

# Amateur Radio

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

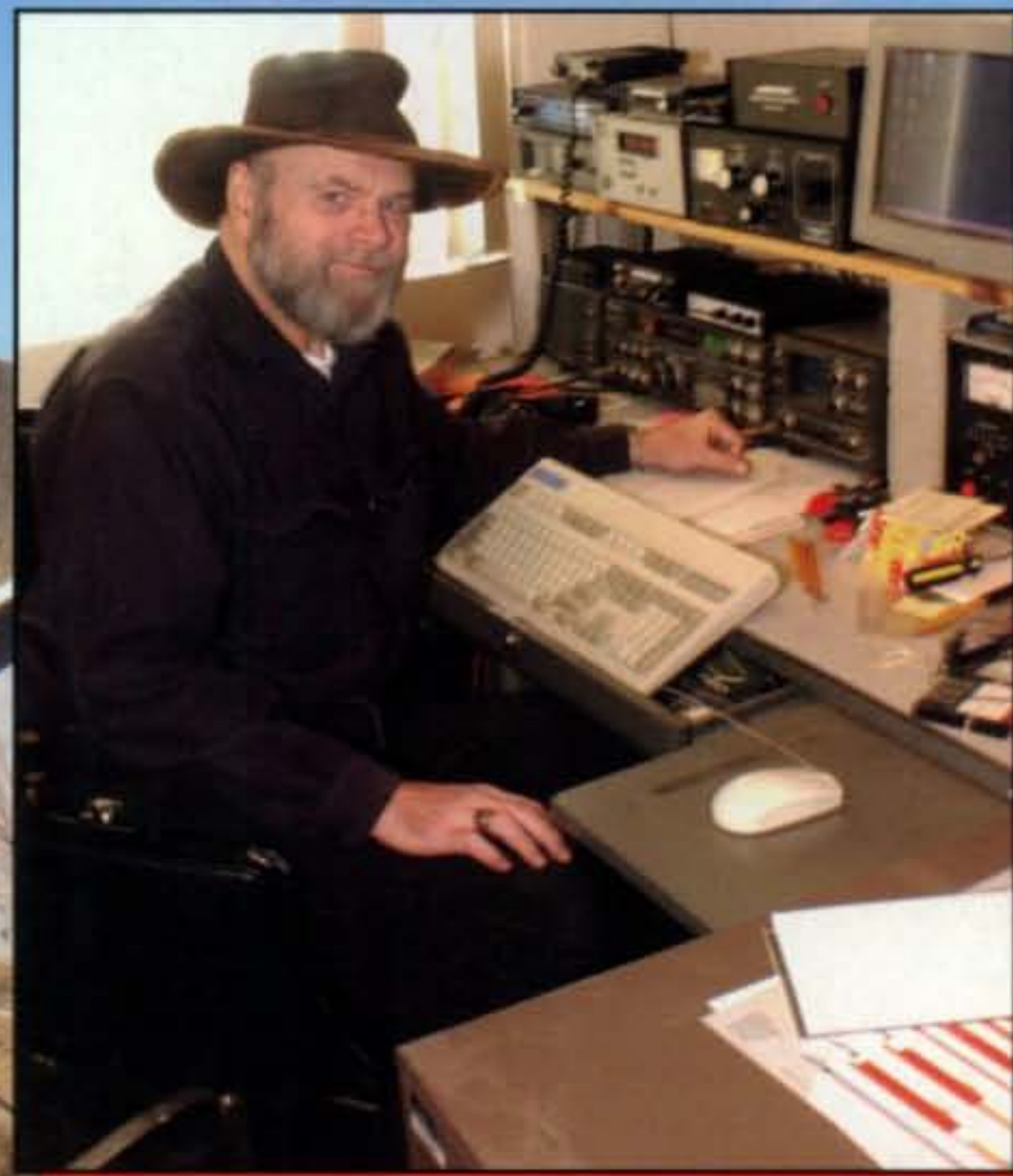
COMMUNICATIONS & TECHNOLOGY

OCTOBER 2009

# CQ

Announcing the  
CQ Diamond Jubilee  
WAZ Award, p. 28

**CQ Interviews:**  
**Nobel Laureate**  
**Dr. Joe Taylor, K1JT, p. 13**  
**The GB2CW Project, p. 24**  
**Product Reviews:**  
**The "New" Ameritron**  
**S-600 Amplifier, p. 36**



**On the Cover: Dick Flanagan, K7VC,  
of Minden, NV. Details on page 102.**



6196 JEFFERSON HWY  
MINERAL VA 23117-3425  
BUCKMASTER PUB  
JACK SPEER  
CQ 50065 XXXX 1

05319

\*\*\*\*\*SCH 3-DIGIT 230



# KENWOOD

Listen to the Future

## EchoLink<sup>®</sup> Ready



### TM-V71A

With the Kenwood TM-V71A you have a choice of where you want your speaker, on the top or on the bottom of the radio. Simply remove the faceplate and flip the main body, then reattach the face, it's that simple! Yet another Kenwood 1st, this dual band transceiver has ten dedicated EchoLink<sup>®</sup> memory channels as well as EchoLink sysop-mode operation. EchoLink connection to your PC via the optional PG-5H cable kit is easy with no expensive interface needed.

*EchoLink<sup>®</sup> is a registered trademark of Synergenics, LLC. For more information please see: [www.echolink.org](http://www.echolink.org).*

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Large dual color amber or green thirteen segment LCD.



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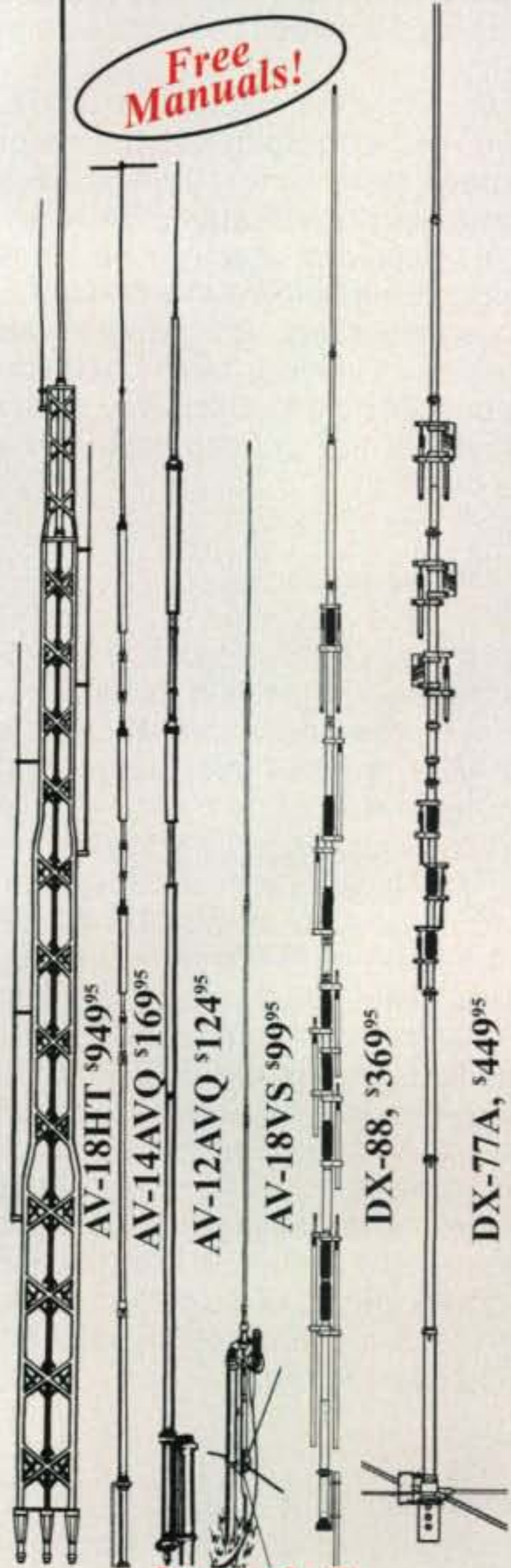


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# hy-gain® HF VERTICALS

Self-supporting -- no guys required... Remarkable DX performance -- low angle radiation, omnidirectional... 1500 Watts... Low SWR... Aircraft quality aluminum tubing... Stainless steel hardware... Recessed SO-239 connect...



Free Manuals!

## hy-gain® Classics

All hy-gain multi-band vertical antennas are entirely self supporting -- no guys required. They offer remarkable DX performance with their extremely low angle of radiation and omnidirectional pattern. All handle 1500 Watts PEP SSB, have low SWR, automatic band-switching (except AV-18VS) and include a 12-inch heavy duty mast support bracket (except AV-18HT). Heavy duty, slotted, tapered swaged, aircraft quality aluminum tubing with full circumference

### Two year limited Warranty...

compression clamps is used for radiators. Includes all stainless steel hardware. Recessed SO-239 prevents moisture damage. Hy-gain verticals go up easily with just hand tools and their cost is surprisingly low. Two year limited warranty.

**AV-18HT, \$949.95. (10,12,15,20,40,80 M, 160, 17 Meters optional). 53 ft., 114 lbs.**

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

**AV-14AVQ, \$169.95. (10,15,20,40 Meters). 18 ft., 9 lbs.**

The Hy-Gain AV-14AVQ uses the same trap design as the famous Hy-Gain Thunderbird beams. Three separate air dielectric Hy-Q traps with oversize coils give superb stability and 1/4 wave resonance on all bands. Roof mount with Hy-Gain AV-14RMQ kit, \$89.95.

**AV-12AVQ, \$124.95. (10, 15, 20 Meters). 13 ft., 9 lbs.**

AV-12AVQ also uses Thunderbird beam design air dielectric traps for extremely Hy-Q performance. This is the way to go for inexpensive tri-band performance in limited space. Roof mount with AV-14RMQ kit, \$89.95.

**AV-18VS, \$99.95. (10,12,15,17,20,30,40,80 Meters). 18 ft., 4 lbs.**

High quality construction and low cost make the AV-18VS an exceptional value. Easily tuned to any band by adjusting feed point at the base loading coil. Roof mount with Hy-Gain AV-14RMQ kit, \$89.95.

**DX-88, \$369.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs.**

All bands are easily tuned with the DX-88's exclusive adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 160 Meter add-on kit, KIT-160-88, \$199.95. Ground Radial System, GRK-88, \$99.95. Roof Radial System, RRR-88, \$99.95.

**DX-77A, \$449.95. (10, 12, 15, 17, 20, 30, 40 Meters). 29 ft., 25 lbs.**

No ground radials required! Off-center-fed Windom has 55% greater bandwidth than competitive verticals. Heavy-duty tiltable base. Each band independently tunable.

Model #	Price	Bands	Max Power	Height	Weight	Wind Surv.	Rec. Mast
AV-18HT	\$949.95	10,15,20,40,80	1500 W PEP	53 feet	114 pounds	75 MPH	-----
AV-14AVQ	\$169.95	10,15,20,40	1500 W PEP	18 feet	9 pounds	80 MPH	1.5-1.625"
AV-12AVQ	\$124.95	10,15,20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	\$99.95	10 - 80 M	1500 W PEP	18 feet	4 pounds	80 MPH	1.5-1.625"
DX-88	\$369.95	10 - 40 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	\$449.95	10 - 80 M	1500 W PEP	29 feet	25 pounds	60 mph no guy	1.5-1.625"

## Hy-Gain 160-6 Meters Self-Supporting Vertical

Full 1500 Watts, 43 feet, includes base mount  
**New!** AV-6160 Operate all bands 160-6 Meters at full 1500 Watt with this self-supporting, 43 feet high performance vertical!  
**\$399<sup>95</sup>** UPS SHIPPABLE

It assembles in less than an hour and its low profile blends in with the sky and trees -- you can barely see it...

### Exceptional Performance

The entire length radiates to provide exceptional low angle radiation 160-20 Meters and very good performance on 17-6 Meters. You can shorten it by telescoping it down for more effective low angle radiation on higher bands.

### Just talk with automatic tuner!

A wide-range automatic or manual antenna tuner at your rig easily matches this antenna for all bands 160-6 Meters. There's no physical tuning adjustments on the antenna -- you simply put it up!

An optimized balun design allows direct coax feed with negligible coax loss (typically less than 1/2 dB 60-6 Meters and less than 1 dB 160-80 Meters with good quality, low-loss coax).

### Extremely low wind loading

With just 2 square feet wind load, the AV-6160 has the lowest wind-loading and lowest visibility of any vertical antenna! The key is a six foot section of tapering diameter stainless steel whip that flexes in strong wind instead of stressing the bottom sections. Its 2-inch O.D. and .120 inch thick walled tubing bottom section makes it incredibly strong.

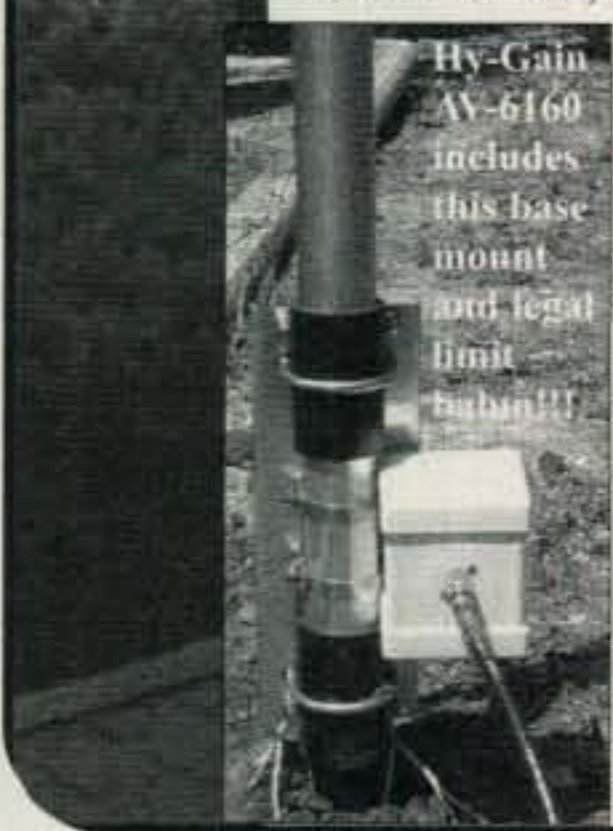
Just 20 lbs., uses super-strong 6063 aircraft aluminum tubing. Stainless steel hardware.

### Assembles in an hour

Ground mounting lets you hide antenna base in shrubbery. Requires ground system -- at least one radial. More extensive ground work better.

### Stealth Operation

Low profile. Hide behind trees, fences, buildings, bushes. Use as flag-pole. Easily telescopes down during the day.



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### Baker, Clyburn, Adelstein Confirmed by Senate

Meredith Attwell Baker and Mignon Clyburn were confirmed by the U.S. Senate on July 24 as FCC Commissioners. Clyburn is a Democrat; Baker, a Republican. Their confirmations bring the FCC back to its full strength of five commissioners, along with Chairman Julius Genachowski and Commissioners Michael Copps and Robert McDowell.

On the same day, the Senate confirmed former FCC Commissioner Jonathan Adelstein as Administrator of the Rural Utilities Service in the U.S. Department of Agriculture. A major part of Adelstein's new job will be working with the FCC to expand the availability of broadband internet service in rural areas.

### Ex-Ham Bolden Confirmed as NASA Administrator

Former astronaut and former ham Charles Bolden, ex-KE4IQB, is the new administrator of NASA. He began work July 17 after being confirmed by the U.S. Senate. A veteran of four trips into space, Bolden commanded the flight on which the Hubble Space Telescope was launched and the first joint U.S.-Russian space mission, a prelude to the regular pairings of astronauts and cosmonauts today aboard the International Space Station. Bolden is also a 34-year veteran of the U.S. Marine Corps, during which time he rose to the rank of Major General. The Senate also confirmed Lori Garver as NASA Deputy Administrator. This is also Garver's second stint at NASA, having served as a special assistant to the NASA Administrator from 1996-2001.

### FAR Awards More Than \$70,000 in Scholarships

The Foundation for Amateur Radio has announced its scholarship winners for 2009. The foundation, which administers 55 different scholarships for a variety of amateur radio organizations, awarded a total of \$74,500 in educational grants this year to young hams. The largest scholarship this year, the \$2500 Lawrence E. and Thelma J. Norrie Memorial Scholarship, went to Rebecca Rich, KB0VVT, of Raytown, Missouri. Rebecca is a junior at MIT, majoring in electrical engineering. A complete list of this year's FAR scholarship winners will be available in the November issue of *WorldRadio Online* and on the FAR website at <[www.amateurradio-far.org](http://www.amateurradio-far.org)>.

Meanwhile, the OMIK Scholarship Fund, run by the OMIK Radio Association, presented a \$1000 award to Caitlin Grey of Wadsworth, Ohio. The grant pushed the organization's total scholarship gifts since 1991 above the \$100,000 mark.

### MFJ Buys Cushcraft Amateur Antenna Line

MFJ Enterprises has purchased the Cushcraft amateur radio antenna product line from Laird Technologies, Cushcraft's parent company. In a news release, Mississippi-based MFJ said the antennas will continue to be manufactured in New Hampshire. For more details, see the "What's New" column elsewhere in this issue.

In other industry news, the current edition of *Passport to World Band Radio* will be the final one. Publisher Larry Magne says he will maintain the WorldScan database on the Passport website. He gave no reason for the decision to cease publication.

Also, RadioShack is dumping radio, at least from its name. The company announced in early August that it is "contemporizing" its brand by dropping "Radio" from its name and calling itself simply, "THE SHACK."

### ARRL Briefs National Safety Council on Radio vs. Cell Phones

The National Safety Council (NSC) is "on a mission" to educate Americans about the relative crash risks associated with different types of driving distractions. Among the greatest risks, says the council, are talking and texting on cell phones while driving, and it is seeking a nationwide ban on them. The ARRL is trying to educate the council on the differences between cell phones and two-way radios.

In a letter to NSC President Janet Froetscher, ARRL President Joel Harrison, W5ZN, explains that the major difference is that amateur radios and other two-way radios are simplex communication systems, in which only one person talks at a time and each person tends to do more listening than talking and the microphone is put down in between transmissions. According to the *ARRL Letter*, Harrison said, "Two-way radio operation has been going on for decades without highway safety being an issue. The fact that cell phones have come along does not change that."

### League Urges Caution on 70-cm Medical Devices

The ARRL is calling on the FCC to exercise an abundance of caution in response to a petition to allow the use of certain implanted medical devices that operate between 413 and 457 MHz, a block of spectrum that includes the 70-centimeter amateur band. According to the *ARRL Letter*, two of the four channels proposed for use by these devices—which claim to restore function to paralyzed limbs and organs are within the 70-cm band. Hams occupy the band on a secondary basis, along with the Medical Data Radiocommunication Service, under which these devices would operate. The League said in comments filed with the FCC that the Wireless Medical Telemetry Service, which does not share frequencies with the Amateur Service, would be more suitable for these devices. In addition, the ARRL urged the FCC not to permit the marketing of any devices that have not been tested in the presence of strong RF fields and that do not carry "very specific patient notifications" regarding use in the presence of RF fields on the devices' operating frequencies.

### AMSAT Seeks Relief on Technology Restrictions

AMSAT is asking the federal government to transfer jurisdiction over its activities in support of the international Phase 3E amateur satellite project to the Commerce Department from the State Department. The lead organization on the P3E project is Germany's AMSAT group, AMSAT-DL, and the US government had previously determined that AMSAT-NA's contributions to the project were prohibited under the International Traffic in Arms Regulations (ITAR) program, administered by the State Department. AMSAT-NA's involvement in the P3E project was suspended in 2006.

In a recent filing with the State Department, AMSAT says that its status as a not-for-profit corporation, the fact that its activities have no military applications, and that everything it does is publicly available on the internet mean that it would more appropriately be regulated by the Commerce Department's less-restrictive Export Administration Regulations. At press time, there had been no response to the request by the State Department.

*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.*



## The Biggest and Smallest Amps in the Industry!



**Lightest and Most Compact  
1kW HF Amplifier**

### HL-1.5KFX HF/50MHz Linear Power

#### Features

- The amplifier's decoder changes bands automatically with most ICOM, Kenwood, Yaesu.
- Solid State.
- 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 (200/220/235/240V) and (100/110/115/120V) selectable.
- Equipped with a control cable connection socket, for the HC-1.5KAT, auto antenna tuner by Tokyo Hy-Power Labs.

**Outstanding for  
Desktop or DX-peditions!**

#### 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.  
50MHz 650W PEP max.

##### Circuit:

Class AB parallel push-pull

##### Cooling Method:

Forced Air Cooling

##### AC Power:

AC 240V default (200/220/235)  
- 10 A max.  
AC 120V (100/110/115)  
- 20 A max.

##### Dimensions:

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

##### Weight:

Approx. 20kgs. or 45.5lbs.

##### Optional Items:

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

##### Accessories Included:

Band Decoder Cables included for  
Kenwood, ICOM and some Yaesu

### HL-1.1KFX Lightweight HF Linear



**NEW!**

#### Features

- The amplifier allows operation in full break-in CW mode due to the use of the amplifier's high speed antenna relays.
- The amp utilizes a sophisticated circuit to run the various high speed protection circuits such as overdrive, high antenna SWR, DC overvoltage, band mis-set etc.
- An analog multimeter allows the operator to monitor Pf (Forward output power), Pr (Reflected power), Vd (Drain voltage of power FET), Id (Drain current) etc.

#### Specifications

##### Frequency:

1.8 - 28MHz all amateur bands including WARC bands

##### Mode:

SSB, CW, RTTY

##### RF Drive:

75 - 90W

##### Output Power:

SSB 600W PEP max.  
CW 600W.  
RTTY 500W (5 minutes)

##### Final Transistor:

SD 2933 x 4  
(MOS FET by ST micro)

##### Circuit:

Class AB parallel push-pull

##### Cooling Method:

Forced Air Cooling

##### Multi-Meter:

Output Pf 1kW, Reflected Power 100W, Drain Voltage Vd 60V, Drain Current Id 50A

##### Input/Output Connectors:

Type M-J (UHF SO-239)

##### AC Power:

1.4kVA max. when TX  
AC 100 - 250V (Auto Select)

##### Dimensions:

9.1 x 5.6 x 14.3 inches  
(WxHxD)

##### Weight:

Approx. 22.5 lbs.

### More Fine Products from TOKYO HY-POWER



**HC-1.5KAT**  
HF 1.5KW  
Auto Tuner



**HL-2.5KFX**  
Legal Limit  
1.5kW  
HF Amplifier



**HL-45B**  
HF/50MHz 45W  
Linear Power  
Amplifier



**HL-1.2KFX**  
750W PEP  
HF Desktop  
Linear



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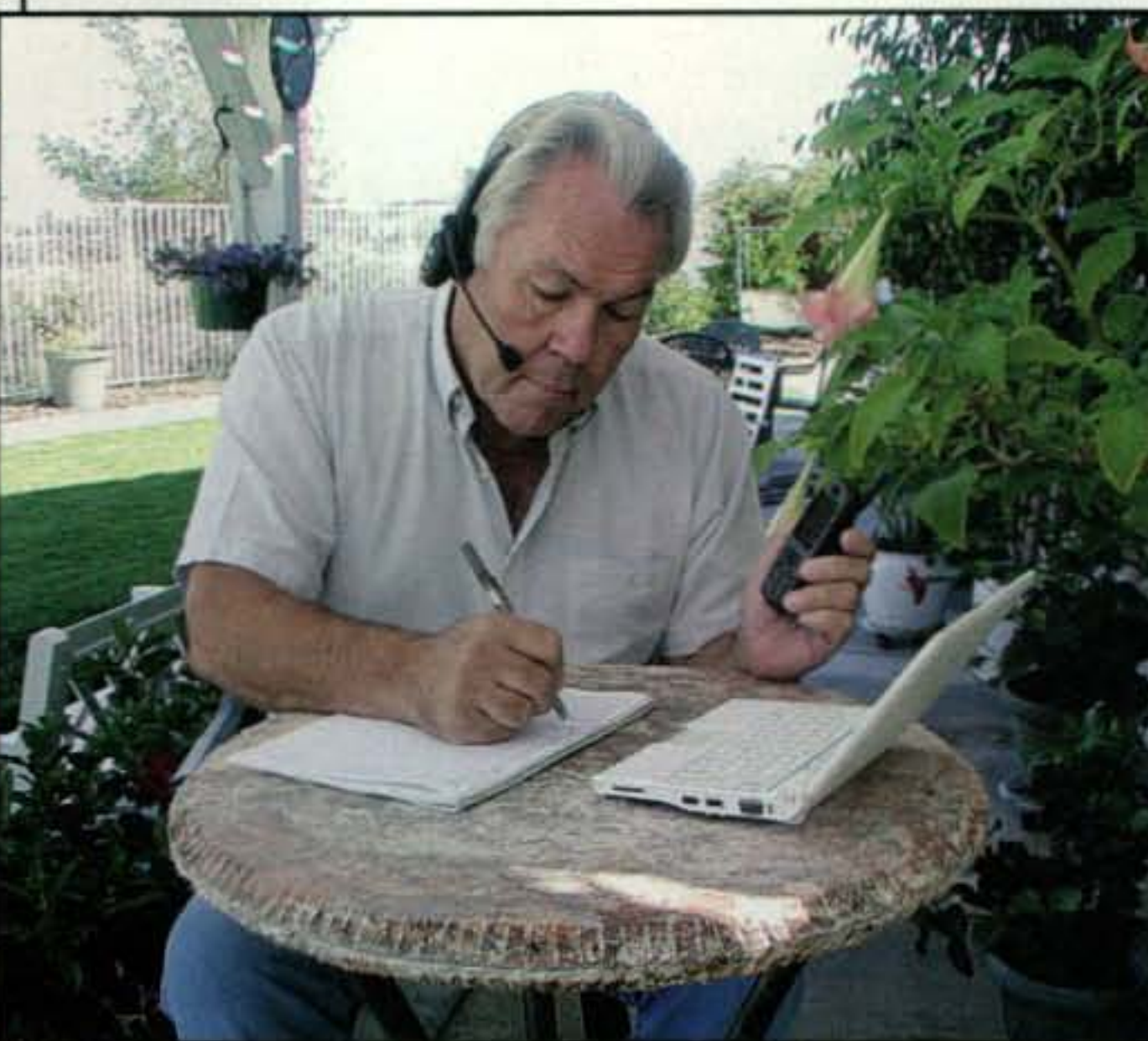
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## Optimize Your Antenna With the Field-Proven AntennaSmith™ ...



### TZ-900 AntennaSmith™ Antenna Impedance Analyzer -

**FREE!**  
ARRL Antenna Book  
with every TZ-900

- Graphic display - full color in bright sunlight!
- Stand-alone operation - no computer required
- Before & After color graphic overlays - instant comparison
- Handheld - take it to the antenna - measure where it counts!
- Store complete sweeps in permanent memory - download to your PC via USB when it's convenient
- Hours of portable operation, fast recharging
- Complete with software, charger, coax adapters and more!

Patented - portable - battery powered

Check Antennas and Transmission Lines

**Once you use the TZ-900 -  
you'll never want to use any other!**

## ... and Kill the Noise with the ANC-4 and DSP-599zx!



- **DSP-599zx Audio Signal Processor\***  
Noise Reduction & filtering for Audio, CW & data



- **ANC-4 Antenna Noise Canceller**  
Kill noise before it gets to your receiver!

## ... then Decode the Data with the Legendary PK-232/USB



- **PK-232/USB Multimode Data Controller\***  
Sound card interface, USB, Pactor, RTTY, Packet & more!

100,000 sold - All-time top selling data controller!

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Complete Bluetooth® wireless rig control for your station.

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Use a standard cellphone Bluetooth® headset to keep your hands free for driving and operating.

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Adapter Cable with 1 USB to 2 RS-232 DB9

- **HamLinkUSB™ Audio Adapter**  
USB Sound Card Interface  
No software drivers! Just plug it in.

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**IP57**  
Submersible  
3 feet for 30 min  
Body/Front panel

**DUAL BAND**

10 W 2 m/70 cm\*  
Dual Band FM Mobile  
**FTM-10SR** \*70 cm 7 W

**Bluetooth**  
(Optional Bluetooth unit required)

Great New Features to Support  
Outdoor Motor Sports Activities  
Mobile Transceiver...  
Great Appearance ...  
Easy to Operate

**IP57**  
Submersible  
3 feet for 30 min  
Front panel



50 W 2 m/70 cm\*  
Dual Band FM Mobile  
**FTM-10R** \*70 cm 40 W

Get "Back to Basics" with YAESU's FM Dual Band Mobile  
One-Touch Operation/Wide Receiver Coverage Included



**DUAL BAND**

50 W 2 m/70 cm\* Dual Band FM Mobile  
**FT-7800R** \*70 cm 35 W

**A TECHNOLOGY BREAKTHROUGH**  
The New Prestigious Compact - **VX-8R**

All-in-one High-performance Tri-Band Transceiver with GPS/APRS\* Operation\*1



\*Attached to the radio (microphone input) using the optional GPS Antenna Adaptor CT-136  
\*The optional GPS Antenna Unit FGPS-2 attached to the optional Speaker/Microphone MH-742

\*1 With optional accessories  
\* APRS\* is a registered trademark of Bob Bruninga WB4APR.

**Bluetooth**  
(Optional Bluetooth unit required)

5 W Submersible  
6 m/2 m/70 cm Tri-Band  
FM Hand held (222 MHz: 1.5 W)

**VX-8R**

6 m / 2 m / 70 cm Tri-Band

**IPX7**  
Submersible  
3 feet (1m) for 30 min.

**QUAD BAND  
DUAL RECEIVE**



50 W 10 m/6 m/2 m/70 cm\*  
Quad Band FM Mobile  
**FT-8900R** \*70 cm 35 W

**DUAL BAND  
DUAL RECEIVE**



50 W 2 m/70 cm\* Dual Band FM Mobile  
**FT-8800R** \*70 cm 35 W



50 W 2 m Ultra Rugged VHF FM Mobile  
**FT-1802M**

2 m Band



65 W 2 m Rugged FM Mobile  
**FT-2800M**

2 m Band



**IPX7**

Submersible  
3 feet (1m) for 30 min.

5 W Ultra-Rugged, Submersible  
6 m/2 m/70 cm Tri-Band FM Hand held  
**VX-7R/VX-7RB**  
(220 MHz: 300 mW)

6 m / 2 m / 70 cm Tri-Band



**IPX7**

Submersible  
2 feet (1m) for 30 min.

5 W Heavy Duty Submersible  
2 m/70 cm Dual Band  
FM Hand held (220 MHz: 1.5 W)  
**VX-6R**

2 m / 70 cm Dual Band



5 W Heavy Duty 2 m/70 cm  
Dual Band FM Hand held  
**FT-60R**

2 m / 70 cm Dual Band



1.5 W Ultra Compact 2 m/70 cm  
Dual Band FM Hand held  
**VX-3R**

2 m / 70 cm Dual Band



**IPX7**

Submersible  
3 feet (1m) for 30 min.

(8 key)

5 W Heavy Duty Submersible  
2 m FM Mono Band Hand Helds  
**VX-120 VX-170**

2 m / 70 cm Mono Band



70 cm FM Mono Band  
Hand Helds  
**VX-170**

(16 key Version)



(16 key)

Ultra-Rugged 5 W Full Featured  
2 m FM Hand helds  
**VX-150**

2 m Mono Band

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Shown with after-market keyer paddle, keyboard, and monitor (not supplied).

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## Contesting and the “DQ Effect”

There were a few tidbits of information hidden away last month in the 2008 CQ World-Wide DX Contest CW results and in the 2009 CQ WW rules. Since the SSB weekend of the 2009 contest is this month, some of these tidbits are worthy of additional comment.

### The Good...

The worldwide single-operator low-power winner in last year's CQ WW CW competition was P40Q, operated by CQ Amateur Radio Hall of Famer Scott Redd, KØDQ. Scott is recently retired for the second time from government service ... first as a Vice Admiral and Commander of the U.S. Navy's Fifth Fleet, and then as a civilian in several roles, culminating as Director of the National Counterterrorism Center. Ham radio and contesting have always been close to his heart, and this win gives Scott the distinction of being possibly the only person ever to win all six major DX contests. See our writeup on page 30 for more details.

Anyone who has ever had any dealings with Scott is impressed not only with his enormous record of accomplishment and his competitive spirit, but also with his immediately obvious code of personal integrity of the highest order. It is part and parcel of who he is and what he has done. It makes us proud to be associated with him, whether as friends, acquaintances, or simply fellow hams.

### The Bad...

While KØDQ is a contester of the highest integrity, the letters “DQ” in contesting circles usually are associated with shorthand for “disqualify,” about the most severe sanction that a contest sponsor can impose on a competitor. This year, the CQ WW Contest Committee found it necessary to “DQ” several entrants in the 2008 competition ... in the SSB competition for altering times in the Multi-Single category and in the CW competition for “log results deemed incompatible with category of entry.” In other words, submitting a log in one category, such as Single-Op, when the log made it obvious that the entrant had help of some sort, either from another person or from an alerting system such as the DX Cluster® or CW Skimmer®. Both of these may be used, but only in the Assisted or Multi-Op categories. Understand that “DQing” is a last resort. Someone who has simply misunderstood the rules has his/her entry reclassified into the proper category or is sent a friendly advisory letter which explains the rules as clearly as possible. If the problem recurs, then a log may be reclassified as a “check log” while committee members continue their persuasive efforts.

The CQ WW rules (in the September issue of CQ and online on our website and at cqww.com) clearly spell out the criteria for disqualification as well as the consequences—suspension from award eligibility, check-log status, and more. In addition, as of this year, the rules now specify that “(a) a competitor who wishes to be judged for a top score in their category must agree to a potential visitation at any time during the contest by an observer appointed by the CQ WW Contest Committee. Failure of the entrant to respond to our correspondence or to allow an observer full access to the contest QTH may result in the competitor being removed from award eligibility for 3 years.”

*This is an important note:* Assigning an observer to a station does *not* automatically imply that we think there has been illicit behavior by that entrant. Rather, it simply

suggests that the station is a world-class contender and we want to allay any questions other contesters might raise about the operation.

In our ongoing efforts to protect the integrity of our contests, we will continue to do what is necessary to prevent cheaters from taking away other competitors' enjoyment and pride in a job well-done ... and a job done by the rules. After all, the only “prizes” in ham radio contests are plaques, certificates, and bragging rights. Any honest competitor can accept losing fair-and-square to someone else—after all, the tables may be turned the next year—but having your pride of accomplishment stolen hurts as much as it does to have something tangible taken from you. What we don't understand, and probably never will, is what pleasure there is in looking at a plaque on your wall that you know you haven't really earned. To us, it would be a reminder every time we looked at it that we weren't good enough to win it legitimately. Integrity. The *true* bottom line.

With that, we hope you will participate in and enjoy this year's CQ World-Wide DX Contest, even if your only competition is your own performance in prior years. According to NW7US, prospects for improved propagation on both CQ WW weekends look good as of mid-August (see Tomas's column on page 108 for more), and of course, the CQ WW has a well-earned reputation for creating its own propagation! So get on the air and have fun!

### ... and the YHOTY

At this year's Huntsville Hamfest in Alabama, I had the privilege of presenting 2009 Newsline Young Ham of the Year Andrew Koenig, KE5GDB, with a certificate for a week at Space Camp®, CQ's major contribution to the YHOTY program each year. I am pleased to report that Andrew will be an excellent representative for our hobby. I got to spend some time not only with Andrew and his dad, but with a couple of his friends—whom he met via ham radio—who traveled to Huntsville from upstate New York solely to share this occasion with him. Friends like that, folks, is what ham radio is all about!

73, W2VU



2009 Newsline Young Ham of the Year presentation at the Huntsville Hamfest. From left, ARRL Southeastern Division Director Greg Sarratt, W4OZK; Vertex-Standard's Dennis Motschenbacher, K7BV; Chip Margelli, K7JA, of Heil Sound; emcee Don Wilbanks, AE5DW, representing Amateur Radio Newsline; CQ Editor Rich Moseson, W2VU, and 2009 Young Ham of the Year Andrew Koenig, KE5GDB. (Photo by Joe Eisenberg, KØNEB)

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T-2XD  
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with DCU-1

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Control Cable Conductors	8
Shipping Weight	26 lbs.
Effective Moment (in tower)	2800 ft.-lbs.

Wind load capacity (inside tower)	20 square feet
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Brake Construction	Electric Wedge
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Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	8
Shipping Weight	31 lbs.
Effective Moment (in tower)	3400 ft.-lbs.

Wind load capacity (inside tower)	8.5 square feet
Wind Load (w/ mast adapter)	5.0 square feet
Turning Power	600 in.-lbs.
Brake Power	800 in.-lbs.
Brake Construction	Disc Brake
Bearing Assembly	Dual race/48 ball brngs
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	8
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**Iowa QSO Party** – The first Iowa QSO Party will be held on October 17 from 1400–2300Z. Sponsoring the event is the Ottumwa ARC and working its club callsign, WA0DX, will earn a 100-point bonus. Special multipliers will be earned for working the three present or past Section managers who live in the state (SM1, SM2, SM3). Prizes and certificates will be available. For rules go to: <<http://www.wa0dx.org/iaqsoparty.html>>.

**NY QSO Party (NYQP)** – This event, sponsored by the Rochester DX Association, will be held from 1800Z October 17 through 0600Z October 18. The object is for stations outside of New York State to work as many NY stations in as many NY counties as possible. Modes: SSB, CW, RTTY or other digital mode. Stations in NY State may work everyone. For further details go to: <<http://www.rdxa.com>>.

**Arizona QSO Party** – Sponsored by the ARRL Arizona Section and Catalina Radio Club, this event will be held from 1600Z October 10 to 0600Z October 11, and 1400–2359Z October 11. Phone, CW, and digital modes on 160, 80, 40, 20, 15, 10, 6, and 2 meters. For rules along with log and summary sheets, Cabrillo electronic file format, and award information, go to: <<http://azqsoparty.org/>>.

**The following special event stations are scheduled for October:**

**K3R**, from public demonstration of amateur radio and emergency preparedness, Pittsburgh, Pennsylvania; Rotarians of Amateur Radio; 10 AM to 6 PM EST October 3 and 4 on 7.130, 7.180, 14.155, 14.230 MHz. QSL via Bob Mente, NU3Q, 305 Ewing Rd., Carnegie, PA 15106-1509. <<http://www.nu3q.com>>

**N7V**, from Nevada Day, Las Vegas, Nevada; Las Vegas radio Amateur Club; 1700–2200Z October 30 on SSB 14.250 and 7.250 MHz, CW 14.050 and 7.050 MHz. QSL to LVRAC, P.O. Box 27342, Las Vegas, NV 89126-1342. <[www.lvrac.org](http://www.lvrac.org)>

**W9M**, from commemoration of the 30th anniversary of the Metro DX Club, Oak Lawn, Illinois; 1500–2359Z October 3 on 7.240, 14.040, 14.240 MHz. For certificate send 8 1/2 x 11 SASE to John Holmes, W9ILY, 8728 Sproat Ave., Oak Lawn, IL 60453. <[www.metrodxclub.com](http://www.metrodxclub.com)>

**W0CWP**, from 21st annual Anamosa Pumpkinfest, Anamosa, Iowa; Jones County ARC; 1300–1700Z October 3 on 14.260 ±QRM. For certificate send SASE to JCARC, 304 South Ford St., Anamosa, IA 52205. <[www.qsl.net/kc0lgb](http://www.qsl.net/kc0lgb)>

**The following hamfests, etc., are slated for October:**

Oct. 4, **25th Annual Southeast Iowa Hamfest**, Muscatine County Fairgrounds, West Liberty, Iowa. Contact Tom Brehmer, N0LOH, e-mail: <[n0loh@arrl.net](mailto:n0loh@arrl.net)>, phone 563-263-3097. (Exams, contact Jerry Schroder, e-mail: <[kc0wwv@arrl.net](mailto:kc0wwv@arrl.net)>, phone 563-607-0793)

Oct. 11, **Maysville Hamfest**, Community Center, Maysville, North Carolina. Contact K4BMH at 252-753-2895. (Talk-in 146.685, tone 88.5)

Oct. 11, **Hall of Science ARC Hamfest**, NY Hall of Science parking lot, Flushing Meadow Corona Park, Queens, New York. Contact (evenings only) Stephen Greenbaum, WB2KDG, 718-898-5599, or e-mail: <[wb2kdg@arrl.net](mailto:wb2kdg@arrl.net)>. (Talk-in 444.200 PL 136.5, 145.270 –600kHz PL 136.5; exams 10 AM). <[www.hosarc.org](http://www.hosarc.org)>

Oct. 18, **RF Hill ARC Hamfest**, Sellersville Firehouse, Sellersville, Pennsylvania. Contact Jim Soete, WA3YLQ, e-mail: <[wa3ylq@arrl.net](mailto:wa3ylq@arrl.net)>, phone 215-723-7294. (Exams 10 AM) <[www.Rfhill.ampr.org](http://www.Rfhill.ampr.org)>

**Oops . . .**

Our September news item "FCC: We Don't Regulate Contests" had the wrong prefix on the callsign of the ham who submitted the petition. Jack Najork is W5FG, not N5FG. (N5FG is, of course, CQ WAZ Award Manager Floyd Gerald, who had nothing to do with this petition.)

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After you've won the Nobel Prize for physics, what do you do for an encore? How about using some of what you've learned as an astrophysicist to revolutionize ham radio weak-signal communications?

## CQ Interviews:

# Dr. Joe Taylor, K1JT

James McDonnell Distinguished University  
Professor of Physics (Emeritus), Princeton University

BY RICH MOSESON,\* W2VU

**W**alking into Jadwin Hall at Princeton University, you quickly realize that you are in a rarified atmosphere. Home to the university's Physics Department, there is one corridor lined with portraits of more than a dozen of the department's current and former students and professors, all of whom share a singular distinction: they each have been awarded the Nobel Prize in Physics. In another area, there are several colorful posters briefly explaining the discoveries and innovations of several of the department's Nobel laureates. Included in both displays is the man I am on my way to see, Dr. Joseph Taylor.

But if the atmosphere of the building, and of the university, is somewhat forbidding, quite the opposite is true once you walk into Joe Taylor's office. It is a typical professor's office filled with books, papers, and computers, and a blackboard behind his desk covered with formulas and the occasional ham radio callsign. Yes, Joe is a ham, K1JT, and despite all of his honors and accolades (see sidebar "A Life of Achievement"), he is friendly, modest, and unassuming.

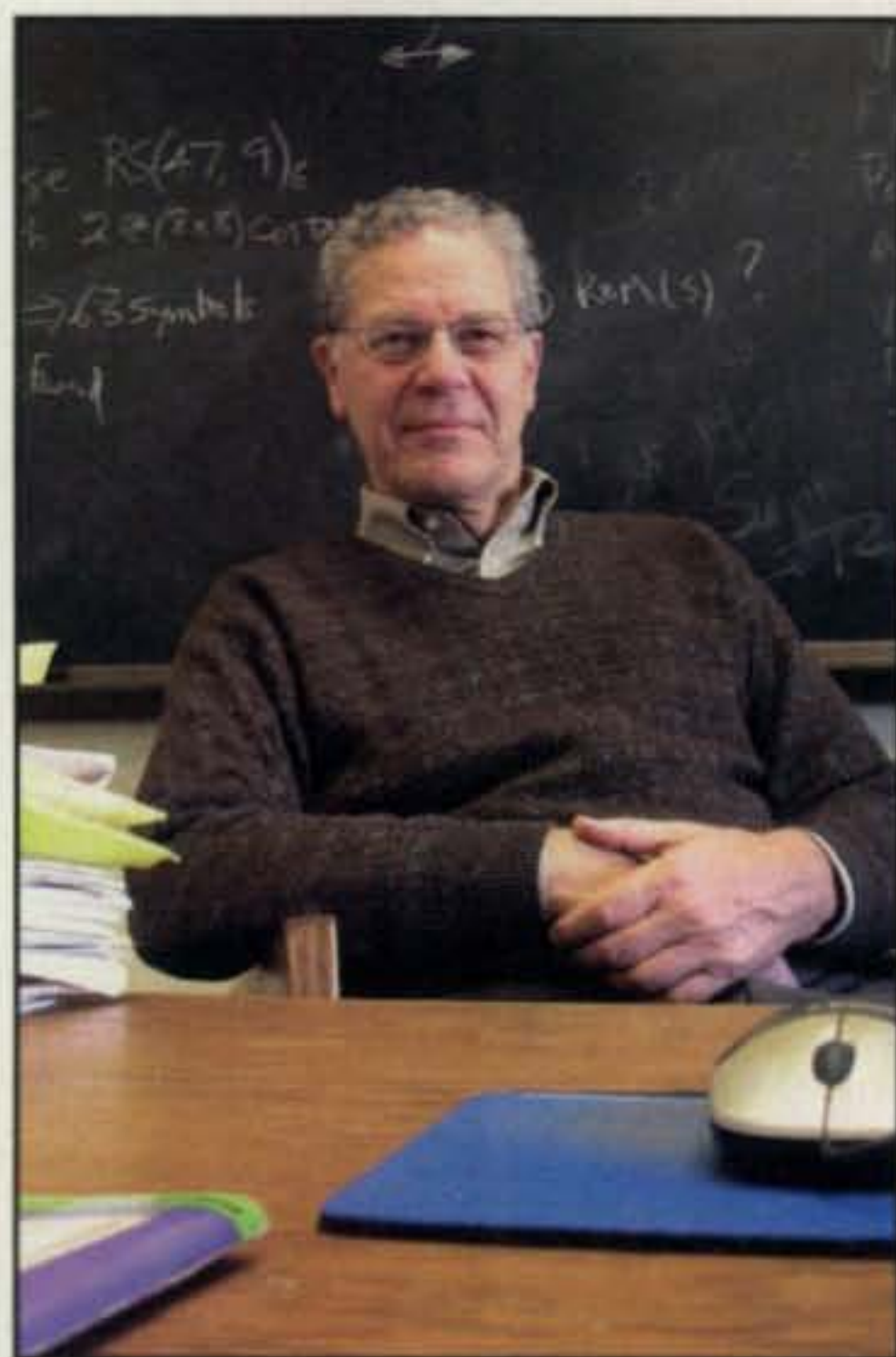
One of the marvels of our hobby is that, to the rest of the world, Dr. Taylor is one of the world's leading astrophysicists, the James McDonnell Distinguished University Professor of Physics (Emeritus), and the former Dean of the Faculty at Princeton

University. To hams, though, he is Joe, K1JT, eager to make you feel at home and to show off his latest ham radio toys. Joe is also well-known among hams as the developer of the WSJT software suite, which revolutionized meteor-scatter and moonbounce communications on VHF (and is finding increasing use on HF as well). He's currently working on a propagation monitor system for HF called WSPR.

In the course of our interview, we discussed Joe's scientific career, the influence ham radio has had on his career, and the influence his career has had on ham radio. To some extent, it was difficult to keep them separated, since, as Joe put it, "I don't usually think of a particular distinction between my professional interests and the ham radio interests since they have always overlapped, a certain amount at least." But there is so much ground to cover that the more detailed parts of our discussion will be posted as a "Digging Deeper" supplement on the CQ website.

### A New Jersey Farm Boy

Taylor was born in 1941 in Philadelphia, Pennsylvania—one of six children in his family—but at age seven, he moved with his family to his grandfather's peach farm in southern New Jersey. The farm, which has been in his family since 1720, is on the Delaware River, just across from northeast Philadelphia, said Joe, noting that he is descended from a family of Philadelphia Quakers



Joe Taylor, K1JT, in his Princeton office.

that goes back just about to the time of William Penn. It was here on the farm, with his brother Hal (who also became a ham and is now a Silent Key), where Joe discovered the wonders of both ham radio and science.

"We were sort of our own best friends, out in the country away from other kids, and we were always into gadgets—farm machinery certainly, but also electronic things. We built crystal sets in the 1950s and then single-tube radios and

\*Editor, CQ

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



that kind of thing, and then went on to building shortwave sets. ... We got licensed when I was in 7th grade, I think, with Novice licenses, and went on from there ... I got onto 80 and 40 meter CW, I guess, with a Heathkit AT-1 and a wire antenna out the window tied to a tree. We also were on 2-meter phone at the time, pretty much with all homebuilt stuff, although it took us a while to get much of it working the first go-round. I remember the light bulb that went off in our heads, my brother and me, when we discovered that the reason we weren't coupling any power into this antenna was because it was non-resonant, and with a couple of capacitors and a coil, we could make it resonate and take power, and that sort of thing is eye-opening to a teenager. ... The best part of getting interested in ham radio in the country, where we were, was that we had lots of space, lots of places to put up antennas. The farmhouse was big and had plenty of room. ... We basically took over the third floor in this place and filled it up with radios."

Taylor said his parents were not scientists, but his father was a teacher and school administrator and "always encouraged his kids in educational ways." He and his brother Hal, who became K2PT and was a physics professor at Stockton State College (now Richard Stockton College) in New Jersey, were the only ones of the six children to pursue careers in science. As a high school student, though, Joe thought his future lay in math and initially set his sights on being a math major at Haverford College in Pennsylvania.

"I was good at math in high school, and although I did take physics in high school, it wasn't a very modern physics course, just kind of ropes and pulleys and sliding weights, and I didn't find it very interesting at that point. But my freshman year at college, I discovered how much fun messing around in a physics laboratory is compared to proving theorems in math courses, (so) by the end of my sophomore year, I had become a physics major and sort of knew that science, anyway, was my interest.

"I think around about maybe the end of my third undergraduate year I was beginning to become aware that this would be over soon and I would have to decide something to do with myself and decided at that point to look for an area of physics in which to do graduate study if I wanted to go on and get a higher degree. At that point, I really decided on astronomy as a field, because it's a field of applied physics in which I could

## A Life of Achievement

Here is a quick rundown of some of the milestones in K1JT's life and work:

- 1941—Born in Philadelphia, Pennsylvania
- 1954—First licensed as a radio amateur
- 1963—B.A. in Physics, Haverford College
- 1968—Ph.D. in Astronomy, Harvard University
- 1968–1969—Post-doctoral fellow, Harvard University
- 1969–1981—Professor, University of Massachusetts, Amherst
- 1974—With graduate student Russell Hulse (then WB2ALV) discovered first binary pulsar.
- 1980—First recipient of the Dannie Heineman Prize for Astrophysics, awarded jointly by the American Institute of Physics and the American Astronomical Society, for outstanding work in the field of astrophysics.
- 1981–2006—Professor of Physics, Princeton University
- 1981—Among the first group of MacArthur Award recipients when the "genius grant" program was introduced. Taylor is one of 12 MacArthur Award recipients at Princeton.
- 1992—Wolf Prize in Physics "for his discovery of an orbiting radio pulsar and its exploitation to verify the general theory of relativity to high precision."
- 1993—Nobel Prize in Physics (shared with Russell Hulse, ex-WB2LAV) for discovery of first binary pulsar and using measurements to confirm Einstein's theory of relativity. He is one of 16 Nobel laureates in the Princeton Physics Department.
- 1997–2003—Dean of the Faculty, Princeton University
- 2006—Present—Professor Emeritus, Princeton University

combine my interests in radio frequency electronics with my interest in physics and do radio astronomy."

## Becoming a Radio Astronomer

Joe's hands-on experience as a ham got him off to a running start in this field. As his senior honors project at Haverford, Taylor built his own radiotelescope, using as his main references an early book on radio astronomy and what he termed in his Nobel autobiography, "an old friend, *The Radio Amateur's Handbook*."

"So I went off to Harvard then as a graduate student to do a Ph.D. in radio astronomy," Taylor continued. "Radio astronomy was then a very new field;

this was the early 1960s. Radio astronomy sort of grew out of radar work in the Second World War, and it was only in the '50s that it started to become an active field of astrophysics and so there were lots of new horizons to be looked into. It was a great time for a graduate student to be entering a field."

Joe's doctoral dissertation involved finding the locations of cosmic radio sources using a technique known as *lunar occultation*. Early radiotelescopes did not have very fine resolution, but if a radio source lay in the moon's orbit, its location could be pinpointed by watching for the moon to pass in front of it and block its signals.

By the time he finished his dissertation on measuring lunar occultations,



Jadwin Hall is home to Princeton University's Physics Department. It was built into a hillside to insulate basement laboratories from street vibrations.



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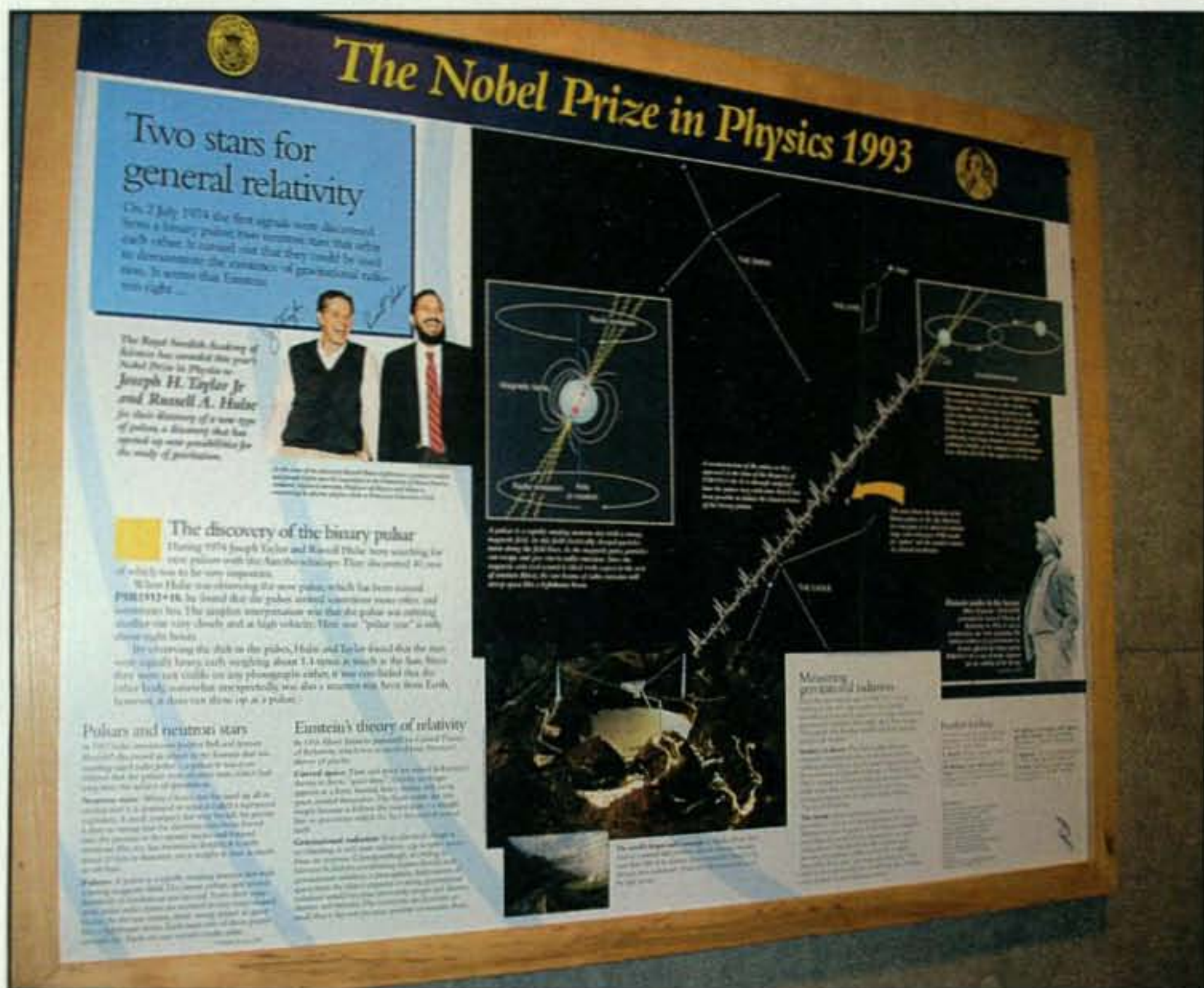
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Students and visitors to Jadwin Hall are reminded of (and informed about) the 1993 Nobel Prize in Physics shared by Joe Taylor and Russell Hulse, ex-WB2ALV.

Joe had decided that he wanted to find a different field within radio astronomy to focus his post-Ph.D. work.

"I turned in my thesis at the end of 1967, took my final oral exam in January of '68, and it happened that just a couple of weeks later, the British journal *Nature* came out with an article announcing the discovery of what we now call pulsars, by a group of radio astronomers in Cambridge, England. So since I was looking for something new to do, this discovery sounded very exciting and I got in on the ground floor, so to speak, in the study of pulsars. I then went on to accept a junior faculty position at the University of Massachusetts in Amherst, and started a radio astronomy group there that would discover the next pulsar that was discovered by anybody other than the Cambridge group, and we built up a very sizable pulsar radio astronomy group there at UMass."

It was at UMass that Taylor would meet and begin to work with the man with whom he would ultimately share the Nobel Prize, fellow ham Russell Hulse, WB2ALV.

### Searching for Pulsars

"I talked Russ into getting interested in doing a Ph.D. thesis himself on a project in which we would use the Arecibo radiotelescope (in Puerto Rico) to at-

tempt to discover a large number of new pulsars. We knew at that time that pulsars were almost certainly identified with neutron stars, the remnants of supernova explosions, and we knew that they should therefore be concentrated along the plane of the galaxy, the Milky Way. Therefore we knew, roughly speaking, where to look for them in the sky. But still, the sky is very large and the beam of the Arecibo telescope is pretty small, so we had to make a sort of semi-automated scheme for scanning the sky at random, looking along the galactic plane for the kinds of signals that would be the clues that there were pulsars there.

"This was 1972 when we got started on it. It was a time when computers were beginning to become affordable for use in university laboratories. What was then called a mini-computer was about the size of a refrigerator, but we bought one of them with a grant that I managed to get from the National Science Foundation, a very modest grant, about \$30,000, of which \$20,000 went for the computer and the remaining \$10,000 pretty much went for airplane tickets back and forth to Puerto Rico. But we got this computer and interfaced it to a radio astronomy receiver in a novel way that allowed us to make this semi-automated search of the sky for pulsar signals. ... Russ stayed for about a year, most of the time in Puerto Rico; I was

going back and forth because I had lecturing duties at Amherst as well, but we found 50 new pulsars, which more or less doubled the number of them that were then known. And of that number, one object turned out to be exceedingly interesting, and that's the discovery of the first *binary pulsar*, a pulsar orbiting around another star.

"We knew that that was a possibility when we started the project, and we were certainly on the lookout for them, although none had previously been found, which was a bit of a surprise, because most stars are not single objects—they have planetary systems or companion stars about which they orbit—and it turns out that most pulsars are not, simply because the binary orbits in which those stars might have evolved became disrupted when one of the stars underwent a supernova explosion to produce a pulsar. But not all of them are disrupted and a few remain, and this binary pulsar turned out to be a fascinating discovery. It allowed us to make tests of Einstein's relativity theory, and that is the work for which we were both honored 20 years later with the Nobel Prize." (See our web supplement "Digging Deeper with Dr. Joe Taylor, K1JT" for Joe's explanation of how they were able to use binary pulsars to prove Einstein correct, as well as a look at the current work of the Cosmology Group in the Princeton Physics Department.—ed.)

Taylor left Amherst for Princeton in 1981, joining the faculty of the Physics Department. "Here I (taught) physics courses to undergraduates as well as graduate students, and I've trained a number of graduate students over the years," he said, summarizing the next 25 years. In 1997, I took on extra duties as Dean of the Faculty at Princeton, and did that for six years. In 2003, I returned back here to the Physics Department and taught for a few more years before retiring in 2006."

### A Phone Call from Stockholm

In 1993, Taylor got an unexpected telephone call from Sweden notifying him that he and Russell Hulse would be sharing the Nobel Prize in Physics.

"It was 19 years after the work for which we were being honored, so we certainly were not expecting it or thinking that this was something that was going to happen. I think that's typically the case for people who receive that honor. It sometimes happens the very next year or something, but more commonly, as was the case for us, it took a



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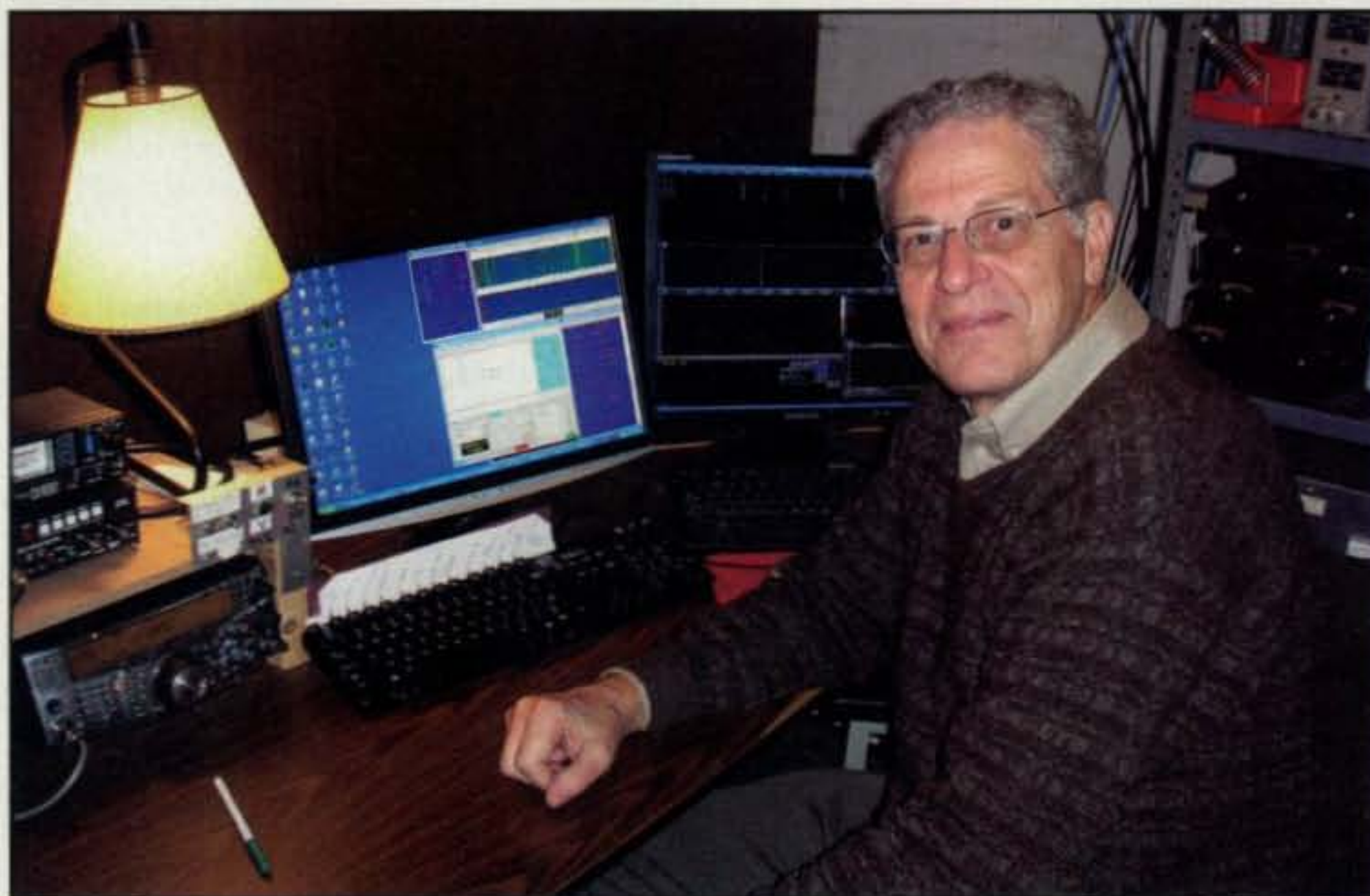
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while for the importance of what we had done to become recognized, and frankly, in this case, although the prize was made for the discovery in 1974, the discovery by itself would not have been Nobel Prize-worthy had it not been for a lot of follow-up work that was done over most of those 19 years afterwards. Russell had gone on, after finishing his thesis, to do other work, and in fact was not working in astrophysics anymore. ... I had kept very much involved with it, and did all the follow-up observations with other colleagues and students over the years, so was a bit closer to it at the time that the honor came."

I asked Joe how winning the Nobel Prize changed his life.

"Well, it changes a lot, especially in the short term," he replied. "The Nobel Prize receives a lot of attention, certainly from the press and even from the academic world, much more broadly. The press interest dies away after six months or so; it's no longer newsworthy after that time, but interest of others in the academic field lasts a lot longer. So for several years, I was ... deluged with invitations to visit places and give talks." Taylor added, "I felt that it would be very ungracious not to be available for that sort of thing, so for several years



K1JT in his basement ham shack.

I spent a lot of time, in addition to my normal duties teaching here, making visits to other colleges and universities around the country and even internationally quite a bit. I would typically show up for two or three days and give a public lecture in the evening, perhaps, and then a more detailed technical talk to a

physics or astronomy department, and I tried to fit these things in amongst my normal duties here. The Nobel Prize was in 1993, and when, after having done that for a few years, with a relatively complicated life as a result, an opportunity came up, talking to the president, who was at that time looking for



a new Dean of the Faculty to take on these other duties. I realized that that would not only be an interesting challenge for me to take on, but it would be a sort of iron-clad excuse not to be able to do much traveling anymore for a while. And so, in 1997, when I took on that new responsibility here at the university, I pretty much stopped doing the lecturing duties, the lecturing tours."

As Dean of the Faculty, Taylor was one of the university's top administrators.

"At Princeton, the Dean of the Faculty is sort of the principal academic officer of the university, serving together with the Provost and the President as the central administration, the top of the pyramid if you like. So my duties were to appoint and then interact with the department chairs for all of the 36 academic departments. ... I had to get to know the rest of the university very well and know where our strengths and weaknesses were, and where we could aspire to generate new work by hiring new people and getting into new areas, that sort of thing. So my job was really to oversee the appointment and development of faculty resources, faculty people, and the necessary support for them."

### Returning to Ham Radio

The relatively normal hours and reduced travel Joe enjoyed as Dean of the Faculty allowed him to return his attention to ham radio after years of relative inactivity.

"I would get on the air once a year or something and make a QSO or two, or at my brother's place ... but I didn't, for many of those years, have a station at home. But when I became Dean of the Faculty I really got back on the air. I needed something to do when I got home that would allow me to forget about all the problems and all the departments that were bugging me," he laughed, "and it was fun to rekindle that old interest. I first just bought a transceiver, put up some wire antennas, and got on HF, but soon enough I was back on the VHF bands as well, and those remain my principal interest today."

### Giving Back to the Hobby That Launched His Career

When 13-year-old Joe Taylor got his Novice ham license back in 1954, it was his entry point to world of science and technology that would take him to the far reaches of the universe as one of the world's leading radio-astronomers. But he never forgot his roots in ham radio and, in fact, has helped revolutionize some aspects of the hobby by applying the knowledge he gained in pursuit of pulsars to bouncing radio signals off the moon, meteor trails, and even the good ol' ionosphere.

Joe's signature contribution (so far) to ham radio has been the WSJT software suite, a group of programs and sophisticated digital signal processing technology designed to make esoteric weak-signal modes such as meteor scatter and moonbounce accessible to typical hams with typical stations. While designed primarily for these VHF/UHF modes, WSJT is also finding growing popularity on 160 and even 20 meters. Joe's current "baby" is a mode called WSPR, designed to help spot and track band openings across the amateur spectrum. We'll start out with his first and best-known program, WSJT, which stands for "Weak Signal Joe Taylor" (or "Weak Signal K1JT").

### WSJT

I asked Joe how WSJT came about and how hams who are not particularly experienced with weak-signal VHF modes



*Joe's 70-foot back-yard tower is dominated by his 2-meter EME array—not surprising for someone who revolutionized amateur moonbounce communications. See the sidebar "At Home with K1JT" for descriptions of all of the antennas on the tower.*

could relate to it. He explained that the program originated from his realization that weak-signal ham radio had a lot in common with the weak signals sought by radio astronomers.

"I had always thought, during the years that I was not particularly active as a ham, that it would be fun to apply some of the techniques that we use in radio astronomy for detecting very weak signals," Joe explained, "and, in particular, for extracting modulated extremely weak signals from the much stronger noise backgrounds. That really is what a pulsar radio astronomer is doing—detecting extremely weak but modulated signals from a noise background, and after all, that's what we're trying to do in weak-signal ham radio communication as well."

"We all know that, with the right equipment, you can work the world on 20 meters most anytime, depending on the sunspot cycle and so forth," Joe continued, "but VHF weak-signal people like to do it the hard way and try to push the limits a little bit, and either find the band openings or find some other way to make it possible to make long-distance contacts with stuff that you've put together yourself, in your own station. Now ... I think all hams have a pretty good feeling for the fact that CW can get through when voice can't, because it's somehow a more effective mode when the signal-to-noise ratio is not very high, and other modes are even better than the digital CW mode."





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"CW is basically, if you like, digital AM. It's amplitude modulation where the amplitude is either zero or 100 percent, key up or key down, and AM is not a particularly efficient modulation mode, even digital AM, like CW is. So communication theorists, going back to the 1950s, have known that other modulation schemes are more efficient users of a noisy channel. Frequency shift keying, for example, is better than simple on-off keying, and multi-tone frequency shift keying can be even better than two-tone frequency shift keying. Our ordinary ham radio RTTY (radio-teletype) is two-tone frequency shift keying. If you have the bandwidth available and can use more than two tones, even higher efficiencies are possible. And there's also phase-shift keying, like PSK-31. That can be very effective under the right conditions. All these kinds of options are possible, and particularly with computers, and most of our computers these days have a sound card system so that you can get audio into and out of the computer. So we have a lot of modes now in ham radio where the signal is generated in the computer, comes out from the sound card, goes into your microphone jack or whatever,

and on receive, the converse things happen. With the right software, you can generate PSK, FSK, multi-tone frequency shift keying, and so forth in the software."

What became WSJT began as a quest to learn more about communication theory and to solve what Joe termed "the meteor scatter problem." He recalled, "I wanted to be able to have a mode that would convey—at a minimum—at least a couple of callsigns and a signal report in a tenth of a second, because the typical length of a frequently-available meteor trail is a tenth of a second or so. Some last longer and that's why you can occasionally make SSB contacts on meteor scatter, but the ones that are there all the time, day and night, every day of the year, don't give those long bursts like that, and I wanted to be able to make meteor-scatter contacts anytime." Joe determined that very fast-modulation multi-tone frequency shift keying was a good way to go, and realized such a signal could be made to fit in the bandwidth of a single sideband transceiver. "So that was the first thing I tried to design," he said.

"The moonbounce problem is a rather different one," Joe added. "The signals

are much weaker. The meteor-scatter signals, while they don't last very long, can be heard. Moonbounce signals can barely be heard, even when you have huge antennas and a lot of power. It seemed to me that if we could make a system that would work at the very threshold of audibility or below that, with signals that were perhaps *not* generated with 1500 watts and a huge array of Yagis ... if somebody has a satellite-style system with only a couple of Yagis and only 300 watts or something, what about moonbounce with that? And it turns out that with frequency shift keying of many tones, it is possible to make a system that will work. ... Now a moonbounce contact is not a good time to do any ragchewing. You're basically going to exchange callsigns and a signal report and probably not much else. You might say 'good morning, Jack' or something, but you're not going to exchange a lot of information. So the WSJT moonbounce modes allow you to send callsigns and your grid locator and a signal report, and if you want to chit-chat a little bit, you can also do that, but the maximum message that you can transfer in a single transmission, which lasts for one minute, is 13 characters. So anything you can say



in 13 characters, you can say on WSJT!" (For a full description of how the programs work, and the work that went into developing them, see "Digging Deeper with Dr. Joe Taylor, K1JT," on the CQ website—ed.).

Joe notes that WSJT is not for VHF only. "JT-65 (WSJT's moonbounce mode) has become popular on HF as well. Generally on 20 meters people congregate around 14.076, and almost any day of the year, if you tune in on 14.076 with WSJT, you'll find some people exchanging callsigns and chit-chat on JT-65. It works on 160 very well, and since 160 is a weak-signal band, if you're trying to do DX it's effective there as well.

The microwave guys have been using it as well for things like cloud scatter on 10 gigahertz."

### From WSJT to WSPR

Joe's current project—called WSPR—is focused on automated reporting of propagation openings on the HF bands. WSPR records low-power beacons heard on the air and can plot them on a map. The spots can also be posted to an internet page displaying who's heard whom, both in tabular form and on a map. On the map screen, clicking on the callsign of

### At Home With K1JT

After our formal interview was over, Joe took me over to his house—a very short drive from the Princeton campus—to meet his wife, Marietta, and (of course) to see his ham station. The Taylors live in a typical suburban home, except for the EME array on the 70-foot tower in the back yard. The tower cranks down to 22 feet, and there is a work platform installed at the 20-foot level to allow Joe to work on his antennas without removing them from the tower.

Inside his basement shack, the operating position consists of one radio and two computers (one of which is always running WSPR), but a rack of equipment off to the side is filled with various converters, pre-amps, tuners, and amplifiers.

Back outside, the tower is dominated by Joe's array of 2-meter EME antennas, four M<sup>2</sup> 2MXP28s, which are 28-element cross-polarized Yagis, each containing 14 horizontal elements and 14 vertical elements. Joe has computer software that can monitor both and automatically adjust to whichever polarization the incoming signal actually has to minimize loss. On transmit, he has to manually select

either horizontal or vertical polarization, but the software can advise him which to select. Back on the tower, there is a 28-element M<sup>2</sup> 432-MHz beam at the top, followed (below) by seven elements on 6 meters, a K1FO 16-element beam on 222, and loop Yagis on 903, 1296, and 2304. There is also a dipole at the 50-foot level for WSPR and some other HF work, as well as the driven element from a Moseley tribander on a separate roof tower. Plus, Joe shunt-feeds the main tower for 160 meters.



The metal shelf unit behind Joe contains the "guts" of his VHF/UHF station, filled with transverters, amplifiers, and other assorted goodies (except for his 2300-MHz station, which is barely visible on the window sill at the right).



A work platform has been built at the 20-foot level of Joe's tower, allowing him to crank down the antennas to work on them without removing them from the tower or needing to climb to the top.



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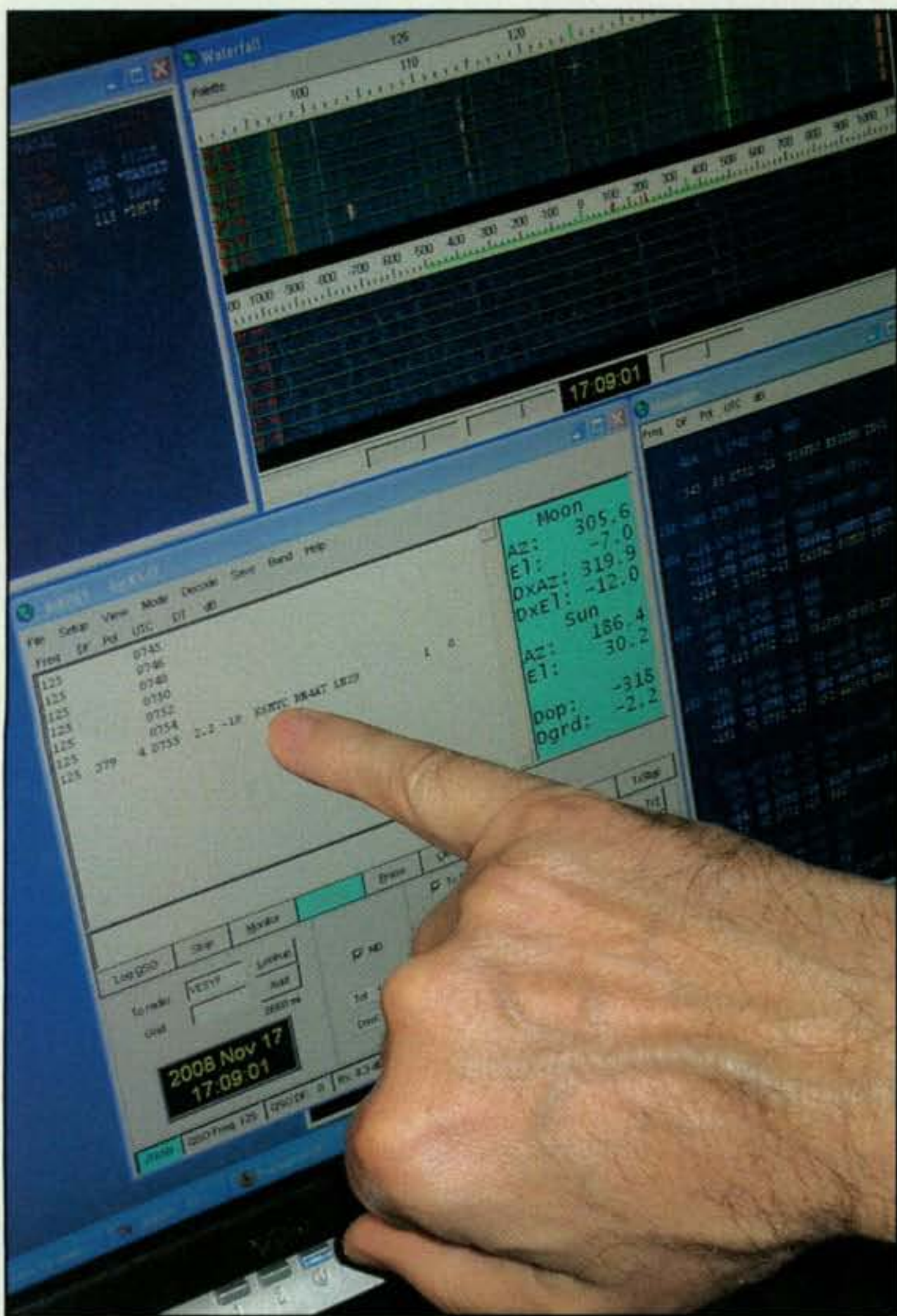
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Joe points out a signal received from another station operating JT-65, the moonbounce portion of the WSJT software suite.

a station shows you not only where that station is located, but who has been heard there and who has heard *its* transmissions as well.

Joe explained that the project got its start with an inquiry from a QRPer “down under” about a year before our interview. “Somebody from New Zealand wrote to me,” Taylor recalled, “and said, ‘You know, a bunch of us have been doing these QRP experiments to put sort of beacon-like signals on the air and see how propagation is varying over the years. What about a digital mode for that? Would you be interested in developing it?’ So I got started thinking about it and sort of sketched out some ideas on a pad, and finally wrote a program that would do it in a simple way. I has now become a program known as WSPR, for Weak Signal Propagation Reporter, pronounced ‘whisper,’ which sounds like a good thing for QRP.

“A lot of people are WSPR’ing now. There are a couple of little band segments where if you run this program you’ll hear, you’ll *see*, signals start to pop up on the screen, being decoded, because they’re being sent out by somebody else around the world. There are now a few hundred people who are doing this, and there are special activity days where everybody gets on 40 meters or everybody gets on 160. The default band, when there’s nothing special going on, has been 30 meters. It’s a lot of fun, and it is a good way of watching the propagation variations. The signals are typically running with a few watts at most. Some people are running milliwatts. The sig-

nals can be detected by the decoding software when they’re 10 or 15 dB below the audible threshold, so you don’t necessarily even hear anything if you tune your single-sideband receiver to these little band segments. But if you have your program running, then callsigns start popping up on the screen.” (*We’ll cover WSPR in greater depth in a future issue.—ed.*)

## Ham Radio and Modern Science

I also asked Taylor whether he believes that a background in ham radio is still valuable in today’s computer-dominated scientific world. “Yes, I do,” he replied. “Ham radio has always had one really important kind of activity, a kind of personal satisfaction to offer, and that is building it yourself. I think the kind of developing professional who is going to be good at design and implementation of new techniques can very often benefit from an early exposure to ham radio, where homebrewing is a part of what’s happening. And homebrewing these days doesn’t necessarily mean you have to build your whole station. You may well buy your transceiver, but you can’t just put a transceiver on the air without doing a lot of other things, almost all of which have to be done by yourself. You have to put up some kind of an antenna, you probably have to have other station auxiliary equipment, and almost everybody gets some building experience doing those sorts of things. I think people who have developed that kind of skill in an avocation—in a thing that they do just for the fun of it—often develop skills that translate into their professional work.”

Joe added, “I definitely used those (skills) in my early work in radio astronomy. That is, I was a knowledgeable RF electronics person ... not from a professional engineering training level, but from a seat-of-the-pants-in-the-ham-shack level. And those things were very useful to me as a radio astronomer. Typically, you know, science these days is pretty highly specialized, and in a science laboratory you will often have some distinction between the scientists and the technical support people who ... build the equipment. ... But it’s still very valuable to the scientist to have the technical equipment-type knowledge as well, partly because, at least at the forefront of scientific frontiers, the instruments ... don’t necessarily even exist yet (for conducting) a particularly important experiment. So the scientist would want to be involved in the design and detail implementation of a new instrument. We did that for this radio astronomy experiment that allowed us to detect the binary pulsar. That involved a pretty sophisticated development of equipment that interfaced a multi-channel spectrometer-type receiver to a computer. That hadn’t been done before, and the fact that I was knowledgeable enough in the laboratory to know which end of a soldering iron to pick up, and how to build the stuff, was very valuable.”

## Young People in Science and Technology

I next asked Joe if he agreed with the sentiment expressed by many of our other recent interview subjects that our country is facing a critical shortage of young people getting into science and technology, particularly in RF and analog areas.

“I do agree with that assessment,” he replied. “That’s one of the reasons why our science and engineering laboratories these days are populated to a very significant extent ... by recent immigrants to the country. It is still true that America is often seen as a land of opportunity for people in other parts of the world, people with the kind of training that makes them desirable for industries and other pursuits here in this coun-



try. It means that we can still be attractive to them, and our immigration policies permit them to come, but many of these jobs are being taken, then, by people who come here from overseas. That's fine, as they become good American citizens, but we hope that in future generations (enough of) their children and a large fraction of other people's children also ... will become interested in these things such that we can remain self-sustaining."

What, I asked, does he see as being behind this lack of interest among our kids? Is it the way science is taught in middle schools and high schools?

"I do think that there are some weaknesses in our educational system, for sure," answered Joe. "We know that our schools are not always ... as good as they should be and as good as what they are in some countries that are our economic competitors around the world. We don't place first by any means in a lot of these areas and we should aspire to do better. ... We know that today's society is heavily based on science in medical areas and in other places. We need people who are going to spend the time as young people ... to get up to speed, to the level that they can, in *their* generation, contribute to what the *next* generation is going to need. And we need to be sure that somehow the national attitudes toward dedicating the amounts of effort to education, both on the parts of the educators and ... the students, (are sufficient) to build the strengths in those areas.

Finally, I asked Joe what he tells young people when he talks to them about careers in science and technology.

"Well, one of the things that I always encourage kids to do when I give talks at high schools is to ... follow your interests," he said. "If you get involved in something that is giving you pleasure, intellectual pleasure or any other kind, you get into it at a level that will almost surely mean that if you persist with it and continue with it, you'll get good at it, and that may well develop into something that is going to be an interesting line of work for you in the future."

Joe concluded, "I always leave students with a wish for each one of them that they will have the very good fortune, as I think I have had, to allow their life's work to become something that makes it possible for them to feel as though, every day when they get up in the morning, they can hardly wait to get to work. Probably that's not possible for everybody in our society, but if you can make it possible for yourself, you will enjoy life a lot and you'll become good at what you do."



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The elimination of the Morse code exam as a licensing requirement in many countries has led to a remarkable resurgence of interest in code operating, and many newer hams now want to learn code. G3LDI explains how the Radio Society of Great Britain is helping them.

## The GB2CW Project

BY ROGER COOKE,\* G3LDI

**T**he United Kingdom, like many other countries around the globe, has abolished the traditional Morse test for earning a ham license. When I was licensed, a 12-wpm (words-per-minute) Morse test was mandatory, usually taken after the three-hour written City and Guilds RAE examination. I well remember going to London, accompanied by my dad, as I was only 16 at the time. London was then like the other side of the planet! The examination was carried out by a qualified GPO (General Post Office) Morse examiner. This was quite a nerve-racking examination, but in fairness, the examiner was very good and put me at ease from the outset. In fact, he asked me if I would like to receive a passage similar to what was going to be used on the examination. Of course I jumped at the chance for practice. He sent a passage of plain text at 12 wpm and looked at it. I managed to copy it 100% and he said, "Well, that's the text part of the exam over."

These days, with no Morse knowledge required, some people come onto the HF bands and cannot use up to a third of the allocations (in the UK), not because of license restrictions, but because they simply don't know "the language."

Just think of what the non-CW operator is missing, not only that amount of the bands, but all the fun that goes with being able to chat on CW, work DX, use CW in contests, and so on. The major DXpeditions use CW more than any other mode, and it is much easier to work them on CW than on SSB. These benefits are a large part of the reason why so many newer hams now *want* to learn Morse. The Radio Society of Great Britain (RSGB) has set up a program of code practice to help them—one with more of a personal touch than the code practice offered by the ARRL through W1AW in the States—as well as incentives for slow-speed operators in at least one operating event.

### Morse in General

I have been teaching Morse since I was licensed, in 1956, and still encourage the mode at our local radio club and nationally in the UK (I am the coordinator of the GB2CW code practice program). This also happens at most UK radio clubs, such is the interest in CW since the abolition of the Morse test. I think there are several reasons for that.

Firstly, since it is not mandatory to take a test, there is less pressure on the individual, and the whole process becomes more of a pleasurable experience, despite the necessity for

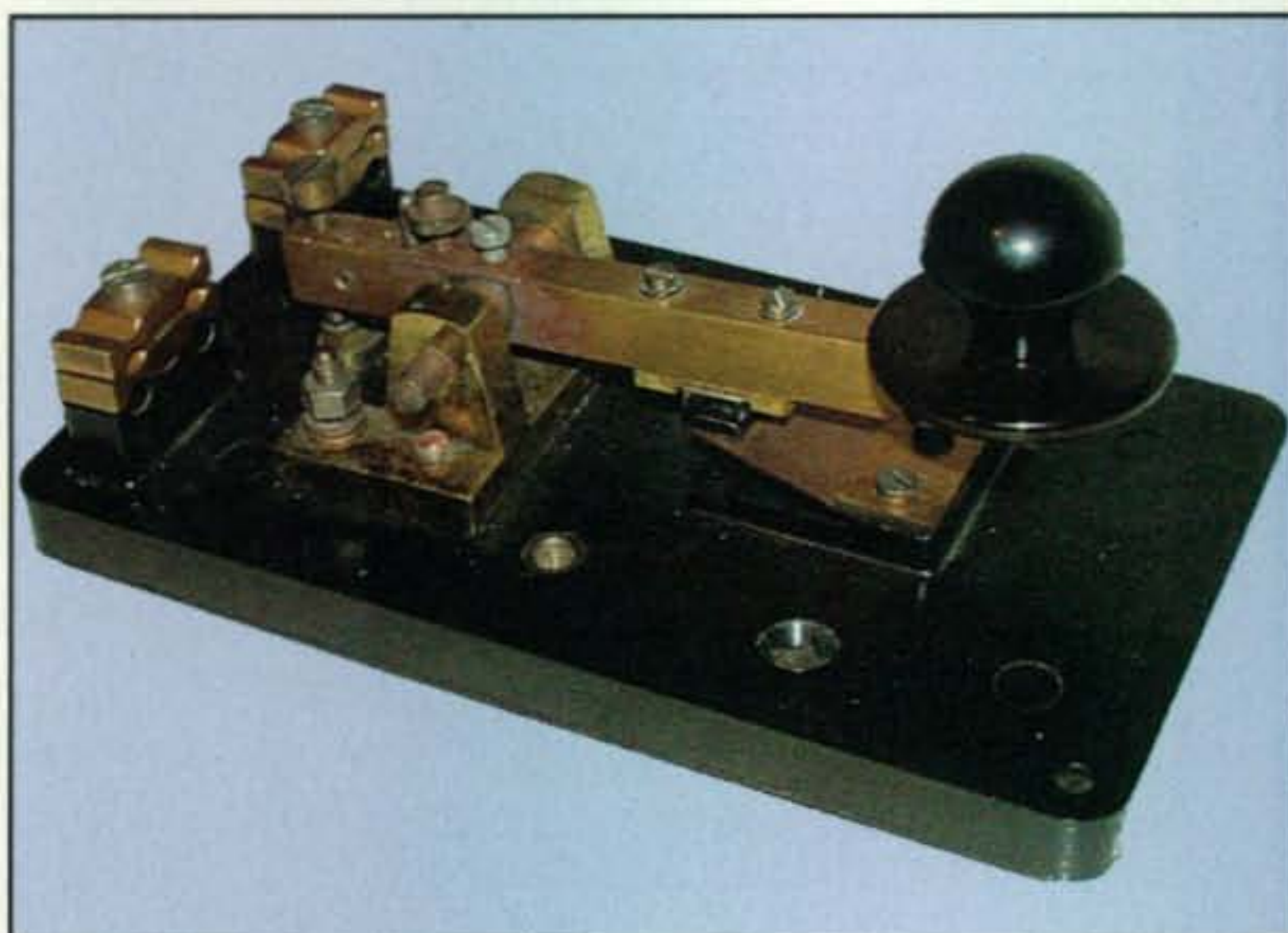


Photo A— The straight key on which I teach Morse and insist that my students become proficient before moving on to electronic keyers.



Photo B— The "Rolls Royce" of British paddles, the hand-made to order Chevron. (See text for details.)

\*e-mail: <roger@g3ldi.co.uk>



constant practice. Secondly, they have a licence for the HF bands anyway, so Morse can be tackled at any time to suit. Thirdly, the RSGB has introduced the Cumulative Club contests. These are 90 minutes in length and run from February through to July each year on 80 meters. There are three contests per month, SSB, RTTY, and CW. There is a QRP section and also a QRS (slow-speed) Corral in which the newcomers to CW and contesting can gain some valuable experience. More experienced operators usually slow down when using the QRS Corral and benefit both themselves and the QRS operator with extra points.

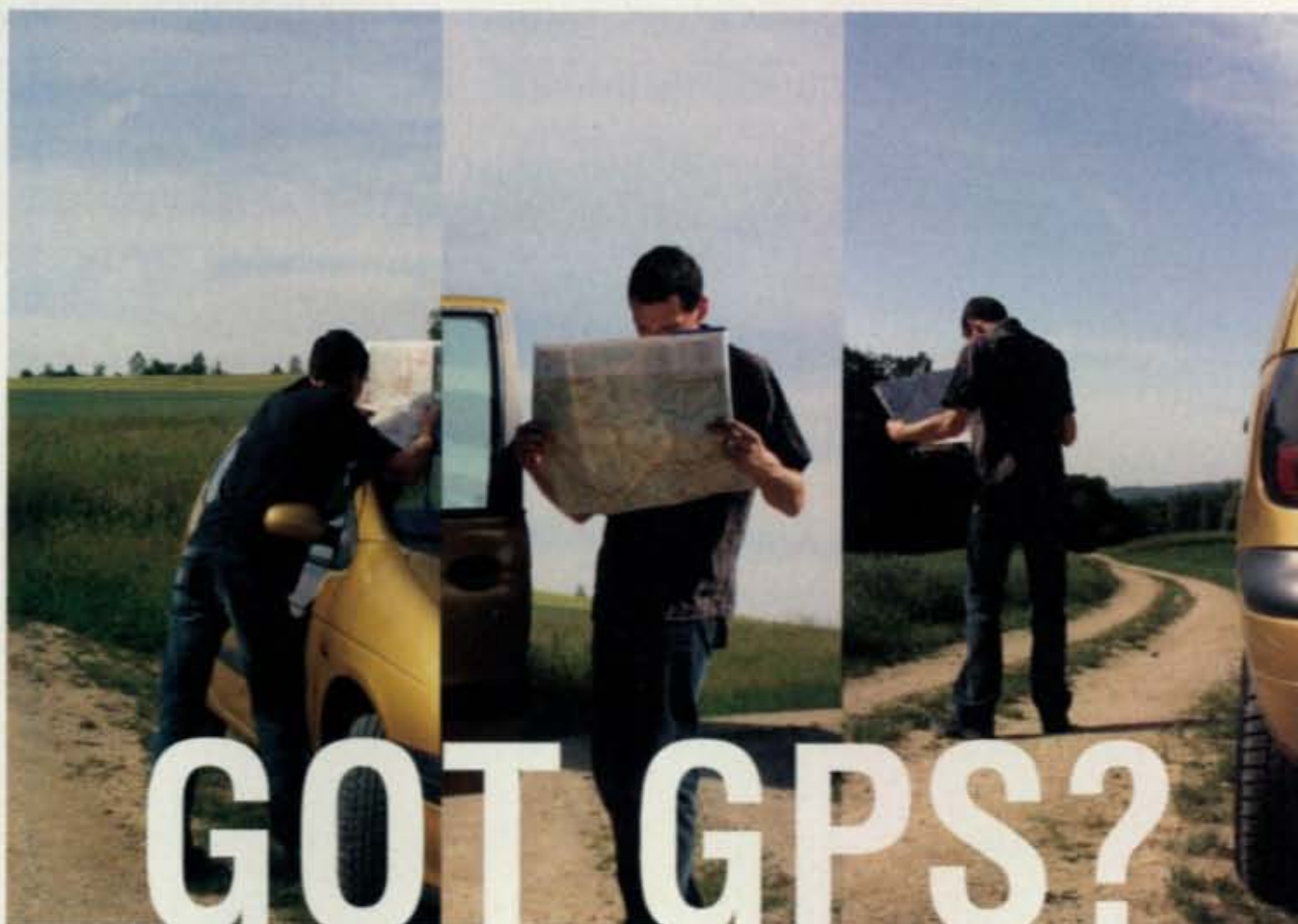
### GB2CW

The GB2CW Morse Broadcasting Service of the RSGB was set up several years ago and indeed was well supported for a while. However, the interest died down and the many volunteers who used GB2CW seemed to vanish. However, I was instrumental in rejuvenating it a couple of years ago. As co-ordinator of the GB2CW service and on behalf of the RSGB, I issue letters of confirmation to volunteers, allowing them to use the call when broadcasting to a group of amateurs or listeners, as distinct from having a solitary QSO. We already have a backbone of volunteers using 80 meters and also 2 meters. As you can see from the schedule, shown in Table I, they are situated all over the UK. The volunteers must be members of the RSGB, have good CW skills themselves, and be prepared to donate an hour or so per week.

GB2CW is a special call issued by Ofcom, our version of your FCC, to cover "broadcasting," or one-way transmissions, on the ham bands. We are not allowed to broadcast under our personal calls (for example G3LDI), so when I am presenting a Morse practice session on the air to several amateurs I have to use the call GB2CW.

The call may be used by any licensed amateur who is a member of the RSGB, and as coordinator of the GB2CW scheme, I have to issue a letter of confirmation to each amateur wishing to use GB2CW. They have to stipulate what frequencies they will be using and when. Once all that is done, they can then go ahead, their broadcast taking place at the same time and frequency each week, or once a day if they wish to do so, but it has to be stipulated in their application.

They may use either a key or a computer program to transmit the Morse, and a selection is usually sent—random characters, letters, numbers, punctua-



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## GB2CW Broadcast Schedule

HF Transmissions				
Day	Time	Freq.	Instructor Call	Area Covered
Monday	19.30	3.550	G6XCJ	National
	20.30	1.9787	G3SJE	Harrow
Tuesday	19.30	3.550	G6XCJ	National
	20.00	3.605	G0BYA	Stafford
	20.00	3.555	GW0KZW	Prestatyn
Wednesday	19.30	3.550	G6XCJ	National
	20.00	3.555	G0IBN	Essex
Thursday	09.00	3.605	G3UKV	Telford
	18.00	3.605	GW3PRL	Anglesey
	19.30	3.550	G6XCJ	National
	20.00*	1.9787	G3SJE	Harrow
Friday	19.30	3.550	G6XCJ	National
	20.00	3.563	GW0KZW	Prestatyn
Saturday	19.30	3.550	G6XCJ	National
Sunday	19.30	3.550	G6XCJ	National
VHF Transmissions				
Monday	09.00	145.250	G4OOC	Pontefract
	18.30	145.250	M0APY	Leeds
	20.00	145.550	G3KAF	Stockport
	20.30	50.2787	G3SJE	Harrow
	—	145.250**	GM4XQJ	Falkirk
	—	144.2508**	GM4XQJ	Falkirk
Tuesday	09.00	145.250	G4OOC	Pontefract
	18.30	145.250	M0APY	Leeds
	19.15	145.250	G0BYA	Stafford
	20.00	145.250	G3LDI	Norwich
	—	145.250**	GM4XQJ	Falkirk
	—	144.2508**	GM4XQJ	Falkirk
Wednesday	09.00	145.250	G4OOC	Pontefract
	18.30	145.250	M0APY	Leeds
	19.30	145.250**	GM4XQJ	Falkirk
	19.30	144.2508**	GM4XQJ	Falkirk
Thursday	09.00	145.250	G4OOC	Pontefract
	18.30	145.250	M0APY	Leeds
	19.30	145.250**	GM4XQJ	Falkirk
	19.30	144.2508**	GM4XQJ	Falkirk
	20.00*	50.2787	G3SJE	Harrow
	20.00	145.250	M0RYB	Norwich
Friday	18.30	145.250	M0APY	Leeds
	19.30	145.250**	GM4XQJ	Falkirk
	19.30	144.2508**	GM4XQJ	Falkirk
Saturday	08.00	145.250	G4OOC	Pontefract
Sunday	10.30	145.250	G3PDH	Norwich
	20.00	145.375	G3NCN	Bracknell

### Notes:

Modes of emission:

A1A/J3E—144.2508 and all HF transmissions

F2A/F3E—All VHF transmissions

\* First and third Thursday in the month

\*\* Listen on both frequencies during the evening

tion, and plain text being the main practice groupings. Typical QSOs are also sent, along with sets of callsigns, as these form a large part of what will be needed when using CW on the air. From a personal point of view, I usually take participants from 2–3 wpm right through to around 25 wpm, adjusting the speed according to the capability of those checking in.

It really is very rewarding to see the end results. There is always a certain “drop-out” number who fall behind for whatever reason. Some of those give up, but others take it up again where they left off. Our local radio club also runs a Raw Beginners class, taking them from zero up to around 12–15 wpm. They can then transfer to my Home Class, taking them from 12–15 wpm up to 30 wpm. Success depends on the amount of practice that the pupils put in during the week, and I can always tell if they have done their practice or not.

### Home Class

Here is where the GB2CW program starts to be different from W1AW's, but where a local club virtually anywhere can step up to the plate. We supplement on-air instruction with in-person teaching and practice. I run a class at my home each week, and have done so for several years. Nominally, I can only cope with six students at one time, as I don't have too much room (or coffee and biscuits!).

Sending instruction is normally given on a one-to-one basis, as I insist that no transmitting is done until the proper techniques are used, both on a straight key and a paddle. I always insist that they master the straight key first before transferring to a paddle. Photo A shows the key that I use for that torture! The emphasis is on fun, and we do have a lot of that whilst they are learning.

### Paddles

Using a paddle is a personal preference, so I usually get them to try a single lever and a dual lever, using iambic keying, and then choose which they like best. I had my Vibroplex paddle bought for me as a Christmas present, but in 1957 there were no dual-lever paddles and I find them very difficult to use; hence I stick to the trusty old Vibroplex. It is in need of some TLC now, however, as it has seen over 50 years of action! There are a number of models available to buy, ranging from the very basic to the very expensive. However, you do get what you pay for, so don't buy the cheapest on the market, as it has to last

Table 1—GB2CW Broadcast Schedule (04.11.08)



and perform well. It's much like playing a musical instrument. As a pianist I always cringe when I hear children trying to learn to play on an out-of-tune, battered piano where some of the notes don't even work! Playing a good piano, such as a Bluthner or Bechstein, helps you play well, and it's the same with the paddle.

One paddle manufactured in the UK that has been hailed as the Rolls Royce of paddles is the Chevron, seen in photo B. This is a handmade paddle, made to order only, and is available in chrome or gold. The engineering is superb, Kevin, MØAGA, and Alan, G4HCD, being the two engineers responsible. Tension is controlled by powerful magnets, allowing an extremely close gap to be achieved, making high-speed keying a pleasure. It will sit on your desk nicely, too, without moving around, as it weighs nearly 5 pounds. You can choose what goes on the top plate as well, making it a very personal key. Like the Bluthner piano however, you will pay for this pleasure. It does not come cheap, but when it comes you will love it. Take a look at: <<http://www.chevronmorsekeys.co.uk/key.html>>.

So, if you fancy a Rolls Royce paddle from the UK, you had better get an order in, as they are only made to order. Mentioning this article might help too!

## Software

When teaching I use several different programs. One interactive program on the internet is AA9PW, found at <<http://aa9pw.com/morsecode/>>. This allows quite a number of combinations, plus callsigns, and punctuation, etc. The callsigns are all USA ones, which is one limitation. It would be useful to have worldwide calls in there, too. However, overall it is a very good program. It utilizes the Farnsworth method of sending. This means that the characters are sent at a higher speed than the mean speed of the text. It allows the student to become accustomed to the faster sound.

Then there is the ZL1AN program. This has blocks of text, with the ability for text files to be added as required. It also has typical QSO format blocks using all the abbreviations that will be encountered on the amateur bands. This also utilizes the Farnsworth method. A Google search will show the URL from which you can download it.

The third one utilizes the Koch method. This allows the raw beginner to start by just learning two characters. The program will send a long program-mable string of these two letters. A third is added and so on until the whole

alphabet is covered. However, it does take rather longer than learning the complete alphabet to start with.

There are loads of Morse programs available on the internet. I wrote a Morse book for the RSGB called *Morse Code for Radio Amateurs*. It has sold very well indeed, even in the USA. It also contains a free CD with lots of practice sets and programs on it.

Most of those learning Morse in the UK also listen to the W1AW news on 20 meters when propagation allows. The various speeds that are employed help too, allowing several levels of learning

to benefit. Hopefully there is a similar enthusiasm in the USA for CW. Most of the major DXpeditions work more stations on CW than any other mode and the pleasure that you will achieve from being able to use CW at 30 wpm, contesting, and working DX will last a lifetime. All it requires is about 20 minutes of your day for a period of time and you will soon be working all the juicy DX on the Low End.

I hope I have inspired some of you to take up CW, and some clubs to adopt our personal approach to teaching it. It really is a lot of fun!

## RIGblasters

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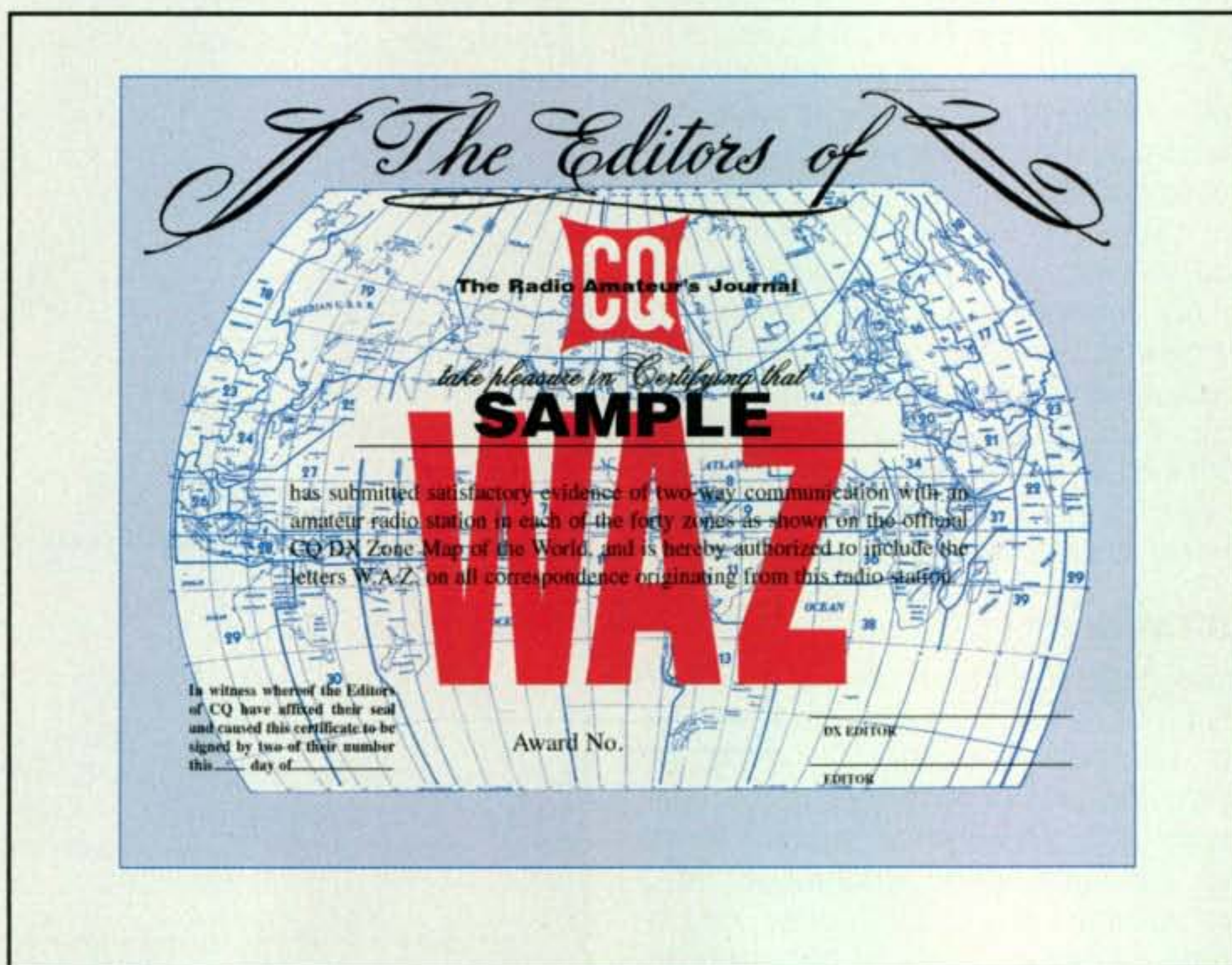


*Announcing:*

# The CQ Diamond Jubilee Worked All Zones Award Celebrating 75 Years of WAZ



**T**he Worked All Zones (WAZ) award is 75 years old, and *CQ* is offering a special, limited-time version of the award in celebration. WAZ, *CQ* magazine's premier operating award, was introduced in the November 1934 issue of *R/9* magazine, a predecessor of today's *CQ*. It is earned for making confirmed contacts with radio amateurs in each of 40 zones into which the world has been divided. It is considered one of the most difficult and most prestigious operating awards in amateur radio today. It is also believed to be the oldest U.S.-sponsored operating award, predating the ARRL's DX Century Club (DXCC) by a little more than a year (DXCC was announced in the January 1936 issue of *QST*). The only older award currently offered, to our knowledge, is the International Amateur Radio Union's Worked All Continents (WAC) award.



## CQ Diamond Jubilee WAZ

To celebrate the 75th anniversary of WAZ, *CQ* is pleased to announce the **Diamond Jubilee Worked All Zones** award. It will be issued upon presentation of log extracts showing two-way contacts with each of the 40 *CQ* zones of the world (SWL okay as well) during the period from November 1, 2009 to December 31, 2010 (UTC), and payment of the appropriate fee. Log extracts must list contacts in zone order, from 1 to 40, and must show date, time, band, and mode of contact, along with the callsign of the station contacted. There will be a single award with no band or mode endorsements available. Awards will be numbered in order of issuance. Applications and log extracts for the *CQ* Diamond Jubilee Worked All Zones award must be received by the WAZ Award Manager by March 31, 2011.

Confirmations are not required; however, amateurs are expected to uphold the hobby's longstanding tradition of honesty and self-regulation. Be especially careful of contacts in Zones 2 and 17, as errors regarding the borders of these zones are common. Applications determined to be false or fraudulent, or containing excessive errors, will be disqualified. Decisions of the WAZ Award Manager in this regard will be final.

An application form and log extract form will be posted on the *CQ* website. Use of these forms is not mandatory, as long as the required information is presented in the same sequence as on the forms. The standard WAZ application fee (\$6 for *CQ* subscribers, \$12 for non-subscribers) will apply. E-mail applications are acceptable and encouraged. Payment may be made by check, money order, IRCs (International Reply Coupons), or via PayPal (see the main WAZ page on the *CQ* website: <[www.cq-amateur-radio.com/wazrules.html](http://www.cq-amateur-radio.com/wazrules.html)>) for details. Applications will not be processed until payment has been received.

Mailed applications and payments should be sent to:

CQ Diamond Jubilee WAZ Award  
c/o Floyd Gerald, N5FG  
17 Green Hollow Road  
Wiggins, MS 39577 USA

Questions regarding the *CQ* Diamond Jubilee WAZ Award may be directed to WAZ Award Manager Floyd Gerald, N5FG, at the above address or by e-mail to <[n5fg@cq-amateur-radio.com](mailto:n5fg@cq-amateur-radio.com)>.



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**COMET NEW! CSB790A DUAL-BAND 2M/440MHZ W/FOLD-OVER**

Gain & Wave: 146MHz 5.1dBi 7/8 wave center load, 446MHz 7.7dBi 5/8 wave x 3 center load • VSWR: 1.5:1 or less • Length: 62" • Conn: PL-259 • Max Pwr: 150W

**Maldol AX-50 DUAL-BAND 2M/440MHz**

Gain & Wave: 2M 1/4 wave • 70cm 5.0dBi 9/8 wave • Length: 21" • Conn: PL-259 • Max Power: 60W

**Maldol AX-75 DUAL-BAND 2M/440MHz W/FOLD-OVER**

Gain & Wave: 2M 1/2 wave center load 3.2dBi • 70cm 5/8 wave x 2 5.7dBi • Length: 30" • Conn: PL-259 • Max Power: 60W

**Maldol AX-95 DUAL-BAND 2M/440MHz W/FOLD-OVER**

Gain & Wave: 2M 1/2 wave center load 3.3dBi • 70cm 5/8 wave x 2 5.8dBi • Length: 38" • Conn: PL-259 • Max Power: 60W

**COMET B-10 / B-10NMO DUAL-BAND 2M/440MHz**

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# KØDQ Wins Them All

## CQ WW CW Win

### Gives Redd Singular Distinction

The September issue was already too far along in the production process to make any changes when we realized that Scott Redd, KØDQ, had achieved a major accomplishment in ham radio contesting by winning the single-op low-power category of the 2008 CQ WW CW Contest. Thus, a month late, here's why Scott's win is such a big deal!

— W2VU

**S**cott Redd, KØDQ, operating the 2008 CW weekend of the CQ World-Wide DX Contest from Aruba as P40Q, racked up over a million more points than his closest competitor in the Single-Operator Low Power category and became perhaps the only person ever to win single-op world championships in all six major ham radio DX contests.

"I don't know of anyone else" who has won all the major contests, said CQ WW Contest Director Bob Cox, K3EST, in announcing the results, which were published in the September issue of CQ.

#### A Four-Decade Effort

Scott had his first taste of contest victory back in 1966 as a young Navy officer posted to Uruguay and operating CX2CO in the phone weekend of the CQ World-Wide DX Contest. Over the succeeding years, Scott worked his way through the Navy ranks to Vice Admiral and became Commander of the Fifth Fleet, and then served as a civilian in the Iraq Coalition Provisional Authority and as Director of the National Counterterrorism Center before retiring in late 2007. However, ham radio and contesting were never far away, and operating from Mexico as XE1IJ in the early 1970s, Scott won single-op world championships in the CQ WW Phone Contest, the ARRL DX Phone and CW Contests, and the CQ WPX Phone Contest. Thirty years later, when his professional life permitted a little more hamming time, Scott added the WPX CW crown as P41P, operating from



Retired Vice Admiral and former National Counterterrorism Center Director John "Scott" Redd, KØDQ, with his family and then-President George W. Bush in the Oval Office on January 16 of this year. One of President Bush's final acts in office was awarding Scott the National Security Medal in recognition of "his more than 40 years of exceptional service to the nation, strengthening its intelligence capabilities and improving national security." (White House photo by Eric Draper)

P43P's station in Aruba in 2002. The only prize that eluded him—until now—was the CQ WW CW.

"I've been trying like a son-of-a-gun to win (the) CQ World-Wide CW," Scott commented in a 2008 interview with CQ. "I've come in number two, I've come in number three, but I've never won that one ... so that's still my goal, every time I get close, in CQ World-Wide CW, to win the world."

When informed that he had finally achieved his goal, KØDQ said, "I guess the message is if you keep at it long enough good things happen. In this case, four decades. It's been a great ride ... and it's still magic!"

CQ congratulates Scott, already a member of the CQ Amateur Radio Hall of Fame, for his contesting achievements on top of all of his other achievements.



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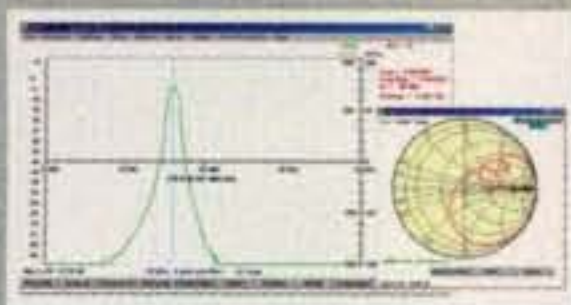


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# CQ World-Wide DX Contest All-Time Records BY FREDERICK CAPOSSELA, K6SSS

These records represent the pinnacle of achievement by the true champions of contesting. We congratulate them on their success. Number groups after calls are: year of operation, total score, contacts, zones and countries. All-Band and Multi-Operator records include a band-by-band breakdown of the world leader in each category.

## Phone Single Operator/Single Band WORLD RECORD HOLDERS

1.8	IG9/IV3TAN('96).....	441,252	1,203	24	102
3.5	CN2R('06) (Opr. W7EJ).....	1,091,694	2,409	33	126
7.0	CN2R('05) (Opr. W7EJ).....	1,590,675	3,287	35	132
14	PY0FM('94) (Opr. PY5CC).....	3,202,242	5,109	38	175
21	ZD8Z('94) (Opr. N6TJ).....	3,481,925	5,535	36	179
28	HC8A('01) (Opr. N6KT).....	3,916,600	6,957	39	161

### Single Operator/All Band

AF	EA8BH('99) (Opr. N5TJ).....	10,253	176	692	
AS	A61AJ('04) (Opr. S53R).....	15,272,745	7,204	173	622
EU	CU2X('08) (Opr. OH2UA).....	11,043,872	7,768	141	517
NA	8P1A('04) (Opr. W2SC).....	16,250,784	9,254	158	568
O	KH7R('00) (Opr. CT1BOH).....	11,894,730	7,473	170	392
SA	HC8A('99) (Opr. N6KT).....	18,607,050	8,638	175	595
QRP	P40W('00) (Opr. W2GD).....	5,097,780	3,599	127	381
LowPwr.	D44TD('02) (Opr. IV3TAN).....	11,199,793	6,097	141	508
Asst.	9Y4ZC('03) (Opr. DL6FBL).....	14,979,055	8,114	137	500

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	150	13	54
EA8BH	3.5	547	18	80
(Opr. N5TJ)	7.0	682	27	97
(1999)	14.0	2,655	39	158
25,646,796	21.0	2,071	39	148
	28.0	4,148	40	155
Total		10,253	176	692

### Multi-Operator/Single Xmtr.

AF	D44TC('01).....	22,978,944	9,638	178	694
AS	P3A('03).....	20,196,420	9,210	167	656
EU	IQ4A('90).....	17,255,700	7,253	183	717
NA	VP2E('03).....	25,299,296	11,617	182	720
O	KH0AA('02).....	12,599,064	6,872	158	490
SA	PJ1B('93).....	22,596,570	9,386	164	646

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	128	13	47
VP2E	3.5	414	24	88
(2003)	7.0	1,162	32	130
25,299,296	14.0	2,763	39	147
	21.0	2,990	39	151
	28.0	4,160	35	157
Total		11,617	182	720

### Multi-Operator/Two Xmtr.

AF	IH9P('03).....	29,447,379	11,831	171	688
AS	P3F('07).....	15,277,836	7,494	148	613
EU	IR4X('04).....	18,385,620	8,626	185	754
NA	VP2E('04).....	40,907,104	16,868	188	804
O	KH0AA('03).....	14,109,480	7,589	172	488
SA	PJ2T('02).....	28,415,835	12,916	161	628

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	216	17	62
VP2E	3.5	945	23	102
(2004)	7.0	2,346	34	145
40,907,104	14.0	3,794	40	172
	21.0	4,771	39	163
	28.0	4,796	35	160
Total		16,868	188	804

### Multi-Operator/Multi-Xmtr.

AF	CN8WW('00).....	78,170,508	25,711	199	854
AS	A61AJ('02).....	33,377,700	13,376	186	784
EU	M6T('99).....	29,338,624	14,655	188	836
NA	VP2E('01).....	44,332,785	19,214	185	760
O	KH0AM('90).....	35,730,600	16,309	179	565
SA	PJ4B('99).....	59,127,810	20,618	188	834

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	923	17	77
CN8WW	3.5	1,818	25	106
(2000)	7.0	3,545	37	138
78,170,508	14.0	6,737	40	177
	21.0	5,754	40	175
	28.0	6,934	40	181
Total		25,711	199	854

## CW Single Operator/Single Band WORLD RECORD HOLDERS

1.8	CN2FF('07) (Opr. UA2FF).....	618,849	1,599	26	107
3.5	CN2FB('07) (Opr. WA2FB).....	1,590,288	3,244	35	133
7.0	CN2R('06) (Opr. W7EJ).....	2,006,576	3,910	35	141
14	CN2M('08) (Opr. OH2MM).....	2,026,725	3,742	39	144
21	ZD8Z('97) (Opr. N6TJ).....	2,357,967	4,589	39	140
28	ZX5J('99) (Opr. N6TJ).....	2,131,942	3,962	39	152

### Single Operator/All Band

AF	EA8BH('00) (Opr. N5TJ).....	18,010,765	7,555	183	634
AS	A45XR('03).....	10,837,434	5,886	161	520
EU	CU2A('06) (Opr. OH2UA).....	8,513,294	6,208	155	519
NA	KP3Z('03) (Opr. N5TJ).....	11,440,230	6,675	174	536
O	KH7X('03) (Opr. KH6ND).....	7,673,314	5,256	170	347
SA	P40E('03) (Opr. CT1BOH).....	15,943,070	7,828	169	546
QRP	P40W('99) (Opr. W2GD).....	5,024,800	3,277	137	413
Low Pwr.	P40W('01) (Opr. W2GD).....	10,198,792	5,723	151	475
Asst.	9Y4ZC('04) (Opr. DL6FBL).....	14,581,665	6,576	169	596

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	197	17	60
EA8BH	3.5	541	20	82
(Opr. N5TJ)	7.0	1,091	33	95
(2000)	14.0	1,601	39	129
18,010,765	21.0	1,746	39	134
	28.0	2,375	35	133
Total		7,555	183	634

### Multi-Operator/Single Xmtr.

AF	3V5A('05).....	14,026,738	7,137	163	564
AS	P3A('02).....	19,470,528	8,432	176	702
EU	RU1A('00).....	12,753,600	5,670	203	757
NA	8P9Z('99).....	18,711,252	8,245	192	669
O	AH2R('04).....	10,283,200	5,279	188	512
SA	PJ4A('06).....	19,776,302	8,369	174	643

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	148	18	67
PJ4A	3.5	472	25	94
(2006)	7.0	3,060	33	133
19,776,302	14.0	1,822	39	150
	21.0	2,538	35	127
	28.0	329	24	72
Total		8,369	174	643

### Multi-Operator/Two Xmtr.

AF	D4C('08).....	31,955,086	13,008	178	675
AS	A61AJ('02).....	24,384,292	10,505	194	704
EU	RU1A('03).....	16,533,164	8,314	209	749
NA	HI3A('07).....	18,467,772	10,600	160	594
O	AH2R('02).....	11,311,266	6,390	171	482
SA	HC8N('04).....	30,971,500	12,429	196	679

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	205	22	80
D4C	3.5	1,957	30	117
(2008)	7.0	3,475	34	127
31,955,086	14.0	4,153	37	147
	21.0	2,973	35	142
	28.0	244	20	62
Total		13,008	178	675

### Multi-Operator/Multi-Xmtr.

AF	CN8WW('99).....	70,713,270	23,068	219	843
AS	A61AJ('99).....	38,789,751	15,812	213	788
EU	OH2U('99).....	22,244,067	10,956	211	786
NA	6Y2A('98).....	39,279,140	17,609	192	740
O	KH0AM('92).....	23,951,385	11,253	190	527
SA	PJ4B('99).....	47,516,600	17,889	208	757

### WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	1,694	24	100
CN8WW	3.5	3,248	35	121
(1999)	7.0	4,358	40	141
70,713,270	14.0	4,837	40	159
	21.0	4,319	40	161
	28.0	4,612	40	161
Total		23,068	219	843



# MFJ-989D 1500 Watt legal limit Tuner

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New crank knob lets you reset your roller inductor quickly, smoothly and accurately.

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make tuning much easier.

New cabinet maintains components' high-Q. Generous air vents keep components cool. 12<sup>7</sup>/<sub>8</sub>Wx6Hx11<sup>5</sup>/<sub>8</sub>D inches.

Includes six position ceramic antenna switch, 50 Ohm dummy load, indestructible multi-color Lexan front panel with detailed logging scales and legends.

The MFJ-989D uses the superb time-tested T-Network. It has the widest matching range and is the easiest to use of all matching networks. Now with MFJ's new 500 pF air variable capacitors and new low loss roller inductor, it easily handles higher power much more efficiently.

## MFJ Differential-T™ 1.5kW Tuner



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## MFJ compact kW Tuner



A few more dollars steps you up to a kW tuner for an amp later. Handles 1.5 kW PEP SSB amplifier

input power (800W output). Ideal for Ameritron's AL-811H! *AirCore™* roller inductor, gear-driven turns counter, pk/avg lighted Cross-Needle SWR/Wattmeter, Six position antenna switch, balun, Lexan front panel, 1.8-30MHz. 10<sup>3</sup>/<sub>4</sub>x4<sup>1</sup>/<sub>2</sub>x10<sup>7</sup>/<sub>8</sub> in.

MFJ-962D **\$299<sup>95</sup>**

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MFJ-976 is a fully balanced wide range (12-2000 Ohms) antenna tuner that gives you superb current balance. Handles full 1.5kW SSB/CW, 1.8-30 MHz.

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# MFJ 2500 Watts ContinuousCarrier™ Tuner

Silver plated Edge-Wound Roller Inductor . . . 1000/500 pF Variable Capacitors . . . Antenna Switch . . . 4-Core Balun . . . true Peak Cross-Needle Meter . . . Dummy Load . . . Extremely Wide Matching Range . . .

The MFJ-9982 ContinuousCarrier™ antenna tuner handles 2500

MFJ-9982 **\$699<sup>95</sup>**

Watts continuous carrier output on all modes and all HF bands into most unbalanced antennas -- even on 160 Meters where even the best antenna tuners fail!

The MFJ-9982 gives you every feature you'll ever want in a high power tuner -- wide matching range, 1.8 to 30 MHz coverage, 6-position antenna switch, 4-core balun, dummy load, true peak/average lighted SWR/Wattmeter, 6:1 reduction drives with detailed logging scales, 3-digit turns counter, extra large knobs.

### New Components, New Technologies

The Heart and Soul of the MFJ-9982 is its roller inductor and variable capacitors.

MFJ's high power, high-Q continuous current *AirCore™* roller inductor is no ordinary roller inductor! It's edge wound from thick .06-inch silver-plated solid copper strap.

It can carry huge circulating RF currents and withstand tremendous heat that'll melt or burn up ordinary roller inductors.

Self-insulating construction reduces stray capacitance -- keeps self-resonant frequencies high and out-of-the-way. Dual, silver-plated compression wheels give ultra low-resistance contacts. New fast-tune crank knob.

High-current, high-capacitance 1000 pF and 500 pF air variable capacitors have low minimum capacitance and are self-insulating.

These newly developed air variable



capacitors give you very high efficiency on 160/80 Meters and MFJ's patent pending innovation gives you extremely wide matching range on 10/12/15 Meters at 2500 Watts -- a feat only the MFJ-9982 has achieved.

### Hi-Voltage/Current Antenna Switch

The antenna switch is completely isolated to handle high-voltage, high impedance antennas. High-current, low impedance antennas are handled by parallel sets of high-current contacts of two ceramic switches.

### New 4-Core Balun

Powerful balun -- Four 2<sup>1</sup>/<sub>2</sub> inch cores, 12-gauge Teflon™ wire. Run balanced lines at full 2500 Watts SSB/CW continuous, 24/7.

### New Balanced Line Feed-Thru Insulator

Allows massive transmitter currents to flow directly to the antenna without passing through lossy screws or bolts.

### TrueActive™ Peak Reading Circuit

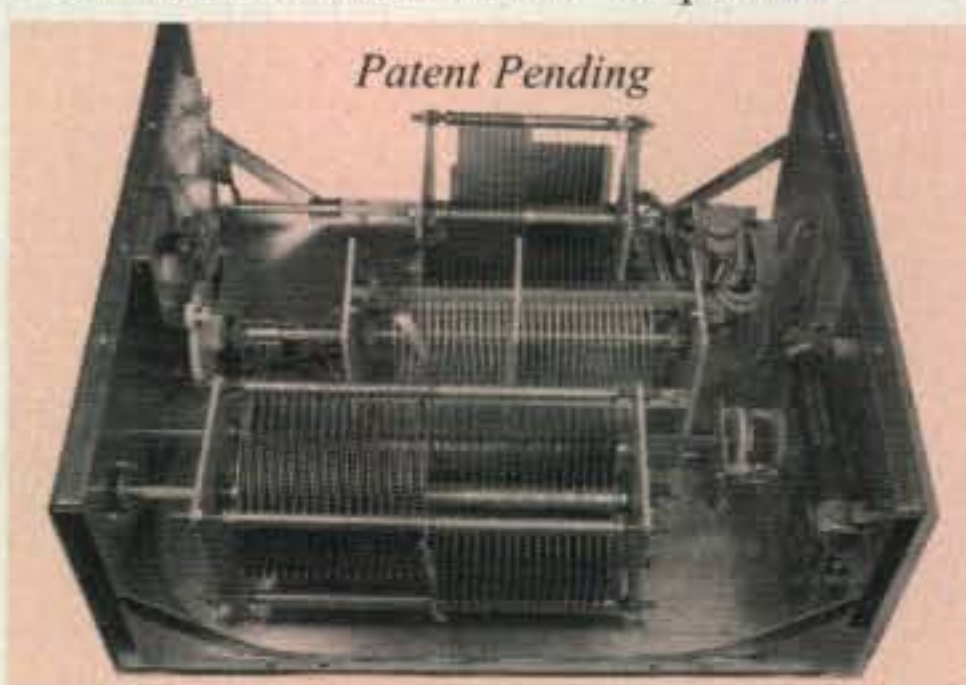
New *TrueActive™* circuit reads true peak or average power on all modes. Cross-Needle meter reads SWR/forward/reflected power.

### 1500 Watt Dummy Load

1500 Watt air-cooled non-inductive 50 Ohm resistor. 100W/10 min., 1.5kW/10 sec.

### New Cabinet maintains high Q

New roomy cabinet maintains high Q. Vent holes. Heavy gauge, .08 inch aluminum braced chassis. Vinyl cover, non-stripping PEM nuts, heavy 10-gauge and copper strap wiring throughout. 13<sup>3</sup>/<sub>4</sub>Wx7Dx16<sup>1</sup>/<sub>4</sub>D inches. 15 pounds.



Patent Pending

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# CQ World-Wide DX Contest All-Time U.S.A. Records BY FREDERICK CAPOSSELA, K6SSS

Tabulated below are the record-high scores achieved by U.S. contesters in the CQ World-Wide DX Contest. Number groups following calls and bands are: year of operation, total score, contacts, zones, and countries.

PHONE				
Single Operator/Single Band				
1.8	K1ZM('95)	55,420	251	15 70
3.5	K1ZM/2('96)	292,100	952	27 100
7.0	N4PN('08)	493,041	1,344	31 118
14	KQ2M/1('08)	1,242,150	2,504	38 144
21	KQ2M/1('99)	1,327,139	2,624	39 148
28	W4ZV('01)	1,464,255	2,654	40 155

Single Operator/All Band				
Station	Band	QSOs	Zones	Countries
	1.8	21	8	15
K1AR	3.5	154	16	59
(1999)	7.0	231	29	84
7,898,499	14.0	1,145	38	142
	21.0	1,150	36	123
	28.0	1,393	33	128
Total		4,094	160	551

QRP				
KR2Q('00)		1,507,506	1,181	104 358

Low Power				
K1ZM/2('00)		3,368,010	1,907	151 504

Assisted				
KI1G('01)		8,053,315	3,768	168 617

Multi-Operator/Single Xmtr.				
Station	Band	QSOs	Zones	Countries
	1.8	32	12	30
K1AR	3.5	197	18	76
(1990)	7.0	154	26	95
11,193,606	14.0	1,370	39	167
	21.0	1,167	38	165
	28.0	1,517	37	170
Total		4,437	170	703

Multi-Operator/Two Xmtr.				
Station	Band	QSOs	Zones	Countries
	1.8	56	14	40
K3LR	3.5	439	27	89
(2004)	7.0	830	33	122
18,382,950	14.0	2,024	40	169
	21.0	2,899	40	166
	28.0	1,390	33	145
Total		7,638	187	731

Multi-Operator/Multi-Xmtr.				
Station	Band	QSOs	Zones	Countries
	1.8	197	16	36
KC1XX	3.5	699	24	102
(1999)	7.0	746	31	119
25,963,386	14.0	2,711	40	185
	21.0	3,245	40	170
	28.0	2,596	36	170
Total		10,194	187	782

CW				
Single Operator/Single Band				
1.8	K3BU/8('06)	151,970	527	26 104
3.5	W1MK('06)	530,264	1,390	32 104
7.0	K1ZM('90)	839,520	1,783	34 125
14	K2WK('98)	1,007,781	1,955	39 144
21	K2SS/1('00)	974,440	2,035	36 134
28	W4ZV('00)	965,874	1,984	37 137

Single Operator/All Band				
Station	Band	QSOs	Zones	Countries
	1.8	104	14	40
K5ZD/1	3.5	384	19	73
(2000)	7.0	971	29	103
8,756,568	14.0	988	33	105
	21.0	848	33	104
	28.0	1,189	33	106
Total		4,484	161	531

QRP				
K3OO('00)		1,731,450	1,299	114 371

Low Power				
K1TO/4('02)		4,141,188	2,276	140 526

Assisted				
K3WW('00)		8,465,815	4,091	166 589

Multi-Operator/Single Xmtr.				
Station	Band	QSOs	Zones	Countries
	1.8	49	13	46
K1AR	3.5	569	27	101
(1998)	7.0	1,384	35	136
12,063,114	14.0	991	38	151
	21.0	999	36	135
	28.0	1,083	32	132
Total		5,074	181	701

Multi-Operator/Two Xmtr.				
Station	Band	QSOs	Zones	Countries
	1.8	79	18	56
K4JA	3.5	625	21	105
(2002)	7.0	1,480	36	133
14,084,994	14.0	911	38	146
	21.0	1,568	35	144
	28.0	1,085	34	137
Total		5,748	182	721

Multi-Operator/Multi-Xmtr.				
Station	Band	QSOs	Zones	Countries
	1.8	291	23	63
KC1XX	3.5	1,040	34	116
(1999)	7.0	2,119	40	138
24,602,524	14.0	2,155	40	155
	21.0	2,028	38	150
	28.0	1,947	38	148
Total		9,580	213	770

Club Record: Yankee Clipper Contest Club ('99) 702,296,971  
 Team Contesting: Phone - Neiger's Tigers Team #1 ('99) 66,546,582  
 CW - Neiger's Tigers Team #1 ('03) 56,282,996

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# our readers say



## The Woodpecker Fix

Editor, CQ:

I heard a woodpecker, which I thought was humorous, until I realized it had sawed through my RG-8U coax feeding my 10-meter beam up on my 60-foot tower. I called numerous "governmental" agencies asking how to get rid of the woodpecker. I got suggestions from spray the coax to shoot the bird.

I then went to the local nursery and they explained that woodpeckers are *very territorial*. If one is there another will not come. For \$5.00 I purchased an artificial "woodpecker" (see photo) that appears so far to scare away the local bird.

Richard Molentine, WA0KKC  
Overland Park, KS

## Reveal Authorship

Editor, CQ:

I do not appreciate anonymous or pseudonymous authorship in a respected publication and ended my subscription to *WorldRadio* for their refusing to reveal the identity of "Kurt N. Sterba," who had a monthly column on antennas. The article, "Let's Improve Our DX Pileup Act," by "Uncle DX" (June 2009 CQ) falls into the same category. There is nothing in this article from which an author should hide.

That said, there is a major oversight in this article. A *multi-station DXpedition should dedicate one station to 20 meters and have that station on the air around the clock unless that band is absolutely dead. This gives the small fry the best shot at contacting the station.*

As one who uses wire antennas, I have grown accustomed to following a DXpedition from band to band, only to hear the same batch of "guns" work and rework the DX a dozen times while I still have not managed a single QSO. In my own prac-

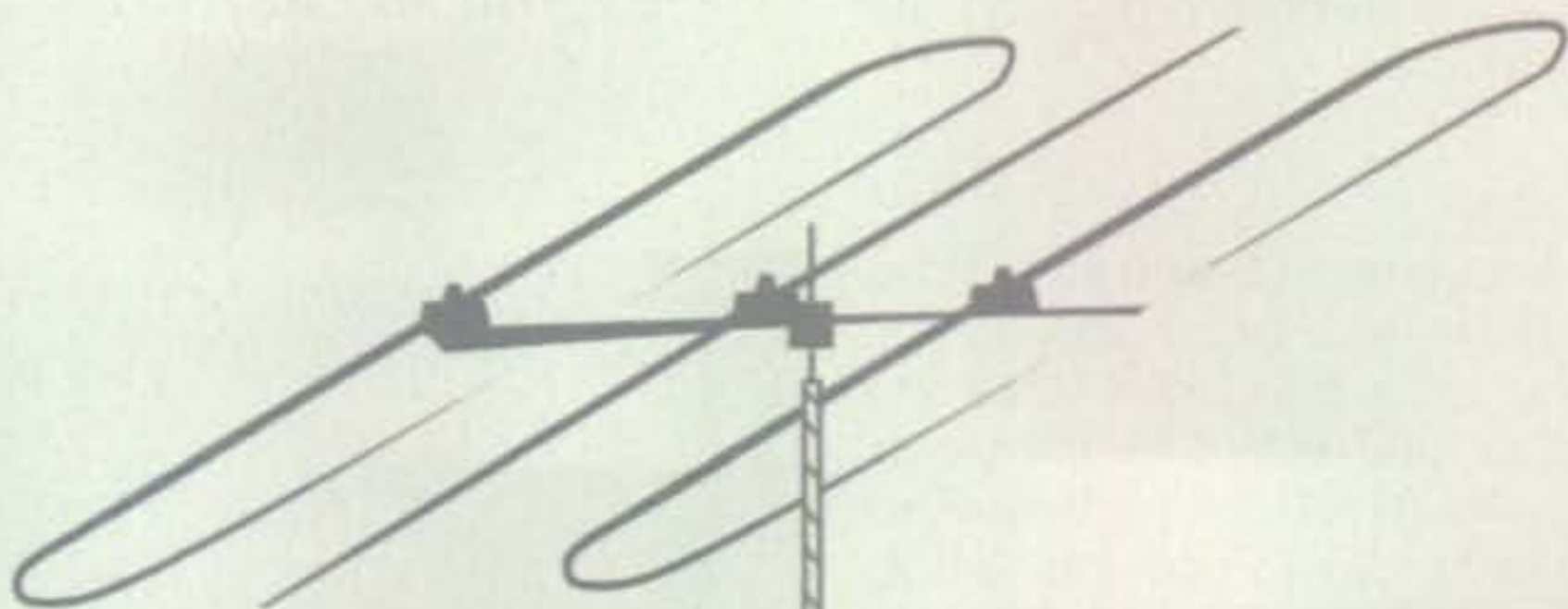
tice, if a DXpedition is scheduled for a week or longer, I usually stay away the first 3-4 days. If weather cuts short a DXpedition, it's my loss.

Kurt Meyers, W8IQ  
Toledo, OH

*W2VU responds:* Kurt, there are sometimes valid reasons for writing under a pseudonym, and over the years, we have had several such writers as regular con-

tributors to CQ, including the inimitable Scratchi (whose identity was revealed only after his death several months ago). Uncle DX's identity is known to us. He is a well-known and well-respected member of the DX community but prefers, for reasons of his own, not to publicly identify himself. As to your suggestion for an additional point, it is certainly valid. The author did make a point of saying that his list was neither exhaustive nor all-encompassing.

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This latest in AD5X's occasional series of reviews of solid-state high-power amplifiers looks at the "new" Ameritron ALS-600 HF amplifier. Why has Phil put "new" in quotes? Read on.

## CQ Reviews:

# The "New" Ameritron ALS-600 HF Power Amplifier

BY PHIL SALAS,\* AD5X

The Ameritron ALS-600 solid-state amplifier has been around for many years. It provides 600 watts PEP SSB and 500 watts CW typical output power from 160–10 meters. The ALS-600 is simple to use (no tuning required) and effective (only 4 dB down from full legal limit). It includes internal protection circuits that automatically protect it from improper operation, high SWR, or high heat-sink temperatures; and an ALC interface that can be customized for virtually any transceiver. Finally, a cross-needle meter on the amplifier reads SWR and forward and reverse peak power, and the power supply cross-needle meter monitors both voltage and current. Now while the ALS-600 provides your basic amplifier needs, new solid-state amplifiers on the market are offering additional features that many hams want.

### The "new" ALS-600 Amplifier

Ameritron's solution to the competition has been to quietly evolve the ALS-600 with small changes so options can be added for those who want them, while keeping the basic amplifier cost low for those who don't need the additional features. First, Ameritron introduced a switching power supply option. As the ALS-600 consists of separate amplifier and power supply units, you can choose either the less-expensive linear power supply or the lightweight but higher cost



Photo A— The ALS-600 provides 600 watts PEP on SSB from 1.8–30 MHz. RJ45 jacks (upper right) provide optional remote-control capability.

switching power supply. At about 10 pounds, the switching power supply is one-third the weight of the linear power supply, making it attractive for portable operation.

The most recent ALS-600 change (serial numbers 14378 and higher) adds remote control and automatic transceiver band-change capability with the optional ALS-500RC Remote Control unit, the ARI-500 Automatic Band Switch, or both! These were originally designed for the ALS-500M mobile amplifier, which is normally mounted remotely from the transceiver.

Now both units also interface to the ALS-600 via a pair of front-panel RJ45 jacks (photo A). The new low-pass filter board in the amplifier uses relay switching to provide remote control and automatic band-switching capability (photo B). Let's take a look at each of these new, optional control units.

### ALS-500RC Remote Control Head

The ALS-500RC allows you to remotely mount your ALS-600, yet still have access to the amplifier's frequency

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



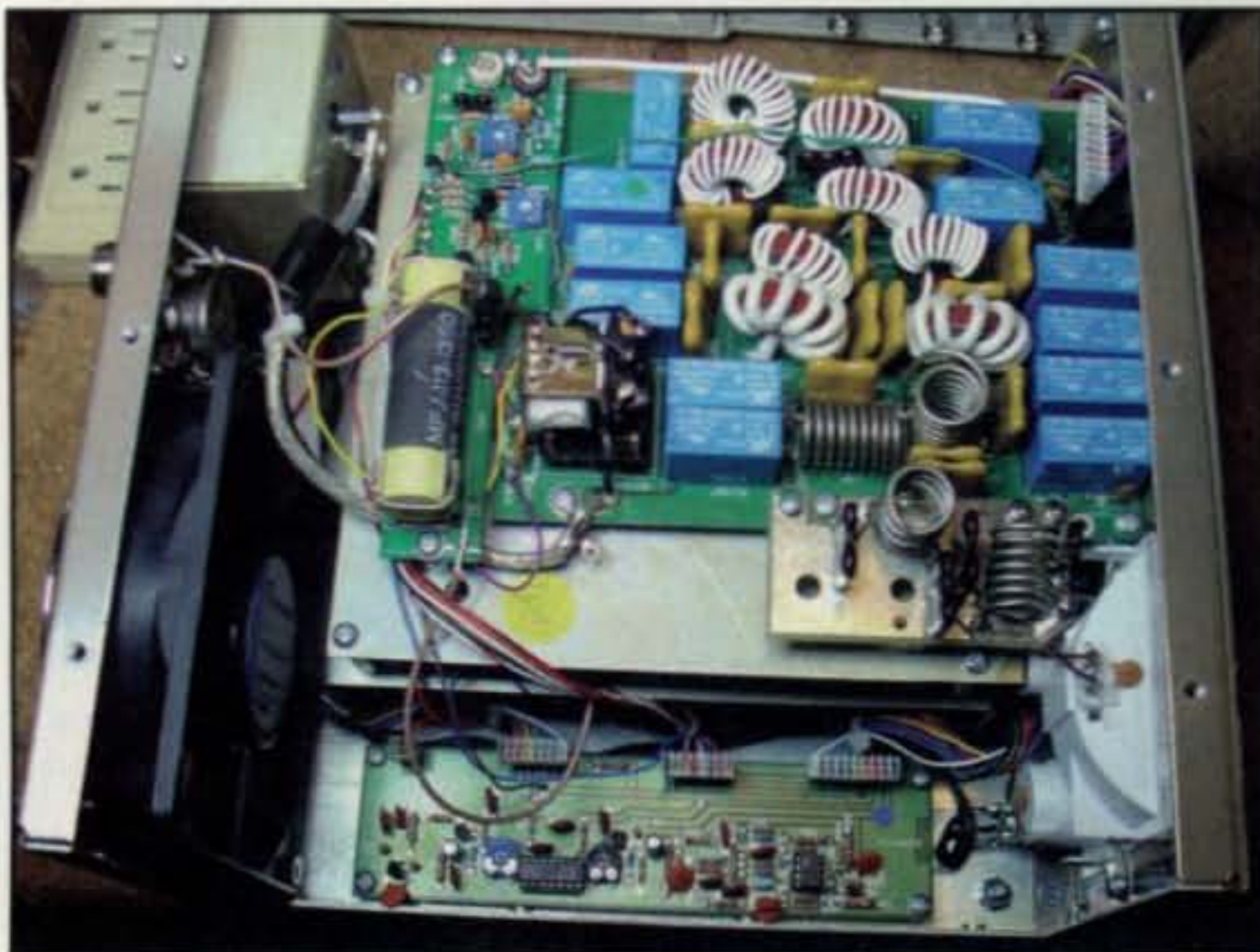


Photo B— The new relay-switched low-pass filter board permits remote band selection of the amplifier.

Photo C— The compact ALS-500RC provides all the control and monitoring needed.

switch and fault reset function. It also provides amplifier RF output power monitoring, and DC PWR, TX (transmit), and O/L (fault/overload) LEDs (photo C). Anyone looking at your station will not realize that you have a 600-watt amplifier available (photo D)!

### ARI-500 Automatic Band Switch

The ARI-500 is, to me, the most exciting addition. It automatically selects the correct frequency range for the ALS-600 amplifier by reading band data from the transceiver (photos E and F). A pair

of supplied 6-foot CAT-5 cables provides amplifier interfacing, and an additional 6-foot CAT-5 cable (RJ45 on one end)—also provided—can be wired to interface with your transceiver. The manual provides detailed information for installing connectors on this cable for popular ICOM, Kenwood, and Yaesu transceivers, the Elecraft K3, and other equivalent transceivers. If you don't want to build your own cable, Ameritron offers pre-built cables for many popular radios.

Besides controlling the amplifier's frequency range, the ARI-500 has some additional desirable features. A low cur-

rent-drive amplifier keying interface does away with the requirement for an external buffer for all transceivers. It even works with the low-drive HSEND output of the IC-706MKIIG and IC-7000 radios. The ARI-500 can also be strapped to automatically clear an amplifier bypass fault so you don't have to manually reset your ALS-600. I've found this convenient, as I get frequent ALS-600 SWR faults from birds landing on my high-Q MFJ-1775 rotatable dipole!

If desired, you can plug the remote-control head into the ARI-500 to remotely display ALS-600 RF output power and RX and O/L status. When connected in this way, the ALS-500RC automatically defeats the ARI-500 auto-reset feature, since the remote-control head provides manual STANDBY/OPERATE switching at your fingertips. In my opinion, the ALS-500RC is very convenient when the ARI-500 is not used and the ALS-600 is remotely located. However, I don't really see the need for it when you have an ARI-500, and the ARI-500 is strapped for automatic fault reset.

### Let's Fire-Up the ALS-600 with All the Options

The ALS-600 power supply comes wired for 120-VAC operation, so it is ready to plug into your wall outlet. However, you should plug the amplifier into an AC branch separate from the one to which your transceiver is connected unless you have at least a 20-amp AC branch circuit (transceivers typically draw 3–4 amps, and the ALS-600 typically draws 11–14 amps). Connect a ground wire from the amplifier to your station's single-point



Photo D— 600 watts out and no amplifier in sight!





Photo E—ARI-500 on the author's transceiver. If used, the ALS-500RC plugs into REMOTE A.

ground, and an ALC cable between the ALS-600 and your transceiver. Finally, connect the two RJ45 cables between the ARI-500 and the ALS-600, the RJ45 cable between the ALS-500RC and the ARI-500, and the transceiver interface cable between your transceiver and the ARI-500. Both the ALS-500RC and the ARI-500 are powered through the ALS-600 RJ45 interface cables, so no external DC voltage is required.

The only setup required is to set the ALS-600 band switch to REMOTE, and strap the ARI-500 for either auto- or manual-fault reset. There is also a strapping option in the ARI-500 to enable 10/12-meter operation if the optional 10/12-meter MOD10-MB kit is installed in the ALS-600. Once you turn on your ALS-600 and transceiver, the POWER and LINK LEDs on the ARI-500 will glow, indicating everything is connected properly and data is being received from your transceiver.

While the ALS-500RC works great for manual remote control of the ALS-600, the real "cat's meow" is the ARI-500 Automatic Band Switch. It is very nice to change bands on my transceiver and have the amplifier follow. I really like this, especially since I've forgotten to manually change bands on my "old" ALS-600 more times than I'd care to

Band (meters)	Drive (watts)	Key Down (watts)	Peak SSB (watts)
160	85	500	600
80	95	480	525
40	95	500	600
20	90	500	600
17	85	500	600
15	95	500	600
12	85	500	600
10	95	500	580

Table I—Amplifier power output measurements (external digital wattmeter).

admit—especially in the heat of a contest or when trying to snag that rare DX station. Fortunately, the amplifier's fault circuitry always protects the amplifier, as it has when I've accidentally transmitted into disconnected or shorted antenna runs! I should be more careful, but I have been spoiled by the effectiveness of the protection circuits.

### Performance Measurement

I ran some basic performance measurements to check amplifier power and power-meter accuracy using an external PowerMaster digital peak-hold wattmeter. As Table I shows, the "new" ALS-600 does a good job meeting its typical power output specifications. I also found



Photo F—Amplifier interface cables connect to these ports on the rear of the ARI-500.

the ALS-600 peak-reading wattmeter to be quite accurate—within my ability to read the amplifier's analog meter. I really couldn't see any difference between the ALS-600 power meter and the external digital power meter.

Finally, I verified that the SWR protection shutdown occurs at 75 watts reflected power, corresponding to an SWR of 2.1:1 at 600 watts. Since the amplifier protects itself at an absolute value of 75 watts reflected power, operating into a higher SWR is possible simply by reducing your output power. However, you really should address the high SWR issue.

### Alas, Nothing is Perfect

You need to be aware that the ALS-500RC Remote Control Head loads the ALS-600 RF Power Meter, resulting in a half-power reading on the amplifier's power meter. This is not considered a problem by Ameritron, as the ALS-500RC is normally used when the ALS-600 is remotely mounted and its power meter isn't readily visible. This is discussed in both the ALS-600 and ALS-500RC manuals.

While the ARI-500 is a great addition to the ALS-600, there are a few things that would improve its functionality. First, the ARI-500 could be made more convenient for remote monitoring of your ALS-600 if the ARI-500 had TX and O/L indicator LEDs.

Next, the ARI-500 automatically puts your ALS-600 in OPERATE whenever your transceiver is keyed, regardless of the OPERATE/STANDBY switch position on the ALS-600. Thus, you must turn off the amplifier power if you want to check your drive level or operate your transceiver bare-foot. Therefore, an OPERATE/STANDBY switch mounted on the ARI-500 would also be nice.

In order to address these issues, I built a very simple interface that plugs into the ARI-500. See the accompanying sidebar for details.

### Conclusion

Now with remote control and automatic band-changing options, the Ameritron ALS-600 price and features make this an amplifier that will fit many budgets, operating options, and operating locations. Incidentally, too, earlier ALS-600 amplifiers can be factory upgraded to this new remote-control version. Contact Ameritron for pricing: 116 Willow Road, Starkville, MS 39759; telephone 662-323-8211; web: <www.ameritron.com>.



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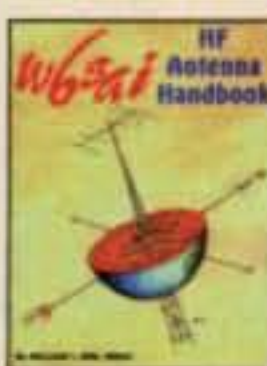
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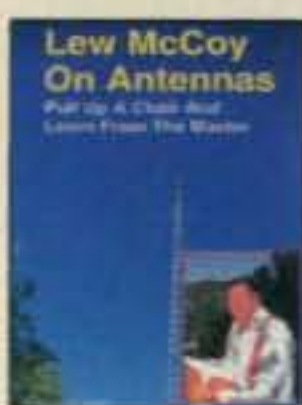
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### What You've Told Us...

Our July survey asked how your family felt about ham radio, and about your mobile operating when family members are in the car with you. The good news is that most of our families appear to be pretty tolerant of our obsession, um, hobby. Among respondents who are married (30% are not), 53% feel their spouse's attitude about ham radio is "It's a wonderful hobby for you, but not for me," while 22% feel the attitude is "It's a wonderful hobby and we share it." In addition, 10% feel their spouses believe "It's tolerable in small doses," along with 8% saying "At least I know where you are and what you're doing." Only 4% each feel their spouse thinks, "Be sure to shut the shack door behind you" or "It's a waste of time and money."

Of the respondents with children (26% have none), 29% feel their kids are generally supportive of their ham radio activity, with another 15% saying their kids are very supportive, and 12% say generally tolerant. In addition, 23% say their kids really don't care one way or another, while only 2% say their kids find their hobby an embarrassment.

Fifty-two percent of the respondents say that one or more family members is or was a licensed ham. Among that group, 26% say they have a child with a ham license, 22% have licensed spouses, 17% have parents who are/were hams, and 10% have/had licensed siblings. In addition, 8% have or had a licensed aunt or uncle; 7% a ham cousin, 6% a niece or nephew with a license, 3% with licensed grandchildren and 1% whose grandparents were hams as well.

Fifty-five percent of those who replied operate their mobile ham rig while driving with family members, but 82% of them tend to do so only on trips, while 11% operate on trips and locally and another 7% use their mobile rigs only when driving locally. Finally, among those who operate while family members are in the car, 63% operate primarily for general contacts, while 16% use the radio mostly to ask for information, 12% limit their use to emergencies and 9% use ham radio to keep in touch with other members of their traveling party.

This month's free subscription winner is Richard Conover, W3RKC, of Jupiter, FL.

## Reader Survey October 2009

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

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

This month, we'd like your views regarding online publications...

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

1. Do you have internet access at home?
  - Yes, broadband .....30
  - Yes, dialup .....31
  - No .....32
2. Do you currently read any online magazines?
  - Yes .....33
  - No .....34
3. Do you currently read any magazines that offer both print and online versions?
  - Yes, and I read both versions .....35
  - Yes, but I read only the print version .....36
  - Yes, but I read only the online version .....37
  - No .....38
3. What is your most common approach to reading an online magazine?
  - Read directly from website .....39
  - Print selected pages directly from website .....40
  - Download and save issue, read on screen later .....41
  - Download and save issue, print some or all pages .....42
  - Do not read online magazines .....43
4. How would you describe your comfort level with reading online magazines?
  - Very comfortable .....44
  - Somewhat comfortable .....45
  - Somewhat uncomfortable .....46
  - Very uncomfortable .....47
  - Don't know/No opinion .....48
5. Do you pay for any of the magazines you read online?
  - Yes .....49
  - No .....50
6. What is your opinion regarding paid subscriptions for online magazines?
  - Would pay the same for an online magazine as for a print magazine .....51
  - Would pay for an online magazine but would expect a reduced rate vs. a print magazine .....52
  - Would not pay for an online magazine .....53
7. What would you consider a reasonable subscription rate for an online monthly magazine?
  - \$25-\$30 per year .....54
  - \$20-\$25 per year .....55
  - \$15-\$20 per year .....56
  - \$10-\$15 per year .....57
  - \$5-\$10 per year .....58
  - Less than \$5 per year .....59
  - Would not pay for an online subscription .....60

Thank you for your responses. We'll be back with more questions in January.



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144/430/1200 MHz

*5/5/1 Watt FM Hand-Held Transceiver  
Outstanding features and Alinco's  
tradition of intuitive user-friendliness  
combine to create one fabulous HT.  
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across any two bands of this feature  
packed tri-bander to offer a  
communications experience you have  
only dreamed about. Housed in a rugged,  
compact case this rig is tough, easy to use  
and ready for action!*

## Loaded with features the DJ-G7 includes:

- Simultaneous full duplex operation of any two bands 144 MHz, 430 MHz, 1200 MHz
- Internal VOX
- Large LCD full dot matrix screen with easy to see and understand display.
- Polycarbonate body ergonomically designed to fit the palm of your hand.
- Rugged die-cast chassis for strength and excellent RF-PA cooling.
- Twin "User Assignable" controls with easy to use knobs for adjusting AF output and Squelch levels.
- 39 CTCSS and 104 DCS encode/decode. Tone scan to detect unknown tones.
- DTMF Auto-dialer for autopatch access. Up to 16 characters per group in 9 groups.
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- Newly designed EBC-23 Swing belt clip
- High-Capacity EBP-73 Li-ion 1200mAh battery and Drop-in charger are standard.
- External DC power port supports 13.8V DC for mobile operation
- Auto-repeater\* and conventional repeater operation\* For USA repeater system
- 1000 Memory Channels with programmable memory banks

\*A free utility software from [alinco.com](http://alinco.com) ERW-4c or 7 and EDS-10 or 14 required for a PC connection. Use EDS-11 for cable-cloning.





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## Your Next HF Mobile Rig May Be Your Cell Phone!

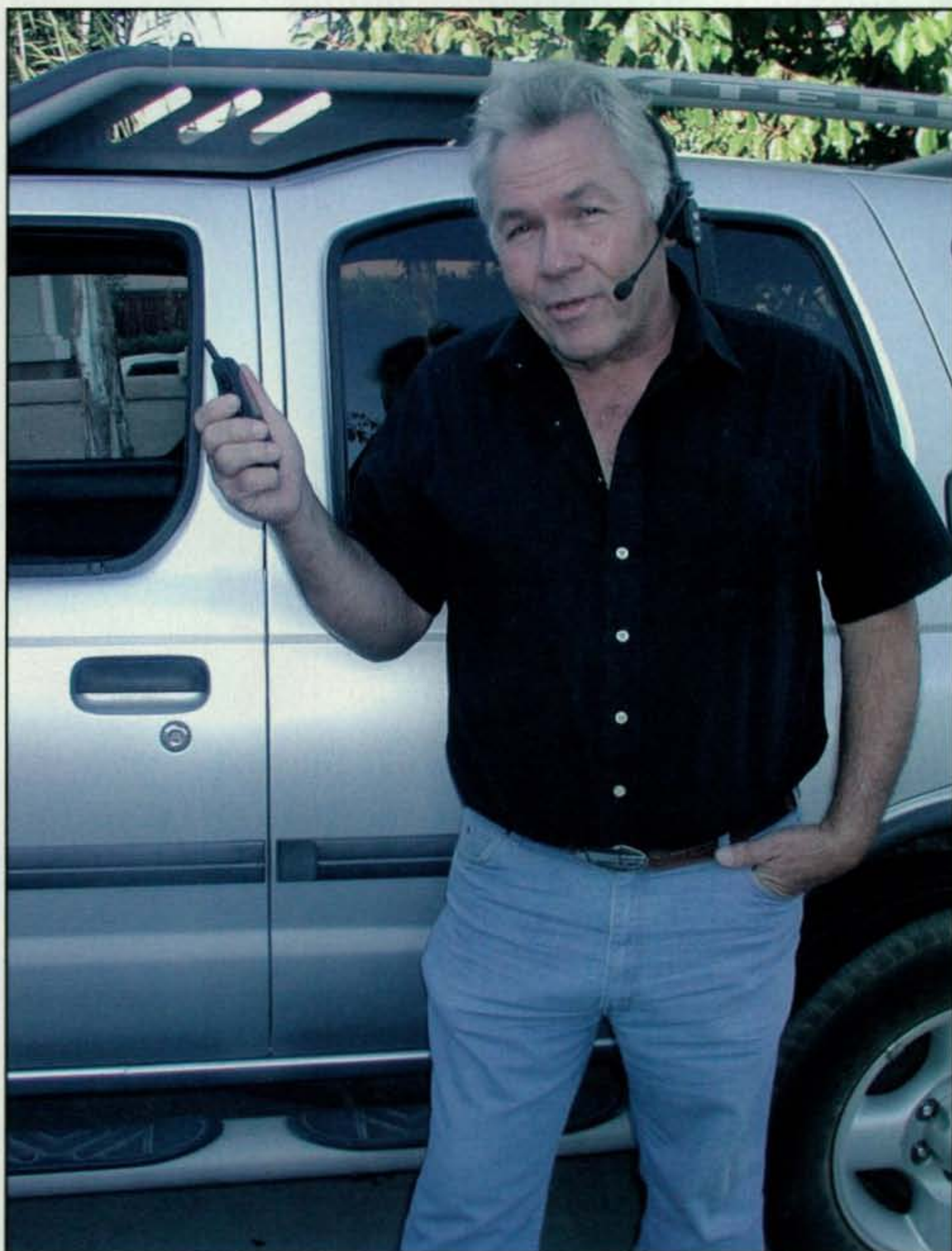
BY BILL KEARNS,\* WB6JAR

**H**ow many times have you wished you had a complete HF radio setup in your vehicle? (Or for some, *any* radio setup?) While driving around, you may have noticed other hams whizzing by with their fancy screwdriver antenna installations with the whip swaying back and forth, and maybe you've promised yourself "one of these days..."

Possibly, you have been on a few too many long trips in a vehicle with no two-way radios at all except that trusty, beat-up handheld you keep lugging around (I endearingly like to call these devices "dead battery holders"). You also may even have found yourself out of town in a rental car or on vacation somewhere and all you really want to do is check in with the "morning group" on your local repeater back home.

HF mobile radios are relatively expensive, though, as are the screwdriver antenna systems needed to effectively radiate their signals. Plus, there's the hassle from your YL over her perceived unsightliness of your mobile HF radio installation. Many of us would like to do more ham radio operating while away from home and especially from the mobile, but is the only answer to spend more money and purchase more radios and more antennas? I am here to tell you "NO!"

The answer to your problem is probably not very far from you right now—your cell phone! Yep! Your cell phone. Now you do have cell phone, don't you? Nearly everyone does these days (and it's usually always with you, isn't it?). Many cell phone providers now offer plans to give you unlimited minutes or



*Photo A— The author operating 40 meters while standing outside his car via his cellphone and wireless headset! (Photos courtesy of the author)*

\*P.O. Box 1054, Wildomar, CA 92595  
e-mail: <wb6jar@yahoo.com>



at least a lot of free minutes during off-peak periods. Well, with a little bit of hardware, a little bit of software, and an inexpensive account or two with Skype, you can use your cell phone from wherever you are (see photo A) to remotely control and operate your rig at home!

### Using Your Cell Phone for Remote Control

This project is relatively cheap, easy, and fun. Before we start, I am going to assume you already have a working HF station (or at least a standalone VHF/UHF radio) at home, as well as a computer you can power on full-time with high-speed broadband internet. If so, then all you need are one or two inexpensive soundcard interface devices.

I recommend the Tigertronics *Signalink USB*<sup>1</sup> for your VHF/UHF radio setup (photo B) and any model *RigBlaster*<sup>2</sup> (or similar device) for your HF radio setup (photo C). If you have a Kenwood TS-2000 or an ICOM IC-706 and you want to use it for HF and VHF/UHF, then all you will need is the *RigBlaster*. (Both of these radios have built-in VOX for the push-to-talk circuit needed for VHF/UHF.) The *Signalink* is preferred for your standalone VHF/UHF radio because you will definitely need the built-in VOX circuit for keying the radio.

### Software

You will also need one (or possibly two) SkypeIn accounts for your computer(s).<sup>3</sup> A SkypeIn account will give you an actual telephone number that you can call and that will automatically be answered by the "Skype" application you will download and install into your computer.

The security lies in the fact that only you, or only people you authorize in your contacts lists, can make a call to this computer and actually have it answered. All others will get a busy signal (when the internet is down, you will get a recording). What this means is no wrong numbers, no sales calls, no fax machines, etc. That is the beauty of this setup. Your remote-control amateur radio station will have complete security. This should ease the nerves of those of you already worried about meeting the Part 97 requirements for preventing unauthorized access to your transmitter. Skype also logs all calls and their duration, so you can keep track of whether anyone in your "contact list" has been using your radio and for how long.

Your SkypeIn installation and setup should include the following: (1) Select-



Photo B— WB6JAR's VHF station set up for remote operation via cell phone using a *Signalink* sound card adapter and Skype software.

ing the proper soundcard device; (2) muting all unwanted computer sounds (this is really important!); (3) allowing only the people in your contact list to contact you (actually, your remote radio); and (4) automatically answering all incoming calls. This all can be found under the Tools/Options section in Skype. Setting up all this is really very easy.

Proper setting of the audio for VHF and UHF radios can be more challenging. Adjusting the outgoing audio and getting it just right with the *Signalink USB* is going to take a group effort. Dial up the SkypeIn number with your cell phone. If you have everything connected properly, you immediately will be putting a signal out on the air. The audio

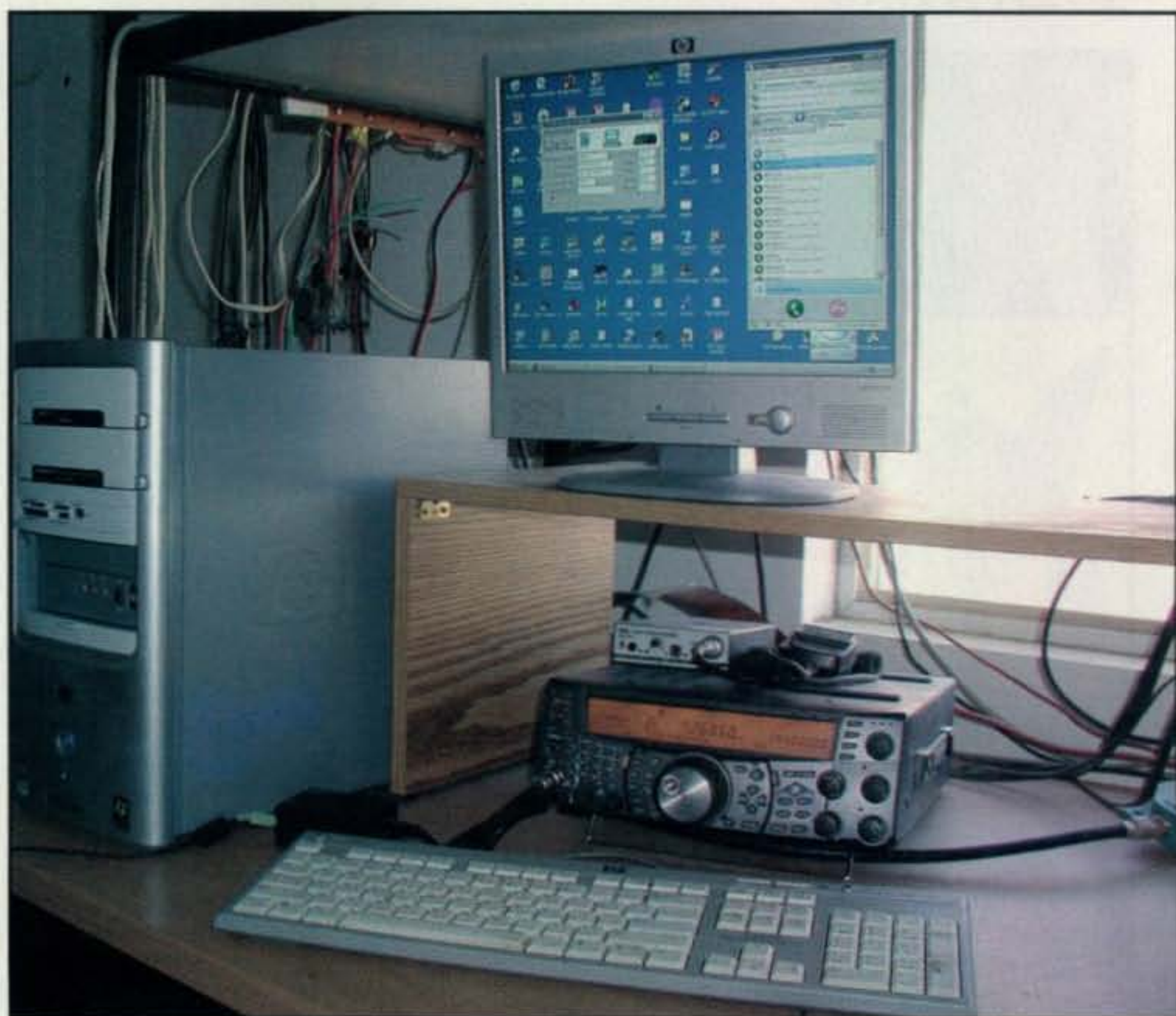


Photo C— WB6JAR's HF station, consisting of a Kenwood TS-2000 transceiver, a computer, and a *RigBlaster NoMic* to link them together.



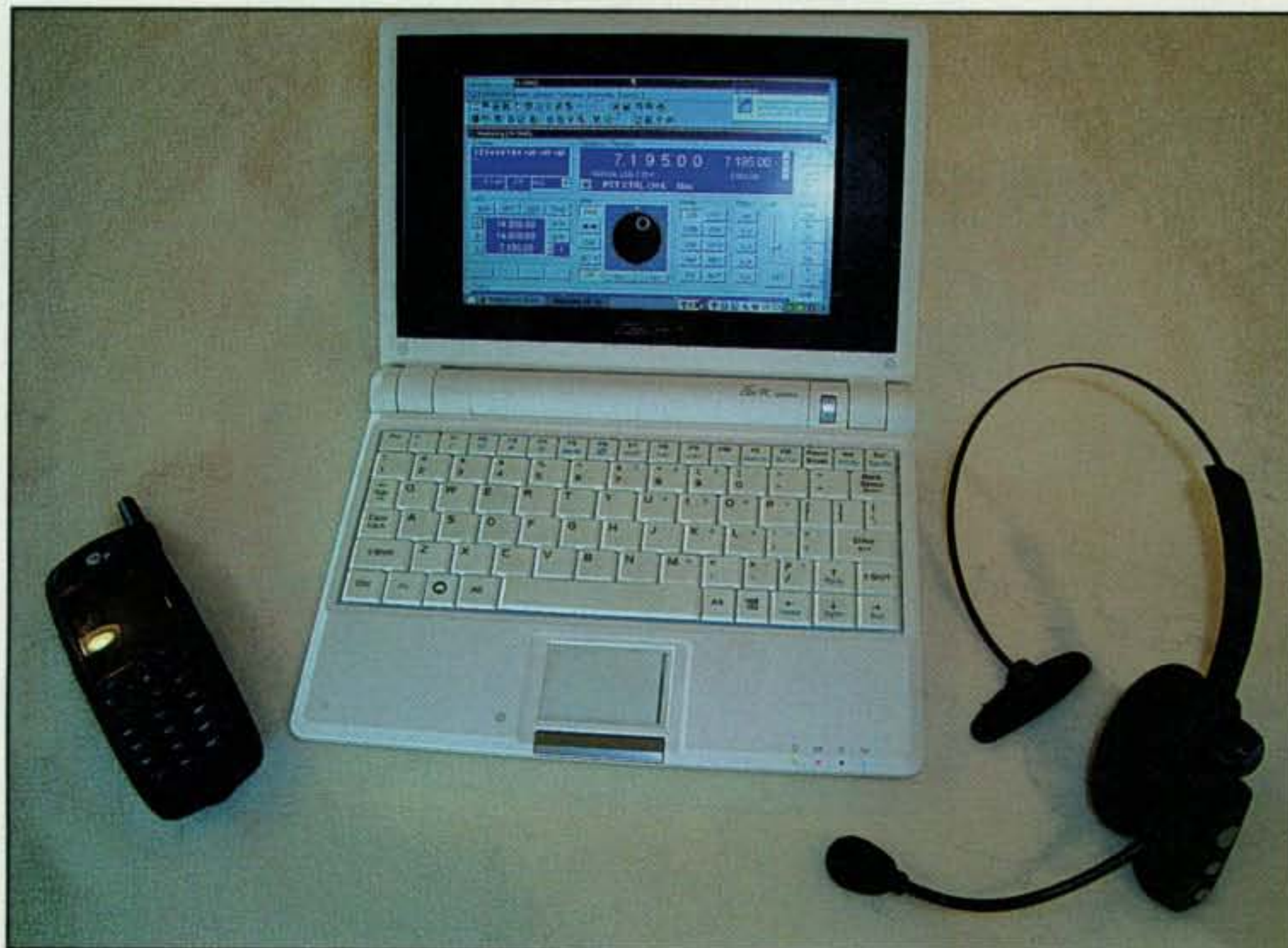


Photo D— The author's remote-operation setup, consisting of a cell phone, a laptop computer, and a wireless headset.

most likely will need adjustment, as it may be too hot. While you are talking on the local repeater or on a simplex frequency with some helpers, have a friend in your shack adjust the audio and VOX settings using the control knobs on

the outside of the Signalink USB. Your part in this is going to be simple: All you need to do is to talk. Your helpers on the air and the friend in the shack are going to do all the work. The guy in the shack should be coordinating with the

helpers by cell phone or by using some other radio on a different band so as to get over the RFI/desensing problem he may have in the shack if he tries to monitor using a handheld on the same band and/or frequency as your remote radio (this was the problem we experienced). Take your time, don't hurry, carefully adjust your audio and VOX levels until you get them absolutely perfect. When this is done right, your signal will be of such high quality that unknowing hams will not have a clue that you are using a cell phone.

Properly setting the audio for HF was easier. I have had excellent results by simply letting Skype automatically adjust the native soundcard setting for use with the RigBlaster devices. I found it too difficult to try to adjust the Signalink USB with its built-in soundcard with external control knobs on my HF station. When you are totally satisfied with the soundcard settings, you may, if you like, save them with a free program called QuickMix<sup>4</sup>.

## Basic Operation

Using your cell phone, call your SkypeIn number. After about two rings, the com-

### Added Bonus: Repeater Announcements

This is a neat feature that really makes use of the Signalink-computer-controlled VHF/UHF radio setup. The announcements you have been hearing on your local repeaters are generated by on-site repeater controller units. The announcement feature of these units was state-of-the-art at one time, but presently sounds archaic and robotic. Most are equipped with the same time-worn vocabularies and voices and that is why they all seem to sound similar. While doing my research on remote control, I tripped over a way to do repeater announcements and IDs a little differently. A high-quality synthesized voice can easily be made and saved to a ".wav" file. After you create it and are satisfied with it, download it and save it to your desktop. The software website can be found at: <<http://www.research.att.com/~ttsweb/tts/demo.php>>.

You can now bring up Microsoft Task Scheduler and set it up to launch this .wav file whenever you desire. This website gives you the flexibility of choosing between several different voices, accents, gender, and even languages. It is really a fun project just creating the announcements. There is also a site for a "text-to-Morse" program called WinMorse. You can now make a CW ID .wav file to play after the repeater announcement has played. The WinMorse text to Morse program can be found at <<http://www.winmorse.com/>>.

## SUCH A HAM

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Sorry we're late... I was trying  
to stick Stan with 12 volts.



puter running Skype will answer your call. Pause for a moment and listen, as the audio volume will slowly "ramp" up and you will begin to hear the radio's receive audio. You can now key the radio and transmit by speaking directly into the mic of the cell phone. The VOX circuit will activate, key the radio, and your cell phone audio will go out over the air. At this same moment, you will hear the receiver of the radio go mute, as the radio is now in transmit mode. (If you are using a parallel radio control program such as CTR on a laptop, you will see the PWR meter progress bar ramp-up as you talk. More on this later.) You can unkey by pausing or simply ceasing to speak. After a very brief delay, the radio's receive audio will reappear. To speed things up, I prefer using the "mute" button on my cell phone, as it is immediate and shortens this delay. Using the mute button is also a safety feature that ensures that no adjacent background noise gets into your cell phone and results in the radio staying keyed up or unintentionally going back into transmit.

**Logging off:** You can log off simply by hanging up.

**Absolute Control:** If the need arises, and you want to shut down your home computer, you can easily do this with a simple cell phone text message. When I first did this, I found it absolutely amazing. You can actually shut down the HF remote-control computer in your shack using only your cell phone merely by sending a text message. (You will need to properly set up your computer and get a free "kwiry" account. Find out how to do it at <[http://youtube.com/watch?v=KUw\\_9qbNj\\_E](http://youtube.com/watch?v=KUw_9qbNj_E)>.)

## Changing Frequencies

This is where things get interesting. The basic setup—using just a cell phone—will work great if you are going to be operating on a single frequency, such as your local repeater on VHF/UHF or your favorite net frequency on your HF radio. (If you are setting up cell phone remote control for more than one rig, each radio will require its own computer and its own SkypeIn account.)

If you would like to change frequencies, then you must carry two devices, your cell phone and a laptop (see photo D). The exception to this would be a "smart" phone. To do all this with a smart phone, the phone must be running a later version of the "Windows® Mobile" operating system, along with a registered version of "CTR-Remote"™5. CTR (Control The Radio) is one of several

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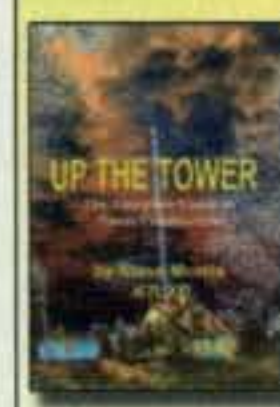
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Photo E— Screen shot of the CTR Server and Skype programs running on the station's "control" computer.

good programs that can be used with a laptop for radio control, station control, logging, or just changing frequencies. Other good programs that do all this and a lot more include TRX Manager and Ham Radio Deluxe. Kenwood also has a program for the TS-2000 called ARCP2000 which I really like, but it requires using <www.logmein.com> from your laptop so as to remote-access your home computer.

I have tried them all and I still prefer CTR-PC because of its small size and simplicity. I simply boot up my laptop, log onto the internet, launch CTR-PC, and I am immediately in control of my radio (see photos E and F). CTR seems to be the do-it-all program, as it will run on both your smart phone (as CTR-Remote) and your laptop with the same quick efficiency.

I prefer using a regular cell phone and

a laptop over a smart phone for the following reasons: With a laptop you can incorporate an external mouse, which is much easier to use than the "stylus" required by smart phones. Also, smart phones are actually a computer first and a telephone second. This means that you cannot always tune in and listen to the band (via cell phone) while changing frequencies on the radio. You are either in phone mode or computer mode, but not both at the same time. Some smart phones also require you to use the stylus to mute and unmute the phone, which I find is very inconvenient. These are things that may change with future releases of smart phones and smart-phone software.

Using a regular cell phone and laptop also enables you to have complete remote control of your home station, including any and all of the digital-mode software you have installed on your home computer. Operate all the digital modes including CW send and receive, logging, and voice keying. Imagine sitting at an airport (or at your desk in the office) working a DX pile-up with your

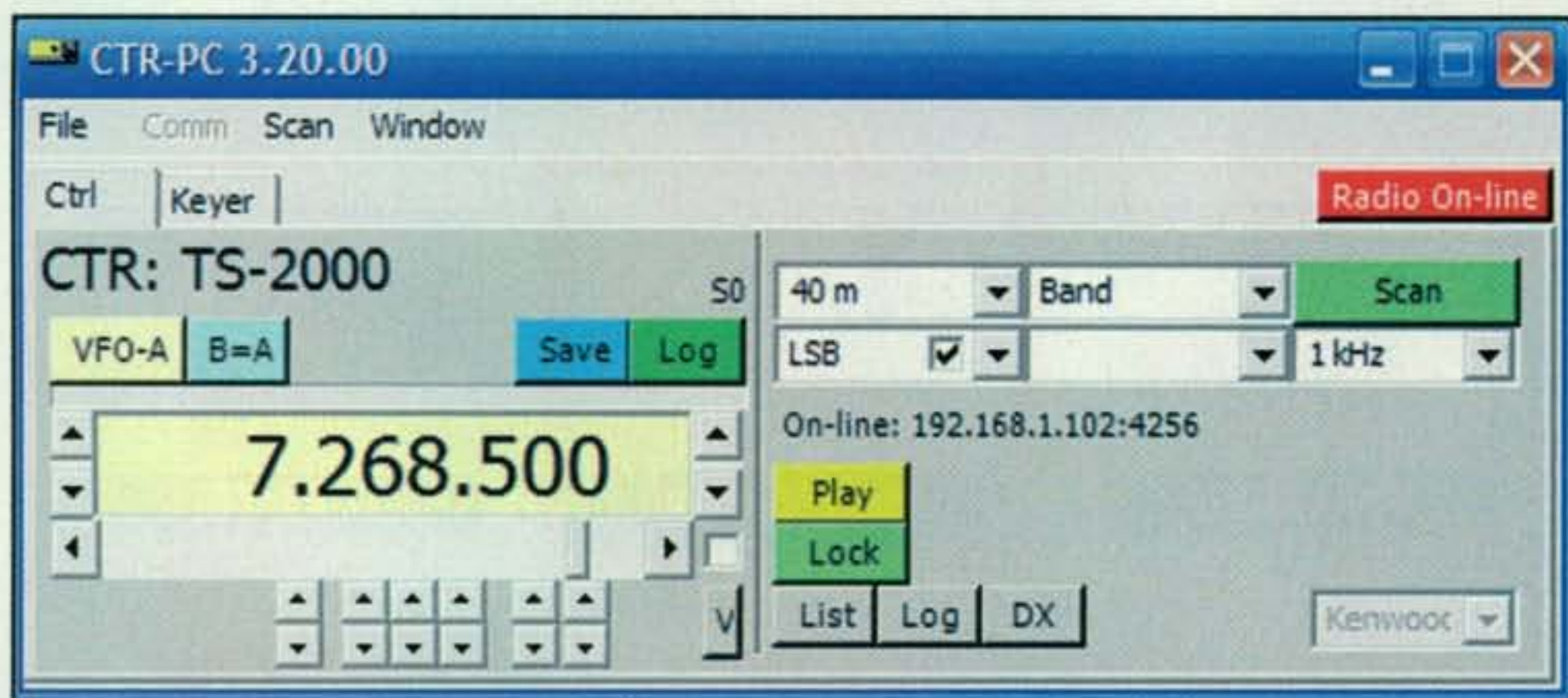
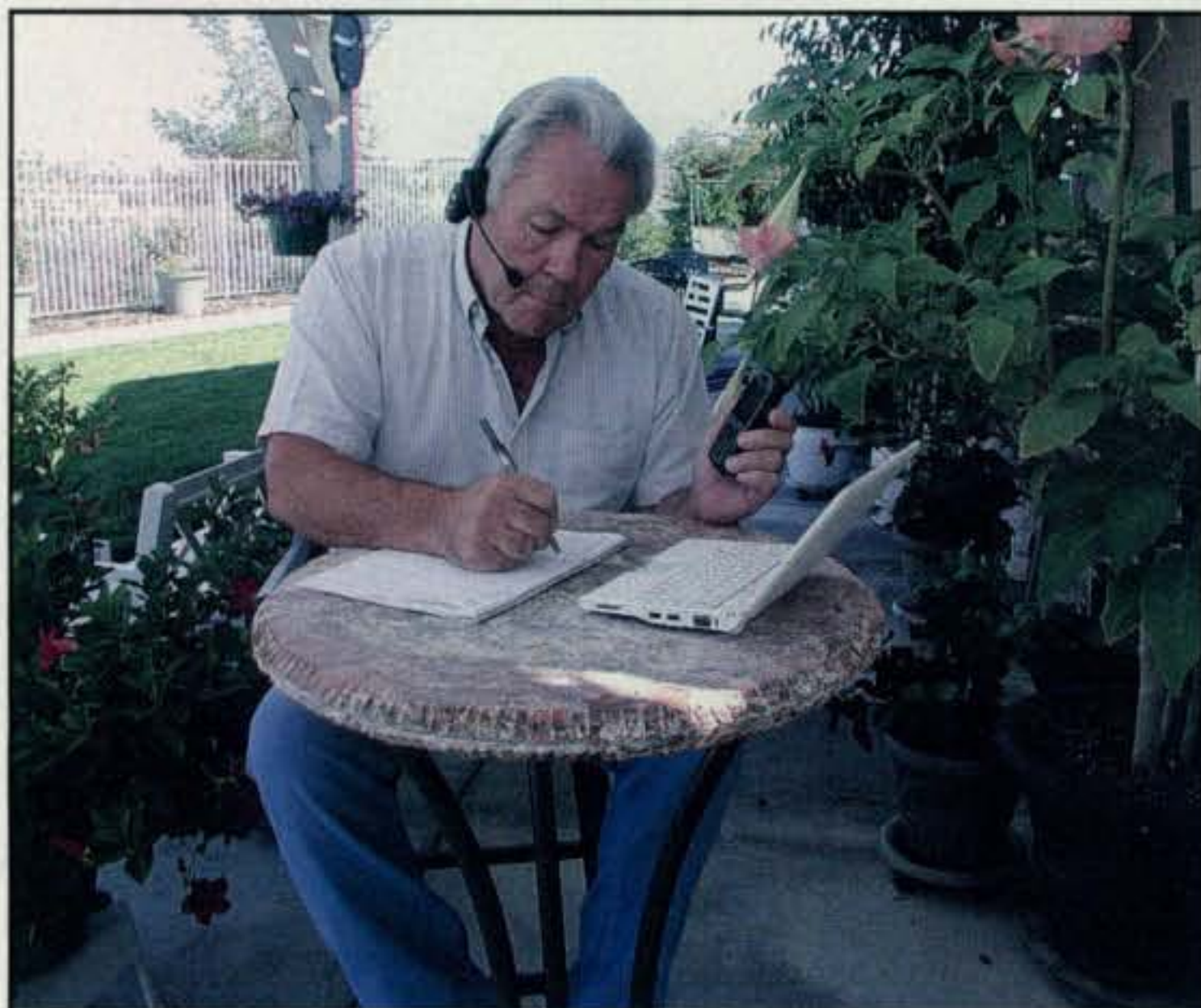


Photo F— Screen shot of CTR-PC running on the "remote" computer.



Photo G— This setup is not just for mobile use. Here WB6JAR is operating via remote control while sitting on his patio.



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### Getting Started with What You Already May Have

**A standard cell phone only:** All you really need is your cell phone and a possibly a Bluetooth® headset<sup>6</sup>. You will get bi-directional audio to and from your HF radio by dialing up your "HF Radio" SkypeIn number. You may also operate a standalone VHF/UHF radio if you have a second SkypeIn number and a Signalink USB device.

**A smart cell phone:** This is cool. You can both operate the radio and change the frequencies with just one device. This is done by installing CTR-Remote (see note 5). This program also runs on a Pocket-PC for local Bluetooth® remote control.

**A cell phone and a laptop with internet access via WiFi or an "AirCard":** This is the best way to go if you don't have a smart phone, or if you prefer (as I do) to be able to monitor the band while controlling the radio. The cell phone is used for the bi-directional audio. The laptop is for controlling the radio and changing the frequencies, etc.

**A wireless laptop only, no cell phone:** This is how I got started with remote control. I saw one of Randy, K7AGE's videos on YouTube. I did a variation of his wireless laptop remote control for quite a while. No cell phone is needed, as plain-vanilla (free) Skype and the free version of <www.logmein.com> are the software used. You should use external speakers and an external mic, or, a headset/boom-mic for best results. Randy's video can be found at: <http://youtube.com/watch?v=whe9nV9InnQ>.

**Magic Jack (alternative to SkypeIn):**

I have successfully used a Magic Jack for the bidirectional audio from my cell phone to my radio and it works just as well as SkypeIn, with one exception. If you are using your cell phone along with your laptop for complete remote control of your home station, then answering your incoming Magic Jack call via the laptop is routine. Additionally, there is aftermarket software currently available to enable Magic Jack to "auto-answer" all incoming calls. However, blocking of all incoming calls except those in your "contact list" is still being worked on, but I am told it will be released shortly. The Magic Jack, including device and service, is \$39.95 for the first year and \$19.95 per year thereafter.

In conclusion, I really had a lot of fun doing the research and testing on this project and especially writing this article. I hope my efforts help someone.

### Notes

1. The Signalink USB is available from TigerTronics, on the web at <http://www.tigertronics.com/>, phone 541-474-6700.

2. West Mountain Radio can be found on the web at <www.westmountainradio.com> or by phone at 203-853-8080.

3. To sign up for SkypeIn, go to: <http://www.skype.com/allfeatures/onlinenumber/>. SkypeIn fees are presently \$18 for 3 months or \$60 for a full year.

4. QuickMix may be downloaded from: <http://www.ptpart.co.uk/quickmix/>

5. Download CTR-Remote at <http://www.lynovation.com/>.

6. Bluetooth® headset. I have tried several of these. The best I have found is manufactured under the name "Blue Parrot." Learn more about the Blue Parrot on Randy, K7AGE's video on YouTube at <http://www.youtube.com/watch?v=6ypVUoRVv3U>.

7. Magic Jack is available at <http://www.magicjack.com>.

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# Negative Resistance

Over the next few months we would like to introduce topics that are great for the curious experimenter in an attempt to motivate the technically adept. Don't worry, however, as we will keep the theory and math to an absolute minimum, but hopefully we will give you enough information to spark an interest.

This month we will discuss negative resistance. "How can there be such a thing?" you ask. Well,

*\*c/o CQ magazine*

there is, and we will see just how this unique feature can be of use to us in our experiments.

Fig. 1 is a graph of the normal voltage/current relationship of a common resistor. As the voltage across the resistor increases, the current also increases. Divide the voltage by the current at any point and you will have the resistance—perfectly normal.

Now, however, consider the graph in fig. 2. We start off okay, but look at what happens. Past the "peak," a further increase in voltage results in a decrease in current. Surely this is not a "normal"

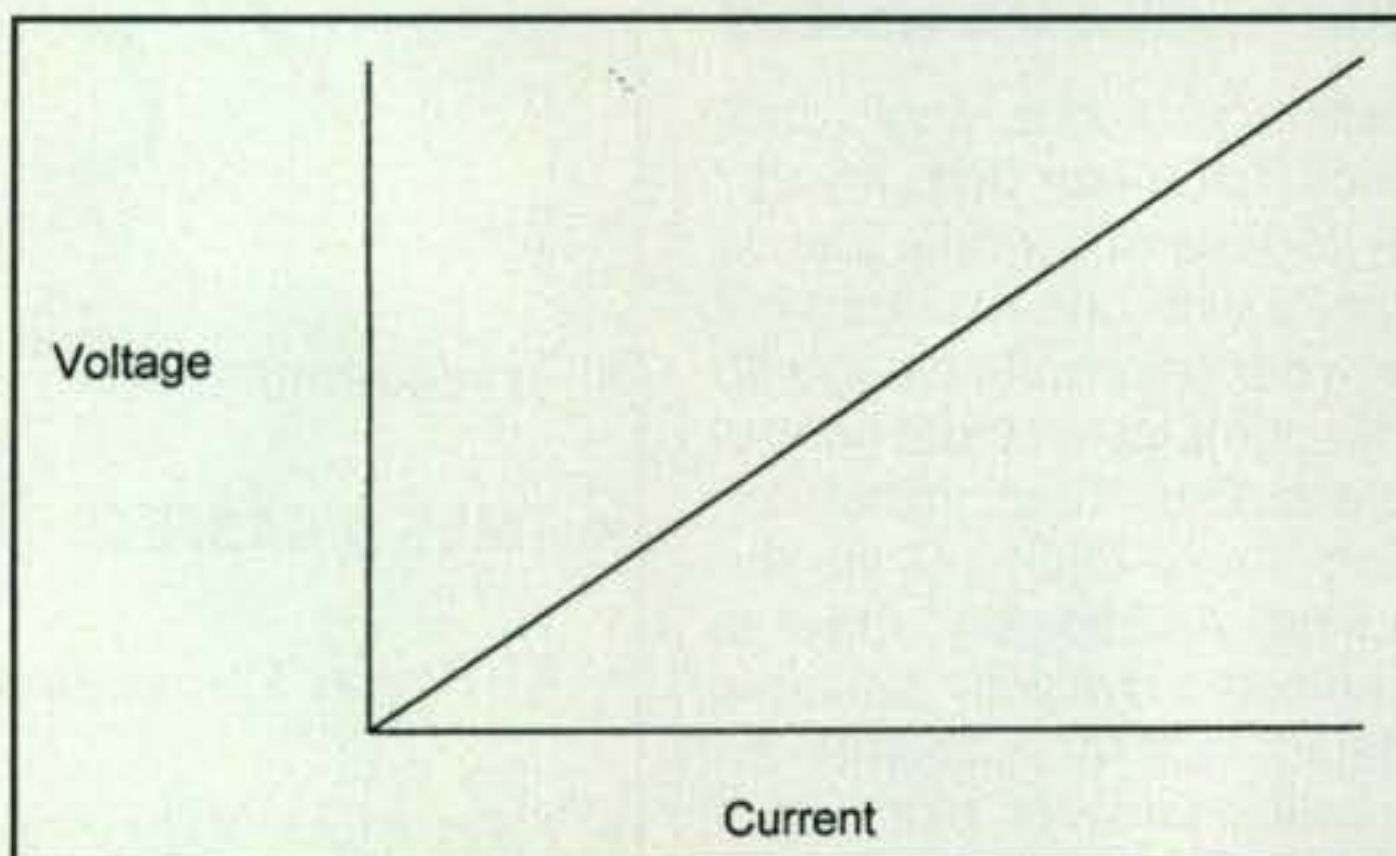


Fig. 1— Voltage/current curve of a "normal" resistor.

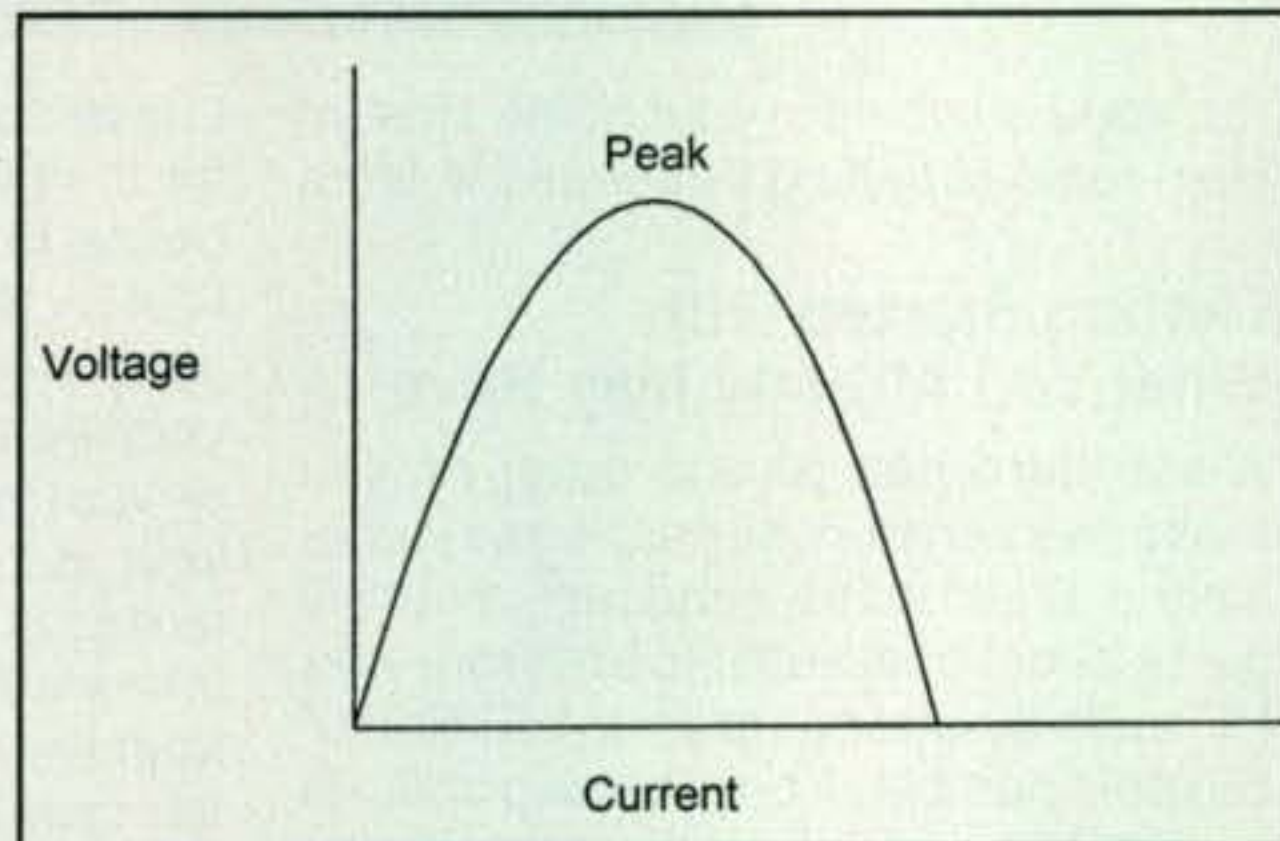


Fig. 2— Voltage/current curve of a "negative" resistor.

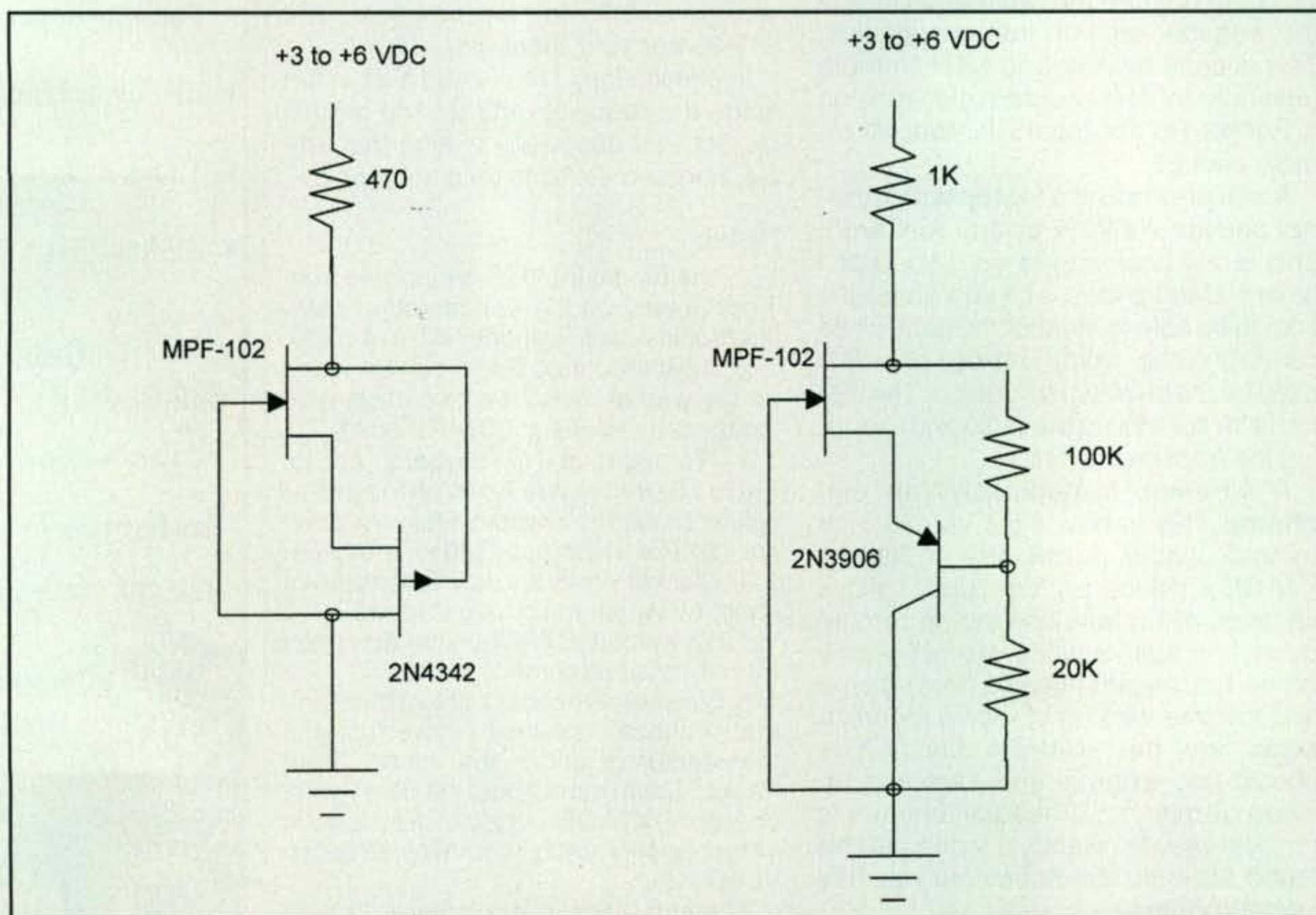


Fig. 3— Two lambda-type negative-resistance circuits.



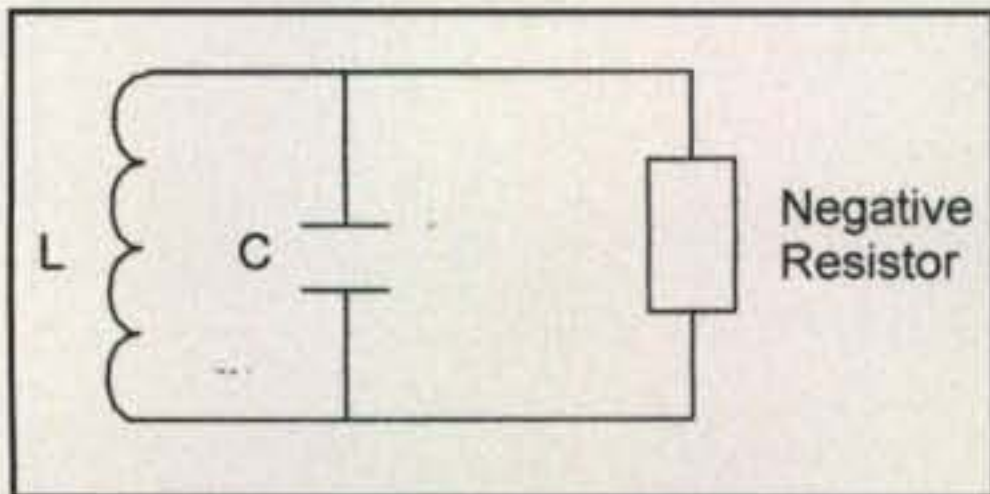


Fig. 4— Negative resistor across tuned circuit.

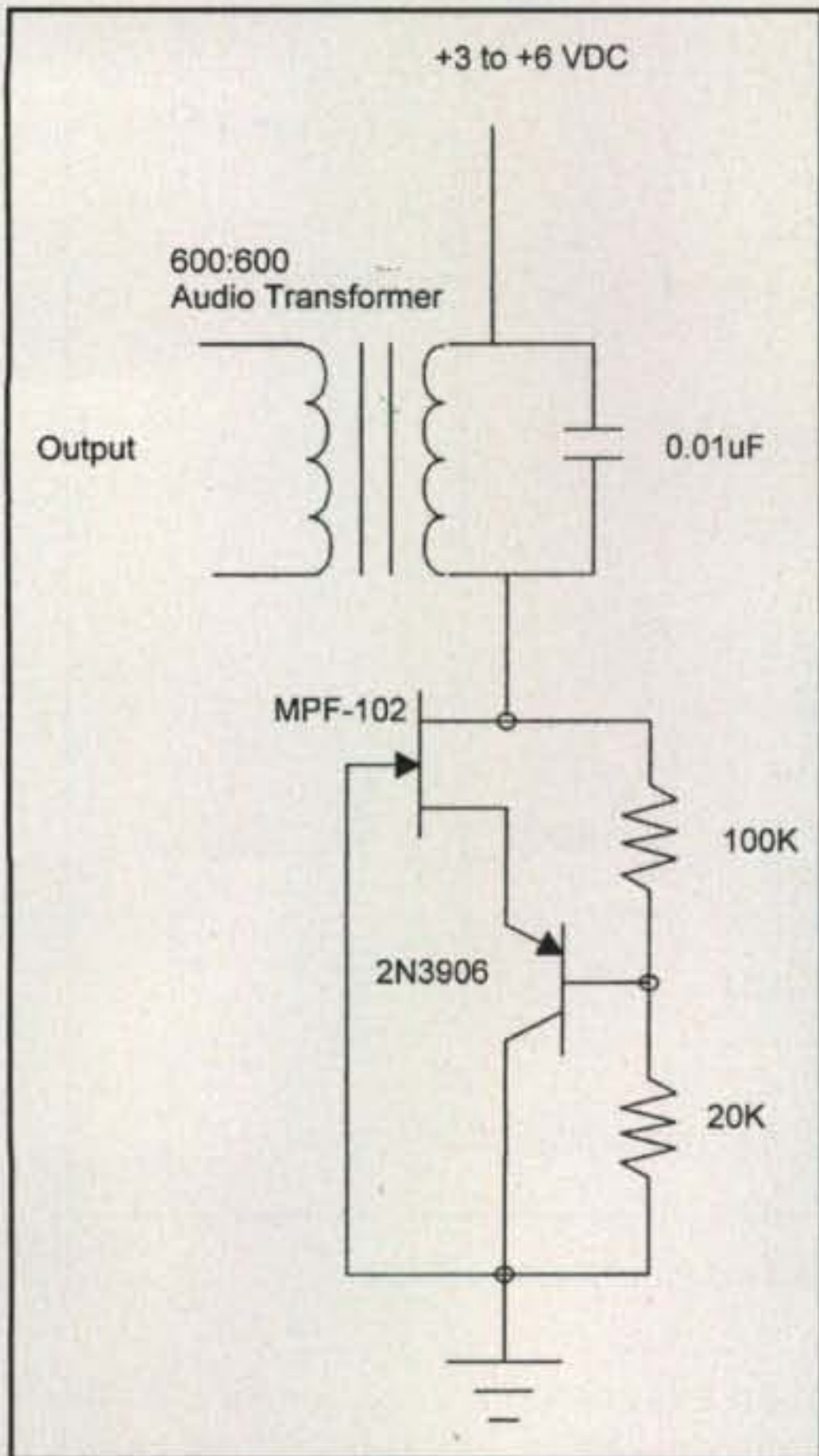


Fig. 5— Negative-resistance audio oscillator.

resistor. This graph, by the way, is representative of a device from the past called a *tunnel diode* (which was quite popular for a while). Unfortunately, these devices are not readily available today but the function can easily be obtained with the circuit of fig. 3, usually known as a "lambda diode." The parts are easy to obtain and not expensive. If you build the circuit and run a voltage/current curve, you will see the results. By the way, if you do plot your curve carefully and divide the change of voltage by the negative change of current (in the negative-resistance area of the curve), you can actually calculate the equivalent negative resistance of the circuit. Values of several hundred to several thousand "negative" ohms are not uncommon. Now let's see what all of this means to us.

Any circuit that you can build—such as a tuned circuit, for example—has a

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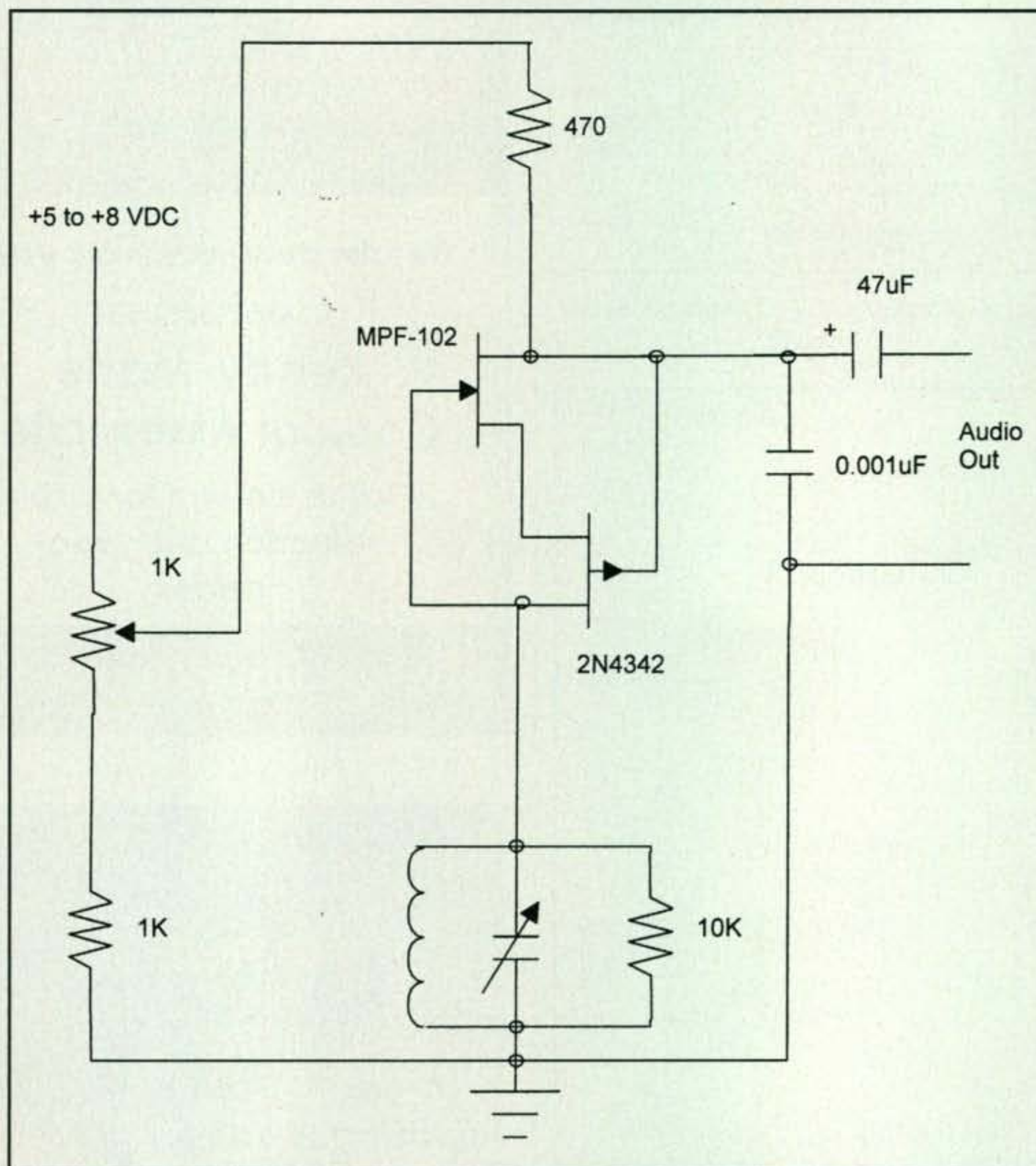


Fig. 6— Experimental negative-resistance receiver.

certain amount of positive resistance. When you apply a pulse of current to the tuned circuit the circuit starts to oscillate, but the resistance of the coil and/or the leakage resistance of the capacitor quickly stop this in its tracks. However, if one were to connect a negative resistance to the tuned circuit (as shown in fig. 4) to cancel the positive resistance, as long as the value of the negative resistance is greater than the positive resistance in the circuit, it will continue to oscillate!

Is this really true? To see for yourself you might wish to build the circuit of fig. 5. This is a simple audio oscillator that uses a low-resistance audio transformer and capacitor. Connect a scope to the junction of the negative resistor and the tuned circuit or the secondary winding on the transformer, and be prepared to be amazed! It is interesting to note that this circuit could be scaled well into the VHF region if desired. Similar tunnel-diode based circuits (from the past) could easily work into the microwave region.

The final circuit shown in fig. 6 is that

of an experimental receiver for the AM broadcast band. In this circuit the tuned circuit covers the band and the 1K pot adjusts the circuit to the point of best operation. The resistor across the tuned circuit is used to lower the Q so that operation is similar to the regenerative receivers of the past. You must experiment with the value of this resistor for best results and can try to see just how high in frequency you can actually go. In the past, the Heath Company offered a so-called "Tunnel Diode Dip Meter Kit" that was based on a tunnel diode and worked well into the hundreds of MHz. You should be able to at least reach the 2-meter band with the components indicated. It would be interesting to see if someone could come up with a complete negative-resistance transceiver along these same lines.

The unusual negative-resistance characteristic of the circuit has other applications as well, but I will leave them to your imagination. Please let us know what you come up with.

73, Irwin, WA2NDM



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## Radio Amateurs in India Take Bold Action During Cyclone Aila

In a remarkable story of dogged determination and communications skill, one of the radio amateurs on the front line against a tropical cyclone that ravaged South Asia in May writes this month of the region's EmComm efforts along a trail of death and destruction that affected millions of people.

S. Yamini, VU2YAM, of India's National Institute of Amateur Radio (NIAR), was among the operators facing down Cyclone Aila in a fight to fill gaps in a severely damaged communications infrastructure in her country. Her narrative of the heroic efforts of the region's operators is a graphic example of the importance of amateur radio in times of natural disaster.

What first appeared as a weather disturbance in the Bay of Bengal on May 21 would soon grow into a dangerous storm whose high winds, torrential rain, and storm surge pummeled parts of Bangladesh, Myanmar, and India.

By May 25, Yamini wrote, Aila "would go on to strike the coastal districts of West Bengal . . . causing immense devastation in the region.

"The river banks breached at several locations as incessant rains caused river waters to rise to unprecedented levels—inundating farm lands, submerging houses in hundreds of villages, and

resulting in hundreds of casualties," she said. "The storm rendered millions of people homeless."

Roads to many remote areas were cut off by Aila, leaving vast areas without access to food, water, shelter, and electricity, Yamini said. Communication to these remote villages was possible only when the cell-phone towers were brought back into operation.

"The Government of West Bengal sought assistance from (radio amateurs) in the region to bridge the communications gap and for backup communications at remote locations," Yamini wrote. Ambarish Nag Biswas, VU3JFA, and other local amateurs "responded immediately by sending their members to North 24 Parganas District and South 24 Parganas District. The information on severity and scale of disaster started to trickle in as the local administration sent these teams on boats to remote areas" to assess the situation.

Millions of people lost their homes and were forced to flee to narrow stretches of high ground or elevated concrete roads to survive, she wrote. "The trail of destruction was visible over a vast area, a sea of water as far as a human eye can see."

Flood-level waters remained in the area two weeks after the onslaught of Aila. "The situation demanded more (radio amateurs) for efficient management of relief," Yamini wrote. "The district administration requested further support of volunteers with necessary (communications) equipment to assist their relief operations."

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*Cyclone Aila left a trail of death and destruction in the South Asia region of India, Bangladesh, and Myanmar when the devastating storm struck in May. (All photos related to Cyclone Aila courtesy of the National Institute of Amateur Radio, India)*





*A weather disturbance in the Bay of Bengal on May 21 grew into Cyclone Aila, whose high winds, torrential rain, and storm surge pummeled parts of Bangladesh, Myanmar, and India.*

VU2YAM wrote that on June 1, the "National Institute of Amateur Radio (NIAR), well known for its preparedness and committed team of volunteers, immediately rushed its members to Kolkata, the capital city of West Bengal, by train and flight, to further reach Barasat, headquarters of North 24 Parganas District."

The District Administration dispatched the radio amateur volunteers to administrative headquarters and other remote locations of Hingalgunj Block in North 24 Parganas District.

"The team upon arrival met Mr. Srikumar Mukherjee, Honorable Minister for Civil Defense for the Government of West Bengal, which was coordinated by Mr. Arya Ghosh, VU2GKB, and Mr. Joy Chakraborty, VU3JCH," Yamini said. "As per the advice of the government, an amateur radio station was established at the office of Controller of Civil Defense in Kolkata."

She said that later the station was shifted to District Headquarters at Barasat as normal telecommunication links between the District and State Headquarters had been reestablished. "The amateur radio station at Barasat remained as control station for all the other stations operating in this district," Yamini wrote, "which was tirelessly

managed by the most experienced operator, Ms. M. Bhanumathy, VU2BL. The stations checked on an hourly basis to remain in regular contact for transfer of messages."

Each radio amateur carried a suitcase containing a high-frequency transceiver, a VHF transceiver, two hand-held radios, an inverted-V antenna for 20 and 40 meters, VHF whip antenna,



*From left to right: M. Bhanumathy, VU2BL, and S. Yamini, VU2YAM, meet with IWAR members VU3SQY, VU3PFX, VU3PHH, and VU2TKC.*





*S. Yamini, VU2YAM (foreground), and M. Bhanumathy, VU2BL, handle disaster communications at State Civil Defense Headquarters in Kolkata during Cyclone Aila.*

more than 300 feet of coaxial cable, tools "and other essential accessories, all weighing more than 66 pounds."

Yamini said the District Administration provided fully-charged, heavy-duty 12-volt batteries which were "judiciously used to run the transceivers up to five days for uninterrupted communication at two remote locations." Communications were conducted mostly on 40 meters (7.045 and 7.070 MHz), 20 meters (14.160 MHz) and 2 meters (145.500 MHz).

Messages focused primarily on "requirements of relief material, administrative reports on disbursement of relief, reports on public health as well as situation reports of medical camps, and movement of officials," Yamini wrote. "Even as the mobile communications from private cell-phone operators were partially restored, amateur radio communication was asked to remain as backup communication as information received by administration included new weather warnings and a rise in river water currents on account of high tides."

Yamini said that remote locations in India "are known to lack basic amenities and sanitation. Survival of millions of people in these areas is on bare minimum requirement of food, water, and shelter. The homes of the people living in these parts of rural India are made of mud walls with roofs made of hay stacks. The villages in remote areas had no electricity but used solar power and generators."

"Reaching the locations of operation at Block Headquarters was the first task," she said. Being unfamiliar with the region or local language, "part of the journey was on road. Later, men and material were shifted to a small raft to cross a river and then (relief workers had to take a) one hour ride on a motorized tri-cycle. It took nearly eight hours to travel (about 50 miles), and reaching final destinations was just another challenge for the team."

Yamini reported that she was operating the amateur radio station at the Block Headquarters office at Hingalgunj. "Electricity was partially restored when we arrived at this location and a

backup generator was in place as this was administrative control for the division," she said. "The HF and VHF station were installed for around-the-clock operation. . . . The first signs of severe devastation were visible."

Yamini said that Hingalgunj Block was among "the most devastated areas in North 24 Parganas District, with over 28,000 families and 126,000 people affected by Aila," and more than 35 miles of river embankments breached "causing maximum damage. The District Administration and over 300 volunteers from various agencies worked in managing the relief effort at this block, including NIAR; ICDS (Integrated Child Development Services); Departments of Health, Land and Agriculture; NDRF (National Disaster Response Force); Army medical teams; UNICEF; and other NGOs (non-governmental organizations)."

Relief supplies included rice, dal, chira, drinking water, mosquito nets, medicines, bleaching powder, firewood, and medical items, Yamini reported. The NDRF, "an efficient professional team with manpower and resources specially designated for disaster preparedness and response in the country, brought us (on separate rafts) to the shores of Jogeshgunj and Kalitala which were nearly (18 miles) from Block Headquarters . . . a journey that took nearly two hours on a curvy river overflowing with flood waters."

Yamini said the cruise went along the river separating India and Bangladesh "which is only (about 330 feet) wide at most places. . . . A local guide was assigned to each raft to identify the villages in Indian territory and also to avoid



*Ambarish Nag Biswas, VU3JFA, part of the Indian EmComm team, operates the station at the District Magistrate Office in Barasat during May's devastating storm.*



*Ram Mohan Suri, VU2MYH, mans the operating position at Jogeshgunj during Cyclone Aila.*





Indian radio amateur Jose Jacob, VU2JOS, at the emergency communications station at Kalitala.

unwarranted landing on the shores of a neighboring country.

"Jogeshganj Panchayat, with four villages—Jogeshganj, Patghara, Madhavkati and Hemnagar—virtually became an island, with more than 90 percent of 5,282 families severely affected as their homes were completely washed away," Yamini wrote. "The livelihoods of many people depend on agriculture and fishing; many families have left this area or shifted to safer locations or moved to other places in the state to live with friends and families elsewhere." A HF/VHF station was set up in the four-village area, operated by Ram Mohan Suri, VU2MYH.

Kalitala Panchayat consists of three villages—Kalitala, Shamson Nagar, and Pargonti—and is located on an island on the southeastern tip of North 24 Parganas District adjacent to Sundarban Tiger Reserve Forest, Yamini said. It has a population of nearly 21,000. "People stayed in temporary shelters on an elevated road. Relief material was brought (via the river) from Hingalganj Block Office and other places and distributed by Panchayath and other NGOs (non-governmental organizations) on a daily basis."

"A community kitchen was operating near the Panchayath office," she said. "The medical camp reported many



Amateurs supporting disaster communications during Cyclone Aila included, from left to right: Sunil Das, VU2SYD; Deepak, VU3PHH; Jyoti Chakravartty, VU3BGI; S. Yamini, VU2YAM; M. Bhanumathy, VU2BL; and Jose Jacob, VU2JOS.

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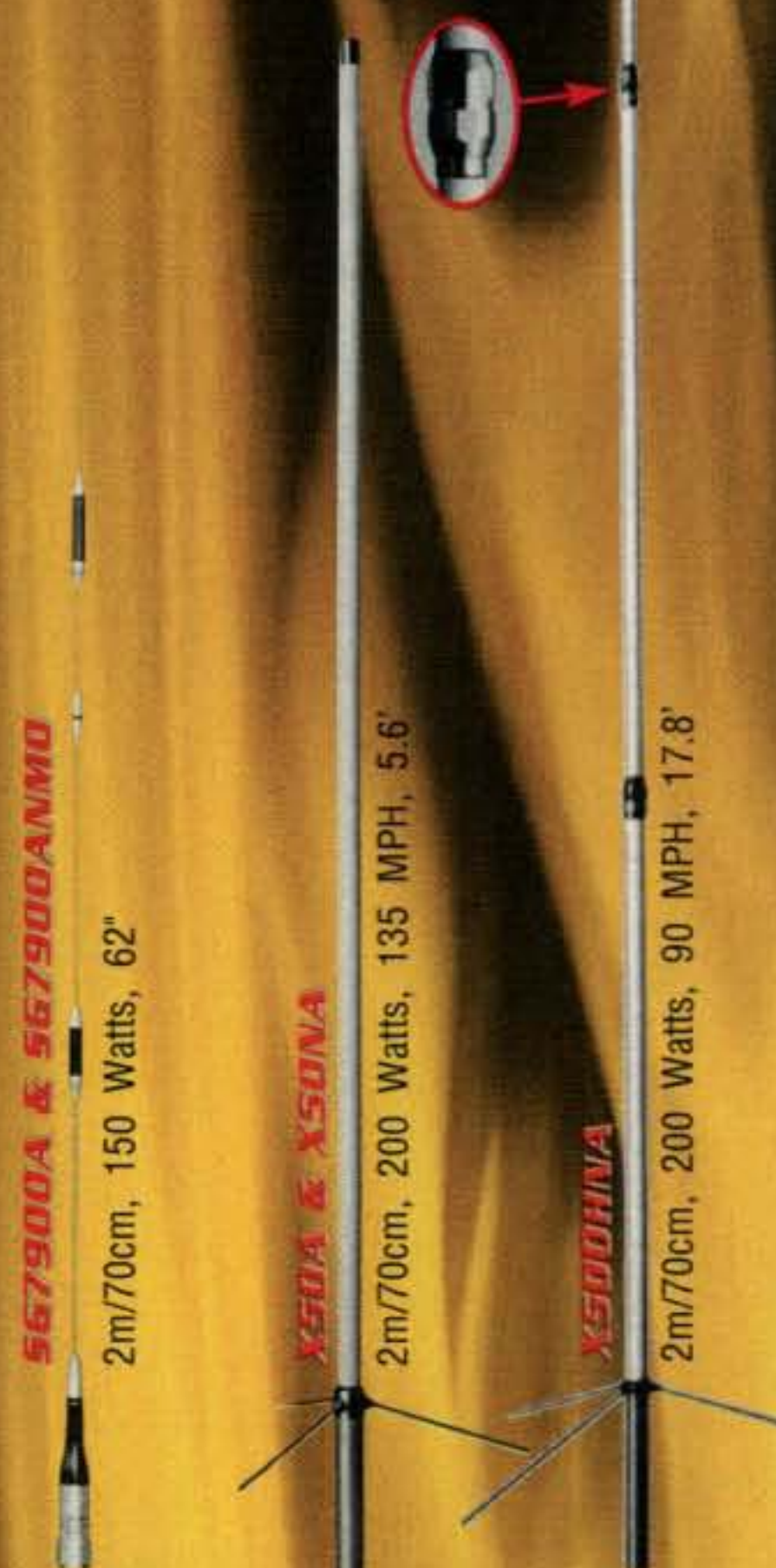
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**See**

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

## AT-1000Pro

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

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cases of diarrhea. Kalitala was among the farthest villages from the Block Headquarters. Jose Jacob, VU2JOS, handled messages on HF/VHF from there requesting drinking water, food, shelter, medicine, etc. On June 7, there was an alert for severe high tide in the area. Fortunately, the high tide did not rise to any danger level."

Yamini wrote that the "station worked on 12-volt battery (power), as this village has no electricity. Several (radio amateur) volunteers from Kolkata and other places were also involved in the Aila relief communications."

Some of them were sent to positions in other affected locations: Subhadeep Chatterjee, VU2CSB; Satyarup Mandal, VU3SCM; and Swapan Dhara, VU3SJR, in Sandeshkali; Parag Ranjan, VU3RUO, in Dhulduli; and Anupam



Twenty students representing seven states participated in the Tennessee Emergency Management Agency-hosted All Hazards Type III Communications Unit Leader (COML) Train-the-Trainer Course in Nashville in early July. (TEMA photos courtesy of David Wolfe, WA4VWX)

Biswas, VU3BIS, in Dhamakali of North 24 Paraganas District.

Additionally, Tanumay Chakraborty, VU3SQY; Tapas Chakraborty, VU2TKC; Ananda Bose, VU2AMB; and other members of Indian Wave of Amateur Radio (IWAR) operated the 20-meter MFJ QRP radio donated by QRP-ARCI from Goshaba in South 24 Paraganas District.

Also to be credited are: Sunil Das, VU2SYD; Subhash Chandra, VU3SUY; radio amateurs from other states and regions: National Institute of Amateur

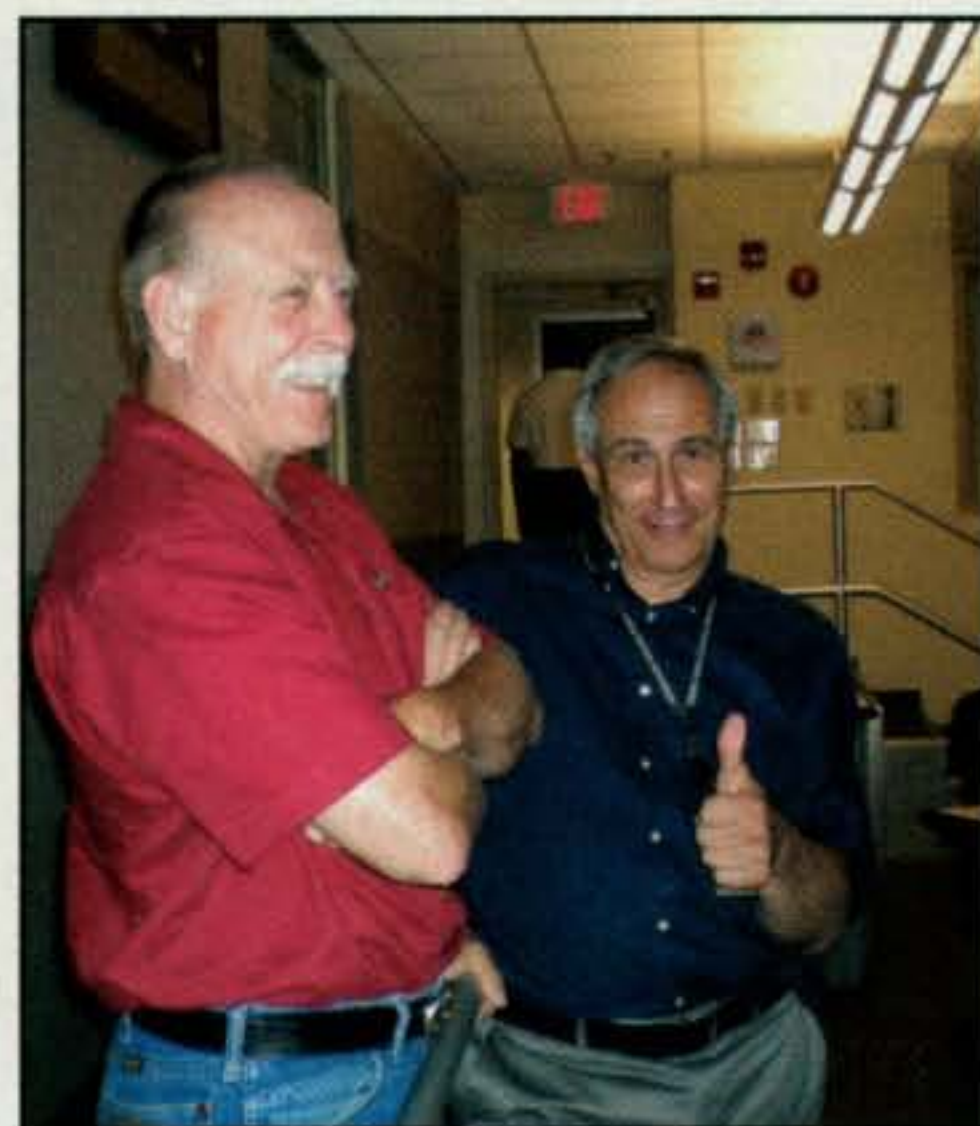
Radio, VU2NRO; Lissy Jose, VU3LMS; and Bolleddu Jayamma, VU2JMA, from NIAR Headquarters in Hyderabad; and Sangeeth Musaliar, VU2CEO.

"Agencies conducting Aila relief activities including the Government of West Bengal appreciated the dedicated service of amateur radio and its volunteers as our teams returned to their bases on June 11," Yamini wrote. "On behalf of the National Institute of Amateur Radio, I wish to thank District Administration and Government of West Bengal and particularly (radio amateurs) from West Bengal for their tremendous support of the activity."

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Jeff Standifer, WB5WAJ (left), and Steve Waterman, K4CJX, were on hand for the TEMA 101 class, in conjunction with the Train-the-Trainer session in Nashville.

### First Responders Prepare to Train Other Unit Leaders

The Tennessee Emergency Management Agency hosted the first All Hazards Type III Communications Unit Leader (COML) Train-the-Trainer Course in Nashville in early July.

According to TEMA spokesman and public information officer Jeremy Heidt, in an ongoing effort to enhance interoperability, 20 students representing seven states joined Tennessee communications unit leaders for the eight-hour course.

"These new trainers will take what they have learned and return to their states as the first step to ensuring that every state has trained instructors capable of teaching the COML course to other first responders," a TEMA news release stated.



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According to David Wolfe, WA4VVX, who is chief of communication for TEMA, participating in the July 9 seminar were: Alan Choutka, KC9DPS (Illinois); George McMakin, KI4WKN/AAM4TKY (Kentucky); Ronald McKnight (Kentucky); Don McFarland, W5WD/AAR6CZ (Texas); Jim Junkins, W4JLJ (Virginia); Leo Domingo, WH7UI (Hawaii); and Timothy L. Peace, N9TP (Indiana).

From Tennessee were: Louis Friedmann, KJ4HJC/AAN4ETN; Mark Hollomon, KD4MJA/AAM4EOW; John Johnson, KC4ZOB; Bill Jorgensen, K4COM/AAR4GP; James C. Massengale, KJ4NAK; John Moyers, N4QEA/AAR4EE; David Wolfe, WA4VVX/AAR4CY; Ed Gaugh, KF4RXI; Jody Clinard, KJ4ITN; Alan McClain, KA4BNI/AAR4EA; Jesse Griggs; and Jamison Peavyhouse.

"The U.S. Department of Homeland Security's Office of Emergency Communications (OEC) recently completed development of the COML Train-the-Trainer Course which allows for an efficient, self-sustaining, and cost-effective process to train COMLs to manage and coordinate on-scene communications

during multi-jurisdictional responses and planned events," Heidt said.

For the class in Nashville, TEMA was in partnership with the Department of Homeland Security Office of Emergency Communications.

"We are proud that DHS selected Tennessee to roll out this highly anticipated train-the-trainer program," said TEMA Director James Bassham. "Communications unit leaders across the nation have been asking for this training, and we have employed the successful and proven train-the-trainer model to ensure that they will be able to take this knowledge back and share it with other communications leaders."

"COML training provides a structure and background for communications unit leaders. The training better prepares responders to assume command of communications during a critical incident or other disaster requiring communications interoperability," said Chris Essid, OEC Director.

According to TEMA, the COML Train-the-Trainer Course "provides the knowledge and skills necessary to effectively teach the COML course in their state, territory, and/or jurisdiction.

The Type III COML course trains emergency responders to be communications unit leaders during all-hazards emergency operations, significantly improving communications across the multiple disciplines and jurisdictions."

"COML training has been employed in the past," TEMA continued. "Responders trained as COMLs served a vital role during the Kentucky ice storm in February, which crippled communications across that state. These responders successfully established radio communications using various communications resources, enabling multi-jurisdictional and multi-discipline first responders to coordinate the response, rescue, and recovery."

For information about additional classes, visit the SAFECOM website: <<http://www.safecomprogram.gov/SAFE/COM/currentprojects/comtraining/comtraining.htm>>.

For more information on OEC, visit <<http://www.DHS.gov.keyword OEC>>.

And for more information about the Tennessee Emergency Management Agency, visit: <<http://www.tnema.org>>.

73, Richard, KI6SN



## FCC to Develop National Broadband Plan

Last month we covered the U.S. Senate confirmation of new FCC Chairman Julius Genachowski and the reconfirmation of existing (Republican) Commissioner Robert McDowell. An existing third commissioner, Michael Copps, did not require reconfirmation. With the minimum three seats filled, the FCC could now transact business.

Commissioner Jonathan Adelstein left the FCC to await Senate confirmation of his appointment to head up the Agriculture Dept's Rural Utilities Service. RUS provides programs to finance rural America's telecommunications infrastructure.

Genachowski was sworn in on June 29 as the newest chairman of the Federal Communications Commission at 2:25 PM at the Supreme Court by Justice David Souter. Genachowski is a former clerk of Souter's. After his swearing in, Genachowski began installing his staff. He literally cleaned house, with most bureau and office heads being replaced. The new Wireless Telecommunications Bureau chief is Ruth Milkman. Amateur radio falls under this bureau.

A Harvard graduate, Milkman has served at the FCC in a variety of positions, including Deputy Chief of the International and Common Carrier Bureaus. Her most recent position was as an attorney and partner at a Washington, D.C. telecommunications law firm.

### Broadband Deployment to be FCC's Focal Point

Chairman Genachowski's first public FCC Open Meeting was held in early July. His opening remarks left little doubt about what the focus of his chairmanship would be: broadband regulation. "Congress has entrusted the FCC with a matter of profound importance to the country," he said. "It is our job to develop a National Broadband Plan for America. We must find ways to ensure that all people of the United States have access to broadband."

He added, "I cannot imagine a more important set of tasks for this agency at this moment in history." He compared broadband deployment with other past networks that connect Americans such as "the railroad, telephone, and electricity" that serve "as platforms for commerce, and improve the quality of American lives."

"If we do our jobs right and enable universal broadband that's fast, affordable, and open, we can unleash new waves of innovation that we can

scarcely imagine today; we can accelerate economic growth, create jobs; we can unlock the power of spectrum to make America a world leader in mobile services and technologies; we can connect small businesses so that they can compete everywhere, improve educational opportunities, help deliver better health care and cleaner energy at lower cost, and extend the benefits of the broadband revolution to our police and firefighters who depend upon communications for protecting their own safety and ours."

### Exactly What Constitutes "Broadband"?

Earlier this spring, the FCC invited comments from the public on the FCC's role in the broadband provisions of the stimulus legislation (GN Docket No. 09-40). Among other things, Congress directed the National Telecommunications and Information Administration (NTIA) to get together with the Commission to come up with a definition of "broadband," and what constitutes "unserved" and "underserved areas" of the U.S. NTIA is the President's principal advisor on telecommunications and information policy.

On April 13, the American Radio Relay League submitted its comments. The League, like many others, said that defining broadband "is a critical determination that will inevitably determine the success or failure of the program." The ARRL believes that "the definition of broadband should include an absolute lower threshold, minimum bidirectional speed [and] should not be a variable concept determined by technology."

The ARRL pointed out that it participates in the Committee for Communications Policy of the Institute of Electrical and Electronics Engineers-USA (IEEE-USA CCP), "...which has engaged in considerable discussion of universal access to high-speed broadband networks, and in particular, broadband definitions and target goals for broadband deployment." The League said it agrees with the IEEE position on broadband.

The IEEE advocates the achievement of at least 20 Mb/s (megabits per second) bidirectional speed with 90 percent availability throughout the nation within five years [and] at least 100 Mb/s bidirectional speed with availability to all businesses and households within 10 years. ...Expenditure of public funds should be limited to the technologies that can meet these goals."

"The FCC should designate ample licensed and unlicensed spectrum bands, including unused portions of television bands, for high-speed wireless networks, ultimately aiming at access for all," the IEEE said.

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



MODEL SRM-30M-2

**2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL**

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25-2	20	25	3 1/2 x 19 x 9 1/2	10.5
SRM-30-2	25	30	3 1/2 x 19 x 9 1/2	11.0

**WITH SEPARATE VOLT & AMP METERS**

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3 1/2 x 19 x 9 1/2	10.5
SRM-30M-2	25	30	3 1/2 x 19 x 9 1/2	11.0



MODEL SS-12SM/GTX



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- KENWOOD TK760, 762, 840, 860, 940, 941
- KENWOOD TK760H, 762H
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- SS-12MC
- SS-10MG, SS-12MG
- SS-101F, SS-121F
- SS-10TK
- SS-12TK OR SS-18TK
- SS-10SM/GTX
- SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
- SS-10RA
- SS-12RA
- SS-18RA
- SS-10SMU, SS-12SMU, SS-18SMU
- SS-10V, SS-12V, SS-18V

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## FCC Reopens Broadband Over Power Lines Issue

### New proposed rules respond to a DC Circuit Court of Appeals remand of the FCC's BPL order

On Friday, July 17, the Commission's Office of Engineering and Technology (OET) released a 28-page Further Notice of Proposed Rulemaking (FNPR) titled "Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems." It asks for comment on the power levels at which Access BPL systems should operate so that they don't interfere with other services.

Access BPL proponents say that transmitting broadband along electric power lines represents a potential "third pipe" alternative to cable and DSL. Supporters believe BPL systems will help make broadband internet service available in rural and other underserved areas and introduce more competition to broadband services.

Two years ago, the American Radio Relay League (ARRL) took the FCC to court over its BPL plans. It warned that its current BPL standards cause harmful interference to licensed radio services. The ARRL also complained that some of the technical studies on which the commission based its decisions had not been fully disclosed.

In April 2008, the Circuit Court of Appeals for the District of Columbia agreed with two of the ARRL's complaints. First, the agency had intentionally eliminated some of its studies of potential BPL interference, to the point where there was "little doubt that the Commission deliberately attempted to exclude from the record evidence adverse to its position." Furthermore, the appeals court concluded that the FCC had not sufficiently explained its rationale for the power/interference standards it established.

The court returned the BPL rules to the FCC for amendment and criticized the Commission for deliberately attempting to conceal information it had showing that interference from BPL was a real concern. The Commission was forced to release the full unedited text of the studies under the Freedom of Information Act, and the FCC was embarrassed when the ARRL released the full "redaction" (intentional concealment of study data).

Basically, the FCC has now issued new proposed regulations for Broadband over Power Lines (BPL). The Commission still believes, however, that the original technical standards it has already set may be sufficient—that is, with a modification or two. BPL's critics "do not provide convincing information" that the FCC should change course, the Further Notice of Proposed Rulemaking says.

In its FNPRM the FCC is seeking comment on the power levels that should be permitted for Access BPL systems so they don't radiate into other licensed services, and on how quickly radio frequency emissions decay (attenuate) the farther away measurements are taken from BPL systems.

One of the major points of contention between the ARRL and the FCC has been the extrapolation (estimation) factor below 30 MHz that is applied to measurements made at distances from power lines to determine what the value of that measurement would be at a distance of 30 meters. The FCC believes that this factor should be 40 dB/distance decade. The ARRL has recommended a figure of half that, 20 dB, backing its arguments with four European technical studies.

The FCC doesn't agree and questions the relevance of those studies, suggesting that they provide only "anecdotal information," insufficient to support "a statistically valid and comprehensive description of how BPL emissions attenuate over the short distances at which measurements are made." The agency further says more recent experiments validate its recommendations.

The Commission says, however, that it is willing to meet the ARRL half way and go with 30 dB per decade, even though this could "increase the compliance burden for BPL equipment." The question is now open for public comment.

"We request comment on the suitability of an extrapolation factor lower than 40 dB per decade, as well as recommendations for how to test the technology," the FCC said. "Interested parties are invited to suggest alternative values for the extrapolation factor that would account for the variability of attenuation rates without unfairly burdening manufacturers of BPL equipment and systems."

The latest stance by the FCC is that there can be considerable variability in the attenuation of emissions from BPL systems across individual measurement sites resulting in the need for 30 dB.

"What is needed now," the ARRL commented "are good rules and industry standards. ... Rules that reflect the industry practice of not using the amateur bands and that specify state-of-the-art filtering could protect the Amateur Radio Service and support this still-nascent BPL industry. That is not seen in this FNPRM." A 30-day comment period was set; reply comments 15 days later.

The FCC's recently adopted definition of broadband speed "as a series of tiers, starting as low as 768 Kb/s is woefully inadequate to perform even current computing applications," the ARRL said. The League called for the elimination of tiers "at least for purposes of determining what broadband technologies should be funded with public funds."

### Guidelines for Broadband Funding Released

In early July, the NTIA and RUS released their long-awaited Notice of Funds Availability (NOFA). It contains the guidelines for dispensing \$7.2 billion in broadband economic stimulus funding. RUS money will go to unserved areas, while NTIA will fund both unserved and underserved areas.

Eligible applications will be evaluated and ranked based on a scoring system. The highest scoring applications will be

invited to participate in step two, which involves submitting additional documentation. The first funding round will give out \$4 billion; the remaining funds will be made available under subsequent NOFAs.

The NOFA contained several important definitions. These definitions will not necessarily carry through to the FCC's National Broadband Plan, but will be a "starting point."

- Broadband means providing two-way data transmission with speeds of at least 768 kilobits per second downstream and at least 200 Kbps upstream to end users. Higher speeds are encouraged and government officials will give applicants extra points for exceeding this speed.

- A Last Mile project provides broadband service to end users. A Middle Mile project does not provide broadband service to end users. Up to \$800 million is available for Middle Mile projects.

- Rural areas are located in (1) cities, towns, or incorporated areas with less than 20,000 inhabitants or (2) urbanized areas next to cities or towns with less than a population of 50,000. An unserved area is defined as one or more census blocks where at least 90 percent of households lack access to broadband service.

- Underserved Last Mile projects are in areas where (1) no more than 50 percent of the households have access to broadband; (2) no fixed or mobile broadband service provider offers broadband transmission speeds of at least three megabits per second downstream; or (3) The broadband subscriber rate is less than 40 percent of households.

All broadband project applicants must adhere to the principles contained in the FCC's Internet Policy Statement (FCC 05-151, adopted August 5, 2005) and written into the Communications Act by Congress.



That policy statement states that "Consumers are entitled (1) to access the lawful internet content of their choice, (2) to run applications and use services of their choice, (3) to connect their choice of legal devices that do not harm the network, and (4) to competition among network providers, application and service providers, and content providers."

The U.S. government plans to start handing out the money by the end of this year and must finish disbursement by September 30, 2010. All projects must be "substantially complete" by September 30, 2012.

Strangely, the broadband stimulus money will start flowing before the clear guidelines are nailed down. This has raised questions about whether the Obama administration has preconceived conclusions about the technologies it will support and whether it might end up spending taxpayer money on projects that are not needed.

## America Lags the Broadband World

Best estimates are that the United States currently ranks 14th in broadband household penetration, 22nd in average price per connection, and 24th in average advertised download speed. Japan and Korea are the world leaders in low-cost, high-speed broadband access. In Japan, the typical internet speed is 8 to 50 Mb/s, much faster than the U.S. Typical cost is from \$30 to \$60 per month.

Nearly half of all broadband connections in Japan and Korea are fast FTTH (fiber-to-the-home). With one third the U.S. population, Japan has more than twice as many homes connected to a fiber-optic network. In Japan, the average fiber-optic speed is up to 100 Mb/s with costs ranging from \$25 to \$56 per month. The Japanese government subsidizes the cost of FTTH by up to one third. Verizon, the only large U.S. provider of fiber-optic service (FiOS), accounts for less than 4 percent of all broadband connections at a higher cost.

## National Broadband Plan

Genachowski said that we can't sit back and wait for universal broadband to happen. "The sad reality is that we are slipping behind as a nation when it comes to broadband. The work ahead of us will not be easy. Our time is short." Congress set a timetable that requires the FCC to present Congress with the National Broadband Plan by February 17, 2010.

The broadband road map must detail the most effective and efficient ways to ensure affordable broadband access for all Americans. Also "How to use broadband to advance consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation, economic growth, and other national purposes."

It will be Blair Levin who will be coordinating the FCC's internet broadband strategy. Levin, an ex-FCC chief of staff, returned to the Commission in June. During the Clinton administration, Levin served as chief of staff to former FCC Chairman Reed Hundt. Interestingly, it was Levin who originally hired Genachowski for a position at the FCC back in the mid-1990s.

Blair Levin and Julius Genachowski were both technology advisors to President Obama during the presidential campaign and members of his transition team. Both helped shape the \$7.2 billion internet grant program that was passed as part of the massive \$787 billion economic stimulus bill.

The FCC will not be granting or loaning any of these funds. Instead, the money will be distributed by the Department of Commerce's NTIA (\$4.7 billion) and the Department of Agriculture's RUS (\$2.5 billion.) The money may only be used to bankroll broadband access projects to unserved and underserved areas.

As part of Obama's Recovery Act, the FCC was charged by Congress to come up with a strategy to make broadband accessible and affordable for all U.S. households. Levin's job is to oversee the agency's effort to craft a plan to blanket the country with high-speed internet access. At the FCC's first open meeting, Levin laid out the framework on how the National Broadband Plan will be developed.

## Universal Broadband Rollout Begins Taking Shape

The national broadband plan asks four questions: (1) What is the current state of broadband deployment, affordability, and other factors? (2) What is the near-term solution if there were no dramatic change in government policy? (3) What are the areas in which there are demonstrable harms to the public interest? and (4) What are the ways of lessening the public-interest harms?"

Levin noted that the FCC doesn't yet know the answers to any of these questions. The plan's framework will begin taking shape in September and will be pretty much developed by year-end. Needed information, input, and ideas will be gleaned from dozens of hearings, staff meetings and public workshops held in August.

Levin said he did not know what the National Broadband Plan will ultimately look like "but I can talk about the process. It will be guided by three principles: be open, be data driven, and deliver a plan, not a report." Levin promised that the plan will have specific recommendations.

One of the first steps toward developing the universal broadband plan was the beta launch of the <www.broadband.gov> website. It will allow the public to follow the process and eventually be able to display maps, consumer information and broadband resources.

Commissioner Michael Copps said that the FCC's "charge from Congress and the President to develop a national broadband plan is "...the biggest and most exciting challenge to come the Commission's way since the implementation of the 1996 Telecom Act, and probably ever."

He said he was "thoroughly impressed with the quality and quantity of [Levin's] forward-looking, strategic, data-driven" approach" and hoped that the plan "can make us the technology leader of the world again." Copps finished by saying that if you "enable broadband, then you enable the United States of America."

Commissioner Robert McDowell noted that increasingly, "the world's economy rides on the rails of broadband."

## Update: Five-Member FCC Now at Full Strength

On July 24, the Senate approved the nominations of Democrat Mignon Clyburn and Republican Meredith Attwell Baker to the two remaining commissioner slots on the FCC. Also approved was the appointment of Jonathan Adelstein to head up the USDA's Rural Utilities Service.

Clyburn has served as a South Carolina public utilities regulator since 1998. Baker was acting head of the National Telecommunications and Information Administration (NTIA) in the Bush White House.

73, Fred, W5YI



# Long Live the 6L6 - Part I

**F**all returns once again, bringing with it fond memories of those fading times when soft, glowing vacuum-tube gear warmed our shacks and filled our lives with excitement. Oh, the glitz, the glamour, the romance! Modern solid-state transceivers are nice—excellent performers for sure—but they just don't have the "real radio" personality of tube gear. Finding commercially made classics at affordable prices today has become a formidable challenge, so this month's column takes the alternate approach of highlighting some easy-to-homebrew delights from eras past.

Before jumping into our featured items, I must add a strict word of warning for newer amateurs and a word of "do it now" encouragement for old-pro amateurs. If you lack actual hands-on experience working with vacuum-tube transmitters and high voltages, do not start here unless you have a well-qualified old-pro guide by your side. High voltage and open-air circuits are very different from **and more dangerous** than 12-volt circuits in protective cabinets. If you are tube-savvy old-pro, also be careful. Shaky hands and "knowing better" but being forgetful can give the old ticker quite a jolt. However, don't become discouraged. Absolutely not! Tubes are becoming endangered. Several European countries are already close to disallowing publication of circuits using over 76 volts, and the U.S. is probably close behind. Have fun building and using tube gear while you can and before their beautiful circuits are banished from publication. That is what happened with spark transmitters, you



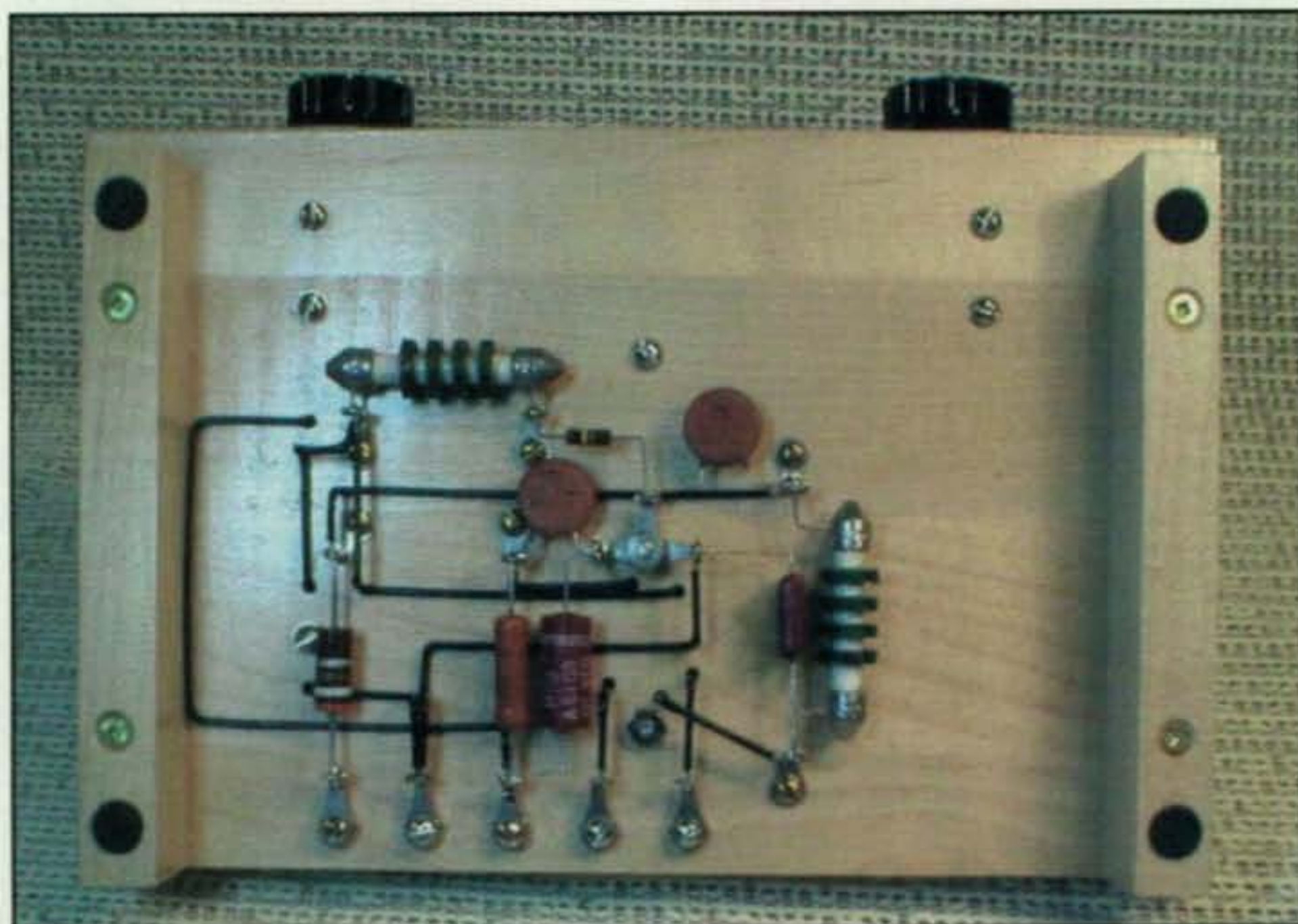
*Photo A— A late 1930s-style transmitter like this heartthrob built by Louis Vermond, VE3AWA, truly brings tears of joy to an old-pro amateur's eyes. The ST-100 tuning condensers, CIR tube sockets, and R-100 RFCs are from National. The round LD2-type crystal is a Bliley. The output standoffs are of E. F. Johnson manufacture. The coil form is an SWF-4 Hammarlund, and the dials are Millen-10009's. The rig pumps out 10 watts on 80 meters. Wow! (Photos A and B courtesy of VE3AWA)*

know. Now let's jump to the fun of revisiting the incomparable 6L6!

## Total Retro 6L6

From up Ontario way comes views and details of one of the most beautiful home-assembled 6L6 transmitters we have seen in many moons (photos A and B). Louis Vermond, VE3AWA, built this

\*3994 Long Leaf Drive, Gardendale, AL 35071  
e-mail: <k4twj@cq-amateur-radio.com>



*Photo B— Underside/wiring view of the VE3AWA 6L6 transmitter reveals perfectly formed wires and well-planned parts layout. Note the tube, coil form, etc., are mounted completely above the board and interconnecting wires route through small holes to below the board-mounted components.*



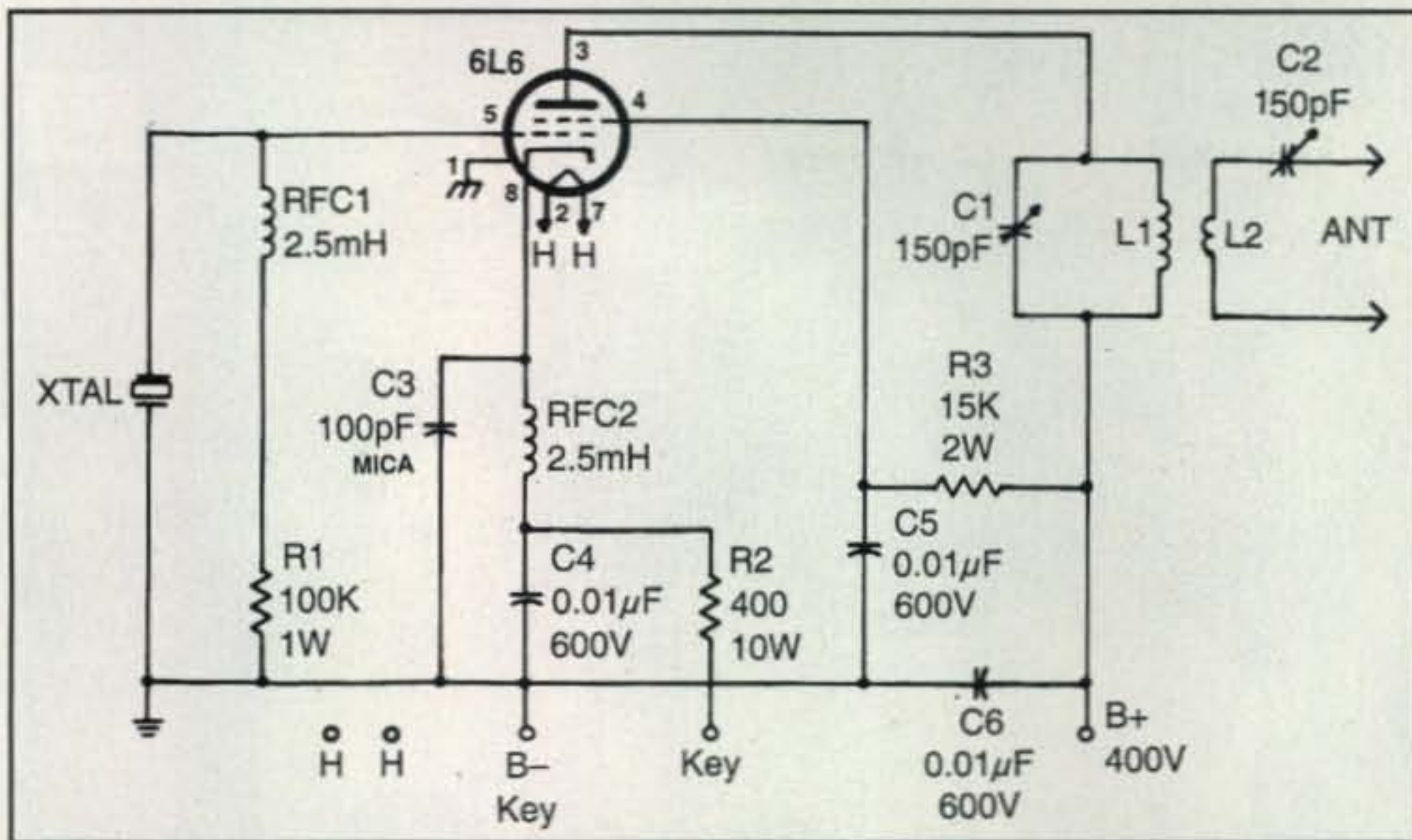


Fig. 1—Circuit diagram of the VE3AWA 6L6 transmitter is straightforward and conventional with two points of special interest. The antenna loading condenser in series with L2 and the series-fed plate circuit are both discussed in the text.

smooth-working showpiece after spending more than a year collecting its authentic-era parts, and his attention to fine detail is remarkable. Look at those knobs, those dials, that crystal, that big envelope 6L6. This is simple elegance at its golden best!

Technically speaking, the transmitter uses plug-in coils (and crystals) to operate 80, 40, or 160 meters and produces a nice 10-watt output signal. Its circuit is conventional but not "totally basic" (fig. 1). I say that because one or both RFCs are often eliminated/replaced with a straight piece of wire, and the 400-ohm cathode-to-key resistor is often replaced with a 200-ohm resistor in 6L6 circuits using approximately 300 volts on the plate. Also, the variable condenser connected in series with antenna pickup coil L2 permits increasing antenna loading "pi-net style" rather than just tuning variable plate condenser C1 for maximum output and accepting the results.

Some readers may be asking if a 6V6 or even a 6F6 can be substituted for a 6L6 (or 6L6G, 6L6GT) in this circuit, and the answer is yes, but we compare that to having a gold medal bronzed. Both tubes are slightly smaller and deliver slightly less output than a "big bottle" 6L6, but we understand 6V6s are less expensive and 6F6s are exceptionally good looking.

Would you like to homebrew a copy of this transmitter? The parts layout and wire routing scheme shown in photos A and B should prove helpful. The tuning capacitors may be 100 or 150 mmFd—that's 100- or 150-pFd items in modern terms, and regular FT243 (or even metal-cased HC-8) crystals may be used. The plate coil/L1 and antenna coil/L2 are wound on a form 1.5 inches in diameter or 2 or 3 inches tall. L1 is 49 turns of No. 22 enamel-coated wire for 160 meters, 28 turns of the same wire for 80 meters, and/or 18 turns of No. 18 E.C.W. for 40 meters. I have not tried it

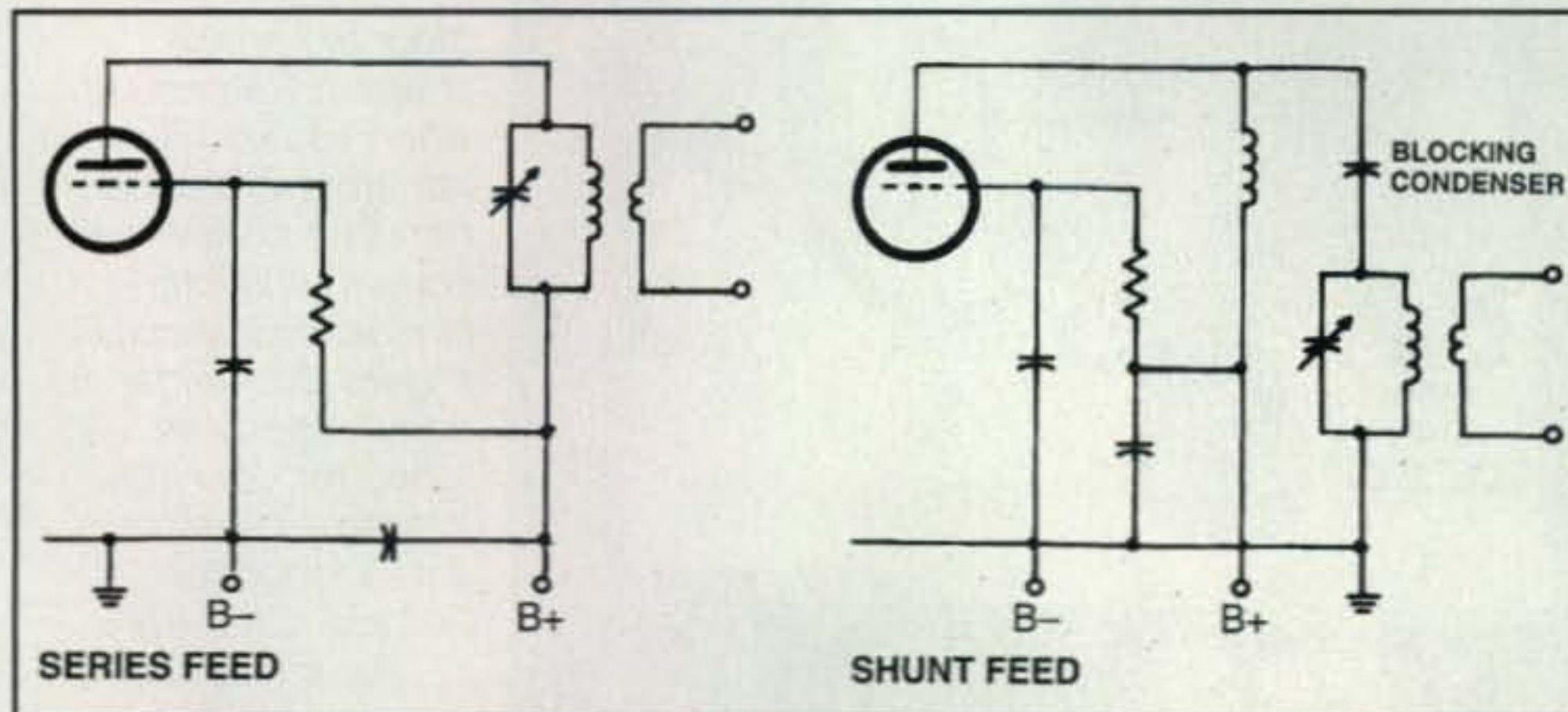


Fig. 2—Comparison of series- and shunt-fed plate/tank circuits as discussed in the text.



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Photo C— Reuben (Ben) Staff, KB5ZO, went all out, homebuilding his two-tube transmitter (6AG7 driving a big 6L6) on a metal chassis. The little gem has plug-in coils that mate with dual crystal sockets, and it pumps out 14 watts on 40 meters or 22 watts on 80 meters. Note the use of a pilot lamp in lieu of a plate current meter. Here you tune for minimum lamp brightness. Total class! (Photos C, D, E, and F courtesy of KB5ZO)

(yet!), but will estimate a coil of 11 or 12 turns of (No. 18) wire would also work for the low-power-favoring band of 30 meters. All plate coils are evenly spaced to a length/height of 1.5 inches. Antenna coil/L2 is 20 turns of No. 28 E.C.W. close wound and positioned at the "B+ end" of L1. Louis says that works for all bands, but some dinking with coil

turns may be necessary if an antenna other than a coax-fed dipole is used.

Tune-up and operation of the 6L6 transmitter is a cinch. Allow 3 or 4 minutes for the tube to warm up (especially if it has been "sleeping" for several years), and then close the key and quickly tune the plate/tank condenser C1 for maximum output as indicated on an in-



Photo D— Look closely and admire this top view of the KB5ZO 6AG7/6L6 transmitter, as it has an honest-to-goodness and rapidly fading from existence power transformer mounted on the chassis. Remember when you estimated a transformer's current-handling abilities by fingers? If center laminations were two fingers thick/wide, the transformer was "good for" 200 ma: if three fingers wide, it was "good for" 300 ma. Oh the joy . . . the memories!



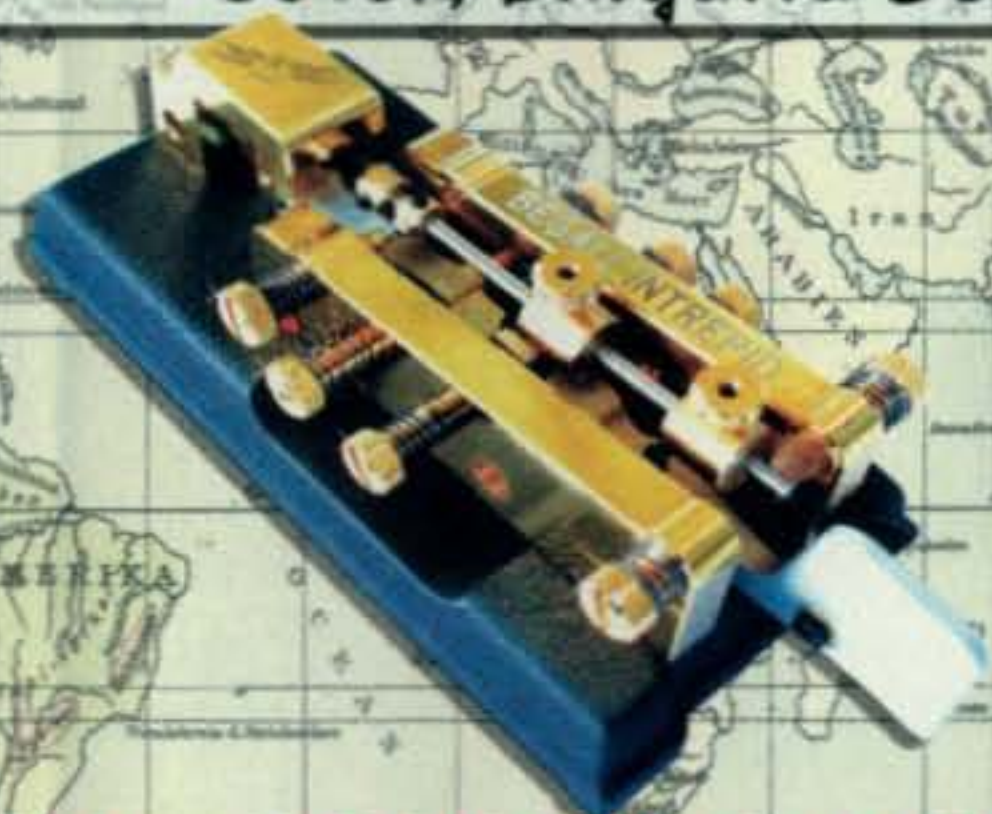


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Photo E- Here's the full KB5ZO vintage station complete with the ever-popular R. L. Drake 2B receiver, homebrewed Doerle twinplex regenerative receiver, and a few extra crystals for the transmitter. It is all tucked in a cove in Ben's 1883 Victorian house in Aberdeen, Mississippi, where a number of older homes are occasionally put on tour, so it must always look prim and proper.

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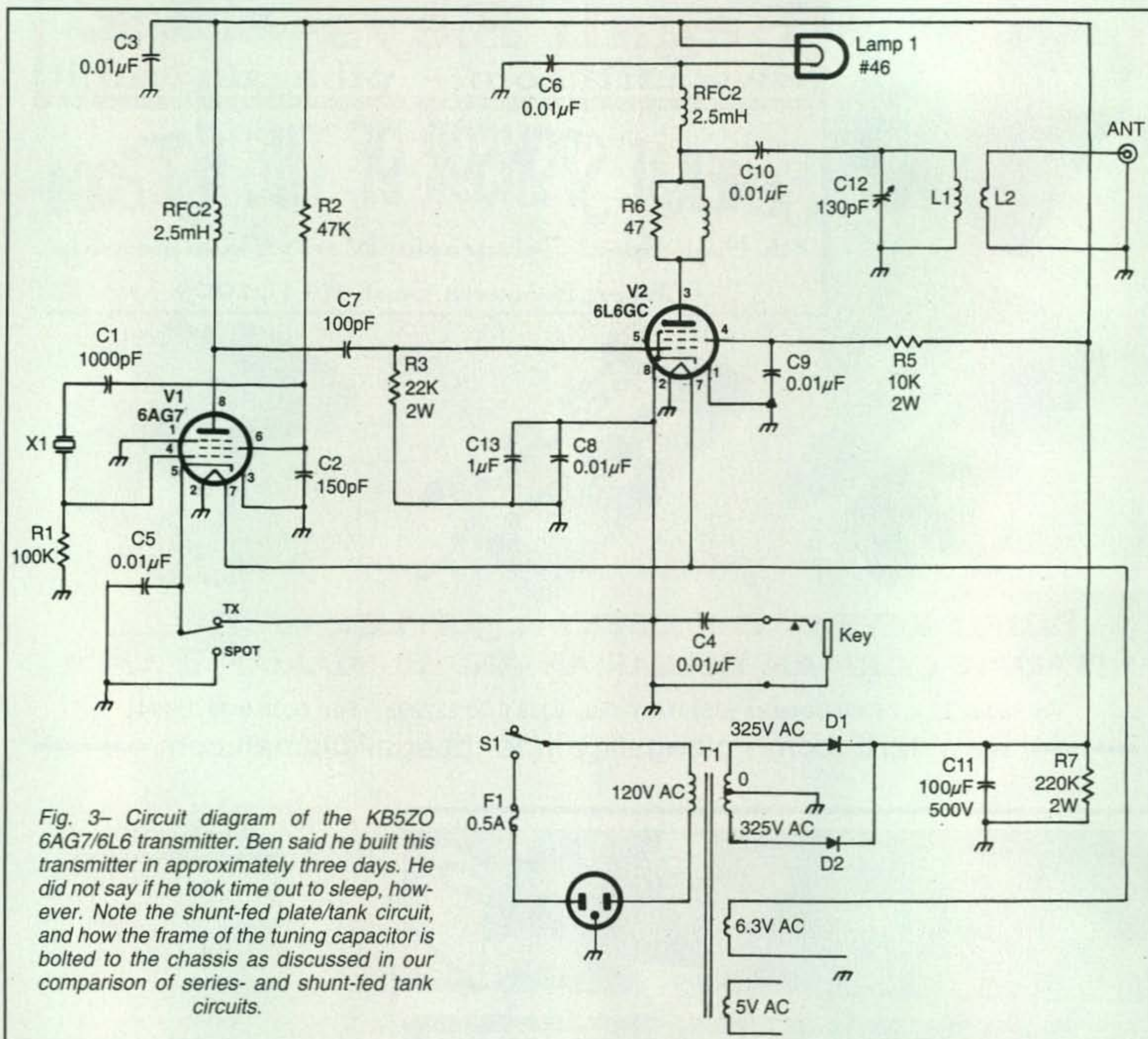


Fig. 3— Circuit diagram of the KB5ZO 6AG7/6L6 transmitter. Ben said he built this transmitter in approximately three days. He did not say if he took time out to sleep, however. Note the shunt-fed plate/tank circuit, and how the frame of the tuning capacitor is bolted to the chassis as discussed in our comparison of series- and shunt-fed tank circuits.

line SWR bridge or wattmeter. If output is low, increase antenna-loading condenser C1 from fully meshed while retuning C1 for maximum output. Monitor signal quality on your receiver (without an antenna connected), and tweak final settings of C1 and C2 for the strongest signal consistent with the best sounding tone. Finally, consider using a plastic-cased key/bug or a keying relay to minimize shock hazard should your hand accidentally fall across the key. We knew to watch that during the "good old days," but modern 12-volt power supplies (and age) tend to make us a bit lax.

Our thanks to Louis, VE3AWA, for sharing views of his 6L6 rig, and Louis welcomes correspondence from others who are building old-time tube gear. You can reach him via e-mail at: <ve3awa@sympatico.ca> or snail-mail

P.O. Box 543, St. Mary's, Ontario, N4X 1B3 Canada.

Some 6L6 circuits, incidentally, employ a shunt-fed rather than a series-fed tank circuit (fig. 2). The VE3AWA transmitter is built on a wood baseboard, and that makes series feed both logical and cost-effective. What's the difference? Series feed means the tube's plate and tank circuit are connected in series with B+ and all the high voltage goes through the tank coil. Shunt feed means the tube's tank circuit and the high voltage are connected in shunt or parallel so high voltage does not go through the tank coil. An added RFC and "blocking condenser" act like electronic "traffic cops" here. The RFC connects B+ to the tube while "choking out" RF so it does not go through the wire routed to B+ and the

power supply. That's the RFC's purpose—passing DC (high voltage) while choking out AC (RF). Simultaneously, the blocking capacitor blocks high voltage from the tank circuit while passing RF to the tank circuit.

Both series and shunt feeds are similar in performance and efficiency, but notice the "bottom" part of the plate condenser C1 is connected to B+ with series feed. If this condenser is mounted on a wood board, there is no problem. If C1 is mounted/bolted to a metal chassis, however, it will short-circuit B+ to (chassis) ground. Kaboom and Yow! You might insulate C1 from the chassis, but if you accidentally touch the capacitor and chassis you can be fried by high voltage (do you feel lucky, kid?). Series feed is easy to implement and cost-effective, just like using a wood base for





Photo F—Homebrewing vintage gear inspired Ben, KB5ZO, to try his hand at key making, and here is the result. This smart-looking critter even matches the wood paneling in his ham shack. Cool!

a transmitter is cost-effective. Shunt feed is a bit more difficult to implement, but it is necessary when using a metal chassis. On the other hand, shunt feed is occasionally used with wood-base transmitters simply because RFCs and blocking capacitors exhibit too much “real radio” glamour to overlook. We are sure you agree.

### Reuben's Romper

After quickly homebrewing a conventional one-tube transmitter to use with his Drake 2B receiver (another timeless classic!), Reuben (Ben) Stapp, KB5ZO, elected to go big time by assembling the 6AG7/6L6 transmitter in photos C, D, and E. This '50s-style transmitter reminds us of a homebrew equivalent of Heathkit's famous AT-1, except the AT-1 had a stack of switch-selected coils for multiband operation and a (wildly banging) iron vane meter in lieu of a pilot lamp for tune-up purpose. Ben's version includes a transmit-frequency “spot” switch for turning on just the oscillator, which was not included in an AT-1, and Ben says it also outputs a 14-watt signal on 40 meters or a whopping 22 watts on 80 meters.

My dear old AT-1 (1957) was doing good when it pumped out 5 watts on 40 meters—and that was using a nice, new, big-envelope 6L6 (discreetly swapped three times with the one in our family's floor-model Zenith radio. They never had a clue even when I diagnosed the radio's distorted sound was because it needed a new 6L6—three times!). Five watts proved a good match for my Hallicrafters S-38, however: it was half deaf and broad as a barn door.

The combo also taught me how the

operator rather than the rig makes the big difference: how to concentrate on only one signal and ignore other near-frequency signals and how to mentally fill in lost copy obliterated by occasional ear-splitting QRM. The big challenge was finding signals again when our refrigerator switched on. With luck and memory of words, I could do it before the other op assumed I had croaked or been fried by high voltage and gave up listening for me. Fortunately, the old-time setup at KB5ZO is noticeably better.

Would you like to home-assemble your own 6AG7/6L6 transmitter? Most component/values shown in fig. 3 should be self-explanatory, but some clarifications are helpful. Plate-tank coil L1 consists of 17 turns of No. 18 solid insulated wire (for 40 meters) wound on a 1.25-inch diameter pill bottle. Its mating antenna coil is five turns of similar wire on the same form. The power supply (325-volt transformer with capacitor-input filter) develops close to 350 volts output for the tubes. A 100-ma meter could be substituted for the No. 46 pilot lamp. Parasitic suppressor R6 is made by winding two turns of solid wire over a 2-watt/47-ohm resistor. Build, dink, and enjoy!

### Conclusion

That overflows available column space for this time, friends, but watch for more easy-brew, fun projects coming in Part II next month. Also watch for my January 2010 “How It Works” column on finding and refurbishing tube-type receivers to complement your homebrew transmitter(s). We are having a ball, and we want you to join the party.

73, Dave, K4TWJ

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## A Field Day "Special Event" plus Some Unsung Heroes

**F**ield Day 2009 found me with at least three other hams playing among the multitude of signals making their way across the sky. What made this a bit unusual is that I was traveling with three other family members (all hams) and about 150 others aboard a transcon flight from Atlanta to Los Angeles at about 37,000 feet. It was the first Field Day I had not actively participated in for over a decade, yet I took some pleasure in imagining the many signals flying all about me, perhaps some of them reflecting off the metal surfaces of the fuselage and wings as we provided a bit of a reflector for the "fly-over states." I would have loved to be making some contacts from that lofty perch, but as we all know, transmitting from a commercial aircraft is not an allowed activity for commercial airline passengers.

Like many CQ readers, I have had a number of interesting Field Day experiences, spending a few transmitting from the beautiful Malibu shoreline. At least two were spent doing mobile operations due to travel obligations, one at a campsite where we were jolted awake Sunday morning by a significant earthquake, and of course we've experienced our

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Photo A— K6MDY and N6MGM make a "permanent" Field Day contact, with KG6AJF presiding. (Thanks to N6MGM for providing the photo)

share of the usual Field Day accomplishments and "klunks" that make for good story-telling when relaxing among friends.

One such friend has a Field Day 2009 story that will be hard to "top." Mark Moore, N6MGM, is known to many amateur radio operators because he works at one of the "candy stores" that sell ham gear. Mark's an interesting person on many levels, but on Field Day, one could say he truly "made the commitment." This year, he took a brief break from the on-the-air activities and married Amanda Moore (nee Guthrie), K6MDY. Leighann Bisby (daughter) gave the bride away; Elayna Bisby (daughter) gave away the groom. The Best Men were Leon Brown, KC6JAR, and Joe Mata, and just to be sure everything was 5 by 9 with "The Big Communicator in the Sky" (and the State of California), the Reverend Lowell Mostyn, KG6AJF, conducted the ceremony (see photo A).

By the way, I'm told that after the ceremony, "normal" Field Day activities resumed. Hey folks, I don't make this stuff up, I'm just the reporter. I wonder if the ARRL awards any bonus points in Field Day scores for getting hitched during contest hours? Congratulations to Mark and Amanda, who during Field Day weekend changed their greetings for one another from 73s to 88s!

### A Double-Take

Speaking of flying, I received a cute birthday card from the thoughtful folks at Southwest Airlines. At first I thought they were prying into my profile as a ham. The front of the card read, "Hotel Alpha Papa Papa Yankee Bravo India Romeo Tango Hotel Delta Alpha Yankee." Very clever, even if they had to swallow hard with that "Delta" in there!

### Glad to Offer Guidance

Along with everyone else, I was recently asked my opinion about a national coverage plan. My response was that it's probably a good thing for those out-of-production radios, in that parts and service are probably getting more difficult to find (photo B). I'm not quite sure how other radio brands might fare, with perhaps the exception of some private party stepping up with a health kit for my Heathkit.

### Some Unsung Heroes

To get serious for a few moments, let's devote some kind thoughts to talented folks who share ham radio as a pastime and mix it with their profession, which is law. At a recent hamfest held at the Southwestern Division Convention in Santa Barbara, California, I attended a forum conducted by Chris Imlay, W3KD, who acts as the ARRL's General Counsel. Whether or not you're a League member, you benefit from his work and from the labors of the many volunteer counsels who donate their services to protect our ability to operate. This point was driven home through a case now being handled by Volunteer



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Photo B- Would an extended warranty for this equipment qualify as national coverage? (AA6JR photo)

Counsel Leonard (Len) Shaffer, WA6QHD, which could have far-reaching implications for hams in California (the most populous state for licensees) with possible "spillover" effects for other states as well.

Like many law stories, the case revolves around a complex set of issues, but to be brief, it centers on actions taken by the City of Palmdale, California that first approved, then rescinded permission for a ham in that city to have an antenna structure. Len was instrumental in winning the first round by getting a judge to decide the case in favor of the ham. At the forum, we were informed that the city has appealed, but the outlook is cautiously optimistic for the decision to be upheld. Watch for updates on this important story. During the convention, Len was appropriately named the Southwest Division's Volunteer of the Year.

General Counsel Imlay also shared the great detail that has been applied to the FCC's handling (or mishandling) of information pertaining to the implementation of Broadband over Power Lines (BPL). Unlike the television shows *Boston Legal*, *Perry Mason*, and *Law and Order*, "lawyering" is not always fun. Quite the opposite; It can be mind-numbing and tedious. It requires sharp attention to just about every word, phrase (many in Latin), and punctuation mark, and the arcane rules pertaining to filings, sharing information, and the like. Chris reported that technical information withheld by the FCC would have likely resulted in that agency coming to a different approach in its handling of BPL regulatory issues. He said additional developments will unfold in this ongoing story. The implementation of BPL in certain locations brought with it interference on several bands, prominent among them HF frequencies.

Whereas (to use a law term) we hams are governed and regulated by a federal agency, it makes sense to me that amateur radio needs top-notch legal talent to make sure that rules, regulations, and other actions are conducted fairly. However, talent costs money, and most law firms are not low-priced nor charitable operations. They have expenses, too. It was gratifying to hear that Len received financial support from several clubs. Even with his volunteerism, there are hard costs for filings, reports, expenses incurred for depositions and the like.

While there's no end to lawyer jokes or anecdotes, every now and then everyone needs good legal help. Send some good thoughts, or if you can, some support their way. At a future club meeting, consider asking one of your local volunteer counsels to make a presentation on his or her efforts to help us all keep the ability to enjoy the "Magic In The Sky."

73, Jeff, AA6JR



## A Beginner's Look at Vertical Antennas

This month we are taking a quick look at the vertical antenna for the high-frequency (HF, 30 MHz and below) bands. This subject came up as a side topic as one of my old ham-friends talked about the hopefully good low-band radio conditions coming up due to the swing into the "good area" of the 11-year sunspot cycle. As always, I think about material for this column, and how these things affect ham radio newcomers. Likewise, my friend Dennis Kidder, W6DQ, always encourages new licensees to look at alternatives to HTs or mobile FM rigs and encourages people to get on the lower bands.

Since Novice and Technician class licensees have privileges in the General Class CW segments in the low (HF) bands at 80, 40, 15, and 10 meters, as well as a small segment of SSB phone on 10 meters, this new propagation aspect should generate some excitement and interest for the Novice and Technician crowd. These bands are

full of new operating opportunities beyond the inter-city FM and repeater contacts most new hams experience.

Some of my more cynical ham friends say the vertical antenna "receives and transmits equally poorly in all directions." This statement refers to one of the main attributes of the vertical antenna: It has neither gain nor directionality. Please note that this statement is not always true, since there are different types of vertical antennas and vertical antenna arrays, including some versions with gain and/or directionality. Let's focus on the good things vertical antennas can do and what to look for as you decide if a vertical is suitable for your station.

### The Good Vertical Antenna

Verticals are among the category of "low profile" antennas, even though they may be many feet in height. Their small diameter allows them to have a smaller impact in a visual sense and does not require a large amount of space. They are fairly easy to install, usually requiring only a piece of pipe or a short mast to support the structure, and

\*c/o CQ magazine  
e-mail: <kh6wz@cq-amateur-radio.com>



← Photos A & B— Some examples of traps used in antennas. These are usually made of coils of wire and capacitors of some type. ↓







Photo C— An HF vertical floating on top of a seawater ground plane may be achievable by some people. For others, like me, it would take a substantial amount of lottery winnings to get there.

there is no need for a tower, as the "supporting structure" is the antenna itself. Also, in many instances there may be no other type of antenna that would fit in your location.

### Basics and Numbers

A vertical antenna is just like it sounds. It is a radiating element with vertical polarization. Think of the vertical antenna as a horizontal dipole turned 90 degrees in space. Although the dipole feed point (the place where the feedline from the rig connects to the antenna) is in the center, most vertical antennas are fed at the bottom.

Vertical antennas come in several variations, both electrically and physically. When you have a moment, take a look at the many commercially-made vertical antennas available today. Many have very creative construction configurations and materials.

The quarter-wave vertical is actually a half-wave antenna. This may sound confusing, but here is a brief explanation: The "quarter-wave" part refers to the radiating element of the antenna, which is one-fourth of a wavelength. The second of two elements in the quarter-wave antenna is the ground system, and this can be either a metallic surface, usually some wires, or can be the earth ground. The ground elements are called *radials*. These radials are also called

the *ground plane* and are the same length as the radiating element, or one-quarter wavelength. Therefore, the total length is one-half wavelength. I am sure you recall the formula for calculating a half-wave dipole from your FCC exam:

$$\text{Length in feet, half wavelength dipole} = 468/\text{MHz}$$

Cut that number in half and you have one quarter wavelength (234/MHz).

For the 10-meter Novice/Tech band, this length is 8 feet, and for 40 meters the length is about 33 feet. These calculations should be considered starting points. When you actually build a real vertical antenna, the actual lengths will vary.

As another example, an end-fed, half-wavelength longwire antenna is a horizontal wire, with its feedpoint at one end, connected to a matching network. The matching network is a circuit made with coils (inductors) and capacitors that will match the 50-ohm feedline to the antenna. Now if we take this horizontal longwire and turn it 90 degrees in space, once again we create a vertical antenna.

But wait! Just about all vertical antennas, especially multiple-band versions, are much shorter than this calculated length. This is because it is so much nicer to have a short antenna, which can simplify installation and is usually called

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### Looking Ahead in CQ

Here are some of the articles we're working on for upcoming issues of CQ:

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- The Ham Radio Twilight Zone, by Derek Yungling, K7FF
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a "selling point" of an antenna for most manufacturers. However, how is this done?

The answer is the use of something called a *trap* (see photos A and B). Think of a trap as an automatic switch that can either turn on an added electrical length of antenna to make the operating frequency of the antenna go down, or turn off or remove a section of wire to make the operating frequency go up.

## Practical Considerations

The main issue with any antenna (not just the vertical) is its practical construction. Because antennas can become very large as frequency goes down, the antenna must be robust enough to keep its shape and maintain its length, and survive harsh weather conditions such as snow, ice, wind, and rain.

Going back to the description of the vertical antenna and its ground system, the optimum ground radial system would be a solid-metal plate, the same diameter as the radiating element, or one-quarter-wavelength long, on top of the ground just below the antenna. As mentioned above, this is about 8 feet for the 10-meter band and 33 feet for the 40-meter band. Not too practical for most of us. On the VHF and above bands, a solid-metal ground system is fairly easy to accomplish, and almost all VHF mobile antennas use the vehicle body as the ground system. However, we are examining HF antennas here, and we must come up with some practical solution that works. The HF ground radial system is usually made of wire, each a quarter wavelength long. The usual question here is "How many radials are needed?" The practical answer is that you must put as many as you can fit,

or afford, in your installation. When it comes to ground radials for vertical antennas, more is always better. Remember, we want to duplicate that solid-metal plate.

There is another ground system that may be considered ideal, and that is the saltwater ground (photo C). This is an open space, and conductivity is excellent. A good friend of mine had an all-band HF vertical antenna installed at the end of his dock, and he could contact hundreds of stations all over the world with that antenna setup. He connected the ocean ground system to his station via a length of anchor chain.

Ground systems for vertical antennas are also documented in many places over many decades. You might want to do some further research on this topic, and check the web pages mentioned above to get you started. Perhaps, though, the best thing to do is to actually install a vertical antenna and see how it "plays" in your station. Do some experiments on ground systems, and see what improvements you can make.

## What's Out There: Commercial Verticals

Although vertical antennas make very good home-construction projects, there are many reasons to get a store-bought vertical. The first reason is that the most popular ones have been in production for many years, and many are installed and are being used every day by hams worldwide. A second reason a store-bought antenna would be an advantage is the materials and the construction methods used to make the assembly. Hardware-store plumbing parts are often poor substitutes for "real" antenna manufacturers' components.

In any case, even a commercial antenna is a construction project, since the antenna will come to you in a box full of aluminum parts and other hardware!

As you shop for an antenna, try to examine the components and how the pieces fit together. Usually, the best way to do this is to ask your ham friends or your favorite ham radio salesperson if they are using an HF vertical antenna. Ask them about its performance and how the assembly and tuning process went. Check the product reviews in *CQ* as well as the online sources such as eHam.net.

Often in the end the vertical antenna one finally selects depends on price and available room for the installation. And I must also add that the performance of the vertical antenna is often enhanced by the location. Having a vertical antenna floating on top of a seawater ground plane might just be the ticket, if I win the big lottery (see Photo C).

73, Wayne, KH6WZ

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- (2) Find the *WorldRadio Online* logo to the left of the *CQ* magazine covers. Click on it. This will take you to the *WRO Welcome*

Page, where you will have several options. There are links to a variety of informational pages. We recommend that you read the "Viewing and Downloading Tips" before doing anything else. The Back Issues link will take you to previous issues (beginning 2/09) to download and view.

**Enjoy!**

## Some Sources of HF Vertical Antennas

Cushcraft Amateur Radio Antennas (owned by MFJ Enterprises): <http://www.cushcraftamateur.com>  
Force 12: <http://force12inc.com>  
Hy-Gain: <http://www.hy-gain.com>  
Bencher, Inc.: <http://www.bencher.com>  
SteppIR: <http://www.steppir.com>  
MFJ Enterprises: <http://www.mfjenterprises.com>

## Useful Web Pages

An excellent electronics and ham radio website by Ian C. Purdie, VK2TIP: <http://www.electronics-tutorials.com/antennas/antenna-basics.htm>

A technical look at ground radial systems can be found here:  
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<http://www.bencher.com/pdfs/00803ZZV.pdf>  
<http://www.steppir.com/pdf/radial%20systems%20for%20vertical%20antennas.pdf>



# Rigs, Keys, and Fly Specks

BY DAVE INGRAM, K4TWJ

qrp

If there is one lesson a QRPer learns on short notice, it is high power is not always necessary for good-time hamming. Might that be sheer hype? No, it is proven on the air every day.

One of many examples for doubting onlookers comes from Jerry, VE3ACA. He recently answered one of my CQs on 30 meters and his signal was S2 but fully readable, so I asked if he might be running QRP. Jerry responded with yes, he was running 500 mw (that's a mere half-watt, friends) with a Yaesu FT-817 (what a popular QRP rig!). Later in our QSO, Jerry stepped up to 2 watts and 5 watts, and his signal strength increased accordingly. Near the end of our QSO, Jerry changed to his "big rig" running 90 watts, and his signal kicked up to slightly above S9. Referencing my transceiver's S-meter and S-units by its built-in 10- and 20-dB attenuators convinced me that Jerry's statements of running 500 mw were indeed true and honest.

Two days later, and by sheer luck, I heard VE3ACA calling CQ (again on the QRP-favored band of 30 meters). The band was not crowded and his signal seemed stronger than before, so I asked if I would be correct in assuming he was run-

ning 50 watts. Jerry replied no, that he was again running only 500 mw. What else can we say except "QRP Romps!" Yes, you have read those words here before, too. It is the title of my all-new book. Perhaps you saw the full announcement in our past QRP column, or read the full details at <www.k4twj.blogspot.com>. The book is available direct from my house to yours and from amateur radio dealers nationwide. Check it out!

I now I sense our solder-sniffing colleagues asking for more rig views, so let's shift the focus.

## Zimmer's Zinger

Elecraft's KX-1 continues to reign high in popularity among kit-building QRPer and with good reason. It is quite small (3"H x 5"W x 1"D), has a number of "big rig" features, and pumps out a clean 4- or 5-watt signal (2 watts with internal AA batteries). Proud owners are always finding unique ways to custom-tailor their KX-1, and Bob Zimmer, NV1X, is an example of that fact in high style (photos A and B). After making enough in-shack QSOs to confirm the little transceiver was working smoothly, he installed it plus some "extras" in a wood 7.5"H x 7"W x 4.5"D) cigar box obtained from a local tobacco shop. He then added a 12-volt 1.2-amp/hour battery (behind the KX-1), a right-angle bug from <www.vizkey.com>, a solar panel for charging the battery, and a meter for reading voltage. The result is a fully self-contained HF station ready for "grab and go" use anywhere and at any time. Look closely and you will see Bob complemented his KX-1 with a new set of knobs—and the solid-aluminum tuning knob truly adds a touch of

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Photo A— This all-in-one-box QRP station assembled by Bob Zimmer, NV1X, truly deserves a second look. It consists of an Elecraft KX-1 transceiver fitted with custom knobs, a 12-volt/1.2-amp/hour battery, K4VIZ right-angle bug and battery monitor meter in a fancy wood cigar box. Nice! (Photos A & B courtesy of NV1X)

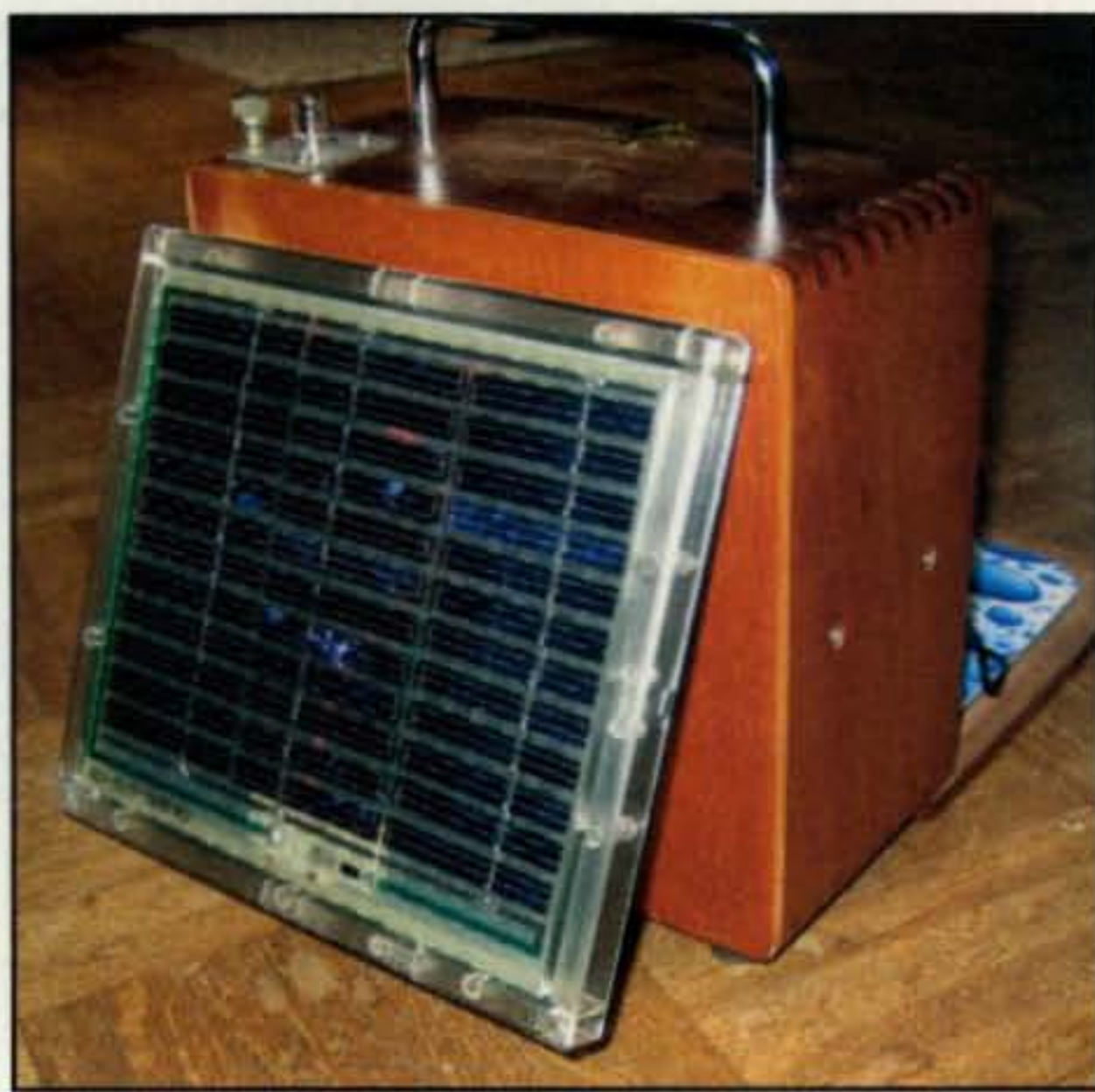


Photo B— Here is the NV1X "cigar-box station" ready for traveling and battery recharging with its pint-size solar panel. This setup is so energy efficient it should be painted green!



class. The KX-1's optical coupler with push switch was slightly awkward, so Bob added a small micro switch to the KX-1's side for changing tuning rates. Classy little gem, isn't it?

## World QRP Day

Did you remember our June's column encouragement to get on the air and make some good QRP QSOs during World QRP Day on June 17th? In my opinion, the event was "comfortably small" (like QRP) and pleasantly successfully (it was an operating event, not a contest, per se). Things looked good right from the start, as my first CQ of the day (0200 UTC on 7.040 MHz) was answered by Curtis, 8P6CF, in Barbados. Static crashes were vicious, but the (approximately 7-minute) QSO was a winner. A bit later, I contacted Zedeno, OK1MBZ, on (quiet and clear as a bell) 30 meters; Aaron, N9SKN, plus several other U.S. stations; and I also missed contacting a low-power JA on 20 meters (unfavorable propagation, you know). How did you fare? Drop me a short note on your activity and add a photo of you and your setup for possible inclusion in a future column. Together we can make this a big annual event.

In looking back on World QRP Day overall, I must say it truly proved low

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Photo C— This is the new Bushwhacker sideswiper/single-lever paddle kit as received from W6AME of <www.americanmorse.com> laid out and ready for assembly. All parts are precisely finished and polished, so all you do is screw everything together and make final adjustments to fit your preference.

power can and does "reach out" admirably. That makes sense, as a 5-watt signal is only 13 dB, or roughly four S-units (worst case example), below a 100-watt signal. Assuming the distant operator's rig registers 3 dB per S-unit (some register 3; some register 6) and a 100-watt signal typically registers around S8, the 5-watt signal is S4.

Assuming a relatively clear frequency, I also find an S4 signal almost as comfortable to copy as an S8 signal. The AGC systems in modern transceivers work miracles in equalizing signal strengths here. In fact, I would say most operators would be hard-pressed to note the difference between S4 and S8 signals if the frequency was fairly clear



Photo D— Twenty or thirty minutes later the Bushwhacker is slightly over half assembled. The mechanism (all those loose parts you see) will be protected by the gold anodized aluminum frame. The fingerpiece is approximately .75 inch by .75 inch, with center area 1.5 inch above the desk when mounted on the optional .5-inch thick base.





Photo E— Here is the fully assembled and fine-adjusted Bushwhacker paddle (with a couple of guitar-pick fingerpieces I added for flash and class) in operation with my Yaesu FT-817 during World QRP Day. The little Bushwhacker looks and handles quite well. It is not in the Begali or N3ZN class, but neither is its price. More details in the text.

and the rig's S-meter was not visible. Maybe I should say it one more time: QRP Romps!

### New QRP Paddle

The previously mentioned World QRP Day proved an ideal opportunity for

giving my new "Bushwhacker" kit sideswiper/single-lever paddle from Doug Hauff, W6AME, of <www.americanmorse.com> a hardy fun run and workout (photos C, D, and E). The little gem handled like a champ with pleasant action and a good feel. This is unquestionably Doug's best produced

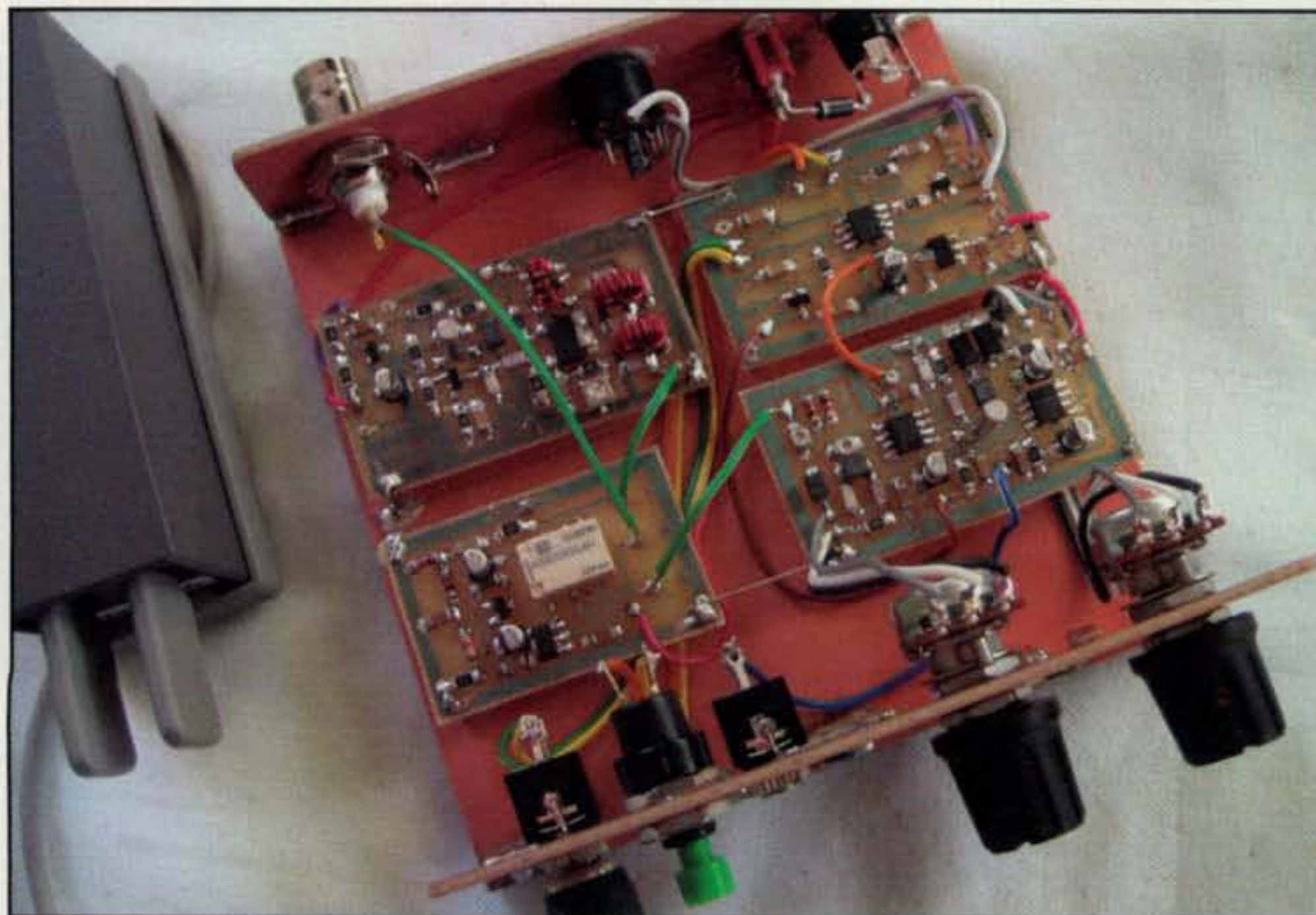


Photo F— The future of homebrew? This all-surface-mount or fly-speck-infested trans-receiver was built by Chuck Carpenter, W5USJ, using a high-power magnifier, needlepoint soldering iron, and stable hand. It runs on 12 volts and pumps out 600 mw on 40 meters. (Photos F, G, H, and I courtesy of W5USJ)

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# SMT 4-Piece Component Transceiver

W5USJ 17 Apr 09

Active Voltages and Signals Shown -- Grounds Implied.

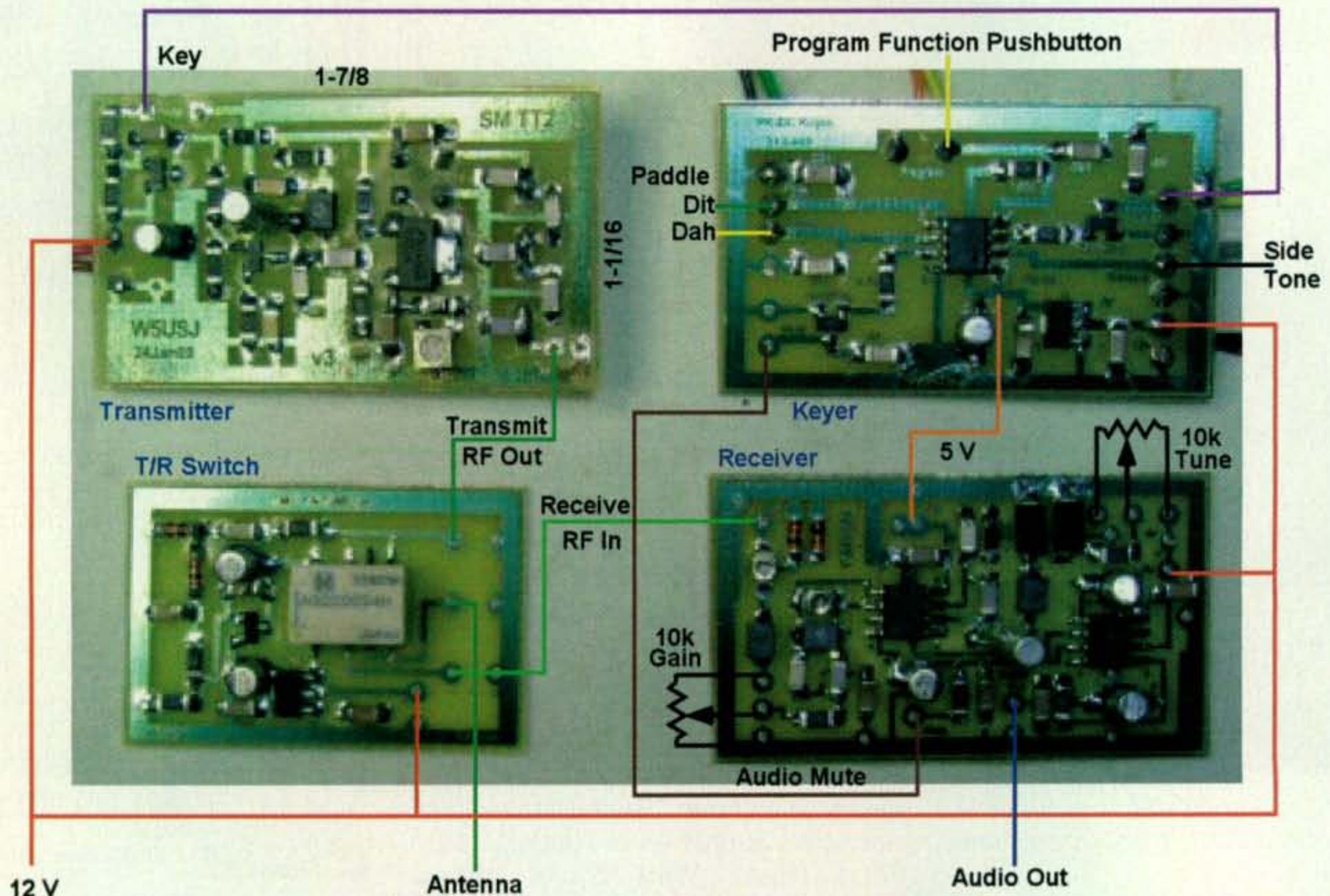


Photo G— A more detailed look at the four modules that comprise the W5USJ trans-receiver reveals a beefed up Tuna Tin 2 transmitter, modified MRX receiver, Jackson Harbor keyer, and custom T/R board similar to that used in the “Tuna Topper” kit from <[www.qrpme.com](http://www.qrpme.com)>. Chuck also etched his own circuit boards.

key kit to date. Understand that it may not be in the Begali or N3ZN class, but neither is its cost. A single-lever paddle is especially helpful for operators who have problems with arthritis or stiff fingers. I say that because uncontrolled fingers may accidentally activate dual levers simultaneously, but a single-lever paddle can move only one way at a time. Operators with nimble fingers can also have some extra fun with a single-lever paddle by adding a stereo-to-mono adapter plug between it and their rig (switched from keyer to straight key function), then using it sideswiper style. As I always say, it's the keys that make CW (and QRP) so incredibly enjoyable, and the Bushwhacker is a good example of that fact.

Does home-assembling your own paddle from a kit hold good merit? Yes, absolutely! Furthermore, nothing compares to operating QRP while using a great-looking paddle assembled by your own hands. Is the process difficult? No. Doug's attention to fine details (such as inclusion of three hex wrench-

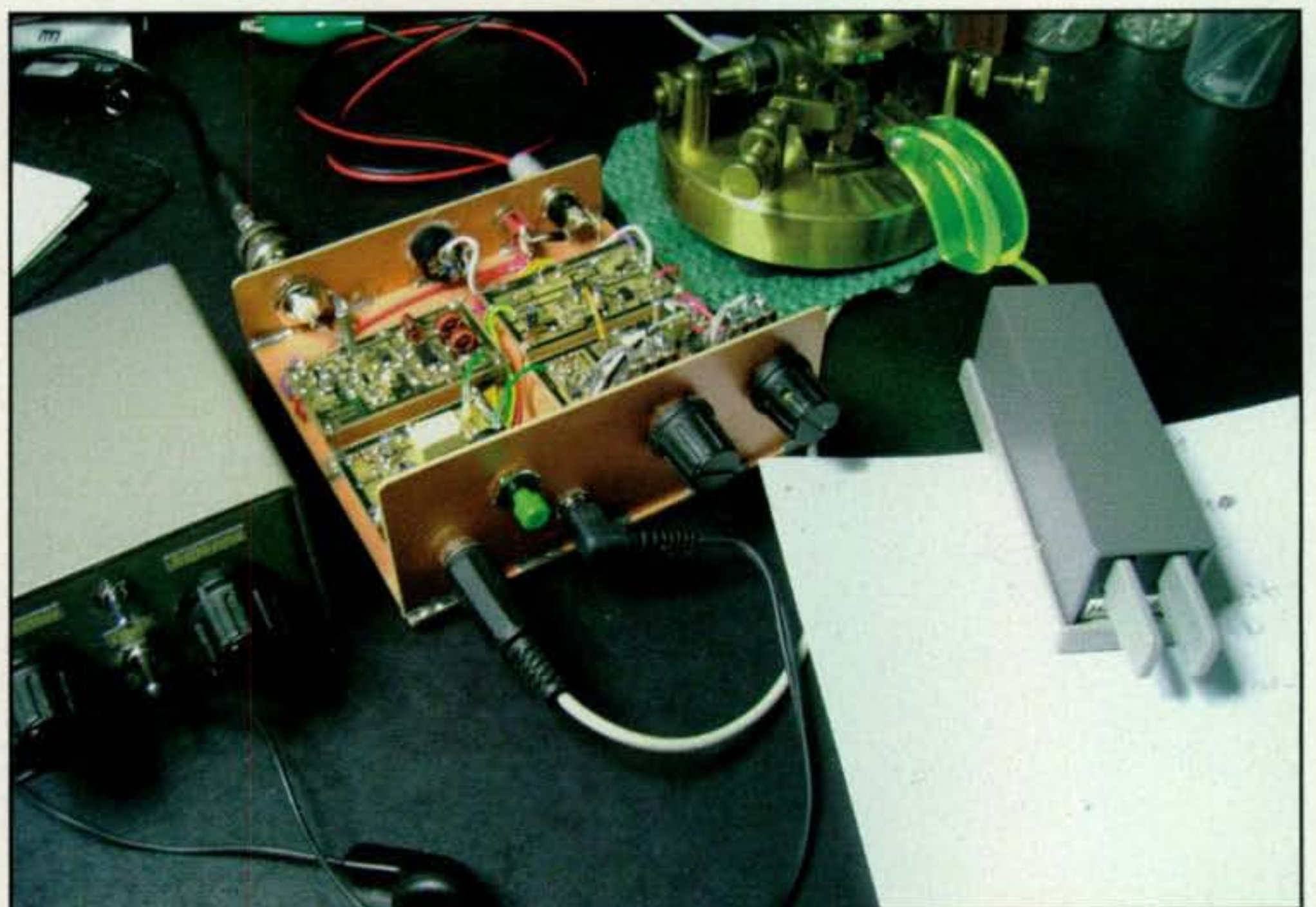


Photo H— The all-SMT W5USJ trans-receiver in operation on 40 meters. The mini rig is complemented with BLT tuner from <[qrpkits.com](http://qrpkits.com)> (left); round-base “R3A” paddle with glamorous fingerpieces from J. M. March, K4QU (<[www.qsl.net/k4qu](http://www.qsl.net/k4qu)>); and Palm Radio paddle on the lower right from <[www.morseX.com](http://www.morseX.com)>.



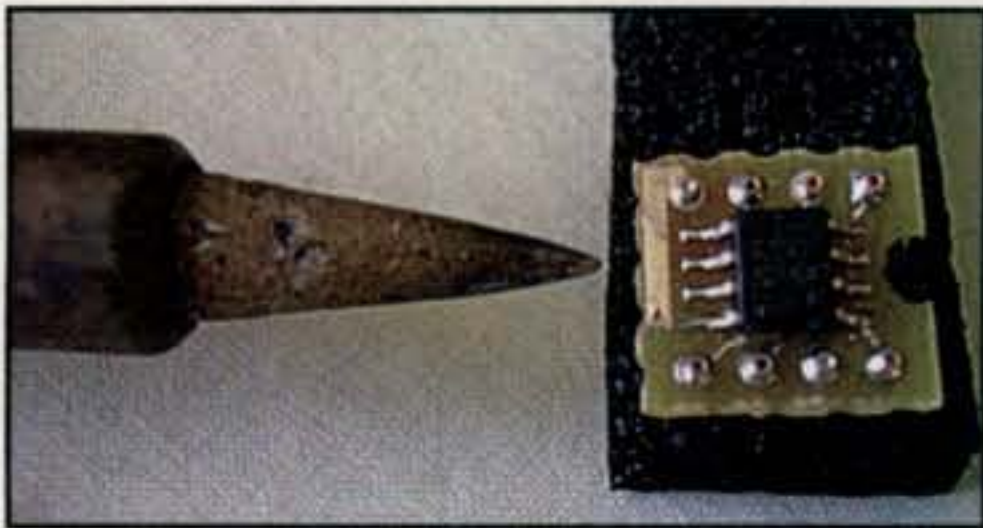


Photo I— Highly magnified view of the super-fine-tip soldering iron W5USJ uses for working with surface-mount components. Note the size compared to the legs of the SMT IC. Chuck emphasizes building surface-mount projects requires developing new-era soldering skills, avoiding solder bridges between connections, and gradually increasing the complexity of projects. Sound advice!

es, different length of screws and springs to avoid confusion), plus step-by-step instructions (which you can review or download free from his website) make assembly a snap. Simply read and follow the instructions rather than "doing it your way."

I assembled my Bushwhacker in approximately an hour, pausing to shoot photos along the way. When completed, I used two supplied screws to mount the 3" x 1.5" x 1.25" paddle on Doug's optional (4.25" x 3" x .5") black steel base and fine-tuned adjustments. The paddle has four adjustments: keying-lever travel, contact gap, lever position/finger force for keying, and tension. That requires explanation.

The main lever has three holes you can select or swap among to secure its pivot rod for a light, medium, or heavy keying force. That force can then be tweaked with the knurled tension screw on the paddle's right side. Set screws in the black keying levers can also be set for positioning the white lever and minimizing looseness (a strange description, but bear with me). Finally, knurled screws on each side fine-tune contact gaps. I am not mechanically inclined and I probably made this description sound more complex than necessary, but it is actually simple (otherwise I definitely could not do it. My forte is strictly electronics, not mechanics).

Want to spice up your CW or QRP life? Check out a Bushwhacker in your own shack, car, or at a vacation site and live a little. For more info or to order a Bushwhacker, go to <www.americanmorse.com>. One final note: I also gave the Bushwhacker a heavy scrutinizing test run with my two big 100-watt rigs and can

state that it is not just a QRP paddle; it works well for QRO, too!

## Fly Specks Everywhere

Well-known QRPer Chuck Carpenter, W5USJ, recently shared views of his homebrewed trans-receiver built surface-mount style, and his (self-taught) ability to work with tiny fly-speck-size components is an inspiration to us all (photos F, G, H, and I). This project started as a surface-mount (SMT) RF probe (that is now being kitted by Rex Harper, W1REX, of <www.qrpme.com>) and grew into a full surface-mount QRP rig. It is based on the ever-popular Tuna Tin 2 transmitter, MRX receiver, Jackson Harbor keyer, and a special T/R switch board. Chuck added a few mods to each board, increased transmitter output to a solid 600 mw, improved rejection of shortwave broadcast signals, and added receiver muting and more as he progressed. Chuck says each of the four boards can function as separate units and, depending on inquiries received, the CW keyer board may be made available as a simple and "easy to do" kit for QRPer interested in trying their hand at home-

assembling a surface-mount project. Anticipating that possibility, the keyer board is laid out open and roomy.

Chuck says dinking with fly specs (SMTs) requires sharp eyesight, steady hands, and plenty of patience. Rather than using metal tweezers, which launch SMTs flying like Julia Roberts opening escargots in the movie *Pretty Woman*, he uses a miniature set of bamboo chopsticks to place and hold SMTs. He also uses a super-thin iron tip and props his hand for stability. You can see more of his work at <www.w5usj.com> or contact him at <w5usj@9plus.net>.

## Conclusion

Once again we ran past the closing bell and could not squeeze in all the good news (such as the continuing development of minimalist gear and WA6OUW's easy-to-duplicate portable antenna or kit assistance at [www.kitbuildersqrpassemblyservice.com](http://www.kitbuildersqrpassemblyservice.com)). Watch for those details and more next (QRP) time in our December column and continue listening for me on 30 meters (I'm one running QRP).

73, Dave, K4TWJ

## Looking Ahead in

Here are some of the articles we're working on for upcoming issues of CQ:

- The Ham Radio Twilight Zone, by Derek Yungling, K7FF
- CQ Interviews: Gospel Music Star Larnelle Harris, WD4LZC, by David Greer, N4KZ
- Ein Funkamateuer in Deutschland, by Nicholas Elias, N3AIU/DL1NE

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

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## SWR Meter and 40M AM Handheld Kits, AM-FM-Ham Receiver, and more

**T**his month, we take a look at a two kits—an SWR meter and a 40-meter AM HT. Next are an AM-FM-Ham Receiver, two ham-related applications for the iPhone, and a 27-amp, 12-volt DC power supply. We also look at two antenna-related items—a book on towers and dog-bone wire insulators. For your shack, we look at a foot switch and an operating desk. Finally, we visit The Amateur Radio Website of the Month.

### DZKit HM-17 SWR Meter Kit

DZKit's HM-17 SWR Meter Kit (photo A) is a rugged, "no-frills," inexpensive device that allows you to measure how well your antenna is matched to your transmitter. The meter measures SWR up to 3:1, at power levels up to 1 kW CW at HF and 6 meters. DZKit estimates a three-hour assembly time for its all point-to-point wiring (no PC board) kit. The kit includes a sturdy case with extra weight in front to keep it from tipping over when coax hangs from the back. The screwed-on rubber feet won't come off and also help to keep the unit from skidding. SO-239 connectors are provided to connect to coax cables from your transmitter and antenna. DZKit provides a comprehensive "Theory of Operation" section in the 24-page assembly manual to help builders learn how SWR meters work. Price is \$99.95. To order or for more information, visit <www.dzkit.com>.

### DZKit HT-7 40m AM Handie-Talkie Kit

DZKit's HT-7 40M AM Handie-Talkie Kit (photo B) is a throw-back to ham days of yesteryear!

\*5441 Park Vista Court, Stow, OH 44224-1663  
e-mail: <k8zt@cq-amateur-radio.com>



Photo A—An example of an assembled DZKit HM-17 SWR Meter Kit.

Photo B—An example of an assembled DZKit 40M AM handheld transceiver kit.



Operating on the 40-meter AM calling frequency (7.290MHz), the HT-7 transceiver's output is 2 watts. The top-mounted BNC antenna jack allows the use of a simple whip antenna (not included) or connection to a large outside antenna for extended range. The receiver is a direct-conversion circuit with a 6–8 MHz bandpass input filter to keep high-power shortwave and local broadcast-band stations out. There is a wide-range, built-in electret microphone, or you can feed an external mic into the top-mounted jack. A 6-kHz, 7-element crystal filter provides great-sounding audio on transmit and receive. There is a built-in speaker, or you can use the headphone jack for private listening. The HT-7 accepts a lithium-ion 11.1V/4aH accessory battery pack (not included), or you can use your own 12-volt external power source. DZKit provides a 44-page detailed assembly manual that includes a section on theory of operation. Suggested building time is approximately six hours. Pricing is \$149.99 for one unit, or purchase two units for \$289.99. Battery pack is \$45, or two for \$85. To order or for more information visit <www.dzkit.com>.

### C. Crane CCRadio-2 AM-FM-Ham Receiver

Although designed for the non-ham market, the marketers of the new CCRadio-2 make a very interesting statement in their ads: "... while the Weather Band can keep you informed of any government-issued alerts. The addition of the 2-meter Ham band may make the CCRadio-2 a life-saver during an emergency like hurricane Katrina. Two-meter Ham operators are early on the scene and





Photo C— The titanium-colored version of the C. Crane CCRadio-2 AM-FM-Ham Receiver.

they donate their time while handling perhaps 90% of the emergency coordination efforts.”

A four-band receiver, the CCRadio-2 covers AM (520–1710 kHz) and FM (87.5–108 MHz) broadcast bands, the U.S. weather band (162.400–162.550 MHz) and the 2-meter FM amateur band (144–148 MHz) with five memories per band. AM-band performance is boosted by a patented “Twin-Coil Ferrite™” AM antenna. After you select a station, the CCRadio-2 evaluates the signal for several seconds and then locks in for the highest strength signal possible. On the 2-meter FM band the CCRadioplus can act like a simple radio scanner and search the five memories for ham operator communications. The sensitivity (squelch) can be adjusted for best results. A link on the company’s website provides the non-ham with a little background on this band at <[www.ccrane.com/library/2-meter-amateur-radio-band.aspx](http://www.ccrane.com/library/2-meter-amateur-radio-band.aspx)>.

The CCRadio-2 comes in the original black mica, or a new titanium color (photo C). It features a bright, clear LCD display with a full backlight and three levels of adjustable brightness plus a battery saving “off” setting. Features also include adjustable bass and treble, clock, alarm, sleep timer, auto scan, stereo headphone jack, line-input jack, and line-output jack.



Fig. 1— Screen-shot of Yaffey Software Development’s applications for the Apple iPhone and iTouch— iGridSquare and HamBands.

Weight: 4 lbs (without optional batteries). Size: 11”W x 6.5”H x 4”D. Price is \$159.95. To order or for more information visit <[www.ccrane.com/radios/am-fm-radios/ccradio-2.aspx](http://www.ccrane.com/radios/am-fm-radios/ccradio-2.aspx)>.

## K8NU iPhone Ham Applications

Carl Yaffey, K8NU, owner of Yaffey Software Development has produced two new applications for the Apple iPhone and iTouch—iGridSquare and HamBands (fig. 1).

The iGridSquare application converts latitude and longitude into a 6-character grid square. Grid squares, also known as the Maidenhead Locator System, are often used by hams to indicate a station’s location, especially during contests or for obtaining awards (for more information on grid squares visit <[http://en.wikipedia.org/wiki/Maidenhead\\_Locator\\_System](http://en.wikipedia.org/wiki/Maidenhead_Locator_System)>). iGridSquare is especially useful for “rovers,” ham operators who go from location to location to provide contacts for other hams from “rare” grid squares.

The program operates in two modes—automatic (Longitude/Latitude Finder ON) and manual (Longitude/Latitude Finder OFF). In automatic mode, it uses the device’s core location service (CLS) to determine the latitude and longitude. The grid square is then automatically calculated. In an iPhone, CLS can use GPS, cell towers, and Wi-Fi signals. In an iTouch, only Wi-Fi is available (therefore, automatic mode will only work with some Wi-Fi signals. Because of this, you will rarely get good results and should normally use the manual mode). In manual mode, the ham operator enters longitude and latitude, perhaps from a portable GPS. Then the grid square is calculated by pressing a button.

The HamBands application displays the layout of the various segments of the radio spectrum assigned to FCC-licensed amateur radio operators. The layouts indicate which portions of each band are for RTTY/CW/Data and which are for Phone/Image. The layouts also indicate which portions

## MFJ Purchases Cushcraft Amateur Radio Antennas Product Line

MFJ Enterprises, Inc., Starkville, Mississippi, has purchased Cushcraft Amateur Radio Antennas Product Line from Laird Technologies, St. Louis, Missouri effective July 31, 2009. Cushcraft Amateur Radio Antenna products will continue to be manufactured in Manchester, New Hampshire.

“We are excited to have the Cushcraft Amateur Radio Antennas product line alongside our other five companies,” said Martin F. Jue, President and founder of MFJ Enterprises, Inc. “This product line increases our ability to offer our customers a wide range of antenna options at different prices. Customers will be able to choose from Cushcraft Amateur Radio Antennas, Hy-Gain, and MFJ antennas through one source.” MFJ purchased Hy-Gain in 2000.

Cushcraft Amateur Radio Antennas will bring over fifty new products to MFJ’s impressive amateur radio product line. Cushcraft Amateur Radio Antenna products have long been a popular source for a wide range of HF/VHF/UHF vertical, beam, and Yagi antennas for the amateur radio community. “We will add more new products to this antenna line and will continue the Cushcraft Amateur Radio Antennas name long into the future. Cushcraft Amateur Radio Antenna product customers will appreciate continued and expected top-quality manufacturing of this product in New Hampshire and the MFJ commitment to superb after-the-sale service and tech support in Mississippi,” said Jue.

A special customer support line has been set up in Starkville, Mississippi: 662-323-5803. This line will handle any Cushcraft Amateur Radio Antenna product technical support, parts requests, and customer service. To order, get a free catalog, or for your nearest dealer, call 1-662-323-5953 or go to: <<http://www.cushcraftamateur.com>>.





Photo D— Front view of the Jetstream JTPS35BCMA power supply.



Photo E— Jetstream Super Dog, "dog-bone" end insulators for wire antennas.



Photo F— Jetstream JTFT1 foot switch.

are for which license class (Extra, Advanced, General, Technician, and Novice).

### Jetstream Power Supply

The Jetstream JTPS35BCMA (photo D) is a 13.8-VDC, 30-amp surge and 27-amp continuous power supply. Features include six power connections—four pairs of Anderson Power Pole® connectors (two in the front and two on the back), a cigarette-lighter-style socket, and one set of binding-post/banana-plug connectors. An additional set of set of binding-post/banana-plug connectors is used to maintain a battery backup. The power supply also includes over-voltage and current protection, a quiet internal cooling fan (with auto/on fan switch), and switchable AC input voltage (115 or 230 VAC). MSRP is \$139.95. More information is available at <[www.jetstream-usa.com](http://www.jetstream-usa.com)>.

### Jetstream Antenna Insulators and Foot Switch

The Jetstream Super Dog, "dog-bone" end insulators for dipoles and other wire antennas are 3 inches long and super strong! (See photo E.) The insulators are available in three colors—white (JTWDOG), black (JTBDOG), and gray (JTGDOG). Price is \$ 0.75 each.

The Jetstream JTFT1 foot switch (photo F) is great for keying your radio, your amplifier, or any other shack

accessory. The JTFT1 comes with 10 feet of cable and a 1/4-inch jack and an adapter to take it to an RCA plug if necessary, depending on your equipment. MSRP is \$19.95. For more information visit <[www.jetstream-usa.com](http://www.jetstream-usa.com)>.

### BlueLounge StudioDesk and Cable Managers

Although the BlueLounge BL\_StudioDesk\_STR01 (photo G) is designed "specifically for laptop users," the StudioDesk's features can make it an option for the ham who prefers a clean, uncluttered operating position. The desk is designed to contain "all peripherals and excess cables ... hidden just under the sliding desktop surface." The cable/accessory storage compartment

is conveniently accessed from the top of the desk. An elongated slot across the width of the desktop allows the necessary peripheral and power cables to enter/exit at any point, thereby keeping the desktop clear of clutter. The design features solid mahogany legs and details with white laminate used for the desktop surfaces. StudioDesk ships flat in one box; only the legs need to be attached. Price is \$599.95. For more details visit <[www.bluelounge.com/studiodesk.php](http://www.bluelounge.com/studiodesk.php)>.

Also available from BlueLounge, are the "CableDrop" cable managers (photo H). Although designed primarily for computer users, these small, colorful plastic devices can be used to hold and route the large number of cables found in the typical ham shack.



Photo G— BlueLounge's StudioDesk.





Photo H— BlueLounge's "CableDrop" cable managers.

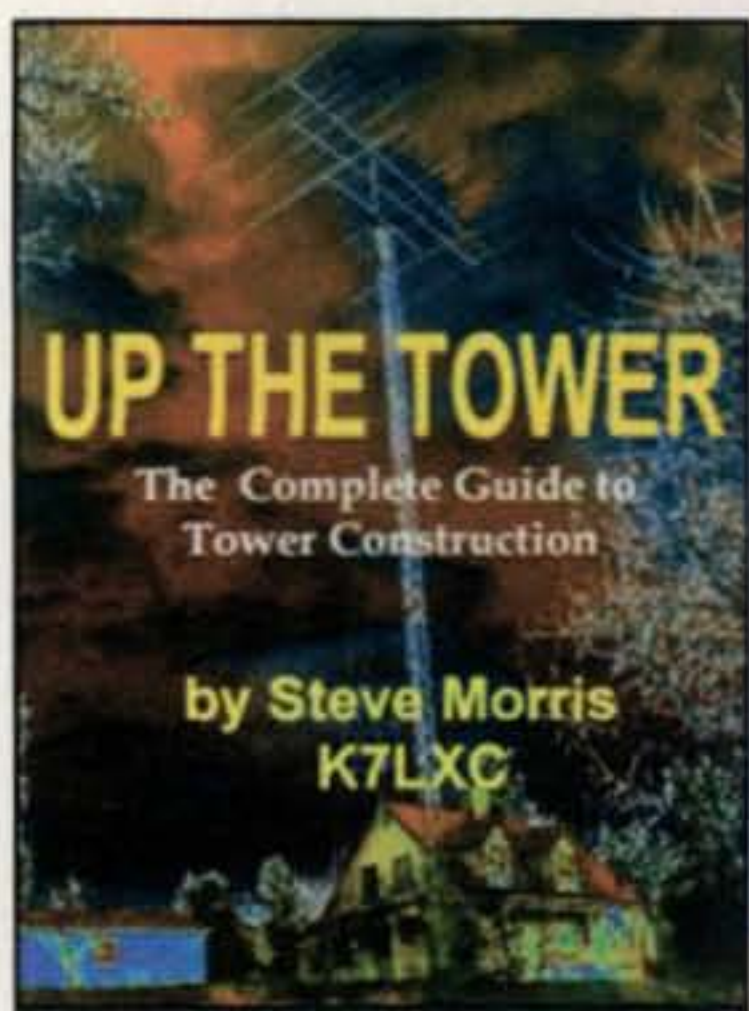


Photo I— Cover of the book UP THE TOWER: The Complete Guide To Tower Construction, by Steve Morris, K7LXC.

CableDrops are sold in packs of six, each package includes three different colors, either muted or bright. Price is \$9.95. For more information visit <[www.bluelounge.com/cabledrop.php](http://www.bluelounge.com/cabledrop.php)>.

### Tower Construction Book

Champion Radio Products is offering a new book, *UP THE TOWER: The Complete Guide To Tower Construction*, by Steve Morris, K7LXC (photo I). Steve used his professional tower experience on over 200 amateur stations and dozens of commercial radio sites to create this guide. He gathered his hard-earned lessons and put them all in one comprehensive book. It's over 220 pages of facts, techniques, hardware details, and lots of answers to your tower-construction questions. Price is \$35.00. To order or for more details, visit <[www.championradio.com/publications.html#1](http://www.championradio.com/publications.html#1)>. The book is also available through the CQ Bookstore.

### The Amateur Radio Website of the Month

This month's site is the "Amateur Radio Exchange Website" (fig. 2). Designed as space devoted to selling and trading of amateur radio equipment, from the "about us" section of the page: "Amateur Radio Exchange was created with the amateur radio enthusiast in mind. We are committed to providing an area on the web where everyone can feel comfortable." The site requires users to register and charges a small fee for listing for-sale items. The site's address is <[www.amateurradioexchange.com](http://www.amateurradioexchange.com)>.

### Wrap-up

First, a correction for the August issue's "2009 Dayton Hamvention® Sunday Safari, Part I" article. The price listed



Figure 2- Screen-shot of this month's Amateur Radio Website—Amateur Radio Exchange

for DX Engineering's DXE-MBV-ATU-1 43 ft. vertical antenna matching system was listed as \$300, which was a typographical error. It should have read \$399. We are sorry for any inconvenience this error may have caused.

That's all for this month's column. As the fall contest season kicks off, I hope to work you on the bands, especially in the CQ WW contests. Remember, I welcome your feedback, questions, and/or comments. If you are a producer of a new product for amateur radio, please feel free to e-mail me or use the snail-mail address on the first page of this column. Until next month . . .

73, Anthony, K8ZT

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# Radio Operations Center

August's column discussed APRS and APRS-TT. Much of that column was based on a presentation by Rick Ruhl, W4PC, of Creative Services Software Inc. <www.cssincorp.com>, but I somehow never got around to actually mentioning Rick's name (oops!). After all, he was the only one at the Dayton Hamvention® with an actual working version of APRS-TT.

I've been using CSS's PKTerm 99 for my PK-232 for several years, but this is a 10-year-old program, relegated to the oldest computer in the shack. I bought my PK-232 in 1988 when it was built by AEA (Rick went into business that year, too, 21 years ago), but many of the upgrades I have installed came from Timewave <www.timewave.com>, which bought the line and continue to sell it and its accessories. (I'm thinking of getting its USB upgrade, so I don't have to tie up my one and only RS-232 port.) For the past few years, with less activity on packet and the introduction of several new sound-card modes, I've hardly used my packet setup, instead opting for my WinXP machine upstairs in the family room, connected with an audio cable running through the floor into the shack below to my ICOM IC-706 MKIIG.

The multitude of sound-card modes certainly makes the digital world exciting, but it leads to another problem—overload. I just counted, and I have nearly a dozen ham-radio-related software icons on my desktop. I admit that I don't use all of them regularly, but uninstalling them and reinstalling them if I want to use them creates some instability in the fragile (in my opinion) Windows® Registry.

\*P.O. Box 114, Park Ridge, NJ 07656  
e-mail: <n2irz@cq-amateur-radio.com>

CSS created its new Radio Operations Center™ Software Suite just for this situation. After using it for a few weeks, I can truly say that this one program has almost everything you would ever need. Not only does it support every function of the PK-232, it also supports several sound-card modes. CSS has even released the DLL source-code information necessary to make new "Snap-Ins" that support other sound-card modes for those who might like to write their own.

Of course, just combining several dozen major functions into a single piece of software is an accomplishment, but the Radio Operations Center (ROC) Digital Desktop is also convenient to use. Little things like a tear-off window—a separate, independent window that can be sized and put anywhere for convenience—to make it easier to monitor activity, and an integrated logbook, all combine to make this *the* one piece of software that you'll use most often.

Before we take a quick tour of the major features, here's a list of the modes that are supported by the PK-232 version of the software: Packet (HF and VHF), all the SSTV modes, CW (Morse Code), Baudot/RTTY, Sound-card RTTY, ASCII, NAVTEX, FEC, AMTOR, PACTOR, PSK31, MT-63, ARQ (*Note: It looks like PACTOR ARQ is having a resurgence on 14.111, but sound cards can't do PACTOR and AMTOR ARQ*), and SIAM mode (Signal Identification and Acquisition Mode, which allows for a variety of digital signals to be automatically analyzed and identified). The Kantronics version (for use with the Kantronics KAM) also supports GTOR/GMON. This list doesn't even cover all the possible of sound-card modes that can be created using the open-code "Snap-In" DLLs.

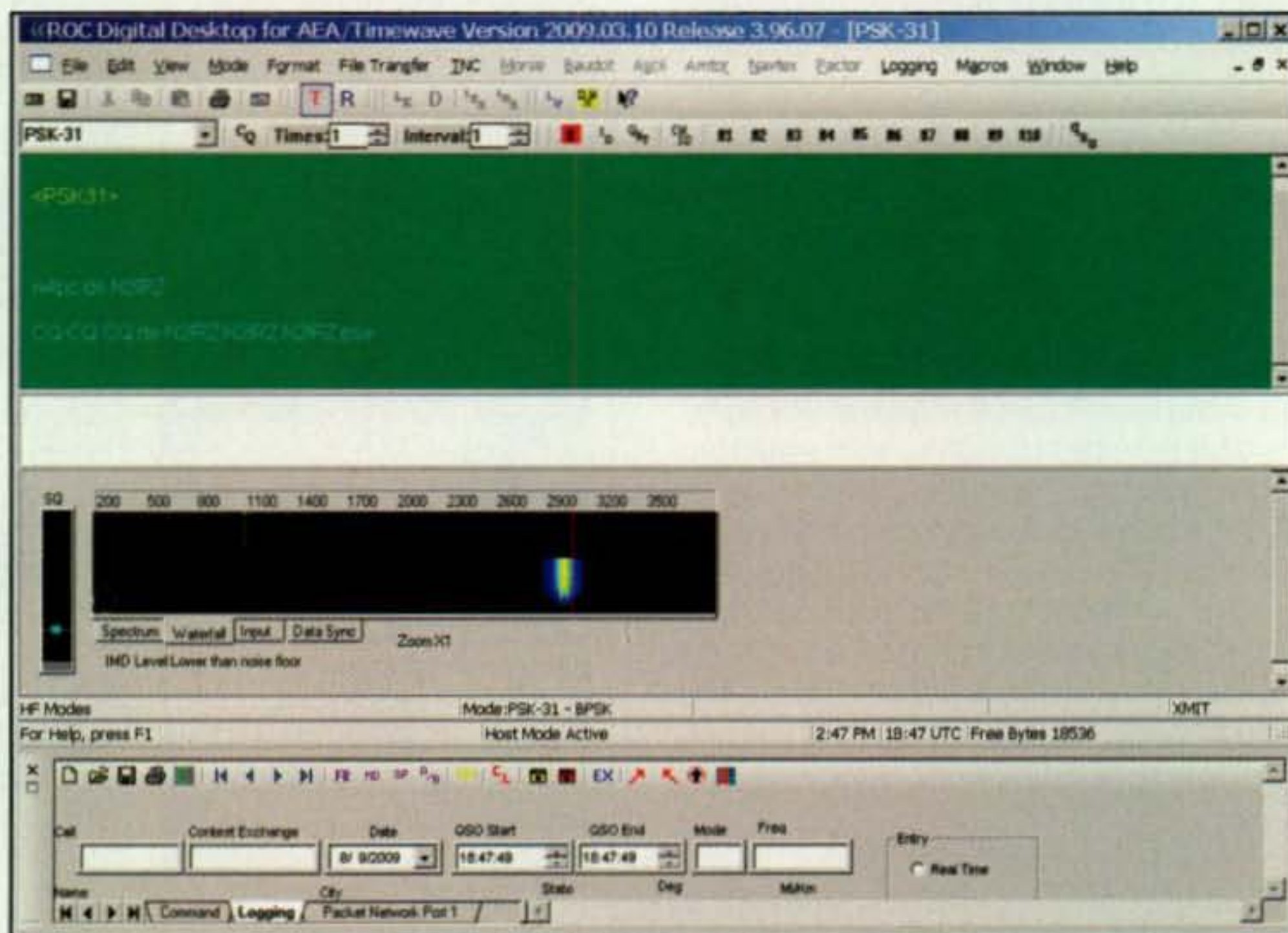


Fig. 1—The main screen of ROC in PSK31 mode, showing the menu and tool bars, main window with spectrum and waterfall display, and a bit of the logging window. Anything you need for digital communications is just a mouse click from here.



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Actually, with all of the features of the Radio Operations Center, the biggest problem is remembering what's there. The regular user windows, where you'll spend most of your time, are straightforward and are learned quickly, but if you need to make changes to the basic settings, it may take some time to find the one you're looking for. I don't find this to be a major disadvantage, though, for three reasons: First, it is rare that these settings would need to be changed, so having to spend a few extra minutes configuring something once a year (if ever) shouldn't be an issue. Second, many of the most difficult settings—those for the TNC communications—are handled by a nifty "TNC Wizard," which finds, identifies, and sets up your TNC for you. Third, and most importantly, Creative Services Software has one of the best support teams in the industry.

Unlike most other software for digital modes, CSS has a telephone number you can call for support. The people who answer really know their product, and I swear they are hired for their extraordinary patience in the face of fools like me. (don't ask how I know). Of course, you can also get support through its website or by e-mail. I guess this is a case of getting what you pay for: Freeware or Begware products generally offer only community-based support, where the answer you get is only someone's best guess, and you have no real idea if they know what they're talking about or not.

Downloading and installing the software is as easy as it gets. Go to the CSS website ([www.cssincorp.com](http://www.cssincorp.com)), and the ROC is prominently featured on the home page. You can read about its features and advantages in great detail and download the manual if you like. CSS also offers a full-featured demo version (that is easily converted to a registered version without reinstalling) that's good for 30 days—plenty of time to decide if it's right for you. You can also download the optional Weather Ops software there.

After clicking on the download link, you can either run the .EXE file directly, or save it to your hard disk and run it later. The well-known InstallShield Wizard opens and takes you through the process. I connected my TNC to the computer's serial port, started the software, and let the TNC Wizard run, which found the TNC and asked me to save the settings. The main screen of the ROC is shown in fig. 1.

For my PK-232 I didn't need anything but cables, since the sound-card interface is built in. However, for a Kantronics unit, I would need to use a sound-card interface. ROC supports essentially any Kantronics or AEA TNC with version 7.0 or later. Check the manuals to be sure.

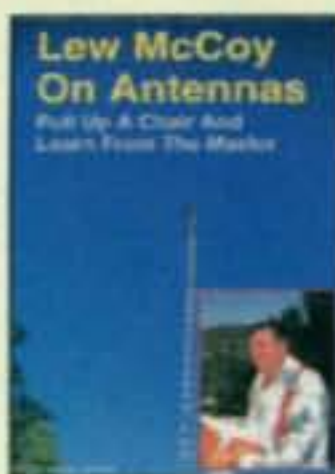
Starting at the bottom, there is the Utilities window, shown in the Logging mode (only a small portion is visible here). The other two tabs bring up the Terminal Window, from which you can control your TNC or Multi-Mode Data Controller (MMDC) directly (from the "cmd:" prompt) and the Packet Network monitoring window, which lets you monitor packet traffic. The mini-logger is handy, especially for a casual contester like me who isn't willing to buy a full-feature logger. Using an MS Access database core, it has several useful features, offers Rig control via RS-232 or TCP/IP (more on that in a moment), and exports to ADIF format, easily converted to standard Cabrillo.





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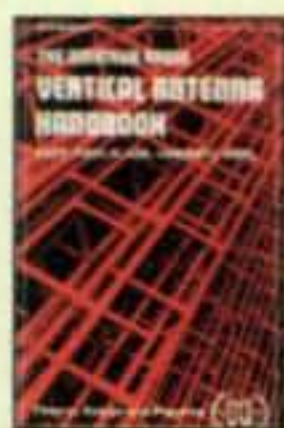


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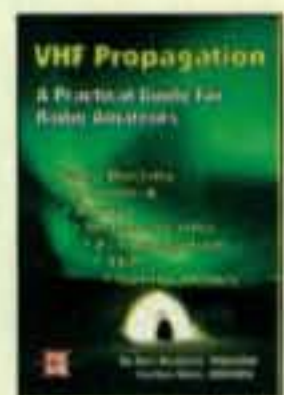


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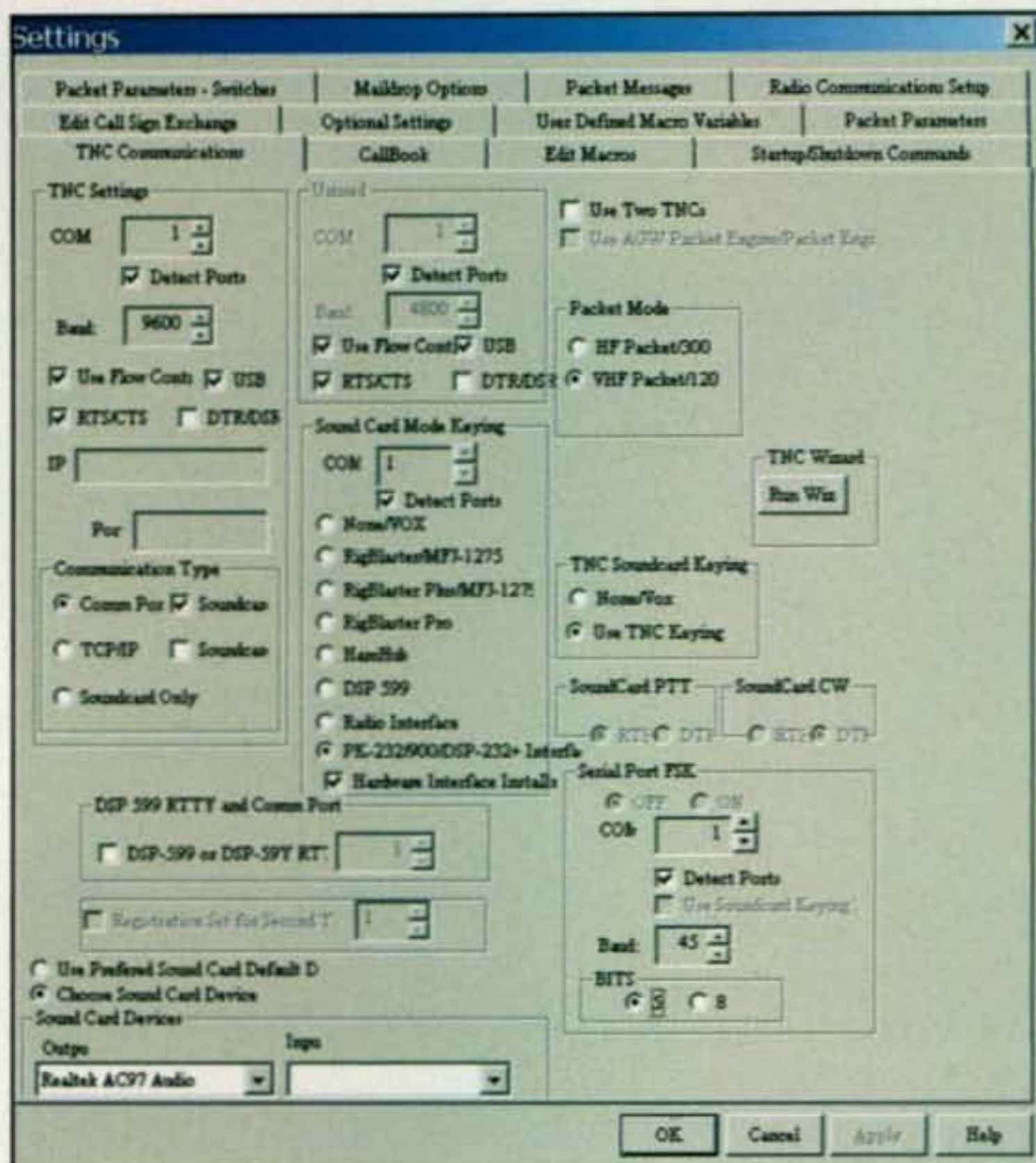
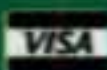


Fig. 2- The TNC Communications tab of the settings window in ROC. I found the settings window, with its multitude of settings and tabs, to be a bit confusing. Thankfully, you usually don't need to visit this window at all.

It also interfaces with DX4WIN and Log Windows, if you have them, as well as popular callbooks and rotators. The Utilities window can be closed easily if you don't need it.

Just a short note on TCP/IP radio control: This is handy whether you want to control your radio through your home network, or really remotely through the internet. For example, I could put my radio out in the shed at the base of the tower, saving myself nearly 100 feet of coax for the run from the house out to the tower base, and control it through my wired home network.

Above the Utilities window is the main window. The upper part shows the text of my communications (transmit and receive, along with mode changes), and when used for HF modes (both soundcard and TNC based) the lower part has a "Sound Card Mode Panel" for spectrum display, waterfall, PSK31 audio 'scope (helpful when setting audio levels) and PSK31 Data Sync, which shows a histogram of the internal signal to determine the center of the received bit. This helps determine if the received signal or the sound card is off frequency.

An interesting and useful feature of the main window is that it can be "torn off." Simply drag it off the ROC desktop and it operates on its own, even if ROC is minimized. Of course, you can have several "main windows" open at once, for multiple modes and streams. Another useful feature is the "right-click menu." If you right click in the main window, you can copy text or push the contact into the log. This saves some typing (and resulting mistakes) for those two-fingered typists like me.

You can also set up "Quick Connect" icons, which work just like shortcuts in Windows®. Simply double-click the icon, and ROC sets up the connection you want, such as to a local packet BBS or WinLink gateway. You can also use this feature like the address bar in most browsers; just type in an



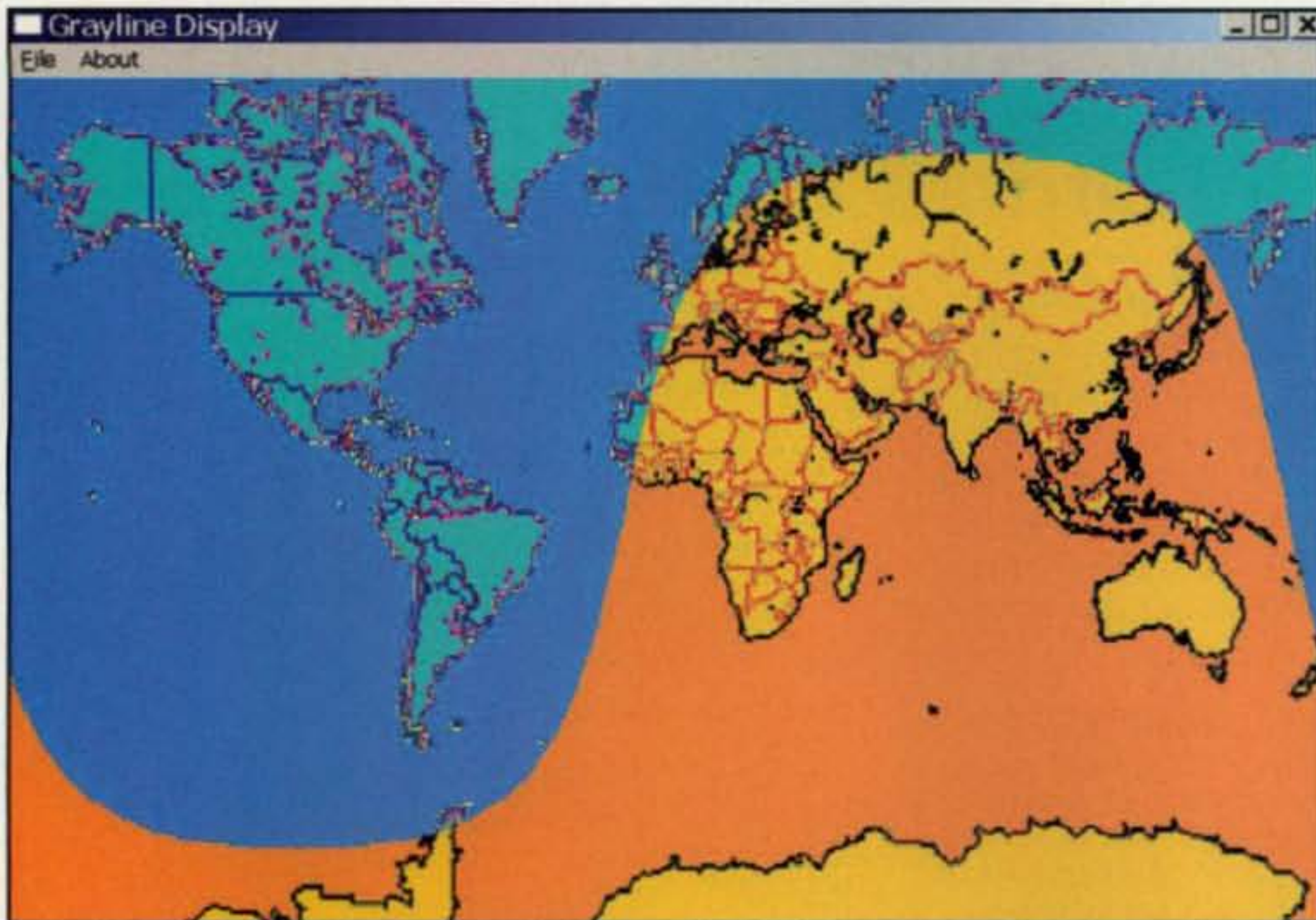


Fig. 3—The real-time grayline display in ROC, just one example of small but handy features that abound in the Radio Operations Center.

“address” (usually a callsign, but you can use any words) and it sets up the connection. It is this feature that gives the ROC its “Digital Desktop” moniker, since it functions much like the Windows® desktop.

MARS operations are supported with the ability to save multiple “registration sets,” each with different setup parameters (such as callsign and default mode), along with robust binary and ASCII file transfers, with an unlimited buffer for ASCII file transfers, an important feature for MARSGRAMS.

At the very top are the toolbar and menu. Several macros are controlled from here—the macro contents for each mode are independent—as well as controls for common tasks such as calling CQ, sending an ID, and a handy emergency stop button, which shuts down the transmitter. The menu, of course, controls everything else in the program, including some mode-specific settings (such as CW speed in Morse mode or the frequency shift in AMTOR). Naturally, there’s a useful help file as well.

CSS has a special upgrade offer on the Radio Operations Center Digital Desktop for licensed users of HostMaster, KaWin, KaGOLD, PkGOLD, and PC PakRatt software, with 20% off until December 31, 2009. Visit its website for details.

CSS also offers a VHF packet-only version of ROC, known as EmComm Ops, currently on offer for about \$30. Built for modern Windows® versions from the ground up, it allows for real multitasking and seamless integration with other applications. Again, this

comes in both AEA/Timewave and Kantronics versions.

I hope this quick tour of Creative Services Software’s Radio Operations Center was informative. By eliminating the clutter and giving me one program

for (nearly) all of my digital operations, it should simplify my life. I urge you to also give it a try.

### AT Golden Packet Results

As I mentioned last time, on July 26, 2009 there was an attempt to send an APRS packet the length of the Appalachian Trail between Springer Mountain, Georgia and Mt. Katahdin, Maine using 15 mountaintop packet relay stations. Since a few sites went unmanned, the overall goal was not reached, but as a first attempt I’d call it successful in that it raised the possibility of actually making this happen in 2010. To see a report on the results and lessons learned, visit <<http://aprs.org/at-golden-packet.html>>. Next year, you can count on seeing me at Sam’s Point, New York, with anyone crazy enough to join me.

That’s all for this month. I’m not quite sure what to write about for December, so if you have any ideas, drop me a line. Meanwhile, the signs that the economy is turning around are all there, so things will only get better from here.

Until next time . . .

73, Don N2IRZ

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# Two More Weak-Signal Operators Join The 48-States Club on 2 Meters

**O**n July 29, 2009 at 2343 UTC, Larry Lambert, NØLL, in Smith Center, Kansas (EM09), completed a 2-meter SSB QSO with Dave Olean, K1WHS, in Lebanon, Maine (FN43), to be the 13th amateur radio operator to have worked all 48 states terrestrially on 2 meters. Writing to Tad Cook, K7RA, ARRL's propagation guru, Larry stated:

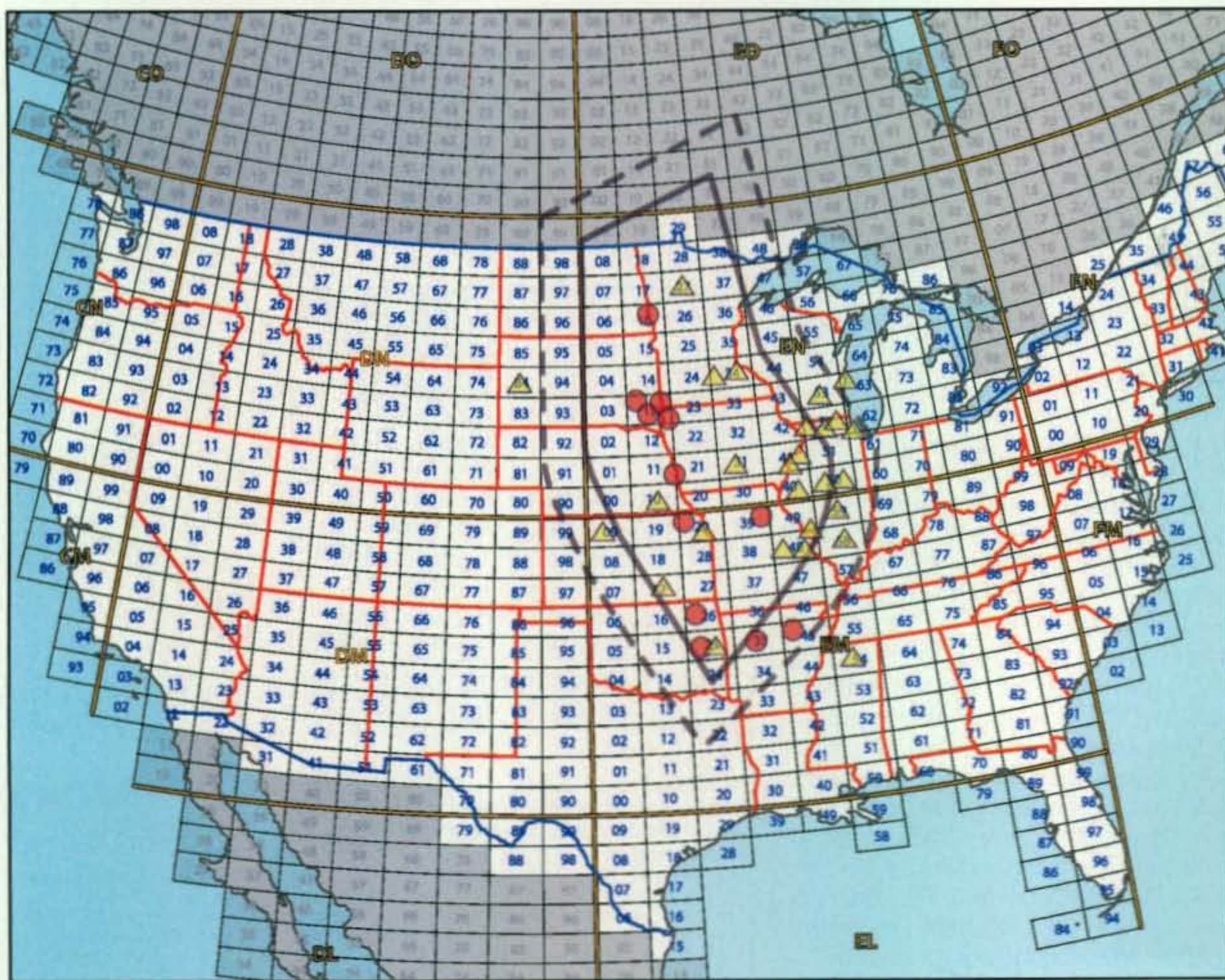
With all the sporadic-E this summer, this happened last evening (July 29) at 2343 UTC. K1WHS in Maine was worked on 2 meters for state #48 on 2 meters. All states were non-EME and non-digital. My state #47 was W1AIM in Vermont during the 1998 *Leonids* meteor shower, so #48 has been 11 years in the coming. I've been on 2-meter weak signal for 33 years. Kevin,

e-mail: <n6cl@sbcglobal.net>

## VHF Plus Calendar

- Oct. 4 Full Moon. Moderate EME conditions
- Oct. 7 432 MHz Fall Sprints
- Oct. 8 *Draconids* meteor shower peak
- Oct. 10-11 ARRL 50 MHz to 1296 MHz EME Contest
- Oct. 11 Moon last quarter, Moderate EME conditions
- Oct. 13 Moon perigee
- Oct. 17 Microwave (902 MHz and above) Fall Sprint
- Oct. 18 New Moon, Moderate EME conditions
- Oct. 21 *Orionids* meteor shower peak
- Oct. 23-24 50 MHz Fall Sprint
- Oct. 25 Moon apogee, Very poor EME conditions
- Oct. 26 Moon first quarter

—EME conditions courtesy W5LUU.



The "who's who" of the all-time greatest stations ever assembled in the central part of the country who are close to working all of the contiguous states on 2 meters but who have not yet been identified. Adapted from W3EP's June 1997 QST article. Emil had four dots on his original map, for those he knew about at the time. The other dots have been added to indicate the rough location of all 12 stations. This map will be updated in the forthcoming CQ VHF Kaufhold article. (W9GKA thanks the ARRL, QST magazine, and Bill Van Alstyne, W5WVO, and his graphic arts abilities for developing the data-points supplied to him.)



W9GKA, says I am #13 to do all contiguous 48 states on 2 meters. One has to live in the Midwest to do it. My 2-meter signal was heard in Maine in July 17, 1980, and that is as close as it got till last evening. I've waited a long time for another cloud to be in the correct location, as this was near the theoretical 1500-mile limit for one hop of sporadic-E on 2 meters. I also worked seven others in New England—it was quite a thrill! (Courtesy the ARRL Letter, July 31, 2009)

On August 13, 2009 at 0650 UTC Bob Striegl, K2DRH, in Albany, Illinois (EN41), completed a 2-meter digital (WSJT) QSO with Pat Coker, N6RMJ, in Lancaster, California (DM14) to be the 14th amateur radio operator to have worked all 48 states terrestrially on 2 meters. Writing to Kevin Kaufhold, W9GKA, Bob stated:

I worked Pat, N6RMJ, in DM14cp CA for state #48 on WSJT logged at 0650Z 8/13. This QSO should be new USA WSJT record too at approx 1560–1570 miles (W9IP states 1566.9 miles center-to-center of the 6-digit grids but I'll get the distance tower to tower off Google maps).

Kevin Kaufhold, W9GKA, presented a paper on this exclusive club of working all 48 continental states on 2 meters at the 2008 Central States VHF Society conference in Wichita, Kansas. In that paper he reported that at that time 12 operators had joined the club. They are, in the order of their known entry: W0SD, EN13; K5CM, EM25; W0EMS, EN11; K0ALL, EN16; K5UR, EM35; W0RRY/K5BXG, EM26; W5ZN (as WB5IGF), EM45; WQ0P, EM29; W7XU, EN13; N0QJM, EN13; and KM0T, EN13. Subsequent to his presentation, N0PB in EM39 joined the club by completing his contact with his 48th state during the 2008 *Perseids* meteor shower.

Commenting in his paper about the limits of the propagation, Kaufhold wrote:

With the exception of the two Arkansas ops and one station in Missouri, everyone else lies in a due north-south line hovering around the western Missouri, Iowa, and Minnesota borders. In fact, no one east of the Mississippi has worked the contiguous U.S., not even super stations like K2DRH, EN41, or K9HMB/K9NS, EN52. While it may theoretically be possible to work all 48 states from anywhere in the outlined area, it is amazing that only those stations in a very tight line have managed to do so.

With the completion of the K2DRH-N6RMJ QSO, Kaufhold's last sentence has now been made obsolete.

Ironically, I had asked him to write an article based on his CSVHFS paper for *CQ VHF* magazine. Twice we have had to hold it over because of other more time-sensitive articles taking precedence in the prior issues of *CQ VHF*. It now seems providential that his article was bumped for those other articles. As of this writing, he is working on a revision of his previously submitted article and it is in queue to be published in the Fall 2009 issue of *CQ VHF*.

As you will read later on in this column, K2DRH wasn't the only one to push the propagation limits. W9RPM was as well when he worked KX9X in CM72 also during the 2009 *Perseids* shower.

### A 2-Meter Sporadic-E Season to Remember

Lambert wasn't the only recipient of good 2-meter sporadic-E propagation. Also writing to Cook was Victor Androsov, VA2WDQ, who worked quite a bit of sporadic-E on 2 meters on the same night, Wednesday, July 29. He uses a 7-element Yagi on a 2-wavelength boom. Commenting on that night, Androsov wrote to Cook:

That was the biggest 2-meter *Es* I've ever heard since I was licensed as VA2WDQ in 2003! I found 144 MHz opened to W0 at around 1800 EST (2200 UTC). The first station I worked at 18:13 EST was N0IRS from EM29, coming in with a strong and clear signal. The last one was a QSO with WR0F (EM29), logged at 19:48. I heard other stations I've worked before until 2000. That was a great opening! Sometimes MUF (*maximum usable frequency—ed.*) dropped down and the 2-meter band got quiet. But after 10–15 minutes, W0, W9, W5 jumped up from noise again. During that *Es* opening I worked 17 stations: N0IRS, KC0CFB, WB0NQD, W9RM, KA9CFD, K9AKS, N0PB, N0MST, W6ZI, KD5ZVE, K0CIY, N4LI, N0DIS, W5MRB, KM0T, K5OMC and WR0F in these grid squares: EM25, EM26, EM27, EM29, EM39, EM44, EM55, EN10, EN13, EN22, EN40, EN41, and EN52. (Courtesy the ARRL Letter, July 31, 2009)

Also getting in on the action were Jon Jones, N0JK, of Wichita, Kansas (EM16), and George Ackincklose, W4GNE, of Chesterfield, Virginia (FM17). Writing about Jones's success and setup, Cook commented:

Jon Jones, N0JK, of Wichita, Kansas, had a lot of 2-meter *E-skip* excitement on July 29–30, but missed openings the following day. On July 29, he worked W1AIM (FN34 in Vermont) at 2242 UTC; K1WHS (FN43 in Maine, 2300 km away—heard off and on for over an hour!) at 2245 UTC; W2RJO (FN23 in New York) at 2252 UTC; KC2RDC (FN14

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in New York) at 2332 UTC; and VE2DFO (FN25 in Quebec, Canada) at 2349 UTC. He sent a link showing the K1WHS station. Jon was using a 7-element Yagi on a stepladder in his bedroom. It was facing northeast, and Jon didn't say it but the antenna was pointed out the window!

Cook commenting on Ackinclose, wrote: "He had an exciting time with that same sporadic-E 2-meter opening on July 29 from 2200-0000 UTC. He was using a 12-element Yagi on a 20-foot boom, but just 25 feet above ground."

Quoting Ackinclose, Cook adds:

George reports that he worked "K0AWU (EN37 in Minnesota, about 1000 miles away); K0SIX (EN35 in Minnesota); KA9CFD (EN40 in Illinois); WB0ULX (EN04 in South Dakota, approximately 1200 miles away); K0KFC (EN35 in Wisconsin); K0CJ (EN34 in Minnesota), and N0UK (EN34 in Minnesota). I have only been in amateur radio since December 2002, and that was the most heart racing, adrenaline pumping action on any band that I have been a part of—so far! I'm certain that if I had a little better antenna height, I would have worked a lot more; I heard many others just too far down in the noise for me to pick out. ... All these contacts had good signals, S5-S9." (Above quotes from Cook courtesy the ARRL Letter, August 7, 2009)

Other reports of the incredibly late in the season, incredibly rare, sustained 2-meter sporadic-E propagation are still coming in. As I receive them, I will publish them in a future column.

## FFMA Update

Kevin Kaufhold, W9GKA, writing on the FFMA reflector on August 13, 2009, stated the following:

The *big news* of this update is that John Kjos, W9RPM, of La Crosse, Wisconsin (EN43) worked Sean Kutzko, KX9X, who was operating from CN72, on August 13, 2009, during the *Perseids* meteor shower on digital! John is now at 486 confirmed/488 worked, or zero not worked, 2 waiting on confirmation. In addition to CN72 outstanding, John is waiting for a QSL from FN67. It all comes down to confirmations at this point. QSLs are indeed the last courtesy of a QSO.

Pat Rose, W5OZI, of Junction, Texas (EM00), is also very close needing only CM79.

A total of eight leaders out of 21 are now at or under 20 needed grids. Congratulations to all. What a summer this has been, with many leaders moving up considerably on their worked and confirmed counts.

Anyone with worked/confirmed updates, please send them to me. If you or anyone you know is at 400 FFMA grids or more, please let me know, as I want them on the Leader Board. Tracking the leaders has been a huge success.

CM79 is the most needed grid among the

leaders, at 14 out of 21 leaders. DN66 and many other western grids are also very much in need. The ME grids are also right up there. EL58 has gone down a bit due to K5N, but it is still needed by many leaders. Interestingly, EL84 is also creeping up the list, even though this was covered in 2006 by the K4T operation.

I also wanted to relay to everyone on the list info about US Park Service Wilderness requirements, since CM79 is now evidently under that program. Last weekend, I attended a very nice presentation made by Jerry, WB9Z, who spoke on the K5D trip to Desecheo Island. It took months of negotiation, a formal request for proposal, and 350 pages of supporting documentation before that operation was approved. Park Service limited the operation to 14 days, 10 or so ops at any one time, and usage of a very small part of the island. Some of the concern by US was the existence of old but very live military ordinance, but there was a broader concern raised over the operation as to environmental impact to the island, as well as safety (due to the drug trafficking in the area). US DEA had police spotters and helicopters patrolling the area for the entire time that K5D was activated.

Generators were allowed, but with many environmental conditions imposed. On-site review of gasoline contamination potential was required by US wildlife officials. Helicopters were allowed for transport of equipment and supplies, but everything transported by boat had to be hand carried over very rocky terrain. Over 100K in QSOs were made, but only 90 or so 6-meter contacts (this was in February 2009).

Partly as a result of the success of that DXpedition, approval has now been granted for K5M to operate from Midway Island in October 2009. Lots of advance preparation with the Park Service has been involved in this operation too, as Midway is also under US protection.

These two operations may give us something to consider if we want to mount a serious DXpedition to CM79. If no one wants to engage in such efforts, we may want to encourage someone to put a KW on a boat off the coast for a week plus at the height of the *Es* season.

## AMSAT Files CJ Requests with US State Department

The Radio Amateur Satellite Corporation (AMSAT) hopes to alleviate what has become a perennial nightmare for them by filing four Commodity Jurisdiction (CJ) requests with the Directorate of Defense Trade Controls, US State Department this past August. From the AMSAT website:

These requests ask that the four commodity groups that AMSAT provided support for AMSAT-DL's Phase 3-E project (SDX, IHU-3, Can-Do! Bus, and thermal design) be transferred to the Department of Commerce and be regulated under the

Export Administration Regulations (EAR), removing them from ITAR (International Traffic in Arms Regulations) managed by the State Department's DDTC.

"Our CJ requests are based upon AMSAT's status as a not-for-profit corporation that adheres to 'open source' and 'public domain' principles where all of our technical activities are freely available through the Internet and publications, such as the *AMSAT Journal*," observed AMSAT President Barry Baines, WD4ASW. "Given the open nature of our activities, the focus on scientific and educational purposes of our satellites, and lack of military applications, we believe that our activities in these areas are better suited for EAR rather than ITAR," said Barry.

The CJ requests will be reviewed by the Directorate of Defense Trade Controls as well as other federal agencies such as the Commerce Department and Department of Defense. AMSAT expects this review to take several months before a decision is made by DDTC whether to grant the request.

AMSAT's involvement with P3-E halted in 2006 due to concerns over possible ITAR violations. In January 2009, AMSAT filed a 'Voluntary Disclosure' with DDTC outlining AMSAT's activities with AMSAT-DL and AMSAT-UK on P3-E. In March 2009, DDTC advised AMSAT that ITAR violations did occur but that the case was being closed. AMSAT was admonished not to violate ITAR in the future. Subsequent to receiving DDTC's letter closing the case, AMSAT is now seeking a means to re-establish technical exchanges in support of P3-E while abiding under rules administered by the Commerce Department.

Further details on AMSAT's efforts to comply with ITAR while developing ways which will allow AMSAT satellite builders to work cooperatively with foreign nationals on amateur radio satellite projects will be available in a future issue of the *AMSAT Journal*.

## Jack Spencer, W9YF, SK

Zack Widup, W9SZ, reported to the VHF reflector that Jack Spencer, W9YF, ex-W9YYF, became a Silent Key on August 8, 2009. While not active for at least the past ten years, he was very active in the 1960s and 1970s. Jack was a mentor of sorts for Zack, as Zack used to watch him work meteors during the years while Zack was growing up.

## Current Contests

**October:** The **432 MHz Fall Sprint** is October 7, from 7 PM to 11 PM local time. The **ARRL 50 MHz to 1296 MHz EME Contest** is October 10-11. The **Microwave (902 MHz and above) Fall Sprint** is October 17, from 6 AM to 12 PM local time. The **50 MHz Fall Sprint** is October 24, 2300 UTC, to October 25, 0300 UTC.

**November:** The **ARRL 2.3 GHz and UP EME Contest** is November 7-8.



For ARRL contest rules, see the issue of QST prior to the month of the contest or the URL: <<http://www.arrl.org>>. For Fall Sprint contest rules, see the Southeastern VHF Society URL: <<http://www.svhfs.org>>.

### Current Conferences

The 2009 **Microwave Update** conference is to be held October 23–24 in Irving, Texas at the Westin, DFW Airport. For further information, please check the Microwave Update website: <<http://www.microwaveupdate.org>>.

The 2009 **AMSAT-NA Space Symposium and Annual Meeting** is to be held October 9–11, Baltimore, Maryland at the Four Points Sheraton Hotel. For details, please see the AMSAT URL pertaining to the symposium at: <<http://www.amsat.org/amsat-new/symposium/2009/index.php>>.

### Current Meteor Showers

The *Draconids* is predicted to peak somewhere around 1640 UTC on October 8. The predicted ZHR (zenith hourly rate) may reach storm levels. The *Orionids* is predicted to peak on October 21.

For more information on the above meteor shower predictions see Tomas Hood, NW7US's "Propagation" column elsewhere in this issue. Also visit the International Meteor Organization's website: <<http://www.imo.net/calendar/2009>>.

### And Finally . . .

As I was preparing this column I had a conversation with Kevin Kaufhold, W9GKA, who, as I mentioned above, is preparing an updated article based on the paper that he presented at the 2008 Central States VHF Society conference in Wichita, Kansas. Commenting on Kjos's QSO with Kutzko, he stated that he never thought that it would take place, even telling John that he didn't think that he could do it, only to be proven wrong by the QSO.

Kevin and I speculated as to the possibilities of 50-state terrestrial 2-meter WAS. We wondered if someone were operating digital from Hawaii and the duct was open between Hawaii and California, if maybe a digital signal from the westward border of the single-hop limit between California and the middle of the country might make it into the duct. I also speculated with Kevin if it were possible to work Alaska any farther to the south and east of the West Coast contacts that previously have

been made to Alaska's southern peninsula. Kevin doubted if that would be possible. Even so, we can dream of the possibility of someone going to the islands with WSJT and making some incredible 2-meter DX contacts.

Concerning WSJT and digital in general, in the aftermath of the successful QSOs reported above, as of this writing there was a firestorm of more than 100 comments on both sides, the pro and con, of digital QSOs posted to the VHF reflector. Kevin commented that it seemed like all of the same arguments that first appeared on the moon-net reflector three years ago had been transplanted to the VHF reflector.

There are some ironies in this controversy. For example, one of the two pioneer operators on the Oklahoma end of the first 6-meter EME QSO, Sam Whitley, K5SW, then W5WAX, refuses to go digital today. Reporting on his success during this year's *Perseids* meteor shower, Sam stated that he made 13 QSOs, all but one of them random. Another irony is that in times past during a similar shower Sam worked more than twice that number. The reason for this difference in numbers has nothing to do with propagation. Rather, the reason is that more and more weak-signal operators are migrating to digital, leaving behind the CW and SSB modes. In doing so, it is making it much less likely that the non-digital purists will be able to achieve their goals because of the lack of operators using the CW and SSB modes. Ah, the arguments will go on and on, with none the winner.

Regarding change, your editor is tippy-toeing into social networking. I am now tweeting on twitter.com as JoeN6CL. I invite you to follow me.

On the other hand, considering the resistance to change, it is said that the only person who does not resist change is the baby who needs a change in diapers. Your editor was once one of those who resisted change. I can remember having written a letter to QST that appeared on page 78 in the March 1963 edition. My comments: "Making everyone go s.s.b. would not solve our problem, mainly because everyone cannot afford it." I was so proud of my being published that I showed the letter to my high school English teacher, who politely told me how nice it was that I had been published. My fellow students in her class were equally unimpressed.

Perhaps you will encouraged to write your comments for a future issue of this, your column. If so, please e-mail me at <[n6cl@sbcglobal.net](mailto:n6cl@sbcglobal.net)>.

Until next month . . . 73 de Joe, N6CL

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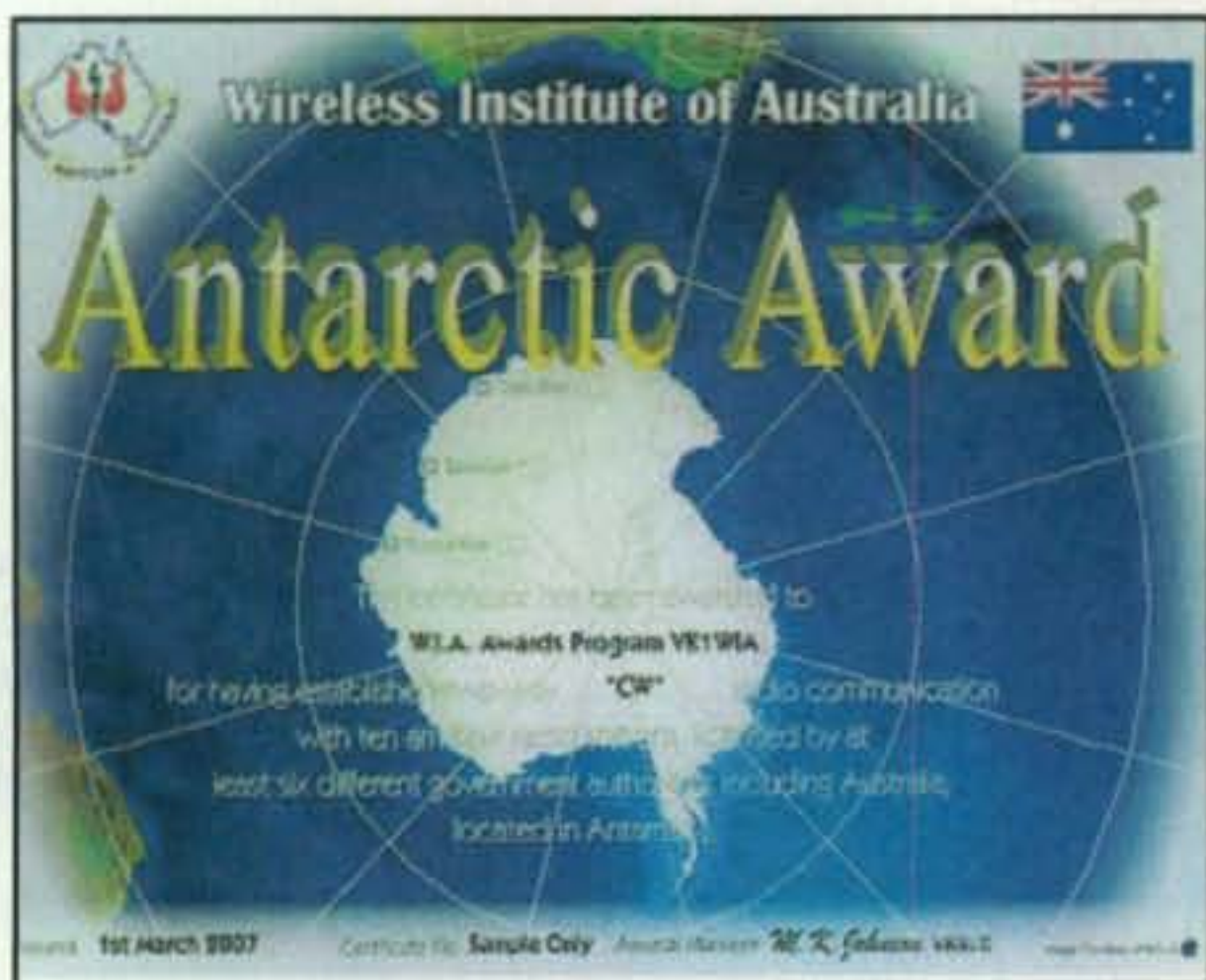


## Antarctica Awards

Contacting stations operating from the hostile environment of Antarctica has held a fascination for amateurs for a long time. Great and deserved bragging rights follow automatically: "Yeah, I had a great QSO with Little America last night, and would you believe the temperature down there was 82 below zero?" No country may own any of the territory known as Antarctica. Scientific studies are the main business there, and amateur radio is often used as a link back to the home countries of the researchers, as well as a morale builder.

Over the years, a number of interesting awards have been developed for contacts with Antarctic stations. As we move into winter in the Northern Hemisphere, the stations in Antarctica look forward to their "summer," such as it is.

The first of the awards is sponsored by the Wireless Institute of Australia.



Contact 10 stations operating from Antarctica, including stations authorized by at least six different national licensing authorities, one of which must be a VKØ, to earn the WIA Antarctic Award.

### Australia's WIA Antarctic Award

Contact 10 stations operating from Antarctica, including stations authorized by at least six different national licensing authorities, one of which must be a VKØ. Contacts after February 23, 1988, the 75th anniversary of the first two-way radio contact between Antarctica and the outside world, count for the award. Antarctica is defined as the land mass, islands, and permanent ice shelf below 60 degrees south latitude. This excludes Heard, Macdonald, and Macquarie Islands, which are sub-Antarctic. SWL okay. All bands okay, no crossband. For foreign applicants the fee is A\$25, US\$25, or 13 IRC's. Applications should be sent to the WIA Awards Manager, Michael Wright, VK5ARD, P.O. Box 752, Roxby Downs, South Australia 5725, Australia.

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

### USA-CA Special Honor Roll

Clifford D. Goldsberry, KIØAZ  
USA-CA All Counties #1186  
July 16, 2009

### USA-CA Honor Roll

<b>500</b>	<b>2000</b>
DJ9MH .....3476	KIØAZ .....1384
KIØAZ .....3477	
	<b>2500</b>
<b>1000</b>	KIØAZ .....1302
KIØAZ .....1781	
	<b>3000</b>
<b>1500</b>	KIØAZ .....1212
KIØAZ .....1497	

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.

### Argentina's Antarctic Awards

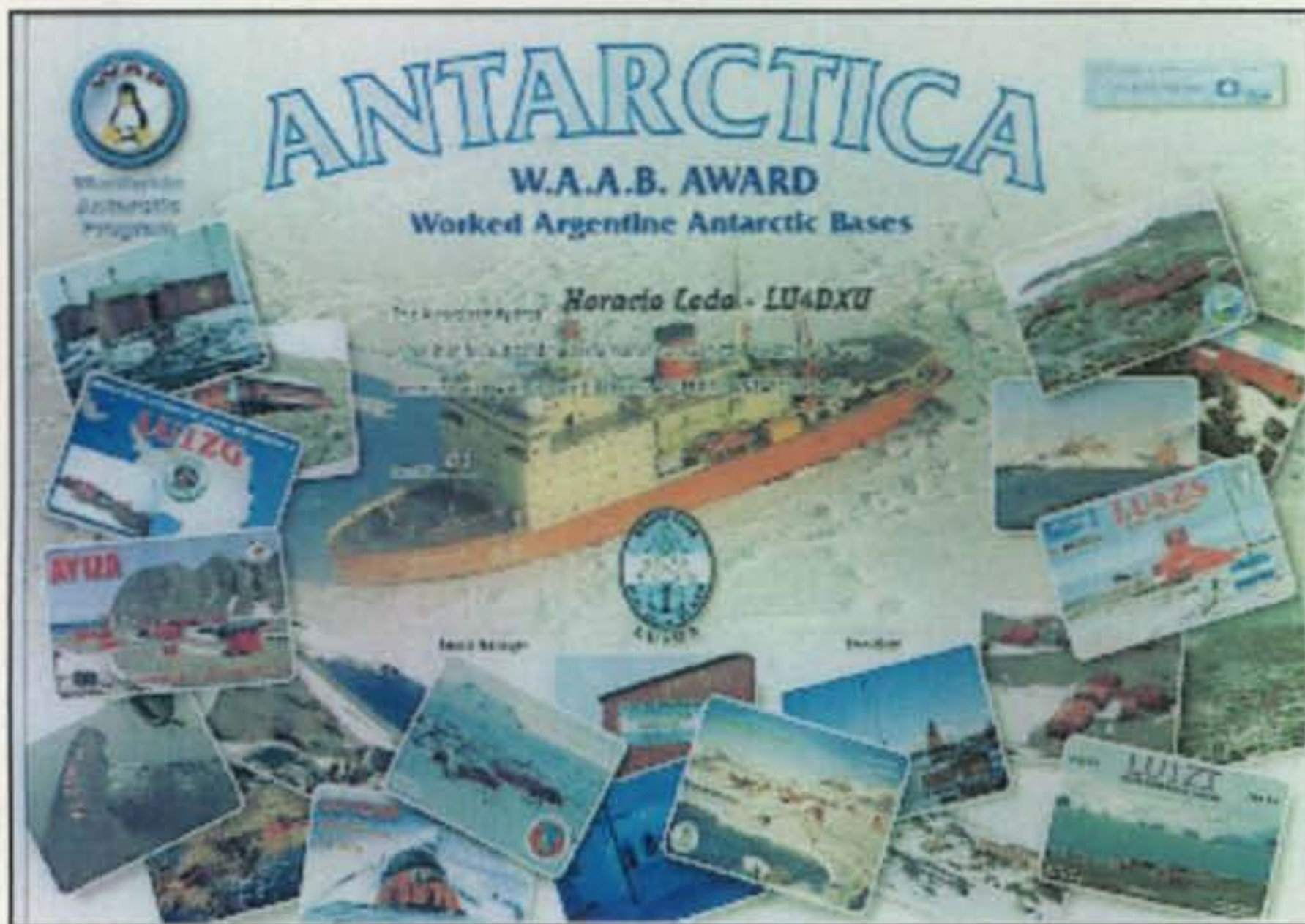
Argentina has had a close relationship with the Antarctic continent, plus bases on the very rare South Georgia, South Orkney, South Sandwich, and South Shetland Islands. The islands are claimed as overseas territories of the United Kingdom, and are claimed by Argentina as well. However, other than scientists there on a temporary basis, the islands are uninhabited. There are two Antarctic awards that come from Argentina.

**Certificado Antartico Argentina (CAA).** The first of the two Argentine Antarctic awards comes from the country's national organization, the Radio Club Argentino. Contact any single LU station (LUs need three) located in the Antarctic area on or after



The Certificado Antartico Argentina (CAA) is issued by the country's national organization, the Radio Club Argentino.





The Worked Argentine Antarctic Bases (WAAB) award is sponsored by The Radio Club Rio de la Plata and requires confirmed contacts with stations located on at least three different Argentine Antarctic Bases.

November 20, 1945. The first letter of their suffix is Z (example: LU1ZA). Separate certificates are issued for phone or CW. The award fee for LU stations is \$US5 or 10 IRCs; endorsements are \$US2 or 4 IRCs. The fee for all others is \$US8 or 16 IRCs, and \$US3 or 5 IRCs for endorsements. SWL OK. Apply to: Award Manager, Radio Club of Argentina, Casilla de Correos 97, 1000-Correo Central, Buenos Aires, Republica Argentina.

**Worked Argentine Antarctic Bases (WAAB).** The second Argentine Antarctic award is sponsored by The Radio Club Rio de la Plata. Confirm contacts with stations located on at least three different Argentine Antarctic Bases since November 9, 2001. SWL OK. All bands from 2 meters to 160 meters and modes SSB, CW, RTTY and Digital are accepted for the award.

*List of Argentine Antarctic Bases:* LU1ZA South Orkney; LU1ZR Petrel; LU1ZB Melchior; LU1ZC Deception; LU1ZS Camara; LU1ZG Belgrano II; LU1ZD San Martin; LU2ZD Primavera; LU1ZV Esperanza; LU1ZI Jubany; LU4ZS Marambio; LU1ZAB Matienzo. Any newly established Argentine Antarctic Base will automatically be added to the list and will be valid for this award.

Send a GCR list of the contacts with QSO details including callsign and date of QSO, in alphabetical order by callsign, plus a photocopy of each of the cards. The sponsor reserves the right to request any actual cards at its discretion. Include fee of \$US17 or 13 Euros for the large-format certificate, or

\$US13 or 9 Euros for the smaller-format certificate. This cost includes shipping inside a tube for greater protection. Apply to: Horacio Ledo, LU4DXU, or P.O. Box 22, Martinez (1640) Buenos Aires, Argentina. Internet: <http://

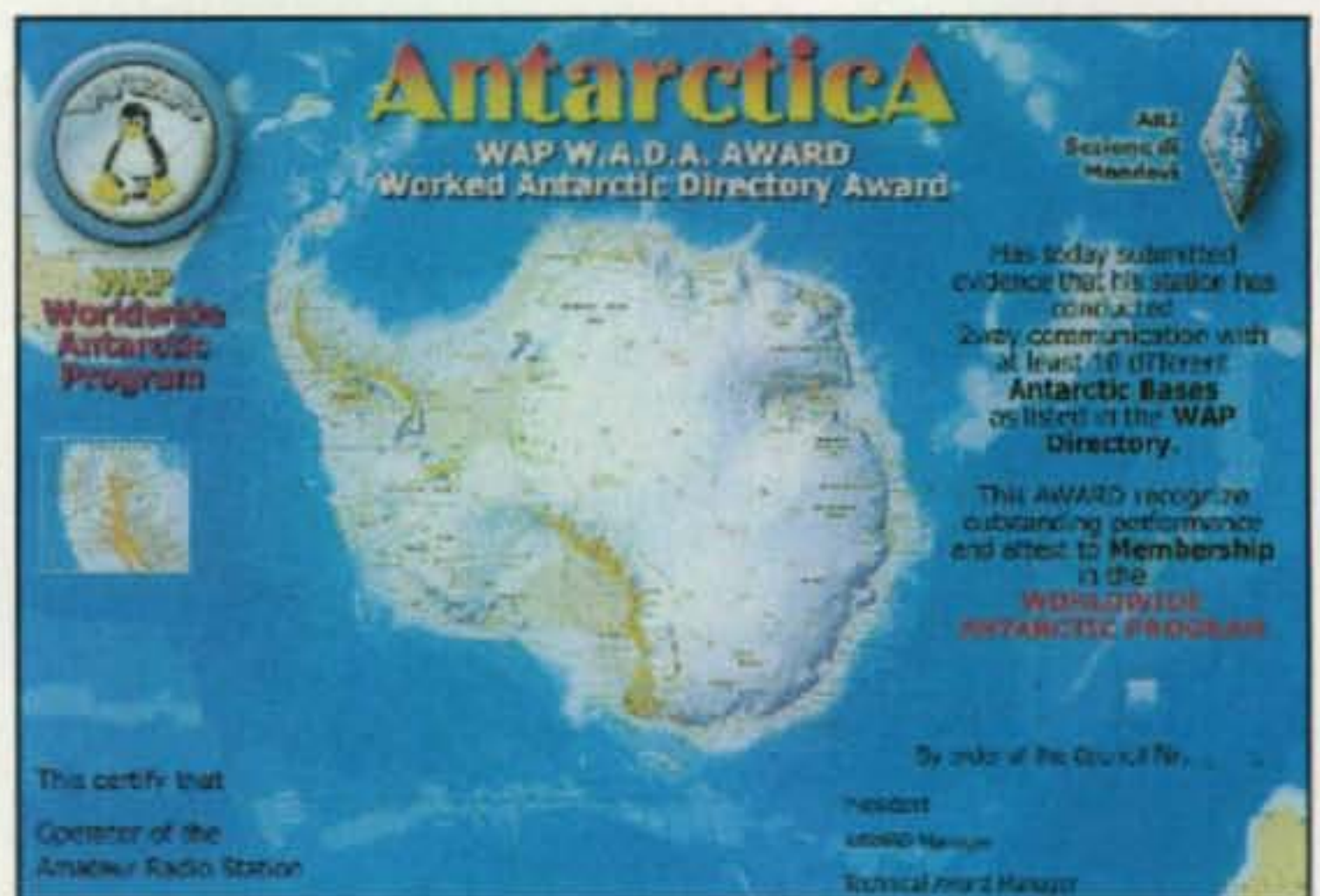
*Provide proof of having contacted at least ten different Antarctic Bases, belonging to at least three different nations, for the Worldwide Antarctic Program/ Worked All Directory Award from Italy.*

www.waponline.it/WapAwards/tabid/61/Default.aspx>; e-mail: <lu4dxu@hotmail.com>.

### Italy's WW Antarctic Program/ Worked All Directory Award

For many years, Italian amateurs seem to have had a fascination with events at the South Pole. The sponsors of the following award have heavily researched ham radio operations in Antarctica that go back many years.

Provide proof of having contacted at least ten different bases, belonging to at least three different nations, all of which are listed in the WAP Directory for Antarctic, Pen & Sub Antarctic localities, and Austral Territories. All bands and modes may be used. Contacts from November 15, 1945 are valid. A base includes a true operating location, supply installations, and logistical facilities, including laboratories, huts, camps, stations, refuges, Naval Detachments, etc. Read the detailed description of valid nationality, ownership, etc., on the WAP website noted below. The WAP Directory may be downloaded and is a comprehensive and interesting document of Antarctic exploration.



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**Bill McFarlen, WA5VGI**  
**USA-CA All Counties #1182, February 26, 2009**

On the wall of my radio room hangs my prized QSL card. The card is from Jay Stark, Jr., W8EGE. In 1948 my family moved from Pennsylvania to Michigan. Jay, W8EGE, was the father of one of my new Michigan school chums, Jay III. His dad had a beautiful amateur radio station in the basement of his home. In his back yard were a 2-element 20-meter beam, and a full-size 75/80 meter dipole at 60 feet. In 1952 his son and I both became fascinated with the ham equipment and the ability to talk to people in the U.S. and abroad. During the same period there was an article in *Popular Mechanics* on how to build a crystal set. Soon I had put one together and was thrilled being able to hear local radio stations on my own home built receiver. Before long Jay and I were both hooked on amateur radio and had our Novice licenses. I received the call WN8KJC and Jay was WN8LGU.

Those were fun days. My first rig was a single 6L6 crystal-controlled oscillator and a 2-tube receiver. A simple doublet provided an 80-meter antenna. Jay's father bought us code-speed records so that we could practice getting our code speed up to 13 wpm and prepare to obtain our General class licenses. Soon we both obtained our Generals, removing "N" from our calls, and we were able to explore all of the HF bands. My home station had been upgraded with a new Harvey-Wells Bandmaster Senior from my father and a used National HRO-50 purchased with my money from working at a local grocery store.

It wasn't long before the DX bug bit me and I was staying up late at night and getting up early in the morning to work DX. I still remember my first DX QSO with a station in England. When I heard his signal coming back with a trace of arctic flutter my heart was beating so loud that I could hear it in my headphones. Although I had a small station at my own home, a block away, the door was always open to walk to W8EGE's station for working DX. Throughout high school and college at the University of Michigan, I enjoyed working DX at my home station and also just up the street at W8EGE's station.

In 1963 I graduated from college and took a job with the Rocketdyne division of North American Aviation in California. Apartment living, small children, and graduate school curtailed any hopes of being on the air. In 1968 I transferred to the Tulsa, Oklahoma, division of my company and came close to getting back on the air. But work and family commitments still prevailed. I did receive a new call, which was WA5VGI. Trips to visit my family in Michigan always gave me the opportunity to work W8EGE's station, and it was always a thrill to get back on the bands. During my absence I had donated my home station to a local private boys' school.

In 1976 I transferred back to work at my previous division in California (now Rockwell International). I was careful to purchase a home in Thousand Oaks that had no CC&Rs and the city did not require antenna permits in my area. In 1984 I decided to get back on the air. Forty-five foot high pine trees provided the supports for dipoles covering 40–10 meters. Later I would add a small 80-meter vertical. My station was equipped with all used Collins Radio gear. My initial operating experience in a tightly built residential neighborhood was an eye-opener. I encountered numerous RFI problems. Some of these included turning on/off a solar heating water pump, opening sprinkler valves, and typical amateur interference to TV/stereo/telephone devices. Fortunately I met a local amateur, Jon, W6KFV, who was representing the ARRL on RFI problems. It took several months, but with Jon's help all of the neighborhood operating problems were resolved. During the period 1984–1996 I upgraded my station equipment, got into computer logging, worked 313 DXCC entities, completed 5B WAS, and started my foray into county hunting. In 1994 I obtained my initial USA-CA certificate for 500 counties.

In 1996 I decided to retire, and my wife Linda and I moved to the central California coastal area. We purchased a home at the top of a ridge on 21 acres. Unlike my experience in southern California, my nearest neighbor was now over 300 feet away. Soon two towers were erected with Yagis covering 80–10 meters and a coil-load vertical for 160 meters. I also took the opportunity to upgrade to Extra Class with the 20-wpm code speed still in effect. In between chasing DX, I always looked up at my USA-CA award on the shack wall and thought it would be fun to get up to 1000 counties. So in between DX, I started spending time on the county hunters nets and eventually worked my way up to the 3000 sticker for my certificate.

Fast forward to August 2008. With the solar flux stuck at 69–71 and DX scarce I decided to try to finish up with all 3077 counties confirmed. At this time I still needed 30 counties in 13 states. In seven of those states I needed just one county. A chance visit to 14.336 MHz netted



*Bill, WA5VGI, USA-CA All Counties #1182.*

Bob, N8KIE, and the last three counties in SD. A QSL sent to WE1H for his WPX prefix yielded my last one in VT. Four down and 26 to go.

By the end of September 2008 I still needed 20 counties. High gasoline prices coupled with poor propagation had impacted mobile activity on the county hunting nets. I realized just listening to the designated frequencies and hoping to find the missing counties was not going to allow award competition any time soon. Thus began a quest to seek out amateurs in the remaining counties to set up a schedule for a QSO.

Using QRZ.com, I developed lists of amateurs in each of the missing counties. I pared down the list to only those licensed for HF privileges. In some cases this left just 1–4 amateurs available in a few of the counties. I then constructed a form letter and mailed it to each of several amateurs the first time around in the counties needed. In about 10 days, I started to receive some responses and got some takers to make a schedule. John, KØGXG, put up a dipole to give me Jackson County for my last one in IA. Soon I was getting several offers a week for schedules, and by October 2008 I was down to 16 counties left. In the course of the schedule requests I ran into cases of silent keys, folks who were no longer active, those who could give me a sked, and those who were kind enough to refer me to someone who could put out the county. Bob, KD4HLA, who received a sked request, found we had worked back in the 1995 ARRL SweepStakes and sent a QSL for Madison County in OH. The amount of help from the amateur community was simply amazing.

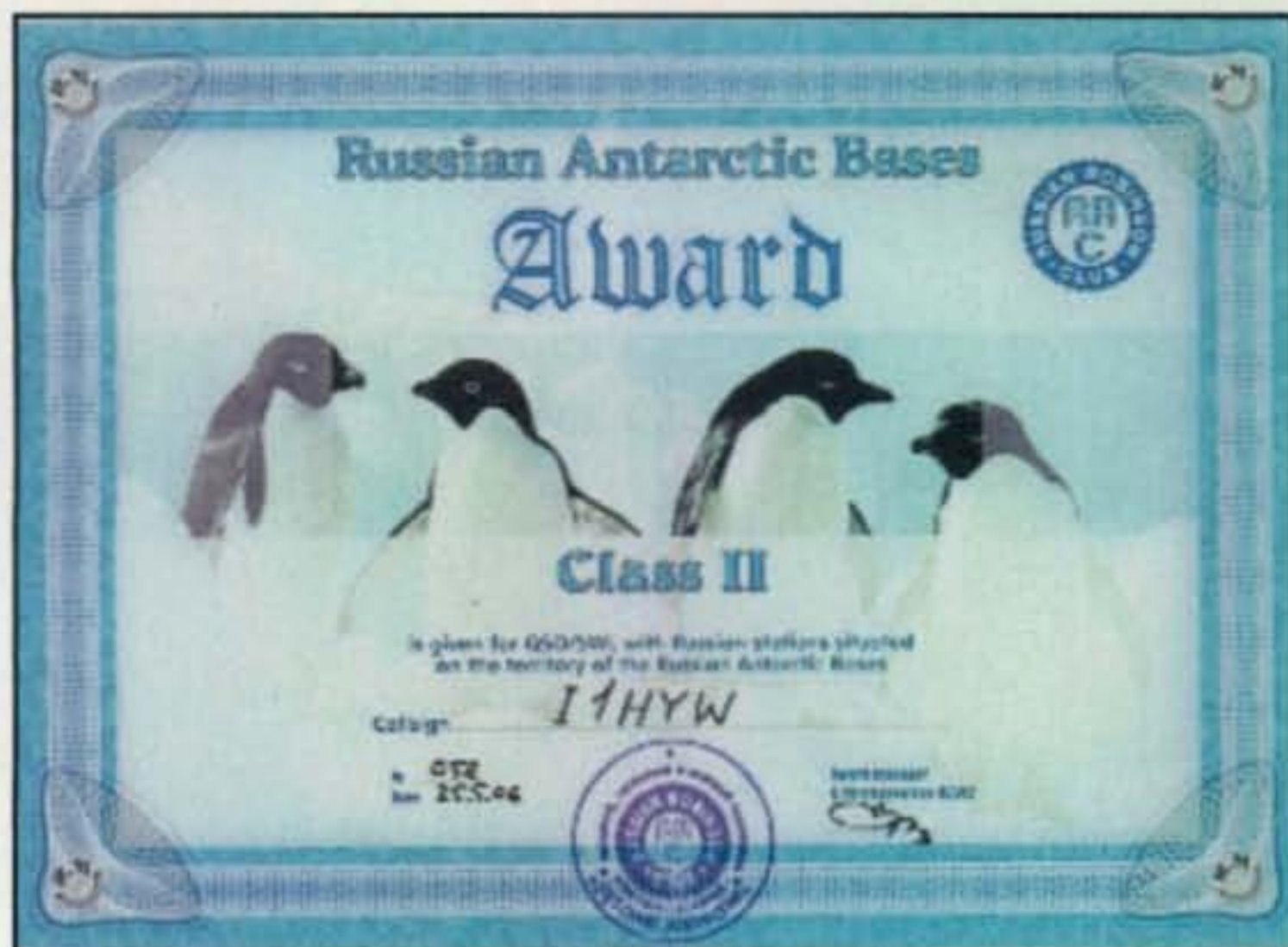
Finally, in January of 2009 I was down to just three counties in three states to finish. Unfortunately no one in these counties was able to provide a sked. I searched the MARAC files to find members in nearby counties who might be able to run the remaining ones I needed. Rufus, KD4HXM, and John, WA8KIW, responded and I finished the last ones in GA (Treutlen) and KY (Fleming). Rufus drove from the other side of GA for our schedule and John had previously given me my last county in OH.

In the end it was Jeff, WBØM, who put out Cuming County in NE for my last one. I was done!! Fortunately I had used computer logging to track the county award, so it was very easy to print out a final copy of the county log, attach it to my application, add the required QSLs, and get my package off to Ted, K1BV.

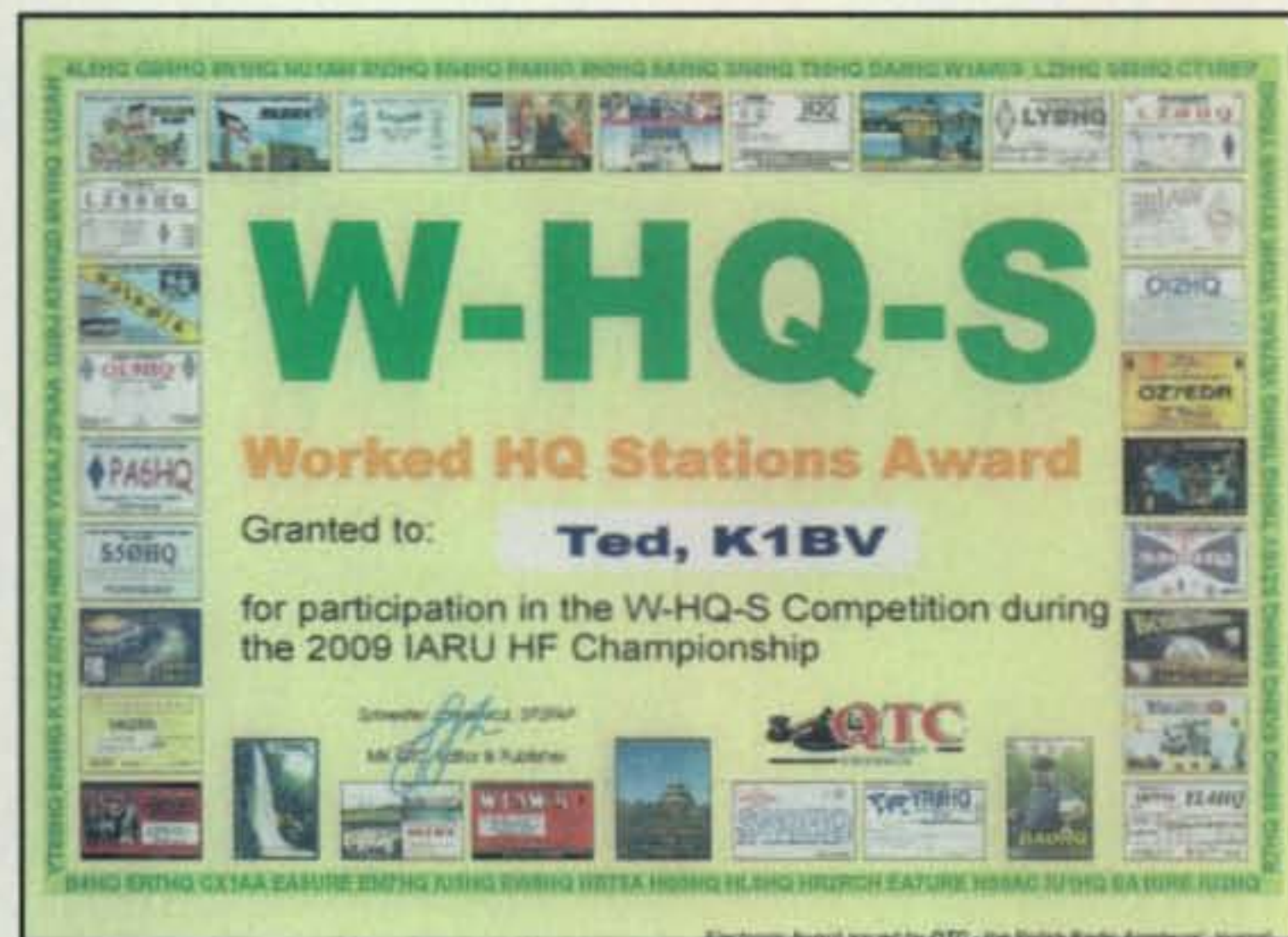
First my thanks to CQ magazine for sponsoring this difficult and challenging award. There are many stations who make up my 3077 confirmed counties but a few stand out. First AA9JJ and N9QPQ, KA9PZS, KA3MMM, N4CD, KC4UG, KIØJD, N8STF, W7GQK, KØGEN, W3CR, and, AI5P. And thanks to the fellows who took their time to run the various SSB and CW nets.

Hats off to Larry, W7CB, Jim, W6OUL, and Jonas, LY2ZZ, for their continuing inspiration and encouragement to work all 3077 counties. A special thanks to Tom, N6BT, who designed and built all of my station antennas and was always there when the big Pacific winds took their toll. But most of all, a big thank you and hug to my wife Linda who tolerates this crazy hobby. She has brought me coffee during the peak of a DX contest, sorted QSLs for me to send to the bureau, and most of all (with tongue in cheek) says my antennas are a thing of beauty. I owe you one, darling. See you all in the pile-ups.—73, Bill, WA5VGI





The Russian Antarctic Bases Award is given for QSOs/ SWL with radio stations situated on the territory of the ex-USSR and Russian Antarctic Bases.



During the 2009 IARU Contest in July, the Polish QTC Magazine offered an award for contacting at least ten of the HQ stations. The certificate is all done via e-mail.

Send GCR list of contacts showing the QSO data plus WAP reference number and fee of \$US13 or 10 Euros to: Award Manager, Massimo Balsamo, IK1GPG, Sezione ARI Mondovi, P.O. Box 4, I-12084 Mondovi (Cuneo), Italy. (No charge for endorsement stickers.)

An Honor Roll level award is available for those providing proof of contacting at least 50 different bases from 20 different nations. The fee for Honor Roll plaque is \$US35 or 25 Euros.

A Top Honor Roll level award is available for those achieving the Basic and Honor Roll levels and showing confirmation of at least 100 different bases in at least 25 countries. No fee listed was listed: if you qualify, contact the sponsor. Internet: <<http://www.waponline.it>>; e-mail: <[wap\\_info@virgilio.it](mailto:wap_info@virgilio.it)>.

### Russian Antarctic Bases Award

This award is a part of the "Russian Robinson" series of awards, which has been featured previously in this column.

The RABA award is given for QSOs/SWL with radio stations situated on the territory of the ex-USSR and Russian Antarctic Bases:

- 3rd class: 3 QSOs/1 Base
- 2nd class: 5 QSOs/2 Bases
- 1st class: 7 QSOs/3 Bases
- Honor Roll: more than 10 QSOs/3 Bases

A complete list of valid bases can be found on the website listed below. Only QSOs with Russian Antarctic Bases count for the award. The application must be based on the received QSL cards, photocopies of which must be sent along with the application. You may also e-mail scans of the QSL cards to the award manager. When applying

for the Honor Roll Plaque, the original QSL cards have to be sent along with the application.

The charge for the certificate is as follows: Russians 100 rubles, CIS 120 rubles, all others 7 Euros or 10 IRCs. RABA Honor Roll Plaque: Russians 1100 rubles, CIS 1200 rubles, all others 37 Euros. Apply to Victor Rochev, RU3GN, 398006, Lipetsk, P.O. Box 59, Russia. Internet: <[http://www.hamradio.ru/rrc/awards\\_e.htm](http://www.hamradio.ru/rrc/awards_e.htm)>; e-mail: <[cjirb@yandex.ru](mailto:cjirb@yandex.ru)>.

### Instant Gratification!

During the 2009 IARU Contest in July, at least five countries offered awards for making QSOs with HQ stations. The Polish QTC Magazine offered a separate award for contacting at least ten of the HQ stations and used the magical word "free," which any marketing person will admit is a powerful word when used in advertising.

The award was free when you submitted a log extract via e-mail and were willing to receive a PDF image of the award by return e-mail. I sent an e-mail to the sponsor, it was confirmed, and a subsequent e-mail delivered a megabyte-size attachment which I printed here in my shack using an inexpensive Canon ink-jet printer. From time of my application to receipt of the free award (15 cents of my ink) was two days. Hence the title of this segment of the column.

**Pluses:** goodwill due to instant service; no printing expenses by the sponsor; no postage expense for sponsor.

**Minuses:** recipient must have a color printer; recipient must have an e-mail account; recipient must have the free PDF reader program by Adobe.

I would say that the pluses far outweigh the minuses!

We're always looking for new and interesting awards to feature in this column. If your club or special-interest group has such an award, please contact me at the e-mail address shown on the first page of this column.

73, Ted, K1BV

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## ZP6CW's Antenna Setup

**S**o, where are we this month? October . . . ah ha. This a good month for several reasons. The first thing DXers and especially contest types think of when you say October is CQ WW DX SSB Contest! I hope you have all your "stuff" together for this season—you know, the computer, software, radios, amplifiers, and oh yes, those antennas. Maybe things will be a little better this year. I mean, this solar thing has to finally hit the bottom and head back up sometime, right?

First I'll tell a little story about myself this month. I have been an avid (maybe too avid) user of CT for my contesting for? Well, I don't remember how many years, but it's been a long time. Some of my local friends kept hounding me for using that "old DOS thing." Well, it was a bit of a pain to switch out of Windows® and back into DOS to run CT (I never liked the Windows® version), and I kept forgetting to switch the computer clock to UTC and back after the contest.

My friends kept talking about the WriteLog program and how great it was. I finally couldn't take it anymore and ordered WriteLog. Well, not being one known for a lot of patience, I tried using it without any real instruction/direction. I failed, and I went back to CT. However, WriteLog just kept popping up in conversation, and I decided to give it another try. After all, so many people can't be wrong, and if it worked for them, and it should work for me. I got the latest version and conned one of my local friends who knew how to use the program into showing me the finer points of using it. Oh! Well, now that I saw how you do this or that, it wasn't so bad after all. A lot of the commands were very similar, or even just like, the ones I had been using for CT.

This really doesn't have anything directly to do with DX, but I was doing something constructive to improve my station capabilities. Uh, oh. Then I saw a problem. I didn't seem to be able to send my CW messages from WriteLog like I did with CT. Why not? Off to my local friend again. Oh, read the book! It seems that capability is not a part of WriteLog. Thus, what I needed was another little gadget to send CW messages. No big deal. After all, I had to wire up a cable from my old computer to allow CT to send the messages. Hmm . . . It would take more than a cable, it seemed, for WriteLog.

My local friend and I talked through the possibilities—some easy, some more difficult; some expensive, some not so expensive. I had to make a choice. After reading through all the literature (on-line, of course) and more discussions with the locals, I chose to get the K1EL WINKEY USB keyer kit.

I'll make this short. I bought the kit, including the enclosure, assembled it in a few hours, testing

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



The big 16 element Log Periodic atop the 48 foot tower. (Photo courtesy of Doug, ZP6CW)

took another hour or so, and lo and behold, with the WINKEY connected, WriteLog worked just fine sending the messages, etc. Now I'm ready for the next contest. Let's see, there's the CQ WW contests as well as the old ARRL Sweepstakes (my all time favorite since 1957). Did I mention that I prefer to operate CW? I guess you figured that out by now.

Okay, enough of my summertime activities. Now let's try to find some DX to talk about.

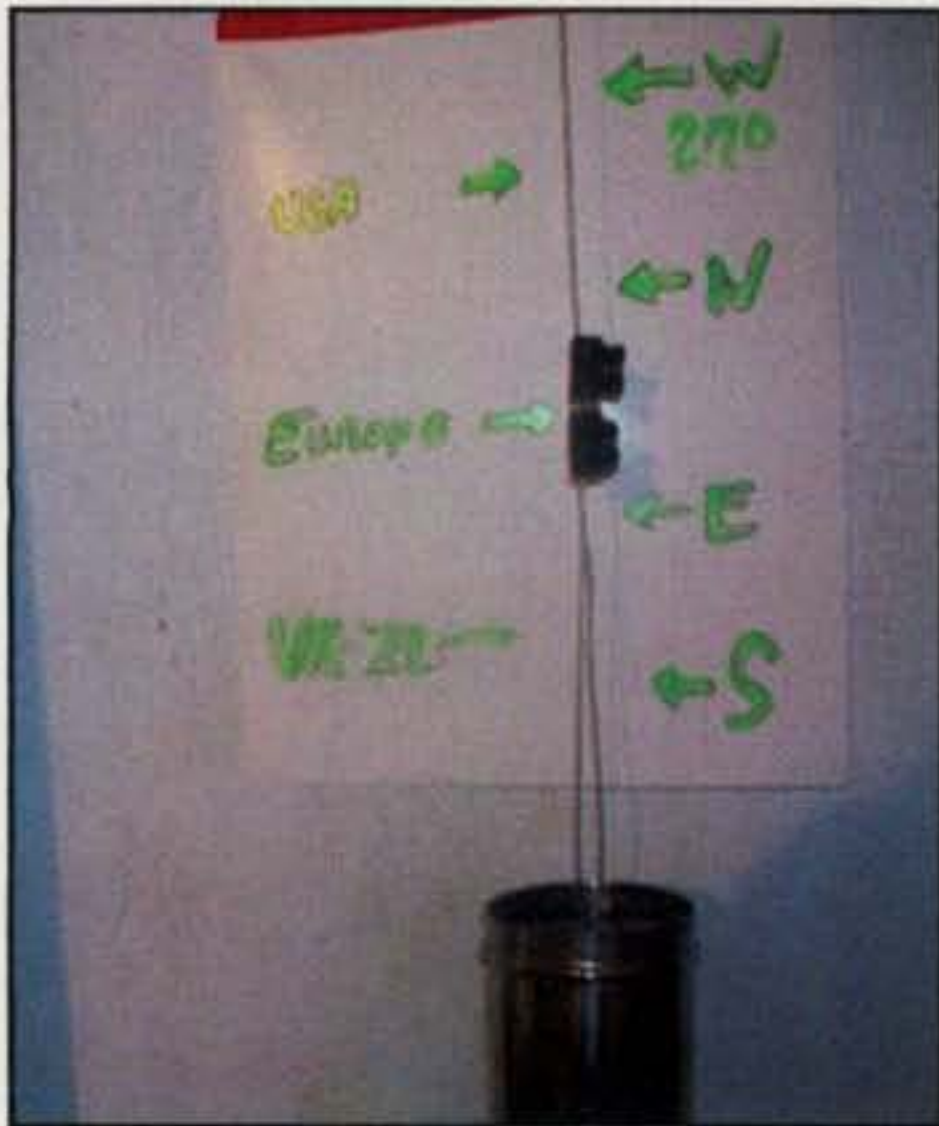
### ZP6CW's Tower and Antennas

My buddy Doug, ZP6CW, started sending me pictures of various *things* back in July. There was a pile of what looked like tower sections: a huge pile of aluminum tubing, some funny-looking motor and large gear combination, along with some cryptic comments about something big in the works down that way.



To turn the antenna Doug had this installed—a rotating mast running from the tower base all the way to the top. The mast is turned by the motor and gear box mounted at the base. (Photo courtesy of ZP6CW)





This is the direction indicator for the new antenna at ZP6CW. A thin flexible wire runs from the tower center-mounted mast to the ham shack through a wall using a couple of pulleys and a weight consisting of a can loaded with lead. It works! Doug says, "It must be about 1915 vintage!" (Photo courtesy of ZP6CW)

He kept sending pictures of the various stages of a tower installation and then one with a huge antenna sitting atop the tower. This antenna had a boom constructed of what appeared to be Rohn 25G tower sections. I counted 16 elements spaced across this long (tower) boom. Doug finally admitted that it was a log periodic covering the 7 to 30 MHz range. The tower holding it up is a self-supporting type, and although it looks much larger, he says it is only 48 feet tall.

Doug retired and moved to Paraguay several years ago and has enjoyed hamming from there with his Force 12

### CQ DX Awards Program

#### SSB

2530.....IV3BSF

#### SSB Endorsements

330.....K4QJ/339      330.....VE3MRS/338  
330.....VE3MR/338      200.....IV3BSF/225

#### RTTY Endorsements

330.....N5ZM/333

The basic award fee for subscribers to CQ is \$6. For non-subscribers, it is \$12. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 339 active countries. Please make all checks payable to the award manager.

## The WPX Program

**CW**  
3230.....S55ZZ

**SSB**  
3051.....WA7QCC

**Mixed**  
2063.....WB4JJJ      2064.....WA7QCC

**CW:** 2350 I0NNY. 2550 JN3SAC. 3300 WA5VGI. 4400 N4NO.  
**SSB:** 1650 JN3SAC. 2050 DL8AAV. 2600 I3ZSX. 3700 N4NO.  
**Mixed:** 500 IK1RKN. 600 WB4JJJ. 2950 JN3SAC. 5000 N4NO.

**160 Meters:** S55ZZ, RA3CQ  
**80 Meters:** RA3CQ  
**40 Meters:** RA3CQ  
**20 Meters:** RA3CQ  
**15 Meters:** RA3CQ  
**10 Meters:** RA3CQ

**Asia:** RA3CQ  
**Africa:** RA3CQ  
**Europe:** RA3CQ  
**Oceania:** RA3CQ  
**North America:** RA3CQ  
**South America:** AA1VX, RA3CQ

**Award of Excellence:** RA3CQ  
**Digital Bar:** RA3CQ

**Award of Excellence Holders:** N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, I0JX, WA1JMP, K0JN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QM, WB8IL, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YLW4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IC, W3ARK, LA7JO, VK4SS, I8YRK, SM0AJU, N5TV, W6OUL, WB8ZRL, W8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, 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, KB0G, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YB0TK, K9QFR, 9A2NA, W4UW, NX0I, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH,

IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DE0DAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBF, W5ODD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, W0ULU, K9XR, JA0SU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KU0A, VE2UW, 9A9R, UA0FZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RA0FU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, K0KG, DL6ATM, VE9FX, DL2CHN, W2OO, A16Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, K0DEQ, DK0PM, SV1EOS, UA0FAI, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH.

**160 Meter Endorsements:** N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, WB8IL, K9BG, W1CU, G4BUE, LU3YLW4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SM0DJZ, DK5AD, W3ARK, LA7JO, SM0AJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TOH, N6JV, ONL-4003, W5AWT, KB0G, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YB0TK, K9QFR, W4UW, NX0I, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JA0SU, I5ZJK, I2EOW, KS4S, KA1CLV, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KU0A, VR2UW, UA0FZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RA0FU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, K0DEQ, DK0PM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UR5FEO, N3RC.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for airmail) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls which have been confirmed by eQSL.cc. Other electronic QSL confirmation means are not accepted.

\*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are \$6.50 each.

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## On the Cover

Dick Flanagan, K7VC, of Minden, Nevada, lives in a high valley about 10 miles south of Carson City, just east of Lake Tahoe. His mile-high location provides a great takeoff point for working DX with the three antennas mounted on his 72-foot crank-up tower (cranked down to fit in the photo). At the bottom is a Hy-Gain TH11DX five-band Yagi, at 73 feet. The middle antenna is an M<sup>2</sup> 6M7 seven-element beam for 6 meters, and at the top is a Cushcraft 40-2CD two-element beam for 40 meters, which sits at 85 feet when the tower is cranked up. Dick has upgraded some elements of his station (seen in the inset) since these photos were taken. A current photo is on his website at <www.k7vc.com>.

While Dick has been licensed since 1961, he has been seriously pursuing DX for only the past decade. In that time, he has managed to confirm 320 countries and earn both ARRL's 7-Band DXCC and CQ's 5-Band Worked All Zones awards. (We're sure the location and antennas don't hurt!)

Dick's interests go well beyond DXing. In the past he has been a repeater coordinator and chaired the ARRL's VHF Repeater Advisory Committee. He also served as ARRL Section Manager for Nevada from 2003 to 2008, and earned the ARRL's Excellence in Recruiting award in 2001. A retired software engineer, Dick's current passion is the annual EMCOMMWEST® emergency communications conference in Reno, Nevada, which he founded and will be coordinating next year.

Dick's wife, Melissa, is also a ham—KK7AA. They share their high-desert home with an Australian Shepherd and a pair of Maine Coons. (Cover photo by Larry Mulvehill, WB2ZPI)

## 5 Band WAZ

As of August 1, 2009, 788 stations have attained the 200 zone level and 1645 stations have attained the 150 zone level.

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

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

S51U, 199 (27)	S58Q, 199 (31)
N4WW, 199 (26)	KQØB, 199 (2 on 10)
W4LI, 199 (26)	K9OW, 199 (34 on 10)
K7UR, 199 (34)	N5AW, 199 (17)
W2YY, 199 (26)	IN3ZNR, 199 (1)
IK8BQE, 199 (31)	EA5BCX, 198 (27, 39)
JA2IVK, 199 (34 on 40m)	G3KDB, 198 (1, 12)
IK1AOD, 199 (1)	JA1DM, 198 (2, 40)
GM3YOR, 199 (31)	9A5I, 198 (1, 16)
VO1FB, 199 (19)	K4CN, 198 (23, 26)
KZ4V, 199 (26)	G3KMQ, 198 (1, 27)
W6DN, 199 (17)	N2QT, 198 (23, 24)
W3NO, 199 (26)	OK1DWC, 198 (6, 31)
RU3FM, 199 (1)	W4UM, 198 (18, 23)
N3UN, 199 (18)	US7MM, 198 (2, 6)
W1JZ, 199 (24)	K2TK, 198 (23, 24)
W1FZ, 199 (26)	K3JGJ, 198 (24, 26)
SM7BIP, 199 (31)	W4DC, 198 (24, 26)
N4NX, 199 (26)	F5NBU, 198 (19, 31)
N4MM, 199 (26)	OE2LCM, 198 (1, 31)
EA7GF, 199 (1)	WK3N, 198 (23, 24)
N6HR/7, 199 (37)	W9XY, 198 (22, 26)
JA5IU, 199 (2)	KZ2I, 198 (24, 26)
RU3DX, 199 (6)	W7VJ, 198 (34, 37)
N4XR, 199 (27)	K9MIE, 198 (18, 21)
HA5AGS, 199 (1)	W9RN, 198 (26, 19 on 40)
VE3XN, 199 (26)	W5CWQ, 198 (17, 18)
YU7GMN, 199 (10)	I5KKW, 198 (31&23 on 20)
K7LJ, 199 (37)	IV3MUC, 198 (1&31 on 40)
RA6AX, 199 (6 on 10m)	UA4LY, 198 (6&2 on 10)
RX4HZ, 199 (13)	UT9FJ (27, 29)
KØGM, 199 (17)	

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

RV4LC (177 zones)	KJ6P (154 zones)
SP5DIR (170 zones)	K5AC (177 zones)
HA5UK (170 zones)	K2XF (185 zones)

### 5 Band WAZ updates:

EA3ALV (188 zones)	IN3ZNR (199 zones)
NKØS (170 zones)	G3VKW (199 zones)

\*Please note: Cost of the 5 Band WAZ Plaque is \$100 shipped within the U.S.; \$120 all foreign (sent airmail).

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

Yagi. He just happened to find this tower and LP in the area that was available for a good price, so he decided it was time for some bigger/better antenna setup. After using the LP for a few weeks, Doug said he wishes he had found this stuff sooner. He's having a ball with it and working bands he couldn't before.

As a side note here, I happened to see him spotted on 17 CW one afternoon. I tuned up to the frequency and there he was running EU as fast as he could. Since I had not worked him on 17, I threw my call out there and there was silence. I started to call again, but

## The WAZ Program

### 6 Meters

86 .....WB8TGY (25 zones)

### 20 Meter SSB

1180 .....WA6JJB 1181 .....YU1FW

### 80 Meter CW

77 .....HB9DDZ

### 20 Meter Digital

001 .....KJ6P

### 160 Meters

312...UR4CWQ (30 zones) 313.....UT3UA (39 zones)

### All Band WAZ

#### Mixed

8601 .....UW7CN	8609 .....SP5DIR
8602 .....OE9WGI	8610 .....W5VQ
8603 .....RV4LC	8611 .....KJ6P
8604 .....KE6V	8612 .....IT9KCD
8605 .....IK1RKN	8613 .....IWØSAF
8606 .....JA3RAZ	8614 .....K5AR
8607 .....WD6L	8615 .....SV1JMO
8608 .....K6FW	

#### SSB

5111 .....SV9COL	5114 .....DF6TC
5112 .....IW8EDA	5115 .....JA3ERG
5113 .....KJ6P	

#### CW

573 .....LA4IR	575 .....JA2CUS
574 .....JO1ABS	

#### Digital

006 .....KJ6P

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then he answered me. He said I scared him, as my signal was so loud, hi. My 100 watts feeding my 2-element 40-meter Yagi and he was telling me I was loud? Well, folks, I will tell you that he certainly was loud; even the S-meter on the FT-1000MP said he was 10 over the S9 mark. Obviously the LP was working quite well. I'm running a few pictures of Doug's "monster" in this column. Oh, he says he still has his old antenna in service as well.

If you hear ZP6CW on 17, 12, or 10 meters, he will be on CW, so drop in and say hello. I know he will be glad to know all the effort was worth it when he has to go split to hold down the QRM.

## October Operations

There are a few DX items for you to keep in mind this month. That Glorioso operation is still going to happen. We just have to wait while the French Military sorts things out after having to assist with the search/rescue efforts after the



## CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 339 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is \$1.00 each plus SASE. Please make checks payable to the awards manager, Billy F. Williams. All updates should be mailed to P.O. Box 9673, Jacksonville, FL 32208.

### CW

NØFW ..... 338	K2FL ..... 338	W7OM ..... 337	N5FG ..... 336	HB9DDZ ..... 335	G3KMQ ..... 334	KA3S ..... 328	EA3ALV ..... 319	XE1MD ..... 280
WB4UBD ..... 338	K4MQG ..... 338	W7CNL ..... 337	K9OW ..... 336	K3JGJ ..... 335	K6LEB ..... 333	K1FK ..... 328	RA1AQB ..... 317	4Z5SG ..... 279
K3UA ..... 338	W8XD ..... 338	WBJLC ..... 337	K8LJG ..... 336	K2JLA ..... 334	K5RT ..... 332	IKØADY ..... 328	W6YQ ..... 316	W2JLK ..... 277
K9MM ..... 338	K2TQC ..... 338	K4CN ..... 337	K9IW ..... 336	F3AT ..... 334	K8SIX ..... 331	F6HMJ ..... 328	WA4DOU ..... 316	HA5LQ ..... 277
W4OEL ..... 338	N7RO ..... 338	VE3XN ..... 337	W4MPY ..... 336	PA5PQ ..... 334	W4UW ..... 331	W1DF ..... 328	ON4CAS ..... 314	
EA2IA ..... 338	F3TH ..... 338	K4JLD ..... 337	K5UO ..... 336	NC9T ..... 334	W7IT ..... 330	IKØTUG ..... 321	WD9DZV ..... 304	
OK1MP ..... 338	DL3DXX ..... 338	N5ZM ..... 337	K7LAY ..... 336	G4BWP ..... 334	N7WO ..... 330	W3II ..... 320	KT2C ..... 304	
N7FU ..... 338	WK3N ..... 338	N4AH ..... 337	N6AW ..... 336	W1JR ..... 334	W6OUL ..... 329	OZ5UR ..... 320	KØKG ..... 303	
N4JF ..... 338	K9BWQ ..... 337	N4CH ..... 337	KA7T ..... 336	I4LCK ..... 334	KE3A ..... 329	CT1YH ..... 320	N2LM ..... 297	
K4IQJ ..... 338	N4MM ..... 337	K2OWE ..... 336	PY2YP ..... 335	YU1AB ..... 334	K6CU ..... 329	W9IL ..... 319	N2VW ..... 283	

### SSB

K4JLD ..... 339	K5OVC ..... 339	K4IQJ ..... 339	AA4S ..... 338	W7BJN ..... 337	N7WR ..... 335	SV3AQR ..... 328	W6NW ..... 314	W4EJG ..... 295
EA2IA ..... 339	K4MQG ..... 339	WK3N ..... 339	VE3MR ..... 338	AB4IQ ..... 337	WØYDB ..... 334	VE7EDZ ..... 328	KA1LMR ..... 312	W9ACE ..... 294
XE1AE ..... 339	N4MM ..... 339	K5TVC ..... 338	VE3MRS ..... 338	W4UNP ..... 337	K5RT ..... 334	XE1MD ..... 327	RA1AQB ..... 312	WD9DZV ..... 292
IN3DEI ..... 339	K9MM ..... 339	KZ2P ..... 338	XE1L ..... 337	W4UW ..... 337	WA4WTG ..... 334	YV4VN ..... 326	N2LM ..... 312	W6MAC ..... 292
NØFW ..... 339	OZ5EV ..... 339	W6BCQ ..... 338	OE3WWB ..... 337	K8SIX ..... 336	K3LC ..... 334	KD5ZD ..... 326	KD2GC ..... 311	AD7J ..... 291
DU9RG ..... 339	VE2PJ ..... 339	W6EUF ..... 338	K9OW ..... 337	KE3A ..... 336	HB9DDZ ..... 334	PY2DBU ..... 325	RW9SG ..... 310	AE9DX ..... 289
K3UA ..... 339	K3JGJ ..... 339	W7OM ..... 338	N5FG ..... 337	K9IW ..... 336	VE4ACY ..... 333	KE4SCY ..... 325	IØYKN ..... 310	W5PVE ..... 288
K6YRA ..... 339	N5ZM ..... 339	K9BWQ ..... 338	PY2YP ..... 337	N2VW ..... 336	K9PP ..... 333	W4MPY ..... 325	KU4BP ..... 310	HB9DQD ..... 286
IK1GPG ..... 339	N7RO ..... 339	W8AXI ..... 338	N6AW ..... 337	W2CC ..... 336	YV1KZ ..... 333	W1DF ..... 325	XE1MW ..... 309	VE7HAM ..... 285
DJ9ZB ..... 339	KE5K ..... 339	W9SS ..... 338	IK8CNT ..... 337	PA5PQ ..... 335	W9IL ..... 333	K6GFJ ..... 324	AA1VX ..... 308	N8LIQ ..... 284
N7BK ..... 339	IØZV ..... 339	VK4LC ..... 338	EA4DO ..... 337	XE1VIC ..... 335	F6HMJ ..... 333	T18II ..... 324	4Z5FL/M ..... 306	N3RC ..... 280
4Z4DX ..... 339	OE2EGL ..... 339	K7LAY ..... 338	CT3BM ..... 337	NC9T ..... 335	YV1AJ ..... 332	W6OUL ..... 322	K7SAM ..... 305	HSØ/EA4BKA ..... 276
WB4UBD ..... 339	W4ABW ..... 339	WS9V ..... 338	YU1AB ..... 337	K1UO ..... 335	KSØZ ..... 332	XE1RBV ..... 321	I3ZSX ..... 304	K9DXR ..... 275
OZ3SK ..... 339	DL3DXX ..... 339	W6DPD ..... 338	K8LJG ..... 337	CT1EEB ..... 335	VE4ROY ..... 332	VE7SMP ..... 320	JR4NUN ..... 303	
OK1MP ..... 339	I8KCI ..... 339	K4CN ..... 338	W3AZD ..... 337	W1JR ..... 335	YV1JV ..... 331	WØROB ..... 320	W4PGC ..... 302	
K2TQC ..... 339	VE1YX ..... 339	VE3XN ..... 338	KØKG ..... 337	I4LCK ..... 335	K7HG ..... 331	ON4CAS ..... 319	EA8AYV ..... 302	
K4MZU ..... 339	N4CH ..... 339	K9HQM ..... 338	W2FKF ..... 337	ZL1HY ..... 335	N5YY ..... 331	LU3HBO ..... 317	4X6DK ..... 301	
N4JF ..... 339	EA3BMT ..... 339	K2FL ..... 338	W7FP ..... 337	K5UO ..... 335	N1ALR ..... 330	N8SHZ ..... 316	K7ZM ..... 300	
W4WX ..... 339	IKØAZG ..... 339	VE2GHZ ..... 338	YU3AA ..... 337	JA7XBG ..... 335	K4DXA ..... 328	XE2NLD ..... 315	XE1MEX ..... 300	

### RTTY

WB4UBD ..... 337	K3UA ..... 332	N5FG ..... 331	OK1MP ..... 328	G4BWP ..... 320	PA5PQ ..... 311	K4CN ..... 303	K8SIX ..... 300
NI4H ..... 336							
N5ZM ..... 333							

civilian airliner crashed off the east coast of Africa. It will happen. We just have to wait for the wheels to turn.

Keep these operations in mind:

Sep 29 to Oct 12—TX5SPA from Austral

Oct 3 to 11—3D2/C From Conway Reef

Oct 5 to 19—K4M from Midway Island

Oct 7 to 14—CYØ from Sable Island

Oct 16 to 22—TX5SPM from Marquesas

With the CQ WW SSB Contest the last weekend of this month, and all of these DXpeditions going in October, there should be no reason for anyone to complain about no DX on the bands.

### MFJ Acquired Cushcraft

A news release came through just as I was finishing this column in early August. MFJ acquired the Cushcraft Amateur Radio antennas product line from Missouri-based Laird Tech-

nologies effective July 31. According to MFJ, Cushcraft antennas will continue to be manufactured in Manchester, New Hampshire, and more new products are planned for the antenna line. For more information see this month's "What's New" column.

Such is the corporate world of today. I've been using Cushcraft antennas for decades, and presently have its 2-element 40 and an A4S. I'm really glad to know that they still will be available just in case one of these antennas needs some attention.

Until next time, enjoy the chase, good luck getting the news ones you need to work, but please Have Fun doing it.

73, Carl, N4AA



Nodir, EY8MM, is quite active on the low bands, especially 160. (Photo courtesy of Franz, DJ9ZB)

### QSL Information

3A/HG3IPA via HA3JB	5R8KD via W5KDJ
3B9/ON4LAC via ON4LAC	5WØKH via DL2FAG
3B9FQ via K5XK	6V7Q via F8IJV
3C2MV via VE6LB	6W1RY via F5VHJ
3D2YA via JA1NLX	7N4AGB/6 via 7N4AGB
3DAØSS via GI4FUM	7P8YV via IT9DAA
3V8SM via F4EGS	7X/DB1JAW via DB1JAW
3Z8ØBEM via SP8ZBC	7X2DD via 7X2VFK
3Z8WFF via SP8AJC	8R1DB via N3DB
4L/UUØJM via EA7FTR	8R1TO via N3DB
4O3A via YU1FW	9A48IFATCA via 9A4WW
4O3A via AI4U (USA)	9H3EP via IV3EPO
4U1WED via 4U1VIC	9M2TI via EA4ATI
4U3ØVIC via 4U1VIC	
5B/G3RWF via G3RWF	
5B/LY4F via LY4F	
5H1FF via PE1ABQ	
5H2WK via DK9IP	
5JØBV via K7BV	

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



## Revisiting Contest Tips

In November 1992, I came up with the idea of including a contest tip of the month for each column. Since then, and with help from many of you, I've written 204 of them! I thought it may be useful to resurrect a few of the better ones and put them in one convenient place as we enter this year's contest season. Feel free to pass them along. More importantly, make sure you add a few of your own to the list. Contest operating is a very personal experience. I hope you'll have as much fun this season as I will!

With over 200 to choose from, it was tough to find the "greatest hits" among them, but here's my best shot. Enjoy!

### Tip #1

Do you suffer from a perpetual lack of organization? If so, you're like many of us. A tip learned from one of my contesting mentors, Jim Lawson, W2PV, is to document your station. Do you know what size wrenches you need next time you go up the tower? What are the resistance readings of your rotator between pins? How is that 4-over-4 relay box constructed? The list goes on, yet a little attention to "administrivia" will go a long way to making you a better contester. (Tnx W1WEF and YCCC Scuttlebutt)

### Tip #2

Here's an idea for that second VFO in your transceiver and perhaps a poor man's SO2R (single operator, two transmitters) alternative. When you're in "search and pounce" mode, try searching with both VFOs. While waiting to work one station on VFO A, you can use that idle time to find another needed QSO with the second VFO. Try tuning up from the bottom of the band with one and down from the top of the band with the other. If you are using a multi-band antenna, you can even try this technique across two different bands!

### Tip #3

Avoid the temptation of diving directly into a pileup after first hearing the frenzy. Take the time, especially when using a smaller station, to listen to the operating style of a needed multiplier before calling. Adding a planned delay of two or three QSOs to learn the DX station's techniques will usually reduce the time needed to get him into *your* log.

### Tip #4

A careful review of the previous year's log before a contest can help you in a number of ways. In addition to revealing a scoring target to beat, it can be helpful in making a list of the top 10 to 15 actions you could have taken to improve your score that year, and place the list in front of you as a reminder for this year's contest.

### Tip #5

Making sure your coax is in good condition is an easy

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

### Calendar of Events

All year	CQ DX Marathon
Sept. 26-27	CQ WW RTTY DX Contest
Sept. 26-27	Scandinavian SSB Activity Contest
Sept. 26-27	Texas QSO Party
Oct. 3-4	California QSO Party
Oct. 10-11	Makrothen RTTY Contest
Oct. 10-11	Pennsylvania QSO Party
Oct. 11	North American RTTY Sprint
Oct. 17-18	Worked All Germany Contest
Oct. 18	Asia-Pacific CW Fall Sprint
Oct. 18-19	Illinois QSO Party
Oct. 24-25	CQ WW DX SSB Contest
Nov. 7-9	ARRL CW Sweepstakes
Nov. 7-8	Ukrainian DX Contest
Nov. 21-23	ARRL SSB Sweepstakes
Nov. 28-29	CQ WW DX CW Contest

thing to verify and can have a huge impact on the effectiveness of your contest station. A bad coax line can look just fine cosmetically speaking but still have tons of loss. A check of all your cables (including switching lines, rotators, etc.) is a great investment in preparation for your next contest effort.

### Tip #6

If the station that you call goes back to someone else, listen to the exchange. If you get through to him the next time, you will already know what exchange information to expect. Also, in case of QRM or QSB you won't have to waste time asking for a repeat. This is especially valuable in contests with a number exchange, such as the CQ WPX. Enter the number on your screen that was sent to the other station, but increase it by one on the assumption that you will be the next QSO. If you have to call several times to get through, keep increasing the number by one. (Tnx G3SXW)

### Tip #7

As we enter into this year's contest season, do you know who's planning on a contest expedition? A little research through the current magazines/newsletters and the internet can help you build a list of probable multipliers that should be prominently displayed in front of your operating position for the upcoming contests. Always remember that extraordinary pre-contest preparation can dramatically improve your final standing and has little to do with signal strength or location. To put it in ham terms . . . it's free!

### Tip #8

When conditions are marginal, it's a great operating strategy to frequently move around the bands. With the exception of unusually good conditions, a big station, or a prime QTH, running time will be a premium for most of us. Also, it will be very likely that the high-band conditions will be very spotty, making the likelihood of missing a major continental opening quite possible. The bottom line is that you should keep your VFO well-oiled this fall. If you're fortunate enough to have a great run going, keep up the rate. If not, make sure you turn over every rock and find great QSOs/multipliers that others miss. It's just one way to keep yourself ahead of the crowd.



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By Rev. George Dobbs, G3RJV

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receivers and some accessories. Other sections include toroidal coils, construction techniques and equipping a workshop. You'll also find a listing of QRP contests and awards.

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by John Clarricoats, G6CL

RSGB, 1st Ed., 1993, 307 pages

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## The Low Frequency Experimenter's Hdbk

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Edited by Roger Balister, G3KMA  
RSGB, 2007 Ed..

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### Tip #9

When you're compiling your multiplier list while operating (if you're not already calling them), think about how you use your rotator. Try working as many stations as possible in the same direction rather than turning the beam for every QSO (and waiting). You'll improve your efficiency and maybe make your rotator last a few more contests.

Also, don't be afraid to call a multiplier with the beam in the wrong direction. Often a station doesn't have that many guys calling and being "loud" is not critical to making the QSO. Your rotator will thank you later and your score will fair for the better—I guarantee!

### Tip #10

Do you really know your radio? I found myself totally befuddled the other day when I got temporarily stuck in a strange memory mode with my "borrowed" TS-950SDX. The thoughts occurred to me: (1) How well do I really know this radio? (2) What features am I missing out on that could improve my contest score? The reality is that most of us use the volume, VFO, and RIT functions and call it a day. However, there's more to most modern transceivers that is worth checking out. I may be the only contester who hasn't taken the time, but I'd guess your score might improve a bit if you take a test drive via the radio's manual!

### Tip #11

Most months are filled with great "warm-up" contests for the big ones. Check out the contest calendar and get involved. One way to add dB to your signal is to get your callsign in the minds of others. How do you do that? Get radio active today!

### Tip #12

When we think of receiving antennas, we often consider Beverages for 160 and 80 meters. As it turns out, Beverages can be effective on all of the ham bands, not only for noise reduction but for receiving signals when using Yagis and other directional transmitting arrays. Another trick along these lines is to use a vertical for alternative receiving on the high bands. There are often situations when someone is calling you "in the mud" only to be missed because the transmit antenna is pointing in the wrong direction. A quick switch to an alternative antenna, such as a vertical, will often result in your ability to copy the calling station, putting a new QSO or multiplier in the log. Try it out!

### Tip #13

Want to know something that can help your contest score nearly as much as a big signal? For me, it's focus and utter concentration. Whether you're trying to lift a heavy weight in a gym or push a few more QSOs out of your station, the key is diligence and unabated attention to the task at hand. Consider another pastime you enjoy that requires intense concentration. If you apply the same techniques to contesting that you do to your other endeavor, your scores will climb and without a single dB of added signal strength.

### Tip #14

Try varying your CQing style. Remember the most important information another station needs is your callsign, not the letters "CQ." You may want to "call CQ" occasionally by just signing your callsign two or three times, especially on CW. Calling CQ with less information apart from your call is always better than more!



### Tip #15

Have you ever called a station in a contest only to have him CQ right in your face? Many times there are good reasons for this to happen (e.g., bad RX conditions or local QRM). However, if the situation just doesn't make any sense, it could very well be that the problem is on your end. You may have an audio problem or have left your transceiver in split mode, or your RIT/XIT has been unintentionally left on. In any event, don't waste precious time calling a loud station that should be coming right back to you. More often than not, a simple check will ensure that QSO makes it into your contest log.

### Tip #16

Take a standard mouse pad and punch or drill holes in the pad to correspond with the three feet of your keyer's paddle. The paddle feet are now touching the tabletop, so the height of the plastic your fingers touch is correct. You also now have a giant surface area of rubber designed not to slide, holding the paddle in place. (Tnx K1VR)

### Tip #17

Practice curing yourself of the bad habit of writing down callsigns and exchange information on paper while operating. This adds unnecessary overhead to your operating style and has become especially pointless with computer logging. The best way to reduce your "paper dependence" is simply to eliminate any access to note paper altogether. Remember, if you want to walk, you have to get rid of your crutch! (Tnx K1ZX)

### Tip #18

It may seem obvious, but labeling antennas and amplifier settings is a must for contest stations. In the excitement of a Friday afternoon before a contest weekend it may be more tempting to work guys rather than take that final step towards efficiency. Paying attention to the details of preparation in the long run is what separates successful contest efforts from mediocre ones.

### Tip #19

Do you really study contest results (especially the ones you participate in), or are you the type who breezes through the numbers and puts the magazine, or whatever, in the pile across the room? I've found over the years that contest reports can truly be revealing about your own results—both good and bad! Try reading the next contest summary with the idea of seeking out areas of improvement!

### Tip #20

Here's a great little tip for working pile-ups. When there are a lot of guys calling, one's natural tendency is to jump right into the fray and call start calling with them. Very often and even when operating from a big station, I'll pause just a second or two in the timing of my calls before sending (or talking). The result, more often than not, is the "Alpha Radio" or "Radio" will be hanging out there all by itself because the other guys finished saying their callsigns before I did. This technique really helps in breaking pile-ups. The key isn't always being the loudest guy; it's being the one who's in the clear!

### Tip #21

It's a good idea to ask multi-operator stations what other frequencies they are using while searching and pouncing (e.g., "where are you guys on 15 meters right now?"). The good operators never hesitate to provide an answer even in the middle of their pile-ups. I usually use this strategy during the second day of operating, not passing multipliers in the traditional sense but rather "passing myself." (Tnx N4GI)

### Tip #22

Contest operating has as much to do with what's going on inside your head as it does with the station hardware and radio conditions. Always remember that if times are slow or propagation is poor, the same scenario is happening to your competitors as well. Keeping a positive attitude throughout the entire contest is a critical success factor in making a great score!

### Tip #23

Sometimes doing the obvious is not the right operating strategy in contesting. Being flexible and searching for the obscure is a great way to approach contesting. Good advice says to never get in a rut; taking unconventional routes sometimes is the right thing to do!

### Final Comments

That's all the room I have for this month. It was tough culling out 23 contest tips from a repository of 204 entries. I'm sure you have your own. The key message this month is that maximizing your contest score is much more than putting up lots of antennas and using the best equipment. You can control more of your destiny than you may think!

See you in the next contest!

73, John, K1AR

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# Good Conditions Predicted for CQ WW DX SSB Contest

## A Quick Look at Current Solar Cycle Conditions

(Data rounded to nearest whole number)

### Sunspots

Observed Monthly, July 2009: 4  
Twelve-month smoothed, January 2009: 2

### 10.7 cm Flux

Observed Monthly, July 2009: 68  
Twelve-month smoothed, January 2009: 69

### Ap Index

Observed Monthly, July 2009: 5  
Twelve-month smoothed, January 2009: 5

## One Year Ago: A Quick Look at Cycle 23 Conditions

(Data rounded to nearest whole number)

### Sunspots

Observed Monthly, July 2008: 1  
Twelve-month smoothed, January 2008: 4

### 10.7 cm Flux

Observed Monthly, July 2008: 66  
Twelve-month smoothed, January 2008: 70

### Ap Index

Observed Monthly, July 2008: 6  
Twelve-month smoothed, January 2008: 8

High-frequency radio enthusiasts celebrate the arrival of the fall and winter DX season. From October through November 2009 we will see a steady improvement in the DX bands. During the CQ WW DX contests taking place in both months we should experience fairly good success.

The 2009 CQ WW SSB Contest (<http://www.cqww.com/>) will start at 0000 UTC, Saturday, October 24, and run through 2359 UTC Sunday, October 25. Looking at the 27-day rotation of the Sun, taking into consideration the current solar activity at the time of writing this column, propagation may be good on both days. Expect conditions to be comparable to conditions in the 2008 contest weekend.

Predictions for one 27-day rotational period are far more accurate than for three 27-day rotational

\*P.O. Box 9, Stevensville, Montana 59870-0009  
e-mail: <nw7us@arrl.net>

## LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for October 2009

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 1-11, 13-26, 28-31	A	A	B	C
High Normal: 27	A	B	C	C-D
Low Normal: 12	B	C-B	C-D	D-E
Below Normal: N/A	C	C-D	D-E	E
Disturbed: N/A	C-D	D	E	E

Where expected signal quality is:

- A—Excellent opening, exceptionally strong, steady signals greater than S9.
- B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
- C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
- D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
- E—No opening expected.

## HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.
2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 2 will be good (B) on Oct. 1st through the 11th, fair (C) to poor (D) on the 12th, etc.
3. As an alternative, the Last-Minute Forecast may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the path is ionospherically supported.

periods. Be sure to carefully check conditions on September 28 and 29, since this would be one rotational period before the SSB contest weekend. There is better than a 90-percent chance that conditions observed on those days will recur during the October contest weekend.

See the "Last-Minute Forecast" for expected day-to-day conditions for the entire month of October. An updated day-to-day forecast for the SSB contest weekend will appear as a bulletin at the beginning of next month's column. November's issue should reach most subscribers before the SSB contest begins. You can also see an up-to-the day "Last-Minute Forecast" on my propagation resource center, at <<http://prop.hfradio.org/>>.

Table I tabulates the smoothed sunspot count during previous CQ WW DX Contest periods since 1998, and what's predicted for the 2009 contest.

	1998	'99	2000	'01	'02	'03	'04	'05	'06	'07	'08	'09
October	71	108	115	114	91	58	36	26	14	6	2	8*
November	73	111	113	116	85	57	35	25	13	6	2	10*

\*Predicted values expected during the 2009 contests.

Table I—Smoothed sunspot numbers recorded during CQ WW DX Contests since 1998 (October SSB, November CW).



Contest conditions could be somewhat like those of last year, but perhaps slightly improved if any increase in solar activity occurs (a slight possibility). Low- to middle-latitude propagation paths should be fair to good on the lower HF bands (160, 80, 40 meters), while it might be a struggle to find propagation on the higher HF bands above 20 meters. It is expected that the bands will have a lot of fluctuation in performance, although the lower frequency bands will be quiet, much like last year.

Even if you are not a dedicated contester, you should give it a try. If you are trying for your DXCC or other wallpaper, the CQ WW contests are the contests of choice, especially during more active solar years. Sure, conditions may not be as hot as during the years of the solar cycle maximum, but with the improvement in propagation on lower HF bands such as 40 meters, there's a lot of opportunity to make a good score.

Try out propagation modeling and forecasting software programs to see how those programs model the contest conditions based on parameters such as your antenna properties, geographical location, power levels, and operating times. A program that I have reviewed in past columns is ACE-HF Pro. Using such a program, you can work out an operational plan using tools such as ACE-HF's Animated Coverage Maps, or the ACE-HF Pro's band-opening charts for the various propagation paths you wish to target to get those extra contest points. (See <http://hfradio.org/ace-hf/> for these past reviews).

## October Propagation

The following is a band-by-band summary of DX propagation conditions expected from mid-October through mid-December and centered on the two CQ WW contest weekends. Next month we will update this summary.

**160 meters:** Considerably decreased static levels, more quieter geomagnetic conditions (as compared to the last few years), and longer hours of darkness in the northern latitudes should provide a number of DX openings on this band. These openings will often be weak due to the relatively high signal absorption, since we are not yet to the longest periods of daily darkness. However, give this band a try, as some fairly good openings should be possible toward Europe and the south from the eastern half of the United States, and toward the south, the Far East, Australasia, and the South Pacific from the western half of the country. Other DX openings might also be possible. The best propagation aid for this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path. A good Internet web site featuring a gray-line map display is found at <http://www.fourmilab.ch/earthview/>. Follow the link, "map of the Earth," showing the day and night regions.

**80 Meters:** This should be a good band for DX openings to many areas of the world during the hours of darkness and into the sunrise period. The band should peak towards Europe and in a generally easterly direction around midnight. For openings in a generally western direction, expect a peak just after sunrise. The band should remain open toward the south throughout most of the night. Propagation in this band is quite similar to that expected on 40 meters, except that signals will be somewhat weaker on the average, noise levels will be a bit higher, and the period for band openings in a particular direction will be a bit shorter.

**40 Meters:** This should be the hottest DX band during hours of darkness as the seasonal static levels are lower than



*July saw a number of sunspots. The largest one is seen here and was numbered sunspot region 1024. It produced the largest flares yet seen (at press time) since the start of solar Cycle 24. The flares were C-class in magnitude. Following this sunspot were a series of very tiny spots. Next month be sure to read this column for an explanation of why we're seeing such tiny spots, and how spots may disappear completely by 2015. (Source: NOAA)*

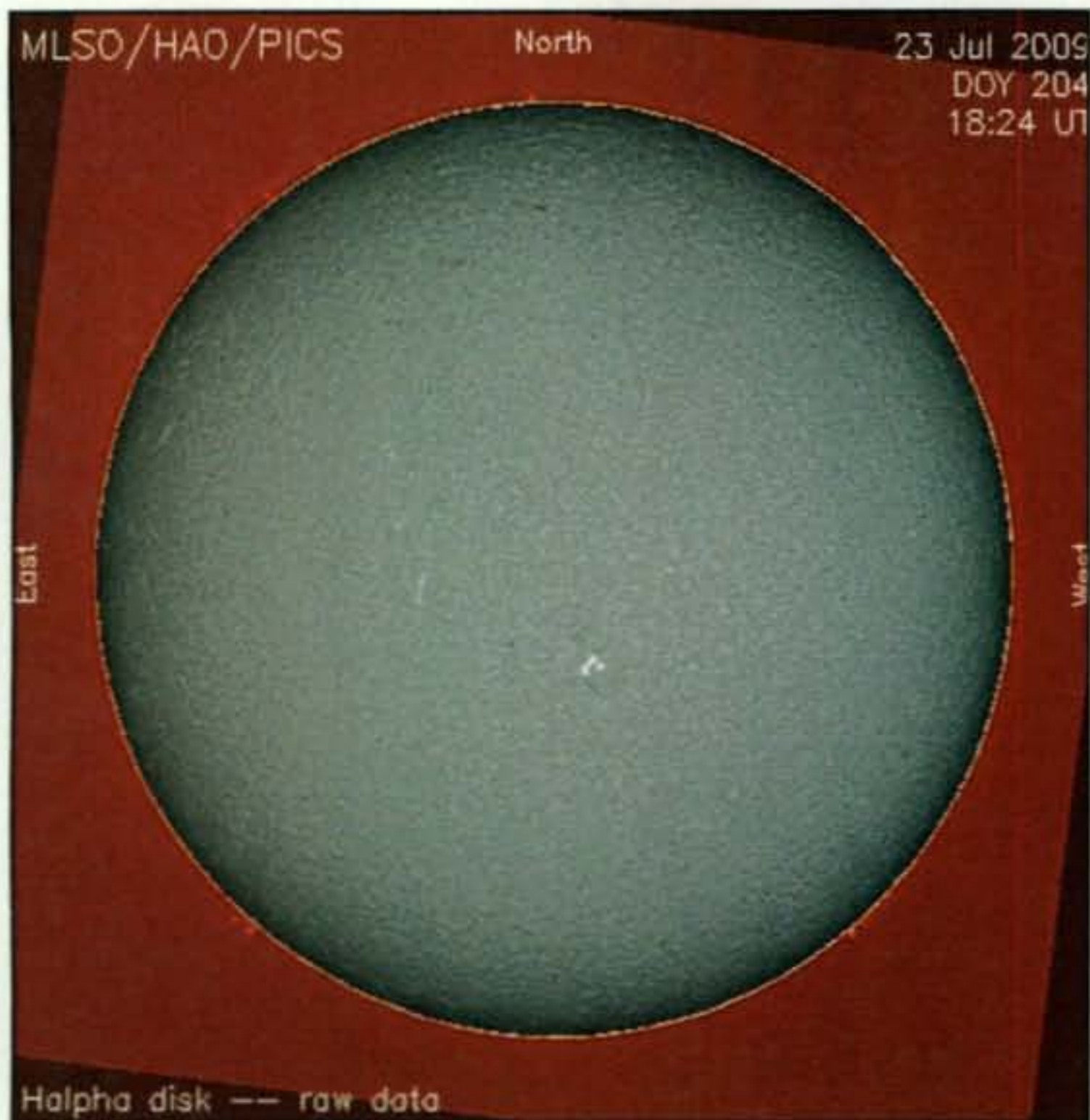
they were during the summer. The band should be open first for DX toward Europe and the east during the late afternoon. Signals should increase in intensity as darkness approaches. During the hours of darkness expect good DX openings to most areas of the world. Signals should peak from an easterly direction about midnight, and from a westerly direction just after sunrise. Excellent openings toward the south should be possible throughout most of the nighttime period. When the Last Minute Forecast indicates "Above Normal" or "High Normal," the choice for best nighttime band will be between the 40- and 20-meter bands.

**20 Meters:** DX openings should be possible on this band both day and night. Conditions should peak about an hour or two after sunrise and again during the late afternoon and early evening hours. Expect to work into some areas of the world between sunrise and sunset, when conditions are a mix of low geomagnetic activity and an increase in solar activity. Good openings should be possible to many areas of the world during the dusk and dawn periods, following the grey-line. When conditions are above normal, expect 20 meters to offer a few surprise worldwide DX openings during the night (I've recently sat listening to Australian stations on 20 meters during the local late evening, and this should continue to occur during the months of October and November).

Look for long-path openings for about an hour or so after sunrise and again for an hour or so before local sunset. Signal levels are expected to be exceptionally strong during the October contest period.

**15 Meters:** This year 15 meters will be a marginal DX band. However, during the daylight hours, this band should still see some significant action. Fair to Good conditions are expect-





A small sunspot, given an International Sunspot Number (ISN) by the official keepers of sunspot counts (the SIDC, Belgium), but not numbered as an active region by NOAA. A series of small sunspots such as this one were observed during June and July. These show signs of an increase, ever so slight, in solar activity during the middle of 2009. However, the first part of August became very quiet, once again. (Source: NOAA/NWS Space Weather Prediction Center)

ed from shortly after sunrise through the early evening hours. The band could remain open into the evening toward southern and tropical areas.

**10 Meters:** For those in low- and middle-latitude locations, this band could yield a number of daytime contacts during the contest weekends, especially between the points in the Southern Hemisphere, and along paths crossing the equator. However, I don't expect too much excitement on this band. With the continued decline in solar activity, this band suffers. Those in the Caribbean and other tropical regions will find 10 meters a possibly usable band this year.

## VHF Conditions

Sporadic-E activity is very rare during October in the northern temperate zone (where much of the U.S. is located). While the contest weekend looks like a quiet period, there are a few days forecast with moderate geomagnetic activity and possible radio storms. It is possible to have a few aurora-mode (Au) propagation events during October. Remember that digital modes and CW are the best way to go with aurora, particularly on 144 MHz through 432 MHz, as the voice modes become extremely distorted and unrecognizable due to the effects of the aurora. The best times to check for VHF aurora openings are when conditions are expected to be Below Normal or Disturbed, as shown in the Last-Minute Forecast at the beginning of this column.

There is some possibility of extended tropospheric conditions during October because of the changing weather patterns. Two meters is the best band to watch for this.

October does have the *Draconids* meteor shower active between October 6 and 10 and expected to peak on October 8. The shower could reach storm levels—hundreds of meteors per hour. The best time to check for radio propagation would be from about midnight onward until dawn.

The *Draconids* is primarily a periodic shower that has twice produced spectacular, brief meteor storms in the last century, in 1933 and 1946. In 1999 a wholly unexpected minor outburst was witnessed from the Far East. *Draconid* meteors are exceptionally slow moving, a characteristic that helps separate genuine shower meteors. This shower could produce meteor-scatter (Ms) mode propagation openings on VHF and UHF.

Check out <<http://www.imo.net/calendar/2009>> for a complete calendar of meteor showers in 2009.

## Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for July 2009 is 3.5, up from June's 2.6. The lowest daily sunspot value recorded was zero (0) on July 1–3, 11–22, 24–29, and 31. The highest daily sunspot count was 16 on July 4–6. The 12-month running smoothed sunspot number centered on January 2009 is 1.8. A smoothed sunspot count of 11, give or take 7 points, is expected for October 2009. An interesting modification of the observed sunspot number for March 2009 now puts that month as the lowest in the minimum between Cycles 23 and 24, at 0.7. We still have to wait for the smoothed sunspot numbers to pass through December and March for us to see when the statistical end of Cycle 23 will actually occur.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 68.3 for July 2009. The 12-month smoothed 10.7-cm flux centered on January 2009 is 68.7. The predicted smoothed 10.7-cm solar flux for October 2009 is 69, give or take about 4 points.

The observed monthly mean planetary A-index ( $A_p$ ) for July 2009 is 5. The 12-month smoothed  $A_p$  index centered on January is 4.8. Expect the overall geomagnetic activity to vary from quiet to active during most days in October.

## Conclusion

Next month, startling research covering nearly two decades will be discussed which reveals the possibility that we will see no sunspots by 2015. Will sunspots become extinct for a period of time? Be sure to get a copy of next month's issue to find out.

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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





NASA Solar Physics Group Leader Dr. David Hathaway explains space weather at the 2009 Huntsville Hamfest. He is predicting a short and weak Cycle 24, but notes that the scientist who first explained what is now called the "solar dynamo" and predicted a huge cycle three years ago is sticking by her predictions. (W2VU photo)

### Hathaway Reassuring, Pessimistic, at Huntsville

NASA's point man on solar cycles and space weather says we are definitely not heading into another Maunder Minimum, but continues to predict a weak solar Cycle 24. Speaking to hams at the 2009 Huntsville (AL) Hamfest on August 16, Dr. David Hathaway, Solar Physics Group Leader at the Marshall Space Flight Center, said we are definitely into Cycle 24, and believes that the official date of the solar minimum will be pegged at November 2008—this despite the unprecedented six-month sunspot hiatus at the start of 2009 and the complete lack of sunspots through most of the summer.

Hathaway said several aspects of the current cycle do not match up with any others on record and thus make predictions difficult. He said the strength of the polar magnetic fields at the current minimum are about half those of the previous three cycles, despite indications beginning in 2003 that those fields would be very strong. "Exactly the opposite (of what was predicted) is happening," he said.

However, he was reassuring that we are not headed into another extended period of very low solar activity, such as the "Maunder Minimum" of several centuries ago. "There have been more sunspot regions seen since January of 2009 than in the first 20 years of the Maunder Minimum," he noted, despite the fact that very few sunspot regions have been seen in that period.

Hathaway spent much of the session explaining the "solar dynamo" theory by Dr. Mausumi Dikpati of the National Center for Atmospheric Research in Boulder, CO, a theory that is now generally accepted as correctly explaining the movement of solar materials and magnetic fields on the sun and their relationships to sunspot cycles.

As for the future of Cycle 24, Hathaway said all indications except one are that the cycle will be weak and short. He is predicting a solar maximum of  $85 \pm 25$  in 2010, although others are predicting a longer cycle. The one indication that does not agree with the others, he noted, is Dr. Dikpati's Flux Transport Dynamo prediction—the theory on which everything is now based—and, Hathaway says, "Dikpati is sticking with her prediction of a huge cycle."

He added, "I have job security. We don't understand this thing."

Bottom line for us hams: Despite the generally gloomy predictions, there is still hope!

—W2VU

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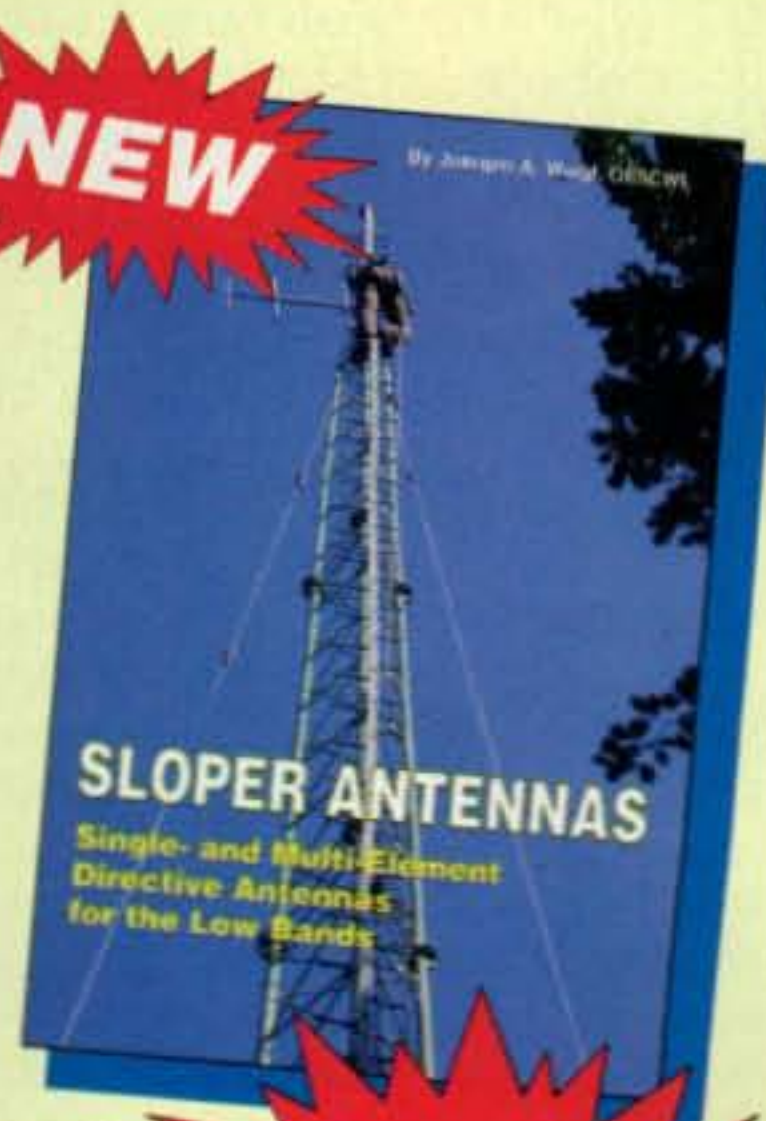
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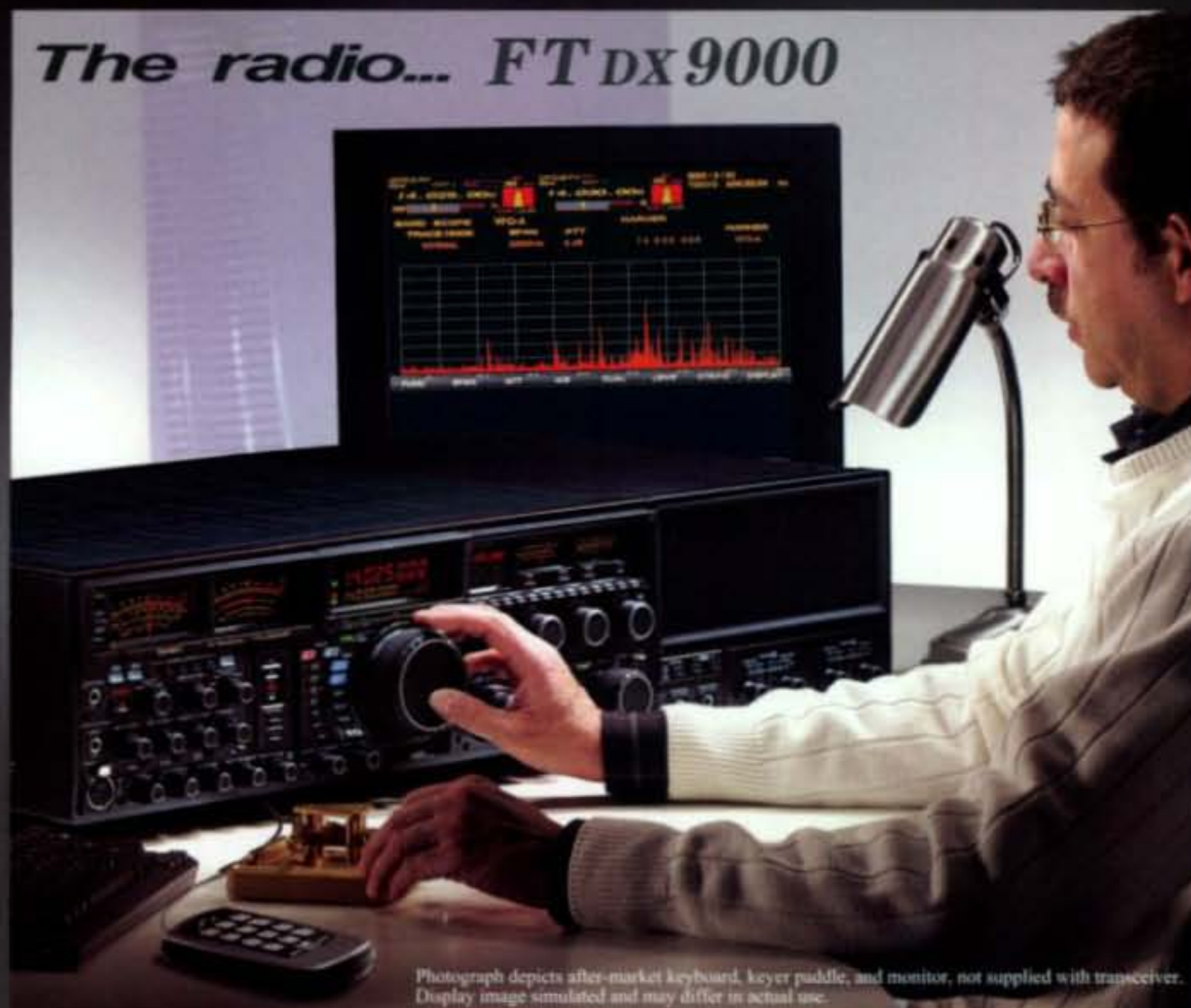
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