. According to the foundation's website, scholarship amounts range from $500 to $3000, and some of them give preference to students from certain geographical areas or in certain courses of study. Detailed information on each of the 56 scholarships is available online at <http://www.amateurradio-far.org/info2007.php>.

A New "Flavor" of BPL?

Two energy companies have been issued experimental licenses by the FCC for testing broadband over power lines (BPL) systems. San Diego Gas & Electric Company has been issued WD2XZO to operate between 1.7 and 80 MHz at "temporary fixed locations" in its service area, while Centerpoint Energy has been granted two experimental licenses, WD2XZF and WD2XZG, for BPL testing in Texas on 2–34 MHz and 3–34 MHz, respectively. Since the BPL systems currently in use are already permitted under Part 15 of the FCC rules without licenses, these actions suggest the companies might be experimenting with a new "flavor" of BPL that has not yet received an FCC OK. (Tnx *Newsline*)

February 19 Deadline for Dayton Nominations

The Dayton Amateur Radio Association is accepting nominations for its 2007 awards. The three awards—Amateur of the Year, Technical Excellence, and Special Achievement—are considered among the most prestigious recognitions in amateur radio. Nomination deadline is February 19. Details and forms are available online at <www.hamvention.org/nomination07.html>. Nominations may also be mailed to Dayton Hamvention Awards, P.O. Box 964, Dayton, OH 45401.

ARRL Hikes Outgoing QSL Bureau Rate

The cost of using the ARRL's Outgoing QSL Service increased 25% as of January 1, with rates rising from $4 per half-pound of cards to $5. There are also new, lower costs for small volume users, with a fee of only $1.50 for up to 10 cards, $2.50 for 11–20 QSLs, and $3.75 for 21–30 cards. According to the *ARRL Letter,* recent changes in postal rates and price structures doubled the QSL bureau's postage costs. It's the first increase in nearly six years for the service, through which ARRL members may send QSLs in bulk to DX stations worldwide.

Kids Aren't Too Young For Satellites

That's the message behind both the mission and the name of a new amateur satellite scheduled for launch this spring. *Newsline* reports that Stanford University's Aeronautics and Astronautics department is building "KatySat," an acronym for the title above, with the intent "to put space technology into the hands of kindergarten through 12th grade students." It will be a digital satellite, using 1200-baud packet radio, with a 2-meter uplink and a 70-centimeter downlink. It is scheduled for launch on a Russian rocket in May.

Worldwide Online Grid Finder

F6FVY has developed an online tool that should be helpful to those hams chasing CQ's DX Field Award on HF or the ARRL's VHF/UHF Century Club award on VHF. Accoding to *Newsline,* Laurent Haas has programmed a tool on his website based on Google Earth that lets you click on nearly any spot on Earth and have its corresponding grid locator (grid square) displayed. The service is free and you can access it on Haas's website at <http://f6fvy.free.fr/qthLocator/fullSceen.html>. *(Ed. note: We tried it and it works great!)*

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

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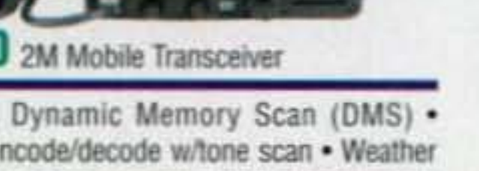

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Lithium-ion batteries are starting to show up in some amateur handhelds, and many of us have integrated Li-ion powered laptop computers into our ham shacks. Amid recent recalls of Li-ion batteries by major computer makers, battery expert Isidor Buchmann asks, and answers, a question that's on many of our minds...

Are Lithium-Ion Batteries Safe?

BY ISIDOR BUCHMANN*

When Sony introduced the first lithium-ion battery in 1991, it knew of the battery's potential safety risks as well as its great benefits. A recall of the previously released rechargeable *metallic lithium* battery was a bleak reminder of the discipline one must exercise when dealing with this high energy-dense battery system.

Pioneering work for the lithium battery began in 1912 by G. N. Lewis. However, the first non-rechargeable lithium batteries did not become commercially available until the early 1970s. Attempts to develop rechargeable lithium batteries followed in the '80s. These early models were based on metallic lithium and offered very high energy density. However, inherent instabilities of lithium metal, especially during charging, put a damper on development. The cell had the potential of a thermal run-away, in which the temperature would quickly rise to the melting point of the metallic lithium and cause a violent reaction. A large quantity of rechargeable lithium batteries sent to Japan had to be recalled in 1991 after the pack in a cellular phone released hot gases and burned a man's face.

Because of the inherent instability of lithium metal, research shifted to a non-metallic lithium battery using *lithium ions.* Although slightly lower in energy density, the lithium-ion system is safe, provided certain precautions are met when charging and discharging. Today lithium-ion is one of the safest and most successful battery chemistries available. Two-billion cells are produced every year.

Photo A– A cell phone with a no-brand battery that "vented with flame" while charging in the back of a car.

Benefits and Risks

Lithium-ion holds twice the energy of a nickel-based battery and four times that of lead acid. Lithium-ion is a low-maintenance system, an advantage that most other chemistries cannot claim. There is no memory and the battery does not require scheduled cycling to prolong its life. Nor does lithium-ion have the sulfation problem of lead acid that occurs when the battery is stored without periodic topping charges. Lithium-ion has a low self-discharge and is environmentally friendly. Disposal causes minimal harm.

However, with the high usage of lithium-ion in cell phones, digital cameras, and laptops, there are bound to be issues. A 1-in-200,000 failure rate triggered last year's recall of nearly 6 million lithium-ion battery packs used in laptops manufactured by Dell and Apple. Heat-related battery failures are taken very seriously, and manufacturers chose a conservative approach. The decision to replace the batteries puts the consumer at ease and lawyers at bay. Let's now take a look at what's behind the recall.

Sony Energy Devices (Sony), the maker of the lithium-ion cells in question, says that on rare occasions microscopic metal particles may come into contact with other parts of the battery cell, leading to a short circuit within the cell. Although battery manufacturers strive to minimize the presence of metallic particles, complex assembly techniques make the elimination of all metallic dust nearly impossible. Energy-dense cells with ultra-thin separators are more susceptible to

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"Consumer-grade lithium-ion batteries cannot be charged below 0°C (32°F)."

impurities than older designs with lower Ah ratings.

A mild short will only cause an elevated self-discharge. Little heat is generated because the discharging energy is very low. If, however, enough microscopic metal particles converge on one spot, a major electrical short can develop and a sizable current will flow between the positive and negative plates. This causes the temperature to rise, leading to a thermal runaway, also referred to "venting with flame."

Lithium-ion cells with cobalt cathodes (same as the recalled laptop batteries) should never rise above 130°C (265°F). At 150°C (302°F) the cell becomes thermally unstable, a condition that can lead to a thermal runaway in which flaming gases are vented.

During a thermal runaway, the high heat of the failing cell can propagate to the next cell, causing it to become thermally unstable as well. In some cases, a chain reaction occurs in which each cell disintegrates on its own timetable. A pack can self-destruct within a few short seconds or linger on for several hours as each cell is consumed one by one. To increase safety, packs are fitted with dividers to protect a failing cell from spreading heat to neighboring cells.

Safety Level of Lithium-Ion Systems

There are two basic types of lithium-ion chemistries: *cobalt* and *manganese* (spinel). To achieve maximum runtime, cell phones, digital cameras, and laptops use *cobalt-based* lithium-ion. *Manganese* is the newer of the two chemistries and offers superior thermal stability. It can sustain temperatures of up to 250°C (482°F) before becoming unstable. In addition, manganese has a very low internal resistance and can deliver high current on demand. Increasingly, these batteries are used for power tools and medical devices. Hybrid and electric vehicles will be next.

The drawback of spinel is lower energy density. Typically, a cell made of a pure manganese cathode provides only about half the capacity of cobalt. Cellphone and laptop users would not be happy if their batteries quit halfway through the expected runtime. Rather than less, the consumer wants more stored energy to support new features that chew up extra battery power.

To find a workable compromise between high energy density, operational safety, and good current delivery, manufacturers of lithium-ion batteries use different cathode metals. Typical mixes are cobalt, nickel, manganese, and iron phosphate. Lithium-ion systems are not yet mature and have the potential of increasing the energy density further. Looking back in history, lithium-ion has achieved a notable energy improvement of 8–10% per annum.

Packing more energy into a cell increases safety concerns, and appropriate measures will need to be taken to achieve the mandated safety standard set forth by UL 1642. Whereas a nail penetration test could be tolerated on the older 1.35-Ah 18650 cell, a high-density 2.4 Ah would become a bomb when performing the same test. UL 1642 does not require nail penetration.

Battery Safety Comes First

Let me assure the reader that lithium-ion batteries are safe and heat-related failures are rare. The battery manufacturers achieve this high reliability by adding three layers of protection. They are: (1) limiting the amount of active material to achieve a workable equilibrium of energy density and safety; (2) inclusion of various safety mechanisms within the cell; and (3) the addition of an electronic protection circuit in the battery pack.

These protection devices work in the following ways: The *PTC* device built into the cell acts as a protection to inhibit high current surges; the *circuit interrupt device* (CID) opens the electrical path if an excessively high charge voltage raises the internal cell pressure to 10 Bar (150 psi); and the *safety vent* allows a controlled release of gas in the event of a rapid increase in cell pressure. In addition to the mechanical safeguards, the electronic protection circuit external to the cells opens a solid-state switch if the charge voltage of any cell reaches 4.30V. In addition, a fuse cuts the current flow if the skin temperature of the cell approaches 90°C (194°F). To prevent the battery from over-discharging, the control circuit cuts off the current path at about 2.50V/cell. In some applications, the higher inherent safety of the spinel system permits the exclusion of the electric circuit. In such a case, the battery relies wholly on the protection devices that are built into the cell.

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Photo B– The Yaesu VX-7R is one of just a couple of current amateur handhelds that come with lithium-ion batteries, but the trend is likely to grow. As the author explains, these batteries are generally safe, despite the highly publicized recall of laptop computer batteries last year. (Photo courtesy of VertexStandard)

safety precautions are only effective if the mode of operation comes from the outside, such as with an electrical short or a faulty charger. Under normal circumstances, a lithium-ion battery will simply power down when a short circuit occurs. If, however, a defect is inherent to the electrochemical cell, such as in contamination caused by microscopic metal particles, this anomaly will go undetected. Nor can the safety circuit stop the disintegration once the cell is in thermal runaway mode. Nothing can stop it once triggered.

A major concern arises if static electricity or a faulty charger has destroyed the battery's protection circuit. Such damage can permanently fuse the solid-state switches in an ON position without the user's knowledge. A battery with a faulty protection circuit may function normally. but does not provide protection against abuse.

Another safety issue is cold temperature charging. Consumer grade lithium-ion batteries *cannot be charged* below 0°C (32°F). Although the packs appear to be charging normally, plating of metallic lithium occurs on the anode while on a sub-freezing charge. The plating is permanent and cannot be removed. If done repeatedly, such damage can compromise the safety of the pack. The battery will become more vulnerable to failure if subjected to impact, crush, or high-rate charging.

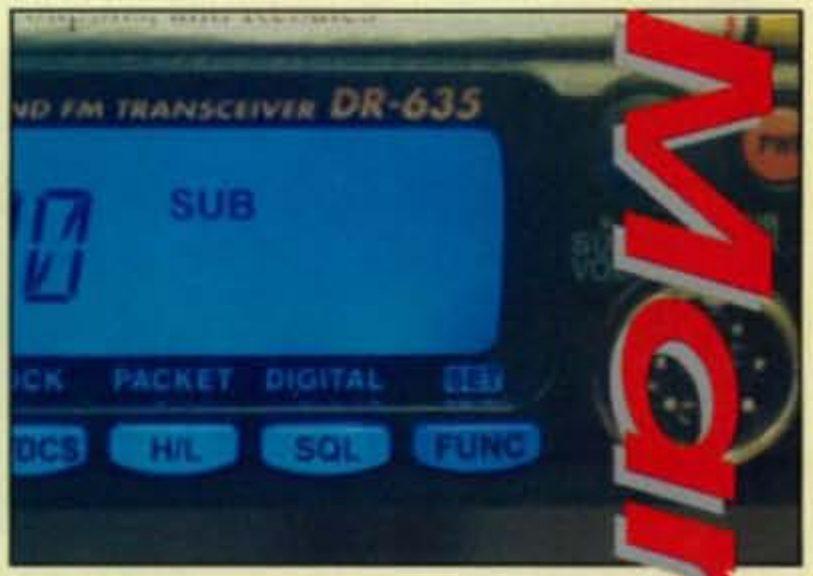
Asia produces many non-brand replacement batteries that are popular with cell-phone users because of low price. Many of these batteries don't provide the same high safety standard as the main brand equivalent. A wise shopper spends a little more and replaces the battery with an approved model. Photo A shows a cell phone that was destroyed while charging in a car. The owner believes that a no-name pack caused the destruction.

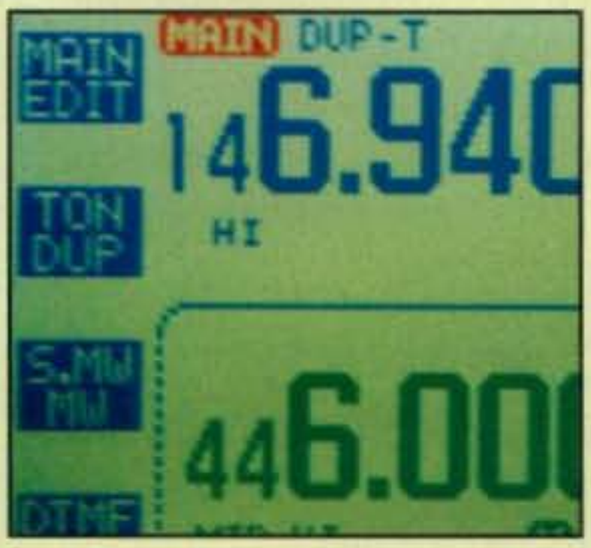
To prevent the infiltration of unsafe packs on the market, most manufacturers sell lithium-ion cells only to approved battery-pack assemblers. The inclusion of an approved safety circuit is part of the purchasing requirement. This makes it difficult for a hobbyist to purchase single lithium-ion cells off-the-shelf in a store. The hobbyist will have no other choice than to revert to nickel-based batteries. I would caution against using an unidentified lithium-ion battery from an Asian source, if such cells are available.

The safety precaution is especially critical on larger batteries, such as laptop packs. The hazard is so much greater than on a small cell-phone battery if something goes wrong. For this reason, many laptop manufacturers secure their batteries with a secret code that only the matching computer can access. This prevents non-brand-name batteries from flooding the market. The drawback is a higher price for the replacement battery. Visitors to my <www.BatteryUniversity.com> website often ask me for a source of cheap laptop batteries. I have to disappoint the shoppers by directing them to the original vendor for a brand-name pack.

Conclusion

Considering the number of lithium-ion batteries used on the market, this energy storage system has caused little harm in terms of damage and personal injury. In spite of the good record, its safety is a hot topic that gets high media attention, even on a minor mishap. This caution is good for the consumer, because we will be assured that this popular energy storage device is safe. After the recall of Dell and Apple laptop batteries, cell manufacturers will not only try packing more energy into the pack, but also will attempt to make it more bulletproof. ■





Mobile operating continues to grow in popularity, and for many hams, it's unthinkable to get into a vehicle that doesn't contain at least one ham rig. Here's our annual look at the ham radio marketplace, focusing this time on VHF/UHF FM mobile rigs.

VHF/UHF FM Mobile Transceivers

BY GORDON WEST,* WB6NOA

Every February issue of *CQ* magazine features the CQ Market Survey. Last year, our focus was on handheld transceivers. In 2005, our CQ Market Survey covered high-frequency (HF) base and mobile stations. This issue examines VHF/UHF FM mobile radios, with a fresh update on changing technology from the last VHF/UHF mobile reviews three years ago.

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There are no *new* manufacturers entering the VHF/UHF mobile market, but we have seen some manufacturers pulling out. They will focus their sales efforts on other two-way radio products.

ADI, also known as Pryme Radio Products, is now directing its marketing efforts on microphones and headsets. "We have dealers who may still carry our AR-147, a 2-meter 60-watt mobile, but after this radio is gone, there will probably be no more mobile transceivers," said Kenan Reilly, N6CCE, Marketing and Technical Director for Pryme. "Our company is now

Alinco's new DR-635 lets you select different display colors for transmit, receive, and standby. (Photo courtesy of Alinco)

focusing on land-mobile and ham radio headset and helmet equipment.

Most of the familiar manufacturers are still here, though. Alinco remains solid with its popular line of single-band and dual-band mobile VHF/UHF transceivers, adding a new mobile dual bander which replaces two outgoing Alinco dual banders. "Our single banders are known for their huge alphanumeric displays, up to 7 characters, plus the provision for an optional internal TNC, and a rear-panel computer port," comments Evelyn Garrison, WS7A, with Alinco. "And wait until you see our new DR-635T dual bander!" adds Evelyn.

"At ICOM America, we continue to add exciting mobile radios to our line, and about the only radio getting discontinued is the IC-2100H," comments Ray Novak, N9JA, Amateur Radio Division Manager. Ray is also all smiles about the successful rollout of ICOM D-STAR analog/digital equipment.

Over at Kenwood, Phil Parton, N4DRO, shares our disappointment that years of triband chassis and component parts finally dried up, forcing the company to discontinue its TM-642/742 triband radios. Overall, Kenwood has dropped six models over the last three years, mostly single banders, while adding the new V-708 dual band, little brother to the TM D-700A (more on this radio later).

Yaesu's FT-1500 single bander has now been superseded by a fabulous FT-1802 single bander, one of five mobile VHF and two-band, dual-band, and quad-band radios in its line. Yaesu also has a new Ham Radio Sales Manager, Dennis Motschenbacher, K7BV, formerly the ARRL's Marketing Manager. In addition, 29-year Yaesu veteran Chip Margelli, K7JA, has left Vertex-Standard to become Vice President of Sales and Marketing at Heil Sound.

Ranger, best known for its CB radio equipment, had also offered a single-band 6-meter transceiver that had few features, but outstanding transmit audio and spectacular receive sensitivity. Ranger had been planning to discontinue the RCI-5054-DX100, but announced just before press time that it had changed its mind due to popular demand, and that the radio would again be available as of March 2007.

New Trends in the New Mobiles

As our four leading manufacturers of mobile VHF/UHF FM transceivers announced new models, we began to see new features in technology. In other words, what they couldn't do three years ago, they are beginning to do now!

The Alinco DR-635 replaces two earlier dual-band models. New color LCD technology will allow the operator to choose amber, blue, or violet to display transmit, receive, and squelched stand-by, and the dual-band control head separates from the body. You will quickly *see* the utility of a color LCD readout when it changes color during receive, transmit, and stand-by squelch.

The DR-635 offers 200 memory channels—80 for VHF, 80 for UHF, plus 40 for any mix of bands, *including* sparkling reception of the FM music band. The Alinco will also take optional digital data and digital voice boards, and handle packet at 1200 and 9600 bps for connecting to a computer via the DSUB 9 port. There is no need to remove the microphone!

Since it is a full dual-band transceiver, the DR-635 allows simultaneous receive and transmit on 2 meters and 70 cm. It also works cross-band repeat and full dual-band duplex for working FM satellites, and features a newly designed RF board which delivers increased resistance to interference and intermod on adjacent and distant frequencies.

As more areas of the country bring in ICOM America D-STAR Systems, ICOM introduces the IC-2200H and IC-800H to get you started on analog with capabilities of going digital for both voice and data.

D-STAR is a digital, open-protocol communication system combining voice and data into a seamless communications network. There are system and backbone components, and the new equipment listed in this guide may be run mobile or base. The ability to simultaneously transmit voice and data lets you communicate your immediate needs, identify who you are, and, with a GPS attached, identify where you are located—all at once! In addition to the digital voice (DV) mode, the 1.2-GHz digital data (DD) mode gives you 128-kbps data, which opens a whole new area of digital communications previously not available in a mobile radio. Nearly 100 D-STAR repeater systems are either on the air or being built at press time, with many of them connected to each other via the internet for VHF/UHF DXing.

The new IC-2200 is a single-band, analog 2-meter FM transceiver with optional D-STAR capabilities. The receiver includes the AM aircraft band, plus the NOAA weather channels, including weather alert. Power output on the IC-2200H is a monster 65 watts, and I would only recommend this higher

The new ICOM IC-2200 single bander puts out a whopping 65 watts on 2 meters and gives you the option of adding digital voice for the D-STAR system. (Photo courtesy of ICOM America)

power level when absolutely necessary. There are 200 alphanumeric memories, all of the tone options including DTCS, plus squelch delay. I like the squelch-delay feature because it always lets me know what radio is passing traffic by its distinctive "kerrrr-chunk" squelch tail.

The ICOM ID-800 is a two-band analog and digital D-STAR transceiver, one band at a time. It has the capability to support 20-character short-text digital messaging, and an easy setup to any on-air D-STAR system. We measured nearly 60 watts output on 2 meters and an easy 50 watts output on UHF, and a built-in tiny fan keeps everything cool during prolonged digital or analog transmissions. We especially like the big, bold display and extremely loud, crisp audio output.

At Kenwood, the one new mobile FM radio is the TM-V708A, identical to the TM-D700A, but minus the APRS firmware, terminal node controller, and computer hookups. Everything else remains the same, so if you never plan to operate APRS, you can save around $100 by going for the nearly identical V-708A, which looks and works just like its big brother, the D-700A. However, if you think there might *ever* be a GPS receiver in your future, go for the extra bucks and step up to the D-700A with all its capabilities.

Phil at Kenwood tells me the V708 is a popular seller, so the slightly lower selling price of the 708 *without* the APRS capabilities must be its draw. As for the radio itself, it is a true dual bander with every bell and whistle in the world, including cross band. It's one heck of a terrific package.

The final new radio to come on the scene in the last three years is a single bander from Yaesu. The Yaesu FT-1802 is a rugged 2-meter mobile, with a solid 50 watts of output power. Solid? This heavy-duty radio has a heat evacuation system that really keeps it cool during prolonged net transmit operation. The FT-1802 is ultra-compact, yet powerful on transmit with wide and narrow deviation control for both transmit and receive bandwidth. The 1802 holds 200-plus memory channels, including alphanumeric labeling. It gives you NOAA weather channels, with weather alert, but unfortunately it does not tune AM down in the aircraft band. I am told the non-receive for aircraft is a small allowance for the ultra-selectivity on the 2-meter band. No intermodulation interference with this radio! The FT-1802 also offers a practice Morse code trainer, along with a security password to help prevent unauthorized use. Overall, using this radio is a delight.

ICOM's IC-800 is a dual-band (2m/70cm) D-STAR-ready transceiver that offers traditional analog voice as well as the digital voice and data features of D-STAR. (Photo courtesy of ICOM America)

One note on the 1802: At the bottom left of the radio is an atomic-energy symbol-like button. This button activates the radio's internet connection feature and transmits a DTMF string to connect with a specific node on Yaesu's WIRES system. If you're not trying to establish an internet link, avoid this button or you will get an annoying beep and 2 seconds of muted transmit audio. It is easily pushed in, and unless you're driving down the road staring at the display, you will wonder why no one is making out your callsign on the first or second try. (See the manual for how to actually use this key.)

Our Popular FM Mobile Spreadsheet

Our side-by-side comparison tables list each manufacturer alphabetically, and include the radio model number, number of bands, and an additional 30-plus specs to assist you in analyzing which mobile radio for VHF and UHF is in your future. Throughout this buyer's guide, we continuously encourage you to play with the radios, live and direct, before you make your purchasing decision. Nothing on our spec sheet can give you the *real feel* that you will quickly like or not like when you start playing with the dials at your local dealer or the live mobile gear in your ham buddy's car. What the specification sheet *will* reveal are important "reminders" to look for in selecting VHF/UHF FM mobile radio equipment.

If you are a pilot, be sure to note which radio has AIR reception. If you are into public-safety work, you'll likely choose a dual-band mobile that displays both VHF and UHF bands at the same time. Although some radios are marketed as "dual band," they may offer only one band at a time. We would classify them as two band, not dual band. In our listing, *dual band* means exactly that—*both VHF and UHF reception at the same time*. This type of equipment can also accommodate cross-band repeat.

Dual in-band receive might be found in certain dual-band transceivers, allowing you to assign left-band and right-band frequencies in the *same* band. This could allow you to monitor 146.520, simplex, while driving out in the country and still continuing to yak on your 147.060 repeater. Or, if you're in public-safety work, listen on 2 meters and receive out-of-band on marine VHF or high-band police and fire. Some radios include a band scope, which is good for those wishing to monitor the entire VHF or UHF band out in the country.

Here are some other major categories within the charts:

Bands and Frequency Coverage. I like a true dual-band radio because all of the neat IRLP systems here in southern California are on UHF, but I also want to listen on 2 meters. However, unless you're involved with emergency communications big time, and need two running bands, you may prefer a two-band radio where you select one band at a time. A dual-band radio sometimes gets confusing when there is simultaneous activity on both bands!

Pay attention to the frequency coverage of each band. There's a lot to listen to outside of ham-band limits. In many cities, TV and radio reporters "feed" the audio of their stories back to the station on VHF and/or UHF. These broadcast "feeds" are a kick to listen to, because many times you hear things over your radio that you won't necessarily hear on the regular broadcast band. Remember, communications that you receive *outside* of ham bands limits are *absolutely secret!* You may listen, but you may not share what you hear with others. It's the law.

Equipment that might tune in 800 MHz could become handy during police

FM Mobile Transceivers

	Alinco DR-235T	Alinco DR-435T	Alinco DR135T MKII	Alinco DR-M06	Alinco DR-635T	ICOM IC-208H	ICOM IC-2200H	ICOM ID-1	ICOM ID-800H	ICOM V8000	ICOM IC-2720	Kenwood TM-G707	Kenwood TM-V708A	Kenwood TM-D700A	Kenwood TM-271A
No. of Bands	single	single	single	single	dual	2	single	single	2	single	dual	2	dual	dual	single
Freq. Coverage	220	450	2m	6m	2m/440	2m440	2m	1.2GHz	2m/440	2m	2m/440	2m/440	2m/440	2m/440	2m
6 m	—	—	—	TX/RX*	88-108RX	—	—	—	—	—	—	—	—	—	—
Air	—	—	RX	—	RX	RX	—	—	—	No	RX	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	TX/RX
148–174 MHz	—	—	RX	—	RX	RX	RX	—	RX	136+WX alert	Yes+WX alrt	RX	RX	RX	Yes
220 MHz	TX/RX	—	—	—	—	—	—	—	—	No	RX	—	RX	RX	No
440 MHz	—	TX/RX	—	—	TX/RX	TX/RX	—	—	TX/RX	No	TX/RX	TX/RX	TX/RX	TX/RX	No
450–470 MHz	—	RX	—	—	335-470	RX	—	—	RX	No	RX	RX	RX	RX	No
800–900 MHz	—	—	—	—	—	RX	—	—	—	No	RX	Mod	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/35U	50V/35U	50/35U	50V/35U	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	212	180	200	200	200
Alphanumeric	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
LCD Color	red	red	amber/red	amber	three	both†	2	computer	amber	both†	both†	amber	amber	amber	green
Remote Head	No	No	No	No	opt	Yes	No	Yes	Yes	No	Yes	Yes	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
decode	Yes	✓	✓	opt	✓	✓	✓	Yes	✓	Yes	Yes	✓	✓	✓	Yes
DCS	Yes	Yes	Yes	No	✓	Yes	Yes	No	?	Yes	Yes	No	✓	Yes	Yes
Auto Repeater Shift	No	No	No	No	Yes	Yes	Yes	No	—	Yes	Yes	✓	Yes	Yes	Yes
Attenuator	No	No	No	No	Yes	variable	Yes	Yes	—	variable	variable	No	Yes	Yes	No
DTMF Memories	10	10	10	—	10	16	24	—	16	8	14	8	10	10	12
Mic Direct Freq. Input	YYes	Yes	No	No	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	1200/9600s	D Star	Yes	D Star	1200	1200/9600	Din,1200/9600	No	1200/9600	No
APRS Ready	opt	opt	opt	No	opt	No	D Star	—	D Star	No	No	Yes	No	Yes	No
Software Programming	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	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	No	Yes	Full	—
Dual In-Band RX	—	n/a	n/a	n/a	Yes	No	—	—	No	No	Yes	No	Yes	All	—
Built-in Duplexer	—	—	—	—	Yes	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	3	3	3	2.2
Lowest "Street" $$ Seen	$249	$259	$169	$259	$369	$329	$159	$1600	$629	$199	$379	$269	$399	$489	$199

* RX 47-60MHz

† Amber & Green

LDG Autotuners Have the Highest Resale Value of Any Other Company's Autotuners

At LDG Electronics we have always been the innovators in the automatic tuner industry. We built the first desktop switched-L tuner, the first automatic tuner for QRP radios, the first automatic tuner with a remote control head, and the first automatic tuner with 3-D memories. We were also the first manufacturer with a two-year warranty on all of our products and the first autotuner company to include all of the cables you need in your box.

Now we can say LDG autotuners have the highest resale value of any company's autotuners.*

LDG Autotuner Resale Value	85% of retail price
Company 2 Resale Value	74% of retail price
Company 3 Resale Value	64% of retail price
Company 4 Resale Value	57% of retail price

Over time, LDG' s well-built, over-engineered, long-lasting autotuners retain more of their value.

So what are you waiting for? Call your favorite dealer today and order a new LDG autotuner with the highest resale value of any autotuner.

Z-11Pro

Everything you always wanted in a small, portable tuner

The original portable Z-11 was one of LDG's most popular tuners, accompanying adventurous hams to their backyards, or to the ends of the earth. Now meet the Z-11Pro, 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-11Pro 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.

Two Year Warranty. Cables Included.

List Price $179

* Based on the average retail price of the product subtracted from the average resale value of used equipment sold on e-Bay. The data was compiled for a one year period in 2005-2006.

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AT-7000

The Hottest Radio in the Industry! Now with It's Own Autotuner!

The AT-7000 is the ideal tuner for IC-7000 & other ICOM Radios: Covers all frequencies from 1.8–54 MHz **(including 6 meters),** and will automatically match your antenna in a flash. Requires just 0.1 W for operation, but will handle up to 125 W (100 W on 6 m), making it suitable for everything from QRP (IC- 703Plus) to a typical 100 W ICOM transceiver.

Ready to go right out of the box! No extra cable to buy. Two-Year Warranty.

Tunes with Tuner button on your radio. Includes over 2,000 memories, uses latching relays, tuning range is 4-800 ohms, powered by your radio. Includes ICOM interface cable.

List Price $169

AT-200Pro

The first auto tuner specifically designed for today's high-powered transceivers.

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)**.

Two Year Warranty. Cables Included.

List Price $249

Z-100

The definitive low cost automatic antenna tuner!

The Z-100 is the definitive low cost automatic antenna tuner!

It has been designed from the ground up to provide the 100 watt power handling you asked for, in a small, light-weight package, perfect for portable as well as sitting on your desk in your shack!

Two Year Warranty. Cables Included.

List price $149

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The new Kenwood TM-V708 is nearly identical to the older TM-V700, but minus the APRS firmware, terminal node controller, and computer hookups. Thus, if your operating plans call for voice only, the 708 will save you about $100 compared to the 700. (Photo courtesy of Kenwood Communications)

and fire *re-banding*, and you need to search and see where everyone went! Although much of police and fire at 800 MHz is digital and/or trunked, you can still find some dedicated analog channels for mutual aid and emergency that sit on a specific 800-MHz frequency.

Power Output. Thirty watts is fine. Fifty watts won't make that much difference (compared to 30), and 60 watts can quickly heat up a radio's amplifier. Although the new line of FM transceivers has exotic cooling systems, power higher than 50 watts is probably not necessary.

Memory. Gone are the days of minimal memory. Most FM mobile radios will give you at least 80 to 100 channels per band. Anything less might cramp your monitoring of out-of-band frequencies. It is easy to fill up 100 memory channels, if you do it by a computer load. Get the associated computer-load kit with your new radio, if one is available! You will need the cable for programming alphanumerics. A radio with alphanumerics will help you remember, by name, what in the world is on 160.100 MHz!

LCD Display and Color. Of major importance! Some displays are downright wimpy. Others are big and bold. Some nearly wash out in the sunlight, but newer equipment gives you a bright readout in almost any lighting conditions. However, can the display go dark enough for nighttime driving? Check it out! Some equipment allows you to change display colors, and the new Alinco dual bander will even shift colors automatically during transmit and individual band receive. This I like!

Remote Head. This is an absolute necessity if you do a lot of driving and want to stay safe. Taking your eyes off the road to look down at a radio near your knees, or in the right arm rest, is downright dangerous when moving. However, if the radio is going to be used mostly while stationary or in a fixed location, a remote display may not be necessary. Double check whether the remote cable kit is included in the price of the equipment or is optional.

Auto Repeater Shift. This you want! This is a no-brainer, and most of the equipment has it built-in. This feature automatically sets the offset, or split, between repeater input and output frequencies, depending on the output frequency you've dialed in. In some areas of the country, though, you may encounter *non-standard* splits, such as a 1-MHz split on 2 meters rather than the standard 600 kHz. In these cases, you'll have to program in the input frequency separately, or manually adjust the repeater offset for that memory position.

In addition, just getting the automatic offset will not likely get you into a repeater that requires subaudible tone encode (CTCSS) for access. Tone encode generally is not used to make the repeater private, but rather to keep it from self "kerchunking" up on a mountaintop with all the other radio systems around, or to reduce interference from other repeaters on the same frequency during band openings. Buy a local repeater directory, and you're all set. Many ham stores also offer local repeater lists, usually showing input as well as subaudible tone encode frequencies.

Subaudible tone for both encode and decode is now standard equipment inside virtually every radio. However, your part of the country may be covered by *digital coded squelch* (DCS). If so (you can find out from a local dealer or your repeater directory), make sure the rig you are shopping for has DCS capability listed on the specification sheet.

Attenuator. Very handy! Many radios offer expanded receive coverage outside the ham bands, but may offer less than optimum intermodulation rejection. It's the price we pay for asking the manufacturers to give us air band, marine band, FBI, ham bands, FM music bands, and high-band/UHF police and fire. No wonder your radio growls and hiccups when you're downtown or staring at a hilltop full of antennas. The attenuator allows you to deaden the receiver sensitivity, sometimes minimizing howls, while still allowing the strong repeater signal to get through.

Microphones. A full-function mic has its benefits and its drawbacks. If you are really into controlling repeaters and IRLP/Echolink, or if you make a lot of autopatch calls, a full-function mic that might offer up to 16 DTMF number strings will come in handy. Certainly, a mic that's backlit for nighttime use makes frequency entry easier than having to simply spin the dial. Again, though, nothing beats having all of your favorite frequencies already in memory for easy microphone selection. Also, an accidental button-push can switch you out of memory mode and into VFO, or even put you on a different band.

If you don't need to do a lot of button-pushing, you might want to check out some of the aftermarket microphone manufacturers, such as Pryme (mentioned earlier) or Heil Sound, whose Mobile Handi Mic series was developed specifically to help improve transmitted audio produced by mobile ham rigs.

APRS and Sky Command. Digital capabilities are an important consideration to allow packet operation and Automatic Position Reporting System (APRS). Our specifications may

Yaesu's FT-1802 puts out 50 watts on 2 meters and keeps its cool with a "heat evacuation system." It even includes a Morse code trainer! (Photo courtesy of Vertex-Standard)

illustrate rigs that can do packet, plus those rigs with a built-in TNC to accommodate APRS, and radios that will take an internal optional APRS board. Look carefully at the packet connection points to see if the 1200 or 9600 controller plugs in with a DIN plug, while others may come with DB-9 connector. On some rigs, you must use the microphone and speaker sockets.

So far, only Kenwood, with its TMD-700 dual-band mobile transceiver (plus the D7 HT) operates straight out of the box with APRS capability when tied in to the GPS NMEA 0183 data stream. However, Kenwood takes APRS to the next level by showing the APRS "hits "of other hams in the vicinity on an AvMap G4T Personal Navigator mapping GPS system.

The Kenwood D-700 mobile (as well as the D-7 handheld) can also serve as auxiliary wireless control points for Kenwood Sky Command HF base stations, principally the TS-2000. Sky Command auxiliary operation became legal on last December 15, allowing you to drive around town with your dual-band D-700, turn on your home station, and dial in to 20 meters or any other HF

FM Mobile Transceivers

	MFJ	Ranger	Yaesu	Yaesu	Yaesu	Yaesu	Yaesu
	3 models	5054-DX100	FT-1802M	FT-2800	FT-7800	FT-8800	FT-8900
No. of Bands	single	single	single	single	2	dual	quad
Freq. Coverage	—	6m	2m	2m	2m/440	2m/440	
29/50/2m/440							
6 m	9406	TX/RX	—	—	—	—	TX/RX
Air	Mod 8621	—	No	No	RX	RX	RX
2m	Mod 9402	—	TX/RX	TX/RX	TX/RX	TX/RX	TX/RX
148–174 MHz	—	—	RX	RX+WX alrt	RX+WX alrt	RX	RX
220 MHz	—	—	WX Alert	—	RX	RX	—
440 MHz	—	—	—	—	TX/RX	TX/RX	TX/RX
450–470 MHz	—	—	—	—	RX	RX	RX
800–900 MHz	—	—	—	—	RX	RX	RX
1270 cm		—	—	—	No	No	No
Power Out	5 SSB	25	50	65	50V/40U	50V/35U	50V/35U
Display Bands	1	1	1	1	1	2	2
Memories	0	20	221	221	1000	1000	800
Alphanumeric	No	No	Yes	Yes	Yes	Yes	Yes
LCD Color	dial	amber	amber	orange	orange**	orange**	orange**
Remote Head	No	No	No	No	Yes	Yes	Yes
Band Scope	No	No	No	No	No	No	No
CTCSS							
encode	No	Yes	✓	Yes	Yes	Yes	Yes
decode	No	Yes	✓	Yes	Yes	Yes	Yes
DCS	No	No	✓	Yes	Yes	Yes	Yes
Auto Repeater Shift	No	No	Yes	Yes	Yes	Yes	Yes
Attenuator	Yes	No	No	No	Yes	Yes	Yes
DTMF Memories	No	—	8	8	16	16	16
Mic Direct Freq. Input	No	—	Yes	Yes	Yes	Yes	Yes
Backlit Mic Keypad	No	—	Yes	Yes	Yes	Yes	Yes
Packet Compatible	opt	No	1200/9600	1200/9600	1200/9600	1200/9600	1200/9600
APRS Ready	opt	No	No	No	wires no	wires no	wries no
Software Programming	No	—	Yes	Yes	Yes	Yes	Yes
Cloning	No	—	Yes	Yes	Yes	Yes	Yes
Crossband Repeat	No	No	—	n/a	No	Yes	Yes
Dual In-Band RX	—	—	—	n/a	No	Yes	Yes
Built-in Duplexer	No	—	—	—	Yes	Yes	Yes
Size	micro	medium	small	small	medium	medium	medium
Weight (lbs.)	1	2	1	3	2.2	2.2	2.2
Lowest "Street" $$ Seen	$369	$300	$139.95	$159	$279	$399	$439

* RX 47-60 MHz

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band. Once your system is up, other operators with almost any type of mobile transceiver can join in on the conversation, with you acting as control operator for any station not licensed as a General or higher.

Digital With D-STAR. ICOM America offers three mobile transceivers with digital capabilities for the growing D-STAR digital voice and data network, creating a worldwide amateur radio network with D-STAR digital repeaters linked via the internet. The D-STAR connection is completely transparent to your laptop or other network device.

The 2-meter IC-2200H starts out as a standard analog mobile 2-meter transceiver, but installing a digital UT-118 voice and data upgrade will allow you to go digital on D-STAR. The ICOM dual-band ID-800H is both analog and digital, straight out of the box, as is the ICOM ID-1 for the 1.2-GHz band.

Channeled Up. The five new models that have been added to the approximately 20 three-year-old models on the market all have over 200 memory positions. Yet some of the three-year-old models have over 800 memory positions! As mentioned earlier, you would do well to also buy the computer cables necessary for programming your new single-band or dual-band radio. In many cases, these will also let you "clone" frequencies from another radio. Cloning allows you to either trade programs between hams with the same equipment, or download a hot frequency list into a mobile radio in minutes, something that would take you hours to enter, channel by channel, along with alphanumerics. Kenwood offers cloning files for free over the internet. RT Systems (www.cloningsoftware.com) is considered the king of radio cloning, and its software is easy to work with.

I continuously encourage local storefront ham radio dealers to have one store display radio fully loaded with the local hot frequencies for both ham and out-of-band receive. This way potential buyers could come in to the store, shop the equipment, and then have the added benefit of having a clone upload of frequencies they probably didn't even know were active.

An example of "I didn't know that frequency existed" is here in southern California, where earthquakes are regular phenomena. Seismologists have set up an earthquake transmitter with a tone that remains steady when there is no activity. As soon as the tone warbles, an earthquake has occurred somewhere in the world or close by. The frequency and pitch of the warble are scientific indications of the distance from the earthquake location. The tone is picked up near 163 MHz.

However, who wants to listen to a steady tone all day? A local repeater group, the ALERT system, tunes in to the tone and mutes it from coming out of the repeater until local life threatening seismic activity occurs. When a local earthquake hits, one would consider the warbling tone as an emergency alert. The tone comes out of the repeater, and we have about 5 seconds before we feel the earth shake down here by the ocean. The warbling tone is accompanied by a CTCSS carrier that would open up the squelch circuit of any radio tuned in. Its a great system meeting FCC rules on emergency communications and a great way for us in southern California to know when to take cover.

Therefore, get a frequency load from a computer or the same brand and model radio and be surprised at all that may be out there in radio land on your mobile transceiver.

Which Radio is Best?

Each radio in our survey has its own specific strong points. You won't easily make out these strong points by just reading over these pages. For the best decision on which radio is for you, *get your hands, eyes, and ears on the radio under consideration!* Turn the big knob and see what it feels like. Is there an accompanying beep? Adjust volume and squelch; are the knobs too big or too small? Is the squelch smooth or does it tends to chop on weak signals?

Does the head separate? Will the mounting bracket accommodate where you plan to install it? How many antenna jacks are on there on the rear? Most important, for driving safety, how easy is it to eyeball the display? Can the display be remote-mounted at eye level? Can you get at all of the knobs and buttons without accidentally pushing the wrong ones?

How loud *is* loud? Is the microphone backlit for nighttime use and can you enter key frequencies and have the radio automatically set the repeater split to positive or negative on a repeater channel? Is there a timeout timer in case you should sit on the microphone?

See for yourself what these features look like beyond just reading over these pages. If your local dealer, or local radio club, has several different models of VHF/UHF radios to play with, take your time and dial them in. One rig will absolutely grab your attention, and this is likely the rig for you. ■

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The shack that launched 10,000 QSOs … all in 2006, all despite operating in an antenna-restricted neighborhood.

At the beginning of 2006, AI4FR set himself a lofty goal for the year—ten-thousand contacts from his deed-restricted QTH. His ingredients for success: patience, perseverance, and (of course) a little ham radio magic.

Ten-Thousand QSOs (and a little bit of magic)

BY JOHN WHITT, JR.,* AI4FR

This is one of an occasional series of articles on the ways in which different hams are dealing with antenna restrictions, all proving that "CC&Rs" should not translate into "off the air."
—W2VU

"Could it be done?" I thought to myself on that New Year's Eve of 2005. Was it at all possible for a ham who lives in a deed-restricted community to actually make ten-thousand contacts in a one-year period? I imagined that it *could* be done if one logged every single contact from sources such as repeaters, Echolink, and the usual group of local hams who meet on HF every day. However, this was not what I was after. I wanted to see if it was possible to actually get 10,000 random QSOs in the logbook from a station that has no tower, no beam, no rotor, and not much more than a wire tossed out the window for an antenna.

I decided to find out, and along with my goal, I set myself a few conditions: all QSOs must be made from home and must be with distant stations, relying only on propagation. The local repeaters, Echolink, going mobile, satellites, and operating remote stations via the internet and such would not

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e-mail: <AI4FR@verizon.net>

be counted toward my goal. Now there is nothing wrong with operating any of the above means, but for my query to be answered, I had to test my ability to overcome the deed restrictions. In other words, it had to be accomplished strictly from home with only antennas that one could be sneaky enough to hide from the prying eyes of the HOA (Home Owners' Association).

Thus, on January 1, 2006 I started my quest to answer that question. At the very end of the quest I ran into something so unbelievable, so unimaginable, something so hard to believe that I can only begin to describe it as the magic of ham radio. This may mean different things to different people, but at the end of my quest, this ham radio magic hit me like a ton of bricks.

Limited Antenna Options

Living under those dreaded deed restrictions is a tough choice for any ham. Many people need to be close to their place of employment, family, etc., and that puts them into neighborhoods with some type of deed restrictions. What is a ham to do? Well he (or she) could give up radio from home and just do it while mobile, or he can get a little creative and find a way to stay on the air. For me, it was a no-brainer: I needed to figure out a way to get on the air. But how was I going to get an antenna up in the air and at the same time keep the neighbors happy?

Installing any type of tower was way out of the question here, so I did what many hams do under such circumstances. I installed numerous antennas in the attic with the help of my XYL. These dipoles for HF and loops for 6 meters and verticals for VHF and UHF worked well, but I still had a yearning to get something up outside. Luckily, there is an old oak tree in my back yard. This tree has stood for many years and was soon to become my deed-restricted tower.

The first thing I did was purchase an Antron 99 antenna, which is known to many simply as an A99. This is a vertical antenna that stands nearly 20 feet tall. The A99 is also a white antenna, which would stick out like a sore thumb if pushed up into the oak tree. However, a few cans of green and black spray paint took care of that problem. I then pushed the A99 up into the center of the tree with the feed point up about 15 feet. Afterwards, while walking around the neighborhood, I could not spot the antenna, so I knew I was safe from the HOA but there still was a problem. The A99

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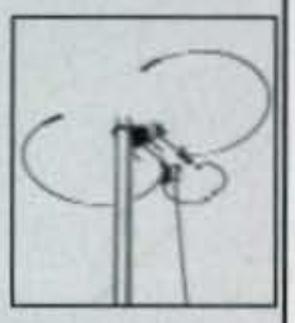

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Month	# of Contacts
January	1,316
February	1,552
March	1,148
April	794
May	879
June	611
July	801
August	648
September	1,002
October	1,187
November (to 11/26)	1,044
Total (to 11/26/06)	**10,982**
Monthly average	**998.36**

Table I– The breakdown of AI4FR's contacts by month.

was only good for 15 through 10 meters. While some claim great success with the antenna on 17 meters, that was not the case here. Plus there was still the question of the other HF bands.

What I did was fashion up a 102-foot version of the G5RV, and using a sling shot, I pulled the G5RV up my tree tower about 18 feet high. The configuration of this dipole antenna does some strange things, such as run along a wooden fence, but it is a far cry from when I first installed it along the top of some 3-foot high shrubbery. To my surprise, these outdoor antennas work like a charm, even though I have to use an antenna tuner with them. That does not matter to me, as I was used to doing so while using the attic antennas.

The Quest Begins

The main radio in my shack is an ICOM 756 Pro II, but at times I do switch to a Kenwood TS-440 or even an old Hallicrafters or some other boat anchor. By far, though, most of the QSOs were made with the ICOM.

Now that I had all the antennas in place and the radio turned on, it was time to see if this deed-restricted ham could make 10,000 QSOs in a year. I started out making a few phone contacts and knew right away that I would not reach my goal by doing it that way. What I would have to do is place myself on the bands when there was the most activity. I knew that on the weekends there was usually a large crowd on for contests, so I started to hit every one. These included not only the phone contests, but also the digital and CW ones. During this time I never officially entered any of the contests by turning in a log (except for one Hellschreiber contest), but depending on the contest, I was making between 200 and 500 contacts each weekend. By far the greatest number of contacts was on RTTY, followed by phone, then CW, and rounding out the end with numerous other digital modes.

What other hams in deed-restriction places might find interesting, but I am sure CW ops already know, is that modes such as CW or digital go such a long way with nearly no power at all. I really enjoy the digital modes and with my simple station here, I can consistently talk with hams from around the world using less than 5 watts. Both CW and digital are fantastic modes to use for anyone in a similar deed-restricted situation. Give either one a try with that wire tossed out the window and do not be surprised when the DX starts to come rolling in.

Getting back to the story, during the week I would work what I could on phone and digital with a touch of CW tossed in. My goal was ten QSOs a day, but there were many days when only one or two QSOs were made because of time constraints. Nighttime was the easiest time to make a quick QSO. I wound up many nights on 40 meters calling CQ in the PSK section, which is right around 7.070 MHz USB. I found it was practically guaranteed that I'd be able to make at least one QSO there every time I tried (see the table for a breakdown of each month's QSO figures).

The Magic Moves In

On the first weekend of November, I was throwing out a CQ call in the Ukraine RTTY contest. Being under deed restrictions, the replies I receive are slow in coming at times, which gives me a chance to get caught up on some reading. (I don't know how many others who are active in contests can say that they actually get a chance to read during a contest, but I sure can here!) Anyway, what I was reading at the time was the October issue of *CQ*. I never imagined that the magic of radio was about to appear to me, but it sure did. I did know that I was very close to hitting my goal of 10,000 QSOs, though.

Anyway, here I was reading and calling CQ when I ran across the editorial by Rich Moseson, W2VU, in which he was talking about a new idea, hamparks—communities set up just for ham radio for a way to help the deed-restricted ham. I thought to myself, John, why don't you shoot Rich an e-mail asking if you should write a short story about making 10,000 QSOs in a year from a deed-restricted home. It might inspire others to do the same.

"Some people may say that the bands are dead, but I know that they are not. Some people may say that the magic of radio has left, but I for one know without any doubt that it has not."

A few contest replies later and a little more into the magazine I ran into an article by Bob Locher, W9KNI ("Revisiting My Roots"), in which he started off by talking about W2VU's editorials and how there is still plenty of DX to be had even at the bottom of the solar cycle. After that I knew I had to e-mail Rich. I read that article and was now at 9,999 QSOs for the year. I needed just one more, but I was also very tired as I had never gone to sleep the night before, trying to reach this goal. Thus, I stopped calling CQ in the hopes of finding another station that was calling "CQ contest" so I could get that last QSO and shut down the rig and get some sleep.

The next thing I knew I was getting hit and getting hit hard with the magic of radio. The very next person I ran into who was calling CQ was not calling "CQ contest," but was just throwing out a general CQ call. It was none other than W2VU, the very person to whom I was thinking about sending an e-mail for the first time. I had never talked with W2VU in the past and here he was calling CQ. QSO number 10,000 was reached on November 4, 2006 with W2VU.

Now to toss in some even more magic, I later heard from W2VU that he actually tried to answer one of my contest calls but I could not hear him. Not only that, my number 10,000 was the only contact that Rich made that day and his only reason for doing so was because he had just connected a piece of equipment in his shack that had been sitting on his desk for six months. Therefore, number 10,000 for me was from a fellow I was just thinking about and with whom I had never talked in the past and who was just trying out a new piece of equipment for the first time that had been sitting on his desk for six months. Wow!!

Some people may say that the bands are dead, but I know that they are not. Some people may say that the magic of radio has left, but I for one know without any doubt that it has not. And oh, yes, it *is* possible for a ham with deed restrictions to make 10,000 QSOs in a year!

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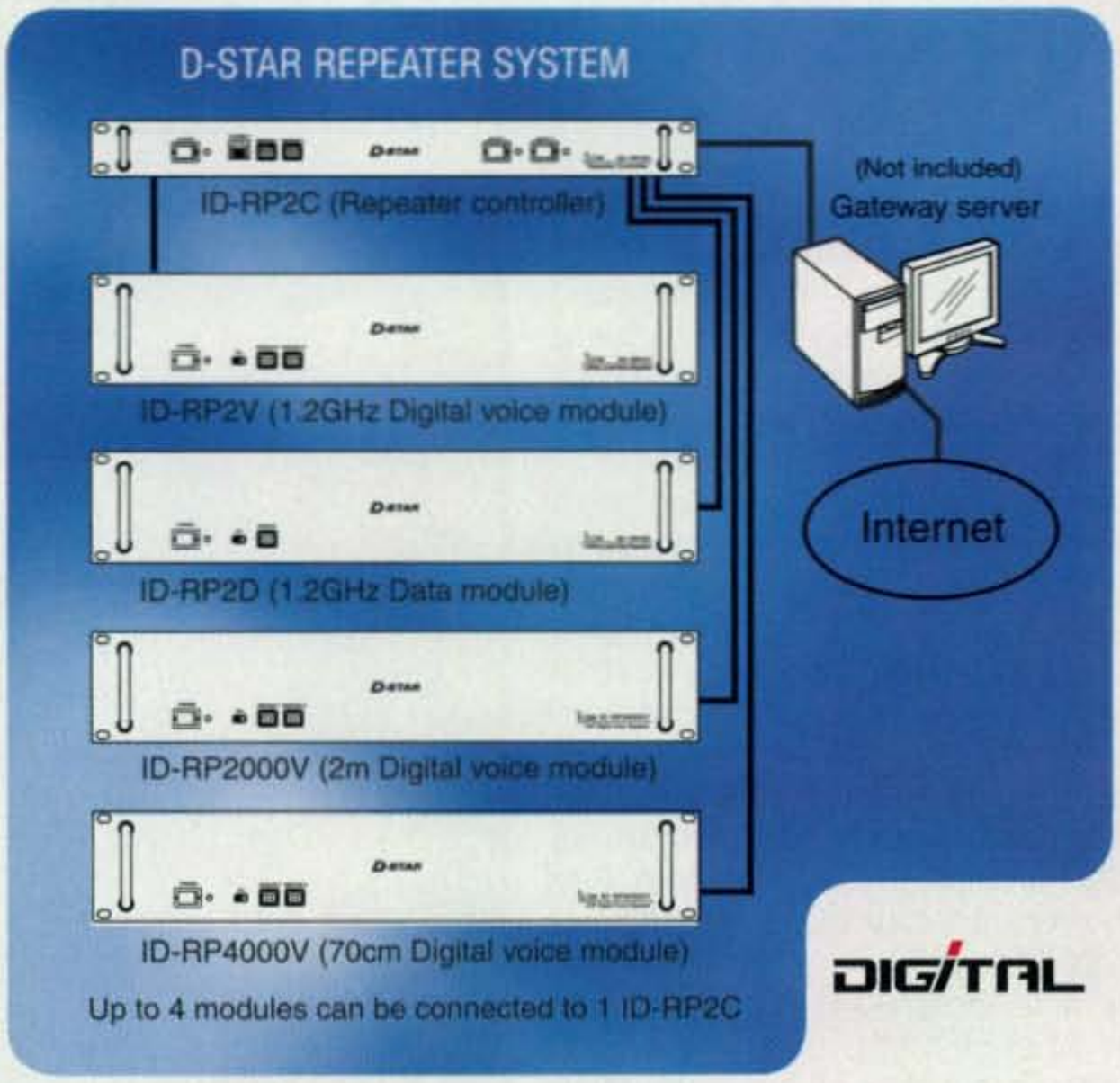

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In the introduction in the first part of this article, it was stated that winter at the bottom of the sunspot cycle is the ideal time to work DX on 160 meters. The purpose of part II is to explain why this is so.

160 Meters

A Great Place to be for the Next Couple of Years

Part II: 160 During the Winter at Solar Minimum

BY CARL LUETZELSCHWAB,* K9LA

When we consider propagation on any of our bands, we need to ask two questions: "Is there enough ionization to refract our signals back to Earth?" and "Is absorption low enough for the signals to be heard?"

If we dig into the first question, we'll quickly discover that there appears to always be enough ionization to refract 160-meter RF back to Earth. Fig. 4 (from Proplab Pro by Solar Terrestrial Dispatch) is a worldwide map of contours of the *F2* region maximum usable frequency (MUF) for a 3000-km path (which requires a low elevation angle) at solar minimum in a winter month. Any point on any contour line is the mid point of a 3000-km path.

Fig. 4 is for 0700 UTC, which puts North America pretty much in the dead of night. Two areas of minimum MUF show up—one over Alaska and one over Iceland. However, both areas still have enough ionization to refract low-elevation-angle 160-meter RF back to Earth (and this statement could pretty much be said for 80-meter RF, too). Thus, our first question is answered: Having enough ionization is not a critical issue for propagation on 160 meters. That brings us to the second question—absorption.

Because absorption is inversely proportional to the square of the frequency (the lower the frequency, the more the absorption), the 160-meter band suffers the most absorption of all of our bands. Fig. 5 (again from Proplab Pro) is a plot of absorption on 160 meters versus time of day for a one-hop 1500-km path in the Midwest. The path chosen is such that the terminator is on top of the entire path at 1300 UTC. Times after 1300 UTC are in daylight, while times before 1300 UTC are in darkness.

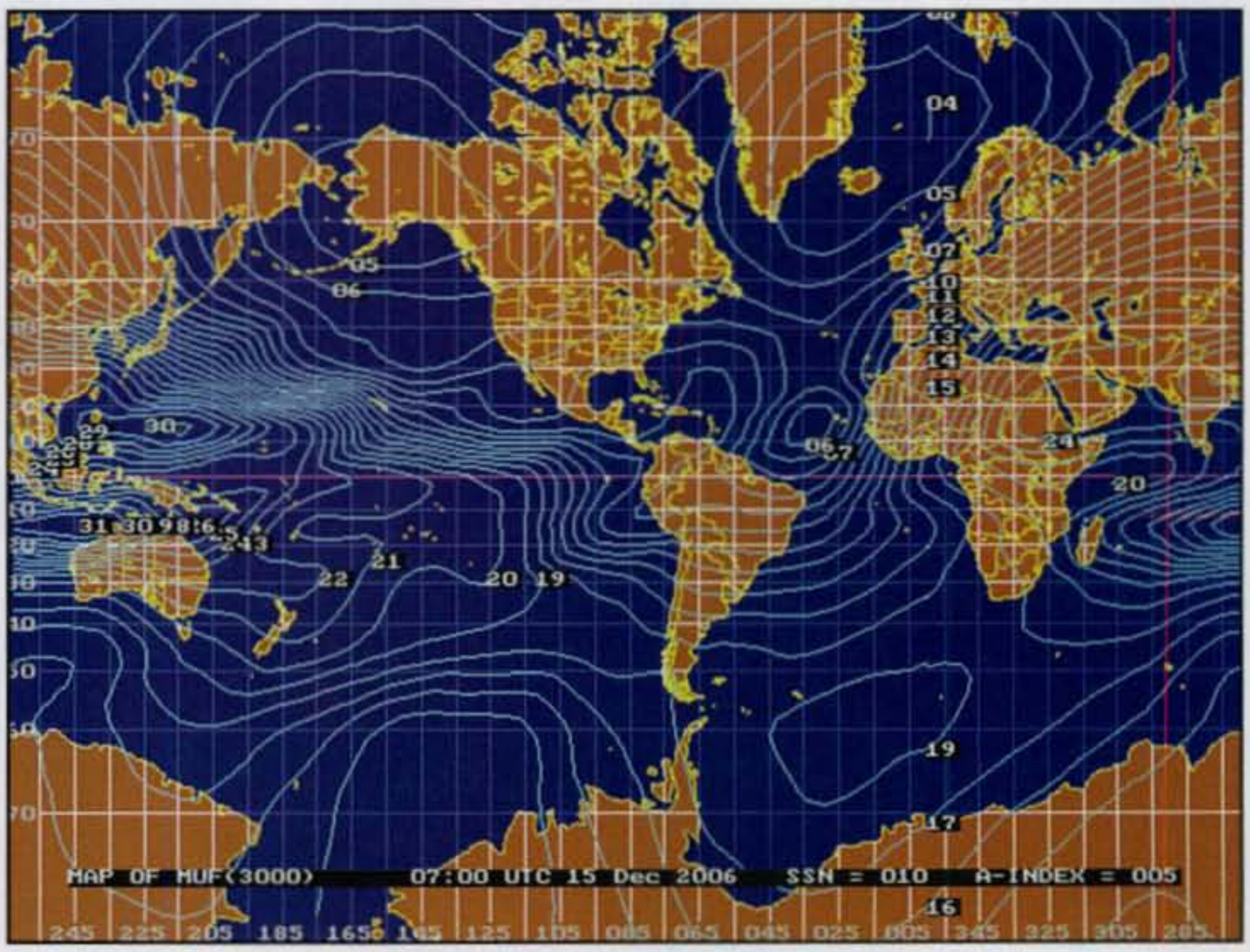

Fig. 4– Worldwide MUFs for a 3000-km hop. (From Proplab Pro by Solar Terrestrial Dispatch)

Note that the daytime absorption is around 35 dB and increasing as the path moves into more daylight. The amount of absorption at night levels off at around 11 dB for this short one-hop path. This value of absorption, although much lower than daytime, still adds up quickly in a long-distance multi-hop scenario.

Now we can make two conclusions about MUF and absorption with respect to operating on 160 meters. First, we're not too concerned about having enough ionization, as there usually is enough ionization to refract 160-meter RF back to Earth. Second, the least absorption occurs, as expected, when the ionosphere is in darkness.

The Advantages of Winter

There are three issues tied to the advantage that winter offers for 160-meter

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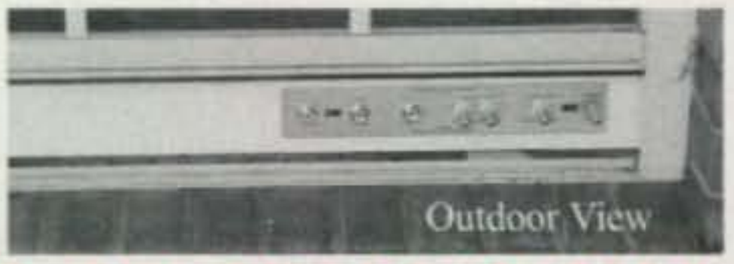
Stainless Steel Bonding Plate

Indoor View



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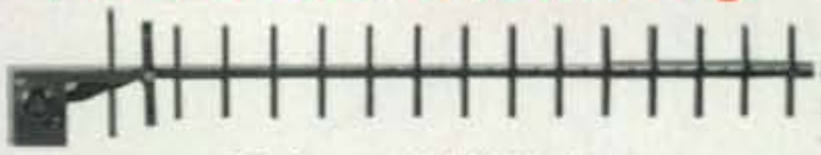

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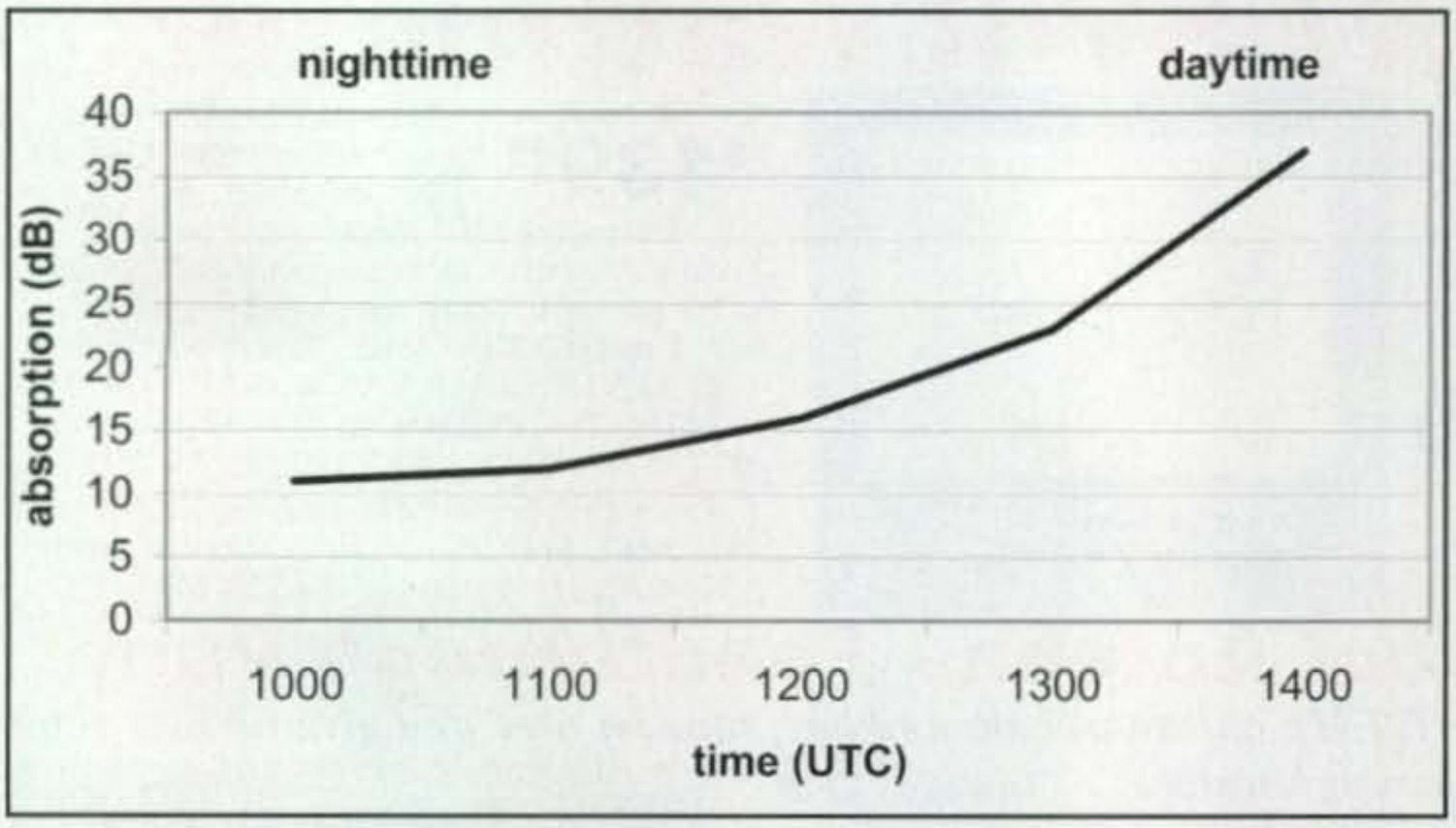

Fig. 5– Absorption versus time of day. (From Proplab Pro by Solar Terrestrial Dispatch)

propagation. The first issue is what we just reviewed: Absorption is least at night. Thus, we'd like the entire path to be in darkness for as long as possible. Fig. 6 shows how long a representative short path from W9 to Turkey is in darkness versus month.

Although the path is in darkness for a couple of hours during the summer months, the winter months offer more opportunity for the dark ionosphere to "settle down."

The second issue is geomagnetic field activity versus month. From previous studies by fellow topband enthusiasts, a quiet geomagnetic field is all-around best for propagation on 160 meters. This is due to the fact that most short great-circle paths from North America to the two major amateur radio population areas of the world (Europe and Japan) get near (or even go through) the northern auroral zone (i.e., they are high-latitude paths). Thus, what months are best to minimize high-latitude propagation problems?

If we look at the number of quiet days in a month (a quiet day is defined as a day with the planetary *A* index less than or equal to 7), we'll find that the equinoctial months are the most disturbed. The winter months offer the least chance of a disturbance to propagation. The summer months also offer this, but that leads us to the third issue.

The third issue is thunderstorm activity. During the winter months, the major areas of thunderstorm activity are south of the equator. Thus, the QRN from lightning discharges has to travel a very long distance to get to our QTH to add to the external noise (low frequency QRN propagates in the dark ionosphere just like our signals) that usually limits us to hearing signals many dB above the noise floor of our receiver.

The Advantages of Solar Minimum

There are two issues tied to the advantage that solar minimum offers for 160-meter propagation. The first is geomagnetic field activity over a solar cycle.

Fig. 7 plots the number of quiet days in the month when the planetary *A* index (*Ap*) was less than or equal to 7 (spiky green curve) against the smoothed sunspot number (thick red curve) from the decline of Cycle 21 to the present. Due to the spiky nature of the *Ap* data, a trend line (thin green sinusoidal-like curve) has been added to smooth the data.

The quietest period of a sunspot cycle starts around solar minimum and continues for a couple of years thereafter, which is when the trend line for a quiet *Ap* maximizes. We are just now entering the quietest period between Cycles 23 and 24. Thus, paths from North America to the major amateur radio population areas (which are mostly high-latitudes paths) will be least affected during this quiet period of a solar cycle.

The second issue making solar minimum best is absorption. Although absorption in the *D* region increases dramatically during the day as a solar cycle increases, we do our DXing on 160 meters during the night. However, during the night, the *D* region has for all intents and purposes disappeared for our activities on 160 meters. If that is true, why is there any absorption at all at night (as seen in fig. 5) on 160?

The answer is the absorption process moves up to the lower *E* region at night. Absorption is proportional to the electron density times the electron-neutral collision frequency. In simple terms, during the day this product maximizes down in the *D* region, but during the night this product maximizes in the lower *E* region.

Therefore, if there's a nighttime *E* region, we will have nighttime absorption. Indeed, there is a nighttime *E* region; the electron density is not as great as during the day, but it's still there. There are three sources generally considered for the nighttime *E* region: extreme ultraviolet in starlight, cosmic rays, and sunlight scattered into the dark ionosphere by the Earth's geocorona. Note that than none of these includes *direct* sunlight.

Thus, our first-pass guess would be that absorption at night is relatively constant over a solar cycle—maybe with some increase as the sunspot number

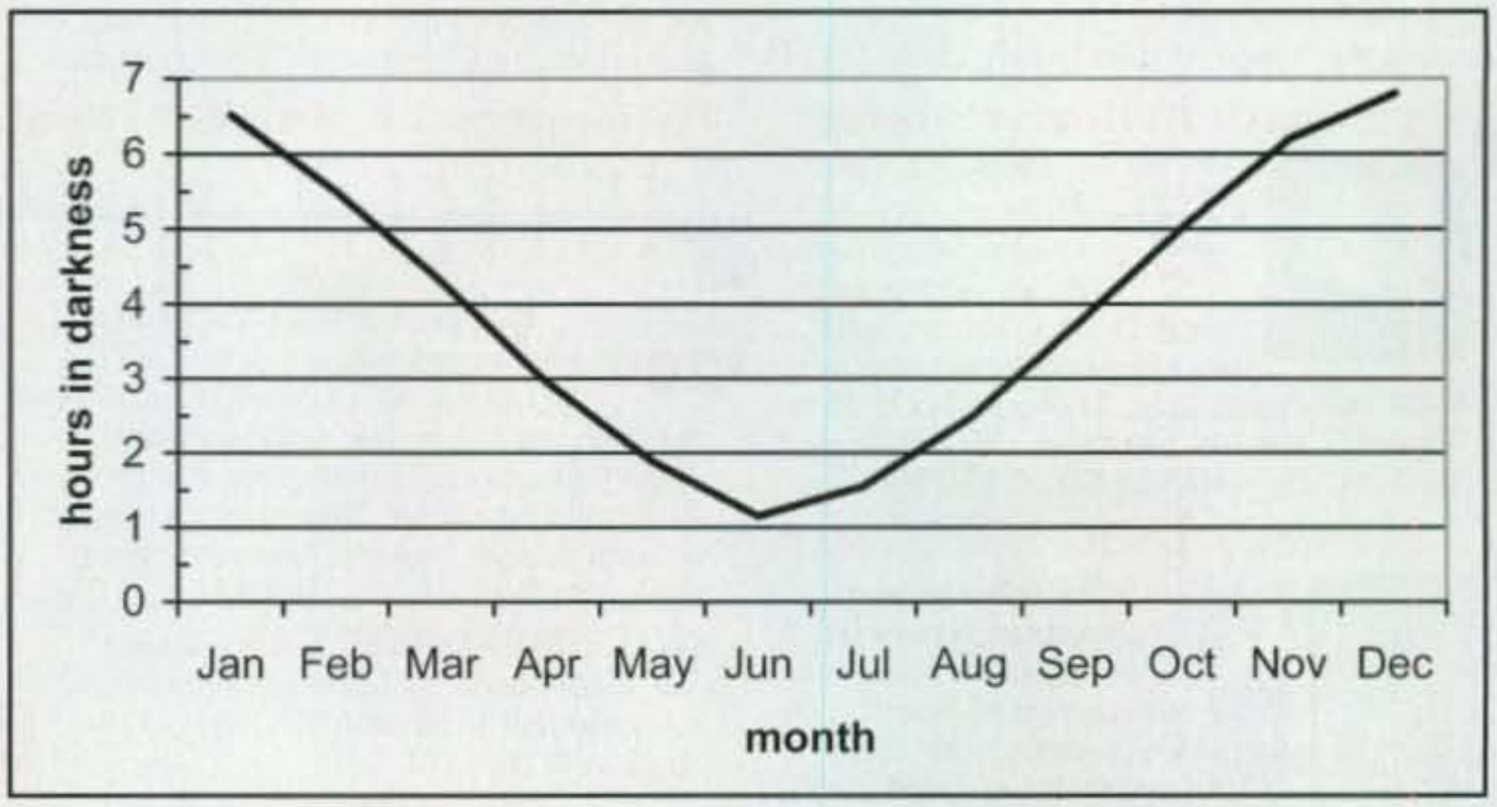

Fig. 6– How long the W9 to Turkey short path Is in darkness.

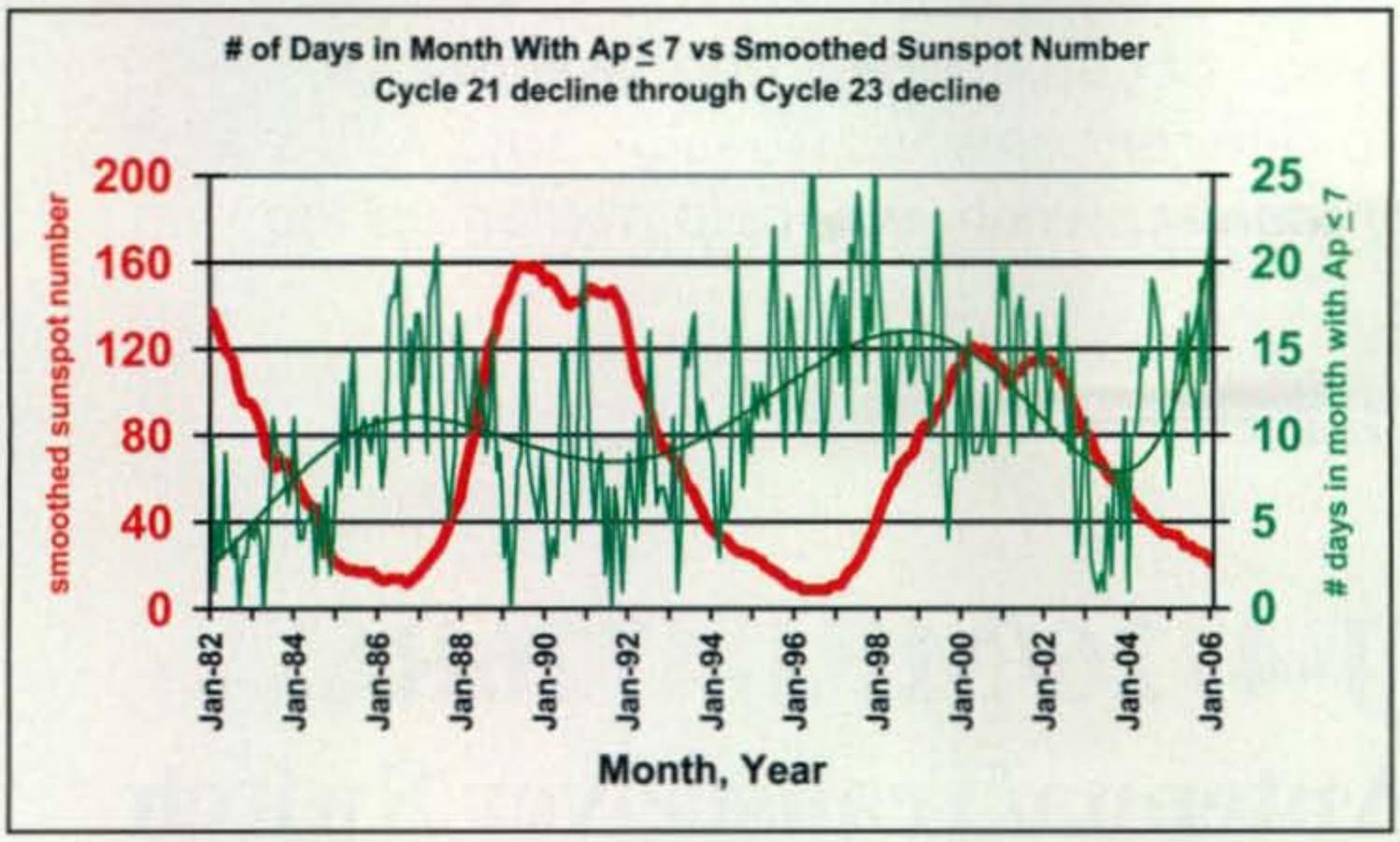

Fig. 7 – Geomagnetic-field quiet times over a solar cycle.

goes up due to the third source. Indeed, with some more work with Proplab Pro, we find that the nighttime absorption on 160 meters over the same 1500-km path as in fig. 5 is for all intents and purposes constant over a solar cycle. It's a lot less than daytime absorption, of course, but it's still there. Also, to reiterate what was stated earlier, the approximate 11 dB per hop adds up quickly over a long-distance multi-hop path.

However, there is a caveat here. Absorption at night being essentially constant over a solar cycle was for RF that remained in the dark ionosphere. Some of our propagation on 160 meters involves being near the terminator when the ionosphere is transitioning from night to day (or vice versa). Thus, for this scenario, where we are in a solar cycle could play an important role. Solar maximum may result in somewhat more absorption on the portion of these paths near the terminator.

What About Operating Habits?

Any analysis of when 160 meters is best would be remiss if it didn't comment on our operating habits. We've grown up thinking that 160 meters is only good for DXing at solar minimum, so that's when many migrate to 160. However, I personally believe there is still a lot of DX to be worked on 160 meters around solar maximum. For example, Tom, W8JI, made over 5000 DX QSOs outside of North America on 160 from September 1999 to July 2002 when the smoothed sunspot number of Cycle 23 was above 100. This included almost 200 countries and all 40 CQ zones. Working DX on 160 meters around solar maximum may be tougher, but I think the opportunity is there—especially on those paths that stay away from the high latitudes that would be most affected by disturbances.

The biggest problem with solar maximum is we're having too much fun on the higher bands. Why dig for weak DX signals on 160 when the higher bands offer S9-plus DX signals during our normal waking hours?

Conclusion

This article explained why winter at solar minimum is advantageous for DXing on 160. Now you know why the first part of this article stated that the next couple of winter seasons (2006–2007, 2007–2008, and possibly 2008–2009) should offer excellent opportunities for the DX minded on 160 meters.

I hope to hear you on 160! ■

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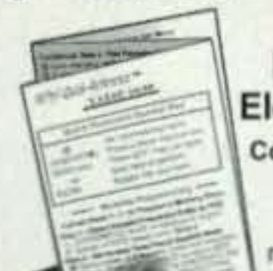

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Do you have a "tangled web" of coax cables and switches for connecting different rigs to different antennas? AD5X says MFJ's combination antenna/transceiver switch may help neaten up the back of your shack.

CQ Reviews:

The MFJ-4726/MFJ-4726RC Six-Position Antenna/Transceiver Switch

BY PHIL SALAS,* AD5X

Many of us have more than one transceiver and more than one antenna, and sometimes selecting the desired rig and antenna can be a messy job. In my case, I've been using back-to-back MFJ-1704 four-port coax switches to route connections between my various radios and antennas. These switches are mounted under my desk to keep the coax clutter reasonable, but I do have to crawl under the desk to flip the switches. However, after seeing the new MFJ-4726 remote switch in the latest MFJ catalog, it seemed as if there might finally be a convenient, clean, and simple answer to my radio/antenna switching problems.

The MFJ-4726

The MFJ-4726 consists of two separate six-position relay-controlled RF switches mounted in the same box (see photo A). One switch unit connects any one of six RF inputs to a common output. The other switch unit connects a common input to any one of six RF outputs. therefore, by connecting the common ports together, you can connect any one of six inputs to any one of six outputs as selected by two rotary switches on the front of the unit—36 input/output combinations in all! All RF connections are made through 1000-volt 16-amp relay contacts, and the de-energized state of all relays shorts the coax center conductors to ground. All unused inputs and outputs thus are grounded, and all inputs and outputs are grounded when the MFJ-4726 is turned off or power is removed. All inputs and outputs can also be remotely grounded by applying a ground to another input connector on the MFJ-4726. Plus, high-voltage transient suppressors on both common ports help protect your radios from any voltage spikes that may be induced on an antenna input.

Finally, while the MFJ-4726 provides excellent desktop control of your transceiver and antenna switching, you can still have quite an unsightly cable mess behind the setup. To solve this problem, MFJ sells the optional MFJ-4726RC unit (photo B) for remote control of the MFJ-4726. This lets you

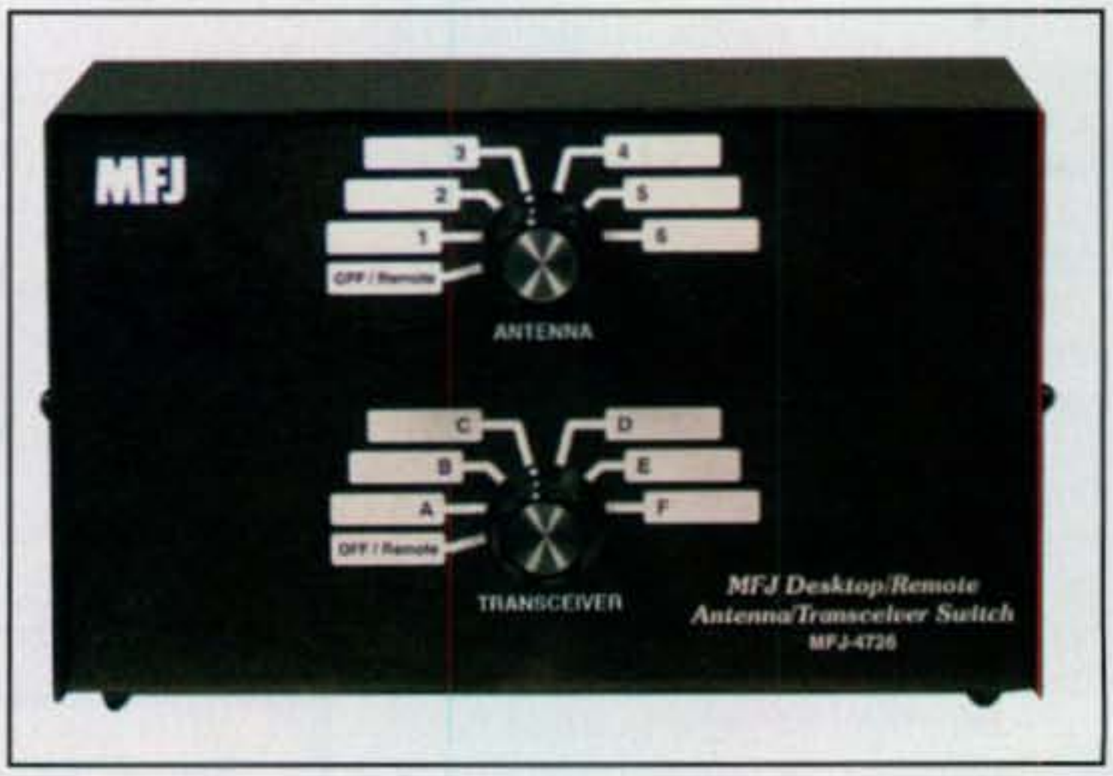

Photo A– The MFJ-4726 main unit. You may switch between any six inputs and any six antennas. Everything not currently in use is grounded.

place the MFJ-4726 main unit under your operating desk photo C), and control all radio and antenna switching with a conveniently located remote switch operating through a pair of user-provided CAT5 computer networking cables.

Testing and Using the MFJ-4726

The MFJ-4726 is spec'd at 1500 watts from 1–60 MHz and "is usable to 150 MHz." With relay contacts rated at 1000 volts peak, the power spec is pretty conservative.

Since

$$V_{pk} = \sqrt{(2P \times Z \times SWR)}$$

you can show that at 1500 watts, a feedline/antenna VSWR of 6.67:1 is required before you exceed the relay peak voltage rating. For lower transmit power, the VSWR obviously can be much higher.

**1517 Creekside Drive, Richardson, TX 75081*
e-mail: <ad5x@cq-amateur-radio.com>

Photo B– Close-up of the MFJ-4726RC. This optional remote-control unit allows you to mount all of your feedlines out of the way (see photo C) and just have the control unit on your desk.

Photo D– The author's multiple radio station. Using a switch such as the MFJ-4726 makes it a snap to connect whichever radio he wants to use to whichever antenna he wants to use.

However, what does "usable to 150 MHz" mean? In the instruction manual, MFJ states that the VSWR at 2 meters may be higher than you would like due to MFJ-4726 internal stray inductances in this band. Therefore, the first thing I did was measure every path combination at 21 MHz, 51 MHz, and 148 MHz. To do this, I connected together the two common ports of the MFJ-4726, and then alternately connected my MFJ-259B antenna analyzer across each of the input ports while alternately connecting a precision 50-ohm RF load across all output ports. I found that the worst-case VSWR at 148 MHz was just 1.5:1, and this only occurred on two of the 36 input/output port combinations. All other port combinations had a VSWR of 1.3:1 or better on all frequencies tested, including 148 MHz. I don't have a good way of measuring VSWR at 440 MHz, but I'm pretty sure that 440 MHz is *not* a viable band for this switch.

Photo C– The MFJ-4726 mounted below the operating desk. When used with the MFJ-4726RC remote-control unit, the clutter of feedline cables can be kept out of sight.

After finishing the SWR tests, it was time to connect everything. My transmit sources include a Johnson Ranger/ Drake 2B, IC-703, Yaesu MKV/ALS-600, and both the HF/6M and 144/440-MHz outputs of my IC-706MKIIG. On the antenna side I have a Butternut vertical, an MFJ-1775 40–2 meter compact dipole, a Hy-Gain 6M/2M/70cm beam, and an MFJ-267 dummy load/wattmeter. I mounted the MFJ-4726 under my desk (photo D) so that the tangle of coax cables would be pretty much out of sight.

Only the MFJ-4726RC remote control unit is visible, and conveniently located at my operating position. I used Casio XR-9X "black-on-clear" labeling tape to label the switch positions so I can easily change the labeling in the future.

Once everything was connected, I found operating with the MFJ-4726/ 4726RC to be a real pleasure! Since I normally operate HF CW, I can now easily switch between my Butternut vertical and MFJ-1775 compact dipole to pick the best antenna for a particular condition. I also like to leave my IC-706MKIIG turned on so I can monitor the 6-meter SSB calling frequency (50.125 MHz). It is now a snap to instantly switch between my MKV and IC-706MKIIG to make quick 6-meter checks on either the MFJ-1775 dipole or the Hy-Gain beam. Everything happens with just a flip of an MFJ-4726RC switch conveniently located at my operating position!

Conclusion

The MFJ-4726 really simplifies transceiver/antenna interconnects, as well as providing convenient and easy selection of various transceivers and antennas. I really like the fact that whenever I turn on my station main power, the last transceiver and antenna selected are on-line, and either can be changed in an instant. Also, when my main station power is turned off, all the transceiver and antenna ports are automatically grounded. If you have more than one transceiver and more than one antenna, the MFJ-4726/4726RC setup bears looking into. ■

If you're looking for a really challenging challenge on the air, how about chasing the "1000 Miles Per Watt" Award? It's harder than you think.

The "Killer Watt" Bags QRP's Ultimate Certificate

or "Real CW Ops Wear Headphones"

BY DENNIS LAZAR,* W4DNN (formerly K4KLQ)

When I first heard of it, I knew I had to have one. I needed one like a DXer needs DXCC, a bee needs a flower, a lemming needs a cliff . . . well, you get the drift. I knew I had to have the QRP Amateur Radio Club International's "1000 Miles Per Watt" award. It was all I could think of for a month. My XYL, Ruthie, now used to the misery of my manias, was resigned to postponing weekend activities and after-work restaurant meals while I relentlessly pursued my holy grail d' jour.

The QRP ARCI awards this prestigious certificate to honor a QSO resulting from an amateur transmitting from or receiving the transmission of a QRP station distant enough that the Great Circle Bearing distance between the two stations, divided by the QRP station's power output, equals or exceeds 1000 miles per watt. Additional certificates can be earned for contacts on different modes and bands.

How far would my QRP signals have to travel to qualify? This would need a bit of calculation. Being kinda lazy and slightly math challenged as well, I turned to the internet, the fount of all knowledge. "Yes, Virginia, there is a website for us." Want the distance to any city in the world? Go to <http://www.indo.com/distance/>. Or you can input the latitude and longitude or grid square of your QTH and that of the DX station you have just worked at <http://www.qsl.net/n9ssa/mpwcalc.html>. Also input your transmitter power and, *voilà*, you have your miles per watt.

My young nephew never ceases to amaze me when he cannot comprehend a time before the internet. A time when one had to think! A time when one had to count on one's fingers. His eyes glaze over as I reminisce about the "olden" days when one had to actually call around to several radio stores to learn about the prices and features of a prospective new rig.

Now, through that wondrous internet, it took me only seconds to learn that a Panamanian QSO, made with my Heathkit HW-8 running 2 watts on 15 meters, would not earn me a certificate. From South Florida, José is only 1200 miles distant; divided by my 2 watts, he only qualified as 600 miles per watt. I needed to reach out farther. I knew I should have tried for this certificate earlier in the sunspot cycle. This wasn't going to be so easy.

The search got under way in earnest on a weekend last April. The XYL was begging to drive north from our Florida home to get one more breath of cool air before the "Florida thaw." That's when the weather goes from warm and muggy to hot, muggy, and buggy.

W4DNN keys the Heathkit HW-8 he used for a 7322-mile QSO with the far side of the world. The antenna is a GAP Titan DX vertical ground-mounted about 200 feet from a salt-water canal.

"Yes, dear," I assured her, "right after I finish off this one certificate. I really need it." The Heathkit was hooked to the tuner, and the tuner to the vertical, and I was ready to roll.

QRP – A Way of Life

QRP has been a way of life for me for many years. In 1967, while serving with the Coast Guard as an electronic technician on an Alaskan LORAN radio station, I caught the QRP bug after building a tiny rig from leftover parts. It had one tube, a 6J6, and a very big coil and no transformer. It was powered directly from the AC line. This rig could bite. I was always very

**227 Stebbins Terrace, Port Charlotte, FL 33952*
e-mail: <lazarcorp@cs.com>

careful to know where my fingers were at all times.

To the delight of my "shipmates," I volunteered for permanent night-shift duty, baby-sitting the megawatt transmitters and LORAN timers. Besides taking periodic meter readings and topping off the diesel generator tanks, my time was my own. Nights full of hamming were a reality, but only from the station control room, not from the ham shack on the second floor of the large Quonset-hut type building we occupied. However, the little QRP rig and a simple dipole allowed me to work the world during those wee hours.

It is amazing how many stations come back to one watt at 3 AM when you are operating from a rare island in the Aleutian island chain of Alaska. My "Killer Watt" got me QSOs with stations from around the U.S., the former Soviet Union, and Japan, to mention a few. This was QRP heaven.

In the following years, I built a few tiny tube rigs, eventually moving up to the Heathkit HW-8 in the mid 1970s. This is a great little QRP radio, still available on swap tables and internet swap sites. It has the distinction of being the most highly modified QRP rig in history. The *Hot Water Handbook* by W5QJM, later updated several times by WB8VGE, is the bible of HW-8 tinkerers. Today the little rig, as well as its "Hot Water" siblings, the HW-7 and HW-9, are considered vintage treasures and often bring a hefty price.

The transmitter puts out around 2 watts on the 80-, 40-, and 20- and 15-meter bands with relay keying. The direct-conversion receiver can't match today's selectivity, but can hear well. Coupled with a (now discontinued) Radio Shack DSP audio filter, I find that it rivals some of today's lower priced transceivers.

Success Comes Calling

It was on that afternoon in April that I heard him. I had been scanning the 15-meter band, searching for a station outside the 2000-mile radius that would bag me a certificate. There were some Caribbean stations out there and also a fairly strong Argentinian. Buenos Aries would do the trick—1500 miles per watt, not too shabby.

As I waited for the LU's QSO to end so I could pounce, I heard a faint station float up from the noise floor. V73NS! What the heck was V73? I didn't wait to find out. He was calling CQ and I was answering. No chance in the world of snagging him. If his signals were S1, mine would be a minus zero.

However, he came back! I couldn't believe it. He came back to *me*. We did a quick exchange and it was over. I had aced a certificate, but how much of a certificate I had bagged was still up in the air.

Once again turning to the internet, I typed in QSL.net and entered the call, "V73NS." The data jumped right off the screen. It was Neil Schwanitz in Roi-Namur. What the heck? Where the heck? Fortunately, Neil has an extensive web posting complete with maps, photos of the island, and his recent history. Roi-Namur, I learned, is a small island in the Kwajalein Atoll chain of the Marshall Islands in the South Pacific. It is Islands On The Air (IOTA) # OC-028 and is 7322 miles from my QTH. Divide by my 2 watts, and that was good for 3661 miles per watt!

According to his website, Neil works for the U.S. Air Force, maintaining some humongous radar installations on the island. Sitting on the other side of the International Date Line, it was already tomorrow there. The QTH actually is two islands, Roi and Namur, the northernmost islands in the Kwajalein Atoll. The population is about 140.

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The fastest and easiest to hookup RIGblaster ever, with the minimum time to the first QSO! Built in USB interface provides rig control, CW keying plus Echolink operation. Unlike other RIGblasters the plug & play works only with a radio's data or aux jacks, not a mic jack and may be ordered for your particular radio. The plug & play is the only USB sound card interface that has fully isolated audio and keying circuits for a clean, hum free signal.

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RIGtalk RT1

For the first time you can control your radio with a computer's USB. port. The USB RIGtalk CAT/CI-V rig control interface allows your radio to share frequency mode and band information with your logging software without tying up a serial port.

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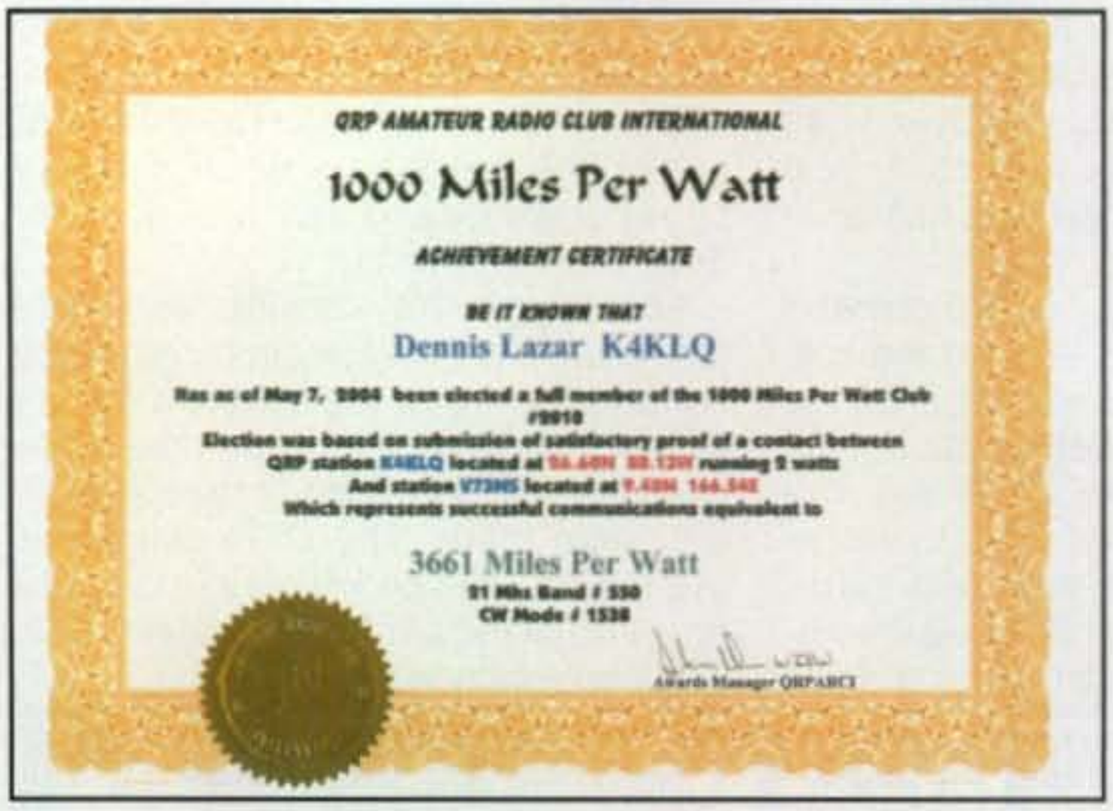
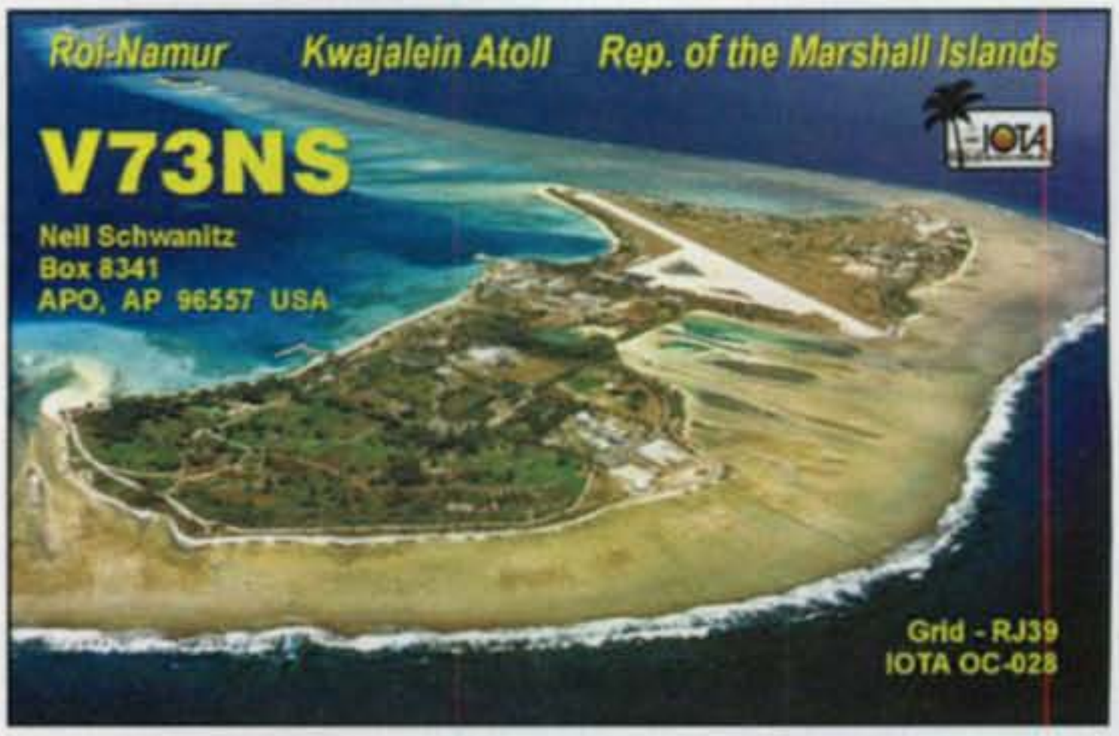


The coveted "1000 Mile per Watt" award from the QRP Amateur Radio Club International probably would have been easier to come by when the sunspot cycle was at its peak, but K4KLQ (now W4DNN) pulled it off at the bottom of the cycle . . . on 15 meters, no less.

"The island of Kwajalein is the southernmost island and is much larger than Roi-Namur. It is referred to as 'downtown' by us Roi Rats," Neil explained. "Trips there for shopping are 50 miles by air."

Kwajalein Atoll consists of a group of 90 coral islets that surround the largest lagoon in the world, and the big island and Roi were the first of the Marshall Islands to be captured by U.S. troops in World War II. Today the atoll serves as a seaport, air stop, and U.S. military missile testing site.



The QSL card that won THE certificate. Roi-Namur in the Kwajelein Atoll is more than 7300 miles from the author's Florida station.

There are no private cars on Roi. The residents ride bicycles to work. However, the salt air eats everything, so a fancy 18-speed mountain bike is reduced in short order to a single speed after the cables have been consumed.

Our CW QSO was followed by a few e-mail exchanges in which Neil provided some insight into his long QRP career. He has been the op at some pretty impressive-scoring contest stations over the years. From Roi, he provides thrilling contacts to QRPers around the world.

Well, I won my certificate. Ruthie now had her husband back. In gratitude, I e-mailed Neil, "How did you hear my tiny signal through all the QRN that afternoon?"

"Real CW ops wear headphones," he replied.

Better than ever! Still 15 months of value - January 2007 through March 2008

The 2007/2008 CQ Classic Radio Calendar features fifteen magnificent full-color vintage radio images including Comcraft, Collins, GROSS, Heathkit, Hammarlund, Millen, National, Hallicrafters, E. F. Johnson, Allied Radio and more.

The 2007/2008 CQ Amateur Radio Operators Calendar bringsyou fifteen spectacular full-color images of some of the biggest,most photogenic Amateur Radio shacks, antennas, personalities and scenics in the country.

These great calendars are better than ever! All calendars include dates of important Ham Radio events such as major contests and other operating events, meteor showers, phases of the moon, and other astronomical information, plus important and popular holidays. The CQ calendars are not only great to look at, but they're truly useful, too!

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

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

Immuned to RFI. Has phone jack, on/off speaker switch, 2 inputs, bypass switch. 10Wx2½Hx6D". Needs 12 VDC.

MFJ-1316, $21.95. For 110 VAC operation. Provides 12 VDC/1.5 Amps.

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Transformer-coupled -- No RFI, hum or feedback . . . 75 seconds total, 5-messages . . . Records received audio . . .

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Let this *new* microprocessor controlled MFJ *Contest Voice Keyer*™ call CQ, send your call and do contest exchanges for you in your own natural voice!

Store frequently used phrases like "CQ Contest this is AA5MT", "You're 59" . . . "Qth is Mississippi" . . . Contest by pressing a few buttons and save your voice.

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

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

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

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

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

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

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

Built-in speaker-amplifier. Speaker/phone jack. Use 9 Volt battery, 9-15 VDC or 110 VAC with optional MFJ-1312D, $15.95. 6½Wx2½Hx6½D in.

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

60 dB Null *wipes out* noise and interference

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

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

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You can null out strong QRM on top of weak rare DX and then work him! You can null out a strong local ham or AM broadcast station to prevent your receiver from overloading.

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

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RF sense T/R switch automatically bypasses your transceiver when you transmit. Adjustable delay time. Uses 12 VDC or 110 VAC with MFJ-1312D, $15.95. 6½x1½x6¼ in.

MFJ-1025, $169.95. Like

MFJ-1026 less built-in active antenna, use external noise antenna.

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What You've Told Us...

Our November survey asked about your personal emergency preparedness, echoing a similar survey in late 2005. This time, 81% of respondents said they feel that they and their families are prepared to protect their personal safety and security in a disaster, up significantly from 68% the previous year ... even though only 60% said they were better-prepared now than a year ago, vs. 66% giving the same response a year earlier. Asked whether disasters of recent years had prompted them to make or improve family emergency plans, 59% said yes this year vs. 54% the year before.

As in the previous survey, the greatest number of respondents said they'd stocked up on batteries and other supplies (78% vs. 69%); 42% (vs. 32%) have developed family emergency plans, 33% (vs. 22%) have now developed family evacuation plans as well, 25% (vs. 23%) have a designated spot to meet if the family gets split up, and 23% (vs. 22%) have designated single contact outside their area to whom everyone reports in. In addition, 33% (vs. 38%) said they'd made other plans, and 10% (vs. 16%) have no emergency plans.

On the radio front, 81% (vs. 78%) feel prepared to help provide communications in a disaster or emergency; 52% (vs. 54%) say they're better prepared than a year ago; and 53% (vs. 51%) belong to an emergency-communications related group. On the question of training, 33% (vs. 35%) have taken SKYWARN training, 26% (vs. 16%) have taken the basic Incident Command System course, 23% (vs. 17%) have taken the Level 1 ARRL Emergency Communications course, and 9% (vs. 11%) have taken higher-level ARRL courses. In addition, 28% said they've taken other ham radio training (no change); 41% have taken other government agency training (vs. 42%), and 33% (vs. 29%) have had no formal emergency communications training.

This month's free subscription winner is John Dossey, K5GD, of Fort Worth, TX.

Reader Survey February 2007

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

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

Since our major issue this month is the FCC's decision to end code testing for amateur licenses, we thought we'd do a little quiz to see how much you *really* know about good ol' CW...

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

1. What is the correct name of the code on which hams have been tested for decades as part of the licensing process?

American Morse code....30
Continental Morse code....31
International Morse code....32
Morris code....33

2. Who actually developed the system of dots and dashes we know as Morse code?

Thomas Edison....34
Reginald Fessenden....35
Mahlon Loomis....36
Samuel F.B. Morse....37
Alfred Vail....38

3. Why is Morse code abbreviated CW by hams?

Early hams couldn't spell "MC"....39
"-.-. .—" (CW) is easier than "— -.-." (MC) to send on the air....40
Because it's an abbreviation for "continuous wave," which is really an erroneous description of "continuous amplitude wave," as opposed to the "damped" waves of old-time spark-gap transmitters, which faded during the course of a transmission....41
It's a trick to catch up those who don't know the code....42
You mean the words "Morse code" *don't* start with the letters "C" and "W"?....43

4. In "well-balanced" sending, how much longer is a "dah" (dash) than a "dit" (dot)?

A dit is twice as long as a dah....44
A dah is twice as long as a dit....45
A dah is three times as long as a dit....46
It dahsn't matter, as long as the dah is longer than the dit....47

5. Which sending device needs a special circuit in order to send code over the radio?

Computer keyboard....48
Hand key....49
Iambic keyer paddles....50
Semi-automatic "bug"....51
All of the above....52
None of the above....53

6. Which amateur radio digital mode can be sent and received without using a computer or other interface device?

AX.25 Packet....54
Baudot RTTY....55
Hellschreiber....56
Morse code....57
PSK-31....58
All of the above....59
None of the above....60

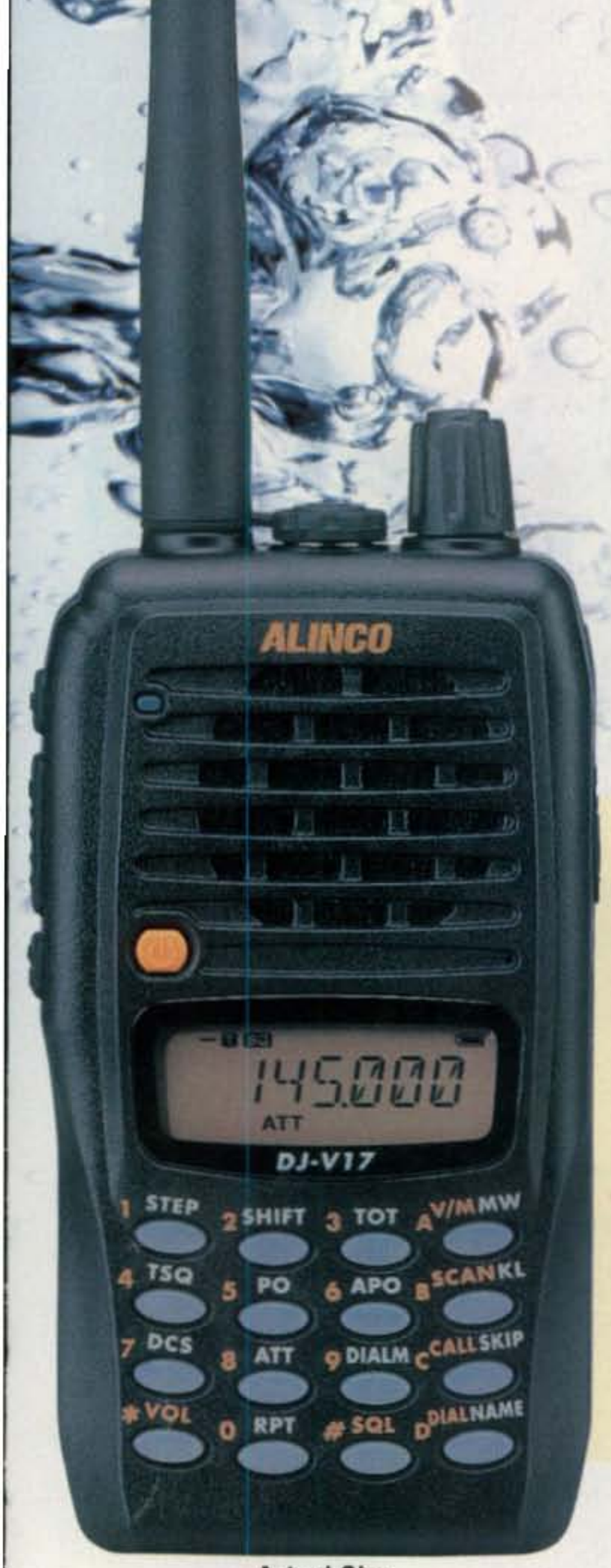
Thank you for your responses. We'll be back with more questions next month.

New DJ-V17 makes a SPLASH

with great audio and high grade waterproof design!

Alinco is proud to introduce a new 5-watt full power 2M HT that makes a perfect companion for outdoor activities like fishing, camping or snow-sports.

The rugged polycarbonate materials are compatible to IPX7* so it's submersible 1m/3ft. for 30 minutes! And unlike water-resistant radios you may have looked at before, the DJ-V17 has a large 40mm internal speaker so its audio is clean and crisp, not muffled. You can enjoy 500mW max audio-output, new two-touch repeater access, and over 200 memories. A special battery-drain function helps avoid battery memory-effect. Other features include an ergonomic design, ultra-flexible antenna with SMA connector, 39 CTCSS settings, split function, two-level attenuator and more. Whatever your idea of outdoor fun, Alinco's DJ-V17 is ready to take on the challenges of rain, dirt and dust and come back for more.



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What do you do when you're on a DXpedition on an island with no radio shops and a key piece of equipment breaks just before a major contest? If you're like the members of the VP5DX team in last year's CQ World-Wide DX Contest, you apply ham ingenuity to the problem and come up with ...

The Kludge

BY DAVID PRICE,* WA4ET

From Wikipedia: "A kludge (or kluge) is a clumsy or inelegant solution to a problem or difficulty. In engineering, a kludge is a workaround, typically using unrelated parts cobbled together," ... but the following story will more accurately define the real meaning of the word.

Located at the island home of Ron Blake, N4KE, VP5DX is nestled on a small, lonely hill in Conch Bar Middle Caicos, in the Turks and Caicos Island chain (photo A). It was also the site of the North Florida DX Association's annual assault during the 2006 CQ World-Wide DX Contest.

Our team—consisting of Ron Blake, N4KE; Jim Iori, NU4Y; Steve Brown, AB4UF; Jim Hughes, KC4FWS; Cory McDonald, N1WON; and your author, David Price, WA4ET—arrived at various times in the days preceding the contest, setting up the site, picking up supplies, and putting up antennas. I supplied the computers this time, assembled from old throw-aways donated by my employer. As the contest approached, we started to assemble our small local area network and work out the problems with antenna switching, when we noticed that the three-element SteppIR antenna was not working properly when connected to the ICOM CT-17 computer system's interface box. Putting that issue aside for the moment, we then tried to get the computers to talk to the ICOM IC-736 in our multiplier station (photo B) via our Writelog computer logging program. We couldn't get this to work either, no matter how hard we tried.

Photo A– The island hilltop QTH of Ron Blake, N4KE, in Turks and Caicos, was home to the North Florida DX Group's VP5DX operation in the 2006 CQ World-Wide DX Contest. It's a great location . . . until something breaks! (Photos by Jim Hughes, KC4FWS)

Photo B– The multiplier station at VP5DX. What's inside that jury-rigged cardboard box next to the rig? You have to read this article to find the amazing answer.

*P.O. Box 143215, Gainsville, FL 32614
e-mail: <wa4et@hotmail.com>

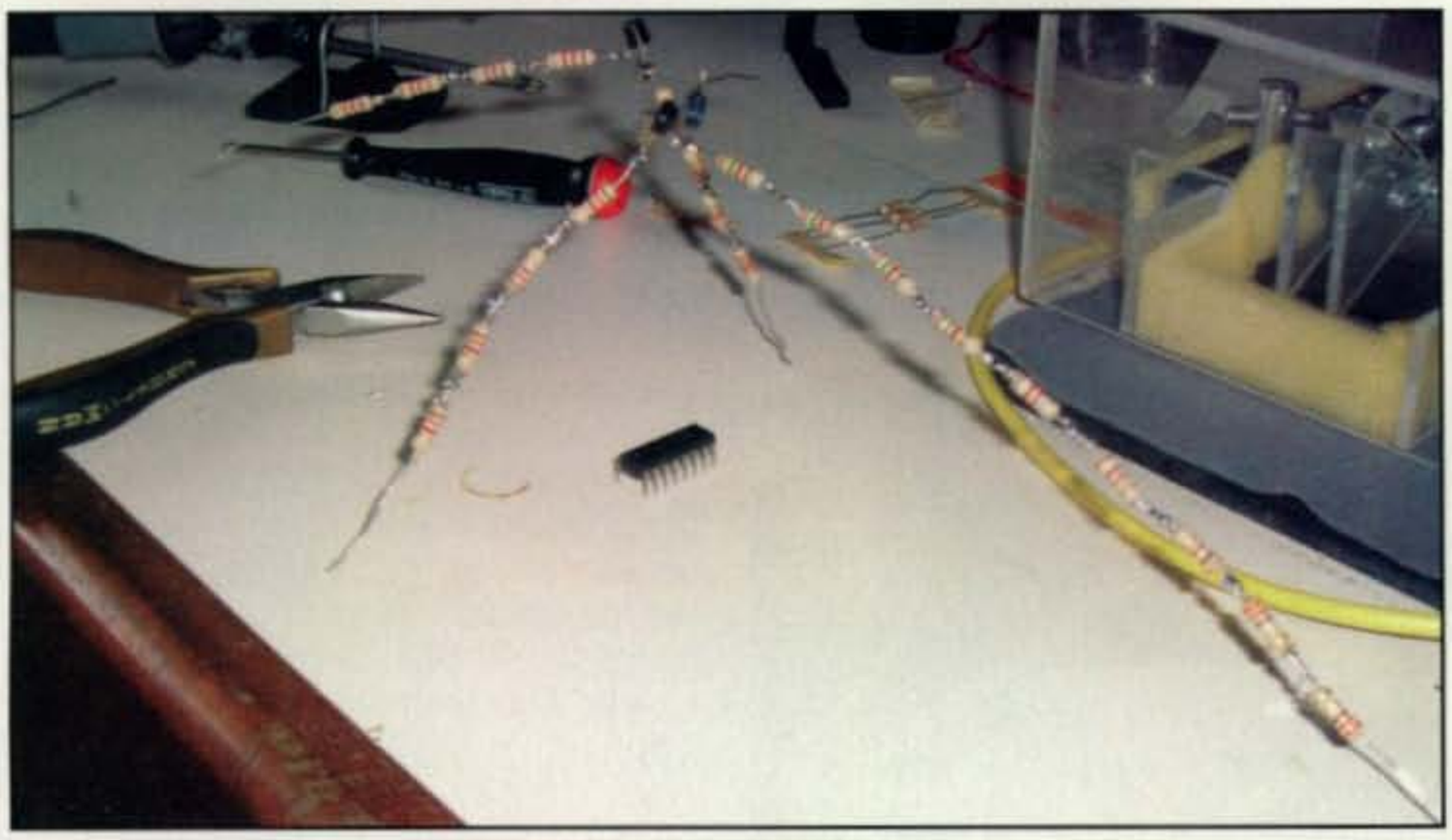

Photo C– Looking like a giant spider, the "discrete parts IC" replacing the dead MAX232 chip (center) takes form on the workbench/shack table.

We first wanted to blame the computers and thought that this was some sort of BIOS or com-port conflict, but as Jim, NU4Y, and I trucked on and analyzed the problems, we began to associate the two unrelated problems as the same problem. Our conclusion: The ICOM CT-17 was toast!

This was somewhat difficult to prove with our limited test equipment, but Jim was satisfied with the results, and I concurred. We then narrowed down the problem to the only IC on the CT-17's circuit board, a MAX232 serial input/output-level translator chip. The question became what to do about it.

Hard-to-Find Parts

Remember, we were on Conch Bar Middle Cacios, a 47-square-mile island with just 277 permanent inhabitants, no stores, and certainly no amateur radio stores anywhere in sight. Jim and I took a look at what we had available, which was a stack of corroded rotor controls, a stack of old partially disassembled computers, mice, assorted cables, a few transistors and resistors, and that was about it! Shipping in a new chip wasn't an option either, as we didn't have enough time, especially considering the inevitable customs delays. We did have one other resource, though: We had the internet (even though it was a slow connection), which meant we had access to Google.

I remembered reading some years back that the ICOM CT-17 has a rather simple circuit design and suggested we look at the possibilities. Maybe we could kludge together a solution with the parts we had on hand. I began doing online research on the CT-17 and its internal structure, and then started looking for comparable substitute circuits. This took several hours, but we finally found one that was simple enough for us to build, considering our rather limited supply of parts. Jim and I, the real tech types in our group, immediately started to gather the parts we needed to make this happen.

It turned out that we really didn't have all that was required, but thought we did have enough stuff to make it work. Jim

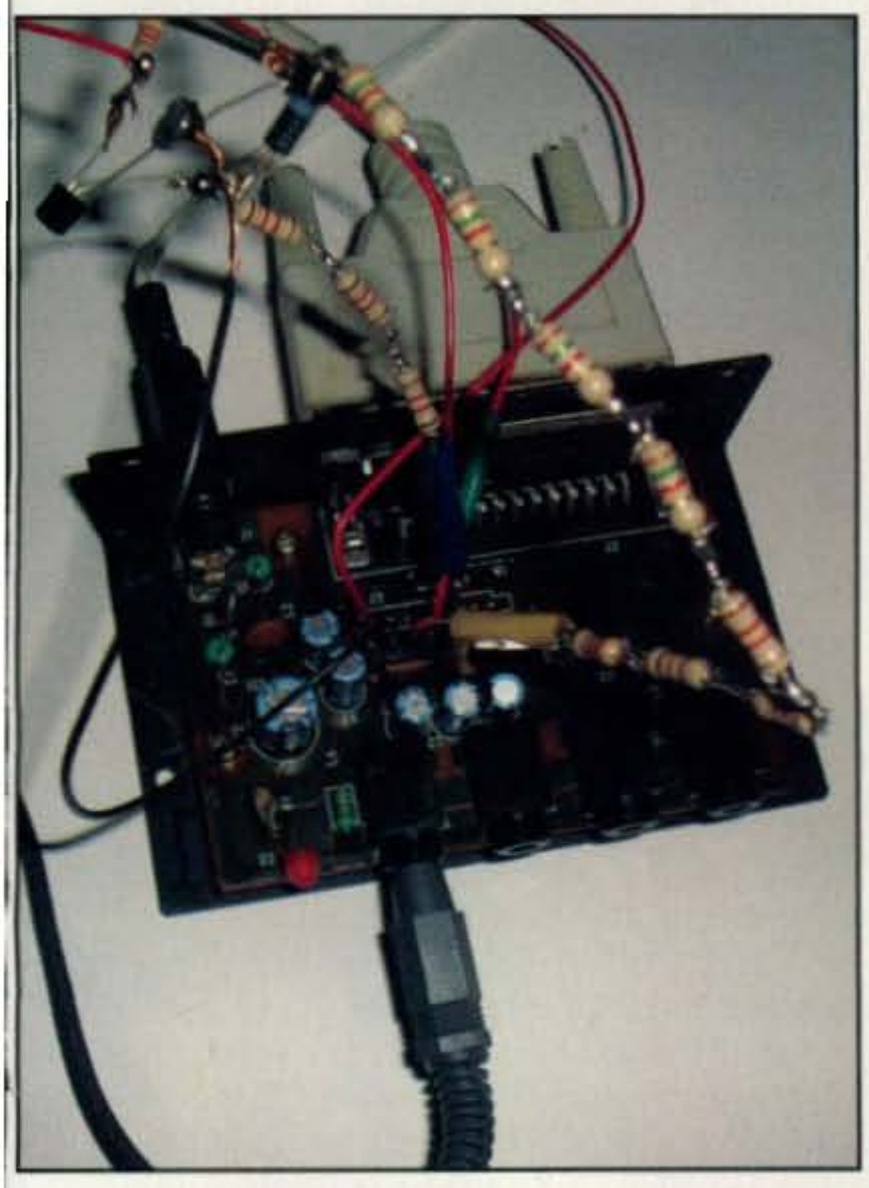

Photo D– The completed "discrete parts IC" plugged into the socket for the MAX232 chip on the IC-17 circuit board.

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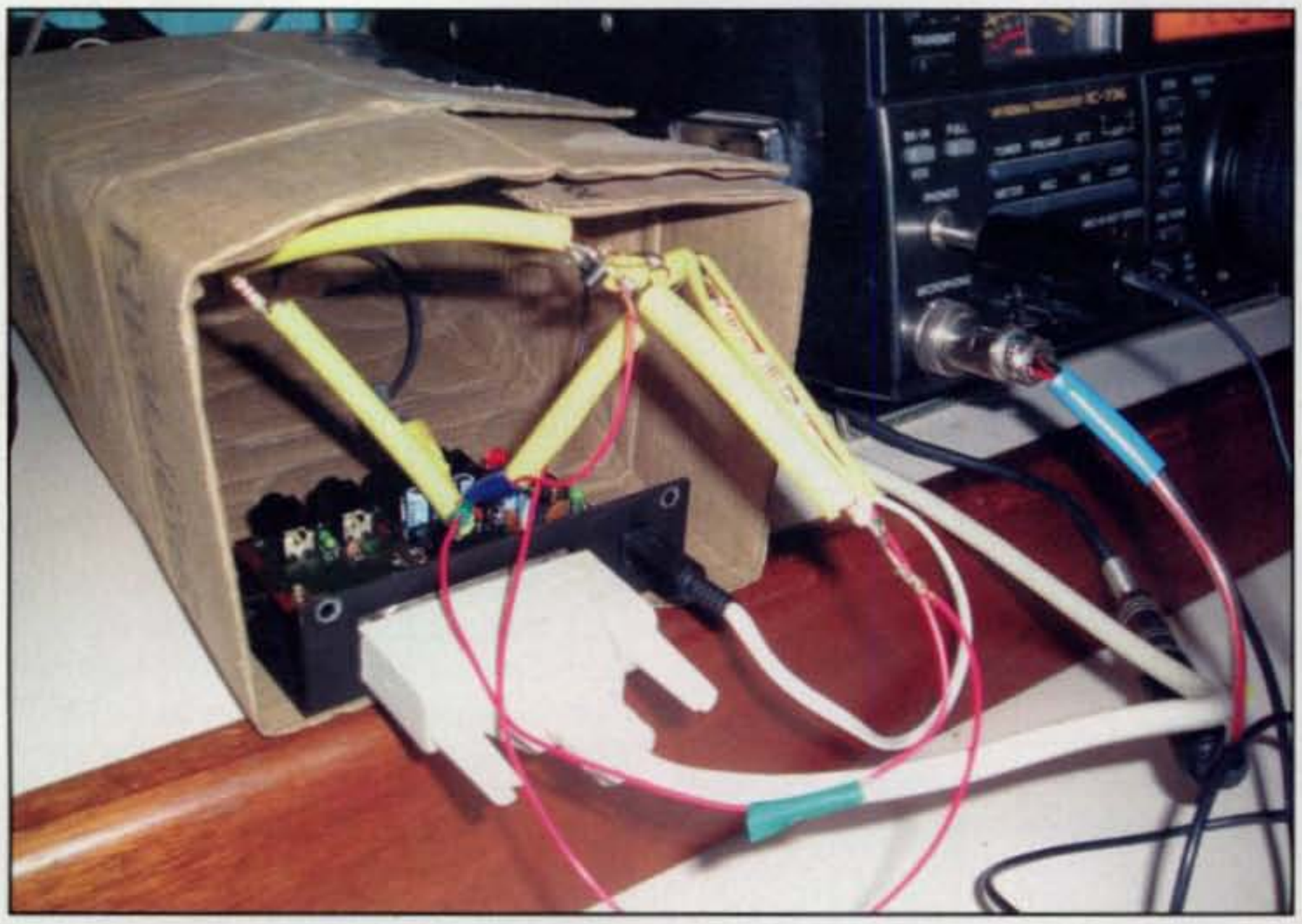

Photo E– "The Kludge" in action, keeping the radio, logging software, and antenna communicating with each other during the contest.

snipped a few diodes from the old corroded rotor controls, and I began chaining resistors together to make the correct values (see photo C). We then conferred for a while, and I came up with the idea that we could get by with even fewer parts if we were able to use the already present supporting infrastructure of the CT-17. There was only one way to do this with the parts we had on hand—*build the MAX232 IC from discrete components,* plug it into the IC socket, and let the original CT-17 handle the actual interface of the external connections. What a brainstorm, and a lot less work to boot … if we could make it happen. A big if, indeed …

Building a New IC

After finding the internal circuitry of the MAX232 IC on the web, I got to work soldering the components together, a two-to-three-hour job in itself, while Jim redrew the diagram to support the notion that less was better, and figured out how to connect the components I had just assembled into the MAX232 IC socket. After I passed out from exhaustion, Jim worked the final magic and pressed the leads of our "discrete component IC" into place on the circuit board (photo D).

Jim Hughes, KC4FWS, then insulated all the bare component leads using some salvaged outer-jacket material from a piece of RG-8X coax, built a new box to house our fragile creation, and nestled it into its new home for the contest. We powered it up and *it worked!*

We had computer control of our SteppIR antenna, and ICOM-736 radio at the multiplier station. We endured many more problems before and during the contest, but this one event seemed to sum up all our efforts. Teamwork and ham ingenuity once again helped up beat the odds and keep the station on the air.

The Kludge

It may not have been pretty, nor engineered using a prescribed technical specification or practice, but it did work, and it has a name: The Kludge (photo E). Further, it may be the most shameless piece of work any of us had ever done, but it was also one of our proudest moments when it actually worked. Our creation survived the entire contest without incident. Needless to say, our next VP5DX pack-up kit will include, among other things, a spare MAX232 chip and an assortment of resistors and other semiconductors. ■

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Even if you don't have a monster station or monster antenna, you can still take advantage of the sunspot minimum to build up your country and zone totals on 80 meters. WØZ says he worked wonders with his vertical after he learned this important lesson…

Just Put Down the Radials, OK?

Or, how I finally worked DXCC on 80 meters — and you can, too

BY LARRY LOEN,* WØZ

Do you want to get some serious DX worked this coming year? Something you haven't done before? Something achievable without sunspots or big-money stations? How about DXCC on 80 meters? It's easier than you think.

Despite a modest station, I had well over 270 countries worked, lifetime, and 4BDXCC. I could even claim a 152-zone 5BWAZ. However, there is no plaque for 4BDXCC. My 80-meter results? In the dumpster. Not good for a guy who wants a full 5BWAZ someday.

With the sunspots down, it was finally time to see if I could, at last, manage to finish up 80-meter DXCC and pick up some 5-Band zones, too. It's what the smart DXer does when the sunspots bottom out.

Simple U-shaped garden stakes can pin radial wires to the ground, in many cases eliminating the need to bury them.

Earlier Experiences

My station has always been modest. No monster tower, and certainly no 80-meter beam. I had already had tried a standard five-band vertical with poor results on 80. Consultation with my betters (especially Lee Crocker, W9OY) confirmed what ON4UN's classic book *Low Band DXing* had already told me: The only remotely inexpensive regime on 80 meters is a vertical—and a serious vertical.

I had done very well on 40 meters with that same modest vertical at my prior QTH. I'd worked places such as South Sandwich Islands with it. However, as I now know, I was handicapping myself even on 40 meters. I needed a better vertical.

It's All in the Radials

Truth is, like all too many amateurs, I'd scrimped on the radials. Just about every ad for every antenna promises "no radials," and I willingly believed, even withn verticals. I think I put down something like four or eight of them, cut for different bands to boot, the first time around. It loaded up; it worked DX; I was happy. And I was dead wrong.

I certainly knew that the antenna was wholly futile on 80 meters. It loaded up well, with a decent SWR (I've since learned this is actually a *problem* on a vertical), but I could barely work Mexico. I had some very minimal QSOs with England and Japan, but as far as the "D" in DX, that was it.

When I made 80 meters my fall 2005 goal, time was short. I looked into the Force 12 vertical dipoles, but as it happened, they were so far backordered that I would have lost the whole 2005–2006 winter season, especially in Minnesota, where "winter" and "antenna installation" do not go together. Therefore, almost by default, I was back to verticals.

How to build a better vertical? Any edition of ON4UN's classic guide, *Low Band DXing,* will tell you to put down the radials … 60 of them for 80 meters. This is the real barrier. If you can put down the radials, the rest is not so difficult.

Getting the Radials Done — The Hard Way, the Easy Way

I decided to go whole hog and get the Butternut HF2V in hopes (buoyed by my consultants) that its specialization on 80 and 40 meters would give me a better pattern for DX.

There are two basic ways to do radials, and I ended up trying them both. The first is the arduous task of burying radials. As I said, I live in Minnesota, so

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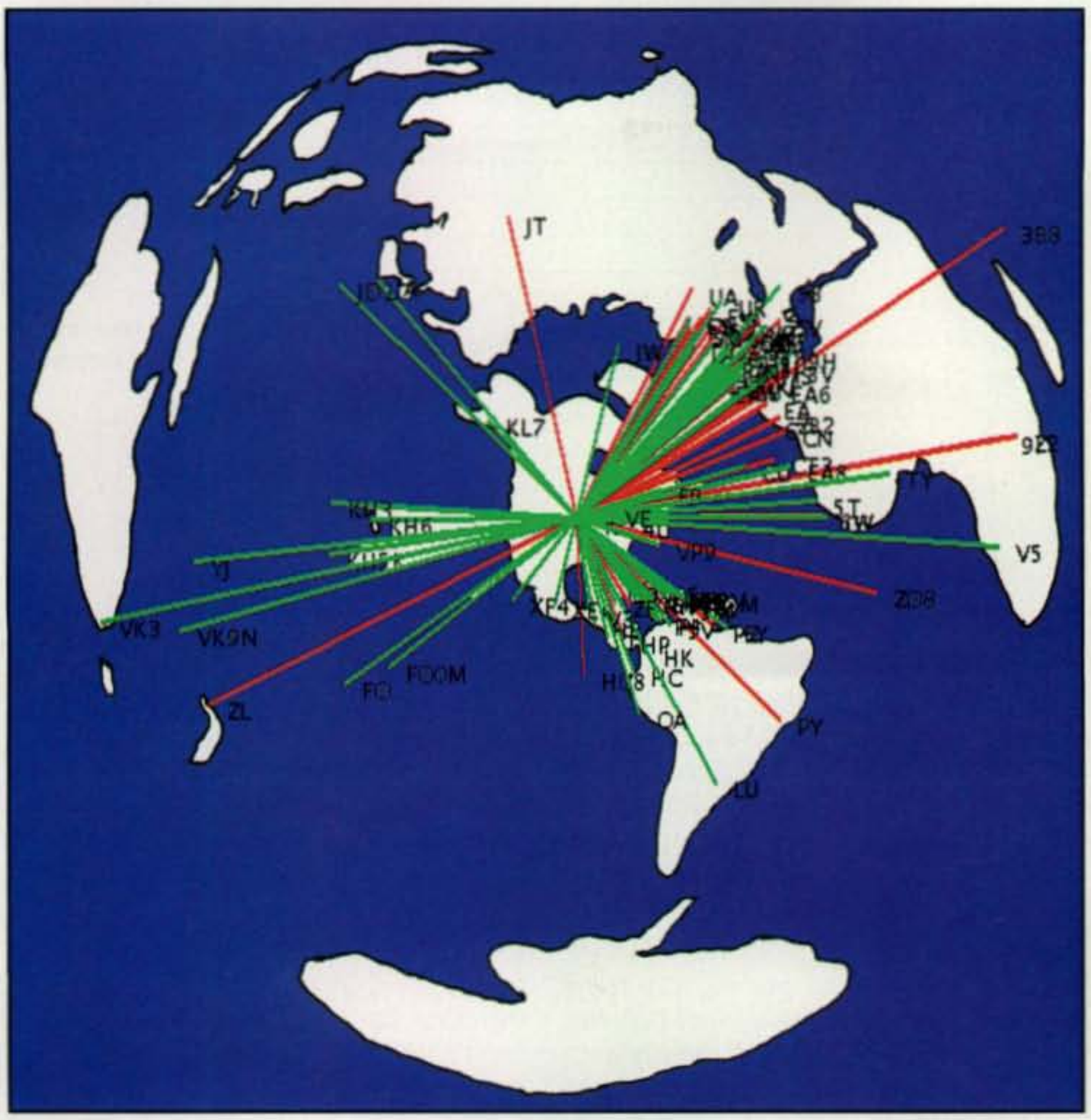

Fig. 1– A "looking down on Minnesota" view of the countries worked by the author on 80 meters after putting up his vertical with the full complement of radials. Red indicates contacts made with the amplifier. Green shows "barefoot" contacts.

after doing 16 of them this way, at 45 minutes each, I knew what "sod busting" meant. Not only was it arduous, but I realized I was going to run out of time before I had enough installed. This is why so many of us give up on a proper radial field and settle for compromised radial systems. However, that just isn't necessary.

Instead, I did what a few clever amateurs have done. I simply laid the rest of the radials *on the ground*. That's right; I skipped the burial part. This took only a couple of afternoons for 44 radials. To hold them in place, I simply got some "U"-shaped garden stakes (see photo) and pushed them into the ground every ten feet or so, pinning the wire to the ground. This included, critically, the far end. I had delayed so long, I'd done the last lawn mowing for the season anyway, so I laid them down without fear. This spring I learned you can mow right over them … mostly. I lost about three, then buried whatever wire stuck up too high, and haven't lost any since. Bottom line: You put down the classic 60, pin them down well, and you're fine.

I also splurged and went for the ground plate from DX Engineering, which is a nice way to go. That gave me something next to the antenna to which to attach the radials. However, I also could have soldered them to a ring of eight-gauge copper wire and gotten about the same results.

Oh, and one other really, really critical item: The radials, despite being cut for 80 meters, were only 34 feet long. Do the math and you'll realize that's the 40-meter size. Am I out of my mind? Nope, I just read ON4UN's book carefully. He says that once a radial touches the ground, it is detuned. It has a velocity factor between 40 and 60 percent. He then went on to describe how hard it was to measure. Thus, I just cut it for 50 percent and hoped for the best over my clay-and-sand soil. I can tell you, it worked! Obviously, buried or not, this cuts the labor in half.

I followed the easy installation direc-

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tions for the HF2V. I had splurged earlier and gotten an antenna analyzer, which made it all much faster, but I could have done it with any old hamfest SWR meter back in the shack. It would merely have meant more running in and out of the house.

Expect a bit of work matching a new vertical. As the HF2V directions note, the more efficient the radial system, the less likely it is that the antenna impedance will be right around 50 ohms. A shortened vertical should be around 35 ohms, it suggests. If you see a perfect SWR without much work, it means something is adding reactance and giving you a match. It also means, however, that you aren't transferring at full power, or at the right angle. Sixteen radials will give you a nice SWR, for instance, but you won't work much DX. Put the radials down and deal with the SWR. Your rig can take it. Your country count will thank you.

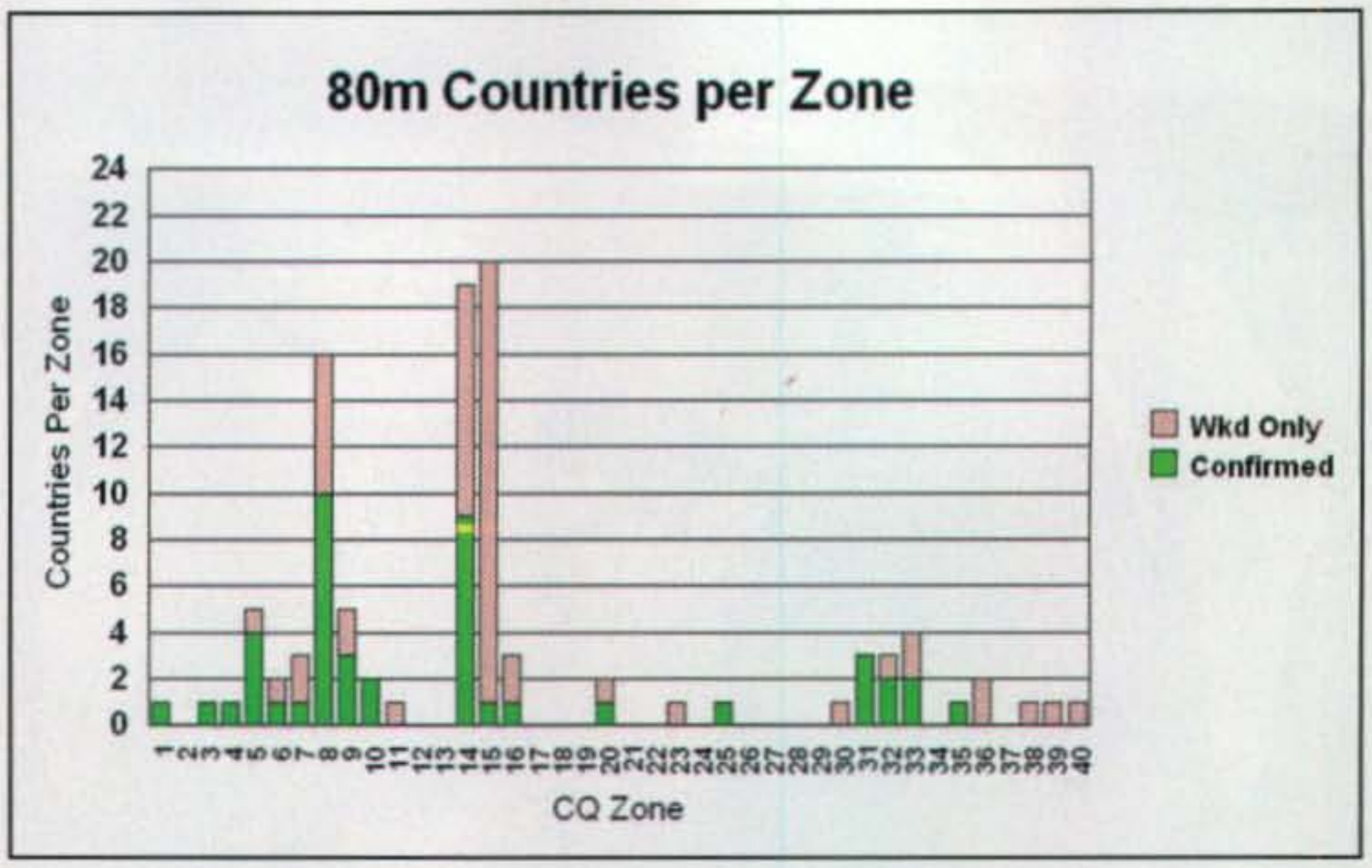

Fig. 2– A graphical view of the number of countries worked in each zone when the author had confirmed exactly 100 countries on 80 meters. As you can see, he did a much better job into Europe (zones 14 and 15) than Siberia (Zones 16–19), despite similar distances. This is most likely due to auroral effects around the North Pole.

The Revelations Begin

With the radials down, I began to experiment with the antenna. I noticed immediate improvement over my previous results.

The first thing I noticed was the band opened earlier. The second thing I noticed was there was more and louder DX. It wasn't as overwhelming as I might have thought, though. I also had a G5RV up, and once the band opened for it, I could hear a lot of the DX. What was up?

What was up is that the vertical is not a "gain" antenna. It is "directional." That is, it puts more of its energy at lower angles (critical for DX), but there is less actual signal going to and fro than on a dipole. This actually makes it a bit quieter, as best I can make out. It's worth whatever the losses might be.

The earlier openings were the big clue, though. It proved that the lower angles were there as they were not on other antennas. It meant that all those radials were working. It beat the heck out of the G5RV.

The second thing, perhaps an even bigger thing, was that I learned to deal with static.

I had seen many a rig with an "attenuation" control or an RF gain; some even had both. What, I wondered, was the point of that? To actually cut down on the incoming signal?

Well, as it turns out, yes. For reasons that experts can explain, but my ears readily confirmed, if you attenuate a typical 80-meter signal, the signal is, of course, softer, but the signal-to-noise ratio improves. It's quieter, but you hear it better. In fact, on my rig, the SDR 1000, when I put on the attenuation, the band doesn't sound like 80 meters anymore. It sounds like 40 meters always has. (A hot receiver also helps. My superb SDR-1000, or classic rigs such as the TS-850 or 930 [available used for around $500], make the attenuation trick work by being able to pull in those weak signals. I don't know if this will work with lower quality receivers.)

The Results

The results, as shown in my diagrams, speak for themselves. Fig. 1 shows a plot of the QSOs from my location with stations throughout the world. The red represents those worked with a kilowatt. The green shows barefoot contacts. Since I plotted the green second, and later plots overlaid the earlier ones, it looks a little "greener" overall than it really is.

The amplifier was a new thing for me, lasting until I blew out a diode. I then soldiered on barefoot. With the amp's help, I made basic DXCC on 80 meters, from scratch, in only three months. This included redoing what little I had done before. Just about everything was done on CW (get that Extra Class license; 80 meter DX hangs out around 3.505). However, before and after the amplifier was deployed, I made plenty of barefoot QSOs as well, about 80 countries worth. Without an amplifier, maybe it takes two seasons. I worked 39 countries in the CQ WW DX CW Contest with the amp on, and while I worked many new Europeans early in the evening, they were a lot louder at the European sunrise (this is the famous greyline effect; use it). Therefore, I might well have worked nearly as many countries barefoot after all. If you do SSB, then you probably will need the amp.

Progress did thin out a bit after those first couple of months, and I was standing at "only" 115 by the end of March. Then again, I had also achieved 5BWAZ Certificate #1480 with (then) 164 zones worked (now 169), way up from 152 (the vertical snagged a few new zones on 40, too).

Look at fig. 2. It plots DXCC countries worked and confirmed by zones. That plot was done when I had worked exactly 100 countries. I was working them barefoot all over the world, including places such as Mauritius and Norfolk Island.

The vertical is not omnipotent. As fig. 1 shows, there is some auroral absorption going on over the poles. I'm working southern Australia (not so terribly far from my antipodes) and yet I can't get Siberia, which is about as close as Italy. Auroral absorption is clearly an issue.

For that, for a true 5BWAZ, I'm going to need more than a simple vertical. It's why people deploy things such as four squares. In the meantime, though, I'm staring at 5BDXCC Certificate #5843. Why not get yours? ■

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SS-18	15	18	1⅛ x 6 x 9	3.6
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SS-30	25	30	3¼ x 7 x 9⅝	5.0

MODEL SS-25M

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SS-25M*	20	25	2⅞ x 7 x 9⅝	4.2
SS-30M*	25	30	3¼ x 7 x 9⅝	5.0

MODEL SRM-30

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

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

MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

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

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3½ x 19 x 9⅝	10.5
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SS-12RA
SS-18RA
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*ICS – Intermittent Communication Service

math's notes

BY IRWIN MATH,* WA2NDM

Unusual Applications of the LTC5507

The Linear Technology Corporation's LTC5507 is a chip originally designed for use by the cell-phone market to both detect and control RF power levels. The device is designed to sense an RF input of between –34 dBm (approximately 0.5 microwatts) to +14 dBm (approximately 20 milliwatts) at an impedance level of 50 ohms. Furthermore, this input can fall anywhere within the frequency range of 100 kHz to 1000 MHz (1 GHz). In this application it works quite well, but there are other uses for this unique device that will appeal to the experimenter. We would like to cover some of these this month.

Before starting, however, let's see what we are actually dealing with. Fig. 1 is a basic schematic diagram of what is contained within the chip. As you can see, the RF input is first applied to a Schottky diode peak detector. This diode is biased to about 60 microamperes, which drops its detection threshold to about 250 millivolts or so. A second, similarly biased matched diode for temperature compensation is also included. The DC output of the diode combination, after detection and filtering, is applied to a differential amplifier and finally is amplified by a factor of two in the buffer stage. The resulting DC is then made available for measurement or control purposes. The table below is a rough representation of the DC output vs the RF input. The values have been rounded off for comparison purposes, but you get the idea.

dBm Input	DC Voltage Out
–34	260 mv
–26	270 mv
–18	320 mv
–10	500 mv
–2	750 mv
+6	1.1 volt
+14	2.2 volts

If you want closer numbers, you will have to consult the actual data sheet, which is available on the Linear Technologies website at <www.linear.com>.

Fig. 2 is a schematic diagram of the standard hookup for the LTC5507, and as you can see, a voltmeter connected to the output, along with a "lookup or calibration chart," will give the approximate readings shown above. The value of C1 is equal to the value of C2 and is derived from the following formula:

C1 = C2 = 1/30f

where C1 and C2 are in microFarads and f is the lowest desired operating frequency in MHz.

*c/o CQ magazine

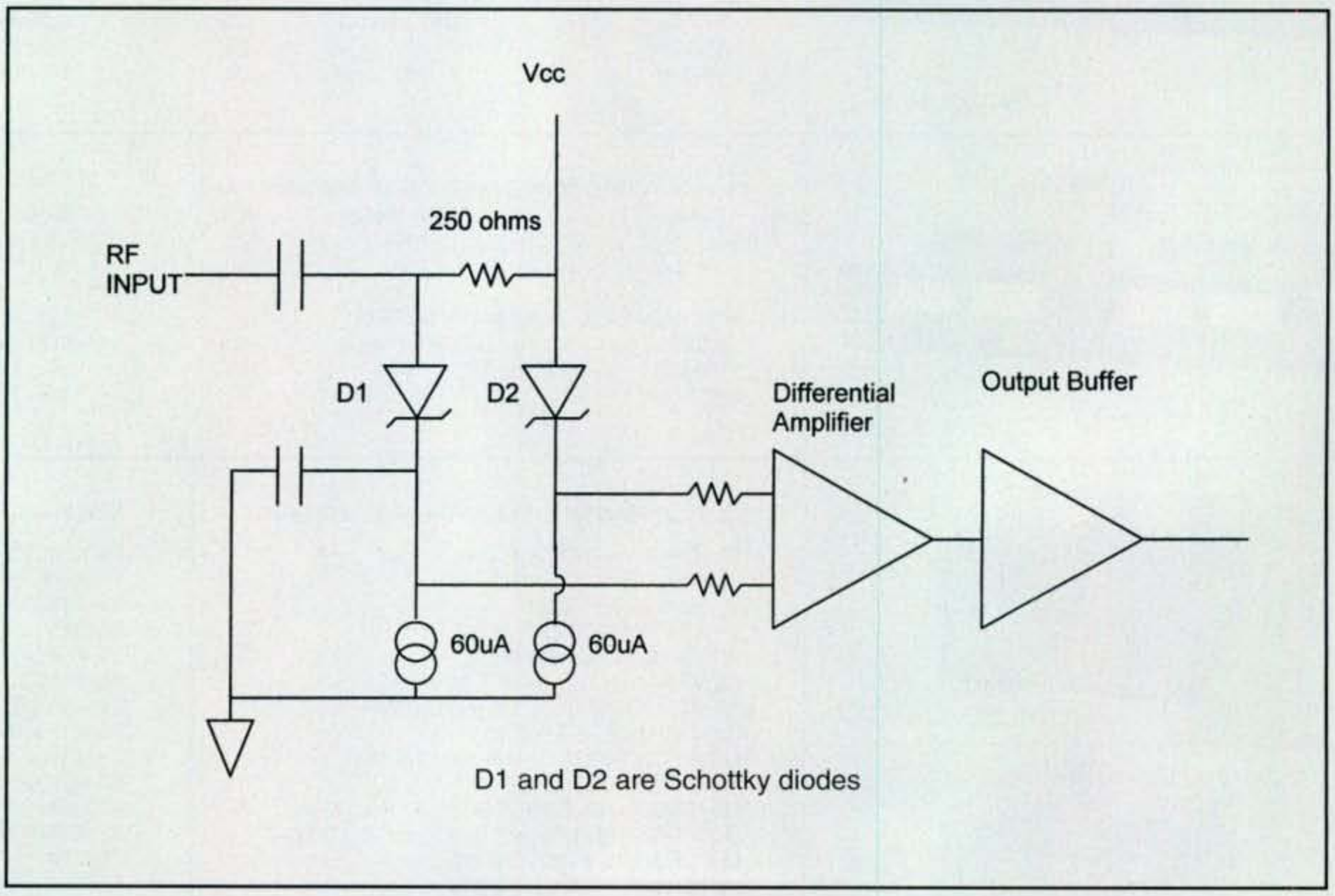

Fig. 1– Simplified block diagram of the LTC5507.

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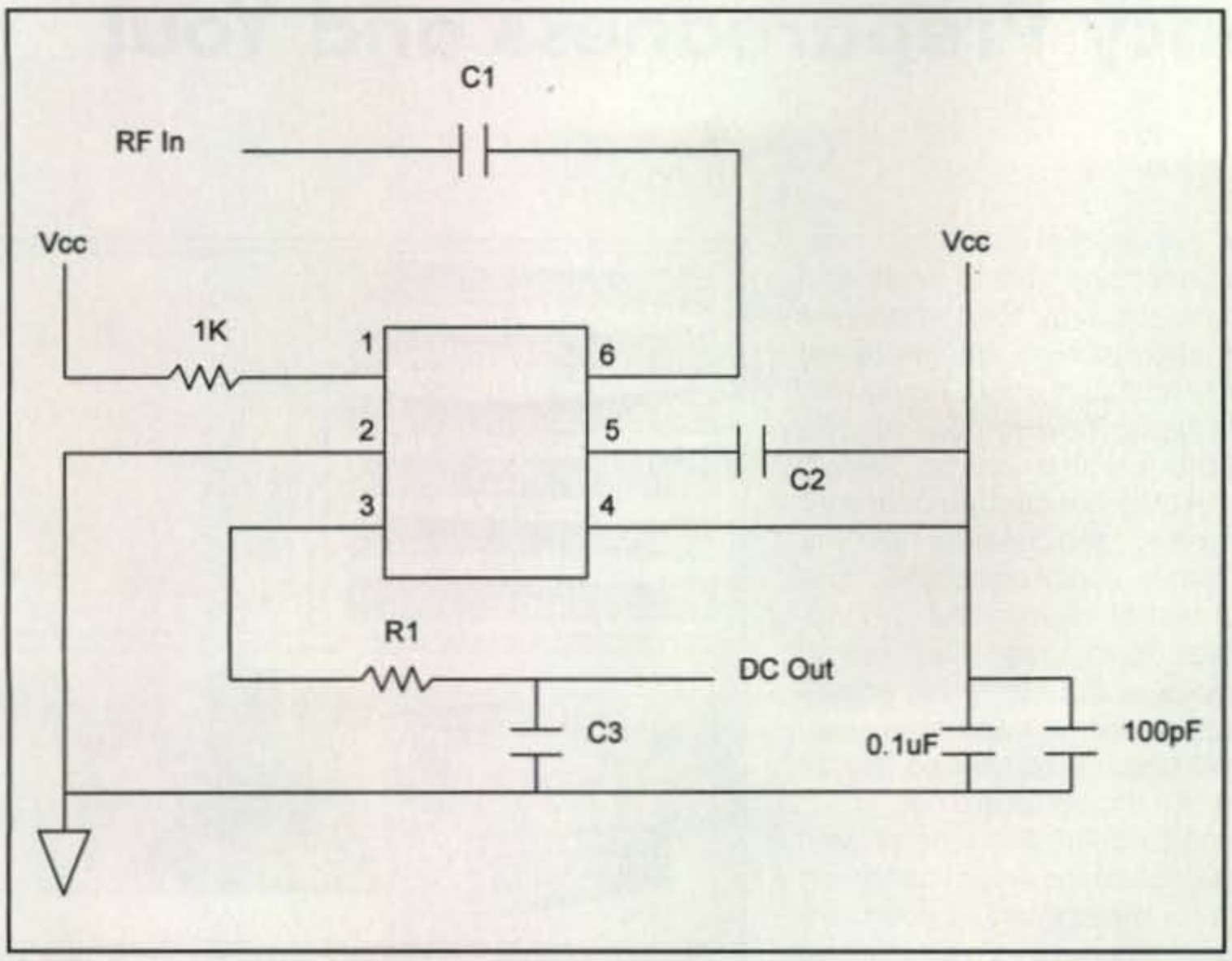

Fig. 2– Basic hookup of the LTC5507.

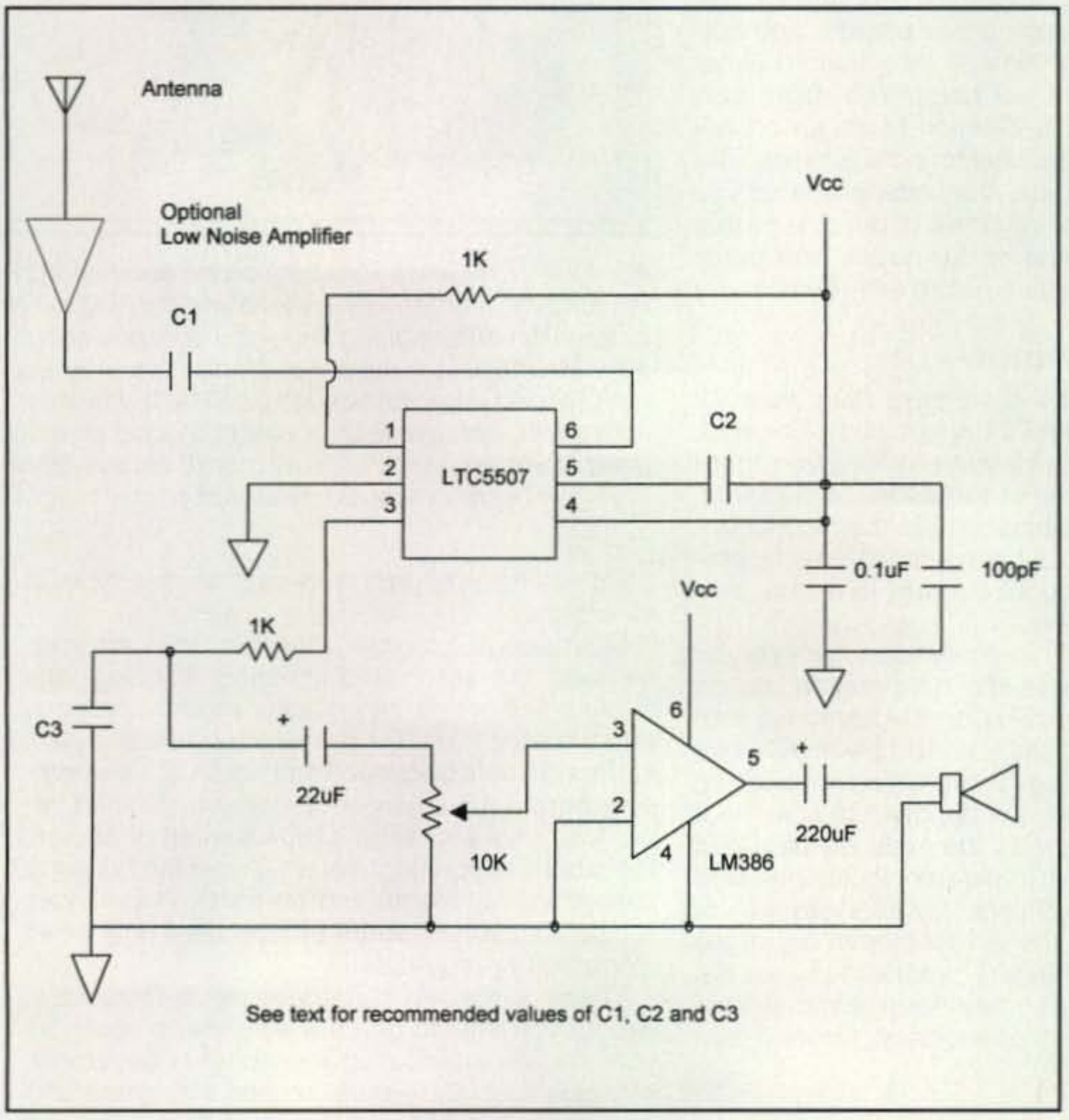

Fig. 3– Simple AM receiver using the LTC5507.

At 100 MHz to 1 GHz, for example, C1 and C2 both will be equal to 330 pF. In the 1- to 30-MHz HF region, C1 and C2 will be equal to 0.03 µF. If you are only interested in reading power, C3 can be anywhere from 1 to 10 µF. In addition, the 0.1-µF and 100-pF capacitors should be mounted as close to the Vcc pin of the LTC5507 as possible for best high-frequency results.

Now take a close look at the DC output, and you will see that the low-pass filter composed of R1 and capacitor C3 limit the speed of response of the output. According to Linear Technologies, however, by changing this time constant the demodulated DC output can vary by as much as a mega Hertz or so. This means that you can produce a neat data receiver by connecting the output directly from pin 3 to a comparator.

You can also make a very simple AM receiver as shown in fig. 3. In this circuit we simply have added an LM386 audio amplifier and a couple of components in order to drive a small speaker. You also will note the addition of an optional low-noise RF amplifier before the input. Since the LTC5507 is usable over a very wide frequency range, a tuned amplifier is suggested. At this point you can use any convenient amplifier, from a Minicircuits MAR or ERA type (for use in the UHF region) to a simple op-amp for lower frequencies. You also should add additional bandpass filtering to reduce unwanted signals. Obviously, all unlabeled components can be selected to achieve the results you wish.

If you now refer back to fig. 1, you will see that the input is directly coupled to D1 and the filter capacitor connected to D1 is connected externally. This means that by the proper choice of C1 and C2 one can even use the LTC5507 down into the audio range. At 1 kHz, for example, C1 and C2 would be 1000-µF electrolytics. This opens up the possibility of all sorts of audio and ultrasonic applications as well. In addition, at the other end of the spectrum (according to Linear Technologies) the LTC5507 will actually operate at reduced specifications well beyond 1000 MHz, so perhaps here is the chance to try your hand in the microwave region. This is certainly a very interesting chip to experiment with.

I would like to sincerely thank Vlad Dvorkin, KB9OCM, of Linear Technologies for his help and comments on the use of the LTC5507.

73, Irwin, WA2NDM

BY DAVE INGRAM,* K4TWJ

Emergency Preparedness and You!

Developing your own plan of action for emergency preparedness and putting together a source of alternate energy for stand-alone communications anytime needed are important issues in today's highly unstable world. Reviewing "what's involved" and basic "how to do it" details thus are the focus of this month's column. We will discuss various types of emergencies, go over your particular needs for survival, and consider how you may best serve your family, community, and country during times of unrest or chaos—the ground-floor aspects of survival, so to speak. Next month we will take a closer look at the electronic angles of communications equipment and alternate energy systems—what you need to remain on the air and communicating when the lights are out.

Let's begin by acknowledging the time-proven fact that there is no substitute for actual hands-on experience during a real emergency. If you have never been part of an emergency communications group, don't feel intimidated. Most of us are in the same position: We wish to help but feel we may be a hindrance.

You might start by just listening on the air during emergencies, studying procedures, and noting how operators handle various situations (what helps and what does not help). You might also check with your ARRL Section Manager on becoming a stand-by volunteer for emergencies. The more exposure you have, the better prepared you will be for helping during times of need. Isn't that logical? Now let's review the needs and perils associated with various types of emergencies.

Photo A– Preparing for stand-alone survival during long-term emergencies involves thinking on a different level from going through a brief power outage. Maintaining a supply of Meals Ready to Eat (MREs) and other items such as SPACE blankets, light sticks, etc., for instant use is a good starting point. Items shown (and many more!) are available from <www.safetycentral.com>.

Emergency Scenarios

Emergencies may be short term (less than 72 hours), long term (over 72 hours), mild mannered, or serious. They may include everything from thunderstorms, hurricanes, or tornadoes to blizzards, terrorist attacks, or situations of international unrest. In each case, your best defense is being prepared with a well-thought-out plan to ensure personal and family safety.

With respect to communications equipment, you probably already have the bare essentials on hand: a 2-meter or dual-band FM handheld with extended receive capability and a 12-volt DC-powered HF transceiver or a multiband mobile rig. Separate transceivers (as opposed to one "do it all" rig) are preferred, as they can be operated simultaneously—even in different locations—and if problems develop with one, the full system is not disabled. Hopefully you will also have an ample supply of extra (and fresh) batteries for your FM handheld and a list of frequencies to monitor for information during an emergency. Beyond that point, being prepared depends on the type of emergency.

Most people consider *thunderstorms* inconveniences, but associated lightning, flooding, and straight-line winds can quickly destroy property and threaten lives. Be prepared to ride out such storms in a safe place, and monitor local TV weather reports and emergency nets on 2-meter repeaters, plus your area's NOAA weather station, for "what's happening" details. Avoid the "alligator syndrome" (all mouth and no ears). Report your area's situation on 2-meter repeaters only when warranted or requested.

These same basic rules apply to *tornadoes,* except you should get in a safe place—such as your home's smallest interior room, a basement, or a public shelter—early on and *stay there* until absolutely certain it is safe to venture out. You will be of no service to anyone if you become injured!

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Photo B– Need emergency heat? Coleman's ProCat Portable Propane Heater keeps small rooms, campers, or tents warm and toasty. It operates up to seven hours on a readily available 16-ounce propane cylinder. It is flameless, has an electric ignition, has a battery-powered fan, delivers up to 3,000 BTU of heat, and is safe for indoor use (crack open a window for fresh air/oxygen). The heater available from <www.coleman.com> or <www.safetycentral.com>.

Are You Prepared?

How well prepared are you to handle unexpected situations and emergencies? Ask yourself what would you do right now if warning sirens sounded and TV or radio broadcast stations announced a tornado on the ground and headed your way. Is a place of safety (shelter, basement, small reinforced interior room on the lowest floor, etc.) within your immediate area?

Can the main items you need for survival plus smaller items you wish to protect quickly be tossed into a nearby grab-and-go bag? Is your 2-meter or dual-band FM handheld emergency-ready with a dependable battery pack plus a refillable battery case and a group of fresh AA alkaline cells? Does the transceiver include NOAA weather and utility band (police, fire, ambulance, etc.) reception? Is a spare roll-up or outdoor antenna included in your grab-and-go bag? Do you know what frequencies and procedures emergency nets use? What frequencies do police and fire departments use? Do you know which NOAA weather channels to monitor? Does each member of your family have a printed sheet listing contact points and procedures for check-in and/or reporting status after the danger passes?

Next, consider what you would do right now if a more serious disaster and long-term loss of commercial power occurred. Lacking power, frozen foods thaw and ruin. Area water pumping stations stop. Gas stations close due to the inability to pump fuel, scan bar codes on products, and/or run charge cards (dumb but true). Traffic lights fail. Cell phone use becomes unpredictable at best. Looting and accidents abound. Your immediate concerns are food, water, protection, and safety of family members (your own needs must be addressed before you can help others). Is your 12-volt DC-powered HF transceiver (and antenna system) ready for operation? What frequencies do you tune to to check and report conditions? Is a battery-powered or wind-up shortwave radio in your grab-and-go bag? What frequencies and times do you monitor for accurate news and information? Answering or at least contemplating the previous questions and spin-off questions will give you a general idea of your preparedness and/or shortcomings that need to be addressed before emergencies arise. Remember, this is only a thought starter. Remember also that you are not fully prepared unless you have the necessary communications equipment and know how to use it in time of need.

In the case of a *hurricane*, everyone is best advised to heed early warnings and evacuate before traffic jams become hopeless roadblocks. If evacuation is impossible, take shelter in the most substantial structure available and stay secure to avoid injury from flying debris. Bear in mind that medical facilities will not be operational to help you if needed. TV, FM radio, and NOAA weather stations (and possibly 2-meter repeaters) probably will be off the air after the hurricane hits. Your HF gear and a breakdown antenna may well prove to be the only reliable means of communication for some time. For starters, check local area 75- and 40-meter net frequencies, SATERN (Salvation Army), 20-meter net frequencies such as 14.265 MHz, and the International Maritime Net (14.300 MHz).

Equipment needs are similar for *blizzards*, with the exception that additional food, water, heat, and energy requirements to survive "stand-alone style" for up to a week are necessary. Meals Ready to Eat (MREs) and portable propane heaters and/or solar or wood-burning stoves are mainstay items here. Gas-engine or wind-driven generators and solar power systems are also adopted for supplying energy/power. Those items are a complete study of their own and will be discussed in subsequent columns.

Terrorist attacks and situations of international unrest (which often evolve from terrorist activities) have increased substantially during recent times, and acquiring accurate "what's happening" information typically involves what I call mixed monitoring. I say that because radio and TV broadcasts are often biased and incomplete. Direct-from-the-source broadcasts from shortwave stations in foreign lands may also be implanted with propaganda. The Tokyo

Event	Affected Area	Resources
Thunderstorms Snowstorms Floods Tornadoes	Usually local	2-meter FM handheld with extended receive for NOAA weather, police, fire, etc.
Hurricanes	Local & semi national	HF transceiver with easy-up antenna. Possibly 2-meter FM handheld for local communications via "direct" frequencies after a hurricane passes.
Terrorist activities and situations of international unrest	National and international	HF transceiver with easy-up antenna. Shortwave receiver and possibly portable television for monitoring various information sources.

Fig. 1– Overview of emergency/abnormal situations, affected areas, and communications gear beneficial for use during such times. (Discussion in text.)

Photo C– High-intensity LEDs are available in 12-VDC and 120-VAC versions and produce a creditable amount of light while using very low current. They are ideal for RVs, campers, all types of emergencies, and are also excellent additions to energy-conscious homes. A wide variety of LED lights are available from <www.ccrane.com> (telephone 1-800-522-8863).

Rose concept still lives—in the form of Argentina Annie, Baghdad Bob, and more. How do you separate fact from fiction? Never believe half of what you see on television or read on the internet. Become familiar with the International Shortwave Bands, the major broadcasters, and the times they usually beam daily English-language broadcasts to the United States. *CQ*'s sister publication, *Popular Communications,* lists such broadcasts in each monthly issue. Sources of news/information you can usually trust are the Voice of America, the British Broadcast Corporation, and Deutsche Welle of Germany. Also learn the traditional/unbiased news sources, such as the Voice of Australia and Radio Japan. Then when troubles of international flavor arise, monitor all pertinent sources of information and contact radio amateurs in related areas and draw your own educated opinions.

Freq. (kHz)	Band (meters)	Freq. Range (MHz)
3200–3400	90	3.2–3.4
4600–5100	60	4.6–5.1
5950–6200	49	5.95–6.20
7100–7300	41	7.1–7.3
9500–9900	31	9.5–9.9
11650–12050	25	11.65–12.05
13600–13800	22	13.6–13.8
15100–15600	19	15.1–15.6

Fig. 2– The popular international shortwave broadcast bands listed here are good sources of information during times of international emergency or unrest. Some broadcasters may be biased with propaganda, so compare reports from several different areas in the world and come to your own conclusion about what's correct and what's half-truth.

Developing a Survival Plan

The Boy Scout motto "Be Prepared" may be old, but it continues to hold good merit. While opinions of what is needed to be prepared for short- and long-term emergencies may vary, knowing your options—what is available and where to find it—is always beneficial. If you are preparing for a relatively short-term emergency, a small supply of high-calorie bars or canned food, drinking water, and personal health products is usually adequate for starters. Then you can regularly draw from one end of the supply while replenishing from the other end during non-emergency times and fine-tune your plan/needs. This "rotation

Items	Company	Telephone #	Website
MREs, water purification tablets, Space® blankets, light sticks, etc.	Safety Central	—	www.safetycentral.com
LED lights	C. Crane	1-800-522-8863	www.ccrane.com
MREs, water purification tablets, survival kits, survival guide book, etc.	Emergency Preparedness Center	1-888-654-3447	www.areyouprepared.com
MREs, Space® blankets, compact stoves, generators	Nitro-Pak Preparedness Center, Inc.	1-800-866-4876	www.nitro-pak.com
Solar cookers, solar ovens, generators	ehealth Supplies	1-866-441-9344	www.ehealthsupplies.com
Water, candles, survival kits	Walton Feed, Inc.	1-800-847-0465	www.waltonfeed.com
Survival kits, food, water	PaPa G Enterprises	1-800-775-5646, Pin 05	www.disastersurvivalpreparedness.com
Survival kits, food, water	—	—	www.amazon.com
Portable solar-powered generator, solar panels	Thomas Camp, LLC 2006	—	www.solarauthority.com
Space® blankets, 120-hour candles, water purifiers	Campmor, Inc.	1-800-525-4784 or 1-888-226-7667	www.campmor.com
Space® blankets	—	—	www.wise4living.com
BlackCat Heater, Survival Cat Heater, emergency preparedness kit	Coleman, Inc.	1-800-835-3278	www.coleman.com
Survival supplies	—	—	www.doubleought.com
Survival supplies	—	—	www.modernsurvival.net

Fig. 3– A sampling of companies that specializes in items and supplies for emergency preparedness and long-term stand-alone survival.

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Stations	Locations	Frequencies
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WGN	Chicago, IL	720 kHz
KCBS	San Francisco, CA	740 kHz
WSB	Atlanta, GA	750 kHz
WABC	New York, NY	770 kHz
WCBS	New York, NY	880 kHz
WLS	Chicago, IL	890 kHz
KMOX	St. Louis, MO	1120 kHz
KOMA	Oklahoma City, OK	1520 kHz

Fig. 4– Time-proven "clear channel" AM super stations operating 24/7. These are good stations/frequencies to monitor during widespread abnormal situations. Make a copy of this list and keep it in your vehicle for out-of-town travel.

technique" is necessary because regular grocery-store-obtained packaged and canned goods have a relatively short shelf life (expiration dates are usually marked), and some bottled water can contain micro-organisms or bacteria that grow and render the water unfit for consumption within two months.

Preparing for more serious or long-term emergencies is a different matter and involves stocking up on foods that can be stored for several years (MREs) and utilizing your own water purification system. A number of survival-based companies sell MREs, SPACE® blankets, chemical "light sticks," portable propane heaters and water heaters, and more.

Keeping a comfortable amount of cash in small bills is also beneficial for short- and long-term emergency use, as it may prove your only means of purchasing dry goods, staples, and hand-pumped fuel when power is out and charge cards cannot be processed.

Some emergencies such as terrorist attacks or bombings occur without warning, so right now—before another day passes—take steps to protect yourself and your family. Start a list of telephone numbers and addresses for each family member. Select one family member as a central check-in point for each person to contact during an emergency. Choose a retiree or grandparent perhaps—someone who is home or telephone-accessible most of the time. Also, someone capable of accurately writing down messages is ideal for this function. Out-of-town relatives are fine here, too, as pay phones and long-distance services are often accessible when cell phones and local telephone lines are down or jammed with calls.

If any (all) family members are radio amateurs, select a simplex and a repeater frequency, plus an HF gathering spot for out-of-towners to check in each hour. Once the list is complete, pass laminated copies to each family member and two copies to the members designated as check-in points. Emphasize the importance of each person contacting, by whatever means necessary, the check-in points after a major emergency. As a finishing touch, run a simulated emergency test and again fine-tune the plan as necessary.

Information Sources, Good and Bad

Getting accurate information in emergencies can prove to be a rather ticklish situation. Accurate reports also depend on the type of emergency. Generally speaking, NOAA weather stations and local TV stations furnish reliable reports during times

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2M5-440XP, 2m/70cm	$219
440-470-5W/420-450-11	$169/119
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948/949E, Tuners	$139/159
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986, 3kW Tuner	$319
989D, Deluxe 3kW Tuner	$339
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Yaesu G-550	$299
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BPC25G/BPH25G	$89/229
HB25AG/BG/CG	$89/109/119
GAR30/GAS604	$39/49
45G/45AG2/45AG4	$209/289/289
AS455G/GA45GD	$115/149
BPC45G/BPL45G	$129/189
SB45G/WP45G	$119/139
55G	$259
AS455G/GA55GD	$115/179
BPC55G/BPL55G	$149/399
SB55G/WP55G	$169/249
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15-40'/50'	$1159/1629
16-60'/80'	$2329/3529
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35-40'	$1739

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TMM541SS	$2259
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TX455, 55' Crankup Tower	$2229
TX472, 72' Crankup Tower	$3689
TX489MDPL, 89' Motorized HD	$9599
HDX538, 38' Extra Heavy Duty	$1919
HDX555, 55' Extra Heavy Duty	$3379
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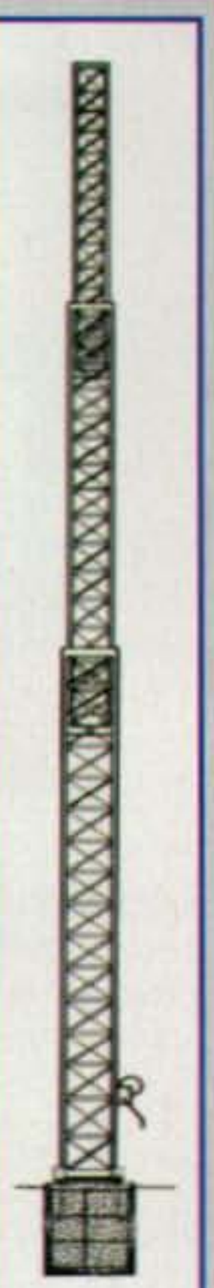

- Handles 35 square feet of antenna load at 50 MPH, 14.75 square feet at 70 MPH.
- All models supllied with hinged T-base, anchor bolts, hand winch (except motor drive models), top plate, and rotor plate.
- MDP & MDPL models include motor drive
- Options include coax arms, raising fixtures, masts, motor drives, and more!

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TX SERIES HEAVY DUTY CRANK-UP TOWERS

TOWER MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	LIST PRICE	SALE PRICE
TX-438	38'	21'6"	355	$1,972	$1,619
TX-455	55'	22'	670	$2,727	$2,229
TX-472	72'	22'8"	1040	$4,481	$3,689
TX-472MDP	72'	22'8"	1210	$7,211	$5,929
TX-489MDPL	89'	23'4"	1800	$11,692	$9,599

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- Heavy duty, handles 44.7 square feet of antenna load at 50 MPH, 35 square feet at 70 MPH.
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- MDPL models include motor drive
- Options include coax arms, raising fixtures, masts, motor drives, and more!

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HDX SERIES HEAVY DUTY CRANK-UP TOWERS

TOWER MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	LIST PRICE	SALE PRICE
HDX-538	38'	21'6"	600	$2,339	$1,919
HDX-555	55'	22'	870	$4,093	$3,379
HDX-572MDPL	72'	22'8"	1600	$10,719	$8,769
HDX-589MDPL	89'	23'8"	2440	$14,031	$11,499
HDX-689MDPL	89'	23'8"	3450	$27,104	$22,199
HDX-5106MDPL	106'	24'8"	3700	$29,495	$23,799

MA SERIES CRANK-UP MASTS

- Handles up to 22 square feet of antenna load. (See chart below)
- MDP models include motor drive.
- All models supllied with anchor bolts, load-actuated hand winch, and house bracket.
- Options include coax arms, raising fixtures, motor drives, self-supporting and rotator bases, remote control panel, and more!

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MA SERIES CRANK-UP MASTS

MAST MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	50 MPH (sq. ft.)	70 MPH (sq. ft.)	LIST PRICE	SALE PRICE
MA-40	40'	21'6"	242	16.5	6.8	$1,569	$1,289
MA-550	55'	22'1"	435	22	9	$2,427	$1,999
MA-550MDP	55'	22'1"	620	22	9	$4,639	$3,799
MA-770	71'	22'10"	645	15.5	5.5	$4,001	$3,279
MA-770MDP	71'	22'10"	830	15.5	5.5	$6,329	$5,149
MA-850MDP	85'	23'6"	1128	15.3	6.3	$8,531	$5,949

TMM SERIES COMPACT CRANK-UP TOWERS

- Handles 20 square feet of antenna load at 50 MPH, 8 square feet at 70 MPH.
- Compact design is great for areas with tower restrictions, or where a less intrusive installation is desirable.
- All models supllied with hinged T-base, anchor bolts, load-actuated hand winch, 8' steel mast, top plate, and rotor plate.
- Options include coax arms, raising fixtures, motor drives, thrust bearing, remote control panel, and more!

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TMM SERIES COMPACT CRANK-UP TOWERS

TOWER MODEL	MAX. HT.	MIN. HT.	WT. (LBS.)	LIST PRICE	SALE PRICE
TMM-433SS	33'	11'4"	315	$2,105	$1,719
TMM-433HD	33'	11'4"	400	$2,550	$2,089
TMM-541SS	41'	12'	430	$2,764	$2,259

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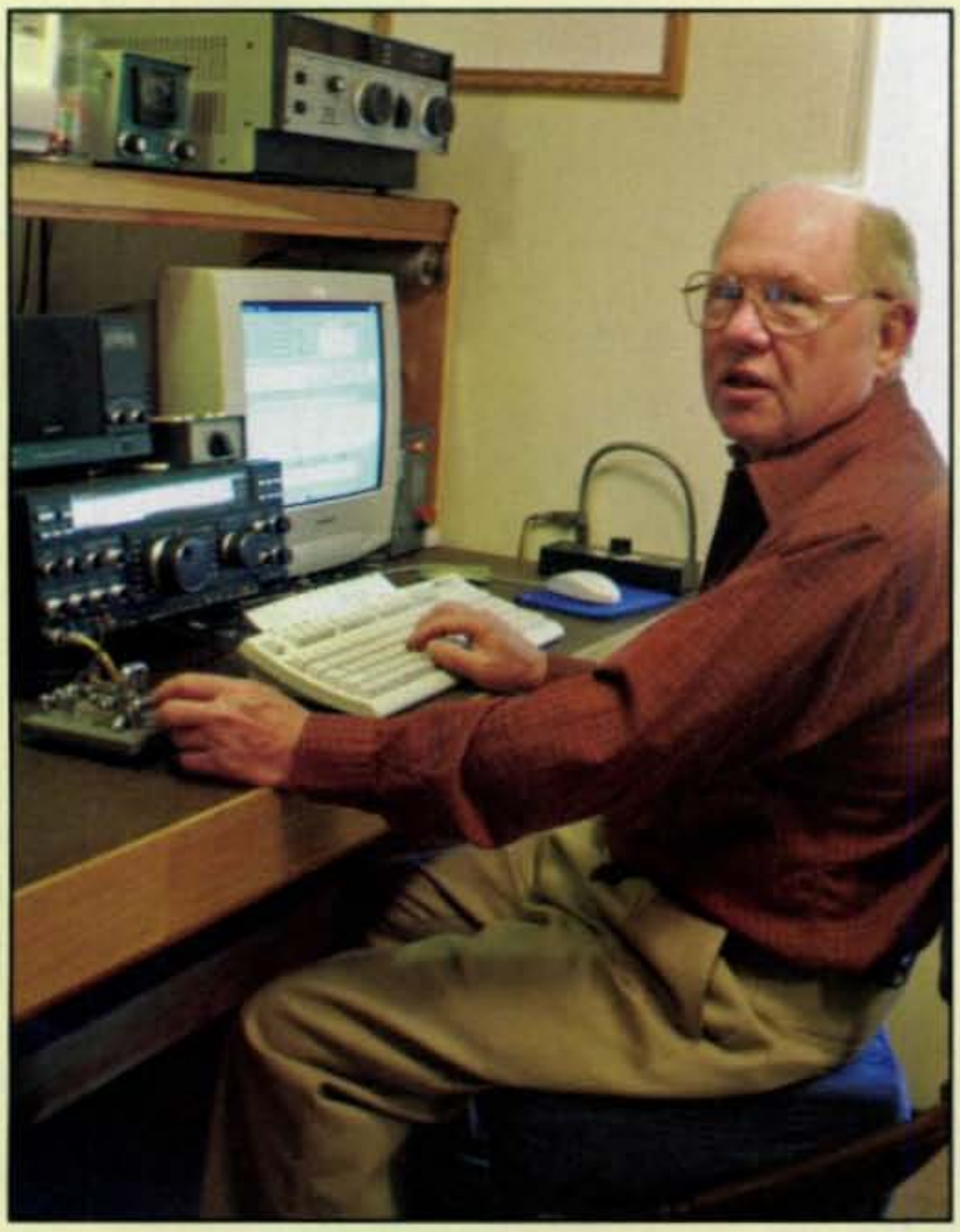
On the Cover



With or without an FCC-required code test—which rides into the sunset this month—many hams will continue to use and enjoy Morse code. "I learned CW the hard way," says LaMar Ray, WA7LT, of Spokane, Washington, who's on our cover this month. "It did not come easy for me. But now that I'm proficient, I really enjoy it."

You can't see it in the photo, but LaMar actually has two nearly identical operating positions set up side-by-side in his shack that's fine-tuned for contesting, particularly multi-operator, single-transmitter (multi-single) operating in the CQ World-Wide DX Contests. (A second station may be used to search for and work new multipliers on a different band, but only one signal may be on the air at a time.) The equipment at each position consists of a Yaesu FT-1000D transceiver, an Idiom Press memory keyer and Ten-Tec Centurion amplifier, along with an ICE bandpass filter, Hy-Gain rotor controllers, and a switch for various 160-meter transmitting antennas. Outside, LaMar has two towers, with a third under construction, supporting a variety of antennas for 160–10 meters.

LaMar—who's been a *CQ* subscriber continuously since 1947, just before he got his license—says he got into contesting through DXing. "My elmer was a dyed-in-the-wool DXer," he told us. "He encouraged me to try the CQ World-Wide DX Contest to get a few countries under my belt. In about 1950, I won a 10-meter certificate, and ever since, the focus of all my operating has been multi-single operating in the CQWW."

He's taken it a little further than most people, though... "As a teenager and budding DXer," LaMar explained, "I received a scholarship and went to the University of Michigan and got an electronics degree for the sole purpose of improving my amateur station." Now *that's* dedication!

(Cover photo by Larry Mulvehill, WB2ZPI)

Photo D– Cooking fish, poultry, eggs, breads, and pasteurizing water for drinking is easy with this portable/fold-up solar cooker that focuses the sun's rays onto a black pot while trapping resultant heat for cooking. The cooker is available from <www.ehealthsupplies.com>(1-866-441-9344)or<www.safetycentral.com>.

of inclement weather. AM and FM broadcast stations are usually more entertainment oriented. Local 2-meter and/or 75-meter emergency nets prove to be the most up-to-date source of information here (radio amateurs are located in all areas, and they habitually switch on their VHF FM transceivers the moment any abnormal situation occurs).

During a more widespread and serious emergency, do not ccompletely trust reports from the internet or television (assuming either is operational). Listening for distant AM broadcast stations at night may hold merit, if they are operational. Monitoring foreign shortwave broadcast stations is helpful, but only if accuracy of reports can be crosschecked by comparison to two or more neutral and/or time-proven sources. Once again, amateur radio leads the way in relaying timely and accurate information (indeed, amateur radio comes through when all else fails). In this case, 20-, 40-, and 75-meter nets are the main focal points, with conventional QSOs "filling in the gaps." Traditionally, the Salvation Army/SATERN net gathers on or around 14.265 MHz and "concerned amateurs" continuously tune/listen from 14.200 to 14.270 MHz. Just remember to listen (carefully) before transmitting.

Conclusion

This wraps up the first part of our study on emergency preparedness and hopefully it made you aware of some previously overlooked facts (thinking of radios is only part of this large equation; as skilled communicators we must see the "full picture"). We sincerely wish homeowner committees and apartment landlords could read both this month's and next month's columns. We are convinced they then would realize that having a radio amateur (with an outdoor antenna) in the community improves the emergency preparedness of the overall community and gives a life-saving voice when cut off from the outside world, assets that definitely outweigh "ugly" (?) antennas.

73, Dave, K4TWJ

BY BOB JOSUWEIT,* WA3PZO

Public Service on Two Wheels
The Motorcycling Amateur Radio Club

Public Service Editor Bob Josuweit, WA3PZO, was under the weather this month and was unable to prepare his column. Filling in as guest columnist is Contributing Editor Gordon West,† WB6NOA.—W2VU

Celebrating its 15th anniversary this coming May, the Motorcycling Amateur Radio Club (MARC) combines the hobbies of motorcycling and ham radio, while providing public-service communications for various events. Based in southern California, the organization has grown to include chapters around the United States (see "MARC on the Net" sidebar), although the original chapter appears to be the most active.

Because of MARC's mobility and the fact that each motorcycle rider is a licensed ham radio operator, MARC members are regularly asked to provide support communications for a multitude of charitable and public-service events. One example, according to founder and Chairman Ray Davis, KD6FHN (photo A), was last year's Los Angeles/Orange County Tour de Cure bike event, tending to bicyclists with everything from flat tires to minor road rash incidents.

A typical year's events calendar for MARC looks something like this:

April—Gearing Up for Abused Kids ride, which benefits sending kids to camp
April—Thousand Oaks area Tour de Cure (to fight diabetes)
May—Southern California Tour de Cure
June—The BAD Ride (Bikers Against Diabetes)
October—MS 150, benefitting Multiple Sclerosis
November—"Love Ride" (benefits Muscular Dystrophy, Read by Nine, and several other charities).

Last April, Davis notes, MARC members in Texas worked the MS 150 Ride, which drew approximately 13,000 bicyclists, along with 4,000 volunteers. Other MARC chapters throughout the United States work with other charities as well as the MS 150 and Tour de Cure Rides, offering the ability to move along the course without disrupting the flow of bicycle traffic.

"The participants in the events we cover depend on our MARC motorcycle riders and support/rescue vehicles, which are always in the right place in the right time, to assist them when they need help," com-

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Photo A– Ray Davis, KD6FHN, founder of the Motorcycling Amateur Radio Club (MARC), stands next to his packed-full-of-radios Honda Gold Wing. (Photos by the author)

MARC on the Net

There are several websites dedicated to MARC and its chapters *(although most chapter sites look like they haven't been updated recently—ed.)*:

MARC homepage: <http://marc-hq.org>
MARC mailing list: e-mail <marc@nxport.com>

Chapter websites:
Bay Area MARC local site: <http://ba-marc.org>
East Coast MARC site: <http://www.eastcoastmarc.org>
Illinois Wisconsin MARC site: <http://www.angelfire.com/sports/marc>

ments Davis, who, like many MARC members, is a former public-safety officer.

"We always appreciate the help of our MARC members volunteering to make each of these charity events a success. Please volunteer to ride with us on as many of these events as you can," adds Davis, proudly showing off his gleaming motorcycle loaded with ham radio and GPS/APRS navigation equipment.

Each month MARC members report their charitable rides and two-wheel adventures in an eight-page double-sided newsletter that is an absolute kick to read. By the time you finish it, you are ready to jump on your own motorcycle and head out—anywhere—and if you don't own a motorcycle, you are ready to buy one on the spot.

Fully-Equipped Bikes

Ray indicates that nearly all MARC members ride with a minimum of a dual-band transceiver, with many having triband sets and a growing number of members going with detached-head high-frequency (HF) radios as well (photos B and C). MARC maintains a database of helmet wiring sets to allow their members the safest way to operate the radio equipment, their intercom, and their APRS mapping, without compromising safe operation of the motorcycle. Like many other public-service ham groups, they have standardized their power connectors with the Anderson PowerPole (photo D). Most MARC members monitor 144.370 MHz simplex, with a 100.0 Hz CTCSS tone.

MARC members endorse the NCG Company's line of Comet HF, VHF, UHF, and multi-band antennas. Comet's universal mounts will fit nearly any type of motorcycle installation, and MARC members report they have had excellent cooperation from the company in designing antennas that will withstand the additional stresses of operating from a motorcycle.

The most popular choice of VHF/UHF equipment appears to be the Kenwood D-700, tied in to Garmin GPS mapping receivers. Some Garmin units will also show nearby APRS "hits" on the screen. MARC also provides a list of custom cables through one of its members, Chuck, KG6NJP (KG6NJP@pacbell.net). The MARC newsletter contains a full page of motorcycle brackets and stainless trunk rack plates to keep members from cracking the trunk lids when installing larger HF antennas. The plates fit under both the tubular and flat racks on the 1500 and 1800 Gold Wings.

If you ride a motorcycle and enjoy the camaraderie of fellow cyclists providing comms at charity events throughout the country, I recommend joining Motorcycling Amateur Radio Club. Dues are only $12/year. A membership application may be downloaded from the club's website (see "MARC on the Net" sidebar) or requested by mail from MARC, 3 Lindberg, Irvine, CA 92620-3367. 73, Gordo, WB6NOA

Photo B– Radios and other devices, such as GPS receivers and personal digital assistants, are mounted to be safe yet in easy view.

Photo C– Ray has mounted all of his radios in the rear of his bike, putting only remote heads up front.

Photo D– Anderson Power Pole connectors make for easy power hookups and—with the plugs used as a standard by club members—easy swapping of radios as well.

The Days of Whine and Roses

BY JEFF REINHARDT,* AA6JR

Happy 2007 to ham radio road warriors such as you. May your travels throughout the year be a mixture of happy motoring and happy mobiling!

The "whine" part of the headline above refers to the lament that many hams, at times myself included, have expressed at the level of difficulty in placing a two-way radio in many of today's new cars. As we'll discover in this column, the days of whining are over, as a few folks are showing us a little ingenuity goes a long way in conquering the "space crunch" in newer cars. The "roses" go to those innovators, who are showing that it's possible to integrate a modern transceiver into a newer car and perhaps take advantage of some of the display electronics found in more and more of the newer models.

You may remember our last visit, in which we shared photos of N6FFU's installation in his Nissan Murano (*CQ*, November 2006). That slick installation took advantage of the car's in-dash display, showing the operating status of Robert's ICOM transceiver. This month, we'll take a look at yet another nifty installation, this time in a Honda Accord! Ryan Jairam, AB2MH, writes:

I saw the mobiling section in *CQ* with the 7000 displaying on the navi display, and I have a similar setup which I installed after Dayton '06 in my '04 Honda Accord (see photos). I've confirmed almost 60 countries from the car between Dayton and today, and that includes two months when the rig went back and forth to ICOM for service. I operate almost exclusively mobile because of apartment antenna restrictions.

I also have a Yaesu FT-8900 (shown in the pic), which I use for VHF/UHF repeaters and scanning, and it's custom installed in a custom dash trim piece from Metra.

Also included in the setup are: Blitzsafe CD changer Aux adapter to route the 7000's audio to the car stereo, N2VZ Turbo Tuner, 35AH SLA AGM aux battery, W4RRY battery booster (to ensure constant supply of 13.8V to the radio), and Palm Radio Palm Paddles for CW while mobile.

I asked Ryan how he interfaced the car's display with the radio and he replied:

The car display module uses a NTSC to RGB converter. It is available from some car stereo shops and also online from sites such as <www.navwithtv.com> and <www.avelectronic.com>. It's a plug-in module between the navigation unit and the LCD. The 7000 has NTSC video out which you connect to the NTSC to RGB

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

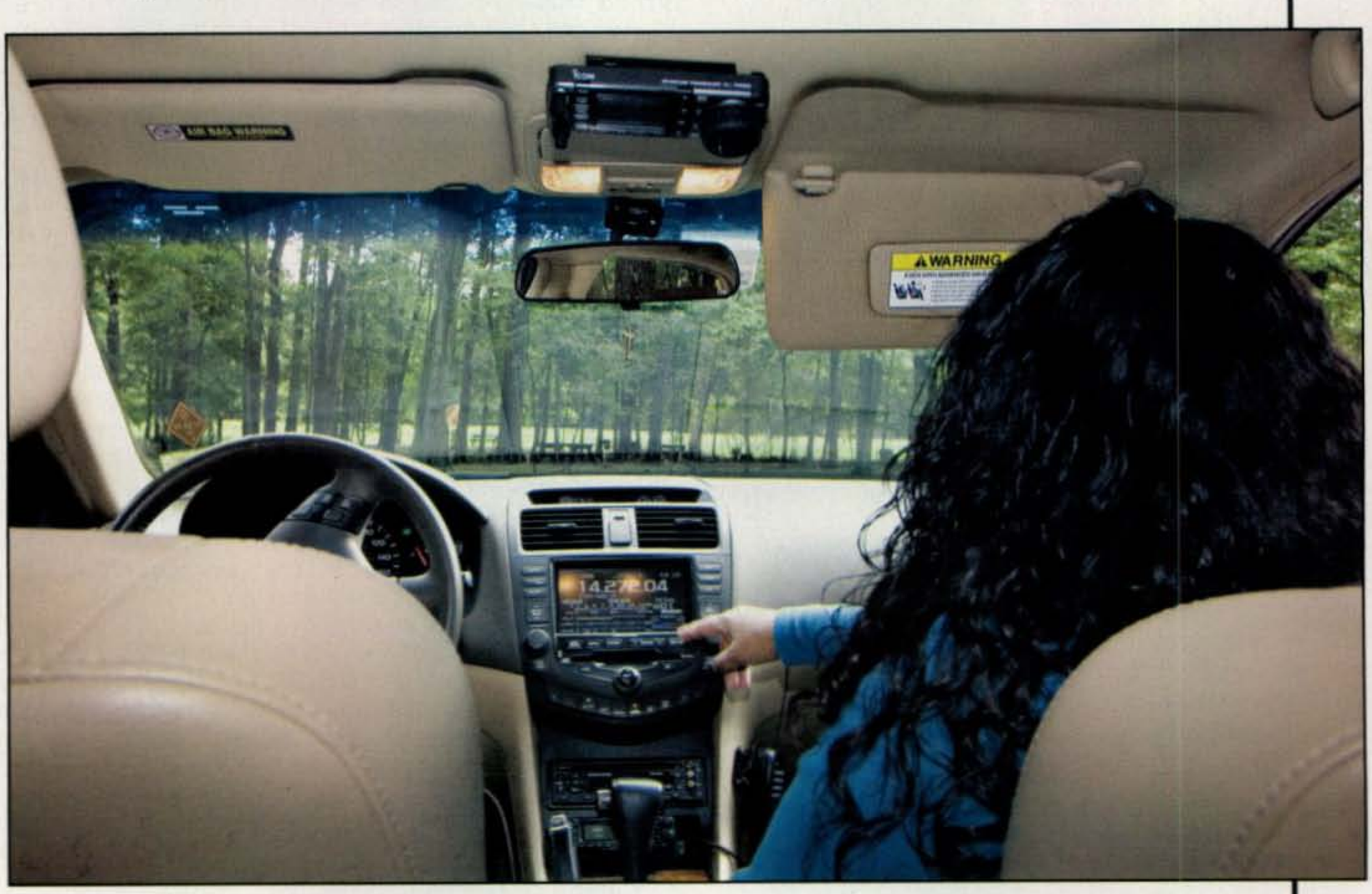

Photo A– Ryan's use of the Honda's navigation screen makes for excellent operations. Note the roof-mounted transceiver! (AB2MH photo)

Photo B– The antenna setup on AB2MH's Honda is simple yet functional. (AB2MH photo)

converter. There's a switch that selects between navi and the 7000's video.

The audio portion is a small adapter from Blitzsafe which plugs into the back of the car stereo to fool it into thinking there's a CD changer attached. It routes the audio from the 7000 to the car stereo.

If you think Ryan's setup is slick, check out this next offering from Jerry Clement, VE6AB. Short of having the Swedish Bikini Team doing the logging duties, his Ford pickup is a mobile operator's dream.

I thought that you might be interested in another mobile. I built this tower in my 2004 Ford F150 to overcome the issue of no place to mount radios. The tower may be removed in less than 2 minutes if required. The mast for the Bugcatcher also is used for my cross Yagis on a rotator for satellite work. Lately the shunt coil has been moved from the bottom of the mast to the interior of the canopy to keep it out of the weather. I enjoy my mobile a lot, with great signal reports when making contacts.

You can check out more photos at Jerry's web page: <www.stormchaser.cjb.net>.

"Roses" to Ryan and Jerry for sharing their ideas and devoting some time to doing quality installations that bring them a lot of mobile operating enjoyment. Now for the rest of us, it's time to stop complaining and get to work on upgrading that mobile installation!

Computer Mobile, Anyone?

As one who enjoys digital operations, including APRS, I have faced the dilemma of what to do with operating a computer in the car. Short of having the XYL hold it on her lap, which was effective but only worked for a brief period of time, I may have come upon another solution. *CQ* recently was contacted by the folks at Rissler Research & Development, and they

Photo C– Jerry has a "tower of power" in this radio stack that's compact and at his fingertips. (VE6AB photo)

offered us a peek at a product they call "MOE," short for Mobile Office Extension.

MOE straps onto the center console of your car or SUV, and it's designed to hold your computer securely in place, but also allows it to quickly be detached and removed from the vehicle as you and your computer continue on your travels.

Now we'll add our voice to the warnings packed with MOE—specifically, that one should never attempt to operate the computer and the vehicle at the same time. Viewing the screen and operating the keyboard are to be done only when the vehicle is safely stopped, out of traffic.

MOE comes nicely packaged in an attaché type bag and only takes a few minutes to assemble. In addition to written instructions, there's a CD included with a PowerPoint presentation that takes you step-by-step through the process.

Now I'm a bit slower than most folks; some even say it takes me two hours to watch *60 Minutes* on TV. However, following the directions, it only took me about 25 minutes to set up MOE in my wife's new car. (She gets the new iron; I get the hand-me-downs.)

Living with MOE takes some adjusting. You need to make sure the main part of the mounting unit is firmly attached to the vehicle's center console and the straps are nice and tight. Next, you need to size MOE's computer cradle to your particular notebook. I had to make a few attempts to get my IBM ThinkPad securely mounted (see photo). It's a good idea to simulate a few bumps to test the security of the cradle fit, rather than find the real thing sending your computer airborne. Although not included with MOE, I might consider adding some strong hook-and-loop strips to the bottom of my computer and MOE's mounting plate as an added measure of attachment. Another option is Rissler's "S3" Screen Support System designed to provide added stability for Search and Rescue personnel. It consists of an adjustable bar for screen support and nylon strap to help secure the computer to the cradle. You also need to be mindful of any external cable connections you may want to make to the computer before finalizing your setup. After the preliminaries are complete, you slide the computer and cradle onto the secured MOE docking unit, and once you're sure all is safe and snug, it's time to hit the road.

With MOE, you optimally pick up a secure mount for the computer, but having MOE in the passenger compartment requires some changes in thinking and in the operational

Photo D– VE6AB's Bugcatcher is securely mounted; cross Yagis can also be placed on the mount for mobile satellite work! (VE6AB photo)

access to controls in some vehicles. You will, of course, lose an "elbow rest," and in my wife's car it takes some modified reaching to access the console-mounted gear selector. That's not too much of a problem with an automatic transmission, but it is a potential issue with some manual-shift vehicles.

All in all, MOE is an option to consider as you weigh the choices in taking a computer (or other gear) mobile. You can check out more information on MOE at <www.rissler-rd.com>; MSRP for the MOE unit is $179.95.

A Look Back

I'll close by sharing a few details of a "dream trip" I took last summer. I scheduled a few weeks to drive coast to coast in my "little blue rocket," a 2004 Corvette. For 17 glorious days I motored through 24 states looking up old friends, making a few new ones via ham radio, and drinking in the vastly varying vistas across the USA. I traveled solo, and driving a car with a manual gearbox often requires two-hands, so radio operations were not as frequent as I might have liked. You might remember that last year was the 50th anniversary of the US Interstate system and I recommended in this column that you take the opportunity to see some part of the USA and take a radio along.

Some pleasant surprises and discoveries: Traffic and construction weren't too bad. Gas prices were elevated, especially when the vehicle requires premium, but the highest prices encountered were in my home state of California. And would you believe a 350-horsepower Corvette can regularly get 30 or 31 miles per gallon when cruising at (mostly) legal speeds in sixth gear? Hams in the deep south were quick to engage in conversation, while long tracts of mid-America and the eastern seaboard states didn't exhibit a lot of activity on 2 meters—maybe they were at the beach?

Photo E– MOE as installed in KD6BIT's new ride. See text for details on how this computer mounting system works! (AA6JR photo)

The Natchez Trace in Mississippi was over a hundred miles of serenity well absorbed. Western North Carolina is a jewel waiting to be discovered. Virginia seemingly has much of its population working for the Highway Patrol (no, I wasn't a customer, but many others were). The southern tier of upstate New York is magnificently bucolic. The Oklahoma City memorial is truly a moving experience. If you love aircraft, the SAC Museum outside Omaha is worth a stop, as is the museum at Wright Patterson Air Force Base in Dayton. Western Colorado's Grand Mesa was a new discovery, and the magnificent desolation of the Utah desert during high summer is both thrilling and humbling, especially when you stop to take photos and step out of an air-conditioned cabin into 117-degree temperatures. And just *what* do they do with all that corn grown across the USA?

In all, I rolled up over 7500 miles and had a wonderful experience. What are doing *this* summer?

Keep those tips and photos flowing into *CQ* via my address at the beginning of this column. We love to show off those great mobile setups.

73, Jeff, AA6JR

An In-Line, Low-Current Ammeter for Under $20

BY PHIL SALAS,* AD5X

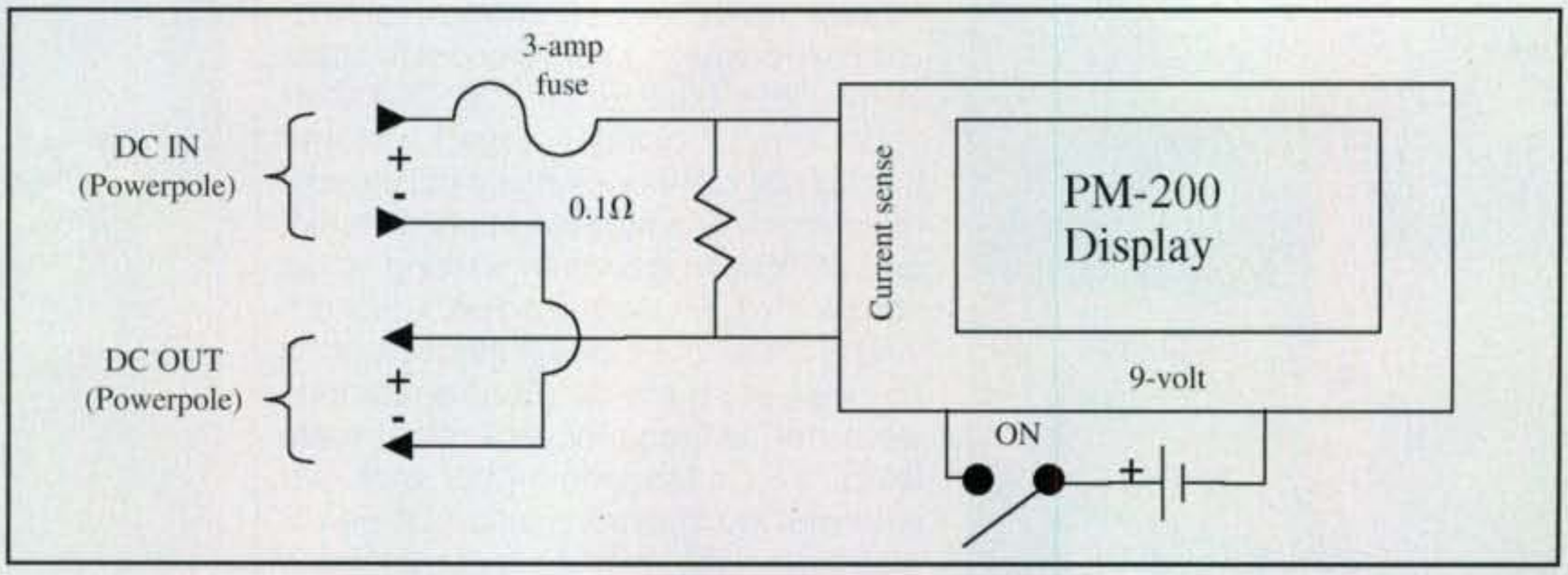

Fig. 1– Schematic of the 2-amp digital current meter.

I've often wanted an accurate in-line digital ammeter for my home-project work. In particular, I've needed an ammeter with at least 10 ma resolution for many of my low-current projects.

Recently while glancing through an All Electronics catalog (www.allelectronics.com), I saw listed several low-current $3^1/_2$-digit LCD displays—200 millivolts, 20 volts, and 200 volts. The 200-mv meter is only $7. The higher voltage displays are $9 each, since they consist of the 200-mv unit with modifications to directly read the higher voltages. These digital meters fit into a rectangular hole just 2.12" × 1.5" and must be powered from a separate 9-volt battery. At just $7 for the 200-mv meter, I felt this would be perfect for my ammeter requirement.

The digital ammeter is very easy to build. All parts can be purchased from All Electronics and Mouser Electronics (www.mouser.com). I used Anderson Powerpole connectors for the DC input and output, as these are my "standard" DC connectors. AMP makes a powerpole-equivalent connector which can be purchased from Mouser if you don't have any Anderson Powerpole connectors on hand. The parts list is shown in Table I.

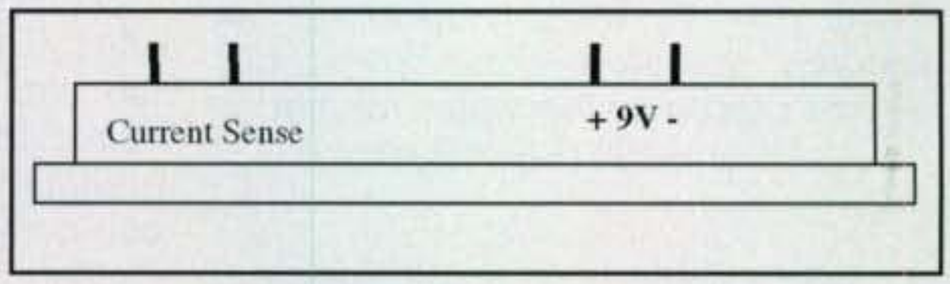

Fig. 2– Interconnect points on the digital meter.

Refer to the schematic (fig. 1) and the side view of the display (fig. 2). You'll see that I included a fuse and fuseholder, but I'm not sure I'd include these in future units. The key to this ammeter is the 0.1-ohm 5% current sense resistor placed in parallel with the meter input. A 2-amp current through this sense resistor gives a 200-mv voltage drop. I used a nibbling tool to cut out the hole in the metal box cover for the digital display. The corners of the digital display interfere with the cover mounting screws for this particular box, so I rounded the display corners with a small file. The unmodified digital display is shown in photo A.

Before soldering any wires to the display, first

*1517 Creekside Drive, Richardson, TX 75081
e-mail: <ad5x@cq-amateur-radio.com>

Qty.	Cat. Number	Description	Price each
1	All Electronics PM-200	200-mv digital display	$7.00
1	All Electronics FHPM-45	GMA fuse holder	2/$1.00
1	All Electronics GMA-3	3-amp GMA fuse	5/$0.75
1	All Electronics TB-2	$3^5/_{16}$" × $2^1/_8$" × $1^3/_8$" box	$1.95
1	All Electronics SSW-37	Miniature slide switch	4/$1.00
1	Mouser 66-OAR1R100JLF	0.1-ohm sense resistor	$0.60
2	Mouser 571-14459572	Black housing*	$0.37
2	Mouser 571-14459575	Red housing*	$0.37
4	Mouser 571-16041122	Contacts*	$0.16

*AMP "powerpole" equivalent connectors.

Table I– Parts list for the digital ammeter.

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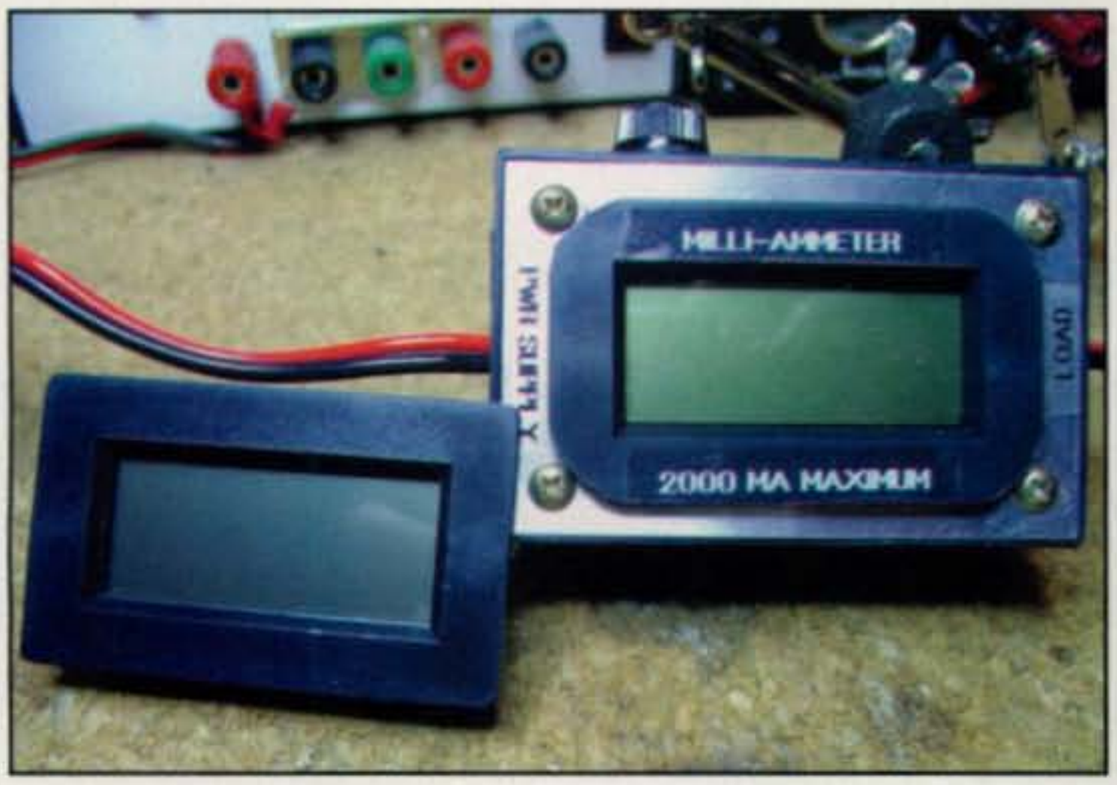

Photo A– Unmounted and modified mounted digital panel meters.

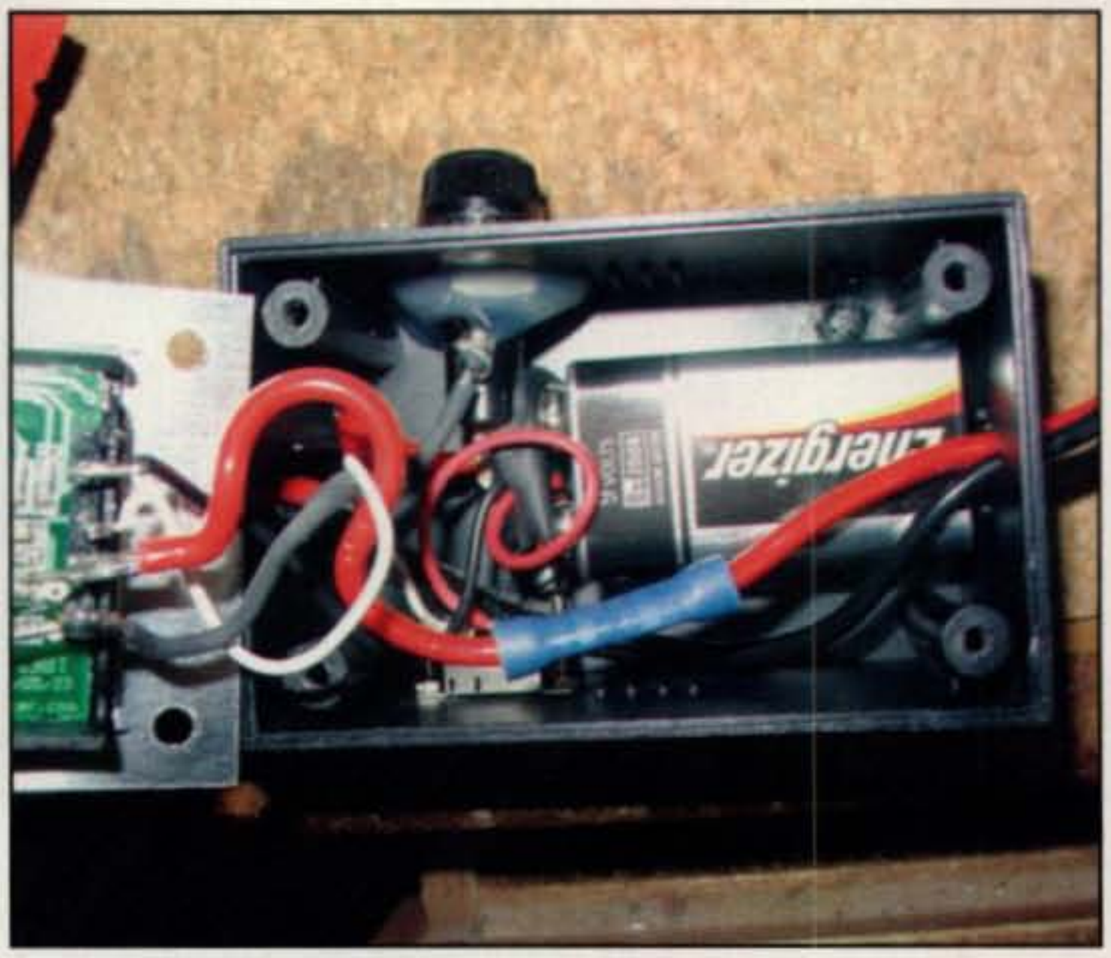

Photo D– Internal wiring view.

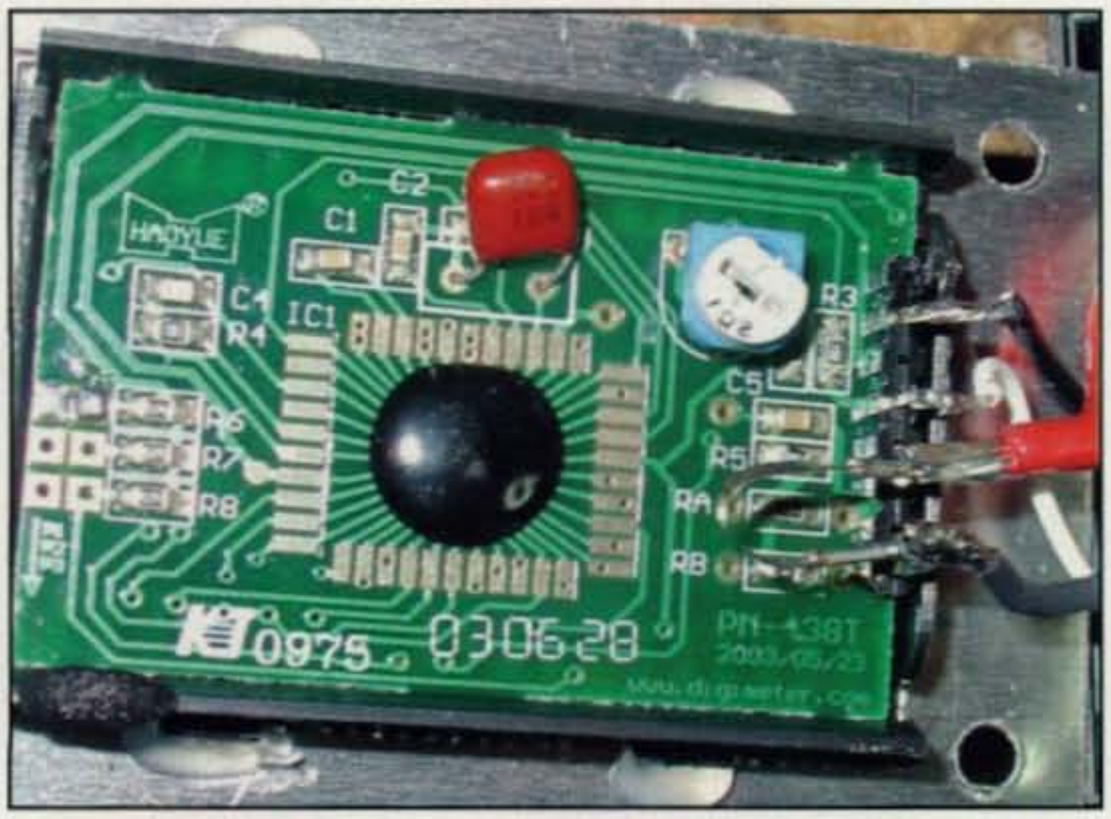

Photo B– Backside of the digital display. Decimal-point solder jumpers P1, P2, and P3 are on the left. The sense resitor is soldered on the right.

unsolder the solder jumper across "P1" on the display PC board. This turns off the decimal point on the display. The jumper is clearly marked on the board, and can be seen on the left side of the bottom of the board in photo B. You'll need to use a small solder sucker or solder wick to do this.

Next, mount the miniature on/off slide switch on one side of the box as shown in photo C, and the fuse holder (if used) in the opposite side of the box. I used 18-gauge DC cabling for the input and output wires, since this meter handles 2 amps (2000 ma) maximum current. The internal 9-volt battery is held in place with double-sided tape. Photo D shows the internal wiring, and photo E shows the measured receive current drain on my FT-817. For labeling, I used Casio "White-on-clear" tape on the box and display, and Casio "Black-on-clear" tape on the metal cover. as can be seen in the photos.

Conclusion

Convenient in-line current meters are very handy for the ham experimenter. The unit described here is an excellent addition to the normal test equipment used by hams and provides accuracy of 5%. which is the tolerance of the sense resistor used. The range of this particular design is 2 amps maximum, but you can easily modify it to cover other current ranges simply by changing the sense resistor (0.01 ohms for 20 amps).

73 until next month, Phil, AD5X

Photo C– Switch mounting position.

Photo E– Measuring the Yaesu FT-817 receive current (milliamps).

washington readout

BY FREDERICK O. MAIA,* W5YI

FCC Begins Proceeding on Amateur Station Identification Rules

Most hams want to retain the current ID regulations.

Thirty years ago, the Amateur Service station identification rules required amateur stations to be "...identified by the transmission of its call sign at the beginning and end of each single transmission or exchange of transmissions and at intervals not to exceed 10 minutes...."

This was changed in the late 1980s to its current wording during the "Reorganization and Deregulation of Part 97" proceeding (PR Docket 88-139, released June 9, 1989). The big change was that stations would now ID at the end, rather than at both the beginning and end of their transmission(s), along with every 10 minutes during a contact (no change was made there). The explanation given was that the station identification procedures were being "simplified."

On Monday, October 30, 2006 the FCC accepted two Petitions for Rulemaking that proposed amendments to the Part 97 rules and placed them on Public Notice. Both want the Amateur Service station identification rules changed again, but they seek to go in two different directions. Here is what the petitioners asked for:

RM 11346 was filed by Murray Green, K3BEQ (Extra Class of Cheverly, MD), over two years ago. in December of 2005. Green requests that the Commission amend the station ID rules required in Section §97.119(a) "...to require Amateur Radio station identification at the end of each communication and at least every thirty minutes."

Currently, says Green, "Each amateur station, except a space station or telecommand station, must transmit its assigned callsign on its transmitting channel at the end of each communication, and at least every ten minutes during a communication, for the purpose of clearly making the source of the transmissions from the station known to those receiving the transmissions. No station may transmit unidentified communications or signals, or transmit as the station callsign, any callsign not authorized to the station."

He argues that identifying every 30 minutes "...would harmonize the Amateur Radio Service station identification requirement with that of other radio services and should not hinder the Commission's enforcement of Amateur Radio regulations."

He feels the 10-minute requirement "...perhaps out of an abundance of caution" has resulted in "...over-identification by Amateur Radio operators."

RM 11347, filed by Glen Zook, K9STH (Extra Class of Richardson, Texas), in May 2006, requested the wording of Section §97.119(a) be amended to more closely resemble the old FCC §12.82(a) Transmission of callsigns rule. (Back in the 1950s, the Amateur Radio Service rules were under Part 12 before being moved to Part 97.)

Zook contends the current rule requiring station identification at the end of a communication or every 10 minutes can result in unidentified communications if the initial exchange takes less than 10 minutes. "If the callsign is not given during the first transmission, then the station has, by definition, made an 'unidentified' transmission that is contrary to the provisions of 97.119(a)," Zook said in his petition.

He said FCC rules used to require radio amateurs to identify their station at the beginning and end of each single transmission. Under his proposal, multiple short transmissions (less than three minutes total duration) would not need to make an ending ID. Station identification would still be required every 10 minutes during longer transmissions. He would also have the FCC require amateurs to identify the station with which they are in contact.

Zook wants Section §97.119 rewritten to the previous (Part 12) rules as follows:

(a) Transmission of callsigns.

(1) The operator of an amateur station shall transmit the callsign of the station or stations (or may transmit generally accepted identification of the network) being called or communicated with, or shall identify appropriately any other purpose of a transmission (i.e., "Test"), followed by the authorized callsign of the station transmitting:

(i) at the beginning and end of each single transmission or;

(ii) at the beginning and end of a series of transmissions between stations having established communications, each transmission of which is of less than three minutes duration (the identification at the end of such a series may be omitted when the duration of the entire series is less than three minutes), and;

(iii) at least once every 10 minutes or as soon thereafter as possible during a series of transmissions between stations having established communications, and;

(iv) at least once every 10 minutes during any single transmission of more than 10 minutes' duration.

(v) When telephony is used, the callsign of the station shall be preceded by the words "this is" or the word "from."

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

RSGB Books available from CQ

Antenna Topics

byPat Hawker, G3VA

RSGB. 2002 Ed. 384 pages.
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Edited by Dr. George Brown, M5ACN
RSGB 2002 Ed, 224 pages
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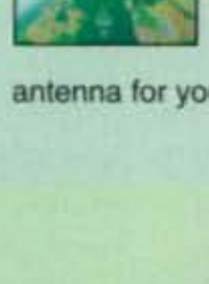

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By Fred Handscombe, G4BWP.
RSGB. 6th Ed., 2003. 48 pages.
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(vi) When telegraphy (CW) is used, the callsign of the station shall be preceded by the prosign "de" (meaning "from").

(vii) When other modes of communications are used the appropriate designation which implies the word "from" or "this is" may be used.

Zook said "(t)he suggested rewording of Section §97.119(a) represents a minor, but important, change in the regulations concerning the Amateur Radio Service."

What the Amateur Community Said . . .

The initial comment period closed on November 29, 2006 and dozens of radio amateurs made their thoughts known. Here is a sample of what they said, as excerpted from the FCC's Electronic Comment Filing System (ECFS). Several amateurs commented on both petitions at the same time.

"The current rules for identification of an amateur station are not a burden. There is no reason an amateur should not identify every 10 minutes. For those who have difficulty remembering to do so, there have been 10-minute timer devices sold for this exact purpose for decades. And those operators who cannot remember to identify every 10 minutes are no more likely to remember 30 minute intervals. ...Another factor to be considered is Amateur Service communications frequently take place on frequency bands where ionospheric propagation changes in less than 30 minutes. Thus, it could happen that a station's transmissions might never be identified in a time frame during which propagation to a monitoring station allows."

Christopher Johnson, WA2ZDY
Wesley Chapel, FL

"If there is an issue with stations failing to identify per the current regulations, those operators should be counseled or tracked down and referred to the FCC for enforcement. Adding the requirement to begin each transmission with your FCC callsign is unlikely to affect a change in behavior in the way an enforcement letter from the FCC would."

Richard A. Aldom
W7STS, Chandler, AZ

"One word describes this: 'Absurd.' Thirty minutes is *much* too long between IDs. This would only promote even more 'lack of ID' problems."

Bruce Ferry, AK8B
Silver Lake, OH

"Too often I find myself wondering who it is that is transmitting on a particular frequency. I depend on the fact that they are 'required' to ID their station [every 10 minutes] in accordance with current regulations. Thirty minutes is too long. The rule should remain as is."

Vince Lombardo, KA1AOC
N. Charleston SC

"Adding a new requirement to also provide the callsign of those stations with whom you are communicating adds an additional burden that neither enhances the service nor aids in enforcement of the Commission's rules and regulations. If an amateur radio operator incorrectly hears the callsign of the other station, will he/she be out of compliance if they incorrectly identify the other station on the air? If an amateur radio operator is engaged in a "round robin" communication with multiple licensees, will he/she be required to list all of the other stations involved in the communication?"

Gerald A. Minor, N5RKE
Albuquerque, NM

"Official Observers monitor transmissions and notify Amateur Service licensees of apparent violations or discrepancies in obeying the FCC regulations. To do so, they must be able to easily and quickly make proper identification of the transmitting stations. Changing the interval to 30 minutes will greatly hamper the OOs ability to make identifications."

Duane Traver, WV2B
Marathon, NY

"I am opposed to the change in the identification requirement [to 30 minute intervals]. I believe that the 10-minute rule should stay in place. Pausing to give a callsign can also provide a natural break in a conversation, allowing other amateurs to join in, interject, or make their calls. It is in the nature of the Amateur Service to take time and respect other users of the spectrum and I believe that [the 10 minute] IDs given are an important aspect of the service.

Jeff Crabill, KK7LU
Salem, OR

"Our operating frequencies are not confined to designated channels. A ham may operate on whatever frequency he chooses within the bounds of his license privileges. This is not true for any other service. If one hears an unknown amateur station on the 20 m band, there is no clue of its identity until its callsign is sent. ...The current rule is reasonable and does not place an undue burden on amateur operators."

William J. Hoge, W3JJH
Westminster, Maryland

"I believe that Amateur Radio operators should have to identify themselves at the start of a communication with their station callsign, then thereafter once every 30 minutes during that communication, assuming it lasts 30 minutes or more, and at the end of the same communication. Having to identify with your station every 10 minutes is too often, especially during nets conducted on repeaters.

Ceburn "Jack" Swinden, W5JCK
Arlington, TX

"The one question I would ask is, 'Why would someone *not* want to identify his/her station often?' The Amateur Radio Service has a history of open communications and this should not be changed. ...I also suggest that the Commission require digital stations to identify in Morse at the end of each transmission. This would aid in the identification of interfering stations without the need to decode the digital mode.

Charles Young, AG4YO
Brandon, MS

"It makes sense for the FCC to modify section §97.119(a) to require station identification at 30-minute intervals, instead of the 10-minute interval now required. This increased interval will allow uninterrupted transmission of certain types of material that could be compromised by requiring breaks for station identification at more frequent intervals. Harmonizing the amateur radio regulations to be more in line with commercial practice is a reasonable accommodation and should present no difficulty for enforcement personnel.

James B. Wiley, KL7CC
Anchorage, AK

"The current requirement to identify at least every 10 minutes during a communication is appropriate and is not a hardship. It serves to maintain a certain order of discipline on the airwaves. I would not want to have to wait 30 minutes in order to identify the source of a deficient transmission."

John Elengo, W1DQ
Cheshire, CT

"High Frequency (HF) propagation conditions can change such that a station can no longer be heard by a given

receiving station and therefore identification is effectively precluded [with a 30-minute ID interval]. ... Regarding the Zook Petition, imposing a new three-minute transmission rule where identification at the end of such a transmission is not required overly complicates the existing rules regarding station identification. The station identification rules as currently written are entirely satisfactory."

Wayne C. Greaves, W0ZW
San Patricio, NM

"By dusting off old regulations instead of carefully considering how to solve the problems, the petitioner proposes several 'solutions' that are unrelated to the problems. (For example, the requirement to say somebody else's callsign as part of your identification, or the requirement to use the specific words 'this is' in identifying.)"

Mark Sienkiewicz, KB3MNG
Pasadena, MD

"A periodic ID requirement in my opinion is a useful tool to: (a) allow feedback to the originator of long transmissions... (b) provide at least a marginal tool for self-policing of the bands, i.e., not having to wait for protracted periods to find out whether the transmitting station in question has a license at all ...and (c) many of us would simply like to know who we are talking to."

David G. Borcher, K7NG
Logandale, NV

"The transmission of the callsign of the other station or stations is unnecessary and a waste of time. If the FCC does not have a need for this extra identification, I see no reason why it should be required. The addition of the words 'this is' or 'from', or 'de' in CW is also unnecessary, and does nothing to improve identification procedures and is a waste of time."

James C. Preston, N6VH
Santee, CA

"Some time ago the requirement for logging amateur radio contacts was discontinued. I believe the transmission of all of the calls involved in a roundtable or net by a transmitting station to be a reinstatement of the old logging requirement. Since calls are unique, each amateur operator should be responsible for his own ID only."

James L. McCoy, W0LQV
Overland Park, KS

"I agree that the station identification time should be extended from 10 to 30 minutes. Although it is normally not a problem for two stations talking to each other to ID every 10 minutes, it becomes increasingly cumbersome for groups."

William McKeehan, KI4HDU
Kodak, TN

"When monitoring an ongoing conversation on the air, it is reasonable for the monitoring station to learn who the parties to the conversation are with no more than a 10-minute wait. An increase to 30 minutes would place an unreasonable burden on a listening station who may simply want to know who he/she is listening to."

John King, WN5R
Lake Jackson, TX

"As long as operators are obeying the existing rules, they are working fine. If they are *not* obeying the existing rules, then the FCC needs to spend more time enforcing them. ... If nobody is obeying the 20 mph speed limit in a school zone, is it OK to not enforce the law anymore? Or would it be better to change the speed limit?

Craig L. Sturman, N7ZSD
Idaho Falls, ID

"If operators are not identifying as required by current rules, doubling the number of identifying transmissions required will not mean non-compliant operators would conform to the new rules."

Michael A. Hemel, KB7WUK
Portland, OR

"I fully support the petitioner's request to extend ID time from 10 minutes to 30 minutes. Canadian amateurs have been identifying every 30 minutes for as long as I can remember and no problems and enforcement issues have resulted from this action. Although it is normally not a problem for two stations talking to each other to ID every 10 minutes, because transmissions are normally kept to under 10 minutes, it becomes increasingly cumbersome for large groups (three or more in QSO) to ID every 10 minutes. The petition is long overdue and should be granted without delay."

Ron Grandmaison, W4VR
Eagle Lake, ME

"Mr. Green makes an effective case for 30-minute identification intervals. If the FCC will not expand the interval from 10 minutes to 30 minutes, then an expansion to 15 or 20 minutes would seem reasonable and consistent with other radio services [including the Part 80 Maritime service, which operates on all frequency bands]."

Earl Paazig, N8KBR
Frazeysburg, OH

"The old rules of transmitting the callsign of the station(s) being communicated with as well as your own callsign may have had purpose back in the days of crystal control and separate transmitter/receivers, as stations often operated many kilocycles apart out of necessity. However, in these days of modern transceivers and zero-beat operation, there is no reason whatsoever to revert back to this type of identification."

Norman E. Cyr, Jr., KB8KMH
Huntington, WV

"Many operators 'miss' the 10-minute intervals as it is, but sometimes catch the next period. In a 30-minute ID situation a missed ID could result in no identification for an hour! The FCC should look into the practice on many frequencies where operators all ID at the same time on top of each other—the result is no calls are transmitted in the clear, which is as bad or worse than missing an ID."

Wayne P Staats, WS8RM
Cuyahoga Falls, OH

"Is it possible that this filing (RM-11347) is just another attempt to make newer amateur operators experience what older amateurs had to endure? It's like the issue of dropping the code requirement (WT Docket 05-235). I have heard many older amateurs state that they are opposed to removing the code because they themselves had to learn it, and they believe that if they had to do it, then everybody else should as well."

James Melton, KI4MSA
Fountain Inn, SC

Next Steps

Now that the initial comment period has closed, the FCC has two options. It may propose revised rules in a Notice of Proposed Rule Making (NPRM), which would then open another comment period, or it may decide to leave the rules as they are and decline to issue an NPRM. Either way, there is no timetable for FCC action. If an NPRM is issued on this matter, we'll keep you informed.

73, Fred, W5YI

digital connection

BY DON ROTOLO,* N2IRZ

Book and Mini Product Reviews

Back in the December 2006 issue, my column started by promising a review of a great book I had just read, but I never mentioned it again. Oops! Well, don't blame our fine editing staff; that was purely my fault. Thus, to make good on that promise, we'll start off with a review of a book on conducting a site survey for an 802.11 wireless LAN, which is directly related to December's topic of Wireless LAN design.

The digital world has been unusually quiet over the past few months. No really new events, modes, or products have come to my attention lately, so we'll close this month's column with a few handy items that have been accumulating over the months.

Wireless Site Surveying

As I come across interesting and useful books, every so often I'll include a mini-review in this column, as time and space permit. This time I want to give you a look at one of the more scholarly texts that have passed before my eyes lately, *802.11 Wireless Network Site Surveying and Installation,* by Bruce Alexander (Cisco Press, ISBN 1-58705-164-8, 432 pages, $55 hardcover).

This university-level textbook is a thorough introduction to the many considerations and techniques used when surveying a site and deploying a wireless network. Any ham who is considering the use of 802.11 gear for a local LAN, or even an IT professional who needs to deploy a wireless LAN, will benefit from reading this book. The understanding of site surveying techniques and interpretation of the results gained will help a network designer build a far better network than one assembled otherwise.

The author assumes that the reader understands computers and the goals of a wireless LAN, but little else. The first section is an introduction to the basics of wireless networking, the vagaries and magic of radio frequencies, regulations, and choices for architecture and hardware. Most hams will already have a good understanding of a large portion of this section— frequency and propagation, antennas, and feedline losses—but even one experienced in the above will still learn a few things. This part of the book is not intended as a thorough investigation of these points, but rather as an overview so the reader can "get a clue" as to the many issues one needs to consider.

The second section is a much more detailed and thorough treatment of the book's main point: surveying a site for the installation of a wireless network. Here the author gets very specific on exactly how to prepare for, conduct, and evaluate a site survey, with emphasis on equipment and materials, troubleshooting, and incorporating what was learned into the final design. Included are recommended signal levels, suggestions for a site survey "kit," ideas for RF coverage under difficult conditions, and tips on optimizing various settings for best performance. There are few people out there who understand these topics in any depth, so suffice it to say that these chapters were a real learning experience for me.

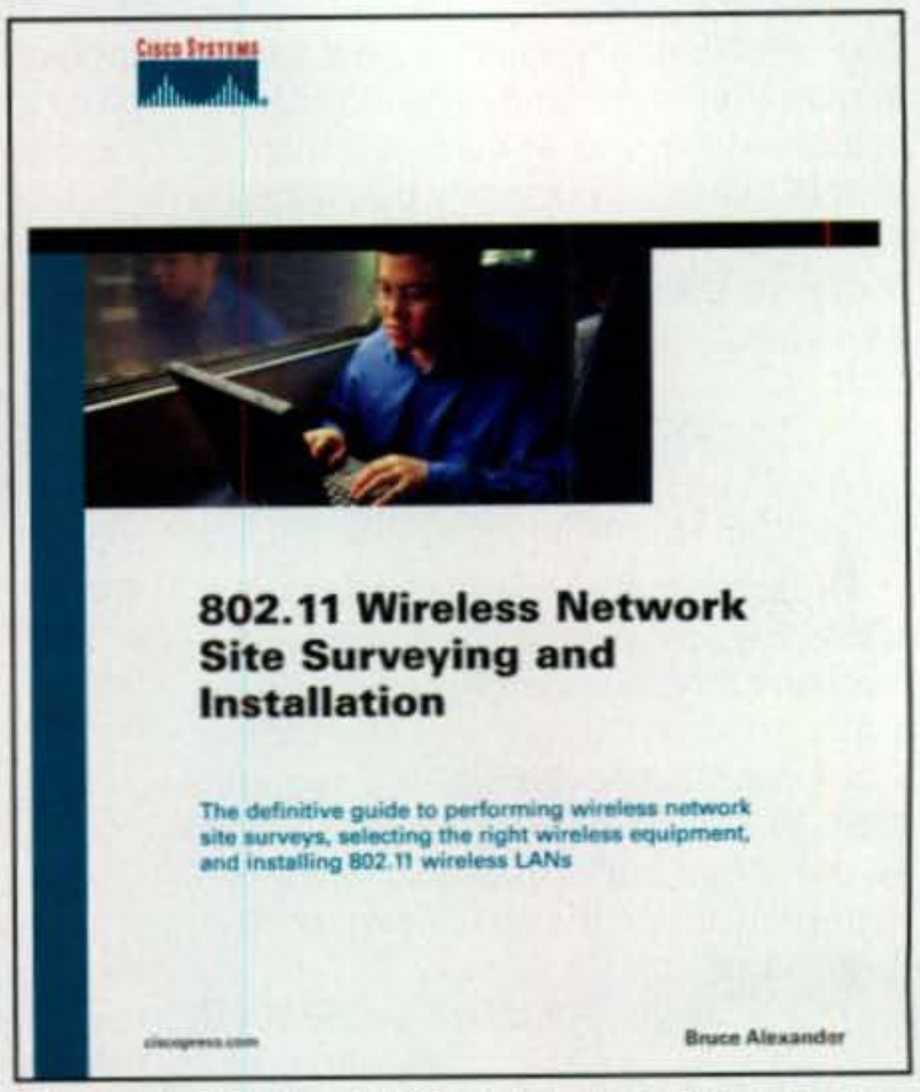

Photo A– The book 802.11 Wireless Network Site Surveying and Installation, *by Bruce Alexander, is thorough and detailed guide to wireless LAN design. It will prove immensely helpful to any hams considering a wireless network, such as for HSMM. (Photo courtesy of Cisco Press)*

The final section focuses on installation techniques. The author shows a great deal of practical experience here, not only explaining how to deploy the equipment properly, but with adherence to safety, safe work habits, and installation aesthetics. A chapter is devoted to ensuring the installation is properly documented: what the site survey found, how the design was determined, what was installed and where, and what to do when there's a problem. While aimed at keeping the customer well-informed (and therefore happy), this also serves as a reference for the next person who has to work on the system (which might be you!). The final chapter covers outdoor bridge deployments for connecting two or more LANs, such as between buildings on a campus.

The appendices cover currently available equipment from many manufacturers to assist you in making intelligent and informed choices, as well as some sample forms for performing a site survey.

In summary, the book will prove valuable for anyone who wants to learn the specifics of conducting a site survey for a wireless LAN installation. Very detailed information on conducting a site survey, and subsequent installation techniques and considerations, is given along with more general information concerning wireless LANs, RF, and regula-

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Burial: **Yes**, UV Resistant: **Yes**.
Shields: **2** (100% bonded foil +90% TC Braid) **VP 85%.**
Attenuation 6.0dB @ 2 GHz at 100ft.
Usage 450 MHz and Higher.

CNT240 (LMR type)
Connector: **N, PL259, TNC, SMA, BNC.** RG8X SIZE SHOWN
Burial: **Yes**, UV Resistant: **Yes**.
Shields: **2** (100% bonded foil +90% TC Braid) **VP 84%.**
Attenuation 3.0dB @ 150 MHz at 100ft.
Usage 1 MHz and Higher.

CNT195 (LMR type)
Connector: **N, PL259, TNC, SMA, & BNC** RG58U SIZE NOT SHOWN
Burial: **Yes**, UV Resistant: **Yes**.
Shields: **2** (100% bonded foil +90% TC Braid) **VP 80%.**
Attenuation 0.45dB @ 2 GHz (3ft Jumper).
Usage 1 MHz and Higher.

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Photo B– The RIGblaster Plug & Play sound-card interface from West Mountain Radio. Truly plug & play, it connects to your radio's data or aux port and gets you on the air in record time. With RS-232 serial ports going the way of spark modulation, a USB interface might be your only choice. (Photo from West Mountain Radio's website)

Photo C– The Timewave HamLinkUSB CAT and CI-V rig control interface. With the RS-232 serial port going the way of spark, this USB interface can come in handy. Different versions are available with features such as PTT keying and external inputs. (Photo from the Timewave Technology website)

tory considerations. I was especially pleased with the author's writing style, which is engaging and authoritative, without being uninteresting and dry.

Amateur radio operators considering the deployment of an 802.11 LAN, or in a more general sense any RF-based network, would be well advised to get a copy of this book. While the methods and information focus on the 2.4- and 5-GHz bands, and on Local Area Networks, many of the concepts are universal in that they apply equally to 2 meters and other bands as well. My thanks to Bruce Alexander and Cisco Press for their helpful book.

RIGblaster Plug & Play

Our friends at West Mountain Radio have come up with yet another radio-to-computer interface box, and this one promises to be the easiest of them all to hook up; it's literally plug & play. A USB interface for the PC side ensures compatibility with modern PCs, which seem to be losing their RS-232 ports. On the radio side, instead of using the microphone and speaker jacks, it works only with the data or auxiliary jacks. There are three different adapter cables, each designed for a specific radio type. Not only can you use it for all of the sound-card modes, it also allows CW operation, rig control, and Echolink operation. Like the name says, just plug it in

and it works, no jumpers or fooling with connectors or switches. For more details, contact West Mountain Radio, 18 Sheehan Avenue, Norwalk, CT 06854 (orders 1-888-937-8686;<www.westmountainradio.com>).

HamLinkUSB

With the prevalence of USB ports, combined with the relative dearth of RS-232 ports, Timewave Technology (the PK-232 folks) has developed the HamLink-USB rig control interface. By using built-in USB ports with unique addresses, it permits multiple interfaces to be connected to your station computer at the same time without problems. It can be used as a normal CAT/ CI-V rig control interface, compatible with most radios, and there are versions to control the PTT line or accept an external input, such as a foot switch. Contact Timewave Technology, Inc., 1025 Selby Ave., Suite 101, St. Paul, MN 55105 (1-651-489-5080; <www.timewave.com>).

SmartDigi and D-STAR

Until recently, the APRS-like functionality within D-STAR has had to live separately from the APRS system. Although both systems carry GPS-driven position reports, they use different protocols and don't work with one another.

Now that D-STAR is really gaining in popularity, Rich Painter, ABØVO, of Painter Engineering, has adapted the SmartDigi expansion board to transport D-STAR position reports to the APRS world. The original SmartDigi is an expansion board for Coastal ChipWorks' TNC-X, allowing an intelligent APRS digipeater to be put on the air without a host computer. It checks for (and eliminates) duplicate calls and duplicate packets and has advanced rule-based controls and filters for great flexibility and power. For anyone who wants to set up an intelligent APRS digipeater, but needs low power consumption (such as for emergency operations) and wants to avoid the hassle of having a computer connected and running, this DSP-microcontroller-based board is just what you're looking for.

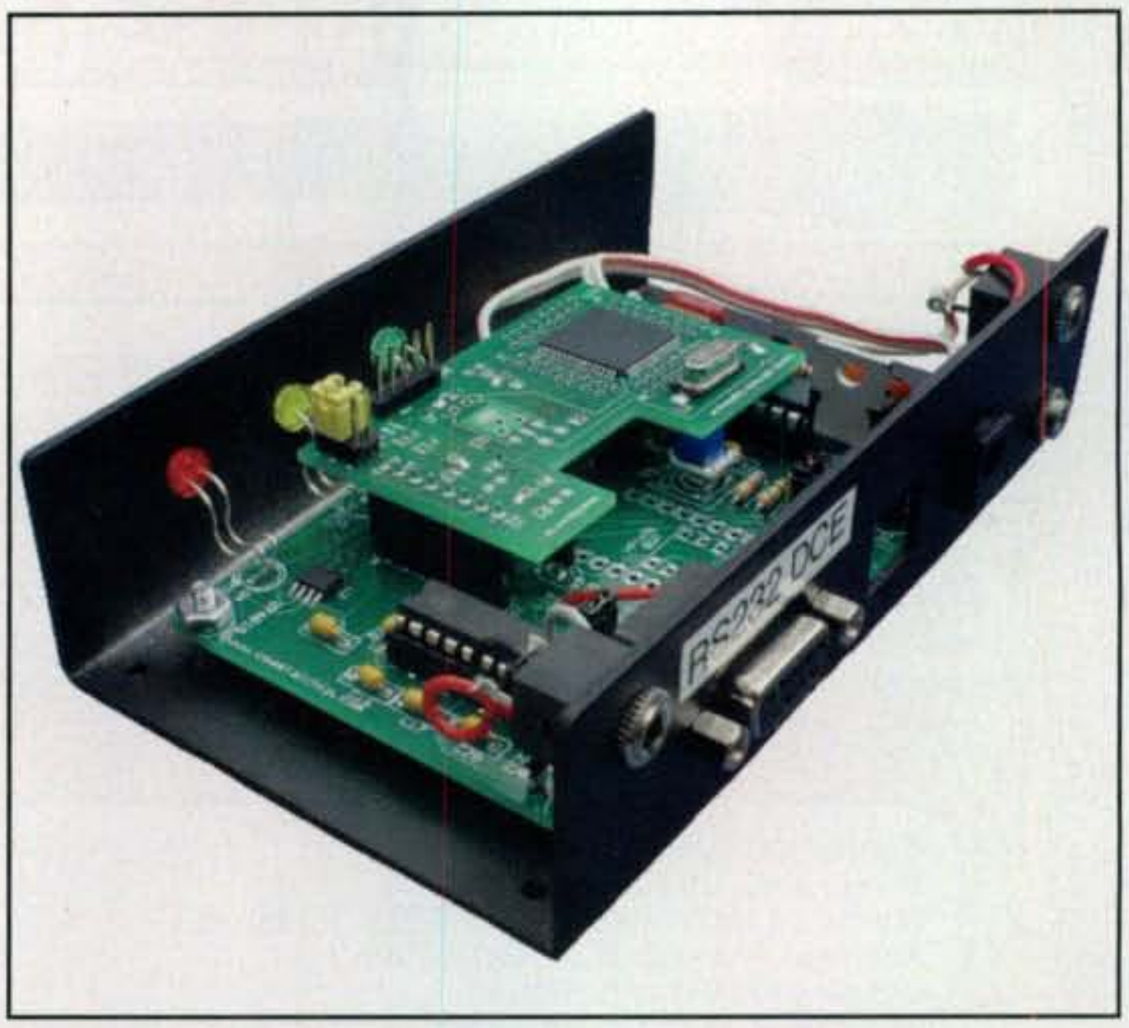

Photo D– The SmartDigi expansion board from Painter Engineering shown installed above the main board in a Coastal ChipWorks TNC-X. One version of this product is an intelligent APRS digipeater; the other is a D-Gate, which translates D-Star position reports into APRS. (Photo from the Painter Engineering website)

The new version of the SmartDigi is called the D-Gate, and it's the first (and, as far as I know, the only) way to translate D-STAR NMEA GPS data position reports into APRS Base-91 compressed position reports. The D-Gate version has several features different from the APRS Digipeater mentioned above, but most of the features and functions are the same.

The exact technical details are lengthy, being the subject of a presentation and paper at the 2006 ARRL/TAPR Digital Communications Conference (DCC), but are available online at <http://usmartdigi.com>, along with a link to the aforementioned DCC paper. You can also order either version, along with a TNC-X if necessary, at the same website.

In Closing

Next time I plan on having a guest columnist get into some details of a simple data-encryption application for use in sensitive emergency communications. While certainly not "strong" encryption, it's more than enough to keep the honest folks honest. Now that encryption for certain purposes appears to be legal, an easy-to-use key-based program such as this can be deployed to the benefit of hams and the agencies they are serving.

Thanks to Cisco Press, as well as West Mountain Radio, Timewave, and Painter Engineering for their great and innovative products. I also thank everyone who takes the time to write to me with comments, suggestions, ideas for future columns, and yes, even complaints. We're used to two-way communications, and this column isn't any different. Until next time . . .

73, Don, N2IRZ

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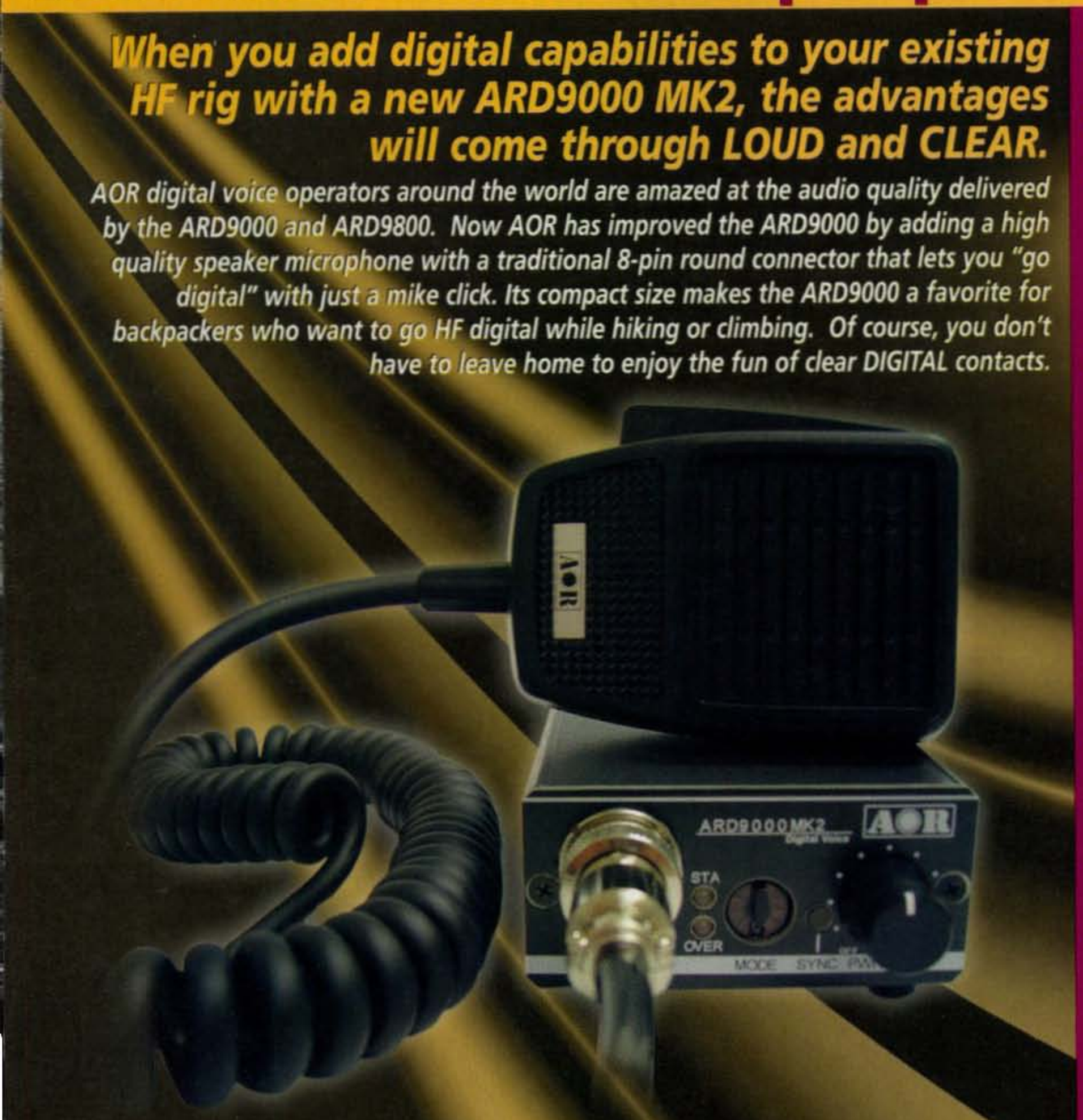
New ARD9000 MK2 steps up to the mike!

When you add digital capabilities to your existing HF rig with a new ARD9000 MK2, the advantages will come through LOUD and CLEAR.

AOR digital voice operators around the world are amazed at the audio quality delivered by the ARD9000 and ARD9800. Now AOR has improved the ARD9000 by adding a high quality speaker microphone with a traditional 8-pin round connector that lets you "go digital" with just a mike click. Its compact size makes the ARD9000 a favorite for backpackers who want to go HF digital while hiking or climbing. Of course, you don't have to leave home to enjoy the fun of clear DIGITAL contacts.



With thousands of AOR digital units worldwide, digital HF is rapidly gaining a dedicated group of followers. **Isn't it time you joined the fun?**

Using the open G4GUO protocol, the ARD9000 or ARD9800 allows any ham to convert any existing HF analog transceiver to work digital voice in one easy step! No radio modifications are necessary and it works with any brand of transceiver. The unit automatically detects digital signals and decodes them, but you also maintain full analog capabilities. Whether a contact comes in as digital or analog, the ARD9000 and ARD9800 can handle it.

It's a real breakthrough in communications technology that uses the same audio frequencies (300 Hz ~ 2500 Hz) as microphone audio to transmit digital SSB voice signals. It's like adding a whole new mode to your HF radio without having to buy a new one!

- ARD9000 MK2 for "voice only" operations
- 12V DC only operation
- Use the provided speaker-mic or your own high-quality audio mic. (rewiring mic input may be required)
- NO transceiver modifications necessary
- Digital voice communications using existing analog transceivers
- Works on Single Side Band (SSB) mode.
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- Optional interface cables for most popular transceivers
- Built-in high grade Vocoder (AMBE)
- Built-in FEC
- Compact unit. Easy to operate.
- Utilizes a uniquely designed high performance DSP engine
- Uses the established G4GUO open protocol

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qrp

BY DAVE INGRAM,* K4TWJ

Kits, Homebrew, and More!

An ever-increasing number of amateurs tell us they have become quite interested in QRP and enjoy reading this column for "getting up to speed" information. Realizing that fact, we strive to include a mix of operating news, equipment views, and quick-brew projects in each column to please the multitude. Over the last year, we also revisited several popular QRP transceivers of the day. This month it's Elecraft's time in the spotlight. Following that is another homebrew favorite we introduced several years ago, the 955 Acorn Tube Transmitter, plus something special—a peek at the new Radio Mate from W4RT Electronics.

Before we get started, however, your attention is directed to what surely can be called the ultimate QRP key (photo A). This incredible beauty is a round-framed bug. It is made by well-known key designer Richard Meiss, WB9LPU, and it (plus some of the dazzling mini rigs made by Dennis Payton, N9JXY, and shown in our October column) shared first place in the QRP homebrew contest at Dayton 2006. The bug is unique and it is also quite complex in design, so I invited Richard to describe it "keep it simple style" in his own words. Richard explains:

The bug uses a rotor that oscillates like the balance wheel of a watch. At rest, the dot paddle holds the rotor, with its attached magnet, against a stop and away from a fixed magnet. Pressing the paddle allows the rotor to move freely back and forth within the magnetic field, closing a reed switch each time a second rotor magnet passes over it. The rate of the dot string is adjusted by moving a weighted arm the proper distance from the center of the rotor.

Wow! Richard continues perfecting this masterpiece of mechanical ingenuity, and a more detailed explanation of his latest version is planned for inclusion in our Keys 2007 column. Sincere compliments to WB9LPU on his revolutionary bug!

Photo A– QRPers are well known for their creativity, and this round-framed bug designed and built by Richard Meiss, WB9LPU, vividly shows that fact. The bug's three-tier mechanism moves on a center pillar/spindle and operates completely by magnetic action. This thing truly takes bug-transmitted QRP to a new level! (Photo courtesy of WB9LPU)

Revisiting the KX-1

A few years ago in this column we introduced a new trail-ready and lap-friendly transceiver kit from Elecraft called the KX-1 (photo B). The QSL-card-size transceiver gained immediate popularity, and recently it has also been upgraded with additional band/frequency coverage, plus complemented with some interesting accessories. We are sure you will enjoy studying the new additions.

As you may know, the basic KX-1 covers 40 and 20 meters plus tunes/receives the popular 49- and 22-meter international shortwave bands. It is a CW-only transceiver, with 4 watts output when using a 13.5-volt DC supply or 2 watts output when powered from six internally installed AA cells. Thanks to low current drain on both receive and transmit, battery life is quite good. The little gem sports a DDS VFO with microprocessor control, 16-function menu set, LED or CW-announced readout (frequency and functions), three memories per band, RIT and three-pole crystal filter that is fully adjustable from 2 kHz down to 300 Hz. It

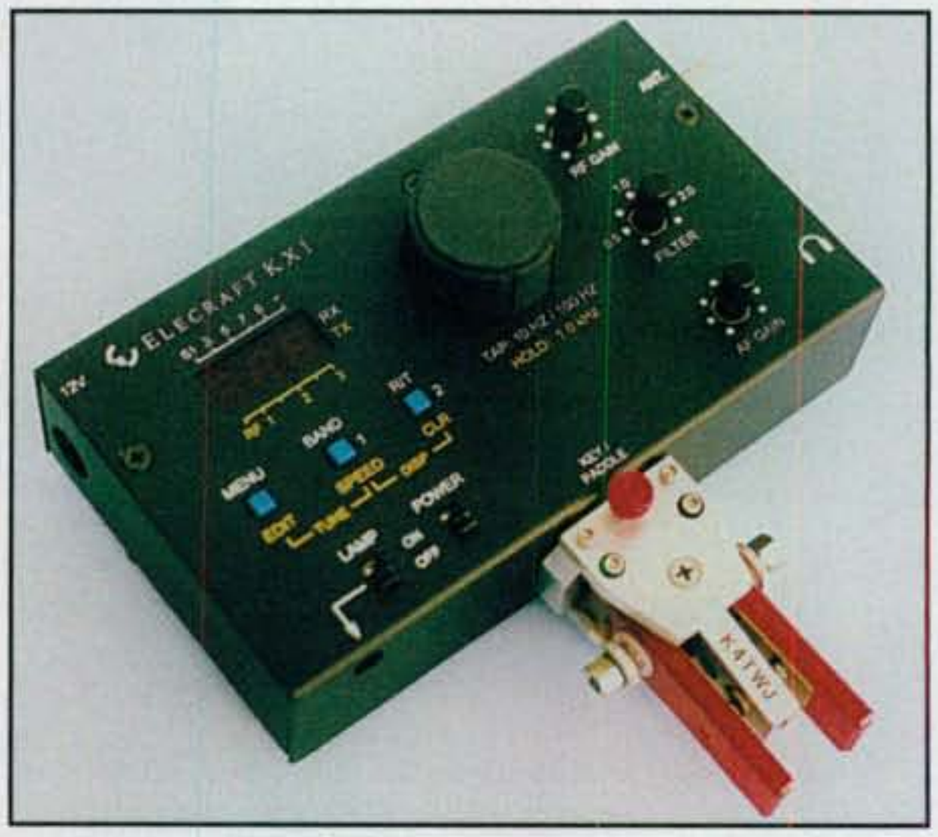

Photo B– Elecraft's palm-size KX-1 QRP Transceiver is loaded with big-time features and when fitted with its optional band-expanding board, works 20-, 30-, 40-, and 80-meter CW in high style. It's a QRP treat. This is my personal KX-1, and its plug-in dream paddle is custom made by WB9LPU. What a combo!

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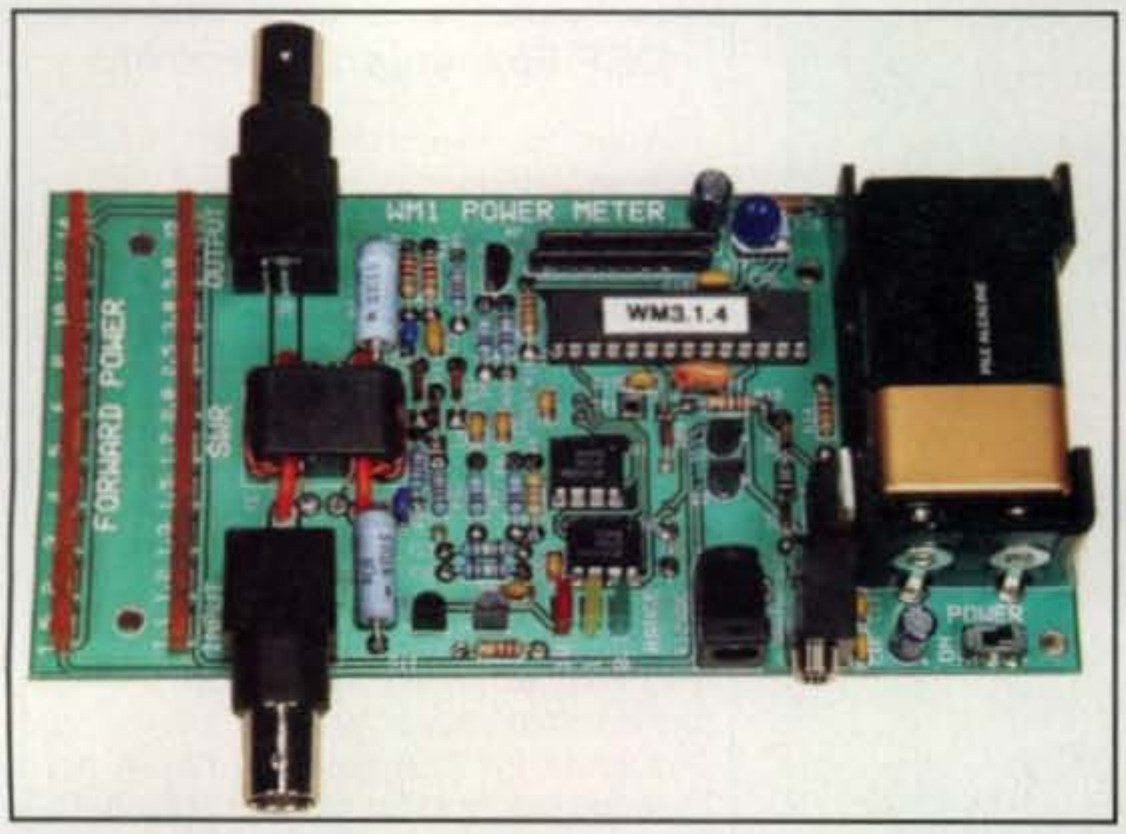

Photo C– Elecraft's new WM-1 Wattmeter mini kit measures RF power from sheer milliwatts to 140 watts while simultaneously indicating antenna SWR on its dual LED bar-graph display. The kit is specially designed for easy assembly by first-time builders. (Photo courtesy of Elecraft)

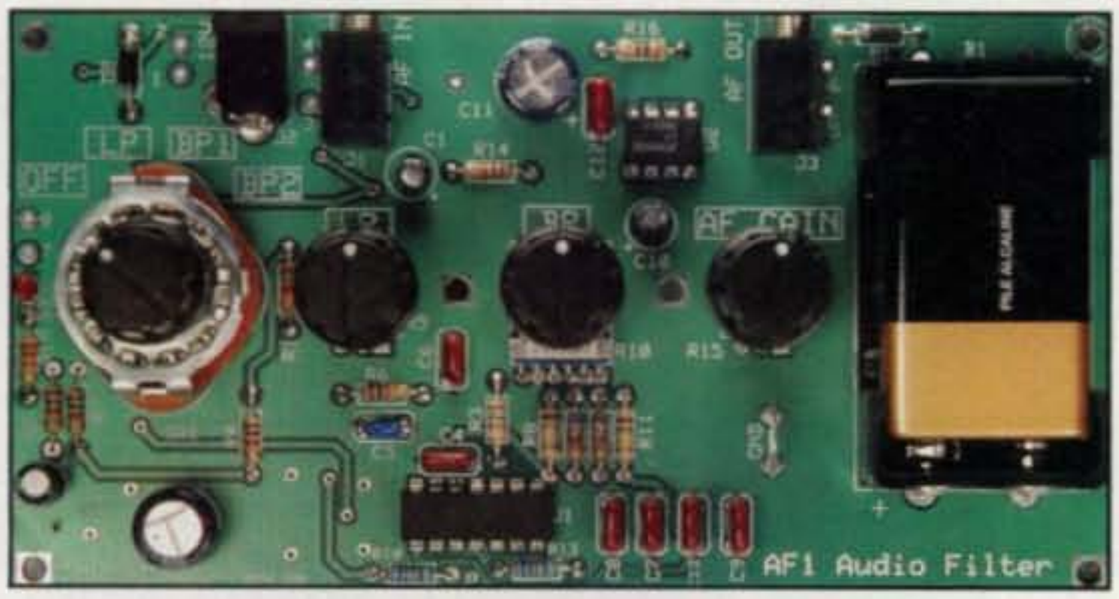

Photo D– Another low-cost Elecraft mini kit is this new AF-1 external audio filter. It sports two levels of selectivity with low-pass and adjustable high-frequency roll-off, adjustable center frequency to mate with various rigs, and a built-in audio amp section for extra volume. (Photo courtesy of Elecraft)

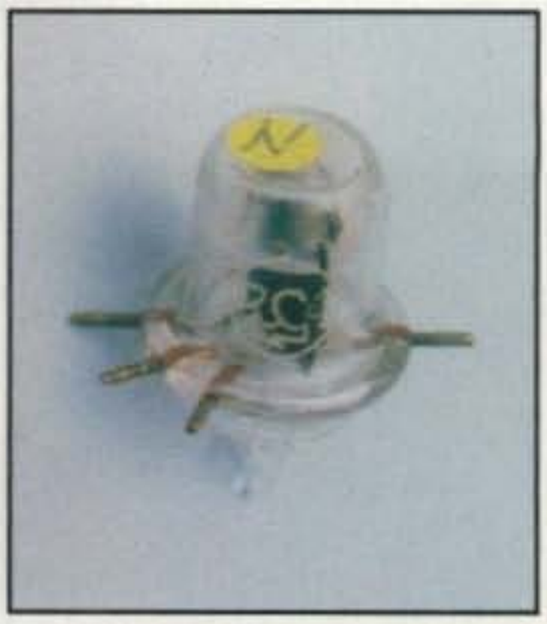

Photo E– It's small and uniquely shaped and it screams classic QRP from all five of its tiny little pins. It is . . . the marvelous 955 Acorn Tube!

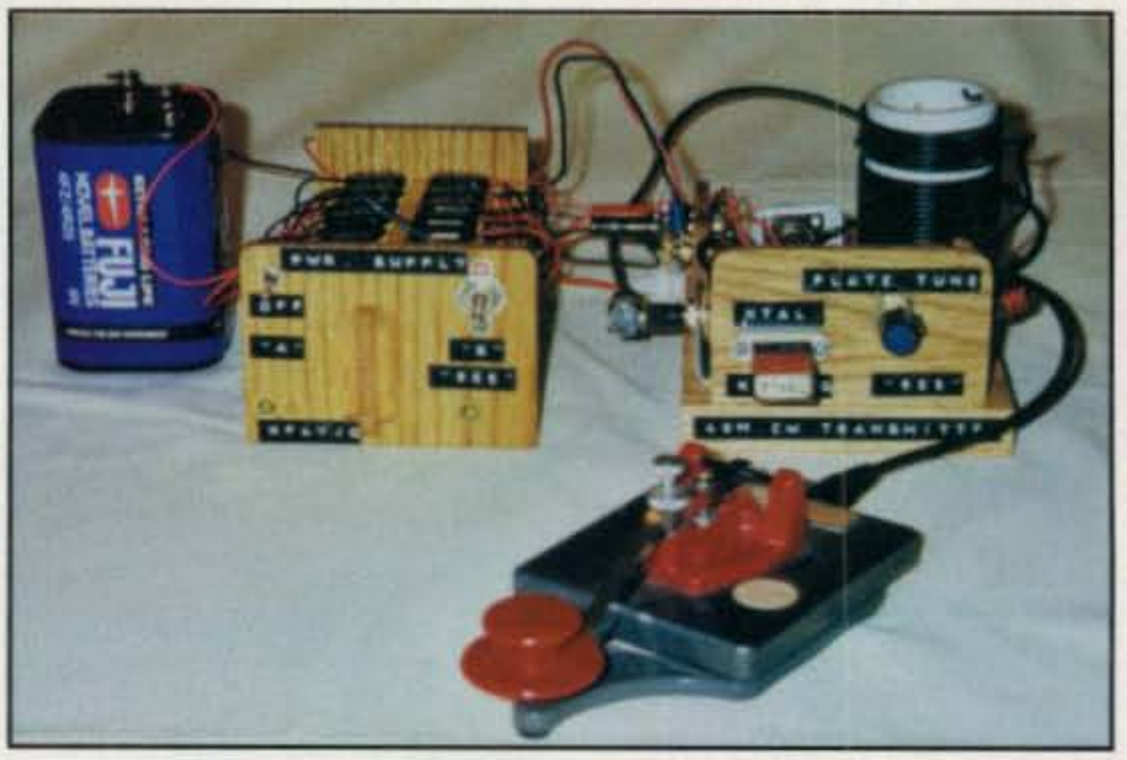

Photo F– A delightful blend of milliwatt magic and nostalgia are immediately apparent in this wood-framed 955 Acorn Tube transmitter and its battery supply built by Walt Bullerwell, KF4YJQ. Running 100 milliwatts on 40 meters with the rig, Walt worked stations around the country immediately after assembly. (Photo courtesy of KF4YJQ)

also has a built-in memory keyer with auto-CQ mode, adjustable side tone and T/R delay time, and a switchable LED light for logging in the dark. Elaborate? Yes. Difficult to build? Not really. That's because all parts, connectors, etc., mount directly to the (KX-1's) single PC board to eliminate off-board wiring fumbles and errors. You just install parts in well-marked holes, solder connections with a steady hand and fine-tipped iron, and emerged with one cool-going QRP rig. The accompanying KX-1 manual is also superb. Indeed, it is the most understandable and easiest to follow manual I have seen.

The KX-1 has now proven its merit as an outstanding performer, and two neat options that mount internally turn it into a real tiger. First is an automatic antenna tuner with SWR indicator that displays on the rig's LED readout when activated. The tuner is specially designed to work with single long wires such as those you toss over a convenient tree limb when camping. You just tap a panel button, the tuner "brapps" through numerous L/C combinations, and you are ready for operation with an optimum match.

The second option adds 30- and 80-meter operation to the KX-1, making it a four-band transceiver. Receive coverage is also expanded; it tunes 3.5 through 4 and 5 to 16.5 MHz continuously. This optional board mounts directly to the KX-1's main board, and 30 meters is a QRPer's dream band. With a U.S. power limit of 200 watts, most operators just run their transceivers at 40 or 50 watts for cool and casual operation, and a 4-watt signal does not get crushed by a 50-watt signal like it does by a 1000- or 2000-watt signal on other bands. In fact, I have experienced good results mobiling with the KX-1 at 4 watts on 30 meters. Try it yourself and see!

Before concluding this Elecraft revisit, two recently introduced "quick-kits" (my nickname for them because they are quite low cost and easy to assemble) warrant mention. First is a combination RF power and SWR meter, the WM-1 (photo C). It auto-ranges to read power up to 1.4, 14, or 140 watts and simultaneously displays the results on two calibrated bar-graph scales. It can be powered by a 9-volt battery or 13-volt source and covers 160 through 10 meters.

Second is the AF-1 External Audio Filter (photo D), which can be used with any transceiver or receiver for improving copy of weak or QRM-laden signals. The filter has two levels of selectivity plus a low-pass function with adjustable high-frequency roll-off and an extra stage of audio amplification, so it also works well for interfacing a small QRP rig with a speaker. Nice! More details on Elecraft's goodies are available at <www.elecraft.com>. Check them out!

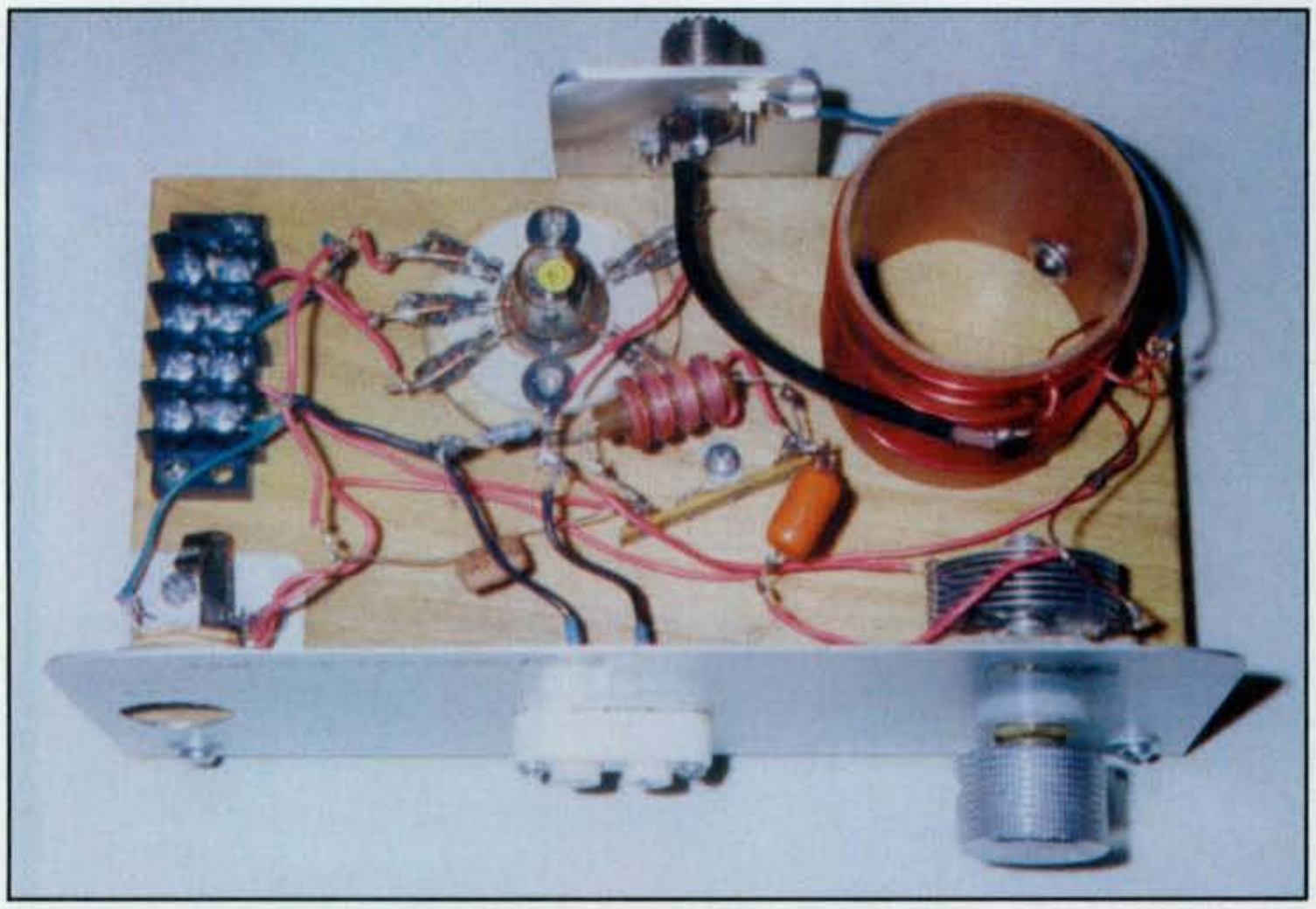

Photo G– This top view of the second version 955 tube transmitter built by Walt, KF4YJQ, gives you a good idea of the parts layout. This little gem also worked great right from the first try, producing a marvelous CW note with no clicks or chirps. (Photo courtesy of KF4YJQ)

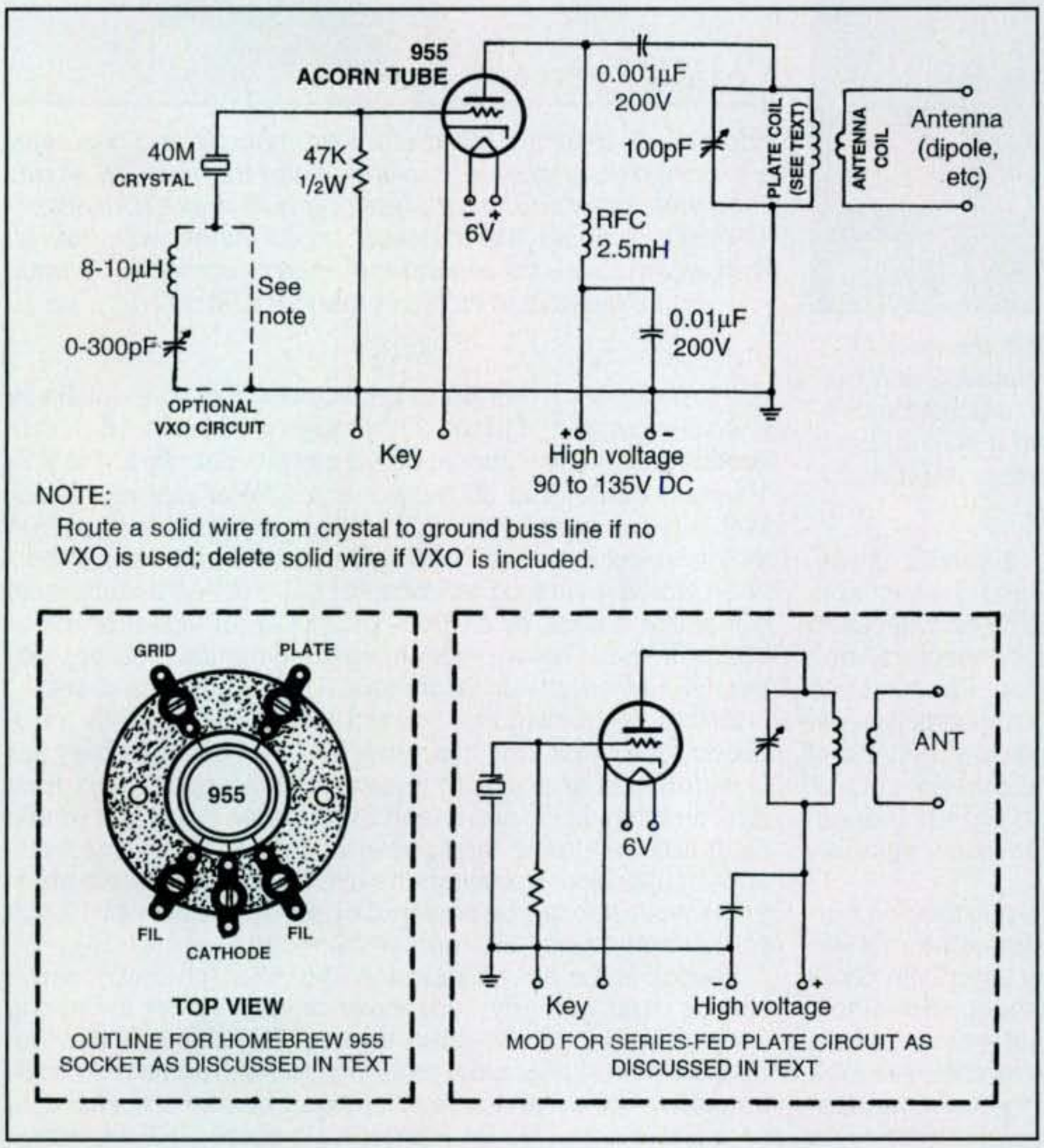

Fig. 1– Circuit diagram of the classic "Li'l Buddy" 955 Acorn Tube Transmitter. (Discussion in text.)

QRP Foxhunts: Fun For All!

Would you like to enjoy a special QRP treat and fine-tune your operating skills at the same time? Join the QRP Foxhunts held between 0200 and 0330 UTC each Tuesday evening around 3560 kHz and each Thursday evening around 7040 kHz until March 22. Foxes "hide" running QRP and operating near the QRP frequencies. They call "CQ Fox De (call letters)" and listen for sharp-op hounds (also running QRP). The chase—err . . . pile-up—can get quite thick, and hounds bagging the most foxes (and a certificate!) are those who most accurately sense exactly when and on what frequency a fox is listening, and when his (the hound's) call is not drowned out by other hounds. A hound's exchange, incidentally, is RST, state, your name, and power level. For more details go to <www.QRPFOXHUNT.org>.

Li'l Buddy Still Rockin'

Remember the sweet little 955 Acorn Tube Transmitter we nicknamed "Li'l Buddy" and featured here in the December 2003 issue of *CQ* (photo E)? Folks loved it, especially Walt Bullerwell, KF4YJQ; he built three of them (photos F, G, and H, and fig. 1). Walt also found a clever and safe way to power the little rascals. He connected fifteen 9-volt batteries in series to give 135 volts of 100-percent pure DC for the plate, then added a 6-volt lantern battery for filament power. QSLs for QSOs Walt made while running 100 mw on 40 meters with "Li'l Buddy" (MD, MI, TX, IN, GA, AL, and more) are proof the little rig works out—and well! Congratulations, Walt!

If you would like to quickly assemble your own 955 Acorn Transmitter (naturally, it has become a classic!), check with <ESRC-1@aol.com> for tubes and <www.fairradio.com> for sockets and tuning capacitors.

The plate coil in Walt's "Li'l Buddy" is 21 turns of 16- or 18-gauge solid, insulated wire wound on a 2-inch diameter and 2.5-inch long form (for 40 meters). The antenna pick-up coil is six turns of similar wire wound above it and in the same direction. The coil is teamed with a small 0- to 100-pF tuning capacitor. They are somewhat scarce, but a small plastic-cased tuning capacitor like those used in inexpensive transistor radios makes a good substitute. If you can find two tuning capacitors, including the second one plus a 6- or 10-µH inductor in series with the crystal makes a nice VXO with a 4- or 5-kHz tuning range.

In looking back over the transmitter's circuit (fig. 1), three additional sugges-

Photo H– Front-panel view of the 955 Acorn Transmitter built by KF4YJQ. Clean, effective, and nice!

tions come to mind. First, plate current drawn during operation is typically 8 to 10 ma, so those two-for-a-dollar 9-volt batteries sold at Dollar Stores make dandy plate batteries (and a 6-volt lantern battery exhibits similar long life when powering a 955's filament). Second, if I had time to build another "Buddy" today, I would try removing the RF choke and its .001-µF plate blocking capacitor and using series-plate feed to reduce cost (see inset of fig. 1). Finally, I would also try making my own 955 socket from a small wood "doughnut" with a center-punched hole for the tube. Small solder lugs can then be placed over each of the tube's pins and small screws used to secure the tube (and pin connections) in place. We will leave final mechanical details to your creative ingenuity and simply say, "build one soon" (maybe on an Altoids® tin). It is truly an all-time QRP favorite!

More good news: I am presently working on a mating 955 receiver to complement the Li'l Buddy. Watch for details in the June QRP column.

New "Radio Mate" from W4RT

W4RT Electronics continues to introduce neat accessories with special appeal to QRPers, and the latest item, the bhi Ltd. Radio Mate shown in photo I, is a real treat for owners of FT-817s (or FT-857s or FT-897s, as it works with all three transceivers). Radio Mate plugs into the rig's rear 8-pin CAT socket and lets you directly enter frequencies, switch modes, and access any of its built-in 20 memories with the forward-positioned keypad. The Mate also includes convenient toggling between VFO A and B, synchronizing of VFOs (A = B), and split VFO operation for DXing and contesting, plus easy loading and recalling of its 20 memories. The pad's "5" key is touch coded for easy "no view" operation.

Using the Radio Mate and rig combo, you can enter a frequency with the Mate, tune the band from that point with the rig, quickly store favorite frequencies in memories, then one-two punch through the memories to call stations rapid-fire style and maximize your on-the-air operating time. If preferred, you can also add a computer-type DIN plug extension cable to the Radio Mate for semi-remote tuning (frequency readout remains on the rig's front panel). For more information on this gem and others (photo J), see <www.w4rt.com>.

Photo I– Check out this new Radio Mate from W4RT Electronics. It plugs into a rear socket on the FT-817 and produces direct selection of bands/frequencies, modes, and any of its built-in 20 memories. It's a blast for contesting and laid-back QSOing as well. Details at <www.w4rt.com>.

Photo J– Another special item available from W4RT Electronics is this K8FF Kranker Knob. It quickly swaps with the FT-817's stock knob and makes band tuning both delightful and accurate. Nice! (Photo courtesy of Barry Johnson, W4WB)

That overflows available space for this time, friends, but rest assured more QRP news and more captivating mini rigs will be in the spotlight next time. It will be an all-around rig blowout!

73, Dave, K4TWJ

beginner's corner

BY WAYNE YOSHIDA,* KH6WZ

FM and Repeaters—Ham Radio's "Fun Mode"

Perhaps the most popular mode of communications on the ham bands is FM on VHF and UHF repeaters, and why not? The equipment is affordable and portable, and the availability of repeaters to extend communication distances is especially useful, both for keeping in touch with your local friends and for emergency and public-service applications.

In addition, the FM mode is more fun to listen to, because audio signals on FM are not affected by static-type electrical noise, such as automobile ignition noise or the electrical noise from motorized appliances such as air conditioners and vacuum cleaners. Radios have a squelch control so you can silence the radio when no stations are active, yet the radio is on stand-by, ready to jump into receive if a station is transmitting on frequency.

There are two forms of VHF and UHF FM voice communications: simplex and repeater. In simplex operation, stations talk to each other directly, on the same frequency. Repeater operation inserts a third station—and a second frequency—into the path. A repeater is a machine that takes a signal in and automatically retransmits it, boosting the comms distance.

When using simplex, communications generally follow a "line-of-sight" rule: The signals will reach as far as you can see, moving along a straight path from point A to point B. There are some very big exceptions to this rule, and part of the challenge for a lot of hams is beating this general rule. This is called "chasing DX," or attempting long-range communications. See photo A for an extreme example of this. The big dish is actually a radio telescope that has been adapted for Earth-Moon-Earth communications on the ham bands.

In addition to the line-of-sight rule, communications distances will vary with terrain. For example, if there are trees, buildings, or mountains in the way, signals are usually blocked. On the other hand, if the "terrain" is a lake or the ocean, distances will increase significantly. The distance covered is difficult to quantify, since another factor in establishing communications is the equipment (radio and antenna performance, transmitter power, and so on).

I guess the best way to think about this, especially when you are thinking of ways to improve your communications capability, is to remember that it is always best to be as high as possible and away from obstructions such as buildings and trees. Therefore, if you are participating in an emergency drill "downtown," it may be wise to move your station—or at least your antenna—into a high location, such as a rooftop office building or parking structure, rather than a basement-level parking garage or inside a building.

Photo A– The Owens Valley Radio Observatory (OVRO) 40-meter diameter dish antenna is actually a radio telescope that is being used to transmit 1296-MHz and 10368-MHz ham radio signals to the Moon and back to Earth. This is a fairly extreme example of equipment needed to move VHF and above signals beyond line of sight. (Photo by Rich Whited, KG6JKJ)

Extending the Communications Range

To overcome some of these obstacles, hams build and install repeaters. Repeaters have sensitive receivers, large antennas in high places, and high transmit power, letting them boost little signals over big paths. Some repeater systems are linked to other systems for even greater coverage. In southern California, where the terrain varies a lot,

A 40-meter Dish for EME

The San Bernardino Microwave Society has made arrangements with the Owens Valley Radio Observatory to use its 40-meter dish for amateur radio EME (Earth-Moon-Earth, or moonbounce). This unique arrangement has allowed members of the SBMS to construct and install transverters for 1296 and 10,368 MHz on the dish. The project benefits both organizations in that radio amateurs have a truly unique experience in operating EME with a world-class station, and allows OVRO to augment its current educational outreach program through ham radio. More details about this exciting educational program can be found on the SBMS/OVRO web page at: <http://www. ham-radio.com/sbms/ovro>

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repeaters can be found in all sorts of places, including on of tall skyscrapers, mountaintops, and towers. Photos B and C show a 900-MHz repeater installation in California. The N6CA repeater includes a 90-watt amplifier and a location that is over 2000 feet in elevation.

Doing the Splits

With only a few exceptions, repeaters have separate receive and transmit frequencies. The repeater receiver frequency is called the "input" and the repeater transmit frequency is called the "output." The difference between these frequencies is called the repeater's "split" or "offset." Repeater users transmit on the input frequency and receive on the output frequency. On 2 meters (144 MHz) the nationwide standard split is 600 kHz, and on 70 cm (440 MHz) the offset is 5 MHz. The other FM bands and their offsets include 1.25 meters (222 MHz), with an offset of 1.6 MHz; 33 cm (902 MHz), offset 12 MHz; and the 23-cm (1200 MHz) band uses a 20-MHz offset. There are some exceptions to this, and that is why FM transceivers reserve at least one or two memory channels to accommodate the "odd split."

By the way, all modern rigs have an "auto" function that simplifies programming your radio: You just enter the receive frequency, and the radio will automatically insert the transmit offset (*if* the repeater uses a standard split; local hams or repeater directories will be able to tell you if there's a nonstandard offset).

Which Band or Bands to Choose?

One confusing question a lot of new hams have to answer is on which frequency band or bands to operate. A recently received ham radio catalog contains over two dozen VHF/UHF mobile radios *(see our annual Market Survey, elsewhere in this issue—ed.)* and another two-dozen handhelds (HTs) to choose from. It certainly is a confusing array of choices to make! The best bet is to ask your friends at the radio club for frequency and rig recommendations.

The most popular VHF-FM band is 2 meters (144 MHz). Take a look through the ARRL *Repeater Directory,* or search the internet for 2-meter repeaters in your area and you will see a huge number of systems to try. Since most VHF-FM rigs are installed in vehicles, it makes sense that the commuting hours before and after work are the most popular times of activity on these bands.

Sometimes Exclusive, Sometimes Not

Speaking of the *Repeater Directory*, this is a good place to mention the concept of the "closed repeater." This does not refer to its operational status, but rather to the use of the system. Remember that a repeater is an expensive electronic machine and is usually located in a remote area. In addition to the electronic hardware that makes up the repeater, there are plenty of other expenses associated with repeater ownership, including, but not limited to, insurance, rent for the site, telephone and related charges, and repairs and upgrades to the equipment. Since someone must pay for these expenses, it makes sense that some repeater owners would like to have some control over who uses the system. Such "closed" or "private" systems require membership in a group or club and most often require members to pay dues in order to use the repeater system.

Of course, there are many "open" repeaters, too, and this implies that you can join the fun and operate your radio on their system for free. However, it is always best to listen to the repeater system first and get to know the regular users and their rules of operating. Like any other social group, repeaters and their users have certain personalities. When you find an interesting group, find out if they have club meetings or a website so you can learn how to join the group, and find out how to become one of their repeater users. Even open repeaters should be supported by joining the sponsoring group if you become a regular user.

Photo B– The N6CA 900-MHz repeater is a sophisticated machine that receives low-power signals and retransmits them with high power and a tall antenna system, extending communications range to the system users. (Photo by Glenn Allen, KE6HPZ)

What's That Tone?

Another term you will come across when operating on a repeater system, especially the private or closed ones, is the use of the continuous tone-coded squelch system (CTCSS), or "tone access." It is also commonly referred to as "PL" or sometimes just "tone." PL stands for "Private Line" and is a Motorola trademark. This is not to be confused with TouchTone® signaling, which is another type of tone used on the VHF and above bands. (TouchTone is a registered trademark of AT&T. The generic phrase is dual-tone, multi-frequency, or DTMF). While you cannot hear the PL tone, the repeater electronics can detect it, and decoding circuits on the repeater receiver allow the signal to pass through the repeater. Signals without the sub-audible tone do not pass through the repeater system, and no one else hears them.

In other words, a closed or private repeater system is set up so that its members have equipped their HT or mobile rigs to transmit the "secret tone" so they can access the repeater. Another use of PL on repeaters is to minimize interference from other repeaters on the same frequency or on a nearby frequency. A repeater with tone-access enabled can help reduce interfering signals from coming in over the repeater.

Photo C– Repeaters are often installed in remote locations. This 900-MHz system is on a mountain ridge at more than 2000 feet elevation. (Photo by Glenn Allen, KE6HPZ)

This is why even many "open" repeaters use CTCSS tone control.

Phoning Home

Many VHF and UHF FM rigs come with a microphone with a telephone keypad on it. The buttons are used to access many functions on the radio, such as frequency entry, transmit power, and so on. The keypad also functions just like its telephone counterpart—and can be used to transmit telephone-compatible tones (DTMF) over the radio. These tones can be used for many things, including remote control of radio (and repeater system) functions, such as accessing a time of day announcement or weather report.

Before cellular phones, hams had the capability of accessing the telephone system using their ham radio gear via "autopatch" on a properly equipped repeater. An autopatch allows system users to make telephone calls through the repeater. Not all repeaters have this capability, but many do, and the autopatch function is usually reserved for "fully registered users" or some other "higher classification" of repeater user. All autopatch functions are accessed via a "passcode" to command the repeater to open a telephone line (remember the phrase "Open Channel D" from the 1964 television series "The Man from U.N.C.L.E."?)

The rules for accessing an autopatch vary from group to group, but the general rule is to first make sure that the repeater is not busy with a conversation. If it is quiet, and you need to place a call, you should first identify with your callsign, and also announce that you intend to access the autopatch. (This procedure also applies to accessing any other function on the repeater, such as getting the time announcement or a temperature reading.)

A typical autopatch call might go something like this:

Listen to make sure the repeater is quiet, and transmit your callsign, followed by what you intend to do—"KH6WZ accessing autopatch."

Release the microphone button, listen for a few seconds, and then press the "turn autopatch on command," usually some combination of telephone keypad symbols and numbers, such as #234*. Press and hold the microphone button, putting your rig into transmit, and press the keypad with the access code and then release the mic button. You should hear a dial tone. Next, press and hold the PTT and dial the telephone number. When you release the PTT button, the radio and repeater system now act like a normal telephone … with one big exception: You can't both talk at once. You need to make sure the person you're calling understands that only one person can talk at a time.

Also, remember that nothing either of you says is private, since you are using the repeater and anyone listening to the system can hear your entire conversation. Use common sense and courtesy and obey the FCC rules, such as not making any sort of business communication over the air.

When you are done, you need to "hang up" the radio-telephone link, which is another series of tone commands, such as ## or something. After you command the autopatch to hang up, you should also identify, and let the other users know that you are finished. Say something such as, "KH6WZ autopatch clear."

When an autopatch conversation is in progress, other stations on the system should keep quiet and wait until the call is completed. This also means that any autopatch call must be kept as short as possible, since everyone on the system must wait until you are done.

Just Talking

Okay, so now what if we just want to talk on the radio through a repeater? How do we do it? This is the easy part. Aside

from just being nervous because hundreds of people may be listening to the repeater system, it is as simple as a casual conversation you may have in the parking lot at the grocery store.

If the repeater is quiet, you can initiate a contact by clicking the microphone push-to-talk button and saying your callsign, like this: "KH6WZ," or you can say, "KH6WZ listening." This method varies for repeater systems or in regions of the *country*, but in most cases all you have to do is announce your presence and tell anyone listening that you are open to a conversation.

What if you want to call a specific person? In this case, you just call the other station: "WB6CWN from KH6WZ." Try to remember this concept of calling the other station first and then giving your callsign. This helps clarify who is calling whom when other people are listening.

If a conversation is already taking place, you can either wait until the parties are finished, or you may join the conversation, making a "roundtable." Multiple-party conversations are most useful when there are a lot of stations on the air, such as during the commuting hours before and after work. It is also fun to see how many stations you can get to discuss a particular topic. You can enter into the conversation by politely asking. In most cases, you "break into" a conversation by announcing your callsign during a pause. In general, the term "break" is not used, but this varies according to your region or even repeater groups. ("Break" is usually reserved for emergency use—"break-break" nearly always.)

Remember, you are asking permission to join a conversation in progress. The persons engaged in the conversation before you appeared can and may not let you in. If that's their choice, they will either ignore you, or will stop and tell you to "stand by" or words to that effect. Just like a high school dance, this sometimes happens to all of us. Do not take it personally, as the other stations may be doing something important and do not want to be disturbed. Usually, though, the opposite is true, and you are welcome to join in.

Once the formalities are completed, you simply take turns talking about whatever it is you want to talk about. Remember to comply with the FCC rules and identify with your callsign every ten minutes and at the end of the conversation.

If you want to quickly call another station—say to ask the person to meet you on another frequency, or to pass a short message, such as "I'll be there in ten minutes"—you may say, "Call, please (your call)" at a break in the conversation. Again, at the discretion of the people already using the frequency, they may or may not stand by to let you make your call. If they do, you *must* keep it very brief, as the other people were polite enough to let you "borrow" the frequency they are already using.

There are two "technical things" to remember when talking on a repeater system.

First, it is important to press and hold the microphone push-to-talk button for at least a full second before speaking. It is very irritating to hear something such as ". . . ing, Dave" when you really said, "Good morning and how are you doing, Dave." This sometimes happens because repeaters have a bit of a delay (fractions of a second) when going from receive to transmit. This is caused by different factors, including any linking repeaters along the path or audio processing within the repeater system or antenna change-over circuitry. In any case, what happens is that the first word or sometimes more of your transmission is cut out, and the receiving station hears only the last part of your sentence.

Second, pausing in between transmissions is good practice, because this allows other stations to break in when necessary, and is especially critical if an emergency call must be made. Some repeaters have a courtesy tone that reminds users to pause, listen for the tone (thus allowing any stations to enter the conversation), and then continue with your conversation. "Quick-keying" means that you violated this rule and did not allow any opportunity to share the frequency. This may cause the repeater to "punish you" by initiating a "time-out timer" that may shut off the repeater during your transmission. (Most repeaters have timers that limit single transmissions to three minutes or less; waiting for the tone generally resets the timer.)

As you make new friends on your local repeater systems, always remember that the repeater is really a tool for you to use. By the same token, you must always respect the tool, since it is a large investment in time and expenses. When you belong to a repeater group, even if the repeater is an open system, consider donating either money or your time to keep the machine on the air. Repeaters extend the useful communications range of small, low-power radios, which is always an advantage, especially in emergency situations.

73, Wayne, KH6WZ

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what's new

BY KARL T. THURBER, JR.,* W8FX

Modular Verticals, Remote Antenna Tuner, Flush Cutter, and more

This month we will focus on antennas and antenna accessories, accessories for the radio shack, new software, and the radio bookshelf, taking a close look at "what's new" in our radio hobby. Ready? Let's dig right in.

Antennas and Antenna Accessories

Garden Antennas™ from DX Engineering. DX Engineering offers the Garden Antennas, custom modular vertical antennas that are designed for quick assembly and disassembly (example shown in photo A). With the purchase of the appropriate antenna hardware, you can conveniently customize and configure the antennas for any band between 10 and 40 meters.

To allow you to cover the maximum number of bands with the minimum investment, the Garden Antennas are available as a Basic Antenna Unit plus band-specific parts that are chosen by you. The firm's website at <http://www.dxengineering.com> is very helpful in designing the final custom Garden Antenna for your installation.

The Basic Garden Antenna Unit includes the following items: insulated polymer mounting plate; threaded brass antenna mounting block; two V-saddle clamp kits for mounting the antenna to a 1/2- to 1 3/4-inch OD pipe (pipe not included); 72-inch aluminum mast; 24-inch aluminum mast extension; two 3/8 × 24 threaded adapters; impedance matching coil assembly; aluminum coil mounting bracket; 16-inch coax feedpoint pigtail; and quick-disconnect mast fitting with protective cover.

Photo A– DX Engineering offers the Garden Antennas™, new modular vertical antennas designed for quick assembly and disassembly. With the purchase of the appropriate antenna hardware, the antennas can be configured for any band between 10 and 40 meters. (Photo from the DX Engineering website)

Contact DX Engineering, P.O. Box 1491, Akron, OH 44309 (telephone 1-800-777-0703; e-mail: <dxengineering@dxengineering.com>; on the web: <http://www.dxengineering.com>).

New from Firestik Antenna Company. The FireStik Antenna Company primarily is a supplier

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

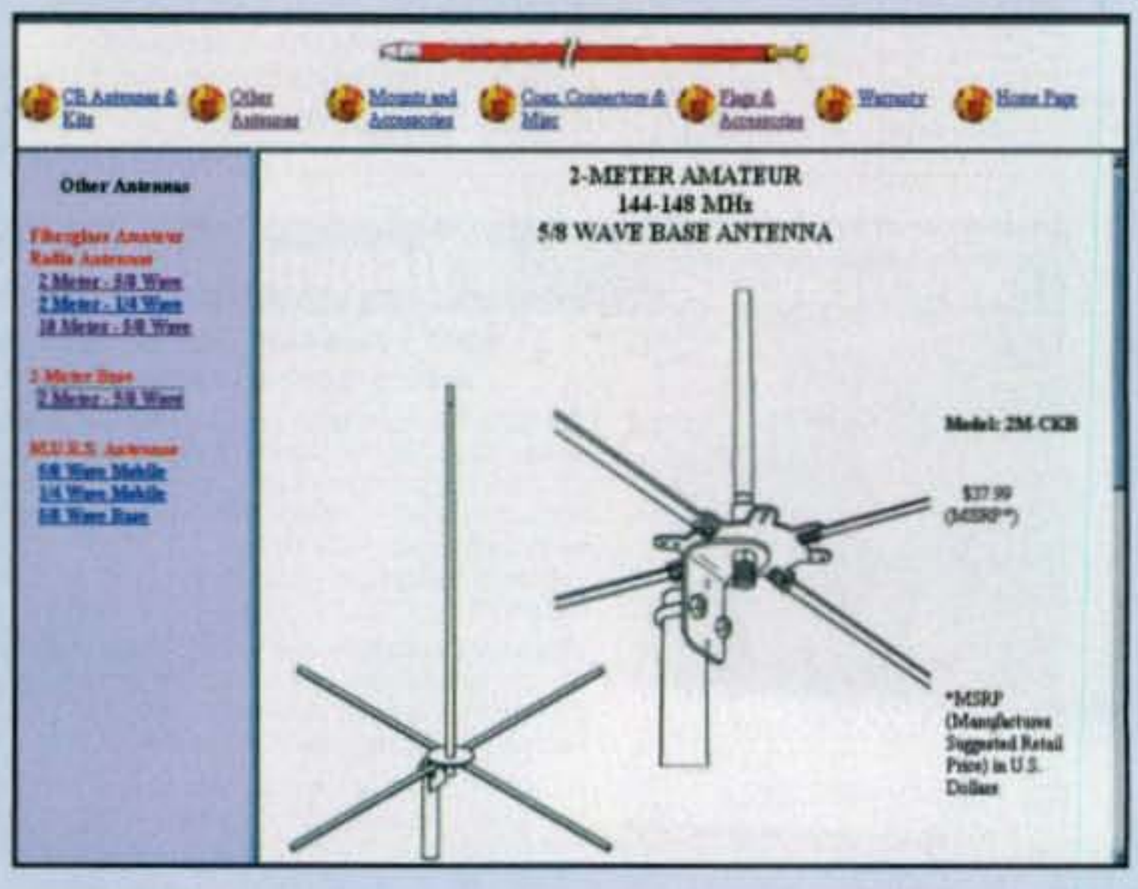

Fig. 1– The FireStik Antenna Company primarily is a supplier of CB and scanner antennas. However, it offers several popular amateur antennas, such as the Model 2M-CKB 2-meter, 5/8-wave base antenna shown here. (Image from the FireStik website)

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of CB and scanner antennas, but its recent price sheets show that they offer several popular amateur antennas, along with much useful antenna hardware and related accessories of interest to radio amateurs.

Through its dealer network, FireStik offers the classic Model 2M-4 two-meter antenna, a 4-foot, 5/8-wave, wide-bandwidth design for 144 to 148 MHz with a low angle of radiation. The mobile antenna is rated at 400 watts AM or 800 watts PEP.

Also offered is the new Model 2M-CKB 2-meter, 5/8-wave base antenna (see fig. 1). It's similar to the 2M-4, but a combination angle bracket, u-bolt, hub plate, and antenna stud adapt the antenna for base-station use.

Rounding out the amateur product line are the Mach-10 series 10-meter, 5/8-wave mobile antennas that boast high efficiency in a "tunable tip" design that lets you conveniently fine-tune the antenna to resonance. These antennas are available in black, red, white, or blue, and in two different lengths (the 3-foot TM3 and the 4-foot TM4). The shorter antenna handles 650 watts, while the longer one handles 900 watts.

FireStik also offers a wide variety of antenna accessories. These include both stainless- and non-stainless-steel mobile mounts and mounting brackets, stainless-steel springs, quick disconnects, coaxial cables, splitters, connectors, installation and repair parts, and other mobile-oriented hardware. Check out the website for more details.

Certainly of current interest, an instructive letter from FireStik mentions the price volatility of several items that go into radio antenna manufacturing. Among the factors pushing upward on prices are the cost of copper, which started rising in late 2002 and which recently has climbed a great deal.

Also, fiberglass (reinforced plastics) and shrink tubing have suffered price volatility (typically rises), since they are petroleum-based products—and we all are reminded of that story each time we gas up our thirsty vehicles. FireStik notes that manufacturers often try to "ride out" raw-material spikes, but long-term climbs often are mountainous rather than spikes.

For more information and pricing, contact a dealer or FireStik Antenna Company, 2614 E. Adams St., Phoenix, AZ 85034-1495 (602-273-7151; e-mail: <support@firestik.com>; on the web: <http://www.firestik.com>).

More from MFJ. First up in the antenna department from MFJ are two compact HF/VHF and VHF/UHF SWR/wattmeters which have huge built-in 3-inch cross-needle meters. The MFJ-822/MFJ-842, each priced at $59.95, simultaneously read forward/reflected power and SWR (photo B). Their compact size makes them excellent for mobile or portable operation.

MFJ gives you two selectable power ranges, a built-in meter light (+12 VDC), and SO-239 connectors. The compact meters weigh in at less than one pound. The MFJ-822 covers 1.8–200 MHz and has 30- or 300-watt range. The MFJ-842 covers 140–525 MHz and has 15- or 150-watt range.

Next up from MFJ is the MFJ-926 Remote Automatic Antenna Tuner for marine and amateur HF SSB use (photo C). The MFJ-926 ($399.95) is weather-sealed for marine use or for use outside at the base of your ham station antenna. A durable hard-plastic cover and chassis plus inner-lip black rubber sealing keep the interior electronics cool and dry for years of dependable use.

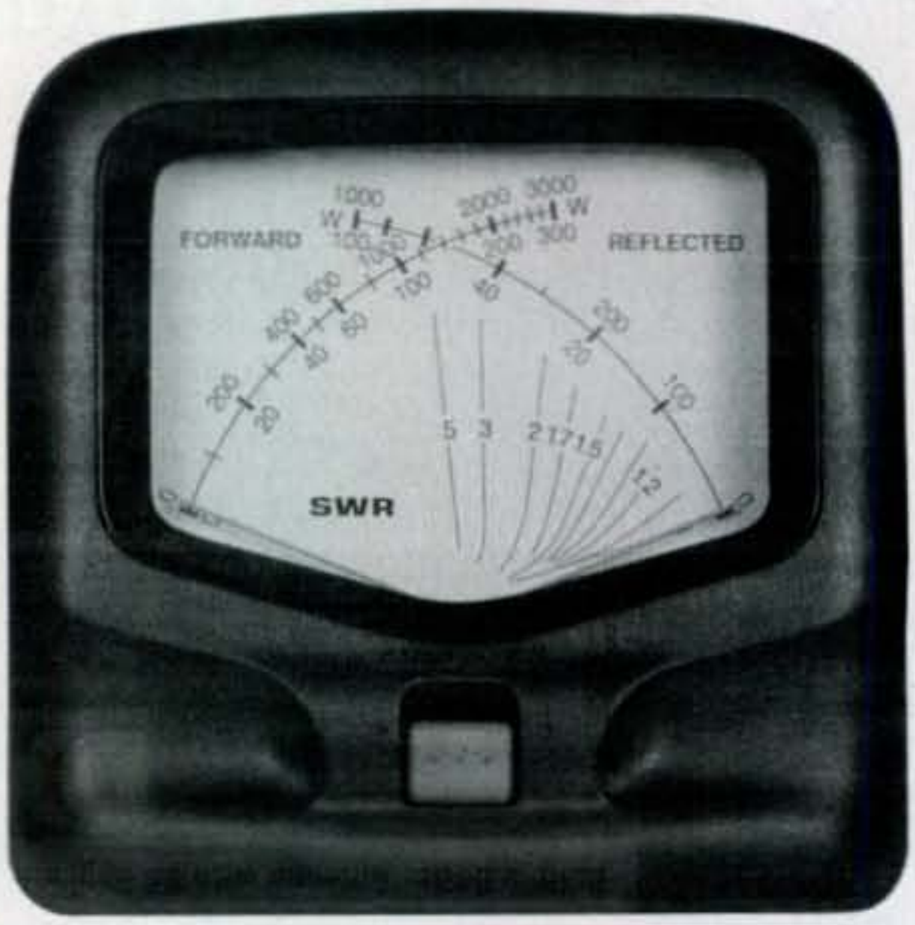

Photo B– Two compact HF/VHF and VHF/UHF SWR/ wattmeters from MFJ have huge, built-in 3-inch cross-needle meters. The MFJ-822/MFJ-842 read forward/reflected power and SWR. Their compact size makes them excellent for mobile or portable use. The MFJ-822 is shown here. (Photo courtesy of MFJ)

Photo C– The MFJ-926 Remote Automatic Antenna Tuner is weather-sealed for marine use or for use outside at the base of your ham station antenna. The tuner covers the entire HF band from 1.6 to 30 MHz and handles 200 watts PEP. (Photo courtesy of MFJ)

The new tuner covers the entire HF band from 1.6 to 30 MHz, and it handles 200 watts PEP maximum and only 10 watts minimum input power. The MFJ-926, with 200 memory channels, reportedly offers very fast tuning; initial tuning is less than 2 seconds and less than 0.2 seconds tuning from memory. It tunes 6 to 30 MHz with wire greater than 8 feet in length and tunes 1.6–30 MHz with wire greater than 27 feet. The MFJ-926 is compatible with 50-ohm transceivers.

The tuner requires 13.8 VDC at 1.5 amps. The unit measures 9.25" W × 14.25" H × 3" D amd weighs just 4 lbs. It's weather-sealed with a tough, durable hard-plastic cover and chassis and black rubber seal around the lip of the enclosure. All connections are double protected.

These new products also are protected by MFJ's No Matter What™ one-year limited warranty. Under it, MFJ will repair or replace (at its option) your MFJ products no matter what for one complete year.

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

Accessories for the Shack

Flush Cutter Features Precision Tip. A flush cutter for precise electronics fabrication applications requiring an extremely sharp tip to reach into highly restricted areas and cleanly cut soft wire up to 20 AWG is available from Xuron Corp. The cutter looks like something that might earn a place in the well-equipped toolbox or workshop.

The new Xuron LX-T Micro-Shear® Flush Cutter (see photo D) features a precision tip which is tapered to reach into tight spaces and produce a clean, square cut on soft wire up to 20 AWG (0.8 mm). Designed with an ergonomic handle, cushioned rubber grips, and a Light Touch™ return spring, this rugged flush cutter features precision-ground high-carbon, heat-treated steel blades.

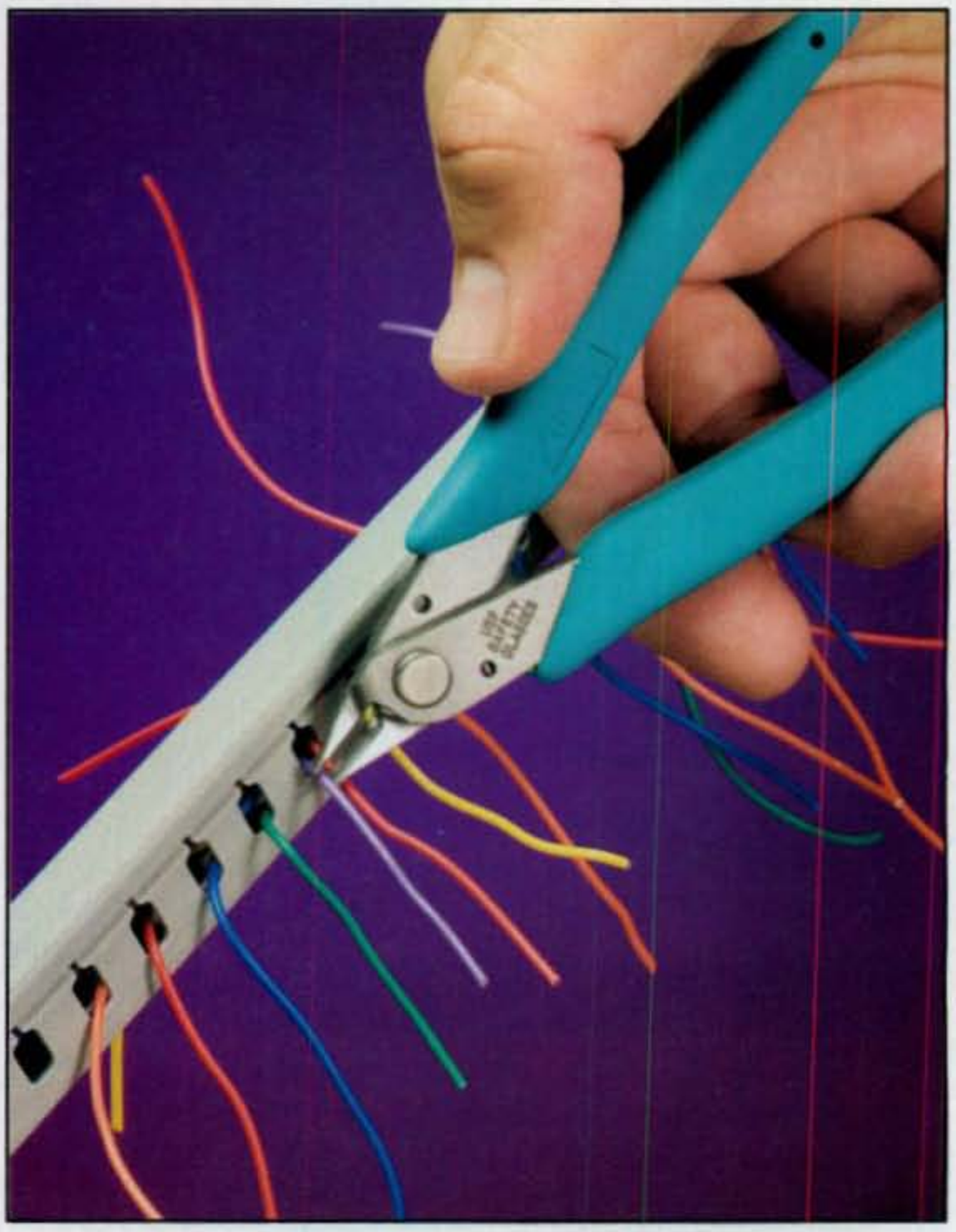

Photo D–The Xuron LX-T MicroShear® Flush Cutter is for precise electronics fabrication applications requiring an extremely sharp tip to reach into highly restricted areas and cleanly cut soft wire up to 20 AWG. (Photo courtesy of Xuron Corporation)

Fig. 2– Street Atlas USA® 2007 offers all the DeLorme map detail along with millions of places of interest, address-to-address routing, comprehensive GPS capabilities, and other features. (Image from the DeLorme website)

Capable of performing millions of cuts, Xuron LX-T Micro-Shear Flush Cutters employ the firm's patented bypass cutting technology, which requires far less effort than conventional compression-type cutters. This compact cutter measures only 4.86 inches long and 1.70 inches closed between the grips. Static control grips are optional and models with lead retainers are offered.

The Xuron LX-T Micro-Shear Flush Cutter is list-priced at $15.15. A complete catalog of shears, wire strippers, pliers, forming tools, tool kits, and specialty products is available upon request.

Contact Xuron Corporation, 62 Industrial Park Rd., Saco, ME 04072 (207-283-1401; e-mail: <info@xuron.com>; web: <http://www.xuron.com>).

MFJ Atomic Wristwatch with Stainless-Steel Band. MFJ's attractive new MFJ-187RC "Atomic Wristwatch" (photo E) is similar to the popular MFJ-186RC atomic watch, but it comes with a stainless-steel band that complements the all-silver face. The new watch definitely has amateur radio in mind, with its 24/12-hour format, manual time setting capability, alarm and dual-time functions, time-zone display, backlight, high water resistance, and included very long-lasting lithium battery.

The watch is protected by MFJ's traditional No Matter What™ one year limited warranty. For more information, to place an order, to get a free catalog, or to find your nearest dealer, contact MFJ Enterprises, Inc., 300 Industrial Park Rd., Starkville, MS 39759 (1-800-647-1800; e-mail: <mfj@mfjenterprises.com>; and on the web: <http://www.mfjenterprises.com>).

Software and Computers

The All-New Street Atlas USA® 2007. With its "catchy" motto "We Bring Technology Down to Earth"™, DeLorme offers a variety of street-mapping software for practically every need, whether that need be business- or consumer-oriented. A longtime favorite in this arena is Street Atlas USA® software.

Photo E– MFJ's new MFJ-187RC Atomic Wristwatch comes with a stainless-steel band that complements the all-silver face. Its many features suggest that it definitely has amateur radio in mind. (Photo courtesy of MFJ)

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Street Atlas USA 2007 (fig. 2) is an all-new upgrade that offers all the famous DeLorme map detail along with millions of places of interest, address-to-address routing, comprehensive GPS capabilities, and many other powerful features that combine to make this an excellent choice for travel-planning software.

The top-of-the-line Street Atlas USA 2007 Plus DVD is priced at $59.95. It's especially designed for business and advanced map users, both for mobile use on the road or work at home or at the office. It adds 120-million phone and address listings linked to the map, with the ability to import and geolocate your own data. It's furnished on two DVDs, one for the application and maps, the other for phone and address data. It has all the features of the standard DVD and CD editions, described below.

Also available is Street Atlas USA on DVD, for $39.95. It features GPS voice commands and spoken directions, along with new Canadian streets and points of interest (in addition to the U.S.), and more than 3.4-million updated streets across the U.S. and Canada. The product is furnished on one convenient DVD.

Also, Street Atlas USA on CDs, with all the same features, functions, and data as the DVD version, comes on three CDs, for those without a DVD drive. However, this version (also $39.95) requires copying all data to your hard drive.

Contact DeLorme, Two DeLorme Drive, P.O. Box 298, Yarmouth, ME 04096 (1-800-561-5105; on the web: <http://www.delorme.com>).

From the Bookshelf

Net Crimes & Misdemeanors. Information Today, Inc., (ITI) has announced the publication of *Net Crimes & Misdemeanors: Outmaneuvering Web Spammers, Stalkers, and Con Artists, Second Edition,* by noted author and cybercrime expert J. A. Hitchcock.

In this revised and expanded edition of her popular 2002 book, Hitchcock provides practical, easy-to-follow methods for dealing with spam, viruses, hack attacks, identify theft, and other online dangers. The author, the target of a cyberstalker, went on to become a leading victim's advocate. She illuminates a broad range of abusive practices and presents dozens of real-life examples and success stories.

"Hitchcock offers first-class advice about ways to protect personal information and detect various kinds of fraud," said Vint Cerf, Vice President and Chief Internet Evangelist for Google®, in his foreword to the book. According to Cerf, "[Hitchcock's] personal experiences lend credibility to the text and her concrete examples help readers formulate defenses to avoid becoming victims. ...Reading this book is a first step toward increasing your ability to stay safe in a cyberworld that has its dark side as well as its sunny one."

The 21-chapter book also features over 65 illustrative screenshots, numerous informative sidebars, an annotated listing of useful reader resources, Vint Cerf's foreword, the author's introduction and afterword, a glossary of terms, and an index. The new softbound book is $24.95.

For more information on this and other ITI books, contact Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8750 (phone 1-800-300-9868; e-mail: <custserv@infotoday.com>; on the web: <http://www.infotoday.com>). You can order the book online at the publisher's website.

New 27th Edition of the National Radio Club *AM Radio Log.* We have said it before: Your column editor frequently is surprised by the number of licensed radio amateurs (including me) who also are avid listeners to DX mediumwave (MW) broadcasts. Supporting these listeners is The National Radio Club (NRC), reportedly the world's oldest and largest medium-wave DX club. An association of MW listeners and radio hobbyists since 1933, the club offers an extensive online catalog of MW-related publications at <http://www.nrcdxas.org>.

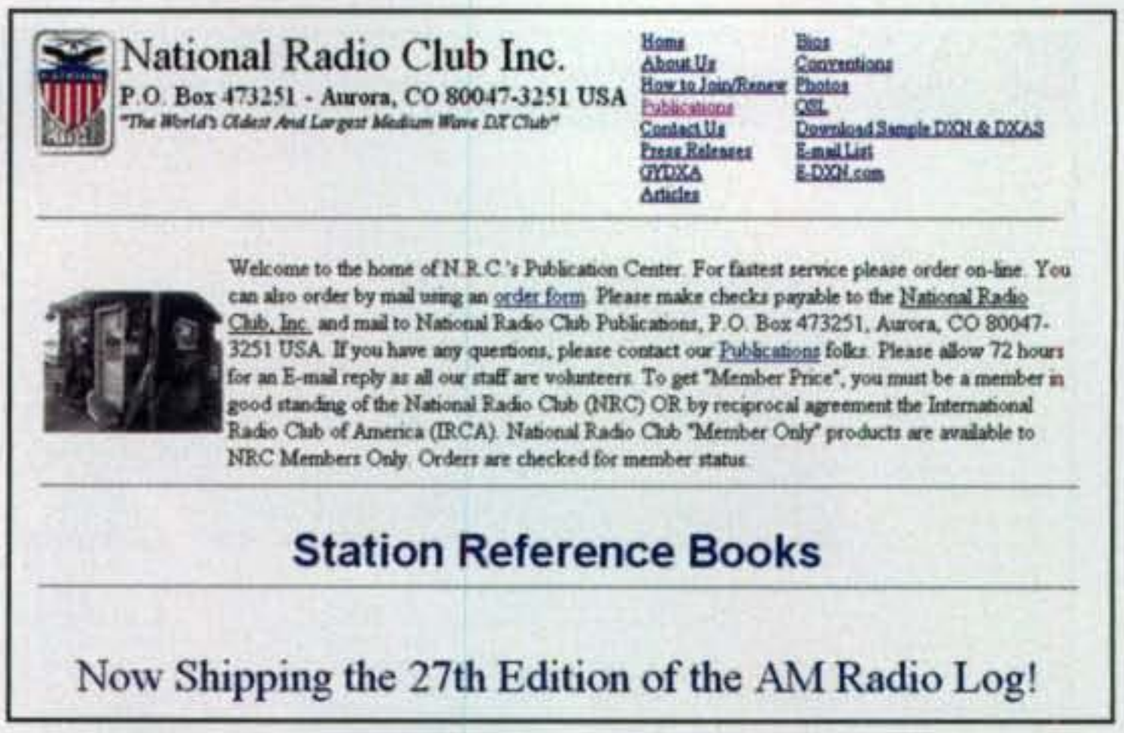

Fig. 3– The National Radio Club's AM Radio Log, 27th Edition, *for the 2006–2007 DX season is now available, and it's a highly authoritative source of information on AM radio stations in the United States and Canada. Convenient online ordering is available through the NRC's website at <http://www.nrcdxas.org>. (Image from the NRC website)*

NRC's chairman (and also a radio amateur), Wayne Heinen, NØPOH, recently told us that the *AM Radio Log, 27th Edition* (fig. 3) for the current DX season is now available. It's a highly authoritative source of information on AM radio stations in the United States and Canada. The new edition, edited by Wayne and Joan Heinen, KBØYRX, contains 278 pages of data and crossreferences, as well as 18 pages of instructions in an $8\frac{1}{2}$" × 11" three-hole punched, looseleaf format, one that fits nicely into a 1-inch three-ring binder.

With nearly 6000 updates since last year's edition, recent additions to the log show call letters of FM simulcasts and listings of regional groups of stations in the separate groups section of the log book. There also is a cross-reference of stations licensed to use the IBOC (In Band On Channel) digital audio format. The book's cost is $25.95 postpaid in the U.S. to nonmembers, or $19.95 to NRC members. Orders are shipped postpaid by Media Rate; USA and Canada add $2.50 for Priority Mail shipping.

Send publication orders to NRC Publications, P.O. Box 473251, Aurora, CO 80047-3251 (e-mail: <sales@nrcdxas.org> or <amradiolog@nrcdxas.org>; on the web: <http://www.nrcdxas.org>). You may place orders online at the club's website.

Wrap-Up

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

Overheard: It just may be that to avoid getting involved in a previous argument, it's best to avoid the person with whom you were having the argument! 73, Karl, W8FX

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

dx

BY CARL SMITH,* N4AA

VU7, Lakshadweep, and More DX

Well, what can I say? After the January column was written things changed relative to Lakshadweep. The Amateur Radio Society of India (ARSI) operation did occur as planned during the entire month of December, or at least the first half (as this is being written in mid-December). Most bands were activated by all Indian operators, as were most modes (CW/SSB/RTTY/PSK). They had some problems getting the on-line logs uploaded to the website, so I'm sure there were a number of those "insurance" contacts being made. Many areas of the U.S. had great difficulty hearing the VU7 signals on any band/mode during the first two weeks of the operation. In all fairness, however, I must mention the solar flares that occurred around December 7th. QSLs for VU7LD are being handled by Joe, W3HNK.

During the VU7LD operation I spent a lot of time listening. Although I did hear some of the QRM, "frequency cops," etc., it did not appear to be as bad as some behavior we've experienced in the past. Could it be that people are finally getting the message? For a very long time now I've been "beating the drum" about proper behavior on the air, and with the stuffers on the subject going out via some QSL managers, maybe—just maybe—we are finally reaching those who don't read these pages of *CQ* or other publications in which I've talked about the subject. We'll never get rid of all of the poor behavior, but if we can reduce it by even 50%, it will be a great benefit to all DXers. Thanks to all of those who have helped with this project, and it isn't going to stop any time soon. I'll continue to pursue it at every opportunity.

The National Institute of Amateur Radio (NIAR) VU7 operation was originally scheduled for January, then changed to December, and then changed again back to January. Thus, we won't know how that operation turns out for some time. It was scheduled to begin January 15th, but no end date was announced. More on that when I know.

5A7A – Libya

This operation turned out very well, with the team making nearly 110,000 QSOs in November. In the CQ WW DX CW Contest they reported making 17,703 QSOs, with 683 countries and 190 zones, for an unverified score of 46 million—a job well done. QSLs are being handled by DL9USA.

Speaking of contests, the "new" frequencies on 80 and 40 meters were available starting December 15th, so it won't be known for awhile how that works out. I suspect there will be a lot of activity just to "check it out," especially on 80 meters. Being allowed to go all the way down to 3600 will

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e-mail: <n4aa@cq-amateur-radio.com>

The team of operators who brought us 5A7A last November, providing nearly 110,000 QSOs. (Photo from the 5A7A web page)

The WPX Program

CW

None

SSB

2966 .....DH2EAS

MIXED

None

CW: 1000 AA4FU. 1250 WA2VQV, K1NU.
SSB: 1400 WM4R, K1NU
Mixed: 950 WB5JID. 1900 K1NU. 2350 7K3QPL. 3750 I5RFD.
80 Meters: AA4FU
North America: LY3BY

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, KBØG, 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, DKØPM, SV1EOS, UAØFAI, N4GG.

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, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, 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.
Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will not accept prefixes/calls which have been confirmed by computer-generated electronic means.

**Please Note: The price of the 160 meter bar for the Award of Excellence is $6.50.*

CQ DX Awards Program

SSB

2491	AE6RR	2493	WA6JJB
2492	IZ8EDJ	2494	F5MSB

SSB Endorsements

330	N7BK/337	330	4Z4DX/337
330	DJ9ZB/337	330	N4MM/337
330	K4MQG/337	330	W8AXI/336
330	N4CH/337	330	K2FL/336
330	K2TQC/337	330	K4JLD/336
330	XE1L/337	330	KØKG/335
330	W6BCQ/337	330	W2CC/334
330	K5OVC/337	200	F5MSB/246
330	W6EUF/337		

CW Endorsements

330	K2FL/336	330	N4MM/336
330	K4MQG/336	330	K4JLD/333
330	K2TQC/336	320	K1FK/325
330	N4CH/336	200	KØKG/242

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 337 active countries. Please make all checks payable to the award manager.

open a lot of spectrum for us to play in. The ARRL phone contest in March should be the first real test of who goes where on those bands.

9N7JO – Nepal

Stig, LA7JO, has been in Nepal for some time now, and he recently told me that he will be there for another year. He expects to be active "on and off" during the year. He is active on all HF bands on SSB/CW/PSK31/RTTY. QSLs for 9N7JO should go *only* to the address on QRZ.com, *not* to LA7JO and *not* via any bureau.

YWØDX – Aves Island

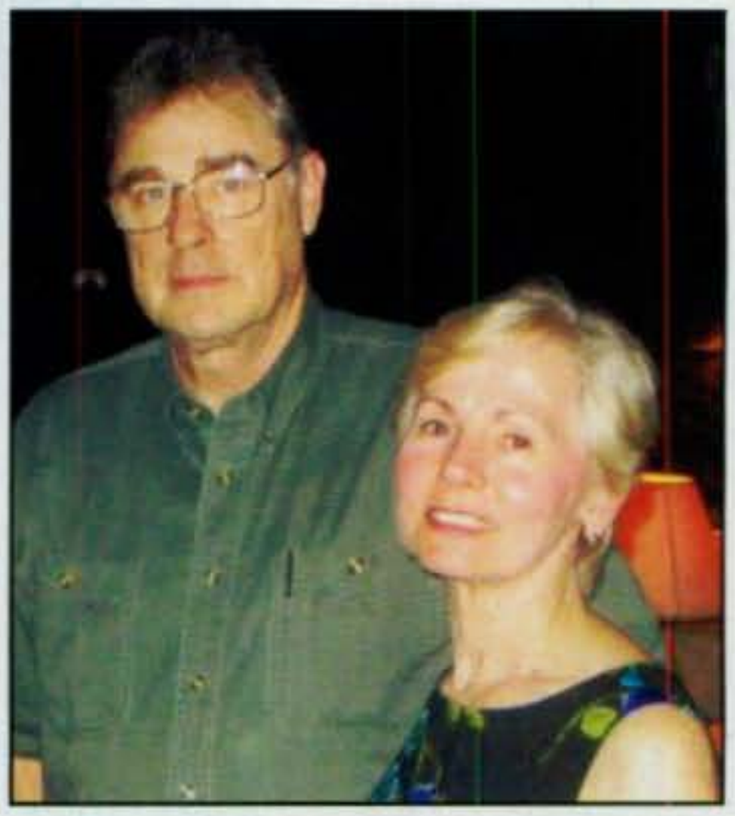
After their success as YX5IOTA, the 4M5 DX Group announced a team of 15 experienced operators, led by Alex, YV5SSB, will begin an operation from Aves Island the second weekend of February for ten days. Activity will be on all bands/modes. Ops include Alex, YV5SSB (team leader); Jose, YV5TX; Julio, YV1RDX; Rafael, YV5RED; Martti, OH2BH; Tomas, YV1CTE; Jesus, YV5MSG; Jose, YV5ANT; Olli, YV5WW (OHØXX); Greg, YV5OHW; Ray, YV5EU (DL2GG); Pasquale, YV5KAJ; Franco, YV1FM; Felo, YV5GRV; Jig, AD6TF; and Conrad, IT9DAA (YV1CD). Sponsors and donations are welcome. All information is on the group's web page: <http://yw0dx.4m5dx.org/>.

Alex, UT5UY, operating from Swaziland as 3DAØUY. (Photo courtesy of Franz, DJ9ZB)

You may remember an operation from Aves Island in April 2006. Shortly after that operation got under way, José "Joe", YV5LIX, suffered a fatal heart attack on the island. The operation continued, but obviously with less enthusiasm by the rest of the team.

S9SS – Sao Tome

Charles, S9SS (home call KY4P), and his wife Lesley, S9YL, closed down their operation from Sao Tome the end of 2006. They had been there for a long time and Charles was very active on all bands. If you didn't work S9SS on some band or mode over the past few years, you must not have been on the air, as he was *everywhere*. We will miss his big signal from western Africa. His friends and I welcome him back to his home state of North Carolina, however, and look forward to hearing his stories of



Charles, S9SS/KY4P, and Lesley, S9YL. They are now QRT from Sao Tome and taking up retirement in the mountains of North Carolina. Thanks for the memories, Charles. (Photo courtesy of Charles, S9SS)

The WAZ Program

10 Meter SSB

580 ..... KT1J

20 Meter SSB

1154 ..... W6AEA 1155 ..... EI9FBB

20 Meter CW

569 ..... W6AEA

40 Meter CW

251 ..... 4Z5SG

160 Meters

240 ..... 9A5CY

All Band WAZ

Mixed

8434 ..... UA4HTZ
8435 ..... DL7BA
8436 ..... IZ3EBA
8437 ..... AC4PY.
8438 ..... UY5YY.

SSB

5013 ..... G3VNI
5014 ..... UA3LHL
5015 ..... JA1DZN
5016 ..... KE6FV
5017 ..... N5CFN.

CW

495 ..... S51DX

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>.

The CQ DX Field Award Program

Mixed

80 ..... KT2C
81 ..... 9A5CY
82 ..... RV3DUT

SSB

48 ..... YC9WZJ

CW

50 ..... OK2BNC

Endorsements

Mixed

225 ..... K2TQC/248
175 ..... JN3SAC/199
175 ..... 9A5CY/187
175 ..... OK1AOV/187
150 ..... KT2C/161

CW

175 ..... JN3SAC
175 ..... OK1AOV/178
100 ..... KT2C/154

The basic award fee for subscribers to *CQ* is $6. For nonsubscribers, 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. Please make all checks payable to the award manager.

operating from a number of places during his career with the Voice of America.

S21XA – Bangladesh

Josep, EA3BT, and his friends were scheduled to be active from Bangladesh January 10–16. This is one we don't hear very often, so as this is being written, a lot of folks are looking forward to hearing/working them.

1AØ – The Sovereign Military Order of Malta

1A4A: Starting in January 2007 a new amateur radio station license was issued from the The Sovereign Military Order of Malta, SMOM. The license is held by the SMOM, and it is being managed by Giorgio, IZ4AKS. The first activity of this station was scheduled to be from January 2–8 from the extra-territorial zone of the Magistral Villa on the Aventine hill in Rome. The operators were IZ4AKS, IZ4DPV, I4UFH, IK4UPB, and IWØDJB (HV5PUL). Activity was to cover from 2 meters to 160 meters, SSB/CW/RTTY, and three stations were to be active at the same time. Japan, South America, and U.S. West Coast, especially on the low bands, were to be emphasized. QSL Manager: IZ4DPV. Updated information and details about the DXpedition can be found at <www.1a4a.org>.

The license was granted into a fundraising program to support the worldwide relief activities of The Order of Malta. The Order follows its historic hospital mission of providing help to the needy and the sick. Today the Order of Malta is a major global, professional organization in terms of the humanitarian aid, medical care, and emergency medicine it provides, in its management of hospitals, specialized homes for dependent elderly people, socio-medical care centers, the collection and transporting of medicines and the training of workers, and ambulance staff. The Order currently has medical and humanitarian programs in more than 120 coun-

5 Band WAZ

As of December 1, 2006, 710 stations have attained the 200 zone level and 1525 stations have attained the 150 zone level.

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

None

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

N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
W2YY, 199 (26)
VE7AHA, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
IK1AOD, 199 (1)
DF3CB, 199 (1)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
HB9DDZ, 199 (31)
RU3FM, 199 (1)
N3UN, 199 (18)
OH2VZ, 199 (31)
W1JZ, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
SP5DVP, 199 (31 on 40)
N4NX, 199 (26)
N4MM, 199 (26)
EA7GF, 199 (1)
N6HR/7, 199 (37)
JA5IU, 199 (2)
CT3DL, 199 (26)
NØIJ, 199 (21)
RU3DX, 199 (6)
N4XR, 199 (27)
WØPGI, 199 (26)
HA5AGS, 199 (1)
EA8AYV, 199 (27)
VE3XN, 199 (26)
K7BG, 199 (22)
W6XK, 198 (17, 34)
EA5BCX, 198 (27, 39)
G3KDB, 198 (1, 12)
KG9N, 198 (18, 22)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K5PC, 198 (18, 23)
K4CN, 198 (23, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
F5NBU, 198 (19, 31)
OE2LCM, 198 (1, 31)
HA1RW, 198 (1, 31)
WK3N, 198 (23, 24)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)
WA5VGI, 198 (34)
W7VJ, 198 (34, 37)
WØCP, 198 (18, 40)
K9MIE (18, 21)

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

9A5CY (197 zones)
KT1J (176 zones)
N4UOZ (175 zones)

****Please note: Cost of the 5 Band WAZ Plaque is $100 ($120 if airmail shipping is requested).**

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

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Lower Mast Length -- 16"
Whip Length -- 32"
Total Height of Antenna at 54 MHz -- 50"
Total Height of Antenna at 3.5 MHz -- 56"
Freq. Coverage Continuous 3.5 to 54 MHz
Power Rating -- 200 watts PEP
Typical SWR--1.5 or less
Weight -- 1.9 lbs.

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Specifications
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Freq. Coverage with 5' Whip -- 3.5 to 28 MHz
Total Height of Antenna at 28 MHz -- 9'4"
Total Height or Antenna at 3.5 MHz--10'4"
Power Rating--1.5 Kw PEP
Typical SWR--1.5 or less
Weight--8 lbs

NEW 3" COIL

THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

MIXED

5264 .....9A2AA	3980 .....I2PJA	3621 .....S53EO	3262.....IK2ILH	2873.....W2ME	2426....W6OUL	1947.....KØKG	1651 .....KX1A	1269 ....K5WAF
4846 ....W2FXA	3968.....YU1AB	3560 ....KØDEQ	3227 .....K9BG	2752 .....W9IL	2415.....K5UR	1826 .....W7CB	1643.....N1KC	1016..RA1AOB
4735 .....W1CU	3956.....VE3XN	3475 ..YU7BCD	3089 .....W9OP	2704.....K2XF	2242 .....I2EAY	1741 .....AB5C	1556.....W2OO	825 .....KL7FAP
4343 .....EA2IA	3703.....I2UIY	3457 .....KF2O	3011 .....W2WC	2637 ..OZ1ACB	2172 .....VE6BF	1705.....W2EZ	1522.....N8BJQ	742.....K5IC
4187.....N4NO	3661 .....I2MQP	3375 .WB2YQH	2897.....9A4A	2457 ...JN3SAC	2024 .....AE5B	1662....SV1DPI	1287 ....K6UXO	648 .....KWØH

SSB

4710 .....IØZV	3395.....EA2IA	2734 ..OE2EGL	2227 ..YU7BCD	2051 .....K5UR	1709 ..SV3AQR	1412.....I2EAY	1183.....AE9DX	816 .....VE6BF
4266 .....VE1YX	3276.....N4NO	2711 ...LU8ESU	2209....IK2QPR	2042 .....W9IL	1688 .....KI7AO	1386....IK4HPU	1145...EA3EQT	729.....K7SAM
3956 .....I2PJA	3155.....I2UIY	2609 .....KF7RU	2196 .....W2WC	1848 .....K3IXD	1655 ...DL8AAV	1371 ....IK2DZN	1042....IZØBNR	637 .....K5WAF
3765 .....F6DZU	3142 ..CT1AHU	2595 .....EA1JG	2178.....NQ3A	1827.....AE5B	1611 .....W2ME	1330 ..VE7SMP	984.....KX1A	
3573 .....OZ5EV	3069 .....I4CSP	2557.....IN3QCI	2082.....I3ZSX	1763.....W2FKF	1595 .....W3LL	1305 ..SV1EOS	978 .....EA7HY	
3532 .....9A2NA	2930 .....KF2O	2431.....G4UOL	2076.....K2XF	1719.....KQ8D	1480 .....AB5C	1258 .....N1KC	950 .....IK8OZP	
3477.....I2MQP	2857 .....4X6DK	2326 .....CX6BZ	2073.....N6FX	1716....W6OUL	1458 ...JN3SAC	1202 .....AG4W	901 .....KU4BP	

CW

4593..WA2HZR	3166 .....LZ1XL	2503.....KA7T	2213.....OZ5UR	2017 .....VE6BF	1832.....I2EAY	1272.....K6UXO	915 .....N1KC	
4346.....K9QVB	3078 .....9A2NA	2476 .....W2WC	2167.....N6FX	1987 .....W9IL	1793..EA7AAW	1202 .WA2VQV	608.....IK2SGV	
3749.....N4NO	2688.....I2UIY	2440.....I7PXV	2120 ...JN3SAC	1955 .....K5UR	1402 .....WO3Z	1109.....KX1A		
3374.....EA2IA	2632 .....W2ME	2437 ...EA7AZA	2089.....K2XF	1901.....I2MQP	1386 .....AC5K	1053 ....K5WAF		
3339 .....VE7DP	2523 .....KF2O	2401 ..YU7BCD	2086....IK3GER	1863....W6OUL	1334 .....RUØLL	1042 .....VE1YX		

CQ DX Field Award Honor Roll

The CQ DX Field Award Honor Roll recognizes those DXers who have submitted proof of confirmation with 175 or more grid fields. Honor Roll lisiting is automatic upon approval of an application for 175 or more grid fields. To remain on the CQ DX Field Award Honor Roll, annual updates are required. Updates must be accompanied by an SASE if confirmation is desired. The fee for endorsement stickers is $1.00 each plus SASE. Please make all checks payable to the Award Manager, Billy F. Williams. Mail all updates to P.O. Box 9673, Jacksonville, FL 32208.

Mixed

K2TQC.....235	N4MM.....196	KØCA.....181
HAØDU.....228	JN3SAC 194	OK1AOV 181
VE3XN 217	W4UM 193	W5ODD.....177
KØDEQ.....207	BA4DW 188	K2AU.....177
KF8UN 205	F6HMJ.....182	NØFW.....176
N8PR.....200	K2SHZ.....182	ON4CAS 175
HA1RW 197	N4NX.....182	K8OOK.....175

SSB

VE7SMP.....190	W4ABW.....177	DL3DXX 175
KØDEQ.....180	NØFW.....176	
N4MM.....179	W4UM 176	

CW

DL3DXX 203	OK2PO.....184	KØCA.....175
KØDEQ.....198	JN3SAC 181	
W4UM 184	N4MM.....177	

tries.To learn more about The Order of Malta, visit <www.orderofmalta.org>.

1A4A (One Aid 4 Africa) first humanitarian activity has been finalized, and it is to collect funds to build a school for young girls as part of a support plan for the rebirth of Southern Sudan, coordinated by The Order of Malta, together with the Italian government.

K8S – Swains Island

The website is now up and running and provides the following information. I noted the callsign shown is not what was announced earlier. Keep watching the website for updates: <http://www. yt1ad.info/nh8s/index.html>.

Hrane, YT1AD, with the team K1LZ, K3LP, N6TQS, RA3AUU, UA3AB, RK3AD, YZ7AA, KD7RCD, and YZ1BX, and potential members of the team YU7NU, YU1DX and YZ1EW, will be active from Swains Island from March 29 to April 21, 2007. The team will stay on the island for ten days and will operate with six stations at the same time, signing K8S. QSL via YT1AD.

For many of us, it's not antenna weather now. All we can do is make the best of what we have for now and plan improvements for later in the year. If your antenna is not working for you, dig out the books and decide what to try next. We still have a few years before we head out of this solar minimum, so we need to make the most of the low bands while we can. Until next time, enjoy the chase and Have Fun!

73, Carl, N4AA

QSL Information

B1Z via K5SF
B7M via BG7LHY
B7P via BA7NQ
BD1DRJ via BG1DRJ
BD1DRJ/2 via BG1DRJ
BG1DRJ/3 via BG1DRJ
BG1DRJ/4 via BG1DRJ
BG2QMP/2 via BG1DRJ
BI4F via BA4XA
BY1TX/2 via EA7FTR
C52T via GØTSM
C6APR via K3IXD
C6AQC via W3HNK
C91BWW via CT1BWW
CE6TC via CE6DFY
CGØXN/P via VE3XN
CIØXN/P via VE3XN
CN2ZR via W7ZR
CT3/HA5PP via HA5PP
CT3IA via CQ9K
D20VB via UA4WHX
D90HE/4 via DS2GOO
DR1A via DL6FBL
DX6M via W6PDX
E20PFE via E20PFE
EA1COZ via EA1EAG
EA6/DK3DUA via DK3DUA
EA8/DK3TNA via DK3TNA
ED3SSB via EA3QP
EF8A via EA8URL
EI7M via EI6HB
ER570C via ER1DA
FG5JK via FG5JK
FM/K9NW via K9NW
FS/K1RH via K1RH
FS/N3VOP via N3VOP
FS/W3ADX via W3ADC
FS/WY3P via W3ADC
FY/W6IZT via W6IZT
G6PZ via MØDXR
GB4GIN via M5AFY
GDØBPS via GØBPS
GMØB via MMØBHX

(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>.)

awards

BY TED MELINOSKY,* K1BV

County Hunting Q&A
Plus the JARL Award Series, Part I

The following are some valuable bits and pieces of county hunting information written in response to questions that have come up recently:

First, *CQ* magazine does not sponsor, authorize, run, or administer any county hunters net (or any other kind of net) on any frequency. In addition, the FCC does not recognize any exclusive usage of a frequency except during an emergency, and even this is only for a relatively brief period of time. County hunters depend on dedicated volunteers who usually start a net early enough so that they are the first users of that frequency. Propagation normally allows stations in different parts of a continent to operate on the same frequency without disturbing each other. However, propagation changes; we all know that. If the frequency is in use, then the net control should either wait until the contact is over or move frequency enough to minimize any interference. You can always move back to the well-known net frequency when it is clear.

Bob, K4CY, asked whether 4U1UN or 4U1WB QSO/QSLs are valid for USA-CA. 4U1UN is the club station for the United Nations, located in New York City, and while it is physically located in the city, is also is considered a separate entity for the ARRL's DXCC award. Because of its unique status, 4U1UN is considered to be outside of the USA-CA program.

4U1WB is the club station of the World Bank, located in Washington, D.C., which is an independent city, and by USA-CA rules may be counted as either Montgomery or Prince Georges County, Maryland.

Ron, K2RP, has run into a common problem. He's closing in on 3000 counties and is trying to arrange schedules with stations in rare counties by e-mail. Over half of the stations he's looked up online do not show an e-mail address (they may be inactive) and of the remainder, for half of those that *do* show e-mail address the messages sent "bounce" and are invalid. If you're active and have e-mail, please make sure that your current e-mail address is shown on QRZ.com or Buckmaster.

Peter, ONL-5923, asked if he can use a computer printout in his application for USA-CA. Yes, definitely. When I took over administration of the program in 1997, the rules (written in the early 1960s) did not reflect the great increase in use of the computer. We accept printouts of any USA-CA application as long as the following data is included: alphabetical listing by state, by county, and call of station worked, city/town/"mobile," band, and mode.

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

USA-CA Special Honor Roll

Joe G. Watkins, N5UZW
USA-CA All Counties #1146 (All SSB)
November 14, 2006

USA-CA Honor Roll

500		2000	
N5UZW	3392	N5UZW	1340
1000		**2500**	
N5UZW	1724	K4IZQ	1258
K1ZN	1725	N5UZW	1259
1500		**3000**	
N5UZW	1446	K8XF	1169
K1ZN	1447	N5UZW	1170

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.

JARL Awards Series, Part 1

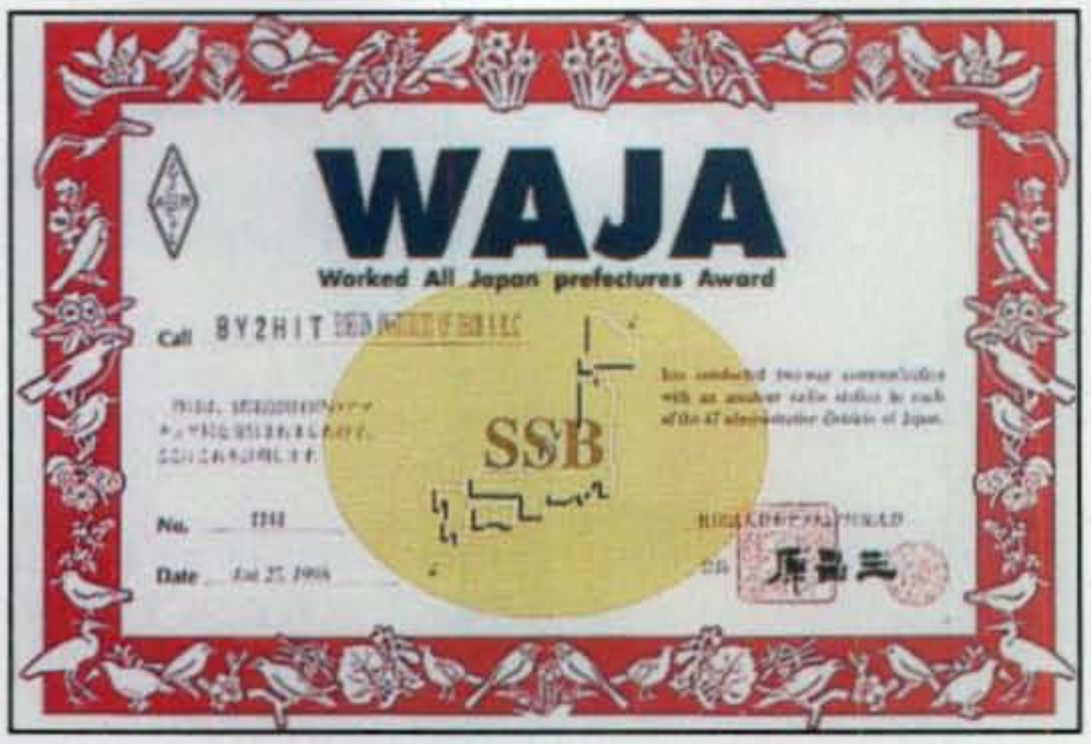
Japanese amateur radio operators are avid award hunters and collectors. I've cataloged over 260 different awards from this island nation. The national organization, the Japan Amateur Radio League (JARL) has been a leader among Asian nations in promoting a strong and diversified selection of awards which address both HF and VHF interests. If your QSL collection has a lot of JA cards, you can add to your awards collection the organization's beautiful and interesting certificates. This is part one of a two-part series featuring the JARL awards.

General Requirements: The awards are available to both amateurs and SWLs. GCR list is accepted. The form of the list is specified, when required, in the rules for each award. The fee is 12 IRCs for each award. Endorsements for the AJA and WASA awards are 6 IRCs regardless of the number of stickers. Endorsement stickers for the JCC and JCG awards are 6 IRCs per application. An additional 2 IRCs will be charged for airmail delivery regardless of the number of awards claimed.

Applicants may request up to three of the following endorsements:

1. Specific band.
2. Modes (only contacts made in the same mode)—CW, AM, SSB, FM, SSTV, RTTY, ATV, and FAX.
3. Satellites—only contacts made through an amateur satellite.

The All Japan Districts Award offered by the Japan Amateur Radio League.



The Worked (Heard) All Japan Prefectures Award for contacting (hearing) each of the 47 prefectures of Japan.

4. QRP—only contacts made through transmitters with final output of 5 watts or less.

5. QRPp—only contacts made through transmitters with final output of 0.5 watt or less.

Only contacts/receptions made on or after 29 July 1952 are acceptable.

Only land-station QSOs are acceptable. MM and AeroMoblile are acceptable for 50 MHz – 100; 144 MHz – 100; 435 MHz – 100; 1200 MHz –10, 50, 100; 2400 MHz –10, 50, 100; and VU – 1000 awards.

Contacts with Far East Military Auxiliary stations in Japan are not acceptable.

All contacts must be made on land within the same call area, or if no call area exists, within the same country.

Apply to: Japan Amateur Radio League, Award Desk, 1-14-5 Sugano, Toshima-ku, Tokyo 170-8073, Japan (http://www.jarl.or.jp/English/4_Library/A-4-2_Awards/Award_Main.htm).

All Japan Districts (AJD) or (SWL-AJD). Contact (or hear) and receive a card from a station in each of the ten call areas of Japan.

Worked All Japan Prefectures Award (WAJA) (HAJA). Contact (or hear) and receive a card from a station in each of the 47 prefectures of Japan. The list of QSL cards should be arranged in order of WAJA reference number. However, name of the prefecture may be omitted.

Prefecture list: 01 Hokkaido, 02 Aomori, 03 Iwate, 04 Akita, 05 Yamagata, 06 Miyagi, 07 Fukushima, 08 Niigata, 09 Nagano, 10 Tokyo, 11 Kanagawa, 12 Chiba, 13 Saitama, 14 Ibaraki, 15 Tochigi, 16 Gunma, 17 Yamanashi, 18 Shizuoka, 19 Gifu, 20 Aichi, 21 Mie, 22 Kyoto, 23 Shiga, 24 Nara, 25 Osaka, 26 Wakayama, 27 Hyogo, 28 Toyama, 29 Fukui, 30 Ishikawa, 31 Okayama, 32 Shimane, 33 Yamaguchi, 34 Tottori, 35 Hiroshima, 36 Kagawa, 37 Tokushima, 38 Ehime, 39 Kochi, 40 Fukuoka, 41 Saga, 42 Nagasaki, 43 Kumamoto, 44 Oita, 45 Miyazaki, 46 Kagoshima, 47 Okinawa.

Japan Century Cities (JCC) (SWL-JCC). Contact (or hear) and receive a card from a station located in each of at least 100 different cities of Japan. JCC-200, 300, 400, 500, and 600 will be issued as separate awards. The list of cards should be arranged in order of JCC reference number. However, the name of the city may be omitted. The list of cities is available at: <http://www.jarl.or.jp/English/4_Library/A-4-2_ Awards/Award_Main.htm>.

Worked All Squares Award—HF. Contact at least 100 different grid square locators in the world (first 4 digits) on the HF bands; sticker endorsements are available for each additional 100 squares. Contacts after 1 July 1992 count for the award. All contacts must be made from the same grid square in your country. Even if the square of the station that issued a QSL card is not shown clearly, a QSL card show-

Contact (or hear) a station in at least 100 different cities in Japan to earn the Japan Century Cities Award.

The Worked All Squares Award is offered for working at least 100 different grid square locators in the world on HF.

The VHF awards from the JARL are available for single VHF bands.

ing the longitude and latitude of the station from which its square can be calculated will be valid. In this case, these coordinates should be shown on the QSL card list. The location where you operate your station should be within one square. The same station may be counted on each band and square. No crossband allowed except by satellite. Endorsement fee is 5 IRCs. GCR list submitted must include grid square data. No endorsements for band/mode.

VHF Awards. These all are available on single VHF bands and require the applicant to contact (hear) and receive a QSL card from the different number of stations on the frequency band listed below:

50 MHz—100
144 MHz—100
435 MHz—100
1200 MHz—10, 50, 100, 200, 300, etc.
2400 MHz—10, 50, 100, 200, 300, etc.
5600 MHz—10, 50, 100, 200, 300, etc.
10 GHz, 5600 MHz—10, 50, 100, 200, 300, etc.
24 GHz, 5600 MHz—10, 50, 100, 200, 300, etc.
47 GHz, 5600 MHz—10, 50, 100, 200, 300, etc.
75 GHz, 5600 MHz—10, 50, 100, 200, 300, etc.

Looking for some help in publicizing your group or club's award? CQ magazine can help. Please send all details and samples to me for review.

73, Ted, K1BV

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BY JOE LYNCH,* N6CL

Five New Ham Satellites in Orbit

Five new satellites, each carrying amateur radio equipment, are now in orbit. The first of these five to be fully deployed was the GeneSat-1, which was launched on December 16, 2006 from the Mid-Atlantic Regional Spaceport (MARS) at NASA Wallops Flight Facility as a secondary payload with the TacSat-2, the primary satellite, aboard a Minotaur launch vehicle. GeneSat-1 is a 10 × 10 × 30 cm spacecraft which was designed to conduct a cellular biology technology demonstration. The following is from the Center for Robotic Exploration and Space Technologies (CREST) website (http://www.crestnrp.org/genesat1/ahc.html):

Of particular interest to the amateur radio satellite community, is the GeneSat-1 beacon. Operating at 437.075 MHz FM, the beacon sends an AX.25 packet at 1200 baud every 5 seconds; the packet contains data about the spacecraft systems operation. The beacon was scheduled to initiate transmission as soon as the spacecraft is deployed from its carrier on the 4th stage of the launch vehicle.

To foster interest in the amateur community, and to support amateur radio and space technology outreach to secondary and higher education student groups, the GeneSat Mission Team is sponsoring a contest, with recognition and awards as follows:

Grand Prize: A radio station set up for satellite tracking! The rig will be donated by the Silicon Valley Center for Robotic Exploration and Space Technology (CREST) at NASA Research Park to the college or university of the winner's choice. The honor of choosing the recipient school goes to the station that logs 12 or more data packets each (about 1 minute's worth of listening) from the greatest number of satellite passes during the experiment.

The academic institution must be approved by CREST management. Approval will be awarded on the schools ability to demonstrate that they have suitable infrastructure and licensed amateur(s) available to operate and maintain the station, and to provide for connectivity from CREST for remote support and operation. The station will be installed with the cooperation of CREST staff.

The winners also will receive a commemorative plaque for station team members and pictures and recognition on the GeneSat-1 website.

In case of a tie, the station with earliest initial packet submittal will win the right to award the station.

First Contact Prize: The station submitting the first packet after initiation of transmission will receive the First Contact Prize. They will receive a commemorative plaque and mission pins for station team members and pictures and recognition on the GeneSat-1 website.

The First 20 to post packets will receive mission pins and a certificate of recognition from the GeneSat Mission Operations Director.

All contestants who submit one or more packets will receive an electronic QSL card from GeneSat-1's website (genesat1.org) upon submission of data.

Entries will be made by uploading packets received onto the GeneSat-1 website.

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

VHF Plus Calendar

February 2	Full Moon.
February 4	Moderate EME conditions.
February 7	Moon Apogee.
February 9–11	Orlando HamCation (See text for details.)
February 10	Last Quarter Moon.
February 11	Very poor EME conditions.
February 17	New Moon.
February 18	Good EME conditions.
February 19	Moon Perigee.
February 24	First Quarter Moon.
February 25	Poor EME conditions.

—EME conditions courtesy W5LUU.

According to the U.S. Naval Academy website (http://www.ew.usna.edu/~bruninga/ande-raft-ops.html), the other four satellites are part of USNA student projects. From this website is the following information:

The ANDE and RAFT and MARScom all contain systems involving US Naval Academy Student Projects.

Bob Bruninga, WB4APR, gives the ANDE satellite a "final tweak" at the US Naval Academy's Satellite Laboratory. (All photos courtesy the USNA Satellite Laboratory)

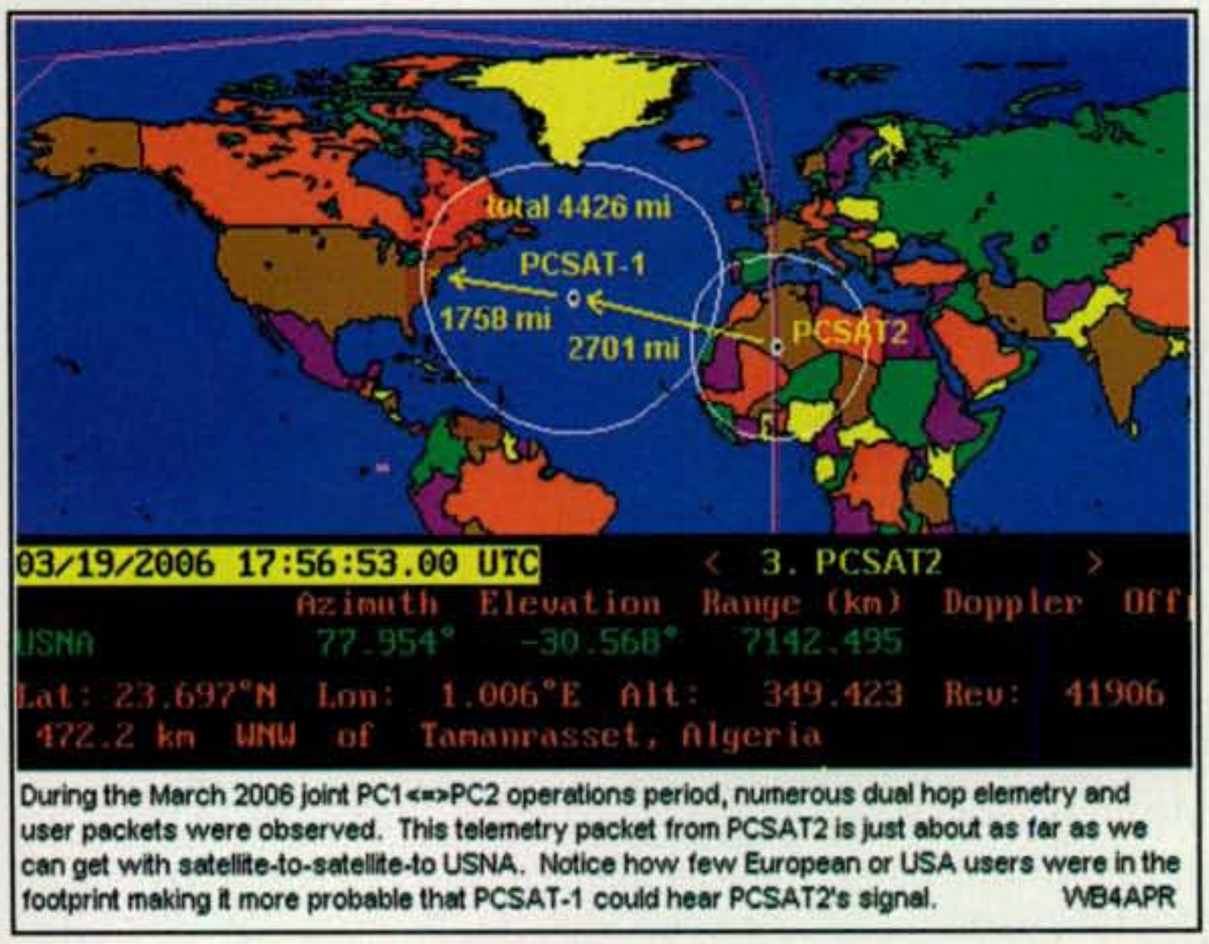
Bob Bruninga, WB4APR (left), and satellite lab midshipmen pose with the RAFT-1 and MARScomm CubeSats.

An interior look at MARScomm.

RAFT and MARScom are complete student spacecrafts and the ANDE comm system was a student project. The fourth satellite, FCAL, was built at NRL but also contains an amateur radio CubeSat for its comms and telemetry. These four satellites, all operating in the Amateur Satellite Service, were carried to orbit on the Space Shuttle *Discovery,* mission STS-116, at 8:47 PM on 9 December 2006.

These satellites were subsequently deployed from the Shuttle *Discovery* on December 20. The following is from the *ARRL Letter,* dated December 13, 2006:

The ANDE (Atmospheric Neutral Density Experiment) and RAFT (Radar Fence Transponder) and MARScom satellites all contain systems involving student projects. Midshipmen at the US Naval Academy's Satellite Laboratory designed and built RAFT and MARScom and the ANDE communication package under the tutelage of Bob Bruninga, WB4APR. The fourth satellite, FCal (Fence Calibration satellite), was built at the Naval Research Laboratory (NRL). It contains an amateur radio CubeSat for communications and telemetry.



During the March 2006 joint PC1<=>PC2 operations period, numerous dual hop elemetry and user packets were observed. This telemetry packet from PCSAT2 is just about as far as we can get with satellite-to-satellite-to USNA. Notice how few European or USA users were in the footprint making it more probable that PCSAT-1 could hear PCSAT2's signal. WB4APR

Fig. 1– During the March 2006 joint PC1-PC2 operations period, numerous dual-hop telemetry and user packet were observed. This telemetry packet from PCSAT-2 is just about as far as we can get with satellite-to-satellite to USNA. Notice how few European or US users were in the footprint, making it more probable that PCSAT-1 could hear PCSAT-2's signal. (Image courtesy of WB4APR)

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The amateur radio payload within the ANDE satellite will contain two independent AX.25 packet command and telemetry systems. The primary system is designed to operate like PCsat and PCSAT2, providing telemetry and supporting 1200 bps packet communication (i.e., digipeater operation) on 145.825 MHz. The secondary is designed to operate on unpublished frequencies.

Bruninga says midshipmen had to rebuild the ANDE communication package from scratch after the finished modules "were burned to a crisp" the day before delivery by a heat-chamber thermostat failure.

"This project has taken multiple years to complete and the current team has taken the work of past students and moved forward with it," Bruninga explains.

RAFT-1 will have a PSK31 uplink passband of 28.117 to 28.120 MHz as well as a UHF telecommand uplink. The 145.825 MHz uplink/downlink frequency will support 1200 bps packet communication.

RAFT also will provide a 216.98 MHz transmitter/receiver for the NSSS radar fence experiments. Radio amateurs will be able to listen to the signal as the satellite crosses the National Space Surveillance Satellite Network (NSSS) radar-tracking system.

MARScom will operate on Navy-Marine Corps Military Affiliate Radio System (MARS) frequencies. It will feature a UHF AM uplink, a VHF FM uplink, and an HF SSB downlink (27.965 MHz). The initial operations plan for MARScom is to have ground stations hone their downlink tuning skills by transmitting occasional packets on the 148.975 MHz FM uplink.

FCal's downlink frequency will be 437.385 MHz (AX.25 AFSK 1200 bps packet). It will identify as KD4HBO.

Again, from the USNA website is the following:

Depending on altitude separation at launch, the satellites were to have been in view of each other for about 15 days and then rejoined again about 31 days later, etc. As RAFT speeds up as it decays faster, the next joint ops will only last 3 days, 24–27 February and then again 10–13 March. When they are in view of each other, exciting dual-hop packet relays are possible. Please see figure 1 for an illustration of how this may take place.

A more complete report of the operations is scheduled to appear in the Winter 2007 issue of *CQ VHF* magazine.

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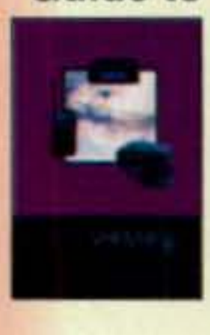

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An invaluable and unique reference written to meet the needs of amateurs and experimenters interested in low power radio techniques below 200sHz.

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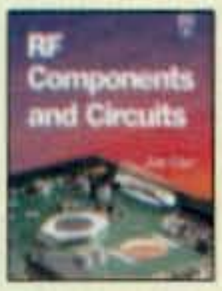
Packet Radio Primer
By Dave Coomber, G8UYZ & Martin Croft, G8NZU
RSGB, 2nd Ed., 1995, 266 pages
Detailed practical advise for beginners. Completely revised and greatly expanded to cover developments in this field and beyond bare basics into advanced areas such as satellite operations.

Order: RSPRP $16.00

RF Components & Circuits
By Joe Carr, G3YWX
RSGB, 2002 Ed, 416 pages.
A complete self-study course in RF technology, with conscise reference text to dip into in a readable and straightforward format.



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VHF/UHF Handbook
Edited by Dick Biddulph, M0CGN
RSGB, printed 2002., 317 pages.
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The First-Ever EME Operation from Mali

The following is from the website of Ned Stearns, AA7A (http://members.cox.net/aa7a/results_of_tz6ns.htm):

Results of TZ6NS, EME DXpedition to Mali November 2006

Mike Fulcher, KC7V/TZ6MF, and Ned Stearns, AA7A/TZ6NS, planned and executed a small EME DXpedition to Mali, West Africa in November 2006. This effort was tightly integrated into a larger project, the CQ WW DX CW Contest DXpedition TZ5A, which was pulled off by the VooDoo Contest Group. The VooDoo Contest Group consists of US and UK hams who have been meeting in West Africa for over a dozen years and have put together a string of highly successful contest operations that have placed high in the worldwide rankings in the CQ WW DX CW Contest.

Mike and Ned, members of the VooDoo Contest Group, have recently become infatuated with some of the new digital communication technology that has been evolving in the EME community, and they decided in 2006 to try their hand at putting together a portable 2-meter EME station that would exploit this new technology, which permits even modest-size stations to participate in EME. And, once the equipment for this year's effort was moved into Africa, it could be used in conjunction with the 2006 VooDoo Contest effort and possibly for many years to come as this roving contest group moves their act to other West African nations.

Altogether Mike and Ned made over 70 contacts during their DXpedition.

Huge December Solar Flares

Huge mid-December solar flares produced mid-latitude aurora that gave VHF and low-band operators alike especially good propagation. You can read more about the effects of these storms in this month's Propagation column by Tomad Hood, NW7US. As VHF-plus propagation reports become available, they will be reported here.

New VHF-Plus DX Record Claimed for 300+ GHz "Traditional RF" Operation

Perennial millimeter-wave operator Brian Justin, WA1ZMS, has laid claim to yet another VHF-plus operating record. The following is his report:

I'd like to report some new DX on 322 GHz, and claim a new DX record overall for traditional RF operations above 300 GHz. (i.e., excluding light). The QSO was made by WA1ZMS and Peter Lascell, W4WWQ, using slow-speed CW and Spectran software.

Details of QSO: Date, December 10, 2006; Time, 0216 UTC; Mode, FSK-CW; Frequency, 322 GHz; Distance, 7.3 km; W4WWQ/4 was located in FM07 at N37-21-13.8, W79-10-15.0; WA1ZMS/4 was located in FM07 at N37-23-09.8, W79-14-33.9.

The weather at the time of the QSO was: Temp –2° C; Dew Point –17° C; Relative Humidity 31%; and Station Pressure 1004 mb. These weather conditions resulted in an atmospheric loss of 4.13 dB/km due to oxygen and water vapor.

The gear used for this QSO was the same gear used previously on 241/322/403 GHz, that being harmonic mixers and 12" parabolic dish antennas. This latest QSO exceeds our former DX of 1.4 km as well as makes a claim for best DX on any amateur frequency above 400 GHz (except for visible light). Photos are available at Brian's website: <http://www.mgef.org>.

Some Comments: A note to US amateurs that in 2005 the FCC changed the amateur allocations from 300 GHz and above to now read: "275 GHz and above." It is also my understanding that Germany remains the only country with a segmented amateur allocation above 275 GHz, that being 411 GHz. Lastly, the ITU over the next several years will be reviewing and possibly making dedicated amateur band allocations above 275 GHz. That promises to be a positive event for amateurs worldwide.

Remember when the US ham bands used to be 30 GHz and above? Look how far we as hams have come!

AMSAT-NA Signs Agreements to Build Eagle at a UMES Facility

The following announcement is from the AMSAT-NA website (http://www.amsat.org):

AMSAT-NA has accepted an offer to co-locate its Satellite Integration Lab with the Hawk Institute for Space Sciences (HISS), a division of the Maryland Hawk Corporation, which is a 501(c)(3) non-profit educational organization affiliated with the University of Maryland Eastern Shore (UMES). The HISS facilities, currently under construction, are in the Mid-Atlantic Institute for Space and Technology (MIST) building in Pocomoke City, Maryland, on the Maryland eastern shore of the Chesapeake Bay. Maryland Hawk is a member of MIST. HISS is a division/unit of Maryland Hawk. Pocomoke City is about a 3-hour drive southeast of the Baltimore-Washington International airport.

AMSAT-NA has been actively searching for a suitable location for the past two years, as AMSAT's most recent lab at the municipal airport in Orlando, Florida was condemned due to damage by Hurricane Charley on August 13, 2004. With the unanimous approval of the AMSAT-NA Board of Directors, AMSAT-NA has executed two Memoranda of Understanding, one with the University of Maryland Eastern Shore and the other with Maryland Hawk Corporation, formalizing the relationship. These MOUs give AMSAT-NA essentially no-cost access

to the HISS facility in return for sharing its equipment and ideas with HISS. In addition, the agreement with UMES calls for AMSAT-NA to work collaboratively with UMES to identify opportunities to work together on satellite and related technology projects as well as to work with their students and faculty to enhance hands-on studies and dissertation research. The possibility also exists for AMSAT-NA scientists and engineers to receive Adjunct status at the UMES.

AMSAT's VP Engineering, Bob McGwier, N4HY, commented "I consider these happenings to be a serious beginning of the activities towards a real spacecraft." AMSAT's lead mechanical engineer, Bob Davis, KF4KSS, is also an employee of HISS, resulting in AMSAT having a representative on site at all times. Bob Davis was AMSAT's mechanical design expert in the Orlando lab during the AO-40 satellite campaign.

HISS is currently constructing the interior walls for their new 8,000 square foot facility. It is being designed around AMSAT's dual clean room, which was used for AO-40 and is in storage at Florida Space Institute. AMSAT will move the clean room and the parts and equipment currently in storage in the Orlando area to the new lab in the next few months. The facility will also include adequate meeting and office space for visiting AMSAT personnel. The agreement with HISS also provides AMSAT limited access to NASA Wallops Flight Facility, with its environmental testing, machine shop, rocket manufacturing and launch facilities.

AMSAT members Bob Davis, KF4KSS; Rick Hambly, W2GPS; Tom Clark, K3IO; Jim Sanford, WB4GCS; and Bob McGwier, N4HY, have worked very hard on this project. AMSAT members are encouraged to volunteer to work in the new lab, come by and visit (call first), and donate to the P3E and Eagle satellite funds.

Current Conferences and Conventions

Orlando HamCation & Computer Show: As part of the Orlando HamCation & Computer Show on February 9–11, members of the Orlando Amateur Radio Club and ICOM will demonstrate D-STAR via their digital voice/data repeaters. Representatives from OARC and ICOM will be available at their booths, numbers 53–58, to demonstrate the D-STAR equipment and answer questions regarding this exciting technology. For more information see the convention website at: <http://www.hamcation.com/forums.html>.

Calls for Papers

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

Southeastern VHF Society Conference: The 11th Annual Southeastern VHF Society Conference will be held on April 27–28, in Atlanta, Georgia. More information on the conference can be found at: <http://www.svhfs.org/conf_2007.htm>. The society is calling for the submission of papers and presentations for the conference. Papers and presentations are solicited on both the technical and operational aspects of VHF, UHF, and Microwave weak-signal amateur radio. Some suggested areas of interest are: transmitters, receivers, transverters, RF power amplifiers, RF low-noise pre amplifiers, antennas, construction projects, test equipment and station accessories, station design and construction, contesting, roving, DXpeditions, EME, propagation (sporadic-*E*, meteor scatter, troposphere ducting, etc.), digital modes (WSJT, etc.), digital signal processing (DSP), software defined radios (SDR), amateur satellites, and amateur television (ATV).

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. For example, a paper or presentation on the use of APRS to track rovers during contests would be considered.

The deadline for the submission of papers and presentations is the very first week of March 2007. All submissions should be in Microsoft Word (.doc) or alternatively Adobe Acrobat (.pdf) files. All text, drawings, photos, etc., must be black and white only (no color). 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 bound *Proceedings* by the ARRL. Send all questions, comments ,and submissions to the technical program chair, Jim Worsham, W4KXY at <w4kxy@bellsouth.net>.

Central States VHF Society: The Central States VHF Society is soliciting papers, presentations, and poster displays for the 41st Annual CSVHFS Conference on 26–28 July 2007. 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*. Acceptable topics: antennas, including modeling/design, arrays, and control; test equipment, including homebrew, using, and making measurements; construction of equipment, such as transmitters, receivers, and transverters; operating, including contesting, roving, and DXpeditions; RF power amps, including single- and multi-band vacuum tube and solid-state; propagation, including ducting, sporadic-*E*, tropospheric, and meteor scatter, etc.; pre-amplifiers (low noise); digital modes WSJT, JT65, etc.; regulatory topics; EME; software-defined radio (SDR); and digital signal processing (DSP).

Non-weak signal topics—such as FM, repeaters, packet radio, etc.—are generally not considered acceptable. However, there are always exceptions. Please contact the folks below if you have any questions about the suitability of a topic.

Deadline for submissions: for the *Proceedings*, May 7; for presentations to be delivered at the conference, July 2; for notifying us that you will have a poster to be displayed at the conference, July 2.

Contacts: Primary, Lloyd Crawford, N5GDB, e-mail <N5GDB@austin.rr.net>. Alternate contact, Thomas Visel, NX1N, e-mail <Thomas@neuric.com>. Snail mail may be sent to: Roadrunners Microwave Group, P.O. Box 91058, Austin, TX 78709-1058.

Microwave Scatterpoint 2005 Newsletters Now Available

The following is from the Southgate Amateur Radio Club (http://www.southgate.org):

In line with the UK Microwave Group (UKuG) policy of releasing past Scatterpoint Microwave Newsletters into the public domain, the whole of the 2005 series (ten issues) is now available for anyone to download at: <http://www.scatterpoint.org>.

You do not have to me a member of UKuG to download and enjoy these (and ones from years before 2005), but if you wish to read current 2006 and 2007 issues then you need to become a member of the Group. Details of membership can be found at: z,http://www.microwavers.org>.

Bill Duvall, K5UGM, Silent Key

The following eulogies were posted on the eHam.net website (http://www. eham.net/friends/displaystory/3293):

Alex Kaplinsky, K5UNY, wrote: "Bill passed on November 22, 2006 after years of serious health problems. Bill was always an inspiration and motivator to me when it came to VHF/UHF weak-signal amateur radio. I first met Bill in 1970, where in his garage ham shack he was listening to meteor pings on a homemade receiver dedicated to meteor scatter. On the day of his passing he and a ham friend had removed his four EME 2 meter antennas from his backyard tower, readying things for placement of his recently acquired 12 foot dish for 1296 MHz EME operation. Bill passed away while napping after doing what he loved, working on his weak-signal station. He always has been, and always will be, my friend."

Jay Sanford, KE5BCP, wrote: "Bill was a great guy who was always willing to help me out anytime I had a question about anything radio related. I will never forget his kindness and eagerness to share his knowledge. Rest in peace, Bill, and 73."

John Geiger, W5TD, wrote: "I never met him in person, but did do plenty of equipment dealing with him, and QSOs on the VHF/UHF bands. Always a very nice guy. Sorry to see any VHF/UHF weak-signal operator pass; we need more of them. 73s, John, W5TD, (ex- NEØP)."

Lee Kemp, N5TIF, wrote: "Bill will be missed. He was one of the first hams to make a 222 meteor contact in the world. He helped me when others would not. As a VHF/UHF weak-signal guy I have learned many things from him about ham radio and the world of VHF/UHF. I shared many an hour in Bill's shack just talking about this great hobby. I share Alex's feelings that Bill was a friend and always will be. Keep hitting the moon, Bill."

And Finally . . .

This month's column presents a wide variety of reports, attesting to the ever-expanding use of the VHF-plus ham bands. For even more coverage of these activities, please see the latest issue of *CQ VHF* magazine. The Winter 2007 issue is now available.

If you have a VHF-plus item that you want to publicize, please consider this column and *CQ VHF* magazine as your best venues for letting the world of VHF and above know about your activities. I look forward to hearing from you in the near future. Until next month… 73 de Joe, N6CL

RSGB Books now available from CQ

Practical Antennas for Novices

By John Heys, G3BDQ
RSGB, 1st Ed., 1994, 52 pages.
How to build simple but efficient antennas for each of the Noivce bands up to 434MHz plus ancillary equipment to ensure they're working!

Order: RSPAN $12.50

Practical Receivers for Beginners

By John Case, GW4HWR
RSGB, 1996 Ed., 165 pages
Selection of easy-to-build receiver designs suitable for amateur bands (including microwaves) and simple fun projects and test equipment.

Order: RSPRN $24.00

Radio & Electronics Cookbook

By George Brown, M5ACN
RSGB. 2001 Ed.
A collection of the very best weekend projects from D-I-Y RADIO magazine. Step-by-step instructions make this book ideal for hams wanting to build their skills and knowledge.

Order: RSREC $28.00

The Antenna Experimenter's Guide

RSGB. 2nd Ed, 1996. 160 pages.
Takes the guesswork out of adjusting any antenna, home-made or commercial, and makes sure that it's working with maximum efficiency. Describes RF measuring equipment and its use, constructing your own antenna test range, computer modeling antennas. An invaluable companion for all those who wish to get the best results from antennas!

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our readers say

More on "Misguided Guide" Editorial

Dear Rich,

You couldn't be more wrong about the new *Getting Started with Ham Radio* publication. A few years ago, I decided to try weak signal VHF/UHF after over 30 years of mostly HF ham activity. I joined the Northeast Weak Signal Group, puchased equipment and substantial antennas. After five years of attempts at activity, I have concluded that VHF is a wasteland. There is nobody on here in the Boston area anyway. I've had very few 432 and 1296 MHz contacts, and 144 MHz is pretty empty too. Why write a book emphasizing that segment of the hobby for a newcomer where there is so little activity? To maintain interest, you need contacts. Covering HF and VHF in an entry level publication is the way to go.

Dick Bean, K1HC

Rich, & Don (N2IRZ),

I like the new ARRL book. In fact, I have purchased two as gifts, both for Technicians looking to upgrade. But it was not until your excellent editorial that I realized how horribly lop-sided it is! With all the wonderful things to do on VHF-UHF from EME, to satellites, to ATV, and yes, certainly HSMM, it doesn't spend much time with any of these. What a tremendous mis-focus! Also, I agree with Don's reply regarding encryption.Thank you both for another excellent edition.

John Champa, K8[illegible]L

Encrypted Communications

The following letter is to CQ Digital Editor Don Rotolo, N2IRZ:

Don,

In the November issue of *CQ*, you state quite strongly that "the FCC has not forbidden encryption, nor has it forbidden the obscuring of communications." Uh, Don, did you even bother to reference Part 97 before you wrote this rubbish?

§97.113 Prohibited transmissions.

(a) No amateur station shall transmit:

(4) Music using a phone emission except as specifically provided elsewhere in this section; communications intended to facilitate a criminal act; messages encoded for the purpose of obscuring their meaning, except as otherwise provided herein; obscene or indecent words or language; or false or deceptive messages, signals or identification;

Note: "messages encoded for the purpose of obscuring their meaning." Do you find something elsewhere in Part 97 that provides for deliberately encrypting (obscuring) a communication?

Bob Stewart, AE6RV

N2IRZ responds:

Hi Bob,

You mean, like 97.211(b)?: "A telecommand station may transmit special codes intended to obscure the meaning of telecommand messages to the station in space operation." If so, then yes I do. Thanks for writing.

W2VU adds:

Bob, Don discussed this at length in the column. The crux of the matter is the *intent* behind the encryption. If the intent is to limit access to an amateur station by unlicensed individuals (which is what was being discussed), then the intent is not to obscure the meaning of the communications and is permitted under current regulations. This also applies to control codes for repeaters.

Dipole Dimensions

The following letter is to CQ Antennas Editor Kent Britain, WA5VJB:

Hi Kent,

Just got my General Class ticket and want to put up an inverted-V for 3.8 MHz. The mast is at 30 feet and will be made of #14 insulated wire. I've been studying your antennas article in the November *CQ* but still cannot come up with a starting point for the length of the dipole. Will 113 feet be too short?

Mike, KC9HIU

WA5VJB responds:

Hi Mike:

The answer is probably, but it's a lot easier to make the wire shorter than it is to make it longer. You want to keep the tips of that dipole as high as practical.

If your lot limits the length to 113 feet, then lowering the tips can use the ground to tune the antenna to 3.800 MHz. Another trick is to let the extra few feet of wire dangle below the insulator. Good luck with your project.

W2VU adds:

Another option to consider is the G5RV antenna. Its total "up in the air" length is 102 feet, with 34-foot "stub" of twinlead "feedline" between the horizontal portion of the antenna and the coax. It is actually part of the antenna. The antenna will cover 80–10 meters. Even so, many hams put an antenna tuner in line to tweak the SWR.

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contesting

BY JOHN DORR,* K1AR

Disturbing Behavior All Around Us

February's Contest Tip

Things aren't always what they seem to be. If you're lucky enough to have flexibility in antenna choices, try them all. Making assumptions that the highest antennas are the best can be a mistake, as I discovered in this current contest season. When running stations in a high-angle situation (e.g., Europe in the afternoon on 20 meters), sometimes the lowest antenna you have is better than even a stack. Also, signals don't always arrive on the traditional direct path. Marginal conditions can sometimes do strange things to signal paths. Don't give up on a poor band without turning your antenna a bit to make sure you're not missing out on something good! Skewed paths can often be your best friend.

Calendar of Events

All year	**CQ DX Marathon**
Jan. 27–28	**CQ WW 160M CW Contest**
Jan. 27–28	REF CW Contest
Jan. 27–28	BARTG RTTY Sprint Contest
Jan. 27–28	UBA SSB DX Contest
Feb. 3–4	Vermont QSO Party
Feb. 3–4	Mexico Int'l RTTY Contest
Feb. 3–4	10-10 SSB Winter Contest
Feb. 3–5	Delaware QSO Party
Feb. 10–11	PACC DX Contest
Feb. 10–11	**CQ WW WPX RTTY Contest**
Feb. 10–12	YLRL YL-OM SSB Contest
Feb. 11	North American CW Sprint
Feb. 17–18	ARRL CW DX Contest
Feb. 24–25	**CQ WW 160M SSB Contest**
Feb. 24–25	REF SSB Contest
Feb. 24–25	UBA CW Contest
Feb. 24–25	North American RTTY QSO Party
Feb. 25–26	North Carolina QSO Party
Mar. 3–4	ARRL SSB DX Contest
Mar. 24–25	**CQ WW WPX SSB Contest**

One of the great debates in contesting is whether or not there is rampant cheating in our ranks. In fact, when I describe contesting to non-hams, one of the first questions they ask is, "How do you know your competitors are telling the truth when they submit their entry?" A close second is, "If someone is indeed cheating, what would be the point?" The fact is that we are getting really good at obviating the first question's relevance. The second question is incredibly valid: What is the point?

Over the years, there have been the oldies and goodies we've heard about when it comes to contest cheating. The favorite, of course, is running lots and lots of power. After all, where do you think the term "California Kilowatt" came from? For a long time I used to think that most of those claims were simply sour grapes. However, I've learned that there are more competitors than you may think who are running very high power. Fortunately, I don't believe many of them are serious contenders. However, they are out there, from New Jersey to Europe and beyond. You know who you are, and sadly it must be a shallow feeling to compete under those circumstances. Might I suggest you join the rest of us who don't have to wear a paper bag when looking at the mirror?

We now move on to another oldie, which is the concept of padding one's log. Fortunately, modern log-checking techniques have virtually eliminated this one for most contests. Peer pressure is definitely a strong antidote, and the emergence of UBN reports has cleaned up the acts of most sloppy contesters or those who were just outright cheating. While there is a lot of debate on how punitive log checking should be, contest participation is at an all-time high, and accuracy is improving with each and every year. For me, that's the bottom line. The complaints about QSO penalty rules and other reduction guidelines are just senseless noise.

There are many other cheating options, but another one that has become prevalent is packet-spotting abuse. Again, software is coming to the rescue, finding cheaters who use packet and claim single op unassisted. I can speak with authority that if you play this game in the CQ WW contests you will be caught—period. The tools are that good.

The Gray Zone

The real issue I want to focus on this month is not the outright cheaters, but the group that is trying to push the gray-zone envelope. These are operators who are not breaking the rules, but are pushing the spirit in which they were intended. Let me give you two recent examples:

1. Entering a category different from the one you operated. There were several examples last year in which during a contest operators changed their category to another one so that they would either win or place significantly higher. Examples include single operators moving to assisted modes and multi-ops changing to move to a more favorable multi category (e.g., Multi-Two to Multi-Multi). These people lie in the internet weeds like snakes waiting for others to post their scores so that they can maneuver into a more favorable position in a different category whose rules support the operating style they actually used. The rules allow this, but it's not right and we all know it. This one needs peer pressure from all of us. If you see it happen, call them on it. Unfortunately, this game can't be legislated. However, displaying a lack of enthusiasm for their "achievement" when the results are published is a great first start.

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2. Dubious on-the-air behavior. In this last year's ARRL Sweepstakes, a top-10 competitor allegedly was discovered having a station hold his run frequency for them while he went off and worked a needed multiplier that someone told him about on the air. Despite the endless banter that we've had to endure on the internet contest reflectors, the bottom line is that while not specifically banned by the rules, this behavior is wrong. If you're operating as a single op, then do it. That means no help—on or off the air. It's just not that hard to figure out what's right.

As with outright cheating, there are other examples in the gray zone as well. They include post-contest log massaging, real-time databases, loading up the band map before the contest starts as a single op, etc. We not only need to be aware of these situations, we have an obligation to police ourselves. As we've seen with logging accuracy, peer pressure is our most valuable tool to keep us focused on doing the right thing. There are very few contesters who don't care about what their peers think about them. It's one of the key motivators that are a close second to accomplishing personal goals that we ourselves can be proud of.

There are going to be lots of discussions at Dayton and other venues this year about the subject of gray-zone abuse. My challenge to you is to never become complacent. Complacency is not defined by the number of internet posts you make. Rather, it's challenging your peer when you know that person has made a bad decision.

Do top competitors deserve to be held to a higher standard? You bet they do. Do we all need to operate with honesty and the highest degree of integrity? There's no question about that. Thankfully, the majority of us operate properly, and that's what fundamentally makes contesting work. If you choose to go off-track, stop and take a look in the mirror. But don't take too long; the ethics train is leaving the station without you.

Final Comments

We're rapidly coming to the end of another contest season, and while the final results are still to be reported, it looks like contest participation continues to be at or near record highs! Who said there are no solar conditions? With some of the openings we've seen, you'd never know we were in the bottom of a sunspot cycle. We'll make this contest season's conditions our little secret!

73, John, K1AR

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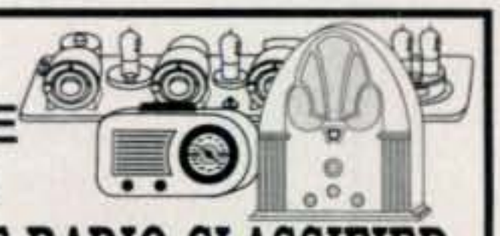

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propagation

BY TOMAS HOOD,* NW7US

Autumn Storms

A Quick Look at Current Cycle 23 Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, November 2006: 22
Twelve-month smoothed, May 2006: 17

10.7 cm Flux
Observed Monthly, November 2006: 86
Twelve-month smoothed, May 2006: 81

***Ap* Index**
Observed Monthly, November 2006: 8
Twelve-month smoothed, May 2006: 8

I often hear or read comments, even from well-meaning scientists, that giant solar flares and space weather storms are very unusual during a solar cycle minimum. The solar cycle minimum is that period of time during the average 11-year solar cycle when solar activity is, on average, the lowest. According to these commentators, the X-ray flare activity such as that observed during the first part of December 2006 is so unusual that it deserves special notice.

The truth of the matter is that such giant outbursts from the sun have occurred with enough frequency during the last few solar cycles that we can rest assured that strong X-ray flares and solar space weather storms do occur, even during the weakest period of a solar cycle.

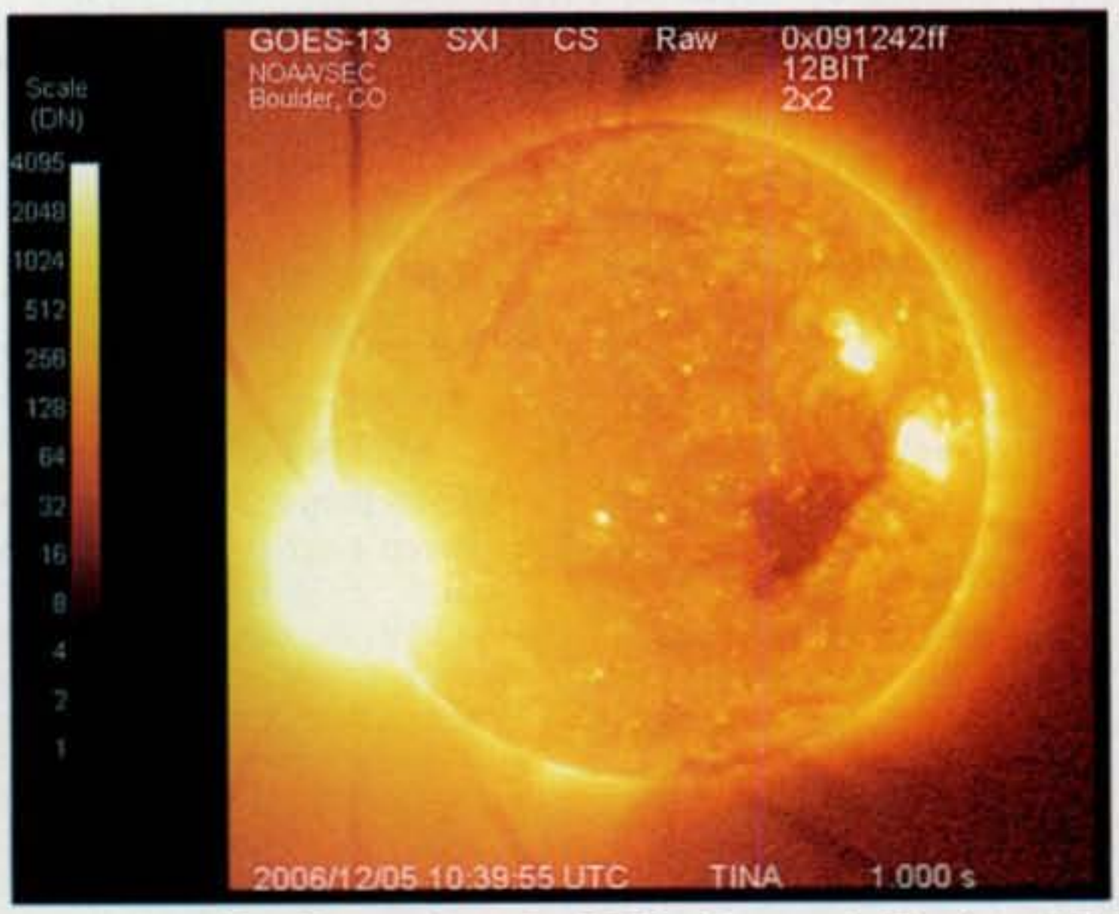
The case in point is that the rather large and active sunspot group numbered 930 by NOAA/Space Weather unleashed a series of very strong X-class flares, proton clouds, and more. It started just as sunspot group NOAA-0930 began to rotate into view on the sun. On December 5, 2006 a major X-class flare measuring X9.0 erupted from Region 930, spewing a massive coronal mass ejection (CME) out into interplanetary space. Thankfully, Earth only received a glancing blow of the plasma cloud, just as the Space Shuttle Mission STS-116 was preparing for launch on December 9 <http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts116/index.html>. This flare is one of the largest during this solar cycle, Cycle 23. (See Table I for a list of X-class flares on record.)

As the sun continued to rotate, Region 930 moved into the window, where if flares occurred, it would be just right for flares to hurl huge clouds of energized plasma directly at Earth. That is exactly what happened before the sunspot group rotated away from view. From December 6 through December 15, as this article goes to press, Region 930 produced four X-class and five M-class flares. (See Table II for the M- and X-class flares from Region 930.)

During the STS-116 mission, there were several very strong proton storms due to the flares and CMEs. These did not hinder the mission, but certainly provided periods of very high geomagnetic activity. The planetary *K*-index (*Kp*) got as high as 8 during some of the geomagnetic storms. This resulted in aurora-mode propagation (*Au*) during December.

One interesting phenomenon experienced by amateur radio operators who enjoy the Top band (160 meters) is that when there is space weather, propagation can be nicely enhanced on the frequencies around 1900 kHz. Consider this testimony from December 14 and 15, 2006 as reported on

*P.O. Box 213, Brinnon, WA 98320-0213
e-mail: <cq-prop-man@hfradio.org>



On December 5, 2006, Sunspot Region 930 (NOAA 0930) rotated into view and exploded with one of the largest flares of solar Cycle 23. The flare measured as an X9.0 X-class X-ray flare. (Source: NOAA/SEC and SpaceWeather.com)

2006 CQ WW DX CW Contest Review of Conditions

Where were you during the CQ WW DX CW Contest weekend of November 25–26? How did you fare in the contest and how was propagation from your location to the many areas of the world where contesters hunted for points?

I forecast poor to fair conditions for the weekend, with an expected 10.7-cm flux level of about 72 during the contest. On November 25, the 10.7-cm flux peaked at 79, and it was 78 on November 26. The daily sunspot count was 12 for both days. No flares were observed, and the background X-ray radiation was very low, measured at the A3.9 to A3.3 level (barely energized).

I predicted the planetary *A*-index (*Ap*) to be about 8 during the CW contest. On both days the *Ap* was 15. This all translates into fair conditions for propagation paths that did not cross high-latitude regions and the polar caps. Paths over the higher regions suffered from minor loss, making signals weak and closing many paths. The prediction seemed to be accurate.

Overall, the contest weekend was typical of any past contest during the very end of a solar cycle, except that there were so many participants using advanced equipment (DSP filtering, well-engineered receivers, and so forth). The majority of activity was on the lower bands, as expected. How did you find conditions? Please send me your report.

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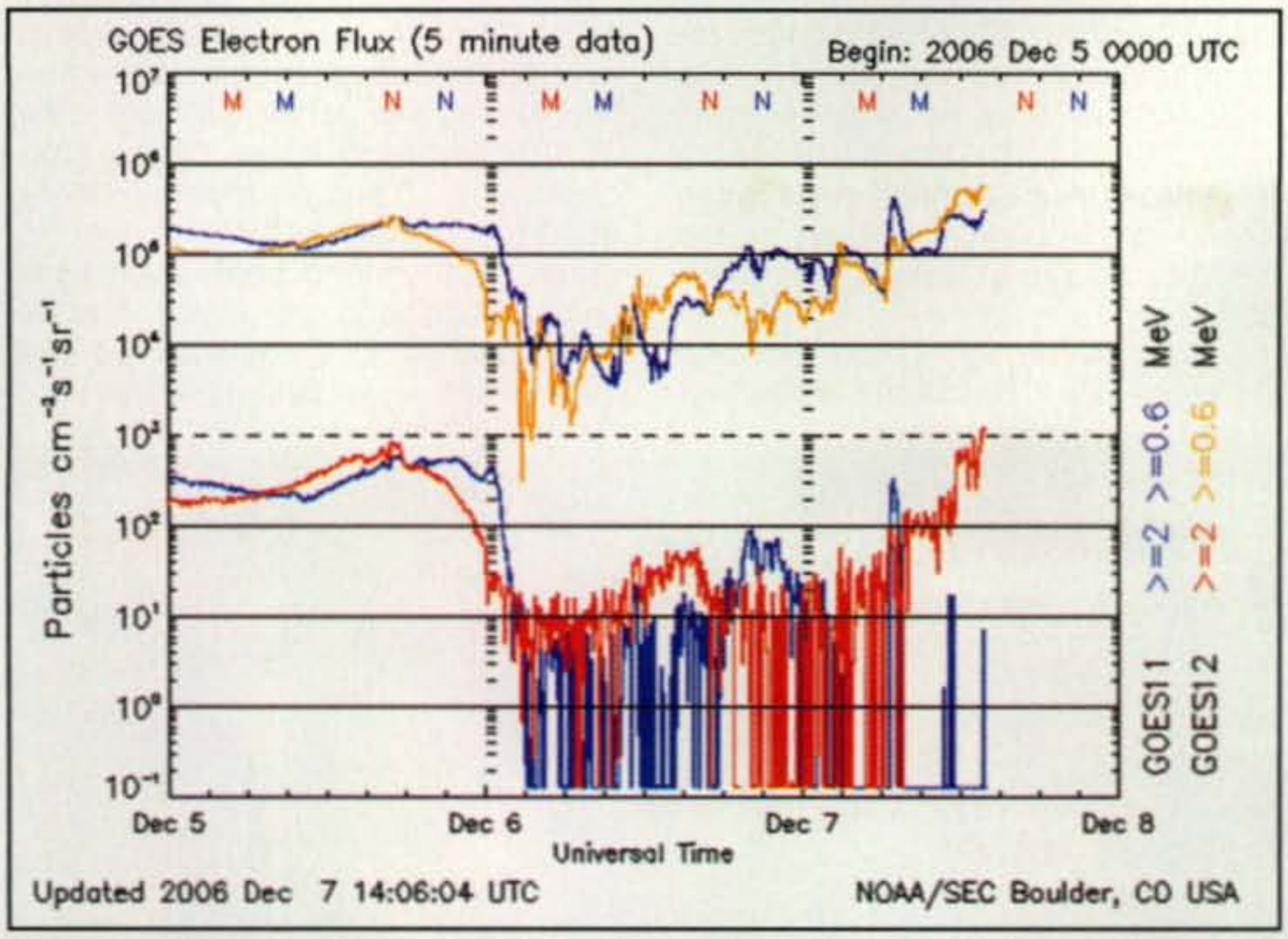


Electron flux during the arrival of the glancing blow from the CME associated with the December 5th X9-class flare. Even though the CME was not directed toward Earth, enough of the plasma brushed our magnetosphere that it caused a significant disturbance. (Source: NOAA/SEC)

Ranking	D/M/Y	X-Ray Class
1	04/11/03	X28
2	02/04/01	X20.0
2	16/08/89	X20.0
3	28/10/03	X17.2
4	07/09/05	X17
5	06/03/89	X15.0
5	11/07/78	X15.0
6	15/04/01	X14.4
7	24/04/84	X13.0
7	19/10/89	X13.0
8	15/12/82	X12.9
9	06/06/82	X12.0
9	01/06/91	X12.0
9	04/06/91	X12.0
9	06/06/91	X12.0
9	11/06/91	X12.0
9	15/06/91	X12.0
10	17/12/82	X10.1
10	20/05/84	X10.1
11	29/10/03	X10
11	25/01/91	X10.0
11	09/06/91	X10.0
12	09/07/82	X 9.8
12	29/09/89	X 9.8
13	22/03/91	X 9.4
13	06/11/97	X 9.4
14	24/05/90	X 9.3
15	06/11/80	X 9.0
15	02/11/92	X 9.0
15	05/12/06	X 9.0
	<— the flare from Region 930	

Table I– Top X-flares so far recorded. This list is based in part on "Large Solar Flares Since 1976" compiled by IPS Radio & Space Services. Additional data from NOAA. Flux values for flares above X15-17 may have been estimated. (Source: IPS-Australia and NOAA)

the 160 Meter DX Refector <http://mailman.qth. net/mailman/listinfo/160m>:

KH8Q had a very nice run this morning into North America, with the sunrise enhancement being enough to put many stations in his log. The wave of successful stations began in one land and moved south and westward following the sunrise progression. Along the way several West Coast stations made it into the log as well. It appeared to be KH8Q's most successful day with NA on Top band. A nice reward for many with what may be the last day of the op.—*73, Dave, WØFLS*

Along with Dave's comments on the KH8, we are heading into a disturbed period from the solar flare. Watch for very good conditions going into and out of the ionospheric disturbance! KH8Q was pretty good here at sunrise today.—*Tom, W8JI*

February Propagation

From the middle of February through March and 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.

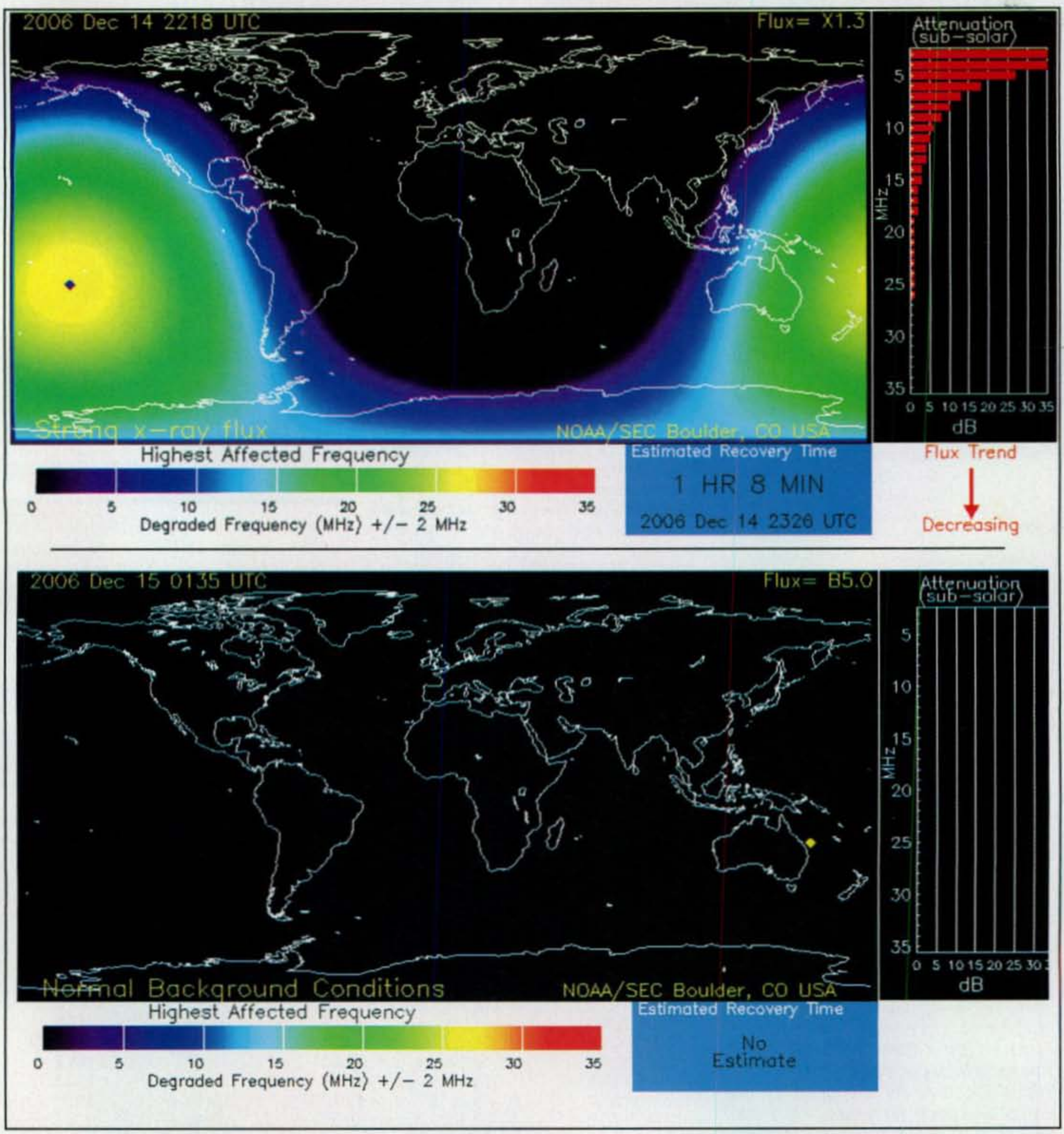
We are at the very bottom of solar Cycle 23. The end is in sight, or perhaps has occurred. How alive can the higher frequencies be with long-distance prop-

Date (UTC)	Start	Stop	Peak	X-ray Class
2006/12/05	07:45	08:06	08:03	M1.8
2006/12/05	10:18	10:45	10:35	X9.0
2006/12/06	01:30	03:15	02:20	M1.3
2006/12/06	08:02	09:03	08:23	M6.0
2006/12/06	18:29	19:00	18:47	X6.5
2006/12/06	20:14	20:22	20:19	M3.5
2006/12/07	18:20	19:40	19:12	M2.1
2006/12/13	02:14	02:57	02:40	X3.4
2006/12/14	21:07	22:26	22:15	X1.5

Table II– NOAA Region 0930 M- and X-class X-ray flares.

agation? It is a surprise to the casual amateur radio operator when he/she gets on a band such as 10 meters during the solar minimum and discovers that there is still some life on the band, beyond Short-Skip distances, especially during periods when massive sunspots occur and raise the daily 10.7-cm flux levels enough to wake up the higher frequencies (examples were during the last months of 2006). However, the weak solar activity of this phase of solar cycle life just does not support worldwide DXing on the highest HF bands for any significant number of days. The lower HF bands can become real players, though, as veteran HF operators know.

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 after-



D-layer absorption caused by the arrival of X-ray energy during one of the X-class flares from Region 930 (see text). Note the scale of frequencies that are affected. The greater the attenuation of the frequency, the longer the red bar. Notice that after the flare has ended, conditions return to normal (second image). (Source: NOAA/SEC)

noon. 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 towards Central and South America and the Caribbean, the Pacific area, 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 towards 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 towards the south and west. Expect similar conditions on 80, but with weaker signals and higher noise levels. Be sure to check 160 meters for some unusual DX openings towards 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.

At this part of the solar cycle, even coronal-hole activity is rare. Without the influence of CMEs or elevated solar wind streams, the geomagnetic field will rarely reach storm levels. With quiet conditions being the rule, it will be rare for any auroral activity to present an opportunity for working aurora. Auroral displays tend to occur somewhat more frequently during the equinoctial period.

Class	Energy Output (in watts/sq. meter)
B	I is less than (I.t.) 10.0E-06
C	10.0E-06 is less than or equal to I, and less than 10.0E-05
M	10.0E-05 is less than or equal to I, and less than 10.0E-04
X	I is greater than, or equal to 10.0E-04

Table III– The ranking of an X-class flare is based on its X-ray energy output. Flares are classified by the order of magnitude of the peak burst intensity (I) measured at the Earth in the 1 to 8 Ångstrom band as shown above.

Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for November 2006 is 21.5, a fairly large jump up from October's 10.4, and the highest since May's 22.2. Could it be that the solar minimum, and the end of solar Cycle 23, already occurred in February 2006, when the lowest observed sunspot number for the month was only 4.7? A few scientists think that the end of the cycle will be sometime during mid- to late-2007, but others think that the solar minimum may have occurred. Time will tell. The lowest daily sunspot value recorded was zero (0), on November 21, 22, and 24. The highest daily sunspot count was 44 on November 3. The 12-month running smoothed sunspot number centered on May 2006 is 17.3. A smoothed sunspot count of 8, give or take about 8 points lower to 12 points higher, is expected for February 2007. Some of

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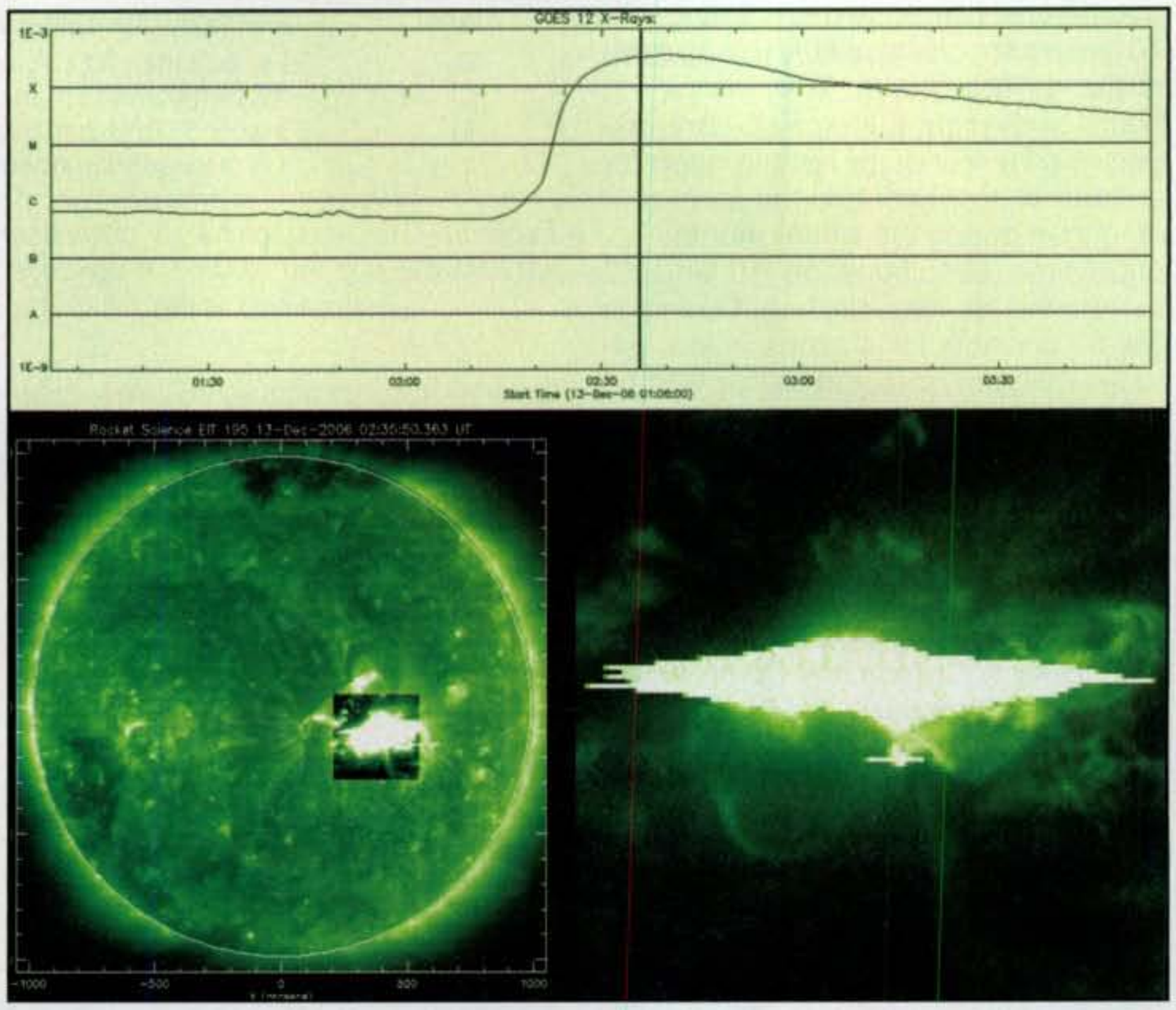

The peak of the X3.4 X-ray flare of December 13, 2006 at 0240 UTC. This shows the SOHO Extreme ultraviolet Imaging Telescope (EIT) image at the wavelength of 195 Å of Region 0930. The image was obtained in the Fe XII emission line at 195 Å. Fe XII (11 times ionized Fe) is common at temperatures of 1.5 million Kelvin (K). The SOHO EIT is able to image the solar transition region and inner corona in four selected bandpasses in the extreme ultraviolet (EUV): Fe IX/X, 171 Å; Fe XII, 195 Å; Fe XV, 284 Å; He II, 304 Å. Using either full-disk or subfield images, the EIT can image active regions, filaments and prominences, coronal holes, coronal "bright points," polar plumes, and a variety of other solar features. (Source: Lockheed Martin Solar and Astrophysics Laboratory)

the solar scientists who are forecasting the end of Cycle 23 believe that the smoothed sunspot counts for the minimum will occur between May and December 2007, reaching down to a monthly average of 2. Others are putting the minimum at about a monthly smoothed average of 9, occurring from January through July 2007, a half-year earlier than those predicting the low of 2.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 86.4 for November 2006. The 12-month smoothed 10.7-cm flux centered on May 2006 is 80.8. The predicted smoothed 10.7-cm solar flux for February 2007 is 73, give or take about 14 points.

The observed monthly mean planetary *A*-index (*Ap*) for November 2006 is 8. Last month's figure was adjusted from 7 to 8. The 12-month smoothed *Ap*-index centered on May 2006 is 7.9. Expect the overall geomagnetic activity to vary greatly between quiet to active during most days in February.

Summary

I invite you to visit my online propagation resource at <http://propagation.hfradio.org/>, where you can get the latest space data, forecasts, and more, all in an organized manner. If you have a cell phone with internet capabilities, try <http://wap.hfradio.org/>.

Some of you probably noticed the long period from November through December 2006 when my online website was not available. This was caused by a grueling project of upgrading all of the computer components, the operating system, and all of the software on the web-server computer. The service is now better than ever, so come check it out.

Drop me an e-mail or send me a letter if you have questions or topics you would like to see me explore in this column. Also, I'd love to hear any feedback you might have on what I have written. Until next month . . .73, Tomas, NW7US

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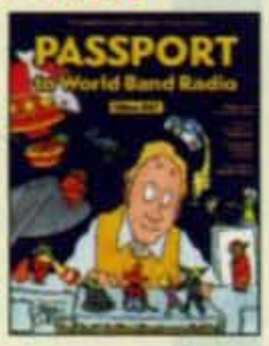

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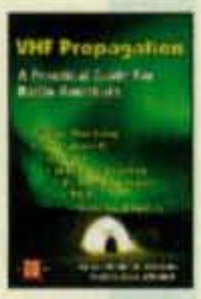

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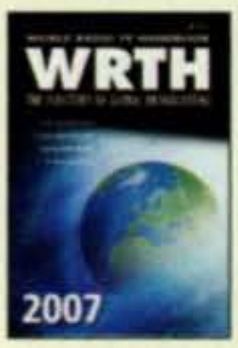

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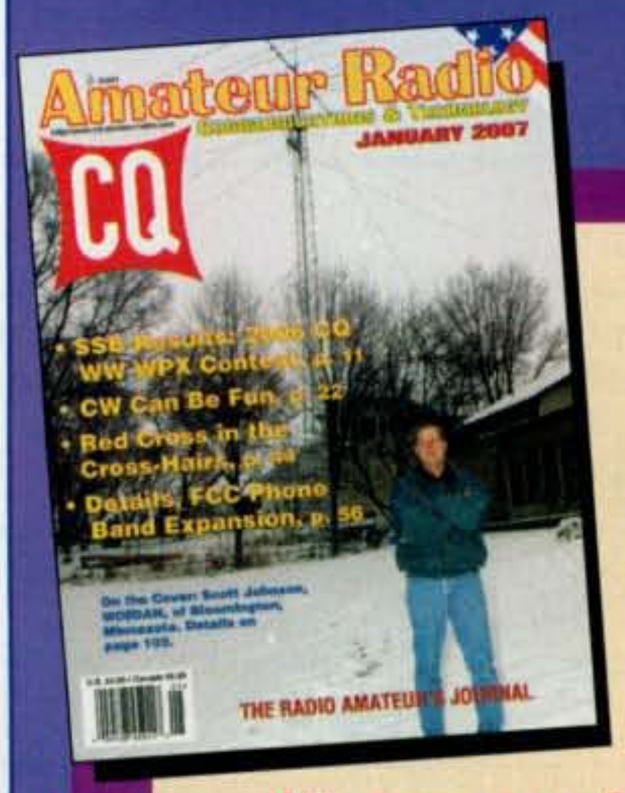

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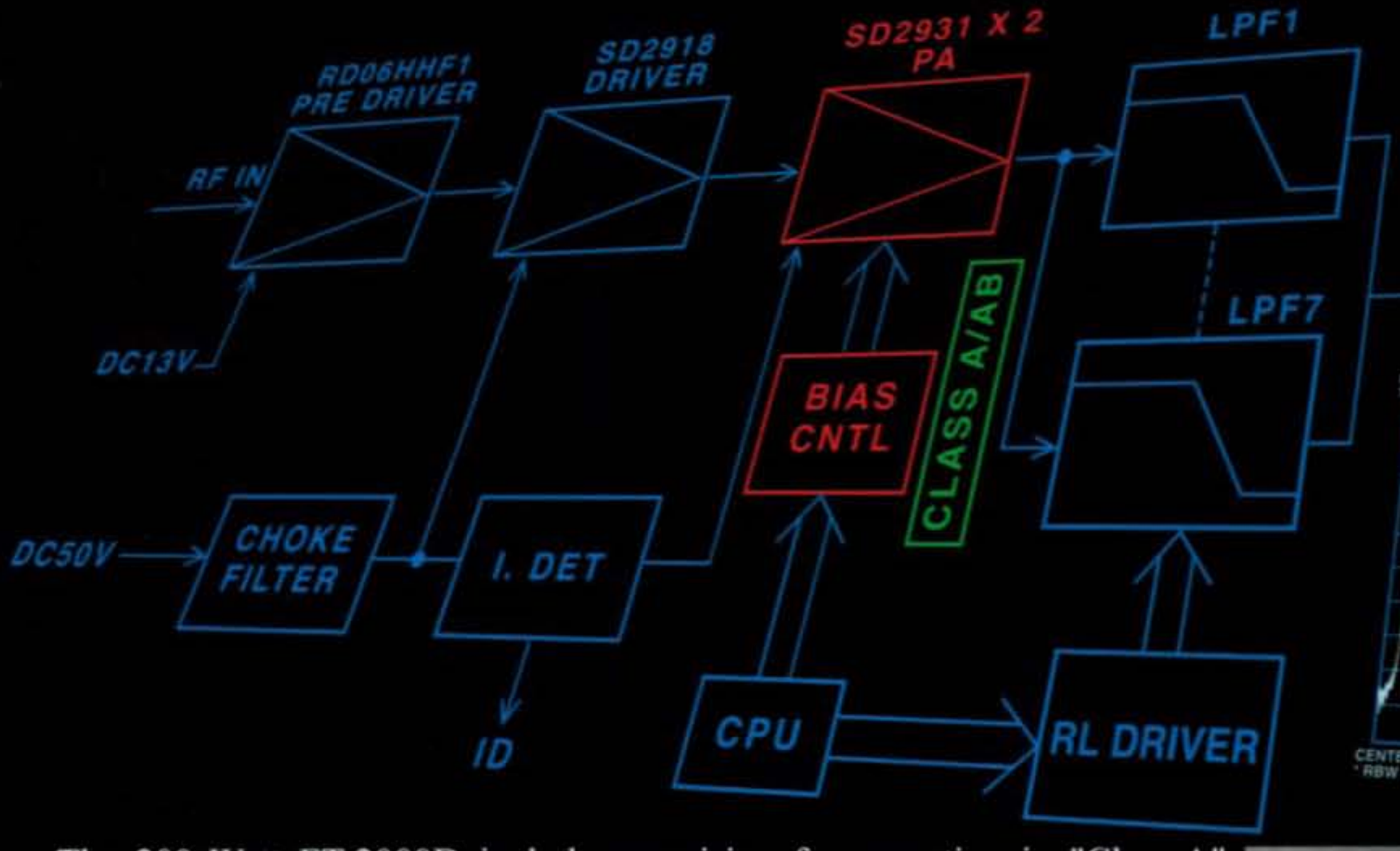

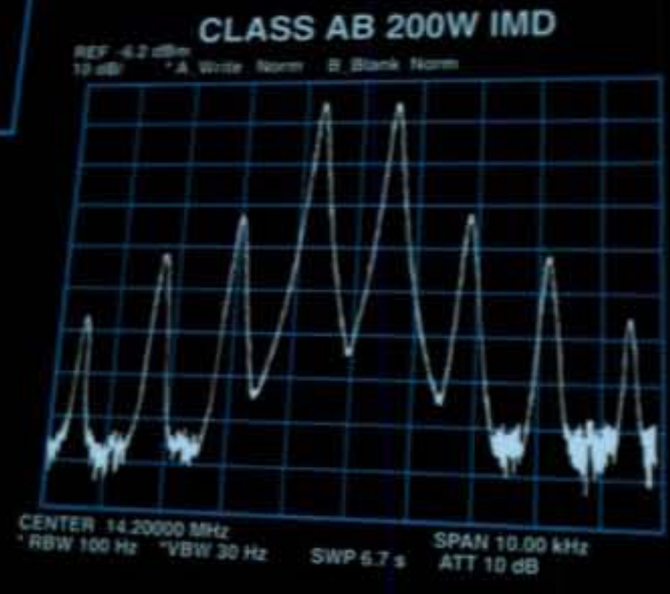

The 200-Watt FT-2000D includes provision for operation in "Class-A" mode at 75 Watts of power output. It utilizes high bias current to produce very low transmitter Intermodulation products. The 3rd-order IMD products are typically suppressed 45 dB or better. The 5th and higher-order IMD is typically suppressed 70 dB or more. You may adjust the bias level between Classes A and AB to meet the demands of high ambient temperature in your station, and the long duty cycles associated with contest or DX-pedition use.

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