10 Best Ham Radio Moments, p. 82

Amateur Radio

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COMMUNICATIONS & TECHNOLOGY

OCTOBER 2010

CQ

1945 Our 65th Anniversary 2010

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On the Cover: R. Bruce Stewart, N9GKE, of Lafayette, Indiana. Details on page 20.

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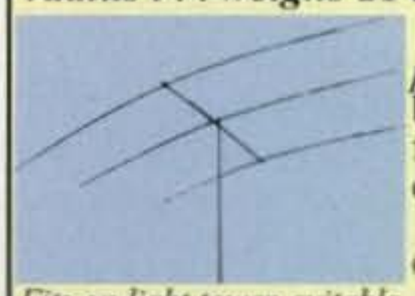

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TH-11DX	11	*For Gain and F/B ratio--See...* • www.hy-gain.com • Hy-Gain catalog • Call toll-free 800-973-6572		4000	10,12,15,17,20	12.5	100	24	37	22	88	1.9-2.5	T2X	$1159.95
TH-7DX	**7**			**1500**	**10, 15, 20**	**9.4**	**100**	**24**	**31**	**20**	**75**	**1.5-2.5**	**HAM-IV**	**$869.95**
TH-5MK2	5			1500	10, 15, 20	7.4	100	19	31.5	18.42	57	1.5-2.5	HAM-IV	$759.95
TH-3MK4	**3**			**1500**	**10, 15, 20**	**4.6**	**95**	**14**	**27.42**	**15.33**	**35**	**1.9-2.5**	**CD-45II**	**$469.95**
TH-3JRS	3			600	10, 15, 20	3.35	80	12	27.25	14.75	21	1.25-2.0	CD-45II	$359.95
TH-2MK3	**2**			**1500**	**10, 15, 20**	**3.25**	**80**	**6**	**27.3**	**14.25**	**20**	**1.9-2.5**	**CD-45II**	**$369.95**
EXP-14	4			1500	10,15,20 (opt. 30/40)	7.5	100	14	31.5	17.25	45	1.9-2.5	HAM IV	$599.95

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radio news

Prison Escapees Charged in Murder of Ham, Wife

Federal authorities have charged two Arizona prison escapees and their alleged accomplice with killing a ham and his wife in New Mexico. According to news reports, John McCluskey, Tracy Province, and Casslyn Welch have been charged with carjacking and murder in connection with the deaths of Gary Haas, N5VGH, and his wife, Linda. The couple, from Tecumseh, Oklahoma, was traveling in New Mexico. Authorities said they encountered the fugitives at a highway rest area, and that McCluskey shot and killed them in their travel trailer. McCluskey, Province, and Welch then allegedly drove the couple's truck and trailer to a remote area where they unhitched the trailer and set it on fire. McCluskey and Province had escaped from a prison in Arizona on July 30. All three have since been apprehended.

Hams in Pakistan Aid in Flood Relief

Hams from the Pakistan Amateur Radio Society have teamed up with members of two other private organizations—the Islamabad Jeep Club and the Pakistan Academy of Family Physicians—to help deliver food, tents, and medical services to areas of the country hard-hit by flooding from monsoon rains. The flooding has left at least 1500 people dead and millions homeless or displaced. According to the ARRL, the group of hams, Jeep owners, and doctors, set up two relief teams, one to help bring support to northern cities and the other for the central part of the Asian nation. Several HF, VHF, and UHF frequencies have been set aside for relief communications. The HF frequencies are 7.070, 14.200, and 14.300 MHz.

Florida Looks Into Narrowband Repeaters

The Florida Repeater Council has formally proposed adopting a narrowband repeater bandplan for 2 meters and 70 centimeters, in order to make more frequency pairs available for repeaters. It is proposing adding repeater pairs with 7.5-kHz separation on the part of the 2-meter band that currently has 15-kHz separation between channels, and 10-kHz separation on lower frequencies that currently have 20-kHz separation. The new pairs would be used to accommodate narrow-band modes such as D-STAR and P-25. The council is seeking comment on the proposals. Complete details are available online at <www.florida-reapeaters.org>.

City Backs Down on RFI Ordinance

A city in Oklahoma that had cited a local ham for violating a local RF interference ordinance has backed off from enforcing it but has decided to leave it on the books. According to *Newsline*, Midwest City retracted the Notice and Order originally issued to David Box, K5DBX, after the ARRL notified officials that only the FCC has authority to regulate interference matters. While the City Attorney says any future citizen complaints will be directed to the FCC, the city council has opted, at least for now, to keep the local law on the books.

ARRL Comments on FCC Proposal for 5 MHz

The ARRL has filed formal comments on the FCC's proposal to do a channel-swap on the 60-meter band, along with permitting increased power and additional modes. Currently, hams may use five specific channels at 5 MHz with upper sideband only and 50 watts effective radiated power, on a secondary, non-interference basis. The FCC proposal, which came in response to an ARRL petition, would substitute 5358.5 kHz for 5368.0 kHz, which is frequently occupied by its primary (government) user; would permit the requested power increase; and permit CW, PSK31, and Pactor in addition to USB. According to the *ARRL Letter*, the League's comments were generally supportive, recommending only a few further tweaks to the FCC's proposal.

Phone Bands and Identity Theft

The FCC has denied two petitions from hams seeking changes in Part 97 of its Rules. Richard Ebeling, K2UTC, of White Plains, New York, wanted the Commission to restore the General Class phone band on 15 meters to where it was before the FCC's "incentive licensing" decision of 1967. *Newsline* reports that the Commission declined, noting that it had recently expanded General Class phone subbands on several HF bands, including 15 meters, and said Ebeling presented no evidence that the current allocation is inadequate.

The second petition was filed by Eric Hilding, K6VVA, of Morgan Hill, California. He wanted the rules to declare that unauthorized use of an amateur radio callsign was a form of identity theft and was prohibited even beyond the amateur radio bands, such as on the internet. The FCC said that Part 97 regulates only the amateur service, and as such, its rules cannot apply to the internet, cell phones, etc. In addition, it noted that the rules already prohibit stations from transmitting false identification, and that any problems with misuse of callsigns could be dealt with under the current rules.

Amateur Space News

The ARISSat-1 amateur satellite is now scheduled to be launched to the International Space Station next January, aboard a Progress supply rocket. ARISSat is an outgrowth of the SuitSat experiment, in which a surplus Russian spacesuit was outfitted with ham gear before being pushed out into orbit from the space station, to eventually be destroyed on re-entry to the Earth's atmosphere. A second surplus suit had to be disposed of before the next SuitSat was ready, so the project morphed into what is now called ARISSat. According to the AMSAT News Service, four functional models of the satellite have been produced by AMSAT, two of which are scheduled to be sent to Russia in September for additional testing and eventual launch. At least one would then be hand-launched from the space station.

A ham satellite being built by students in India was scheduled for launch in September. SRMSAT will have a 2-meter uplink and 70-centimeter downlink. It is being built by students at the SRM University in Chennai.

NASA reports that Japan's Venus Climate Orbiter satellite is approaching that planet and is on schedule to go into orbit around it in December. It will study Venus's climate and weather, in hopes of learning lessons that can be applied here on Earth. The satellite carries an amateur radio payload as well, currently known as UNITEC-1. However, its beacon was heard for only two days after launch and has been silent ever since.

ARDF World Championships Held in Croatia

The seventh biennial Amateur Radio Direction-Finding (ARDF) World Championships were scheduled for mid-September (13–18) in Opatija, Croatia. Teams from countries around the world, including the U.S., were to compete in separate events on 2 meters and 80 meters, according to USA ARDF Coordinator and CQ WW Foxhunting Weekend Director Joe Moell, KØOV.

This year, the event was also to include the first ARDF World Championship for the Blind, with competition taking place on 80 meters only, in an open area with no obstacles. It was to operate under rules developed in 1998 by the Croatian Amateur Radio Association for competitions among clubs for the blind.

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

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

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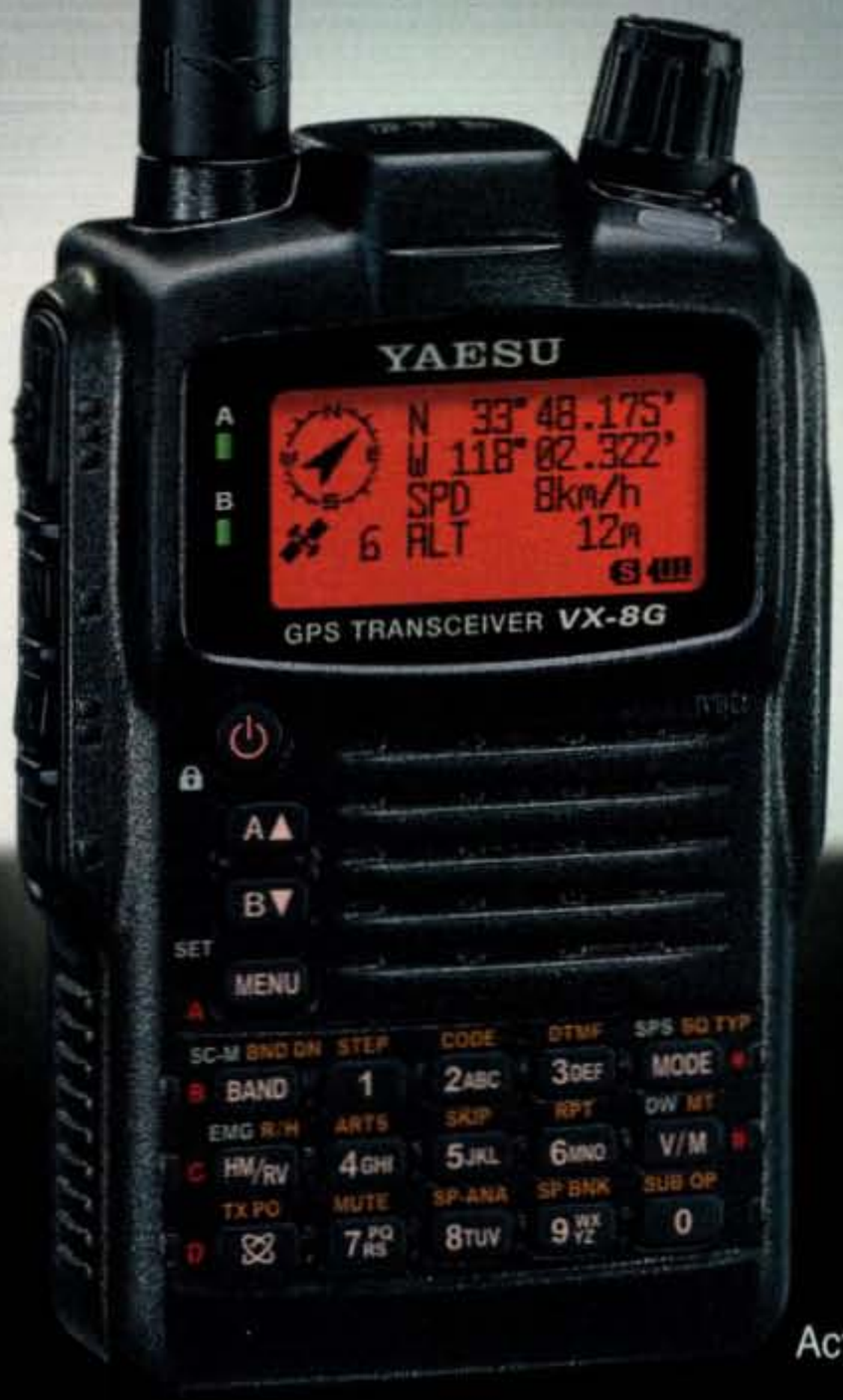

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zero bias — a CQ editorial

BY RICH MOSESON,* W2VU

A Quarter-Century of Honoring Young Hams

"We're just not getting young people interested in amateur radio anymore." "We need to do something to get more young people involved in the hobby." "It's not like the old days, when ham radio was about the only thing available to a kid who was interested in technology." We all hear these comments all the time. Many of us also make them. Some of us are actively working to recruit young people to ham radio. The interesting thing is that these same comments were being heard, and made, and acted on, a generation ago.

One of the people who tried to "do something about it" back then was Bill Pasternak, WA6ITF, producer of Amateur Radio Newsline (then named the Westlink Report). In 1986, Bill rolled out the Westlink Report Young Ham of the Year Award, presented to a ham 18 years of age or younger "who has provided outstanding service to the nation, his/her community, or the betterment of the state of the art in communications through the Amateur Radio hobby/service." Over the years, corporate co-sponsors joined in, including *CQ* magazine, Yaesu (Vertex-Standard), and, most recently, Heil Sound. Now, 25 young hams have been honored for their contributions to the hobby and/or their communities, the latest of whom is Cody Anderson, KI4FUV, of Harriman, Tennessee, who was presented his award in August at the Huntsville Hamfest.

So the question becomes ... after 25 years, is it working? How has the award helped the winners and has it helped bring additional young hams into the hobby? Bill contacted as many of the past winners as he could to find out. Here's what some of them have been up to:

Shawn Wakefield, WK5P, the first Young Ham of the Year in 1986, is an electrical engineer who now owns his own software consulting company and is developing applications for mobile devices. His wife and two eldest children all are hams.

David Rosenman, KA9PMK (1987), is a doctor at the Mayo Clinic in Rochester, Minnesota; Erin McGinniss Gerety, KAØWTE (1989) is a Shakespearean actress; 1990 winner Mary Alestra, KB2IGG, is an attorney; 1991 YHOTY Sammy Garrett, AAØCR, holds a Ph.D. in political science and is an analyst for the Congressional Research Service and an Adjunct Professor at American University in Washington, DC; 1999 winner Brian Mileshosky, N5ZGT, is currently ARRL Rocky Mountain Division Director and a member of the YHOTY judging committee.

Two past winners were at this year's YHOTY award presentation—Christopher Arthur, NV4B (2000), and Andrea Hartlage, KG4IUM (2004). Chris is an active contester and works as a software design engineer with some part-time work in broadcasting. His senior design project at the University of Alabama at Huntsville (from which he graduated Magna Cum Laude in 2006) was a packet radio telemetry device that flew on several BalloonSat launches. Andrea is a junior at Georgia Tech, pursuing a degree in aeronautical engineering and a goal of becoming an astronaut—a goal she set after attending Space Camp as part of her YHOTY award package. (*CQ* provides each winner with a free week at space camp.) Andrea has been working to bring more young people into ham radio ever since she became a ham herself and is the sparkplug behind the "youth lounges" found at many hamfests today, including the Dayton Hamvention®.

A crowded stage at the 2010 Young Ham of the Year award presentation at the Huntsville Hamfest. From left, 2000 YHOTY winner Christopher Arthur, NV4B; 2004 winner Andrea Hartlage, KG4IUM; Vertex-Standard (Yaesu) representative Jerry Darby, N6UME; Chip Margelli, K7JA, of Heil Sound; 2010 Young Ham of the Year Cody Anderson, KI4FUV; CQ Editor Rich Moseson, W2VU; and Newsline Producer/YHOTY Founder Bill Pasternak, WA6ITF. (Photo by Joe Eisenberg, KØNEB)

Is the YHOTY program working? Unquestionably, yes, and not only in ways directly related to amateur radio. More than one past winner told how this award had given them added self-confidence and motivation to achieve more in their chosen fields, and they have provided great examples to other young hams. Perhaps the greatest benefit of this award—not only for the YHOTY winners but even those who are nominated but not selected—is best wrapped up by 1990 winner Mary Alestra, KB2IGG, who said: "There have been a lot of great moments in my life since then, including graduating from college and law school, but the YHOTY award may have been the most important, since it helped me realize that all of these goals were possible."

Congratulations to Bill, WA6ITF, and everyone connected with the Young Ham of the Year program, for a quarter-century of success in drawing attention to outstanding young people in ham radio. The job of continuing to recruit and cultivate young hams is ongoing, though, and the responsibility is all of ours. After all, it is local clubs that encourage ham radio growth and participation by young amateurs, and encourage them to do great things.

One thing *has* changed in the past 25 years, and changed for the better: Older hams and ham radio clubs have become much more welcoming of younger hams. Around the same timeframe in which Bill was starting up the YHOTY program, I was ARRL Section Manager for Northern New Jersey, and I appointed the country's first Assistant Section Manager for Youth. I clearly recall that this young man went to a club meeting, as my representative, to speak about our plans for youth-focused activities in the section, and was basically told to sit down and shut up.

I never hear of anything like that happening today, and the majority of ARRL sections today have Youth ASMs. Thankfully, the old saying which greeted me as a 15-year-old Novice in 1970—"No lids, no kids, no space cadets"—seems to have faded into ham radio oblivion, replaced by a "Kids Welcome" sign on our front gate. It is a necessity. Yesterday's young hams are already becoming today's ham radio leaders, and today's young hams unquestionably will follow.

—73, W2VU

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

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with DCU-1

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

CD-45II

CD-45II
$449.95

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

CD-45II Rotator Specifications	
Wind load capacity (inside tower)	8.5 square feet
Wind Load (w/ mast adapter)	**5.0 square feet**
Turning Power	600 in.-lbs.
Brake Power	**800 in.-lbs.**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/48 ball brings**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight	22 lbs.
Effective Moment (in tower)	**1200 ft.-lbs.**

HAM-V

HAM-V
$1099.95
with DCU-1

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

ROTATOR OPTIONS

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

AR-40

AR-40
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For compact antenna arrays and large FM/TV up to 3.0 square feet wind load area. Dual 12 ball bearing race. Automatic position sensor never needs resetting. Fully automatic control -- just dial and touch for any desired location. Solid state, low voltage control, safe and silent operation. 2 1/16 inch maximum mast size. MSLD light duty lower mast support included.

AR-40 Rotator Specifications	
Wind load capacity (inside tower)	3.0 square feet
Wind Load (w/ mast adapter)	**1.5 square feet**
Turning Power	350 in.-lbs.
Brake Power	**450 in.-lbs.**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/12 ball bearings**
Mounting Hardware	Clamp plate/steel bolts
Control Cable Conductors	**5**
Shipping Weight	14 lbs.
Effective Moment (in tower)	**300 ft.-lbs.**

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HDR-300A Rotator Specifications	
Wind load capacity (inside tower)	25 square feet
Wind Load (w/ mast adapter)	**not applicable**
Turning Power	5000 in.-lbs.
Brake Power	**7500 in.-lbs.**
Brake Construction	solenoid operated locking
Bearing Assembly	**bronze sleeve w/rollers**
Mounting Hardware	stainless steel bolts
Control Cable Conductors	**7**
Shipping Weight	61 lbs.
Effective Moment (in tower)	**5000 ft.-lbs.**

Digital Automatic Controller

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

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AR-35
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announcements

Iowa QSO Party, Oct. 16 from 1400–2300Z on any band except 60 meters annd WARC bands. Suggested frequencies (±): CW 1.810, 3.555, 7.045, 14.040, 21.040, 28.040, 50.140, 144.190, 432.105 and up; SSB 1.855, 3.840, 7.210, 14.285, 21.330, 28.415, 50.135, 144.215, 432.115 and up. For details go to: <http://www.wa0dx.org/iowa_qso_party.html>.

Pacific Amateur Radio Transmitting Society (PAC R.A.T.S.), a Pacific basin DX annd Contest Club, holds informal meetings monthly at various locations. Club station KH6RAT is available for contesting and DX events. Contact Lee Wical, KH6BZF, at phone 808-247-0587 (Oahu), or c/o Yagi Acres, 45-601 Luluku Road, Kaneohe, HI 96744-1854.

The following Special Event stations are scheduled for October:

N1P, from Franklin County Pumpkinfest 2010, Turners Falls, Massachusetts; "Number 1 Pumpkin"; Oct. 23. For full information: <http://n1kxr.webs.com/pumpkinfest_2010.htm>.

K1W, from National Wildlife Refuge Week, Parker River NWR, Newburyport, Massachusetts; Pentucket Radio Association; 1500–2000Z Oct. 9–17 on 18.125,14.265, 7.240, 3.880 MHz. For QSL send SASE to Pentucket Radio Assn.,K1KKM, 25 Elm Park, Groveland, MA, 01834.

N2CMC, commemorating the CMCARC 35th Anniversary at former USCG Loran Unit, Wildwood, New Jersey; Cape May County ARC; 1300 to 2100Z Oct. 2; CW 7.030, 14.040, 21.040; SSB: 7.260, 14.260, 21.260. Stations contacted may request certificate or QSL. Send name and address: CMCARC Fox Run Road, C.M.C.H., NJ 08210.

K3R, from Amateur Radio EmComm Demonstration, Pennsylvania; Rotarians of Amateur radio; 9 AM to 5 PM Oct. 2 and 3 on 14.225, 7.250, 20 meter SSB, 40 meter SSB. QSL to Bob Mente, NU3Q, 305 Ewing Road, Carnegie, PA 15106 (e-mail: <nu3q@verizon.net>.

N4J, from Archaeology Open House at Thomas Jefferson's Poplar Forest, Bedford County, Virginia; Lynchburg ARC; 1300Z–2000Z Oct. 9 on 7.260, 14.263, 14.070 PSK. QSL to Dick Hiner, W4HMK, 3977 Waugh Switch Rd., Big Island, VA 24526. <http://www.k4cq.n4kss.net>

N6W, in commemoration of National Wildlife Refuge Week, Kern County Wildlife Refuge, Delano, California; Oct. 10 and 16 on 20 meters around 14.240 MHz (±QRM). Contact five stations listed as active sites to earn a certificate. Check <http://www.nwrweek-radio.info/>. For more information on the LCWR in Delano, visit: <http://www.fws.gov/kern/ refuges/kern/>. QSL to N6AJ, 2701 Fordham, Bakersfield, CA 93305.

NB9QV, WW II Submarine *USS Cobia* AGSS-245 on the air commemorating the 28 submarines that were built in Manitowoc, Wisconsin during WW II era; USS Cobia Amateur Radio Club, 1400Z–2100Z Oct. 23–24 on 7.250, 14.260 MHz (±25 kHz). For QSL send QSL and #10 SASE to: Fred Neuenfeldt, W6BSF, 4932 So. 10th St., Manitowoc, WI 54220-9121. For special color certificate send $1 and QSL to: Tom McNulty, KØEFV, 4015 Independence Ave., Waterloo, IA 50703-9317. <http://www.qrz.com/nb9qv>

W9JOZ, from "The Town That Never Was," Radioville, Indiana; Starke County ARC; 10 AM to 3 PM CST Oct. 2 on 10–80 meters. QSL via callbook address.

KL-land, from 2010 National Wildlife Refuge Week, Alaska Hams, Friends of Alaska National Wildlife Refuges, Alaska Maritime National Wildlife Refuge, Homer, Alaska; 1600Z–2400Z Oct. 15–17 on 21.310, 14.265, 7.240, 3.910 MHz. QSL via KL1YY.

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

Oct. 2, **HamEXPO**, Bell County Expo Center, Belton, Texas. Sponsored by the Temple ARC. Contact Mike LeFan, WA5EQQ, phone 254-773-3590, e-mail: <expo@tarc.org>; <http://www.beltonhamexpo. org/>. (Talk-in 146.820 [PL 123.0]; exams)

Oct. 3, **Hall of Science Amateur Radio Club Hamfest**, New York Hall of Science parking lot, Flushing Meadow Corona Park, Queens, New York. Information: <http://www.hosarc.org>. (Talk-in: 444.200 MHz repeater [PL 136.5], 145.270 MHz, –600 kHz [PL 136.5]; exams 10 AM)

Oct. 9, **2010 ARC of Augusta, GA Hamfest**, Blythe Area Community Center, Blythe, Georgia. Contact Doug Pugh, e-mail: <doug9945@yahoo.com>, phone 803-279-6725. (Talk-in 145.490–; exams)

Oct. 10, **Maysville Hamfest**, Community Center, Maysville, North Carolina. Contact K4BMH, phone 252-753-2895. (Talk-in 146.685, PL 88.5)

Oct. 16, **Lufkin Hamfest 2010**, Lufkin First Church of the Nazarene, Lufkin, Texas. Jointly sponsored by the Deep East Texas ARC and Nacogdoches ARC. For information go to: <http://www.lufkinhamfest.com/>. (Talk-in 146.940 [– offset], PL 141.3)

Oct. 16, **Old Pueblo Radio Club Annual Swap Meet**, Kino Community Center, Tucson, Arizona. Contact Ron, N7SPW, phone 520-207-3852, e-mail: <n7spw@arrl.net>. (Talk-in 147.3 MHz, CTCSS 110.9 Hz; exams)

Oct. 17, **RF Hill ARC Hamfest**, Sellersville Fire House, Sellersville, Pennsylvania. Contact Jim Soete, WA3YLQ, phone 215-723-7294, e-mail: <wa3ylq@arrl.net>; <www.rfhill.ampr.org>. (Talk-in 145.31– PL 131.8)

Oct. 30, **St. Louis ARC Halloween Hamfest**, Kirkwood Community Center, Kirkwood, Missouri. Contact Steve Welton, WØSLW, 314-638-4959; <www.halloweenhamfest.org>. (Talk-in 147.150; exams 8 AM)

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Surrounded by New York City, but a DXCC entity unto itself, United Nations headquarters is home to amateur station 4U1UN. (Photos courtesy UNSRCARC unless otherwise noted)

If you've always wondered what it's like to be on the DX end of a DXpedition, but your budget won't cover a trip to Tahiti, consider guest operating from a DXCC entity that's smack dab in the middle of New York City (once it's back on the air!).

DXpedition to … New York?

4U1UN and the 2009 CQ WW SSB Contest

BY RICH MOSESON,* W2VU

I've never had the pleasure of going off on a DXpedition to some remote location, so when the opportunity arose to operate from a rare DXCC "entity" that was just a train and cab ride from my home in New Jersey, I jumped at the opportunity. So did *CQ* Managing Editor Gail Sheehan, K2RED, who took the train to New York City from her home on Long Island, and we shared a taxi from Penn Station across Manhattan to a small piece of land that technically is not part of the United States … the headquarters of the United Nations. We were invited to be part of and to document a special operation of the UN ham station, 4U1UN, leading up to a rare appearance by the station in the SSB weekend of the 2009 CQ World-Wide DX Contest.[1]

Despite the ease of traveling to 4U1UN, the logistics for the operation were quite complicated, perhaps even more so than for some more traditional DXpeditions. Due to security considerations, we could enter the UN complex only as a group, under escort, at specified times. Our visit was on a cold and

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

4U1UN club member, and now president, James Sarte, K2QI, waits outside UN headquarters to escort our group inside. (W2VU photo)

Co-host Mohamed Jendoubi, KA2RTD, the 4U1UN club president and station manager at the time of our visit, talks with the group outside the Security Council chambers. Mohamed gave us all a great tour of the UN before taking us up to the station.

windy day, and we had to wait outside until everyone who was scheduled to meet at that time had arrived. After going through airport-style security, we had to wait in the lobby while our escorts got us registered. We had to leave our IDs (photo driver's license or passport) at the desk and travel in small groups, and could not go anywhere without a UN staff escort.

Starting with a Tour

Mohamed Jendoubi, KA2RTD, President of the United Nations Staff Recreation Council Amateur Radio Club (UNSRCARC) at the time of our visit, believes the club and the station are extensions of the UN's mission to promote international peace and understanding, and sees one of his roles as being an ambassador for the UN to the ham community. As a result, getting from the lobby to the 4U1UN station on the 41st floor of the Secretariat building took about an hour and a half! No, we didn't walk up 41 flights of stairs (four, yes, but not 41!). Before going to the station, Mohamed led our group on an extensive tour of the UN facilities, including many areas that normally are not accessible to the average visitor.

We saw the entrance to the Security Council chamber (there was a meeting under way so we couldn't go in) and were able to go inside the General Assembly chamber. We also saw some of the many displays, such as the Escopetarra (see photo), a machine gun turned into an electric guitar by Colombian musician Cesar Lopez. In addition, we saw some behind-the-scenes areas where much of the UN's lesser-noticed but quite important work is done.

As Mohamed put it, "there are really two United Nations ... the one you see on the news, with delegates to the General Assembly and Security Council dealing with world events and international crises; and the other one that you don't hear about, that quietly goes about addressing long-term international problems." Mohamed's UN job, by the way, is as a translator, so he gets the opportunity to read all documents generated in the organization. He has been a member of the UN ham club for 29 years and served as 4U1UN station manager from 1997 until earlier this year, and as club president for seven years, until handing off both of those roles a few months ago to fellow member James Sarte, K2QI.

The UNSRCARC (Just Call it 4U1UN)

The United Nations Staff Recreation Council Amateur Radio Club is the long and official name of the radio club behind the 4U1UN callsign. According to Mohamed, the club has been active since the late 1970s, but ham radio activity at the UN began with the founding of the organization in 1945 in San Francisco and has continued on and off since then, depending on the numbers and availability of licensed amateurs on the UN staff.

The current incarnation of the club was started in 1975 by Dr. Max DeHenseler, HB9RS, Chief of the UN's Cartography Section, who also persuaded the Secretary-General at the time to issue the callsign 4U1UN. Mohamed says the phonetics for the call could be, "For you, there is only one United Nations!"

"Let me tell you about the atmosphere at the time of Max DeHenseler and how I found the club at the time," Mohamed

Guest Operating at 4U1UN

As of now, 4U1UN is off the air indefinitely during renovation of the United Nations Secretariat Building. Once the station returns to the air, Mohamed offers the following guidelines for ham visitors to New York who would like the opportunity be a guest operator:

People interested should send an e-mail to <4U1UN@un.org>. It is auto-forwarded to all club members, to see who, if anyone, is available. If professional duties interfere, we will have to decline; or if a potential guest is staying in New York City for a while, we will try to arrange something. Don't just show up in the lobby! ... We try to help guests by being available when they come. We try to balance guests according to geographical area or country; someone coming from 10,000 miles away will have priority over someone from New York.

Sometimes we receive requests for skeds. Because of professional constraints, we cannot make skeds. We try to be fair to all. We can't play favorites on the air. We must take all comers.

So drop an e-mail to Mohamed or James if you're planning a visit to New York City once the station is back on the air. However, be flexible with your time and don't be upset if their professional responsibilities prevent them from hosting you as a guest op.

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The Escopetarra, a machine gun turned into an electric guitar by Colombian musician Cesar Lopez. (W2VU photo)

continued. "Max DeHenseler was a very good operator. He lived near the UN and could go to the station at any time. He had a tradition of grouping all the members every Wednesday for lunch, and then going back to his office for coffee. I remember often leaving his office with stacks of technical magazines. The impulse he imparted to the club at that time is still keeping the club going today, and we are still in contact with him even though he has retired."

"Among the figures who helped give 4U1UN its name," Mohamed added, was a local ham who did not work for the UN, "K2GM, David Rosen (a Silent Key; his callsign is now held by the Tuxedo Park Contest Club, of which he was an active member). He was not a staff member but was very active with the club after being introduced to it by his late father, who was a friend of Max. At certain times, he *was* the club." Mohamed also noted that "4U1UN is also grateful for the help it received on numerous occasions from other non-UN hams, including Henry Ingwersen, KT1J, and Steven Wheatley, KU9C, for helping to find and retrieve the old 4U1UN paper logs."

Mohamed noted that the club "also has a U.S. call, K2UN, which it uses when outside the UN complex (which is a separate DX entity). It has not been used for years, except occasionally for fun." The trustee of that callsign is Vince Sullivan, K2FC, an old-timer who helped create the station and often operated it in its early days.

In recent years, the club has focused on organizing special events, usually connected with sessions of the General Assembly. In 2009, it operated with the special call 4U64UN because of the 64th General Assembly session. "We have done this almost every year since the 43rd session," noted Mohamed.

It was uncertain at press time whether the station would be active as 4U65UN during this year's General Assembly session (from September to December), as the Secretariat Building—which houses the station—is closed for renovations and the station is temporarily off the air. Mohamed says any special operation this year would depend on the availability and accessibility of operating space. If space can be found, he said, "4U1UN could and probably would go on the air with a special callsign."

2009 UN Week Operation

Last year, because of the impending station closure and because United Nations Day (October 24th) coincided with the SSB weekend of the CQ World-Wide DX Contest, the club decided to organize a special UN Week operation. "We invited many friends of 4U1UN, including local hams," Mohamed explained. There were 21 guest ops as well as three staff members, for a total of two dozen operators. Noted DXer and DXpeditioner Martti Laine, OH2BH, helped organize the event. He noted that it "had to be multinational and multicultural to represent the United Nations at its best." Countries represented among the guests included Brazil, Finland, France, Japan, Norway, the United Kingdom, and the United States. Martti noted that several others had been invited as well, but could not attend, including Villy Umanets, UA9BA; IARU Region 1 President Hans Timmerman, PB2T; and Region 2 President Reinaldo Leandro, YV5AMH. In addition, staff operators came from Tunisia, Norway, and the U.S.

The theme of representing the UN at its best is constantly reinforced for guest operators of 4U1UN. After successfully navigating the labyrinth of security, escorts, etc., station operators must adhere to the following on-the-air guidelines:

Due to the highly sensitive and political environment, operators at 4U1UN need to demonstrate immaculate on-the-air behavior and desist from any acts or statements that may be perceived in any direction politically, religiously, culturally, etc.

In addition to International Conventions, the Amateur Radio Regulations, the Radio Amateur Code of Conduct and the above mentioned issues, the operator shall comply with the following:

• Preference is not to be given to specific

Our third UN ham host, Johnny Johansen, NQ2G/LA5HA (standing), now reassigned to Geneva, set up much of the station architecture that provides for efficient multi-transmittter operation.

4U1UN is located in a small room atop the Secretariat building—and it easily gets very crowded!

Radio Amateurs like friends, family, fellow countrymen, etc., while operating. All calling hams shall be treated equally.

• The hardest geographical areas to contact shall be prioritized if and when propagation allows for it at any point in time.

• If feasible, special attention is to be given to those who never had the chance to contact 4U1UN on any band, and to groups operating as QRP, Novice licensees, etc.

• There shall be no comments about an eventual unruly pile-up, indecent behavior from callers or any other negative statements about the calling stations.

• Normally only name and QTH (United Nations Headquarters New York) is given. Call-sign of operator may be given out, but will usually create a tremendous amount of requests for guest operations, scheduled QSOs, QSO verifications, QSL information, etc., after the operation is concluded.

• Many stations are still waiting to contact 4U1UN as a "new one"; thus one will normally run a fast rate of QSO's in split mode. "Rag-chew" QSO's are usually not feasible or desired.

Up the Steps and On the Air

After Mohamed's excellent tour and a hike up the final four flights of stairs (the elevator does not reach the last two floors), we finally arrived at 4U1UN, a small room crowded with equipment (three operating positions, storage, and the 4U1UN/B beacon station) and people. A group of operators was already on the air from earlier in the day, and our new contingent pretty much filled up the available space. The three stations, mostly club members' personal gear, consisted of:

1. a Yaesu FT-1000D transceiver with an ACOM-1000 amplifier, Bencher Morse paddle, Heil Proset boom mic, and RASCAL computer interface;

2. an ICOM IC-756 Pro III with a Kenwood TL-922 amp, another Bencher paddle, Heil Proset boom mic, and RASCAL computer interface; and

3. a Kenwood TS-2000, also with a TL-922 amplifier, and the same accessories as the first two stations.

Stations 1 and 2 shared a SteppIR BIGIR tunable vertical for 80–10 meters; a Butternut HF2V vertical for 160 CW, 75-meter phone and 40-meter phone; and an Alpha Delta DX-LB for CW portions of 160, 80, and 40 meters. Station 3 was connected to a Cushcraft R8 vertical, covering 40–10 meters; and an M^2 6M3 6-meter Yagi, the station's only beam antenna. All three stations use N1MM logging software, MMTTY RTTY software, and Digipan for PSK-31. There are also bandpass filters available for all bands in the event of intrastation interference. The current station setup is the handiwork of club member Johnny Johansen, NQ2G/LA5HA.

Talking ... On and Off the Air

After a bunch of photos, anyone who wasn't going to be staying to operate after our group lunch was invited to get on the air. I picked up the pile-up on 15-meter phone and had a great time until the band closed up as a reminder that it was time for lunch and there were a lot of hungry people staring at me! (I think Mohamed secretly threw a switch somewhere and shut down 15 meters, HI!)

We all went to lunch at an excellent restaurant nearby, where, in addition to great food, we all got to know each other a little better and I had a chance to talk a little more with the three staff members of the club, Mohamed, KA2RTD; James, K2QI, and Johnny NQ2G/LA5HA. Both James and Johnny are relatively new members and relatively new hams, while Mohamed provides the link to Max DeHenseler and the club's long history.

"I grew up in Tunisia, 3V8, and learned electronics on my own," Mohamed explained as we ate. "I started building receivers and transmitters at

Noted DXer and contester Atilano Oms, PY5EG (back to camera), operates from one of 4U1UN's three operating positions while Johnny, NQ2G/LA5HA, looks on.

The flat roof of the Secretariat building, some 400 feet above street level, provides not only great views of New York City but also a great place to install ham radio antennas.

age 14, but I could not get a license since none were being issued. Even now, Tunisia only licenses clubs. My first ham license was in the U.S. as KA2RTD. My activity has always been within the club and my Elmers have mostly come from the club."

QSLing 4U1UN

QSL card requests for 4U1UN contacts must go via the club's QSL manager in Switzerland, HB9BOU, who has all available logs from 1985 to the present. QSL with SASE (return postage may include any of the following: $2 US or one new-style International Reply Coupon, or IRC; IRCs must have been purchased in Europe for European addresses; outside of Europe for addresses elsewhere) to:

Herbert Aeby, HB9BOU
Route du Moulin 1
CH-1782 Belfaux
SWITZERLAND

In addition, all QSOs from the 4U1UN operations in October 2009 and March 2010 have been uploaded to the ARRL's Logbook of the World (LoTW).

Johnny had a more traditional introduction to amateur radio. "My father was a ham and I started to experiment with stuff while young," he recounted. "I got my own license at 21, while a student at the University of Technology of Norway. It has an active club station, LA1K." Like so many of us, Johnny's interest in electronics and radio has translated into a career as well. "I work in telecommunications for UNICEF," he explained, "especially during emergencies. At headquarters, my role is creating standards, policies, best practices, etc., and streamlining supply arrangements … I spent three years in Afghanistan, from November 2003 to September 2006. I was responsible for all UN telecommunications systems in the country. I have been in New York since 2006." Johnny added, "I was involved with the amateur radio club before I came to New York, exchanging e-mails with Mohamed before arriving."[2, 3]

James, who works in the UN's Document Management Section, said he had also been in contact with Mohamed, through work, before becoming involved with 4U1UN. "For my first seven years at the UN, I had no idea the club existed," he said. "After becoming a ham, I discovered the club, contacted Mohamed … and became a member." Still a relatively new ham, James is now club president and 4U1UN Station Manager.

The Contesters Take Over

After lunch, several of us—including Gail and me—left for home, leaving the station in the hands of the contesting crew as the clock ticked down to the opening hour of the 2009 CQ WW SSB Contest. This group was led by an international team of experienced contesters including Martti Laine, OH2BH; Kari Lehtimaki, OH2XX; Atilano Oms, PY5EG; Kaz Watanabe, JK3GAD; Doug Zwiebel, KR2Q; and Dave Patton, NN1N. "It is a special feeling," noted Martti, who has operated literally from all over the world, "to be operating from the top of the UN building in the middle of the night. It is really something you are offering by letting us operate overnight."

The crew did pretty well on the air, qualifying for a certificate in the Multi-

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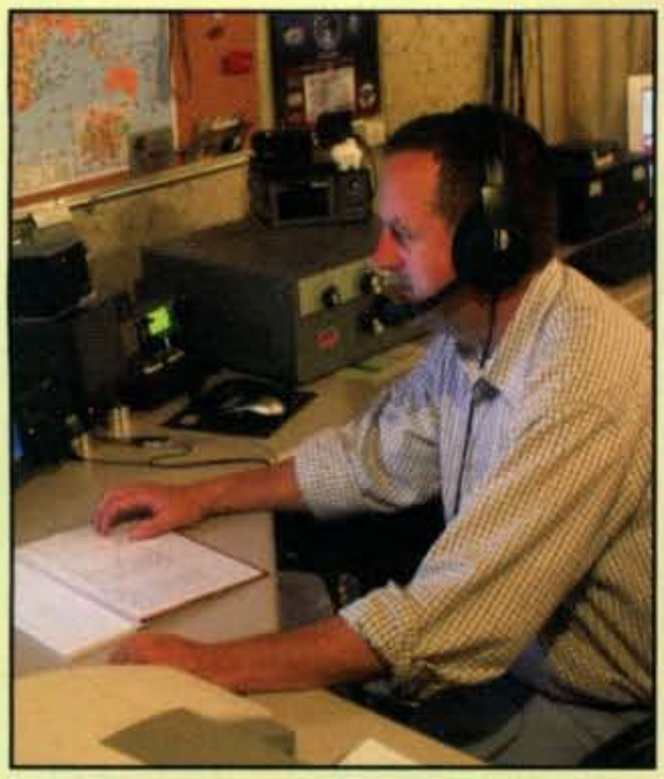

On the Cover

Chasing islands is the ham radio passion of R. Bruce Stewart, N9GKE, of Lafayette, Indiana. He is very active in the IOTA (Islands On The Air) program as well as separate award programs for contacting islands in Scotland and the United States. A ham for more than 20 years and an island-chaser for most of that time, Bruce currently has 639 of them confirmed, noting that his biggest thrill to date was working BS7H, on Scarborough Reef.

Bruce says working DXpeditions to very rare islands is particularly exciting for him. "The fact the operators are there for only a limited time, not like a country where there are plenty of operators" is what really gets his adrenaline flowing. "They're there for just four or five days and then they're gone." He notes that he has often stayed up until 2 or 3 o'clock in the morning to work some rare island. "It's the thrill and excitement of the chase," he says, "and hoping your call will be heard."

Locally, Bruce is also involved in emergency communications, and is ARRL Emergency Coordinator for Tippecanoe County, supervising an ARES (Amateur Radio Emergency Service) group of some four dozen members. He says he is attracted to the challenge there as well, "going out into a remote area, without power and without antennas, and setting up and operating."

Bruce's station consists of an ICOM 7700 (an upgrade to the IC-756 Pro seen in the photo), a Command Technologies Commander 2500 amplifier, and a TH-5 Yagi on a 50-foot tower. He also has a rotatable dipole for 12, 17, and 30 meters, although 20 is his favorite and most productive band for island-chasing. *(Cover photo by Larry Mulvehill, WB2ZPI)*

The main group of contest operators for 4U1UN during the 2009 CQ World-Wide DX Phone Contest (from left): Martti Laine, OH2BH; Olli Rissanen, OHØXX; Doug Zwiebel, KR2Q; Kaz Watanabe, JK3GAD; UN host Johnny Johansen, NQ2G/LA5HA; Atilano Oms, PY5EG; and Dave Patton, NN1N. The team of veteran contesters placed second in North America in the Multi-Operator, Two-Transmitter category.

Two category with more than 7000 contacts during the 48 hours of competition. The bulk of the contacts were on 20, 40, and 15 meters, followed by 80, 160, and 10. The majority of QSOs were with other stations in North America (66%), followed by Europe (29%), South America (3%), Asia (1%), Africa (0.8%), and Oceania (0.5%). Their final score was over 7.7 million points, the #2 score in North America for their category.

Overall, through the entire week's operation, 4U1UN made nearly 21,000 QSOs (13,000 before the contest began) in 141 DXCC entities. The continent breakdown was pretty similar to that during the contest, only with more Europeans and fewer North Americans worked overall. The majority of contacts were made on SSB, followed by CW and RTTY, as well as some on PSK-31 and five SSTV contacts!

A Special Experience

Several participants commented afterward on the experience:

Mike Lisenco, N2YBB, wrote: "What an absolute pleasure last week was! I am honored both to have met and to have operated with all of you. Thank you all so very much for the privilege."

Tony Japha, N2UN, added: "It was great to be part of the week's festivities, particularly to meet all who I had an opportunity to meet … 20,000 QSOs is remarkable for a semi-rare country in a week, and so is the fabulous job done in CQ WW. I live only a stone's throw from the UN, and appreciate the magic of being 400 feet up with an exotic call. Everyone did a wonderful job."

Oms, PY5EG, provided the perspective of a veteran contester: "I'm on the way back home and still with the 4U1UN's spirit, I would like to emphasize how grateful I am for being part of this fraternal week of ham radio activity at the United Nations organization. As a fanatic old timer, every day I realize the debt I have with God by permitting myself to be member of this fantastic community. (This) has been a unique opportunity to renew some old friends, to meet personally some new ones, and at the same time to exercise our contest passion, and in addition, to have a better knowledge of the job [the UN] is carrying out … in the development of the real fraternity among the various cultures.

"[It] has been also an honor to be escorted by Mohamed, Johnny, and James, an experience that will be permanent in my memory."

Gail, K2RED, spoke for many of us in saying, "Thank you to everyone involved in the week and the contest. It was a very special time for me in the realm of ham radio."

James, K2QI, replied, "It has been a pleasure meeting each and every one of you, and I truly hope that we'll all get to meet again in the near future. Until then, I'll look forward to working you on the air."

4U1UN was able to stay on the air through the winter months, including another group operation during the ARRL SSB DX Contest in early March. In early June, Mohamed provided the following update:

The UN Secretariat building is now closed for renovation. 4U1UN radio station is closed and will probably remain inaccessible till the end of the renovation work.

On May 22 we received our QSL Manager, HB9BOU, and a group of operators in a visit from Switzerland and we improvised a small operation in the Rose Garden of the Secretariat building.

We are also in the process of finding a new temporary location for 4U1UN beacon.

It is not clear how active 4U1UN can be during the renovation of the Secretariat building. The members of ARC will be doing their best to keep it on the air as often as feasible.

So keep listening for the return of 4U1UN to the amateur airwaves. Once it is back on the air, if you are in New York City and have a flexible schedule (see sidebar), get in touch with James or Mohamed about the possibility of guest operating, but keep in mind that they both have their jobs to do and can only accommodate guest ops as their work schedules permit. But especially if you have come from far away and provide enough advance notice, one of them will do their best to greet you because, as Mohamed reminds us, "For you, there is only one United Nations."

Notes

1. 4U1UN is rarely active during contests for three reasons: (1) a small number of licensed UN staff members; (2) the station's location in a secure area, meaning that any visitors must be escorted at all times by one of those very few staff members; and (3) difficulty getting permission for guests to be in the UN building overnight.

2. Since our visit last October, Johnny was transferred to Geneva, where according to Mohamed, he is continuing the same work but from a different base of operations.

3. Johnny's replacement in New York, and a new member of the 4U1UN club, is veteran ham Andy Fedorov, KL1A/RW3AH (and several other calls from a variety of other countries). Andy has operated from all over the world. He is formerly Chief Coordinator of the Russian Amateur Radio Emergency Service and was most recently posted in Geneva, where he was trustee of 4U1AIDS, a special event station commemorating World AIDS Day in December 2009.

The power of imagination can be strong. Imagination plus engineering can be, well, read on … especially if you grew up listening to radio programs in the 1940s!

Building Captain Midnight's 1942 "Pocket Locator"

Based on the 1940s Radio Adventure Serial, *Captain Midnight*

BY LEONARD ZANE* AND TOORU KAWABATA†

The *Captain Midnight* radio adventure serial was extremely popular with both young and adult listeners during its broadcast run from 1938 through 1949. Written by retired military pilots Robert M. Burtt and Wilfred G. Moore, the program involved a government-directed paramilitary aviation group called the "Secret Squadron," and it often contained references to state-of-the-art technology of the time.[1] One device introduced on the program during World War II was the "Pocket Locator" (PL), an extremely miniaturized two-way radio used throughout the rest of the radio show's years. The PL was designed to send and receive flashing-light signals, and was a daydream of many of the show's millions of radio listeners. The device remained a fictional ultra-miniature AM transceiver that functioned like a 1940s handie-talkie (see fig. 1). However, could it actually have been built?

Pocket Locator Engineering and Components

Recently a retro-designed, vacuum-tube-powered Pocket Locator was developed that for the first time satisfies the vintage criteria of the radio program *and* is a working QRP CW transceiver! Research into this technology was done by co-author Leonard Zane and the late-1940s radio engineer Bob Kelley (W6TCE). Data and components of the most miniaturized 1940s radio technology were provided to electronics engineer and co-author Tooru Kawabata, who engineered and built working 1942-model Pocket Locators (see the circuit in fig. 2). To also accommodate Morse Code audio capability, an optional audio circuit was added for plugging in a high-impedance ceramic crystal earphone.[2] (At least the

*e-mail: <intraverse@earthlink.net>
†e-mail: <ux-45@hi-ho.ne.jp>

Fig. 1.– BC-611F handie-talkie, and miniature and subminiature tube-size comparison (upper left). →

Captain Midnight radio program had not ruled out such private audio capability as another possible PL feature.)

1/4 Watt in a Small Package

Our 1942-model Pocket Locator uses all subminiature tubes, with all power tubes operating at 90 plate volts. This PL is exceedingly compact, with all parts inside an 8-oz. stainless-steel drinking flask (fig. 3). The flask measures $4^{3}/_{4}" \times 3^{5}/_{8}" \times {}^{7}/_{8}"$ and is cut open, hinged, and latched. A 10-oz. flask, though, would be spacious enough (at $5.75" \times 3.70" \times 0.90"$) to flush-fit the top and bottom, and bolt them together through a wider stainless-steel inner lip, rather than hinging and latching the two sections. Operating at 1/4-watt output-power like the BC-611, the ultra-miniature Pocket Locator nonetheless outperforms the handie-talkie, having a range of 4.4 miles on level ground and 50–100 miles from atop a 3000-ft. mountain *(and who knows how much farther when 10 meters is open—ed.)*. This is compared to a typical BC-611 range of one mile over level ground, three miles over ocean, and considerably more from a mountaintop. As with the BC-611, the PL is turned on and off by extending and collapsing its 30-inch, completely self-contained, telescoping antenna. Contrasted with our Pocket Locator, the 1940s BC-611 has five miniature-size tubes, a considerably shorter range, measures $15^{3}/_{4}" \times 5^{3}/_{8}" \times 3^{5}/_{8}"$, and weighs 5.45 lbs. (3.85 lbs. + 0.5 lbs for a 1.5V filament battery + 1.1 lbs for a 103.5V plate battery). The PL weighs 13.2 oz, or 15% of the BC-611; and the BC-611's physical volume of 306.88 cubic inches is over *20 times* the Pocket Locator's case volume of 15.07 cubic inches!

Fig. 3 shows a small winged-clock emblem (the Secret Squadron insignia) on the Pocket Locator's front. An internal green indicating light (tube V5) shines through the emblem's clear center portion for dot-dash flashing in receiver mode. Most of the case's interior is taken up by two 1.5V "A" (size AA) batteries and two 45V "B" (Eveready *No. 415*) batteries.

Advanced Circuitry

The most advanced, top-secret communications electronics were necessary for 1940s Pocket Locators, enabling Secret Squadron and other engineers to achieve the greatest miniaturization ever of vacuum-tube transceivers. 1940s proximity fuses[3] *(sometimes spelled fuzes—ed.)* employed subminiature

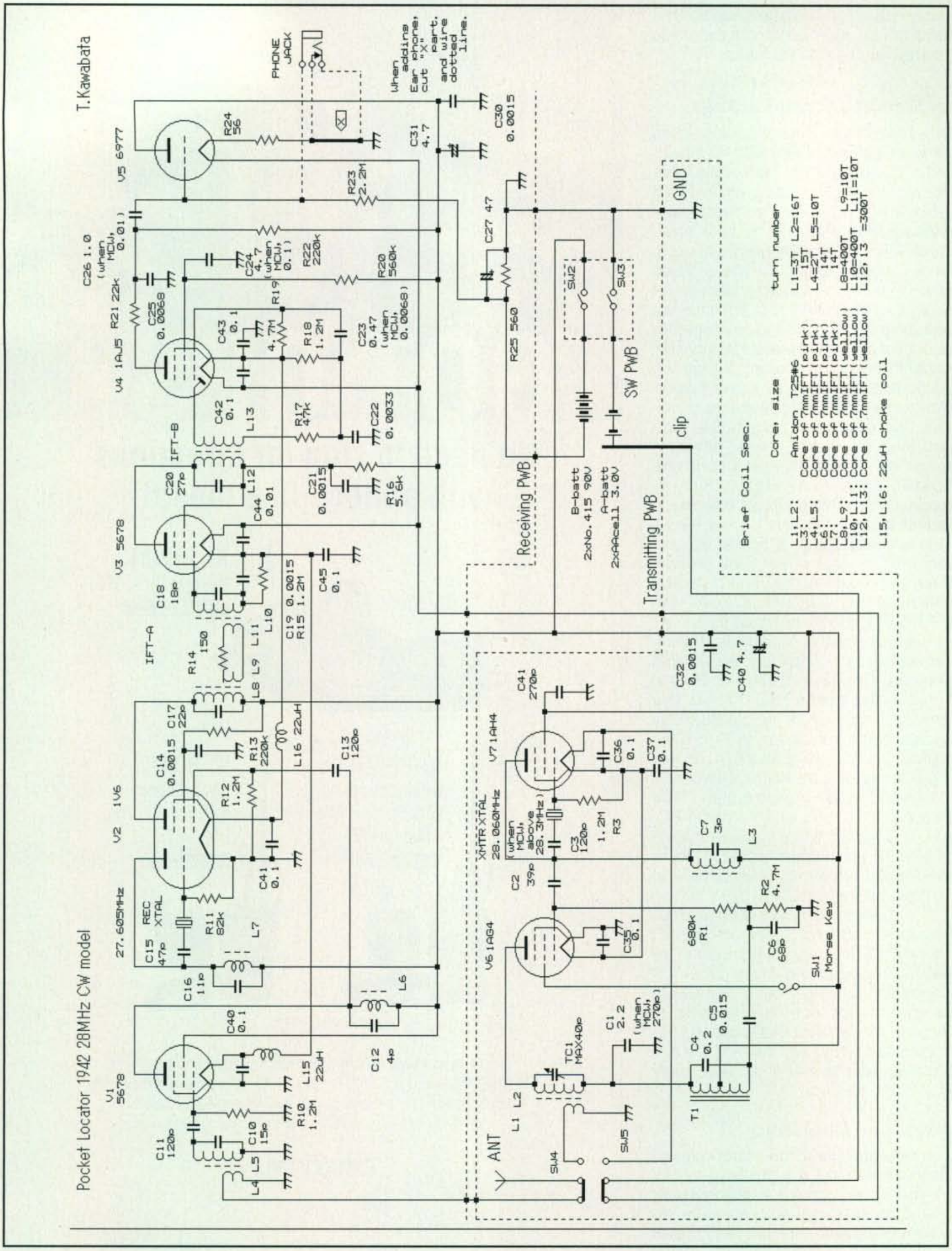

Fig. 2– Pocket Locator circuit.

Fig. 3– 1942 Pocket Locator showing external view (left) and interior layout (right).

tubes, and coils with ferrite cores were used in the BC-611.

Components and Operation of Transceiver Circuitry

1. The 1942 PL's receiver circuit incorporates tubes V1, V2, V3, V4, and V5. The transmitter circuit utilizes tubes V6 and V7. The transmitter operates at 28.060 MHz,[4] per today's FCC amateur-radio standards, as well as WW II FCC standards (for the U.S. Government-directed Secret Squadron).[5] Four of the five tubes on the lower-frequency BC-611 are switchable from transmit to receive mode. However, the PL's transmitting and receiving circuits are almost completely separated from one another. This design requires two more tubes than the BC-611, but it also eliminates more complicated and troublesome transfer-switching and related circuitry, so as to minimize the PL's overall size.

2. The PL's changeover between transmit and receive modes is done by SW4 and SW5. Switch SW4 transfers the antenna between the transmit and receive circuits, and SW5 switches tube filaments on and off. When the transmitting mode is selected, V6 and V7 are switched on and V1–V5 are switched off. When the receiving mode

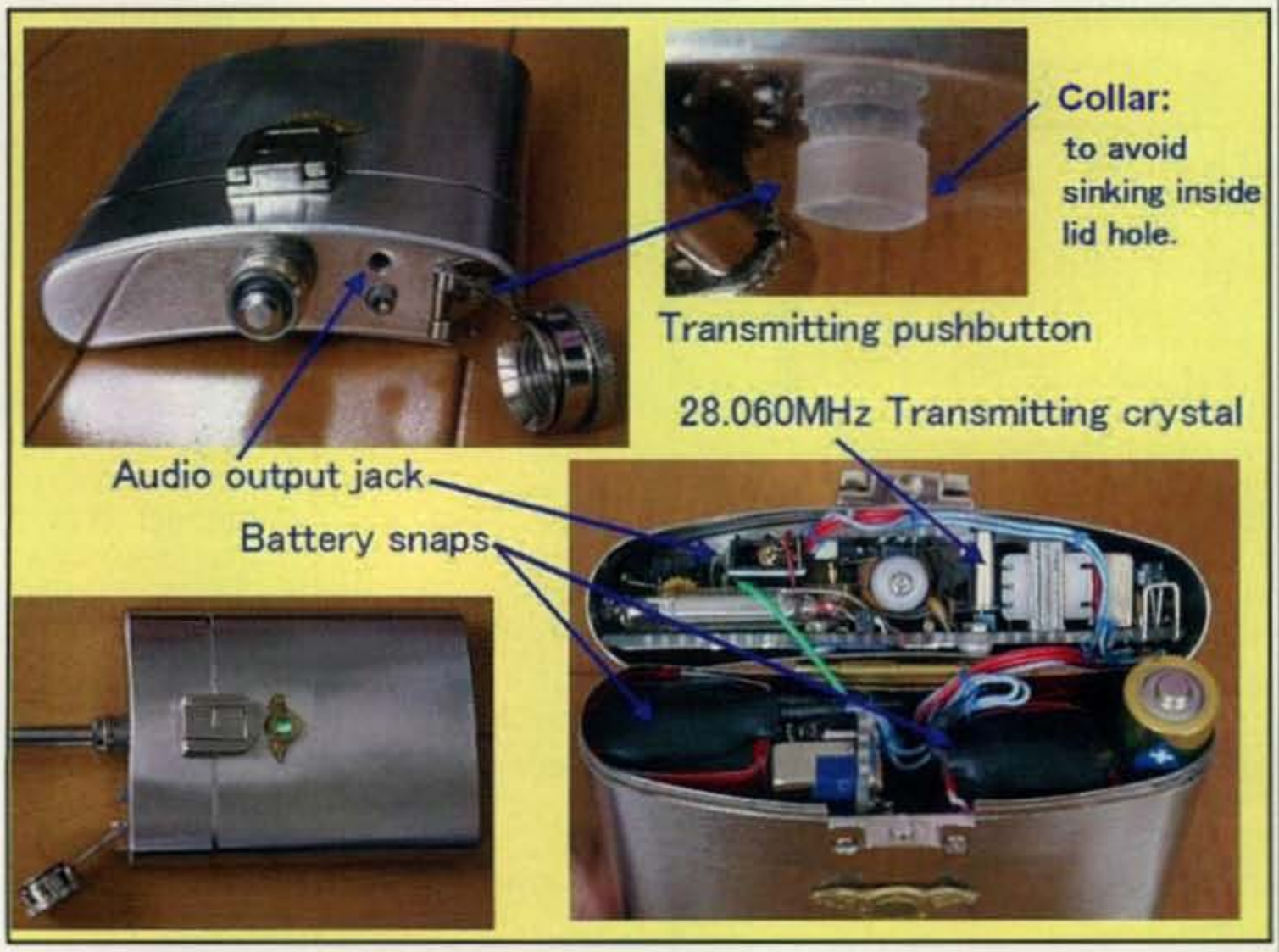

Fig. 4. 1942 Pocket Locator details, including optional audio output jack.

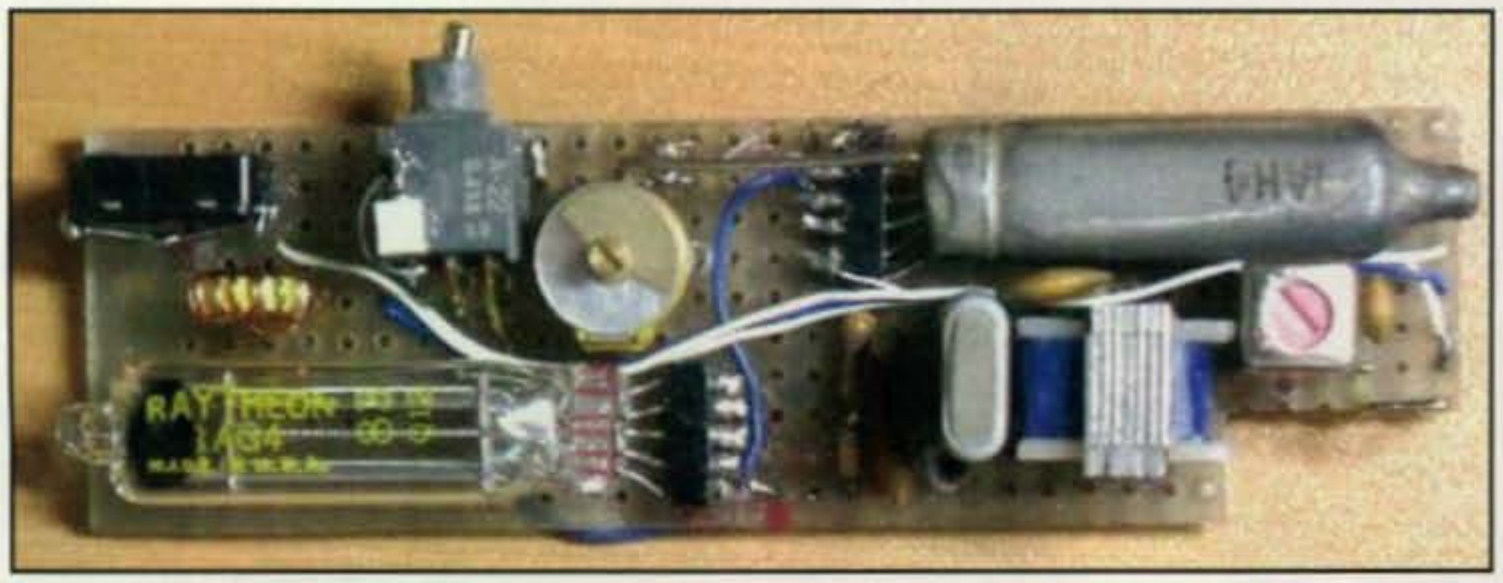

Fig. 5– Transmitter electronics. Those are subminiature tubes at lower left and upper right.

Fig. 6– Receiver electronics.

is selected, V1–V5 are switched on, and V6/V7 are switched off.

3. V1 (5678) works as a tuned RF amplifier. Both input and output of V1 are tuned to 28.060 MHz for the receiving frequency by L5 and C10, and L6 and C12. The inductance and capacitance of the two capacitors and two coils had to be experimentally tested and determined under conditions of stray capacitance created by tube wiring and by the L5 and L6 coils themselves. By comparison, the plate load of the RF amplifier in the BC-611 is tuned only by a coil that is affected by stray capacitance, and does not utilize tuning capacitors as does the Pocket Locator.[6]

4. V2 (1V6) is an oscillator and mixer. The V2 triode section works as a crystal oscillator at 27.605 MHz. The pentode section of V2 converts the incoming signal's frequency to an intermediate frequency (IF) of 455 kHz (28,060 – 27,605 = 455).

5. V3 (5678) works as an IF amplifier.

6. V4 (1AJ5) is a second detector and DC converter. The diode section of V4 rectifies the IF signal and converts it to a DC signal. The pentode section of V4 is the DC amplifier section, but is not actually employed for amplification.

7. In order to discriminate a 28.060-MHz carrier, the DC amplifier has a simple low-pass filter that reduces audio-frequency noise but does not amplify the signal. Time constants for conveying the signal are determined by C23 and R19, and by C26 and R23. The constants are about 2 seconds each, which would be relatively long if V4 functioned as an AF amplifier. However, because of the duration of these time constants, V4 is not actually a DC amplifier. The time constants are, however, adequate for Morse Code operation, and they have the effect of eliminating noise-induced DC output fluctuations in the detector.

8. V5 (6977) is an indicator tube. When its grid potential is below minus 1.6V, the V5 tube turns off; when higher than minus 1.6V, it turns on. Grid potential of the 6977 tube is kept at about –3 VDC to turn off when there is no incoming signal. This bias voltage is created via total B-battery current and R25. The 6977 is also called an "eye tube," similar to what was originally developed in the 1940s as an indicator in early digital computing.[7]

9. V6 (1AG4) works an RF power amplifier to amplify the 28.060-MHz carrier. The 22-µF of capacitance stops the 100-Hz AF oscillation of V6, so V6 transmits a continuous-amplitude wave (CW). The values of C23 and C26 in the receiving circuit are also tuned for receiving CW. The PL's 30-inch antenna is tuned to the carrier frequency.

10. V7 (1AH4) is a crystal oscillator that oscillates the 28.060-MHz carrier. The Morse key SW1 turns V7 on or off, generating a CW signal.

11. Rather than making coils from scratch, all coils are converted from transistor radio coils that could have been built with classified WW II know-how. Ferrite cores have been used in transistor-radio IF transformers and are also contained in the BC-611.

Conclusion

December 15, 2009 was the 60th anniversary of the last *Captain Midnight* radio program. Radio hobbyists and old-time radio enthusiasts have finally analyzed and constructed one of Captain Midnight's most sophisticated and secret devices of the 1940s—a

Fig. 7– Cap-strap key, transmitter button, transfer switch, and 30-inch telescoping antenna. The cap with hinged strap is the transmitting key, with cap extending left and down. The strap is pushed gently against the transmitting button for keying messages; a toggle lever (inside a sealing collar) operates the send/receive t ransfer switch. The audio output jack is optional, with inside plastic casing to provide a shield against outside contaminants.

retro-engineered, micro-transceiver that would certainly have been classified top secret at the time. Key technologies for miniaturizing the 1942 PL are subminiature tubes and ferrite-core coils. Our part-time designing and building of this Pocket Locator spanned four years; and these engineering efforts have thus shown it would have been feasible for a team of 1940s engineers to have designed and built the Pocket Locator, given the most advanced electronic and other technologies of the era. For us, this retro-engineering and development drew upon a wealth of information, including experience and suggestions of 1940s radio professionals as well as subminiature tube data published by Ludwell A. Sibley[8] and his advice. We also received communications and data from Norman B. Krim during his tenure at Raytheon.[9]

Notes

1. Kallis Jr., Stephen A., *Radio's Captain Midnight – The Wartime Biography* (Jefferson, North Carolina: McFarland & Company, Inc., 2000, pp. 187–188).

2. <http://www.angelfire.com/electronic2/index1/Earphone.html>; and a Switchcraft 142A Tini-D-Jax® miniature, plastic-enclosed phone jack blocks contaminant entry into the PL.

3. <http://www.computer50.org/mark1/turing.html>

4. 28.060-MHz crystal supplier: <http://www.af4k.com/crystals.htm>; vintage tubes supplier: <http://www.tubesandmore.com>

5. "Amateur Radio: 100 Years of Discovery," *QST*, January 2000 (Newington, Connecticut: American Radio Relay League). Article excerpt: "By June 1940 the FCC issued an order prohibiting American hams from contacting foreign stations. Portable and mobile operations on frequencies below 56 MHz were also prohibited, although the FCC made a specific exception for Field Day, and later for the Amateur Emergency Corps ... Some hams in New York were so certain that ... ham radio would have a future following the war, that they kicked off a new magazine called *CQ* in January 1945. Hostilities finally ended on August 17 of that same year ... By summer 1946 nearly all amateur bands were restored, from 3.5 to 30 MHz, with the old bands at 5 and 2.5 meters replaced by new bands at 6 and 2 meters."

6. <http://wiki.answers.com/Q/What_is_stray_capacitance_and_how_is_different_from_ordinary_capacitor&src=ansTT>

7. <http://www.history.navy.mil/faqs/faq96-1.htm>
<http://www.smecc.org/radio_proximity_fuzes.htm>
<http://en.wikipedia.org/wiki/Proximity_fuse>

8. Sibley, Ludwell A., *Tube Lore: A Reference for Users and Collectors* (Ashland, Oregon: L. Sibley, 1996, 2000, 2001, 186 pp.).

9. Norman Krim's 2/14/2002 letter to Bob Kelley, and 2/10/2007 letter to Leonard Zane.

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	PYØFM('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)	25,646,796	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	KHØAA('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	KHØAA('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	KHØAM('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	216	17	62
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	CN3A('09) (Opr. IK2QEI)	2,156,652	4,285	36	135
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	P4ØE('03) (Opr. CT1BOH)	15,943,070	7,828	169	546
QRP	P4ØW('99) (Opr. W2GD)	5,024,800	3,277	137	413
Low Pwr.	P4ØW('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	VK6AA('09)	12,331,144	6,524	162	502
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	KHØAM('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

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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	1083	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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Communicating Under the Noise JT65A on HF – Part I

BY DAVID T. WITKOWSKI,* W6DTW, with TOMAS HOOD,† NW7US

Being the geek that I am, I often envision what the invisible world around us might look like if we could see beyond the visible light spectrum; cosmic rays and neutrinos streaking through the sky like a meteor storm, electric and magnetic fields surrounding antennas and power lines, uninsulated walls and windows leaking heat via infrared. Likewise, it's fascinating to think that at any given moment, thousands if not millions of distinct radio, TV, and cellular phone signals surround us, unseen and unfelt, their existence revealed by the familiar magic of a radio receiver's ability to convert microvolts of RF energy into audible sounds. Yet this leads me to wonder: How many signals are there that we *can't* hear, and how might we detect them? When we hear a rush of static from our rig's speaker, is there something underneath the noise unheard and undetected? What if there was a way to receive those messages, to add greater sensitivity to your HF station, using the equipment you likely already have? As it turns out there is, and it's called JT65A.

The JT65A communications protocol was conceived and first implemented by Joe Taylor, K1JT. Joe, a Professor Emeritus of physics at Princeton University, shares a Nobel Prize with Russell Alan Hulse (ex-WB2LAV) for the discovery of the first pulsar in a binary system as well as the first confirmation of the existence of gravitational radiation in the amount and with the properties first predicted by Albert Einstein. Joe has contributed to the amateur radio community in much the same way, changing the playing field for weak-signal operation.

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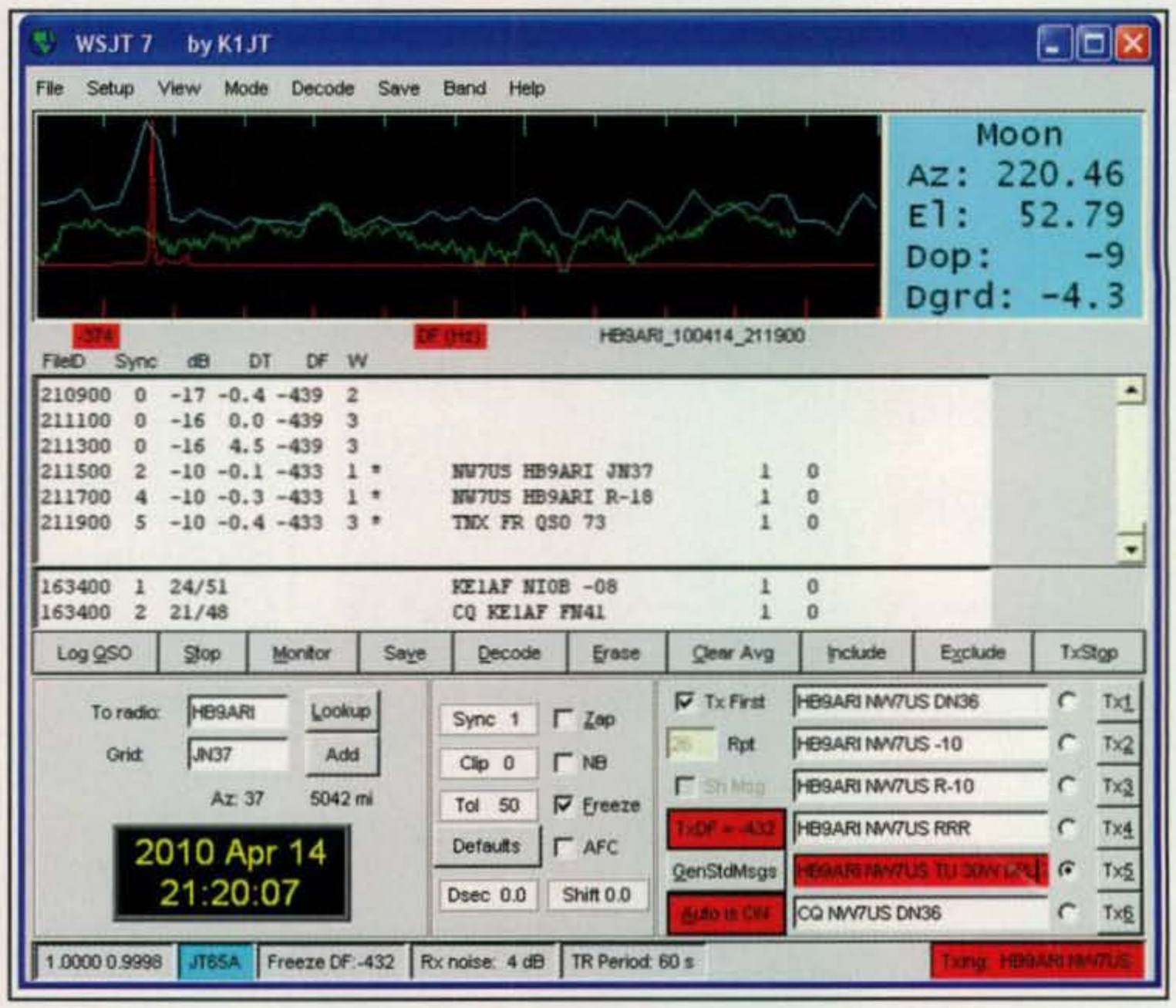

Fig. 1– A screen capture showing the WSJT software by Joe Taylor, K1JT, in the JT65A digital communications protocol mode on the 20-meter JT65A frequency, 14.076 USB. NW7US just made a successful two-way digital exchange with HB9ARI. (Source: NW7US, using WSJT)

Joe was first licensed as an amateur radio operator while he was still a teenager. His ham radio interest led him into astronomy *(see* CQ *interview, October 2009 issue—ed.)*. When he applied his mind to the idea of developing a communications protocol that would work well under very low signal-to-noise ratio conditions on a communications signal path between, say, the moon and Earth-bound amateur radio stations, he formulated a number of protocols that have revolutionized the world of amateur radio weak-signal DXing.

In 2001, Joe wrote the WSJT (for "Weak Signal/Joe Taylor) software (http://physics.princeton.edu/pulsar/K1JT/wsjt.html) that implemented these new weak-signal communications protocols. WSJT offers several modes (including FSK441, the JT65 family, and JT6M) intended to support meteor-scatter, troposcatter, and Earth-Moon-Earth (EME, or "moonbounce") communications. JT65A is a specific protocol designed for weak-signal conditions on the shortwave (HF) frequencies (see figs. 1 and 2), taking into account the specific ways in which an HF radio signal propagates via the ionosphere and "suffers" under changing conditions.

JT65A is actually a "sub-mode" of

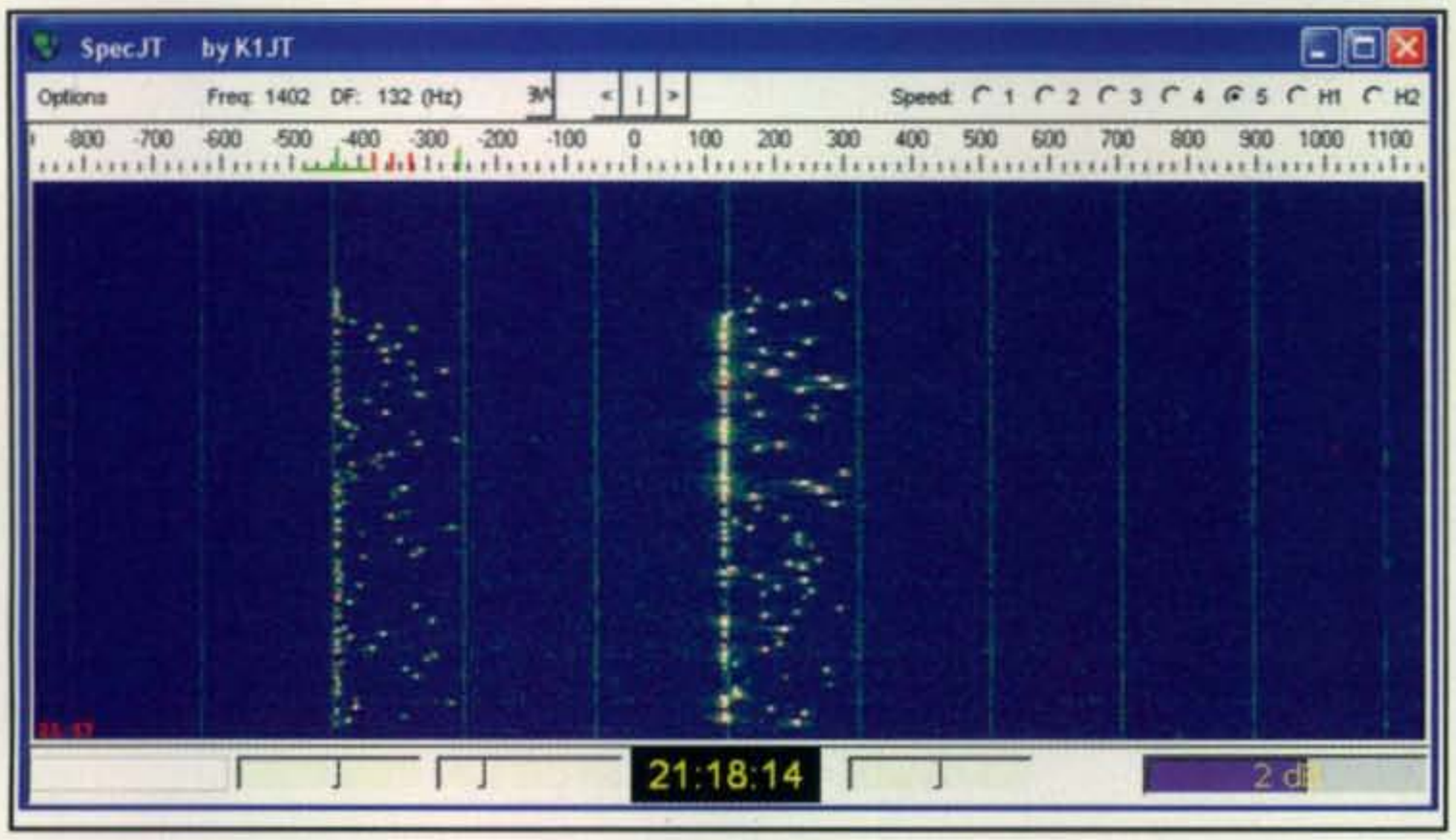

Fig. 2– The "waterfall" display, a feature of the WSJT software, showing several JT65A digital signals. One of these, the "trace" on the left, is the signal from HB9ARI as received at NW7US. (Source: NW7US, using WSJT)

Joe's original JT65 protocol, which he designed to optimize EME contacts on the HF and VHF bands. JT65 includes error-correcting features that make it very robust, even with signals much too weak to be heard. It was later realized that this protocol, with some adaptation, would also be very usable for terrestrial HF communications.

A Bit of Background

Before we can talk about the benefits of a mode such as JT65A, we need to delve into a bit of background on communications and information theory. In the earliest days of wireless, the conversion mechanism between received signals and language was via the human ear, the difference between background static and the static of a spark-gap transmitter interpreted as Morse code and written down by an operator at the receiving end. Technology advancements would later give rise to continuous-amplitude wave (CW) and voice (phone) transmitters, the difference between the two being a tradeoff between better detection of weak signals for CW and faster throughput for phone. Figs. 3 and 4 illustrate this concept by revealing the "footprint" of a "usable" CW and voice (using single sideband), respectively. These figures reveal that, using the same antenna and power level, the useful range of the CW signal is much greater than that of an SSB signal. This is why CW has been noted as a great mode for weaker-signal operation, and why low-power (QRP) operation is typically a CW-mode endeavor.

Speaking strictly in terms of detectable signal-to-noise ratios (SNR), a CW signal that is "encoded" at twelve words per minute (12 wpm) is generally held to be copyable at an SNR of –15 dB, whereas a phone transmission that sends information at 250 wpm requires an SNR of +6 dB. (These ratios are typically calculated based on a 2.5-kHz channel bandwidth.) If we normalize these to a 1 character-per-second (cps) rate—e.g., 12 wpm CW versus speaking one letter per second phonetically in phone—the detectable SNR for phone becomes –8 dB. Therefore, on a truly level playing field, CW yields an improvement of 7 dB over phone.

The adoption of machine-to-machine communication (for instance, RTTY, Hellschreiber, etc.) in the early to mid-20th century provided faster throughput and a marginal increase in SNR performance, but at the expense of channel bandwidth. The normalized SNR of these early machine-to-machine modes works out to be only about 2 dB, hardly an improvement worth getting excited about. (Although to be fair, the value of RTTY was not so much from SNR improvements, but rather that it printed directly to paper, freeing the radio operator to do other tasks.)

Even the development of PSK31 in the late 1990s by Peter Martinez, G3PLX, did not yield an improvement in normalized SNR, although it did reduce the bandwidth requirements through the use of Varicode, a form of data compression.

If the application of data compression can reduce bandwidth requirements, are there other techniques that can be applied to improving SNR performance? And how much room for additional improvement might there be? In the 1940s, Claude Shannon and Ralph Hartley, both of whom were researchers at Bell Labs, developed the Shannon-Hartley Theorem. This theorem provides an equation (proved by Shannon in 1948) for calculating the maximum amount of digital information that can be

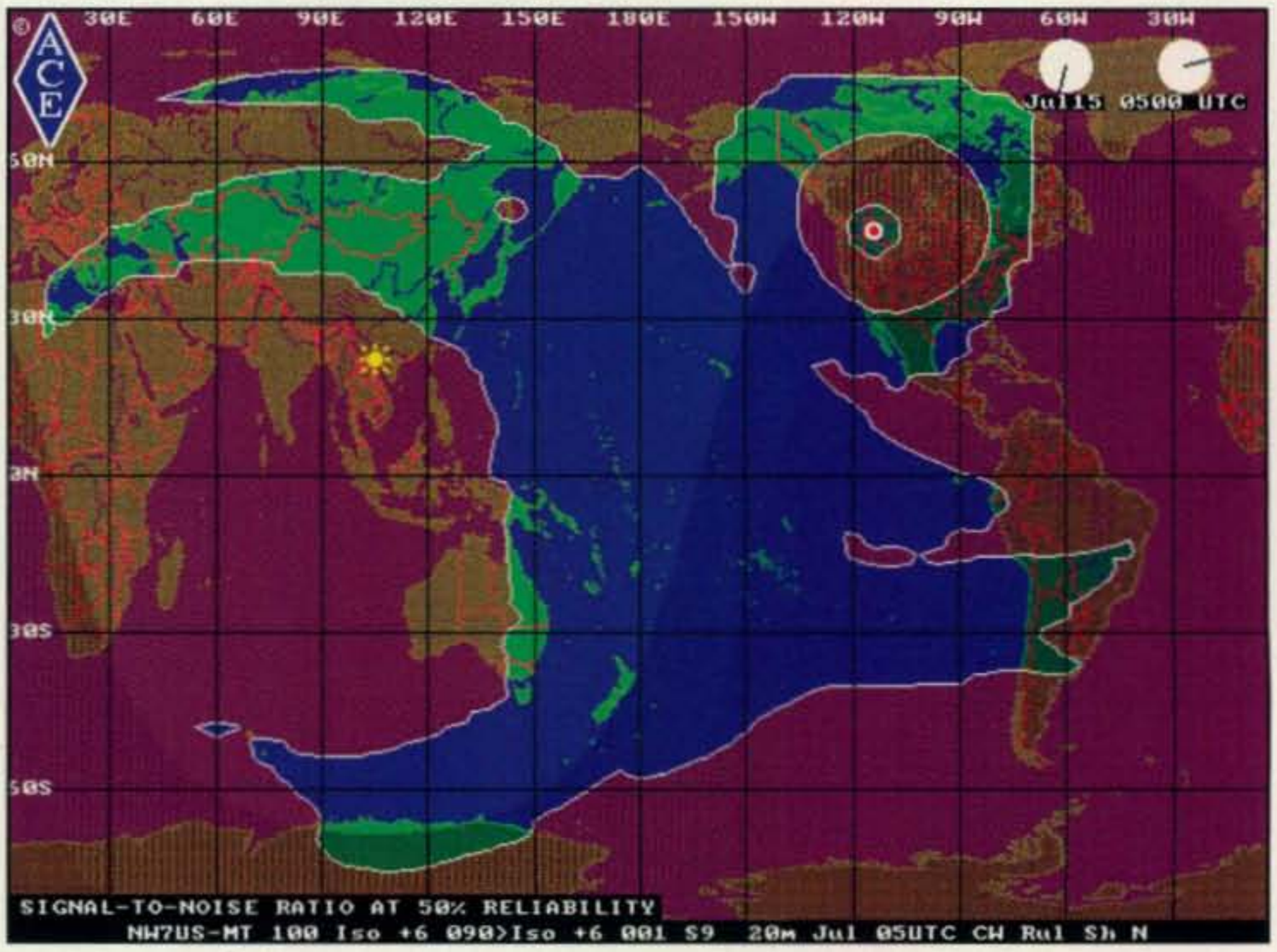

Fig. 3— The "footprint" of a 100-watt CW signal at 0500 on the 20-meter band. Compare this with the footprint of a 100-watt SSB signal at the same time, as seen in fig. 4. (Source: ACE-HF Pro [http://hfradio.org/ace-hf], as used by NW7US)

reliably decoded over a communications channel with a specified bandwidth in the presence of noise (see Equation 1). Shannon-Hartley doesn't tell us how to reach the theoretical limit, it just tells us what that limit is.

As it turns out, for real-time data streams we can't get to the theoretical limit. Each modulation technique (for example, RTTY uses "frequency-shift keying," CW and Hellschreiber use "on-off keying," and PSK31 uses "phase-shift keying") has an inherent limitation in the ability of the receiver system, whether machine-human or pure machine, to discriminate between states. Improving SNR beyond a certain point becomes impossible.

However, all is not lost. An alternate technique for improving SNR is to implement redundancy in the data. We use redundancy all the time in amateur radio—repeating callsigns, signal reports, locator grids, etc. Of course, this effectively reduces the channel capacity, or *throughput*, which appears in Shannon-Hartley as bits/second—i.e., a function of time. If PSK31 has a throughput of 30 wpm, and we repeat our callsign six times to overcome a weak path, then clearly our throughput is less than 30 wpm. What we've effectively done by using redundancy is to reduce the SNR required for detection of our callsign. Of course, in this example, we still rely on the operator to look at the decoded text and, using the human mind's awesome ability to do pattern recognition, extract the callsign from the garbled text.

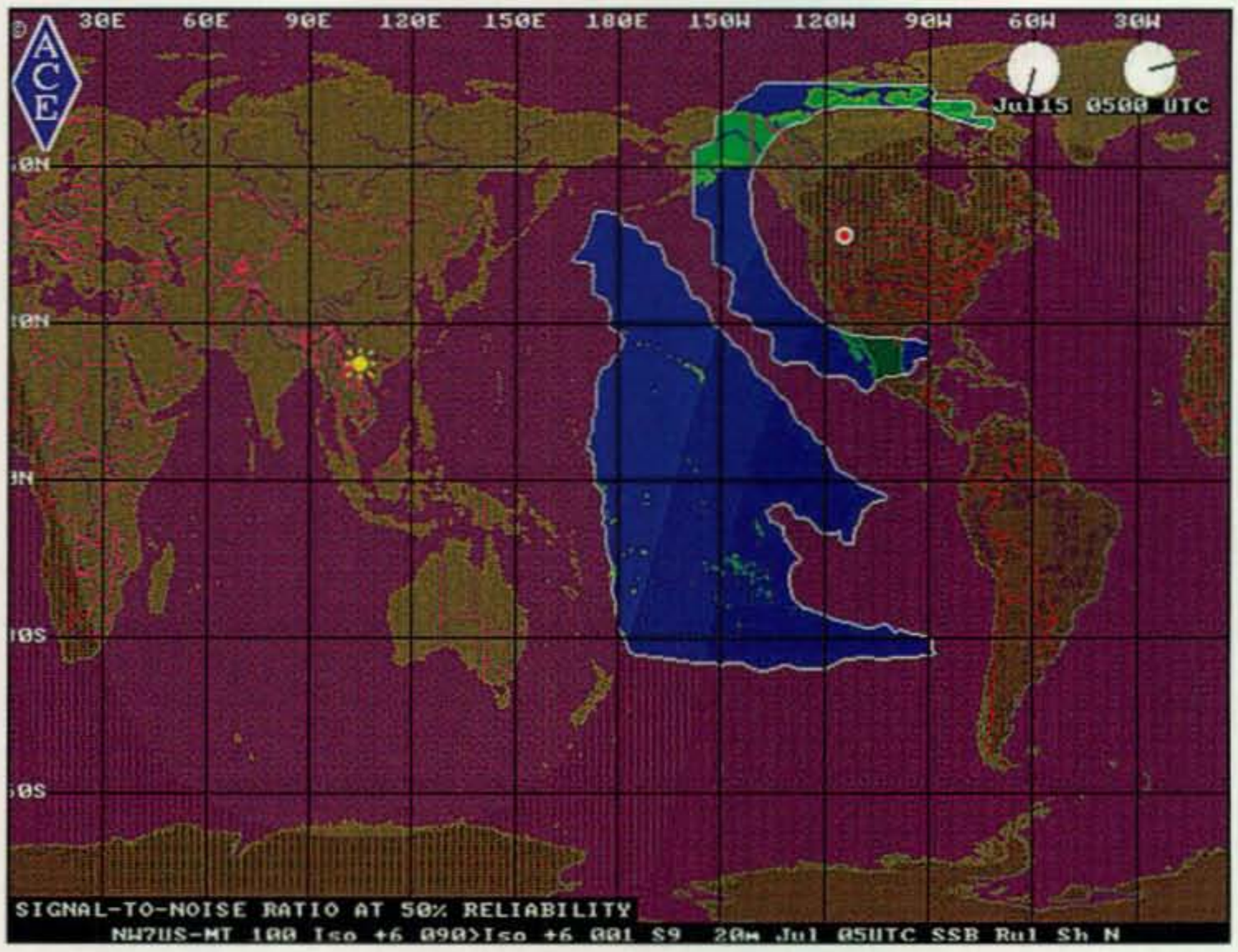

Fig. 4- The "footprint" of a 100-watt SSB signal at 0500 on the 20-meter band. Note tha using the same power level and antenna, the footprint of a "usable" CW signal is greater than that of a SSB signal. (Source: ACE-HF Pro [http://hfradio.org/ace-hf], as used by NW7US)

Thus, if we're willing to accept lower throughput and use redundancy, we can improve SNR for a given modulation method. Further improvement can be achieved by using an error-correcting code, leveraging the power of a computer to encode the data in a process known as Forward Error Correction (FEC). We can then use a computer on the receiver to invert the FEC encoding and correlate the redundant data blocks into a single error-free block of data. Combining redundant sending and error-correcting codes allows us to reach a throughput close to the limit predicted by Shannon-Hartley. JT65A's performance tracks well with theory and has been shown to yield an additional 7 dB of detectable SNR (nearly approaching the theoretical limit), which equates to a 5× improvement in system performance. This mean that reliable decoding of a signal at –24 dB SNR is now possible, and effectively turns your 20-watt portable station into a 100-watt boomer!

Equation 1– Considering all possible multi-level and multi-phase encoding techniques, the Shannon-Hartley theorem states that the channel capacity C, meaning the theoretical tightest upper bound[1] on the information rate (excluding error correcting codes) of clean (or arbitrarily low bit error rate) data that can be sent with a given average signal power S through an analog communication channel subject to additive white Gaussian noise of power N, is:

$$C = B\log_2 (1 + S/N)$$

where:
C is the channel capacity in bits per second;
B is the bandwidth of the channel in Hertz (passband bandwidth in case of a modulated signal);
S is the total received signal power over the bandwidth (in case of a modulated signal, often denoted C—i.e., modulated carrier), measured in watts or volts^2;
N is the total noise or interference power over the bandwidth, measured in watts or volts^2; and
S/N is the signal-to-noise ratio (SNR) or the carrier-to-noise ratio (CNR) of the communication signal to the Gaussian noise interference, expressed as a linear power ratio (not as logarithmic decibels).

Note:
1. For an explanation of this terminology, see <http://oakroadsystems.com/math/polysol.htm#Bounds>

JT65A

In late 2006 Victor, UAØLGY, and Tetsu, JE5FLM, completed the first JT65 QSO on HF. Interest grew quickly in 2007 as several members of the "digitalradio" Yahoo Group began experimenting with applying JT65A to weak-signal DX. People such as Andy, K3UK, created helpful guides for new operators looking to get involved. Dial frequencies range from 80m (3.576 MHz) to 10m (28.076 MHz), but 90% of the activity happens at 14.076 MHz. (All are USB; more on this in Part II.)

Benefits of JT65A

JT65A on HF offers several benefits. It requires minimal transmit power, mak-

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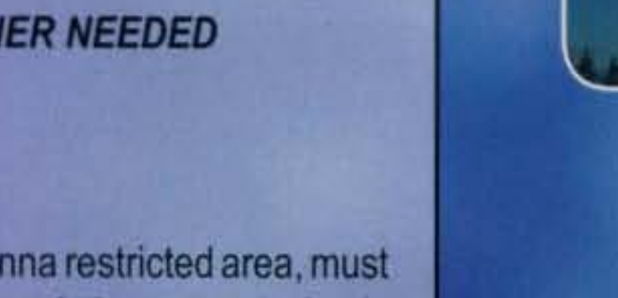

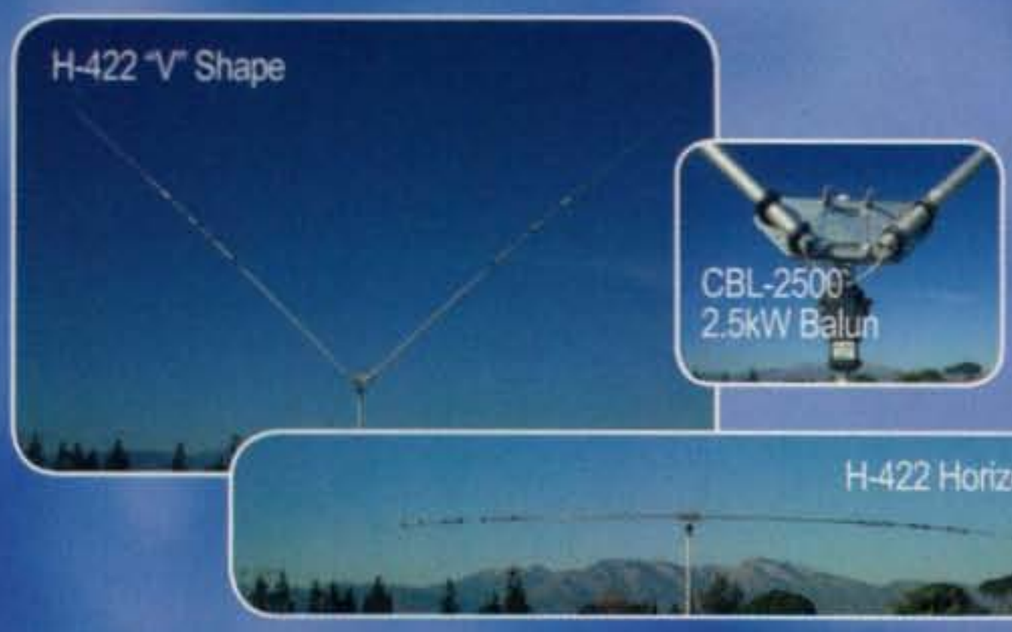

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ing it suitable for highly portable stations, DXpeditions, and situations where running QRO (high power) might create interference and draw the unwanted attention and ire of neighbors or, worse yet, spouses. The vast majority of JT65A QSOs on HF are completed using less than 50 watts ERP.

Perhaps best of all, JT65A allows people whose living situations require the use of stealthy antennas to work some real DX! My first-ever confirmed contact with South Africa was made using JT65A from my home in northern California using 50 watts into a jury-rigged doublet made from TV twin-lead and 16AWG speaker wire, and hung out a second-story window. An apartment-dwelling friend of mine got started on JT65A by attaching an auto-tuner to a rain gutter on his building, a setup that allowed him to work a VK4 station from what normally would be a much-compromised location.

JT65A also allows operation in high-noise and high-QSB environments, because the redundancy provided by the forward-error correction allows nearly 80% of the transmission to be lost and still be decoded.

Hardware

Hardware requirements for JT65A are straightforward and no different from most other digimodes. JT65A uses an AFSK interface between your PC and rig. If you're already set up to run PSK31 via Ham Radio Deluxe's DM780 package, MixW, MultiPSK, etc., then you're good to go with one exception; you'll need a method for accurately syncing your PC's clock. PTT can be accomplished through either serial-port triggering or VOX. The only twist is that the accuracy of your PC clock will have a direct effect on your ability to decode and be decoded, and if you're more than a second or so off-sync, nobody will decode you and you won't decode anyone else. More about this in Part II.

Software

Operators wishing to try out the JT65A mode have several different software packages to choose from. The original WSJT package, originally coded by K1JT, is now an open-source project (under GPL license) that is maintained and enhanced by a small group of developers. To use JT65A you will want to obtain WSJT7, because as of June 2010, WSJT8 contains some new experimental modes such as JT64A and JT8 but does *not* contain JT65A. WSJT7 is available as a binary download for Windows® and a package for Debian-based Linux distros. If you're comfortable with compiling your own source code, it is fairly straightforward to get WSJT7 running on FreeBSD, Macintosh OS/X, and most other UNIX-like operating systems.

In 2008 Joe Large, W6CQZ (now W4CQZ), branched off from the main WSJT codebase and developed the JT65-HF software package (fig. 5). JT65-HF (information on downloading and operation can be found at <http://tinyurl.com/JT65-HF>) is intended, as the name implies, to be used on HF and as such only offers JT65A (it does not offer wider-bandwidth submodes JT65B for VHF or JT65C for UHF; FSK441 for Meteor, WSPR, and so on, the modes that are part of WSJT7). However, JT65-HF offers several enhancements such as simultaneous decode of all signals in a full 2-kHz passband, a real-time client that reports the decoded "captures" from the waterfall to a DX cluster and/or a reception logging system, automatic soundcard rate calibration, and the ability to query your rig's dial frequency via Ham Radio Deluxe, OmniRig, or DX Commander.

Patrick, F6CTE's MultiPSK application also offers JT65A. However, MultiPSK is commercial (versus WSJT and JT65-HF, which are free) and as such I have no experience with it. You are encouraged to experiment with the various software packages and determine which is best suited for your operating style.

Regarding the requirement to keep your PC clock synchronized: If your station is at home, and you have internet access, then you should use a time sync client such as Dimension4 or Symmtime. Both are free and readily available online. The reason you want this is that the built-in time-sync feature in Windows XP/Vista/7 is *not* accurate enough to allow proper JT65A operation; you should disable it and use a dedicated sync client. If you don't have internet access at home, or are working rover/portable, then you might consider using a GPS dongle together with a software package that locks the PC's clock with the time signals received via GPS. (Many GPS vendors provide a small software utility with the GPS which will do just that, but I've also used the UI-View32 APRS software package which can link up with many GPS dongles and adjust your PC's clock.) If you're in a pinch, on a tight budget, and still want to work JT65A, you can try syncing to the WWV tones from NIST in Boulder, CO or other shortwave sources. F6CTE's MultiPSK package comes with a WWV clock receiver application (clock.exe), but bear in mind that PC clocks tend to drift a lot even during a short period of time, so you'll have to tune back to WWV and readjust your clock about every 30 minutes. For best

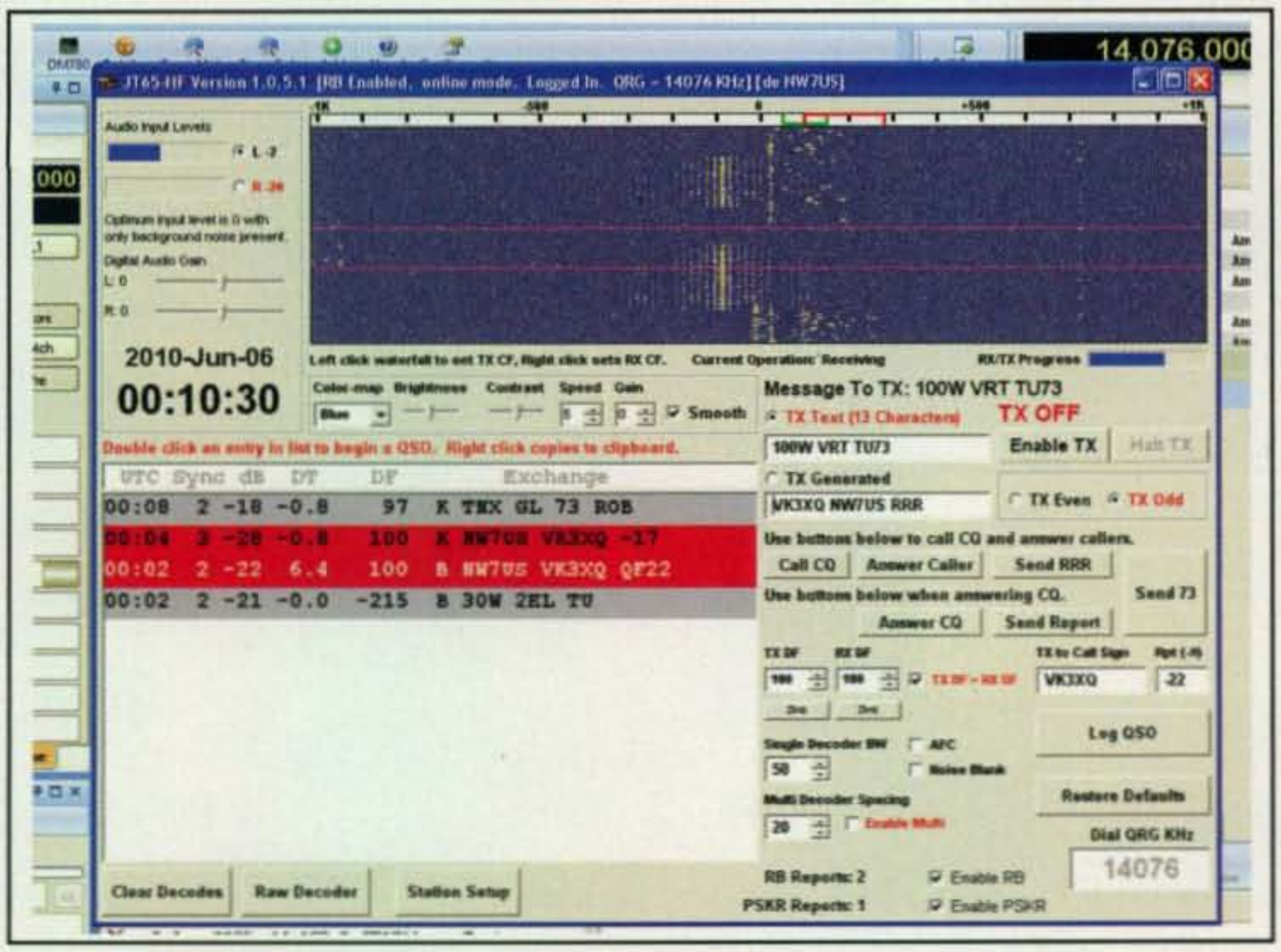

Fig. 5– The window of the JT65-HF software showing the waterfall capture of the JT65A digital signal of VK3XQ and the "captures" of the QSO between VK3XQ and NW7US. (Source: NW7US, using the JT65-HF software)

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performance you'll want a GPS dongle; these can be purchased online for about US$30.

Reverse Beacons and Propagation Maps

One of the enhancements offered by JT65-HF is the reporting in real-time of decoded messages to both a DX cluster and a reception reporting system, often referred to in the JT65 community as a "reverse beacon." Those familiar with the automated DX cluster reporting in Alex, VE3NEA's CW Skimmer, or the ability of DM780 (part of Ham Radio Deluxe) to upload PSK31 decodes to Phil, N1DQ's excellent *PSKReporter*, will quickly grasp the value of this feature; every person running JT65-HF can effortlessly become part of a worldwide network of monitoring stations that report their decoded messages to a web-based server for use by the amateur community (fig. 6). The PSKReporter website is at <http://pskreporter.info>.

The data provided by automatic collection/aggregation of reverse beacons from JT65A users around the world, combined with the ability of JT65A to decode signals approaching the Shannon-Hartley limit, has been very valuable in showing that propagation often exists where common sense says it shouldn't—such as 40-meter and even 80-meter openings that occurred nightly for almost a week last winter around 0700Z between South Africa and the western USA. It also provides a method for visualizing worldwide propagation of JT65A messages via maps such as those provided by PSKReporter. Call CQ and within a minute or two you can check the map to see just how far away you were heard! In addition to monitoring my propagation, I've used the worldwide reverse beacon network to do things such as compare the relative performance of antennas.

If you're looking for less visual and more detailed propagation data in a DX cluster style interface, then JT65A reception reports are also available via Laurie VK3AMA's HamSpots system, and via W4CQZ's website. W4CQZ's website also hosts a JT65A "chat-room" which features a live-updating list of reception reports displayed right on the page.

Using JT65A is not only interesting from the perspective of studying propagation on HF, but is useful for communication with DX stations around the globe which might not be possible using other protocols and modes. Often, JT65A users can work DX on bands where no other mode, including CW, is working at that time.

Coming Up in Part II

Next month, we'll dive into how to use JT65A in real-world communications. We will use the JT65-HF software as our example because of its features and because of the ongoing improvements being made by its author. Until next month, if you are adventurous and jump into this exciting area of weak-signal DXing, enjoy all that JT65A offers.

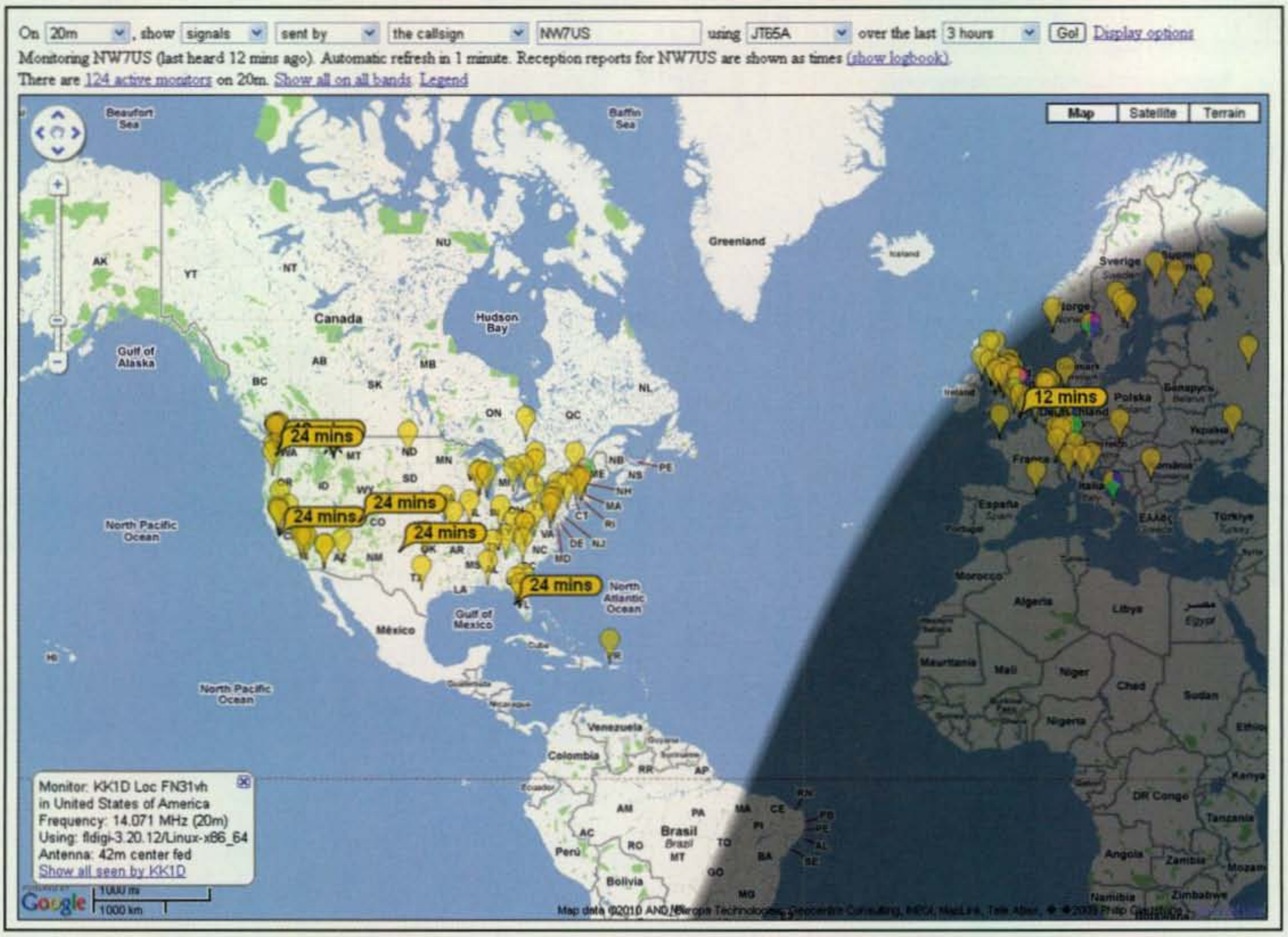

Fig. 6– The PSKReporter map showing the reception of the JT65A signal as sent by NW7US. The stations "hearing" NW7US (as a "capture" by the remote JT65A software) are shown with the time since NW7US was last heard. (Source: PSKReporter at <http://pskreporter.info>)

If you really want to make a statement with your ham callsign, WB6NOA suggests checking out the etched and lighted callsign plaque from KF4NBG.

CQ Mini-Review:

Etched Lighted Callsign Plaque

BY GORDON WEST,* WB6NOA

I really enjoy attending regional hamfests. That's where we find *local* ham radio talent, with products they build in their garages, or maybe a work station at the hamshack!

What I found at one recent show was a great way to display your callsign and name, etched in glass, illuminated by 12 white LEDs within the custom-made wood holder. You can dream up almost any font for name and call letters and have it etched into clear glass, frosted glass, or, the one I chose, the etched mirror. At the Dayton Hamvention® this past May, hams stopped in their tracks and wanted to know the source. Here it is: Jim Thibeault, KF4NBG, Custom Engraving on Ceramics, Glass, Mirrors, and Stone, <www.jimsengraving. com>, phone: 618-409-8284.

"My computerized equipment and state-of-the-art, glass-engraving system can easily do graphics, too—ARRL logo, ARES and RACES images, an antenna tower, and just about anything that a ham might want, in addition to name and call," commented Thibeault, showing off a variety of glass engravings.

"The wood stands are also custom, and I have a variety of colors and clear LEDs to illuminate the etched call letters," added Thibeault, even showing some blinking configurations of color LEDs.

For me, however, the clear LEDs and the mirror finish looked elegant and eye-catching, and as you can see in the photos, it shows up quite nicely, with lots of room lighting or almost no room lighting at all.

Prices vary from $100 to $200 depending on the items you want etched on the glass. Contact Jim for more information.

Gordo's etched and lighted call and name sign made by Jim Thibeault, KF4NBG. (See text for details.)

The KF4NBG callsign plaque comes securely wrapped and packaged for safe transit through the mail.

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

What You've Told Us...

Our reader survey in June asked about your antennas. Nearly everyone who responded (92%) reports having an outdoor antenna at home. In addition, more than half of you (54%) have at least one tower—39% with a ground-mounted tower, 2% with a roof-mounted tower and 18% with more than one tower. Forty-six percent have no tower.

Dipoles are the most popular HF antennas—78% of you say you have one—followed by verticals (51%), Yagis (42%), other (10%), quads (5%), log-periodics (4%) and none (4%). On VHF/UHF, 68% of you have a vertical or ground plane at home. In addition, 26% have a single Yagi, 14% have "other," 11% use a dipole or wire antenna, 10% have a Yagi array, 3% each use a quad or log-periodic, 2% have a dish, and 10% have no VHF/UHF antenna at home.

Antenna heights are about what we expected, the 44% of you having the highest point of your highest antenna between 35 and 70 feet off the ground, followed by 30% at 15–35 feet, 15% at 70–100 feet, 5% at less than 15 feet, 4% with no outside antenna, and 3% peaking above 100 feet.

Finally, we asked about mobile antennas, and 72% of you have one for VHF, 40% for UHF, and 37% for HF, while 23% have no mobile antennas.

This month's free subscription winner is Richard D. Wilson, N4LT, of Ooltewah, Tennessee.

Reader Survey October 2010

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

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

Starting with our July issue, the monthly activity survey on our response card included a new category of "kit-building and homebrewing," and more than 25% of readers who responded checked it off. So this month, we'd like to dig a little deeper into this topic.

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

1. Have you ever built a piece of radio equipment?
- Yes....30
- No....31

2. Which, if any, of the following ham radio items have you built (circle all that apply)?
- Transceiver....32
- Transmitter (separate)....33
- Receiver (separate)....34
- Station accessory....35
- Antenna....36
- Cables and boxes for wiring together station equipment....37
- Vintage gear restoration....38
- None....39

3. Have you ever built a project from the following (circle all that apply)?
- A kit....40
- Published or online plans....41
- Your own design....42
- No....43

4. Have you ever built a project using any of the following (circle all that apply)?
- Vacuum tubes....44
- Discrete components/no circuit board....45
- Discrete components on a circuit board....46
- ICs and/or microprocessors....47
- Surface-mount components....48
- None of the above....49

5. Have you ever built any of the following *non*-electronic projects for your ham station (circle all that apply)?
- Station furniture....50
- Equipment enclosure....51
- Portable/mobile operating kit....52
- Other....53
- None....54

6. How recently have you built a ham radio project? (Choose the most recent)
- Working on one now....55
- Within the past year....56
- One to five years ago....57
- Five to ten years ago....58
- More than ten years ago....59
- Never....60

Thank you very much for your replies. The survey staff will be heading to the Caribbean for a few months, so our next survey will be early next year.

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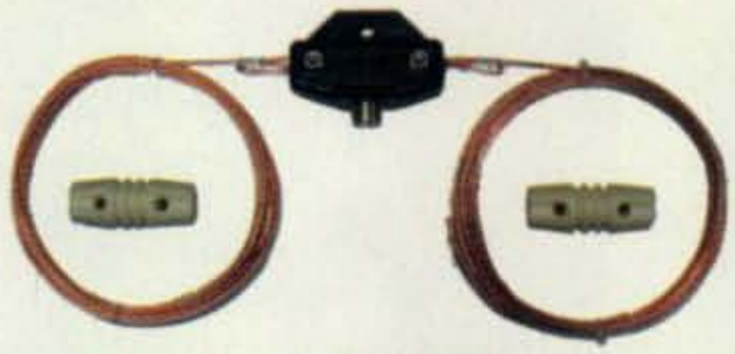

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Prometheus was the Greek god of forethought, and a lot of forethought went into the Dishtronix HF amplifier that bears his name. N8BJQ has our review.

CQ Reviews:

The Dishtronix DX-2400L1 "Prometheus" Solid-State 1.5-KW Amplifier

BY STEVE BOLIA,* N8BJQ

Over a year ago I was asked by *CQ* to review a new solid-state full-power amplifier. Not being the technical type, it became apparent that my main qualifications were the proximity of the manufacturer (Dishtronix) and downtown Thackery, Ohio (reviewer) and the fact that I am a reasonably active HF contester. If you are expecting a lot of technical stuff, there won't be much included. This is a how well does it operate from a contester's perspective review.

The DX-2400L1 Prometheus is a full-legal-power, auto-band-switching, solid-state amplifier with lots of extra features. The amount of technology in this amplifier is impressive, enough so that it is already covered under one U.S. patent, with more pending. The amp is designed to run 1500W PEP on SSB/CW/RTTY and 375 watts on AM with 50–60 watts drive on 10–160 meters. It is rated at 100% duty cycle into 1:1 SWR. I did not verify the AM performance but did give the CW/RTTY and SSB modes a pretty good workout.

Front view of the Dishtronix DX-2400L1 "Prometheus" amplifier. Power supply is at the bottom.

About the Amplifier

The Prometheus puts out a full 1.5 KW on 10–160 meters including the WARC bands. The power transistors are rated at 2400 W PEP. A vacuum antenna relay is standard and a PIN diode switch is an option. All control functions are optically isolated from the radio, as are the ports that interface to the computer. The amp is very well protected via software for every conceivable failure, including operator errors (I tested a few of these.). In all cases, the amp was smarter than I was. I can't say it will be impossible to fry the transistors, but you will have to try very hard to outsmart the software to do it.

The front panel has several bar-graph type displays for reading forward power, reflected power, and computed SWR. These are multi-function displays also used for changing both the user-configurable settings and the factory default settings (not recommended). The manual band switch and the antenna selector are also on this panel.

The rear panel has connections for four antennas plus inputs for two radios and ports for CIV (computer) control for two radios plus band data, PTT, and ALC connections for both radios.

No expense was spared in the construction of the amplifier and the cases. This is definitely a commercial-quality unit. The power supply and the RF deck will fit in standard 19-inch racks with the rack-handle option. The all-aluminum

**CQ WPX Award Manager*
e-mail: <n8bjq@cq-amateur-radio.com>

metalwork in the cases is excellent with every surface either yellow iridite, black anodized, or powder coated. All of the hardware is stainless steel. The circuit boards are all modular plug-in construction with Teflon® coax and gold connectors. The heat exchanger for the power transistors is a whopping 30 lbs. These are rather large cases at between 7" to 10.5"H × 17"W × 22"D.

As noted above, there are two complete transceiver and data inputs to the RF deck. With the optional SO2R (single operator, two radios) module it is possible to use two transceivers at the same time.

The amp firmware can be updated via a serial connection to a computer. This was done once during the review period and worked very well.

The unit I tested had two external fans and two internal fans (standard on all units) which were useful for cooling during the RTTY contest. These are a bit loud for a phone contest, but do the job for CW and RTTY. There are kits available that will make the fans quieter. The fans are temperature-controlled, continuously-variable-speed units that are hardly noticeable in a casual CW or sideband roundtable-type QSO.

Prometheus Arrives

The week after Hamvention® 2009 was chosen because I would be home and the CQ WPX CW Contest was the following weekend. The amp (and installation crew) arrived at my QTH a couple of days before the contest with two large Pelican cases and a couple of hefty cardboard boxes. A bit of warning: This amp is not for those with bad backs or flimsy operating desks. Total weight of the power supply and RF deck is around 250 lbs. A switching power supply is available and was tested in later trials. It is considerably lighter than the linear supply and performed as well.

After I cleared off a suitable space on my operating desk, we first started to assemble the power supply. Assembly is pretty straightforward with all connectors marked and keyed so nothing can be plugged in where it should not be. The transformer weighs approximately 70 lbs. For ease of installation, it does have a strap to lift it into the power-supply case. Once that was installed, the 40-lb filter choke was then installed. Once everything was plugged in, the power-supply case was closed up and we unpacked the RF deck. This is the light part at only 55 lbs. It fits securely on top of the power-supply case. No need to worry about either piece moving around on your operating desk. Several power cords were connected between the power supply and the RF deck (again all labeled and keyed).

A couple of quick checks of the power supply were made and it was time to hook up the radio and antennas. We did some preliminary low-power checks to make sure everything was connected properly and the amp was configured for my radio (a user-configuration menu setting via the front panel). ALC was adjusted and a couple of quick on-the-air tests were made. No smoke was observed, so we shut it down for the evening.

Operation

For the WPX contest the only antennas that I had available were a three-triband-der stack for 10–20. Needless to say, 10 meters at this point in the solar cycle is not much use and 15 has not been much better here in W8-land. This made my operating choice pretty easy. Twenty meters would be the band for the WPX CW contest.

I was able to run the amp at between 1400–1500 watts out for the entire 32 hours I was on the air. I was able to make 1300+ Qs and over 2-million points, which is the best I have ever done in a single-band effort. While I did not use many of the features of the Prometheus, the fact that I could run full power for the entire time without overheating was very impressive. My current amp will do 800–900 watts for a few hours before I have to cool it down.

This was the first contest experience for the Prometheus and its first test with an ICOM radio (756 Pro III). Again, no smoke and no failures. I experienced a few soft faults which were later traced to the keying rise time in the Pro III. When I reduced the rise time setting, the soft faults disappeared.

After the contest I hooked the ICOM CIV cable to the amplifier and enabled CIV control in the menu. Band switching was very fast and there were no communication issues between the radio and the amplifier.

My next foray with the Prometheus was in the CQ WW RTTY Contest in September. RTTY is pretty challenging for most amplifiers. By now my antennas had been repaired and moved and I was able to operate on 10–80 meters. The Pro III controlled the amp via the CIV port so I could change bands and the amp would follow. This worked great except that the N1MM contest logging program, the Pro III, and the amp were not happy together, so I disabled CIV to N1MM. This worked okay except that I kept for-

Rear view of the DX-2400. Note the inputs and RF and computer control from two transceivers, and outputs for four antennas. A four-position antenna switch is built in.

getting to change the band on the computer and had to go back and make corrections to the log. About halfway through the contest, I disconnected the CIV from the amp and reconnected N1MM. It was easier to remember to change bands on the amp than on the computer. The amp did great running full power for the entire time I was on the air. I had a couple of decent runs of 75–80 Qs with no overheating. The end result was 1100 Qs and over 1-million points.

The next contest up (and my next time home) was the California QSO party. I decided to give it a serious effort (amazing what one will do for a bottle of wine). At the end of the contest, I ended up with 700 Qs which were pretty evenly split between SSB and CW. Again the amp was run at full legal power. I had a couple of good runs on SSB on 15 and 20 and had several reports of "you are loud" on phone. Auto band switching using the built-in frequency counter was tried in this contest and performed flawlessly.

Mike, N8WFF, from Dishtronix stopped in one evening to see if he could figure out how to make the amp, the radio, and the computer all happy with auto band switching with my ICOM. Band data from the radio was already being used for antenna switching. The short version of a long story: I lent him an ICOM 746 and a band decoder and in a couple of days a box was delivered with a "gizmo" that plugged between the DB25 output of my band decoder and the control cable to the antenna switch box. This converted the switching voltage from the band decoder to the correct band data format for the amp. When plugged into the band data port on the back of the amp, auto band switching was enabled and the amp switched when I changed bands from either the radio or the logging program. A prettier version of this "gizmo" will be available for ICOM users. It should be noted that the problem I experienced was unique to the amp CIV conflicting with computer and is not an issue for other radios. Dishtronix is revising its firmware to allow the Icom CIV interface to work with the contest logging software.

I made over 3000 contest Qs plus worked a bunch of DX while using the Prometheus. I was not able to make it "cry uncle." It did very well with RTTY, CW, and SSB operating on 10–160, plus a bit of WARC band operation. The final transistors are not as forgiving as tubes, so the built-in protection features have to be really quick. I did not try operating into no antenna, but was on the wrong antenna a couple of times before we had the auto band switching working, and the amp immediately went off line. Once the problem is corrected, hitting the bypass button on the front panel puts you back on line in a couple of seconds.

Features Not Tested

An interesting feature not tested yet is the ability to run SO2R with only one amplifier. Two radios can be hooked up to the amplifier and, with proper control, can be run as a full SO2R station. Each radio can be switched using CAT or CIV control or via a built-in frequency counter which samples the RF and picks the right band. There is also a built-in four-position antenna switch with built-in memory for the last antenna used on each band. Plus there is a remote-control feature that allows control of the amp at distances up to 1500 feet.

Conclusion

This is a very rugged amplifier that does what it claims to—that is, be able to run full legal power in SSB and CW/RTTY modes and not fail. I spent plenty of time watching the wattmeter, especially during the RTTY contest, and never saw the power dip. It performed well into SWRs up to 2:1 at full power on 10–160 meters. I also made a few Qs on 12 and 17 with no decrease in output. It is very nice to be able to QSY to a new band and be ready to go as soon as you get there. I'm told this amp also interfaces very well with Yaesu, Kenwood, and Elecraft radios. This was its first contest with an ICOM.

If you are looking for a full-legal-limit amplifier for contesting or DXing, you might check this out. I'm saving my pennies. For the contester, the SO2R option could allow one amp to serve both radios with full output and auto band switching.

List price for the Prometheus is $10,500 with the linear power supply, $10,250 with the optional switching supply. Contact Dishtronix at 937-292-7981 or <info@dishtronix.com>, or visit the company's website at <http://www.dishtronix.com/prometheus.html>.

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Math's notes

BY IRWIN MATH,* WA2NDM

A Fiber-Optic Primer – Part II

Last month we covered fiber-optic transmitters and some basic information about the technology. This month we will conclude the discussion with the rest of the system.

The Optical Fiber: Launching the Light

Once the transmitter has converted the electrical input signal into whatever form of modulated light is desired, the light must be "launched" into the optical fiber. To understand the various factors that must be considered in this operation, as well as what happens to the light as it travels through the fiber, there are certain parameters about fibers and light that should be understood. Fig. 5 shows a typical path of light as it passes through a fiber.

As previously mentioned, there are two methods whereby light is coupled into a fiber. One is by pigtailing. The other is by placing the fiber's tip in very close proximity to an LED or LD (laser diode). When the proximity type of coupling is employed, the amount of light that will enter the fiber is a function of one of four factors: intensity of the LED or LD, area of the light emitting surface, acceptance angle of the fiber, and losses due to reflections and scattering. Here is a short discussion of each:

Intensity. The intensity of an LED or LD is a function of its design and is usually specified in terms of total power output at a particular drive current. Sometimes this figure is given as actual power that is delivered into a particular type of fiber. All other factors being equal, more power provided by an LED or LD translates to more power "launched" into the fiber.

*c/o CQ magazine

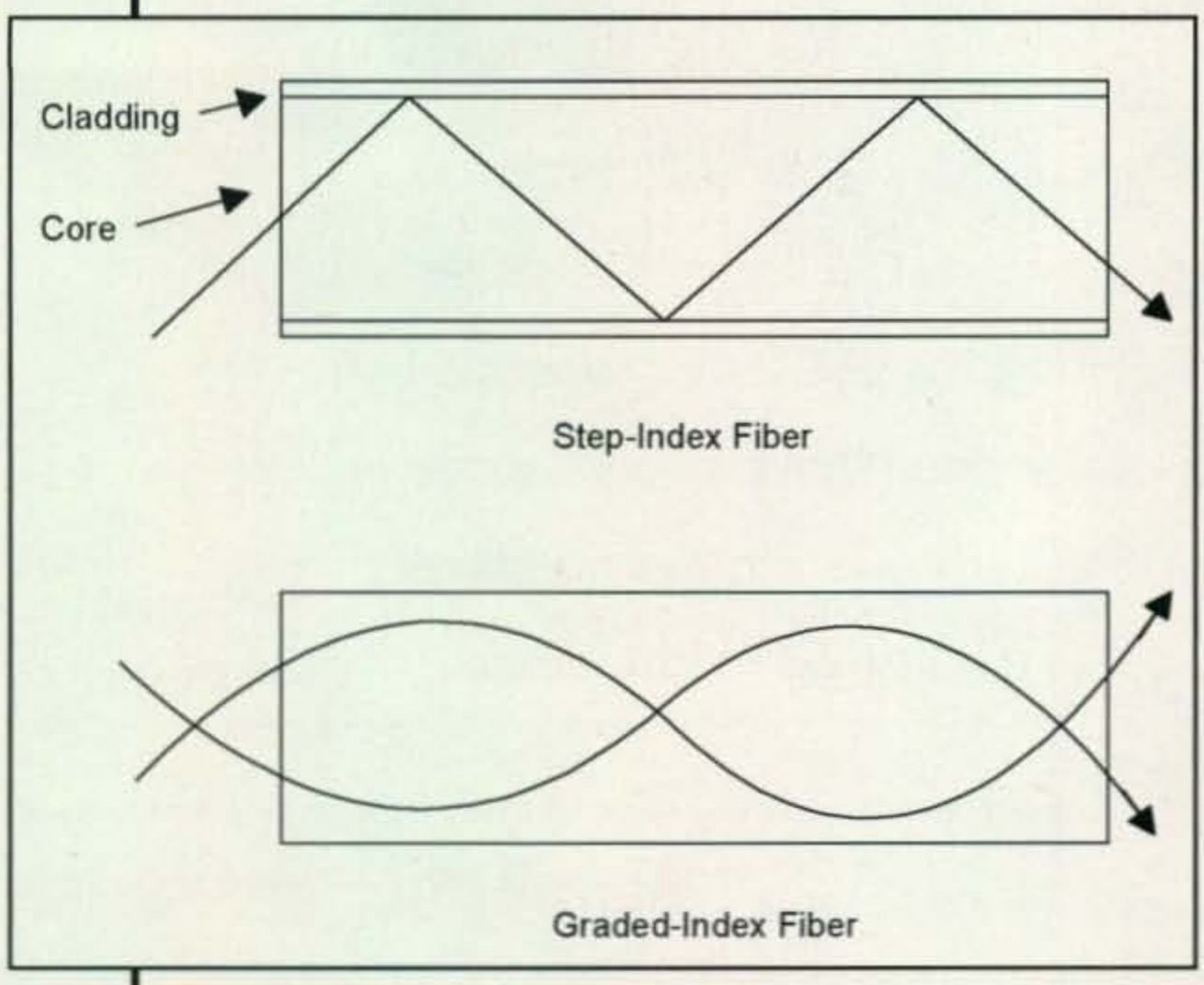

Fig. 5– Light propagation through typical optical fibers.

Area. The amount of light "launched" into a fiber is a function of the area of the light-emitting surface compared to the area of the light-accepting core of the fiber. The smaller this ratio, the more light is "launched" into the fiber.

Acceptance Angle. The acceptance angle of a fiber is expressed in terms of numeric aperture (NA). The NA is defined as the sine of one half of the acceptance angle of the fiber. Typical NA values are 0.1 to 0.4, which correspond to acceptance angles of 11 degrees to 46 degrees. Optical fibers will only transmit light that enters at an angle that is equal to or less than the acceptance angle for the particular fiber.

Other Losses. Other than opaque obstructions on the surface of a fiber, there is always a loss due to reflection from the entrance and exit surface of any fiber. This loss is called the Fresnel Loss and is equal to about 4% for each transition between air and glass. There are special coupling gels that can be applied between glass surfaces to reduce this loss when necessary.

In addition to the losses exhibited when coupling LEDs or LDs into a fiber, there are losses that occur as the light travels through the actual fiber. The core of an optical fiber is made of ultra-pure low-loss glass. Considering that light has to pass through thousands of feet or more of fiber core, the purity of the glass must be extremely high. To appreciate the purity of this glass, consider the glass in common windowpanes. We think of windowpanes as "clear," allowing light to pass freely through, but this is because they are only 1/16 to 1/4 inch thick. In contrast to this clear appearance, the edges of a broken windowpane look green and almost opaque. In this case, the light is passing edgewise into the glass, through several inches. Just imagine how little light would be able to pass through a thousand feet of window glass!

Most general-purpose optical fiber exhibits losses of 3 to 6 dB per km (a 50% to 75% loss per km) at a wavelength of 850 nm. When the wavelength is changed to 1310 nm, the loss drops to about 3 to 4 dB (50% to 60%) per km. At 1550 nm, it is even lower. Premium fibers are available with loss figures of 3 dB (50%) per km at 850 nm and 1 dB (20%) per km at 1300 nm. Losses of 0.5 dB (10%) per km at 1550 nm are not uncommon. These losses are primarily the result of random scattering of light and absorption by actual impurities within the glass.

Bandwidth

All of the above attenuation factors result in simple attenuation that is independent of bandwidth. In other words, a 3 dB loss means that 50% of the light will be lost whether it is being modulated at 10 Hz or 100 MHz. There is an actual bandwidth limitation of optical fiber, however, and this is measured in MHz per km. The easiest way to understand why this loss occurs is by referring to fig. 6. A ray of light that enters a fiber at a small angle has

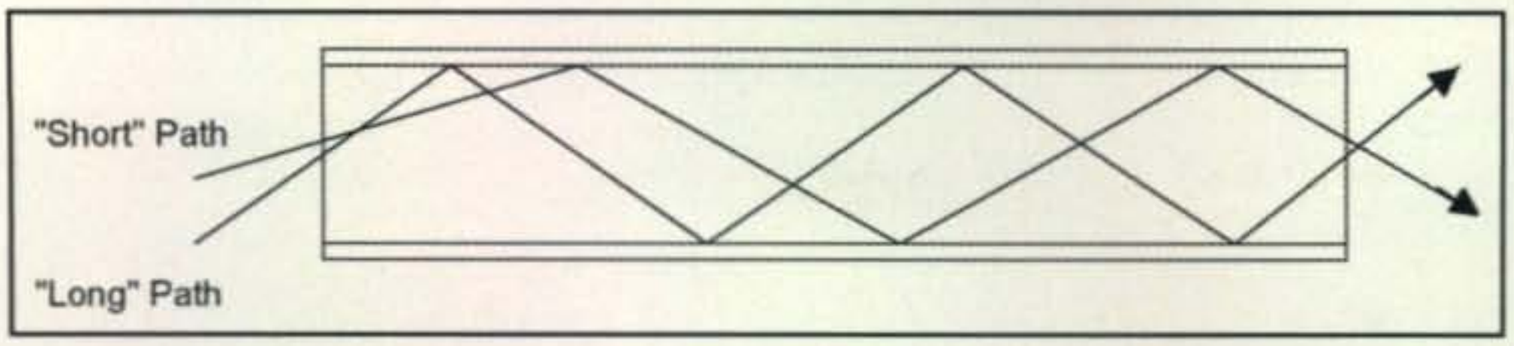

Fig. 6– Different light paths determine the bandwidth of a fiber.

a shorter path through the fiber than light entering at an angle close to the maximum acceptance angle. As a result, different "rays" (or modes) of light reach the end of the fiber at different times, even though the original source is the same LED or LD. This produces a "smearing" effect, or uncertainty as to where the start and end of a pulse occurs at the output end of the fiber, which in turn limits the maximum frequency that can be transmitted. In short, the fewer modes, the higher the bandwidth of the fiber.

The way that the number of modes is reduced is by making the core of the fiber as small as possible. Single-mode fiber, with a core measuring only 8 to 10 microns in diameter, has a much higher bandwidth because it allows only a few modes of light to propagate along its core. Fibers with a wider core diameter, such as 50 and 62.5 microns, allow many more modes to propagate and are therefore referred to as "multimode" fibers.

Typical bandwidths for common fibers range from a few MHz per km for very large-core fibers, to hundreds of MHz per km for standard multimode fibers, to hundreds of GHz per km for single-mode fibers. As the length of fiber increases, its bandwidth will decrease proportionally. For example, a fiber cable that can support 500 MHz of bandwidth at a distance of one kilometer will only be able to support 250 MHz at 2 kilometers and 100 MHz at 5 kilometers.

Because single-mode fiber has such a high inherent bandwidth, the "bandwidth reduction as a function of length" factor is not a real issue of concern when using this type of fiber. However, it is a consideration when using multimode fiber, as its maximum bandwidth often falls within the range of the signals most often used in point-to-point transmission systems.

Fiber-Optic Cable Construction

Fiber-optic cable comes in all sizes and shapes. Like coaxial cable, its actual construction is a function of its intended application. It also has a similar "feel" and appearance. Fig. 7 is a sketch of a typical fiber-optic cable.

The basic optical fiber is provided with a buffer coating which is mainly used for protection during the manufacturing process. This fiber is then enclosed in a central PVC loose tube which allows the fiber to flex and bend, particularly when going around corners or when being pulled through conduits. Around

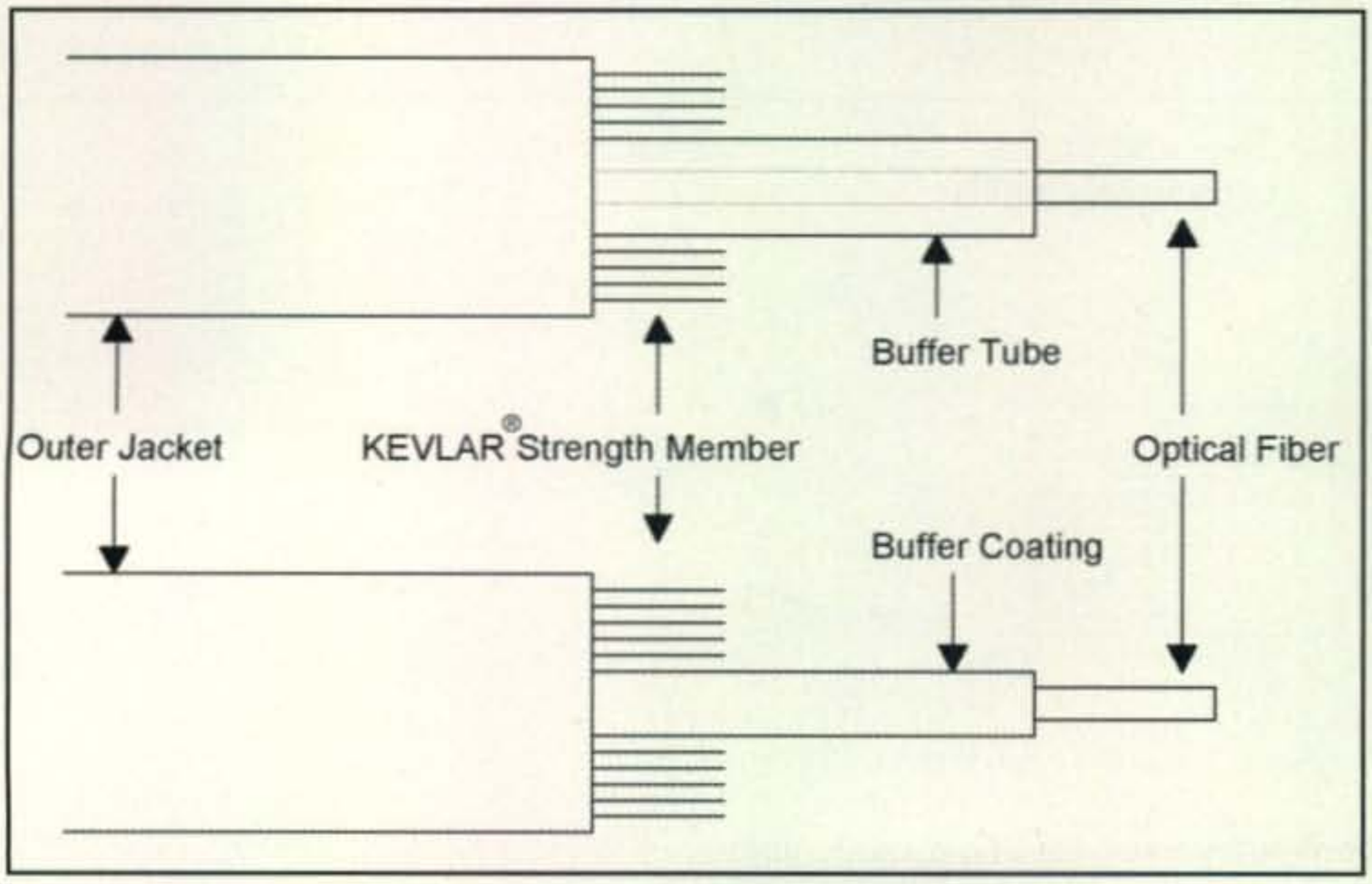

Fig. 7– Basic fiber-optic cable construction.

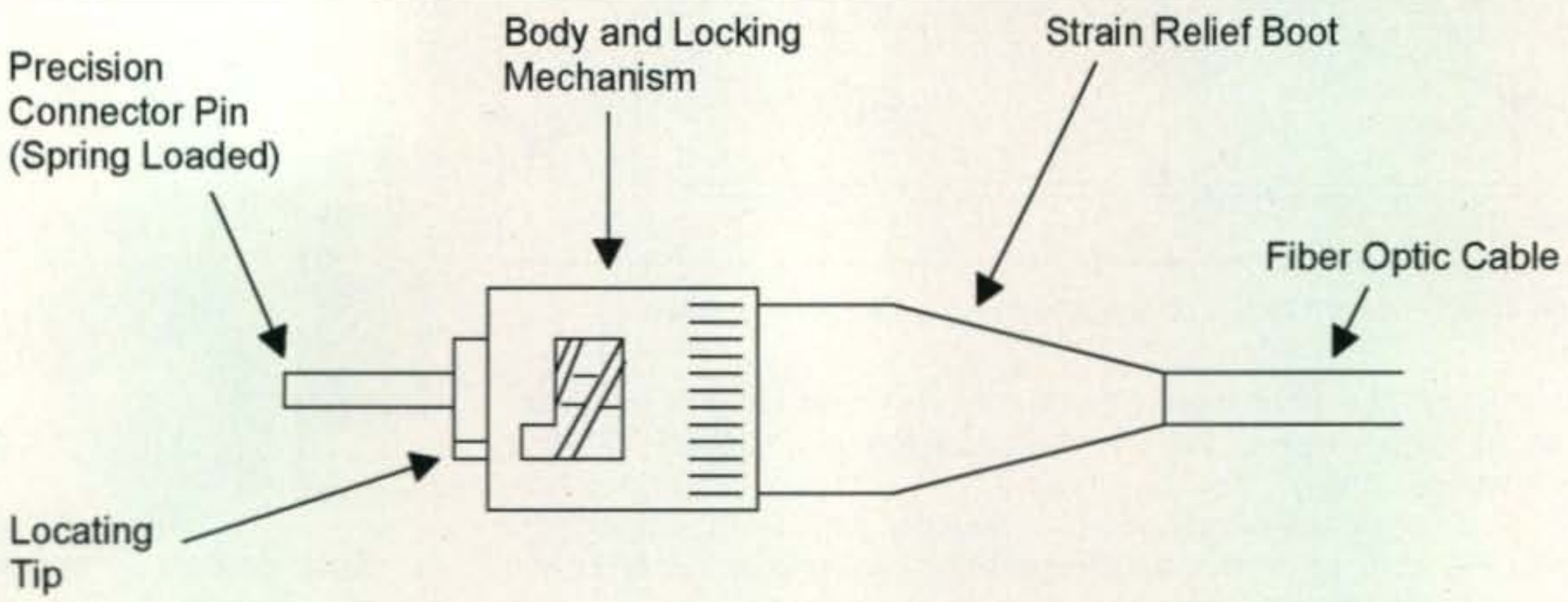

Fig. 8– The SMA-style optical connector.

the loose tube is a braided Kevlar™ yarn-strength member which absorbs most of the strain put on the fiber during installation. Finally, a PVC outer jacket seals the cable and prevents moisture from entering.

Basic optical fiber is ideal for most inter-building applications where extreme ruggedness is not required. In addition to the "basic" variety, it is also available for just about any application, including direct buried, armored, rodent-resistant cable with steel outer jacket, and UL-approved plenum-grade cable. Color-coded, multi-fiber cable is also available.

The Optical Fiber: Other Types of Fibers

Two additional types of fiber—very large-core diameter silica fiber and fiber made completely of plastic—normally are not employed for data transmission.

Silica fiber typically is used in applications involving high-power lasers and sensors, such as medical laser-surgery.

All-plastic fiber is useful for very short data links within equipment because it may be used with relatively inexpensive LEDs. An isolation system for use as part of a high-voltage power supply would be a typical example of an application for plastic fiber.

The Optical Fiber: Optical Connectors

Optical connectors are the means by which fiber-optic cable is usually connected to peripheral equipment and to other fibers. These connectors are similar to their electrical counterparts in function and outward appearance, but actually are high-precision devices. In operation, the connector centers the small fiber so that its light-gathering core lies directly over and in line with the light source (or other fiber) to tolerances of a few ten thousandths of an inch. Since the core size of common 50-micron fiber is only 0.002 inches, the need for such extreme tolerances is obvious.

There are many different types of optical connectors in use today. The SMA connector, which was first developed before the invention of single-mode fiber, until recently was the most popular type of connector. Fig. 8 shows an exploded view of the parts of this connector.

The most popular type of multimode connector in use today is the ST connector. Initially developed by AT&T for telecommunications purposes, this connector uses a twist-lock type of design and provides lower overall loss-

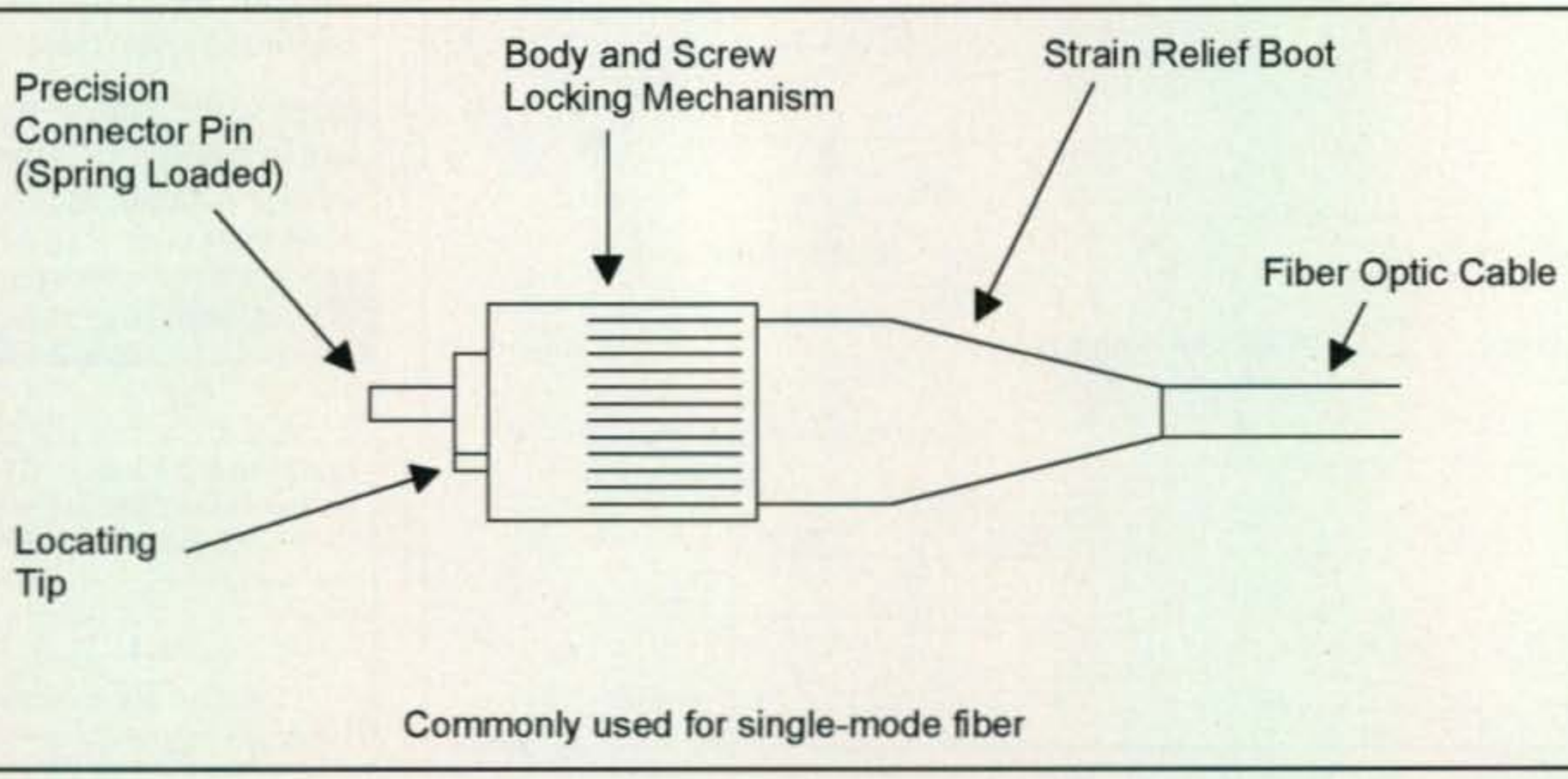

Fig. 9– The ST-style optical connector.

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The ALS-1300 amplifier and its matching power supply can be placed out-of-the-way and controlled remotely. *Remote Control Head*, **ALS-500RC, $49.95**, lets you monitor data and manually switch bands. *Radio Interface*, **ARI-500, $119.95**, reads band data from your transceiver and automatically bandswitches the ALS-1300 as you change bands on your transceiver.

Features Galore!

An Operate/Standby switch lets you run "barefoot" and *instantly* switch to full power when you need it.

Fast 5 millisecond T/R relays (10 million operation lifetime specs) give you full QSK operation. The T/R relay sub-board is easily replaced if the relays ever fail.

Ameritron's *exclusive* front-panel ALC control prevents overdriving your transceiver.

The ALS-1300 can be keyed by any transceiver that can sink 15 mA at 12 VDC without requiring a special interface.

Super-clean modular construction makes service quick and easy.

Fully Protected!

The ALS-1300 is fully protected to prevent amplifier damage if you: switch to a band different from your transceiver, use the wrong antenna or have overly high SWR, if the heat sink temperature exceeds a safe level, if the dual 600 Watt modules are significantly RF unbalanced. Whenever the amplifier faults, it is automatically bypassed.

If output forward or reflected power exceeds a safe level, output power is automatically reduced to prevent amplifier damage by controlling ALC to the transmitter.

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Two accurate Cross-Needle meters use *LEDs* with adjustable brightness for backlighting -- no more burned-out meter lamps.

The left meter continuously monitors DC current of both 600 watt amplifier modules.

The right meter is a multi-meter. Read antenna SWR, forward, reflected output power simultaneously (has adjustable PEP meter hold time) . . . amplifier balance . . . ALC between amplifier and transceiver . . . DC drain voltage of each power amplifier.

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The desktop size amplifier is a compact 10½Wx6¾Hx19D in. Weighs just 23 lbs.

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The *hash-free* fully regulated 50 VDC, 50 Amp switching power supply is wired for 220 VAC but can be rewired for 110 VAC. Includes six foot cable to ALS-1300. Draws 12 Amps at 220 VAC, 25 Amps at 110 VAC. Has inrush current protection, current-limited outputs, exceptional filtering and RFI suppression. Works on 50-400 Hz, 200-260/ 100-135 VAC making it ideal for remote DX-peditions. 10Wx6½Hx9½D inches. 12 pounds.

Options

MOD-10MK $39.95, low-pass filter assembly gives you 12 and 10 Meter operation. Requires FCC ham license.

QSK-5, $359.95, pin-diode T/R switch gives lightning fast silent QSK operation.

Here's what they say . . .

I have had my amp now for a few days and WOW! I picked the amp up at the factory and Mike was very helpful in showing me the ins & outs of the amp. Mine is S/N 8 and these amps are in high demand. It will truly talk 1200 watts all night long and never get warm. Thanks to Ameritron for the way they treat their customers and taking time that I was satisfied. N5SBZ

I've been using SN3 for about six weeks now. No processors or digital read-outs, but very easy to use and it puts out 1200 watts on most bands with no problem. I have been operating QSK as the internal relays are plenty fast enough. AD5X

I have had this fine amp now for a week and have made a number of QSO's (20). It can make the difference, and has in a number of occasions, getting thru the QRN and making a contact. Some of my QSO's have lasted up to 1 hour and there has not been a single problem...runs cool and gives me excellent results. KB4KKX

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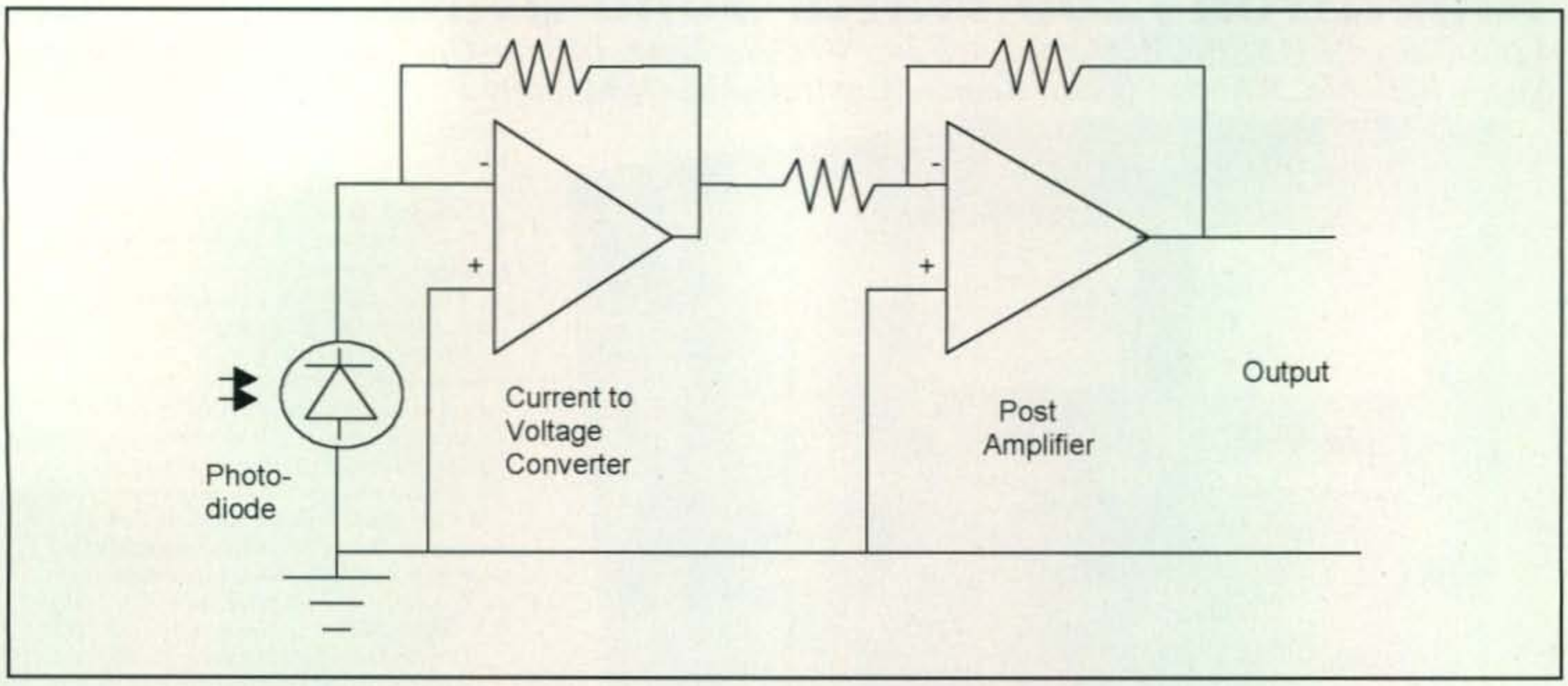

Fig. 10– Block diagram of a typical analog fiber-optic receiver.

es than the SMA. A typical mated pair of ST connectors will exhibit less than 1 dB (20%) of loss and does not require alignment sleeves or other similar devices. The inclusion of an "anti-rotation tab" assures that every time the connectors are mated, the fibers return to the same rotational position, assuring constant, uniform performance.

ST connectors are available for both multimode and single-mode fibers, the primary difference being the overall tolerances. Note that multimode ST connectors will only perform properly with multimode fibers. More expensive single-mode ST connectors will perform properly with both single-mode and multimode fibers. The installation procedure for the ST connector is very similar to that of the SMA and requires approximately the same amount of time. Fig. 9 shows some of the major features of the typical ST connector.

The Optical Fiber: Optical Splices

While optical connectors can be used to connect fiber-optic cables together, there are other methods that result in much lower loss splices. Two of the most common and popular are the mechanical splice and the fusion splice. Both are capable of splice losses in the range of 0.15 dB (3%) to 0.1 dB (2%).

In a mechanical splice, the ends of two pieces of fiber are cleaned and stripped, and then carefully butted together and aligned using a mechanical assembly. A gel is used at the point of contact to reduce light reflection and keep the splice loss at a minimum. The ends of the fiber are held together by friction or compression, and the splice assembly features a locking mechanism so that the fibers remain aligned.

A fusion splice, by contrast, involves actually melting (fusing) together the ends of two pieces of fiber. The result is a continuous fiber without a break. Fusion splices require special expensive splicing equipment but can be performed very quickly, so the cost becomes reasonable if done in quantity. As fusion splices are fragile, mechanical devices are usually employed to protect them.

Optical Receivers

The basic optical receiver converts the modulated light coming from the optical fiber back into a replica of the original signal applied to the transmitter. The detector of this modulated light is usually a photodiode of either the PIN or the Avalanche type. This detector is mounted in a connector similar to the one used for the LED or LD. Photodiodes usually have a large sensitive detecting area that can be several hundred microns in diameter. This relaxes the need for special precautions in centering the fiber in the receiving connector and makes the "alignment" concern much less critical than it is in optical transmitters.

Since the amount of light that exits a fiber is quite small, optical receivers usually employ high-gain internal amplifiers. Because of this, receiver "front end" can easily be overloaded. For this reason, it is important only to the size fiber specified for use with a given system. If, for example, a transmitter/receiver pair designed for use with single-mode fiber were used with multimode fiber, the large amount of light present at the output of the fiber (due to overcoupling at the light source) would overload the receiver and cause a severely distorted output signal. Similarly, if a transmitter/receiver pair designed for use with multimode fiber were used with single-mode fiber, not enough light would reach the receiver, resulting in either an excessively noisy output signal or no signal at all.

As in the case of transmitters, optical receivers are available in both analog and digital versions. Both types usually employ an analog preamplifier stage, followed by either an analog or digital output stage (depending on the type of receiver). Fig. 10 is a functional diagram of a simple analog optical receiver.

The first stage is an operational amplifier connected as a current-to-voltage converter. This stage takes the tiny current from the photodiode and converts it into a voltage, usually in the millivolt range. The next stage is a simple operational voltage amplifier. Here the signal is raised to the desired output level.

Fig. 11 is a functional diagram of a simple digital optical receiver. As in the case of the analog receiver, the first stage is a current-to-voltage converter. The output of this stage, however, is fed to a voltage comparator, which produces a clean, fast rise-time digital output signal. The trigger level adjustment, when it is present, is used to "touch up" the point

on the analog signal where the comparator switches. This allows the symmetry of the recovered digital signal to be trimmed as accurately as desired.

Additional stages are often added to both analog and digital receivers to provide drivers for coaxial cables, protocol converters, or a host of other functions in an effort to reproduce the original signal as accurately as possible.

It is important to note that while fiber-optic cable is immune to all forms of interference, the electronic receiver is not. Because of this, normal precautions, such as shielding and grounding, should be taken when using fiber-optic electronic components.

This concludes our discussion of fiber-optic technology. I hope you have found it interesting and that you now have a better understanding of just what is going on.

73, Irwin, WA2NDM

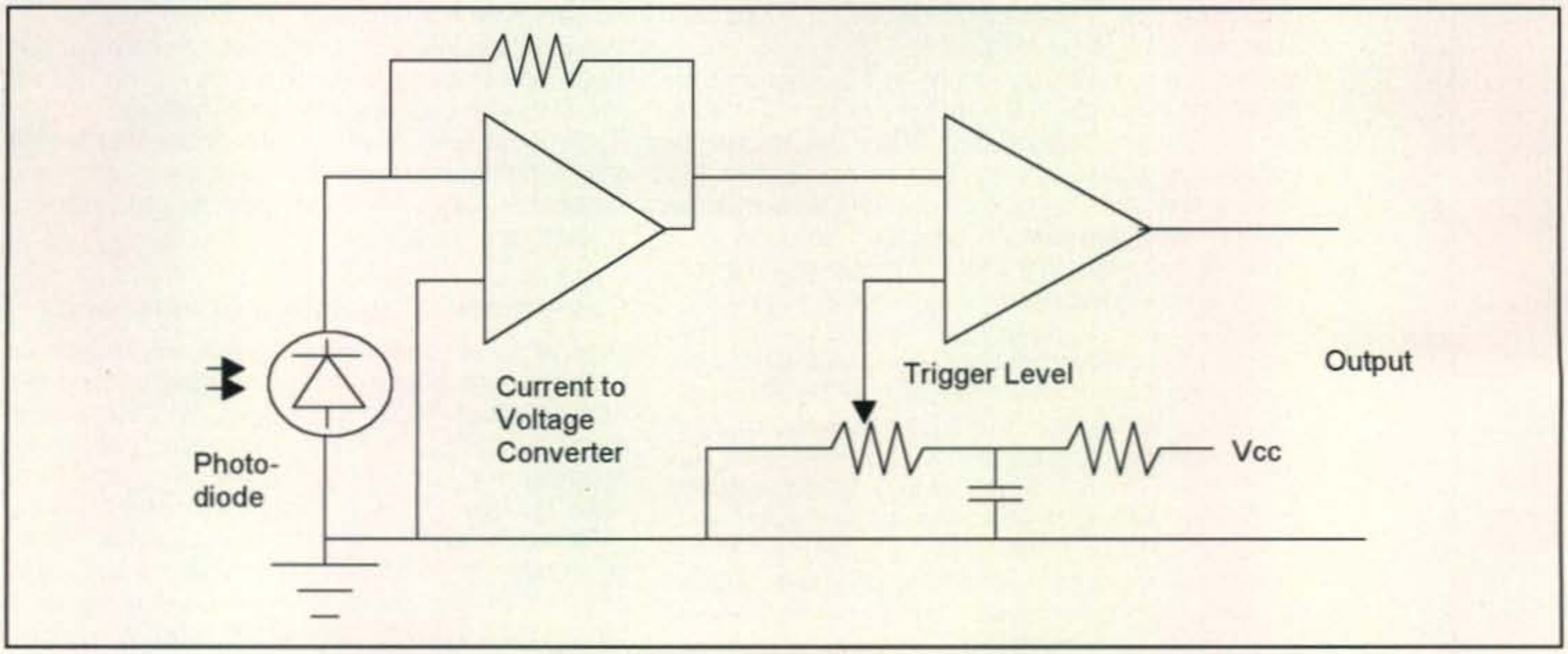

Fig. 11– Block diagram of a typical digital fiber-optic receiver.

BY FREDERICK O. MAIA,* W5YI

FCC's Indecency Policy Struck Down by Federal Appeals Court

Could impact amateur radio enforcement efforts as well

In the mid-1980s, the Federal Communications Commission took the position that its rules regarding profanity and indecency in broadcast media were also applicable to amateur radio transmissions. This is because ham frequencies are shared by all licensees, including children who were encouraged to become amateur licensees. The FCC believes the government has an interest in protecting them from what it considers harmful indecent material. Because of this, the fallout from a recent court ruling that struck down the FCC's indecency rules regarding broadcasting could affect amateur radio as well.

Indecency, Obscenity, Profanity ... and the Law

The First Amendment to the U.S. Constitution prohibits the making of any law ... infringing on the freedom of speech or the press. Traditionally, print publications have the highest degree of First Amendment protection. It basically is legal to print anything. Over-the-air broadcasts enjoy the least freedom. Broadcasters are subject to restrictions barring the transmission of indecent or profane material over the airwaves.

The FCC's power to regulate language content comes from the U.S. Criminal Code, Title 18, Section 1464. The statute was originally in Section 503(b) of the Communications Act and was moved to the Criminal Code in 1948. Section 1464 states: "Whoever utters any obscene, indecent, or profane language by means of radio communication shall be fined not more than $10,000 or imprisoned not more than two years, or both." A subsequent statute and court case prohibited the broadcast of indecent material between 6 AM and 10 PM.

The law covering subscription TV broadcasting is different. It only holds that obscene material is illegal. Section 1468 states: "Whoever knowingly utters any obscene language or distributes any obscene matter by means of cable television or subscription services on television shall be punished by imprisonment for not more than 2 years or by a fine in accordance with this title, or both."

The FCC prohibits highly offensive curse words from being broadcast between 6 AM and 10 PM local time when children could be listening. The Supreme Court has upheld the FCC's position banning indecent material during this period. The term "safe harbor" refers to the hours during which material deemed indecent for children may be transmitted.

Amateur radio transmissions, especially those on HF spectrum, can often be heard across all time zones and indecent material is generally banned around the clock. Thus, the FCC's safe harbor constraints generally do not apply to ham radio communications.

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What Makes Content Obscene, Indecent, or Profane?

According to Supreme Court, obscenity—unlike indecency, which is constitutionally permitted—is not protected by the First Amendment. There is no "safe harbor" for the broadcast of obscene material and it may not be broadcast at any time.

To be obscene, the content must meet a three-prong test: (1) an average person, applying contemporary community standards, must find that the material, as a whole, appeals to the prurient interest (i.e., material having a tendency to excite lustful thoughts); (2) the material must depict or describe, in a patently offensive way, sexual conduct specifically defined by applicable law; and (3) the material, taken as a whole, must lack serious literary, artistic, political, or scientific value.

Indecent material contains "patently offensive" references to sexual or excretory material that does not rise to the level of obscenity. For this reason, the courts have held that indecent material is protected by the First Amendment and cannot be banned entirely.

To be "patently offensive," context is critical. The FCC looks at three primary factors when analyzing broadcast material: (1) whether the description or depiction is explicit or graphic; (2) whether the material dwells on or repeats at length descriptions or depictions of sexual or excretory organs; and (3) whether the material appears to pander or is used to titillate or shock. No single factor determines the decision. The FCC weighs and balances these factors, because each case presents its own mix of these, and possibly other, factors.

"Profane language" includes those words that are so highly offensive that their mere utterance in the context presented may, in legal terms, amount to a "nuisance."

Government Regulation of Indecency

The history of government regulation of broadcast transmissions began when Congress passed the Radio Act of 1927. Congress granted a new agency, the Federal Radio Commission, regulatory power over not only the engineering aspects of radio, but over the "public interest" content as well.

Although the act expressly prohibited broadcast censorship, it did officially empower the agency to grant or revoke radio licenses on the basis of broadcast quality. Three years later, the Commission decided, for the first time, to refuse to renew a broadcast license solely on the basis of

programming deemed not in the public interest. In 1932, another broadcaster's license was not renewed. Both had broadcast content for their personal benefit.

In 1941, the Supreme Court said the right to broadcast was a privilege, not a right, because the radio spectrum was an extremely limited resource. The scarcity of spectrum remained the only legal justification for federal regulation of broadcast content until the 1970s.

This changed when cable TV began to pose a serious competitive challenge to over-the air broadcasting. Unlike radio and television, cable TV did not require broadcast spectrum channels. Cable television was treated more as a communications "common carrier," a medium that required subscription by the public.

Both the Radio Act of 1927 and the Communications Act of 1934 contained regulatory provisions authorizing a $10,000 fine and station license revocation for broadcasting obscene, indecent, or profane language. Seemingly in opposition, Section 326 of the Communications Act prohibits the FCC from censoring material or interfering with the public's free speech rights.

Punishing "obscene" broadcast language presented no constitutional problem, because obscene speech or conduct is legally not recognized as meriting First Amendment protection. "Indecent" or "profane" speech, on the other hand, is constitutionally protected.

In 1973, a broadcast radio station, in a mid-afternoon program, featured an excerpt from a George Carlin comedy album entitled "Filthy Words." It discussed in detail seven four-letter words that couldn't be mentioned on radio or television. The FCC issued a declaratory ruling against the station stating that the terms were "patently offensive" and broadcast at times when there is a reasonable risk that children may be in the audience."

A federal appeals court overturned the FCC's newly established indecency standard almost immediately. However, the Supreme Court affirmed the FCC's right to hold broadcasters to a higher standard due to radio's "pervasiveness and its unique accessibility to children."

In 1987, the FCC declared that indecent programming would be prohibited only if broadcast at a time when there would be "reasonable risk that children may be in the audience." The FCC decided on a time slot of midnight to 6 AM as the appropriate period for "adult" content.

The indecency policy stood until March 2004, when the agency changed its direction. Thereafter, it said, even a single use of "the F-Word" on the air would be treated as illegal if it occurred between 6 AM and 10 PM. The FCC also made it clear that, among other single prohibited words, the four-letter word meaning excrement was also banned.

Indecency Allowed on Internet and Subscription Television

Congress attempted to expand indecency regulation to the Internet with the Communications Decency Act (CDA) of 1996. The law was passed as part of that year's Telecommunications Act overhaul. It sought to impose criminal penalties on anyone who, using an interactive computer, sends or makes available to persons under 18 years of age "any comment, request, suggestion, proposal, image, or other communication that, in context, depicts or describes, in terms patently offensive as measured by contemporary community standards, sexual or excretory activities or organs."

Upon passage, the ACLU (American Library Association) and others challenged the constitutionality of the CDA. They said it violated constitutionally protected speech. The court struck down what it termed the "blanket restriction on speech" and ruled that, "The Internet is entitled to the full protection given to media such as the print press." A subsequent high court decision (2000) extended similar protection to subscription (such as cable and satellite-delivered) television.

In 2006, Congress passed the Broadcast Decency Enforcement Act, increasing the maximum fines to "$325,000 for each violation or day of such violation, to a maximum of $3 million for any single act or failure to act." However, on June 4, 2007, the Second Circuit Court of Appeals held that fines for so called "fleeting expletives" could no longer be collected.

FCC's Indecency Policy Struck Down

The FCC does not monitor the airwaves for language violations. Instead it reacts to complaints from the public. The agency changed its indecency approach after getting many complaints about two TV broadcasts.

At the Billboard Music Awards in 2002, Cher unexpectedly blurted out the "F-word" and Nicole Richie said the "S-word." In addition, Rock singer Bono used a variation of "the F-Word" on the NBC-TV Golden Globe Awards broadcast in 2003.

In reaction to the complaints the FCC

FCC Approves Ham Employee Participation in Emergency Drills

New rule in effect as of September 3

The FCC released a Notice of Proposed Rulemaking on March 24, 2010 seeking to allow radio amateurs, under certain limited conditions, to participate without an FCC waiver in government-sponsored emergency or disaster preparedness drills on behalf of their employers.

While amateur radio rules provide for its use during emergencies, the rules prohibited communications where the station licensee or control operator has a pecuniary interest, including communications on behalf of an employer, except for government-sponsored drills for which a waiver has been granted. The Commission also asked in the NPRM if it should permit employee operation of amateur stations during non-government sponsored emergency drills as well.

"Amateur radio plays a unique and critical role when primary facilities are damaged, overloaded, or destroyed," the FCC said. It believed the proposed rule changes would be in the public interest and consistent with one of the Amateur Service's purposes: the "recognition and enhancement of the value of the amateur service to the public as a voluntary non-commercial communication service, particularly with respect to providing emergency communications." (Part 97, Section 97.1(a)).

The NPRM was in response to a petition from the American Hospital Association requesting a blanket waiver allowing hospitals seeking accreditation to allow ham employee participation in their emergency preparedness drills. Two other petitions were also filed concerning an FCC Enforcement Bureau position holding that such operation was prohibited by Section 113, which forbids amateurs communicating on behalf of their employers.

The NPRM carried a very short (30-day) comment period with replies due 15 days later. The comment period began April 22 with the publishing of the proceeding in the Federal Register. The comment period ended May 24; replies June 7.

The decision came just five weeks after the reply comment deadline, a record time period for a proceeding to go from the NPRM to the final Order. (It normally takes two years or more!)

On Wednesday, July 14, the FCC adopted a Report and Order allowing radio amateurs who are employed by both government and non-government agencies, such as hospitals, to participate in emergency and disaster drills on behalf of their employers.

The ruling added a new paragraph to Section 97.113 of the Part 97 rules. It now reads:

§ 97.113 Prohibited transmissions. (a)(3)(i) A station licensee or control station operator may participate on behalf of an employer in an emergency preparedness or disaster readiness test or drill, limited to the duration and scope of such test or drill, and operational testing immediately prior to such test or drill. Tests or drills that are not government-sponsored are limited to a total time of one hour per week; except that no more than twice in any calendar year, they may be conducted for a period not to exceed 72 hours.

The Report and Order was published in the August 4 Federal Register and became effective September 3, 2010.

on March 15, 2006 issued what it called an "omnibus order" that dealt with about fifty indecency violations ... including those of a single "fleeting" usage of a curse word. The fines totaled more than $4 million. Joined by other broadcasters, Fox TV sued the FCC for what it said was a constitutionally questionable and unevenly enforced indecency policy.

The matter eventually ended up at the Supreme Court. The high court remanded the case back to the New York-based Second Circuit Court of Appeals to consider the constitutionality of the policy. The appellate court heard the case again.

In its latest decision on Tuesday, July 13, 2010, the three-judge panel unanimously struck down the FCC's indecency policy which calls for heavy fines. In a 32-page ruling, the court said it "now holds that the FCC's policy violates the First Amendment because it is unconstitutionally vague, creating a chilling effect that goes far beyond the fleeting expletives" heard over-the-air.

The court faulted the Commission for failing to produce "any evidence that suggests a fleeting expletive is harmful," much less that any such harm was "serious enough to warrant government regulation." The FCC's order and the Commission's underlying indecency policy were vacated.

The appellate court's decision was a major victory for broadcasters who have long complained the FCC's indecency rules violated First Amendment rights. In the past, the FCC has levied fines on scripted expletives but had been more lenient about accidental profanities uttered during live shows. FCC commissioner Michael Copps said in a statement that the court's decision was "anti-family."

The Fox Network was "extremely pleased" with the Circuit Court's decision stating that allowances must be made for the unfortunate isolated instances where inappropriate language slips through. The appeals court decision undoubtedly also impacts language used on-the-air by ham radio operators.

The Second Circuit certainly will not have the final word on this. The FCC likely will either appeal the ruling to the Supreme Court or else craft a new, constitutionally sound framework for punishing over-the-air indecency.

Amateur Radio and Indecency

The Part 97 amateur service rules used to prohibit the transmission of "...obscene, indecent or profane words or meaning." The word "profane" was dropped from Section 113(d) in 1993 even though the criminal law (18 U.S.C. § 1464) and the FCC's website still mention all three.

Cursing or swearing may be profane and/or indecent, depending on the context. In the Part 97 Amateur Radio rules, the FCC has chosen to lump indecency and profanity together as simply being indecent. The new rewrite of Section 113(a)4 now only prohibits "...obscene or indecent words or language."

In the past, the FCC has held that the indecency rules applying to TV and radio broadcasting also apply to amateur radio transmissions. In making obscenity or indecency determinations, the FCC staff analyzes what was actually transmitted.

If the FCC determines that the curse words were obscene or indecent, it can issue a Notice of Apparent Liability (NAL), which is a preliminary finding that the law or the FCC's rules have been violated. Subsequently, this preliminary finding may be confirmed, reduced, or rescinded when the FCC issues a Forfeiture Order.

The fact remains, however, that the FCC has never issued a citation or NAL to a ham radio operator for solely violating its obscenity or indecency rules. Language on the amateur airwaves is a very touchy subject for the FCC, and it rarely cites any radio amateur only for bad speech. The violation notice virtually always mentions other accompanying offenses which can easily be proved ... and don't involve controversial First Amendment issues. 73, Fred, W5YI

CQ Our 65th Anniversary 1945 2010 CQ

Timeline of Ham Radio History 1945–2010

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

This month, we'll cover the years 1996–2000:

1996: Start of sunspot Cycle 23; CQ Communications launches *CQ Contest & CQ VHF* magazines; Vanity callsign system begins phased-in operation, starting with hams who wanted to regain calls that had previously been issued to them.

1997: FCC requires hams to understand and abide by RF safety rules, eliminating previous blanket exemption; the 2-meter and 70-centimeter bands are threatened by efforts to have them reallocated at the 1997 World Radiocom munications Conference (WRC-97) for "Little LEO" low-earth-orbit satellites.

1998: Kachina introduces the first "no dials" computer-controlled transceiver; Ten-Tec responds with its Pegasus, which likewise requires a computer to operate; Senator Barry Goldwater, K7UGA, becomes a Silent Key on May 29; FCC proposes mini-restructuring, eliminating Novice & Tech-plus licenses, eliminating separate RACES licenses, and expanding pool of potential Volunteer Examiners.

1999: After 15-year absence from enforcing ham radio rules, FCC names Riley Hollingsworth, K4ZDH, as Special Counsel for Amateur Radio; FCC adopts Universal Licensing System (ULS), opening door for online license lookups, modifications and renewals; Digital voice arrives in ham radio with introduction of DV handhelds by AOR; Noteworthy Silent Keys include Jordan's King Hussein, JY1, and *CQ* Editor Alan Dorhoffer, K2EEK.

2000: FCC restructures amateur licensing to three classes, Extra, General and Technician; existing Advanced and Novice Class licenses will be renewable but no new ones will be issued, Tech Plus licenses to be renewed as Technician; Code exam speed for General and Extra drops to 5 words-per-minute; OSCAR-40 satellite launched, suffers major damage due to likely explosion on board, operates on and off for several months before falling silent; *CQ VHF* merges into *CQ* magazine; hams help rescue boy injured in pirate attack in Caribbean; ham radio legend Lew McCoy, W1ICP, becomes a Silent Key; Amateur Radio on the International Space Station (ARISS) program makes first school contacts.

Next month, we'll look at 2001 through 2005, featuring ham radio's role in the aftermath of the 9/11 attacks and the explosion of the space shuttle Columbia, the end of the line for 73 magazine and the beginning of the end for Morse code testing in the U.S.

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LDG's newest tuner is specially designed for Yaesu's newest 100 watt radios. The YT-450 interfaces directly with the Yaesu FT-450 and FT-950 radios, making integration easier than ever. Simply connect the tuner to the radio with the supplied cables and you are ready to operate. DC power and all control is done through the interface cable. Just press the tune button on the tuner and the rest happens automatically: mode and power are set, a tune cycle runs and the radio is returned to its original settings. It will quickly match nearly any kind of coax fed antenna with an SWR of up to 10:1. 2000 memories recall settings in an instant! An extra CAT port on the back allows seamless connection to a PC. You have the newest radio, now get the newest tuner to go with it! ***Suggested Price $249.99***

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radio not included

Z-817

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

radio not included

AT-897Plus for the Yaesu FT-897

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

- ***RF Sensing***
- ***Tunes Automatically***
- ***No Interface Cables Needed***

AT-100ProII

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

Z-100Plus

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

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AT-1000Pro

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

IT-100

Matched in size to the IC-7000 and IC-706, the new IT-100 sports a front panel push-button for either manual or automatic tunes, and status LEDs so you'll know what's going on inside. You can control the IT-100 and its 2000 memories from either its own button or the Tune button on your IC-7000 or other Icom rigs. It's the perfect complement to your Icom radio that is AH3 or AH-4 compatible.
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NEW! AT-600Pro

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

KT-100

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

- ***RF Sensing***
- ***Tunes Automatically***
- ***No Interface Cables Needed***

AT-200Pro

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

YT-100

An autotuner for several popular Yaesu Radios. An included cable interfaces with your FT-857, FT-897 and FT-100 (and all D models) making it an integrated tuner, powered by the interface. Just press the tune button on the tuner, and everything else happens automatically: mode and power are set, a tune cycle runs, and the radio is returned to its original settings. It's the perfect complement to your Yaesu radio.
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M-7700 For IC-7700. It will display S-meter on receive, or power out, SWR, ALC level or supply voltages, all selectable from the radio's menu. What's more, the M-7700 and the virtual meter on your radio can work together.
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BY RICHARD FISHER,* KI6SN

Carpe Digitum Diem: Embracing Advancing Technology in EmComm

When looking into the fast-changing arena of digital technologies, emergency communications has been one of amateur radio's greatest beneficiaries demonstrated especially in those cases in which life literally hangs in the balance. Where is the need more urgent for fast, reliable, accurate, and easily obtainable data transfer while using equipment within economic reach and the skill set of most radio amateurs?

Two scenarios this month—one employing Winlink 2000 and the other using the Narrow Band Emergency Messaging System—serve as examples of how amateur ingenuity and dedication help build the bridge between computer keyboard and radio wave to execute our role as public servants and developers of ever-improving modes of communication. *Carpe digitum diem* . . . Sieze the digital day.

"Hamsters" and Winlink 2000 Solve a High-Sea Mystery

On a Saturday morning last fall, Perry Lundquist, W6AUN, got an e-mail from a Colorado woman deeply worried about the welfare of her husband aboard the couple's sailboat *Allure* in the Sea of Cortez, between the Baja California Peninsula and mainland Mexico.

"They had been faithfully communicating every day via Skype [internet-based video messaging]," said Lundquist, Amateur Radio Emergency Service® Colorado District 24 Emergency Coordinator. The last time they had talked, her husband had been docked at Bahia de Los Angeles in Baja, but she hadn't heard from him in four days. It's an awfully long way from Castle Rock, Colorado to the Gulf of California.

Her husband was an experienced boat captain, she said, and while they weren't radio amateurs, during the past two years they had sailed together, they had listened to the 75-meter Sonrisa net (3.968 MHz) each morning to hear weather updates and for information about the Baja region (http://sonrisanet.org). They knew other sailors who were radio amateurs who regularly checked into the Sonrisa net and the Chubasco SSB net, as well.

Now stateside and woefully out of touch, the idea of calling on amateur radio operators to help contact her husband came to the worried wife because "a few years before, when they were in Astoria, Oregon, hurricane-force winds brought down all (communications) infrastructure. When this happened, it was the amateur radio operators who were able to communicate," Lundquist said. An American Red Cross internet posting has the details: <http://redcrossnw.wordpress.com/2007/12/13/amateur-radio-provides-lifeline-during-disaster/>.

"Remembering this, she decided to search the internet for any hams in the local area who might be able to assist her [in contacting her husband], and she came across the ARES® District 24 website" (http://www.aresd24.org).

In this Saturday morning's e-mail "she asked if us 'hamsters,' evidently that's what some sailors call ham radio operators, could provide any assistance," Lundquist said. "In her e-mail she provided a Castle Rock phone number and I was able to confirm her story and collect additional information. I also gained a real sense of the level of concern that she had for her husband."

Lundquist knew that high-frequency propagation wouldn't be favorable and that chances of "being able to check-in to the Sonrisa Net were slim to none. I did some quick web searching to find other Pacific amateur radio maritime nets—there are many—and decided to call an old Navy man for a few suggestions, D24's Rob Rude, KØRAR. He suggested we send a message via Winlink 2000, knowing that HF Winlink was originally created to provide sailors an e-mail option while on the high seas."

Running with that idea, Lundquist "shared the information I collected from the worried wife

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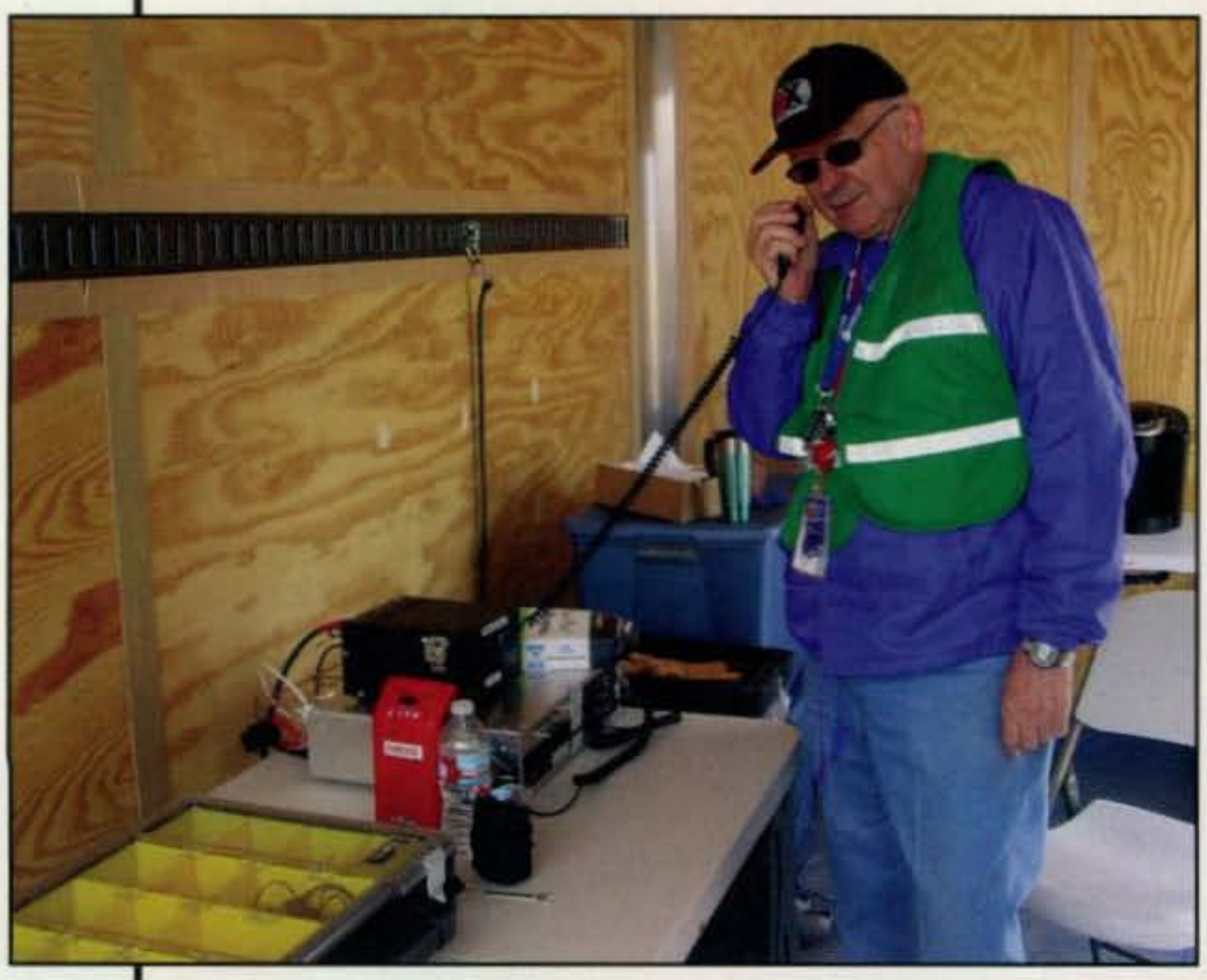
e-mail: <ki6sn@cq-amateur-radio.com>



Rob Rude, KØRAR, was a key player in putting Winklink 2000 into action to reunite a worried wife in Colorado with her sailor husband in the Sea of Cortez, Baja, California, Mexico after she lost contact with him for four days. Rude is shown here in a communications trailer during Douglas County, Colorado's 2010 Interface Drill. (Courtesy of W6AUN)

with Rob and he sent the Winlink 2000 message. The next day I received a phone call from the Castle Rock woman saying she had just talked with her husband."

Evidently, the husband-captain had been contacted "by a sailing couple who heard about the *Allure* on the Amigo Net, a marine high-frequency net on 8.122–8.125 MHz.

As it turned out, "the reason (the couple wasn't) able to communicate via Skype was that while he was docked at Bahia de Los Angeles in the Sea of Cortez her husband was experiencing bad weather (50–60 knot winds) and the rough seas made it impossible to connect to the internet via their satellite-based internet service," Lundquist said.

"For the safety of the vessel, her husband decided to head out toward calmer seas. A fellow sailor heard via Winklink 2000 that the captain of the *Allure* was being sought and found Dennis (the husband), who then went back to port to contact his wife via landline phone."

The story and its happy ending were ultimately chronicled in the "Colorado ARES® D24 Newsletter."

Lunquist said Winlink 2000 "was born out of the Airmail software program, which was specifically developed to enable sailboat enthusiasts to send and receive e-mails over HF communications using Pactor3. With the advent of the Winlink 2000 system, Airmail has

Perry Lundquist, W6AUN, (background), who led the charge in helping a Colorado woman contact her out-of-touch husband, is shown with Ron Hranac, NØIVN, in the South Metro Fire and Rescue Authority's Emergency Operations Center during the 2008 Democratic National Convention in Denver. (Courtesy of W6AUN)

become just one of the programs that can be used to send and receive e-mails. Paclink is another popular program that allows you to use your own e-mail client software such as Microsoft Outlook and Outlook Express.

"Instead of just a software program and communications protocol, Winlink 2000 is a complete e-mail system. The system includes five redundant communications messaging servers placed around the world so that if any region of the internet should fail, the Winlink 2000 system will stay operative." One of the servers is in the Pentagon in Washington, DC, he said.

"The really interesting thing about Winklink 2000 is that gateways into the system exist both on HF amateur frequencies and on VHF/UHF frequencies," Lundquist noted. "Here in the Denver area there are at least four RMS [radio message server] nodes with 2-meter transceivers on packet radio frequencies.

"Not only does this usage breathe new life into packet radio, but it also means that anyone with a Technician class license or above can use Winlink 2000 and local amateur radio communications to send and receive e-mail over the internet," Lundquist said. "This capability really excites our served agency representatives because we are able to send and receive e-mails in the field when local infrastructure is down."

District 24 "maintains excellent served agency relationships with the Douglas County Office of Emergency Management, Elbert County Office of Emergency Management, South Metro Fire and Rescue Authority, The Salvation Army, and the local chapter of the American Red Cross," Lundquist said. "We've been organized for about 20 years and have assisted our served agencies with various local emergencies to include flooding, blizzards and severe snow storms, power outages, 911 outages and wildland fires. In 2002, District 24 and other Colorado Front Range ARES® Districts provided communications support during the Hayman Fire, a 168,000-acre blaze that was the largest in Colorado history."

As D24 EC, Lundquist manages a group "of about 70 emergency com-munications-minded amateur radio volunteers."

"I was first licensed in 1977 and of all the amateur radio related activities I've done—DXing, 10-meter beacon hunting, severe-weather spotting, high-altitude balloon chasing, and so on—emergency communications is the facet I enjoy most. I've been a member of Colorado ARES® District 24 since 1996, and since that time I have met more people and been able to do more cool things than I could have ever imagined."

Lundquist said he has "worked in emergency operations centers during many events, been at the incident command post during several wildland fires, been a part of public safety emergency response planning, and more." In addition to being D24 EC, he is also " . . . the RACES Radio Officer for both Douglas and Elbert counties. I'm a Communications Unit Leader (COML) for the Douglas County Type 4 Incident Management Team, and an interim board member of the Colorado D-STAR Association."

Lundquist is also an acknowledged contributor to the ARRL's Amateur Radio Emergency Communications Course, Level 1.

Why EmComm on N-Beams is so Darned Good

As reported in the September edition of *CQ*'s "Public Service" column, in 2009 the Hall County (Georgia) ARES® adopted use of the Narrow Band Emergency Messaging System for the transfer of digital data over radio. Now considered one of the leading EmComm groups in the state for digital commu-

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nications, Emergency Coordinator Michael V. Crowder, AA4BA, of Gainesville, Georgia, in consultation with NBEMS co-developer Dave Freese, W1HKJ, explains how this mode works and why it is so important and useful in emergency communications:

The Narrow Band Emergency Message System, or NBEMS (commonly referred to as N-Beams), is a true brain-child of the ham radio community. The geniuses who conceived this rendition of digital modes are Skip Teller, KH6TY, and Dave Freese, W1HKJ.

Skip's real-world view of traditional emergency message handling and its weaknesses inspired him to look for a better method. His requirements for this new venture were that all messages be error-free and verifiable. In the event any data was received incorrectly, the receiving station needed to know that and be able to request that the message, or a part, be resent.

Another requirement for this mode was to make ultra-efficient use of the radio spectrum. The less bandwidth used for a message allows more messages or conversations to occupy a particular band.

With the parameters set for this project, Skip provided the conceptual expertise and Dave the systems design expertise. The principal requirement for NBEMS was to provide a method of transferring data files over high frequencies (HF) with 100-percent certainty that the received file was error free. In 2004 Paul Schmidt, K9PS, published a specification for an Automatic Repeat reQuest (ARQ) system for MT63 and other 7-bit transmission systems. This specification was used for the data transfer protocol.

Dave modified his program Fldigi (Fast Light Digital modem) to allow control from an external program. Flarq (Fast Light Automatic Repeat reQuest) was designed to support K9PS's ARQ specification. Flarq provides the data encapsulation and Fldigi the transport mechanism. This design met most of the original goals of NBEMS and was released for testing, criticism, and refinement. The original test suite was available for Linux and Puppy Linux.

Many other hams joined in all facets of the project. Stelios Buonanos, MØGLD, a member of the Fldigi development team, provided the skills needed to port Fldigi and Flarq to Windows® and (Mac) OS X. This was a critical step in the evolution of NBEMS, as there was now a single solution with the user interface on all computer platforms used by the amateur community.

The test team grew when the Windows®/Linux/OS X NBEMS suite was released for beta testing. Some tested, some gave suggestions, and some added their own refinements, while others wrung their hands because this is not the way their Elmer showed them how to pass traffic.

This suite of software is easy to use, requires no specialized equipment, and allows stations to send data to others that is verifiable. Flarq is a one-on-one data transfer. An unconnected station cannot eavesdrop or benefit from the transmission. Some of the NBEMS testers and supporters

You Never Think It's Going to Happen Until It Happens to You

A little lack of motivation on a sultry summer afternoon may have saved the life of Terry Briggs, KJ4BYL.

"The weather had just started to turn cloudy and it was not raining yet," the Wesley Chapel, Florida radio amateur recalled, "when this giant flash—like from an arc welder—blinded us for a few moments."

He had been slowly "getting ready to install a 6-element 2-meter beam that I built from a recycled TV antenna, along with a rotator. Maybe my lack of motivation paid off." A bolt of lightning had stuck a tree only feet from his house north of Tampa, right about the time he had planned to put up the new antenna.

"The point of impact (of the lightning bolt) is about 5.5 feet off the ground and the exit point extends approximately 20 feet out" from the base of the tree, Brigg said. "The three-to-four inch roots are separated in several places. The tree is about even in height with the house and about 20 feet away."

Briggs said the carabineer and looped cable in one of the pictures are "a connection point for exercise straps that I used until this happened. The strike will probably kill the tree, but thankfully not much (else) was zapped."

His home alarm system is gone, "along with a circuit board that drives the garage-door motor and the safety-beam eyes. The house phones were fixed the next day. The phone box on the outside of the house had to be replaced. The Verizon FIOS (fiber optics) box had a surge protector that actually had burn marks from the inside out." It provides Briggs' phone, internet, and cable television service.

"You never think it's going to happen until it happens to you," said Briggs, who became interested in amateur radio, especially EmComm, about two years ago through his work with the Transportation Security Administration. *(Photographs courtesy of KJ4BYL)*

(We know all too well the danger lightning strikes can bring, even when inclement weather seems far distant. The experience of KJ4BLY underscores our need to be constantly vigilant and extremely careful, whether at our home station or on the scene of an EmComm event where weather is so often a contributing factor to disaster.— ed.)

requested that a method be devised to allow a broadcast program that provided a way to verify 100-percent reception.

Dave got to work once more and within a week had produced Flwrap, which encapsulates the data stream and adds checksum data that is used to verify the reception. If the checksum is verified, then there is 100-percent assurance that the data was received error free. By using Flwrap, a station can transmit a text, spreadsheet, or image file, and all receiving stations can verify that they received the file intact.

The receiving station can even configure his software to automatically detect these types of transmissions and store the messages to a file on his hard drive. This means if you have to take a nature break or a nap, when you return to your station your messages are waiting for you. Check your capture file, unwrap your traffic, and pass it to whomever it needs to go. It can be as easy as hitting the print button and handing your message to your served agency representative.

A growing group of hardcore testers is continuously discussing issues, refinements, and potential features via a Yahoo group dedicated to the project. Ideas are shared, bugs are discussed, and friends are made through the common bond of improving EmComm.

In August of 2009, my local ARES® group was invited to observe a training session for message handling sponsored by another local group. Their intent was to teach a group of relatively new hams how to pass NTS and ICS-213 forms using 2-meter phone. The final afternoon live exercise was more of an exercise in frustration. I spent the entire drive home discussing the poor results and brainstorming about how NBEMS could be used to make this type of traffic more efficient with my digital Assistant Emergency Coordinator Marc Shockley, KJ4EZQ.

In early September 2009, discussion of a way to send standardized forms using Fldigi was hitting the high-water mark on the Yahoo group. Everyone involved was throwing in their two cents to a nickel. Then Dave took the ball and ran. By the end of the month he delivered an Alpha version of Flics to a few of us to see how it ran.

What a dream . . . the ability to send an ICS-213 message from station to station almost as easily as a fax. No fancy interfaces, no expensive software, just the equipment many hams already have. A laptop and a handie-talkie using acoustical coupling were all that were needed. My group easily adopted this system. We were zipping our practice 213s back forth via 2-meter simplex, repeaters, and HF within minutes of loading the Flics routine.

Flics has grown to Flmsg (Fl-message) rather quickly and incorporates ARRL Radiograms and additional FEMA ICS forms. The entire suite of Fldigi, FLwrap, Flarq, and Flmsg sees weekly refinements and improvements. Every month new features seem to emerge without undue difficulty added to the system.

Here in northeast Georgia, and around the country, local ARES groups are quickly embracing and incorporating this tool into their EmComm tool boxes. We have had amateurs pick up one of our NBEMS nets on local repeaters and in the course of 20 minutes download the software, install it, and start receiving messages. It is *that easy.*

After sending a team to Gwinnett County, Georgia ARES® to train on the suite, members dove in head first and took to NBEMS like the proverbial ducks to water. After only a month of training they had dozens of operators buzzing files and forms around.

I got this message from their Digital AEC, Kyle Albritton, W4KDA, soon after: "Last night we ran an exercise where we passed digital data in a room. We had 30 to 50 people passing digital traffic concurrently. NBEMS had 100-percent successful transfer. Packet worked great and had 100-percent transfer using Outpost." It went on to say D-RATS and D-STAR fell short—a "lack of error correction on the data channel left it struggling from the intermod that packet and MT63 were easily able to overcome."

Some may ask, "If packet works, why this?" Well, how long does it take to teach someone to set up and configure a packet station? I have found that to be a very tough chore. With Fldigi and NBEMS, we are teaching new Technician class hams how to pass digital traffic with success in less than an hour. *Hmmm* . . . simple and no packet modem to argue with configuration.

In testing, MT63-2000 is a very fast and accurate mode for the VHF/UHF use of Fldigi. When the signals get super weak, roll back to Domino or Olivia and watch the data that you cannot even hear roll across your screen. This stuff works below the noise floor of your radio and just keeps copying.

For HF there are myriad options, but personal testing on 80-meter NVIS (*Near Vertical Incidence Skywave—ed.*) seems to rock with PSK-500R. In tests with Michael Haynes, N4ZNV, and other hams, we have been successful with both text and image files. This system is almost bulletproof once an operator learns the nuances of the system.

We are even jetting MRI and X-ray images back and forth in our drills both next door and regionally. When the faster modes start kicking back errors, just roll back to a slower one and watch the messages keep coming.

While an interface is not required, a box such as a Signalink or Rigblaster does make copying weak signals or large files easier. Many of the hams with whom I am practicing have added the new ICOM 7200 to their kits. This radio, with its built-in sound card and USB one-cable-connection-to-a-computer, is a drop-down simple solution to sending digital traffic.

For more information on this wonderful new mode of sending data you can visit many websites. First on the list is <http://www.w1hkj.com>. After that, just Google Fldigi, NBEMS, Flwrap, or Flics and watch the hits pile up. Give it a try and you might just become a digital guru in an evening. *See y'all on the waterfall!*

I especially want to especially Skip and Dave for their help and patience as they have shared their years of experience with me and with others. No matter how complicated or dumb the question, they always take time to get someone on the path to better communications skills.

—Michael V. Crowder, AA4BA

For more information about Hall County ARES® visit: <http://www.HallCountyARES.com>. The group's NBEMS information page is at: <http://www.hallcountyares.com/index.php?option=com_content&view=article&id=123&Itemid=79>. For a YouTube video showing NBEMS in action, visit: <http://www.youtube.com/watch?v=nF8_Xcg4ofc>.

73, Richard, KI6SN

digital connection

BY DON ROTOLO,* N2IRZ

Internet Security and Passwords

Our topic this month is not directly related to ham radio, but so much of what we do in ham radio today—from the DX Cluster to propagation reports to Echolink—includes using the internet, that keeping yourself safe in that domain is an important subject to review every so often.

Internet Security

Nearly all people who have a computer have some sort of anti-virus software, and if you're one of them, that's great! That used to be enough, since most data was transferred by floppy disk, meaning you just had to scan the floppy when it was inserted to avoid computer viruses. These days, now that the floppy is all but extinct (replaced by the flash drive), and most data comes from the internet, you need additional protection, the so-called Internet Security Suite.

The most important part is a *firewall.* The firewall prevents bad programs from getting into (or out of) your computer, assuming you have it set properly. The standard Windows® Firewall (Win XP and later) is generally sufficient, or you can get one with your anti-virus software/security suite.

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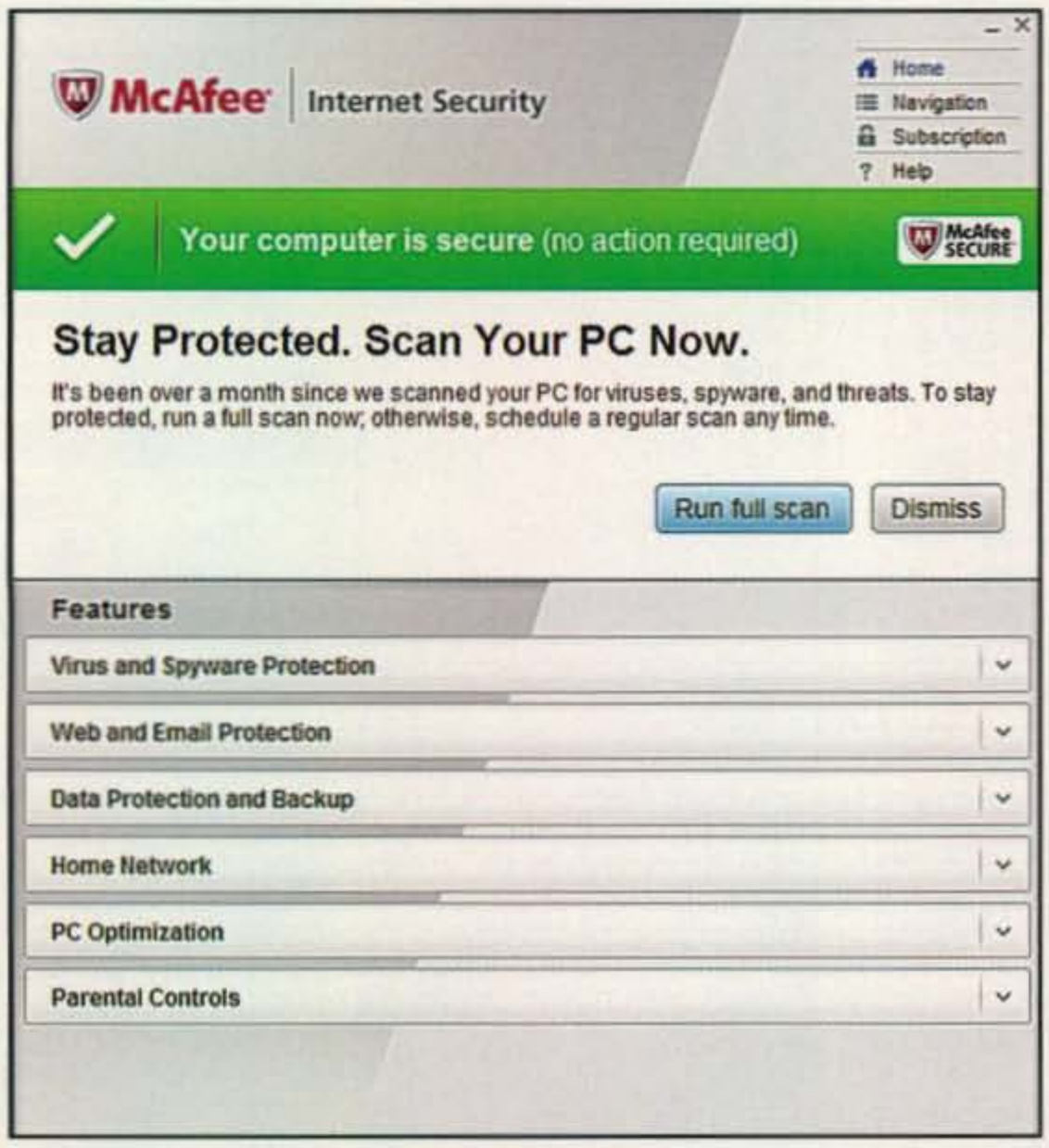
e-mail: <n2irz@cq-amateur-radio.com>



A modern version of McAfee Internet Security doesn't just help protect against viruses. Note the drop-down bars for protection against spyware, e-mail, a web firewall, local network, and parental controls to keep the kids safe. The point is, viruses aren't the only thing you need to worry about.

You also need some kind of anti-AdWare program. Windows Update contains a monthly update of its Malware program, which helps protect you from some common malicious software applications, but it's not a substitute for a more comprehensive program. There are several anti-AdWare programs offered for free (AdAware and SpyBot Search & Destroy come to mind), and every "security suite" I have seen has one as well.

For convenience, I also suggest some kind of anti-spam software. While most spam is merely annoying, and much of the more evil "phishing" messages can be spotted pretty easily, it can't hurt to have some software on your side, too.

Of course, none of these programs will do a whit of good if you don't: (a) keep them updated, and (b) use them all the time.

When was the last time you ran a full anti-virus and anti-adware scan of your computer?

I won't belabor the point, but the bottom line is, spend perhaps a few dollars a year to get as much protection as you can. It doesn't have to be a budget issue, either, as many Internet Service Providers offer internet security software for free. This is absolutely better than nothing, and you can't beat the price.

Visit the Gibson Research Corporation website (www.grc.com) and run some of its security tests, such as its classic Shields Up! Test for firewalls (under the "services" tab) and see how your computer does. Some of the articles there might seem a bit shrill in their warnings, but they have good intentions.

Then there's your browser. Not to be a zealot, but using the most popular internet browser, Microsoft Internet Explorer, might also be exposing you to a greater range of attacks, since it is a big target. Consider browsing with some other product, such as Firefox, Chrome, Safari, or Opera. Not all websites are compatible with every browser, so don't delete Internet Explorer just yet, but I've already been using these alternative browsers for a few years and have been very pleased with their security features and stability. Also, being a smaller target can't hurt.

Passwords

I've written about this before, so I'll cut to the chase: Passwords are a part of modern everyday life, and if you're like most of us, too many passwords and User IDs are already a problem. Using the same password (or, for that matter, even the same User ID) everywhere, using a word that can be found in a dictionary, or using a password that contains your name, user ID, callsign, birthday, or other significant date, address, or semi-public information is a *bad idea.* Why? Just imagine if someone, just for one night, had complete access to all your accounts. Ever set a password on a website to get something (for free!) or join a forum? You may have given away the keys to your kingdom.

Let me show you how to create a *Strong Password System*. By *strong*, I mean not easily guessed or learned, and by *system* I mean a way of setting a different password for each and every account you have, but without having to remember dozens of different passwords.

Yes, that's right: You need a different password for each and every account. Never ever re-use a password! If that sounds strong, it's meant to. Just like you shouldn't walk alone in New York City's Central Park late at night, your basic security is threatened when you use simple passwords, or the same password for more than one account.

A strong password is at least 8 characters long (most websites require 8 to 12 total characters.), does not contain all or part of the user's account name (user ID), and contains at least three of these four categories of characters: uppercase characters, lowercase characters, digits 0 through 9, and symbols found on the keyboard (such as !, @, #). For example, "strong" is not a strong password, but "$Tr0Ng" is.

Come up with a memorable (or at least memorizable) but somewhat random word of about 5 to 7 characters, and make subtle changes to it so that it becomes strong. This will become a so-called "Password Core." For example, the word "saving" could be strengthened to "s@v1Gn"; nobody would ever guess that, especially how I misspelled it. (Yes, evildoers know that people replace the letters A, S, and I with the symbols @, $ and !, so you need to go beyond simple substitutions and misspell things).

Even with such a strong password, using it everywhere defeats the whole purpose. Of course, if you had to remember a different strong password for every single account, you might resort to writing down your passwords—one of the biggest breaches of security you can commit. (If you *do* have them written down, don't. OK, maybe one copy for the safe-deposit box, but that's it! If you pass away, such a list would be useful.) Writing them down won't do, so instead develop a system for each account, using a Strong Password Core, but making modifications that only you would know.

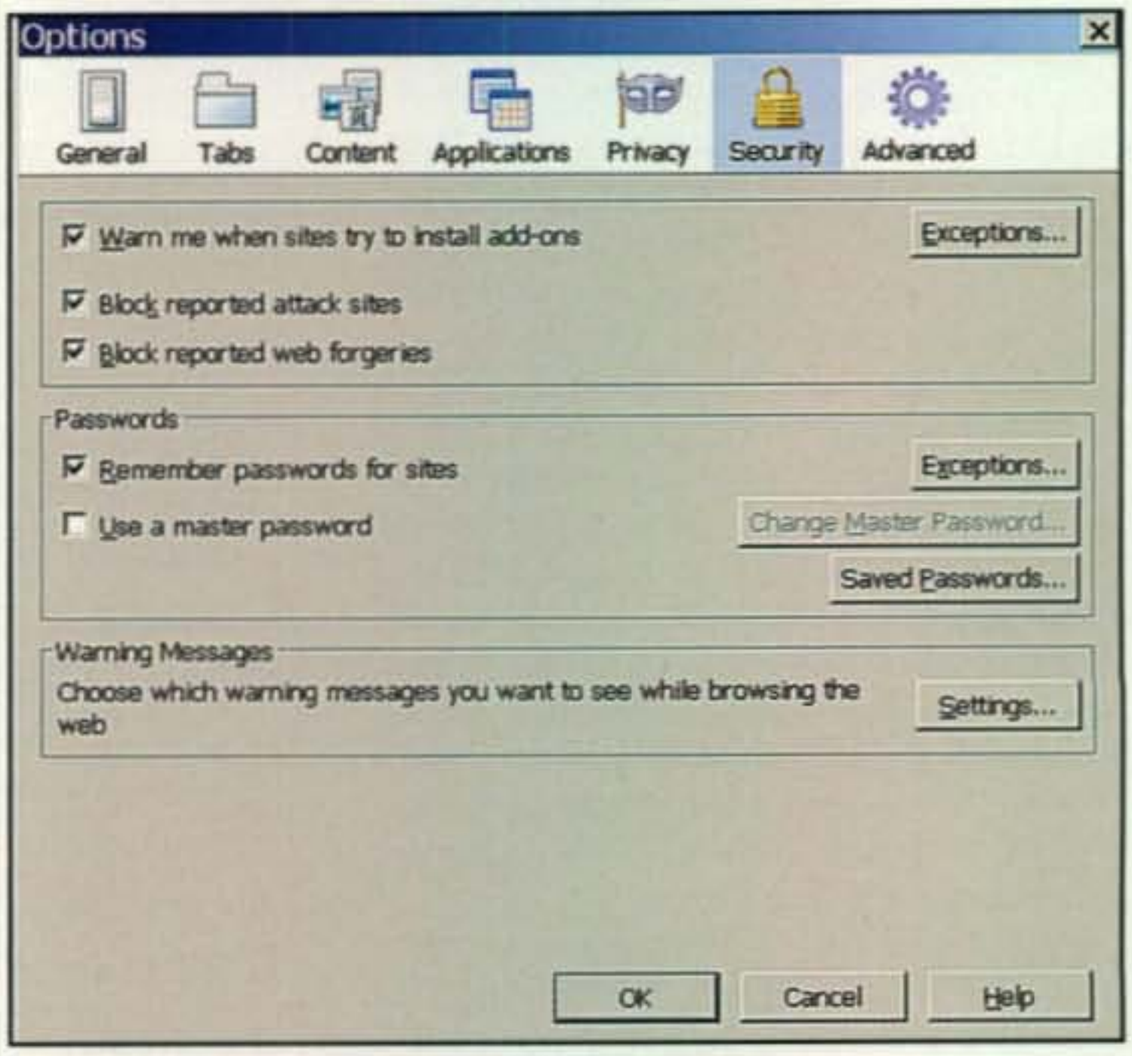
Here is an example of a password system you could use. I urge you to come up with a variation on this theme, and make that *your* system. In this way, all of your passwords will be strong and it will be very unlikely that someone will be able to gain access to any of your accounts in this way. Even if they do get one password, the others will still be secure.

Start with a secure core password, such as s@v1Gn (a distortion of "saving"). Take the first two letters of the site name (such as"eb" for eBay.com) and add those to the beginning of the strong core. Then, count the number of characters in the site name (four for "eBay") and add that to the end of the strong core, resulting in "ebs@v1Gn4" for your eBay account, and "pas@v1Gn6" for your PayPal account. For non-web passwords, you can count the number of letters in the application name, such as five for "Excel."

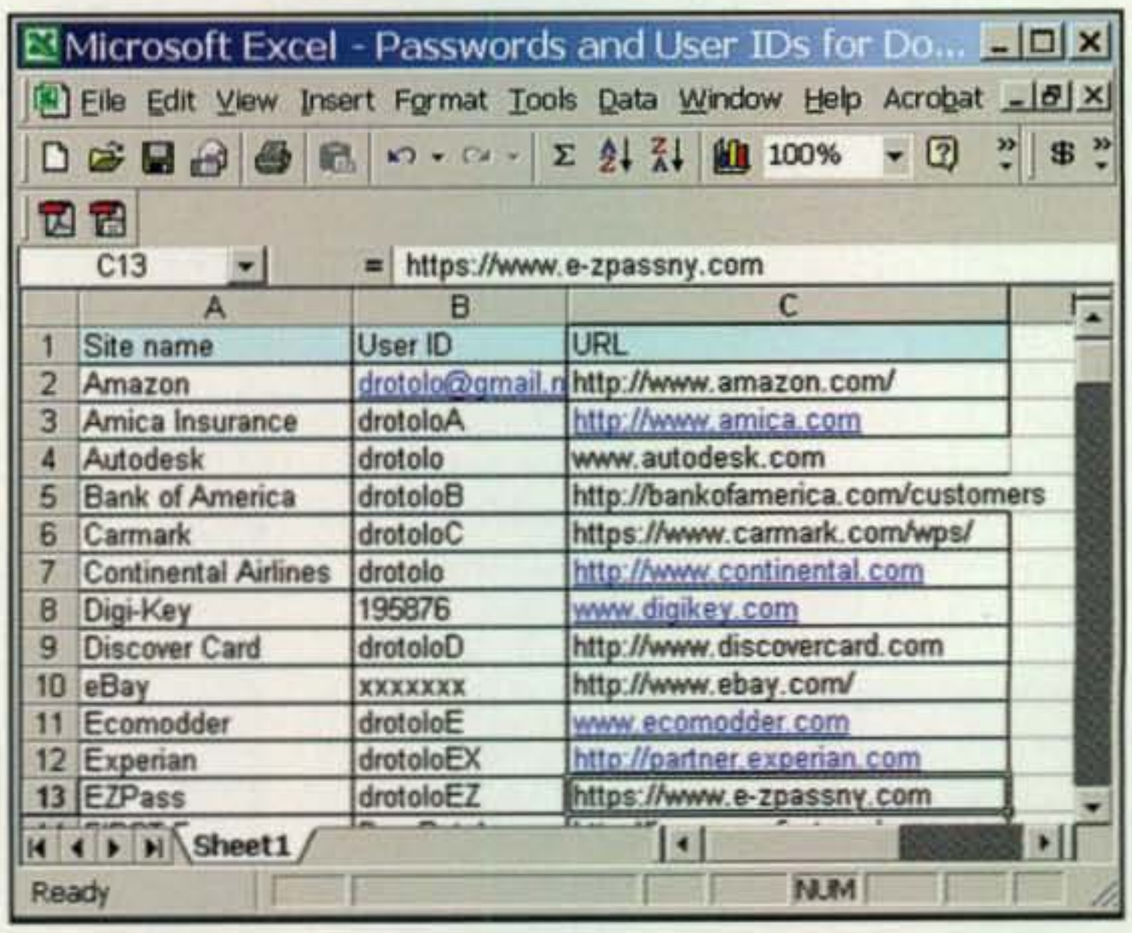
You can see how each account's password will be different and difficult to guess, but easily memorized if you know the system and the core. Please feel free to use the system described, but I strongly recommend picking a core that makes sense to *you*, and of course making at least some minor changes,

such as reversing the letters, using different letters (or in different positions), moving the number, or something like that. You can use different core words for home and for work, or for critical websites (such as banking or investing and others).

Now you can safely write down all your User IDs (along with the website URL) without having to write down the passwords. While having all your User IDs might help some criminal, your passwords remain completely secure.

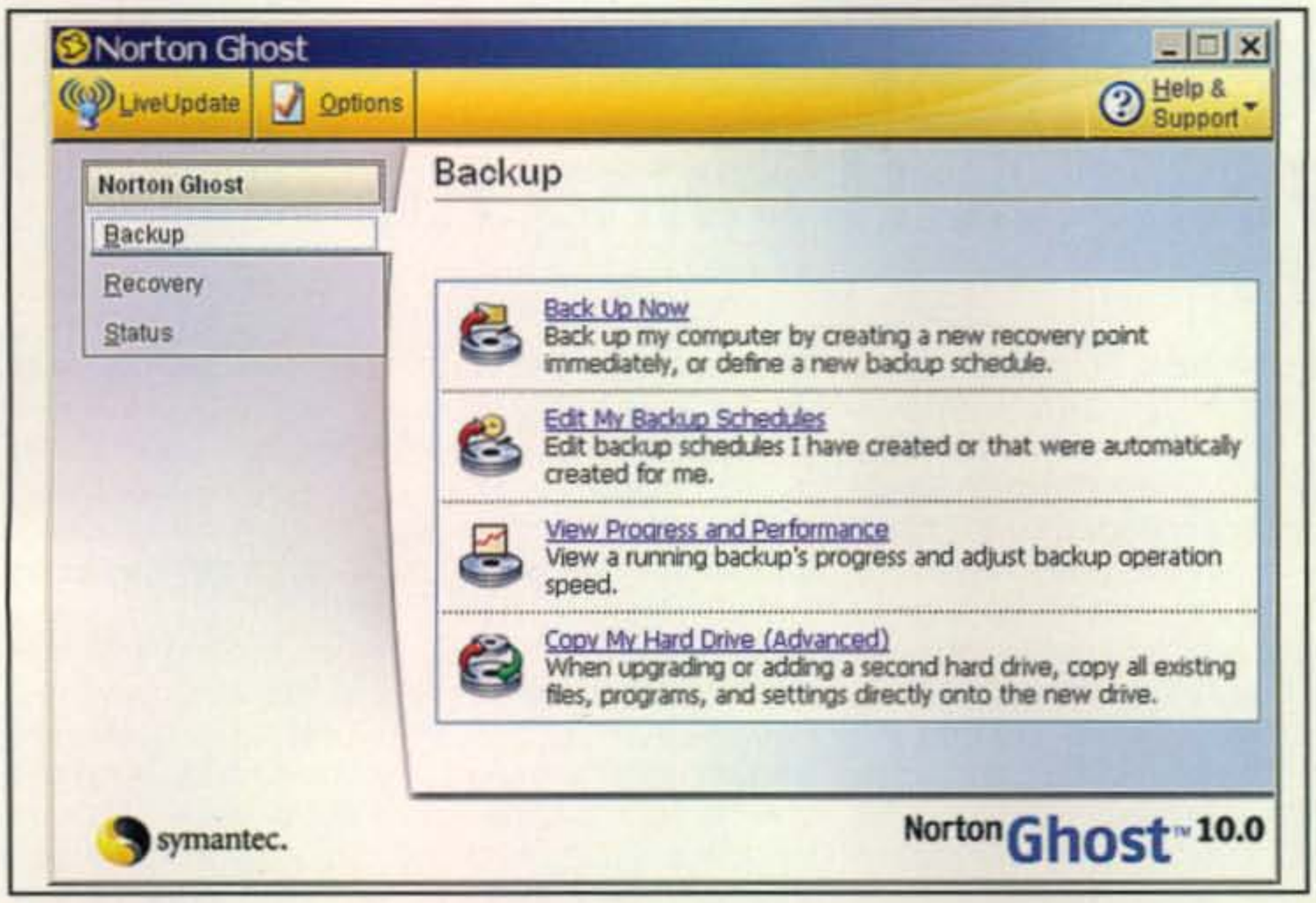


The Firefox browser's Tools menu. The default security settings are pretty good, but you can get as tough as you want; the Help file explains how. The options for Privacy protect your own data, Applications sets permissions for what can access the internet, and Content helps regulate what your browser will display. Alternative browsers tend to be more secure, partly because they are not such big targets.



	A	B	C
1	Site name	User ID	URL
2	Amazon	drotolo@gmail.r	http://www.amazon.com/
3	Amica Insurance	drotoloA	http://www.amica.com
4	Autodesk	drotolo	www.autodesk.com
5	Bank of America	drotoloB	http://bankofamerica.com/customers
6	Carmark	drotoloC	https://www.carmark.com/wps/
7	Continental Airlines	drotolo	http://www.continental.com
8	Digi-Key	195876	www.digikey.com
9	Discover Card	drotoloD	http://www.discovercard.com
10	eBay	xxxxxxx	http://www.ebay.com/
11	Ecomodder	drotoloE	www.ecomodder.com
12	Experian	drotoloEX	http://partner.experian.com
13	EZPass	drotoloEZ	https://www.e-zpassny.com

When you have a Strong Password System, you never have to remember your passwords, even though you have a different one for each website. I do need help remembering my user names, though, so I built myself this Excel spreadsheet to keep track. I can recreate the correct password for any site, even years in the future, by following "The System" and knowing "The Core." (See text.)



Norton Ghost ready to run a backup. My entire hard drive is copied every week, on a regular schedule, running in the background for about a half hour. Take another look at the first figure in the column. McAfee also has a decent backup system, and the one that ships with Windows® is pretty good, too.

This system only takes a few minutes to set up, and I think you'll find that the benefits far outweigh the effort. As I get older, I find that my memory isn't what it used to be. Time once was, I'd visit a website and be unable to remember my password. Using a password system has completely eliminated that. For example, N2IRZ was up for renewal recently, and I hadn't been to the FCC's CORES website in at least five years. No worries. I merely applied my system, and got right in—no "Lost Password?" link for me! This system has made my daily life so much simpler and the extra security is just a free bonus!

Backups

Let me tell you another story: In June the laptop computer my wife uses suffered a hard disk failure. The computer would try to boot, but invariably display the Blue Screen of Death before booting fully. I happened to have a compatible hard drive loaded with an operating system, and I found that it booted just fine. Luckily, the place we bought it from offered a free service: They would re-image the hard drive any time we wanted. I brought them the extra HDD and laptop, and an hour later we had everything working like new. With one exception…

I back up my entire hard drive every week, religiously, using Norton Ghost. I simply set a schedule and it reminds me when it's due. I connect an external hard drive via USB and let it run. My wife, well, let's say she hadn't found religion just yet. The most recent backup was from several months ago, and that's one that I had run. Thus, all our photos of Shenandoah National Park, letters written in support of medical claims, all her more recent web favorites … all gone to the big bit bucket in the sky.

Windows comes with a decent backup utility. I use it at work. It's not as friendly as Norton Ghost, but it has the advantage of being free. These days, you can get a 1-Terabyte external hard drive for well under $100. (I can remember when a Terabyte cost more than the George Washington Bridge!). As with anti-virus software, many ISPs (and others) offer a few Gigabytes of online backup storage for free, in the hopes that you'll buy additional space some day. As long as you have a fast internet connection, and trust the data security systems of the provider to ensure your files don't fall into evil hands, price and convenience are no longer obstacles to this part of keeping yourself safe and productive.

Just like walking through New York City's Central Park late at night, the internet can be a dangerous and scary place. One mishap and you could be cursing yourself for months, or years. Just a small investment in time can help make that part of your life worry-free. Be careful out there!

What Would You Like?

In the August 2010 column we had a whirlwind discussion of Computer Numerical Control (CNC) and how you could build a machine controlled by software. I showed my CNC printed-circuit drilling machine as an example. That topic was somewhat removed from amateur radio, but based on the communications I have received, it seems to have been popular and well-received.

This being an amateur radio magazine, however, my friendly editor would probably prefer that I put more focus on amateur radio topics (I haven't asked him though; I'm just speculating). *(But you would be correct, HI!—W2VU.)* What it really comes down to is you, since you're the customer. What would you like to see in this space for December 2010? Please write to me; I have both US Mail and e-mail addresses listed on the first page of this column, and I check often. Want to hear more about WinLink 2000 or WINMOR? How about Software Defined Radios or PSK-31? Need help deciding on a Sound Card to Radio interface? Something I haven't mentioned here? Please, let me know what you're thinking.

73, Don, N2IRZ

kit-building

BY JOE EISENBERG,* KØNEB

Parts Placement and a Fun Fox-Hunting Kit

Since the last issue I have finished building the Small Wonder Labs Retro-75 in the case that SWL sells for it. Alignment was very easy, and it works well using a $10 RadioShack cassette recorder mic recommended by the manufacturer. Remember to remove and save the 8-pin IC that is called for in the manual, as it is not needed after alignment and can cause noise. I think the only change I might add later is to find a way to put the modulation-indicator LED on the front panel instead of having it on the board inside the case. Like most kits, there is always room for little improvements that a builder can easily make after it is completed.

Parts Placement Tips

When building a kit, to save time I often place more than one part on the board at a time, especially when adding resistors and capacitors. Then I solder them as a group, trim the leads, and double-check to be sure I have placed all of the parts where they belong. I have been asked by readers to explain my techniques for placing parts on the board so that they stay in place when turning over the board for soldering. With resistors, I simply bend the leads outward enough so that the resistor stays in place. With capacitors, you can do the same, but be very careful how hard you bend the leads, being careful to not break the brittle disc type of capacitors. You want the capacitor to be close to the board, but do not force it if the lead distance on the board is much different from the lead spacing on the capacitor. If there is a difference, it is easy to cause them to break. The traditional ceramic as well as the newer blue and yellow ceramic capacitors have leads that easily can be broken off at the base of the capacitor, so always be aware of how you mount them. Using two sets of very fine-tip needlenose pliers to shape the leads without touching the capacitor itself is the best way to mount one that does not exactly fit the lead spacing provided for on the board.

Also keep in mind that when dealing with low-value capacitors (usually in the low picoFarad ranges, such as 5 pF, 22 pF, etc.), you need to be aware that if the capacitor is standing too far above the board, the capacitance of the leads becomes a factor, increasing the capacitor's value and changing the circuit's performance. If the capacitor is part of an oscillator, leaving it too far above the board can also cause the circuit to drift, as the capacitor possibly can wiggle on its leads, changing its apparent value if it is already a low-value picoFarad capacitor.

Small glass diodes such as the 1N914 or 1N4148 are another common troublesome component for many builders. Once again, using two sets of needlenose pliers, one to hold the lead near the glass envelope and the other adjacent to it on the wire, can shape the bend to fit the board without breaking the glass. Diodes with thicker leads but a plastic body, such as the common 1N4001, can still crack. Using the two-pliers technique works well.

When mounting transistors, I make extra sure the part is oriented with the proper leads in the correct holes and then carefully bend each lead outward so the part does not move when I turn over the board. I try to only do one transistor at a time to give myself a chance to make sure that the part is where it belongs.

ICs are another subject. Some kits supply sockets for the ICs and some do not. A socket is a good idea, as should there be a problem, it allows you to remove it without causing damage to the board (or the IC). There are a few circumstances where a socket is not desirable, especially if heat transfer to the board is needed, as in the case of some power-amplifier ICs. When soldering an IC socket, be sure not to overheat the pins or put too much solder on them, as some types of sockets will wick up the solder into the part where the IC pins go, making it impossible to properly seat the IC. The socket can also sometimes melt from excessive heat. Make sure you put the notch of the socket where it is marked on the board to remind you to place the IC correctly in the socket. I also use a pin straightener to make inserting ICs a lot easier. I'll have more construction tips in a future column.

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The finished Retro-75 75-meter AM transceiver from Small Wonder Labs.

"Handi-Finder" Fox-Hunting Kit

At a recent hamfest in Cedar Rapids, Iowa, I was introduced to a kit that is designed for radio direc-

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Weather-proof window feedthrough panels bring coax, balanced lines, HF/VHF/UHF antennas, random wire antennas, ground, rotator/antenna switch cables and DC/AC power into your hamshack without drilling through walls!

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Inside/outside stainless steel plates ground all coax shields. Stainless steel ground post brings ground in.

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Four 50 Ohm *Teflon*® SO-239 coax connectors lets you feed HF/VHF/UHF antennas at full legal power limit.

A 50 Ohm *Teflon*® coax *N-connector* lets you use any antenna up to 11 GHz, including 450 MHz, UHF, satellite, moon bounce and 2.4/5.8 GHz Wi-Fi antennas.

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A pair of high-voltage *ceramic feedthru insulators* lets you bring in 450/300 Ohm balanced lines directly to your antenna tuner.

Has random/longwire antenna *ceramic feedthru insulator*.

***5-way** binding posts* lets you supply 50 Volts/15 Amps DC/AC power to your outside antenna tuners/relays/switches.

Stainless ground post brings in ground connection, bonds inside/outside stainless steel panels together and drains away static charges.

MFJ's exclusive *Adaptive Cable Feedthru*™ lets you bring in rotator/antenna switch cable, etc. without removing connectors (up to 1¼X1⅝ in). Adapts to virtually *any* cable size. Seals out rain, snow, adverse weather.

3 Coax, Balanced Line, Random Wire

Best Seller! 3 *Teflon*® coax connectors for HF/VHF/UHF antennas. Separate high voltage *ceramic* feed-thru insulators for balanced lines and longwire/random wire, Stainless steel ground post.

MFJ-4602 **$69.95**

6 Coax

6 high quality *Teflon*® coax connectors for HF/VHF/UHF antennas. Stainless steel ground post. Full 1500 Watt legal limit.

MFJ-4601 **$59.95**

4 Balanced Line, 2 Coax

4 pairs of high-voltage *ceramic* feed-thru insulators for balanced lines and 2 coax connectors.

New! MFJ-4600 **$79.95**

5 Cables, any-size

5 *Adaptive Cable Feedthrus*™. Pass any cable with connector: 2 cables with large connectors up to 1¼x1⅝ inches and 3 cables with UHF/N size coax connectors. Seals out weather.

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All-Purpose FeedThru/CableThru™

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MFJ-4605 **$159.95** **New!**

Bring cables thru eave of your house

MFJ-4616
shown with standard full-size vent (not included) it replaces. For *6 Cables*
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MFJ-4613
shown with standard half-size vent (not included) it replaces. For *3 Cables*
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Bring in coax, rotator, antenna switch, power cables, etc. *with connectors* up to 1¼x1⅝ inches!

Sliding plates and rubber grommets adjust for virtually any cable size to seal out adverse weather, insects and varmints. Use existing vent hole, mounting screws and screw holes.

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Bring nearly any cable -- rotator, antenna switch, coax, DC/ AC power, etc. -- through walls *without removing connectors* (up to 1¼x1⅝ inches). Sliding plates and rubber grommets adjust hole size to weather-seal virtually any size cable.

Includes *stainless steel* plates for each side of wall, sliding plates, rubber grommets, weather stripping and screws.

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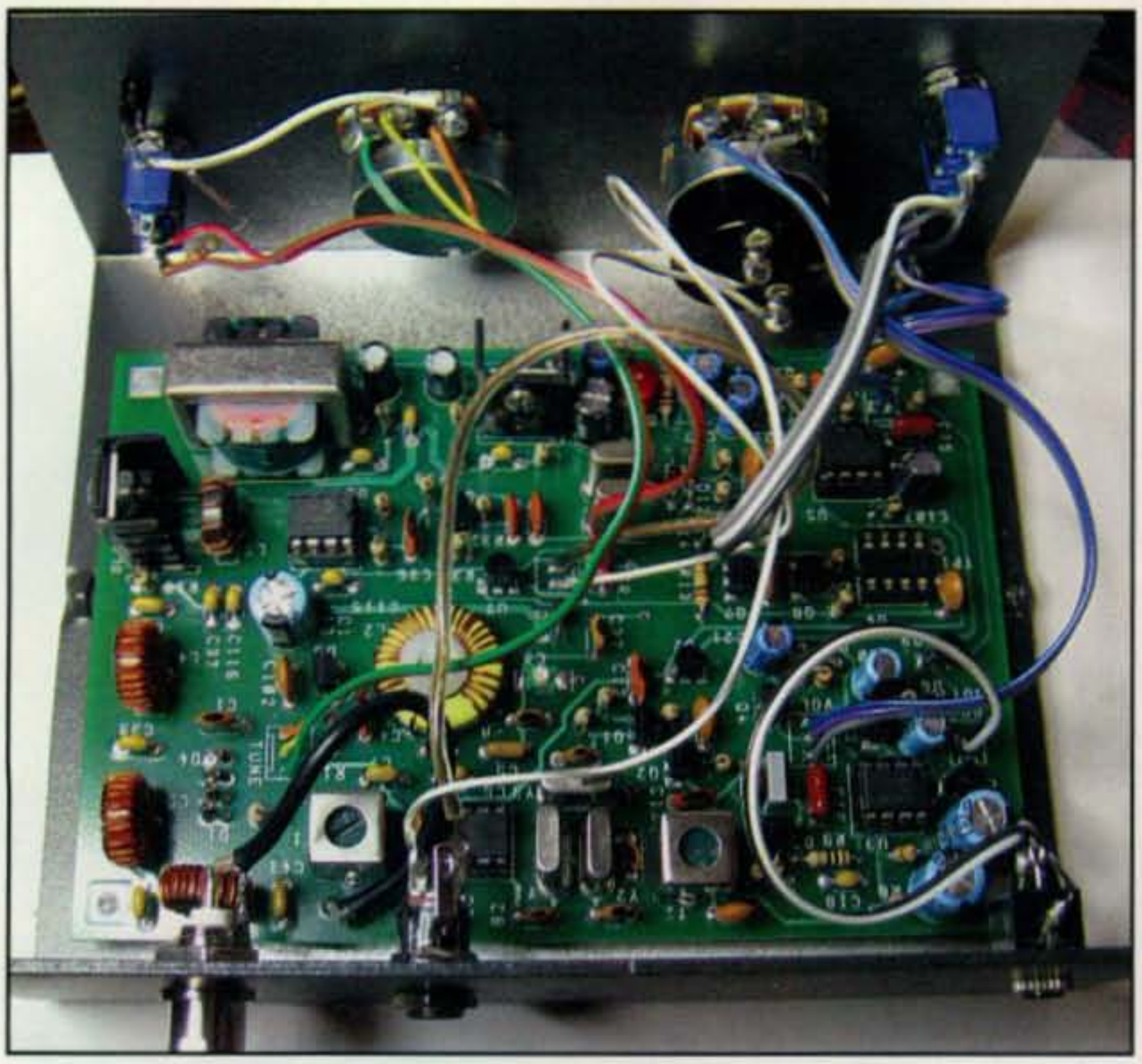
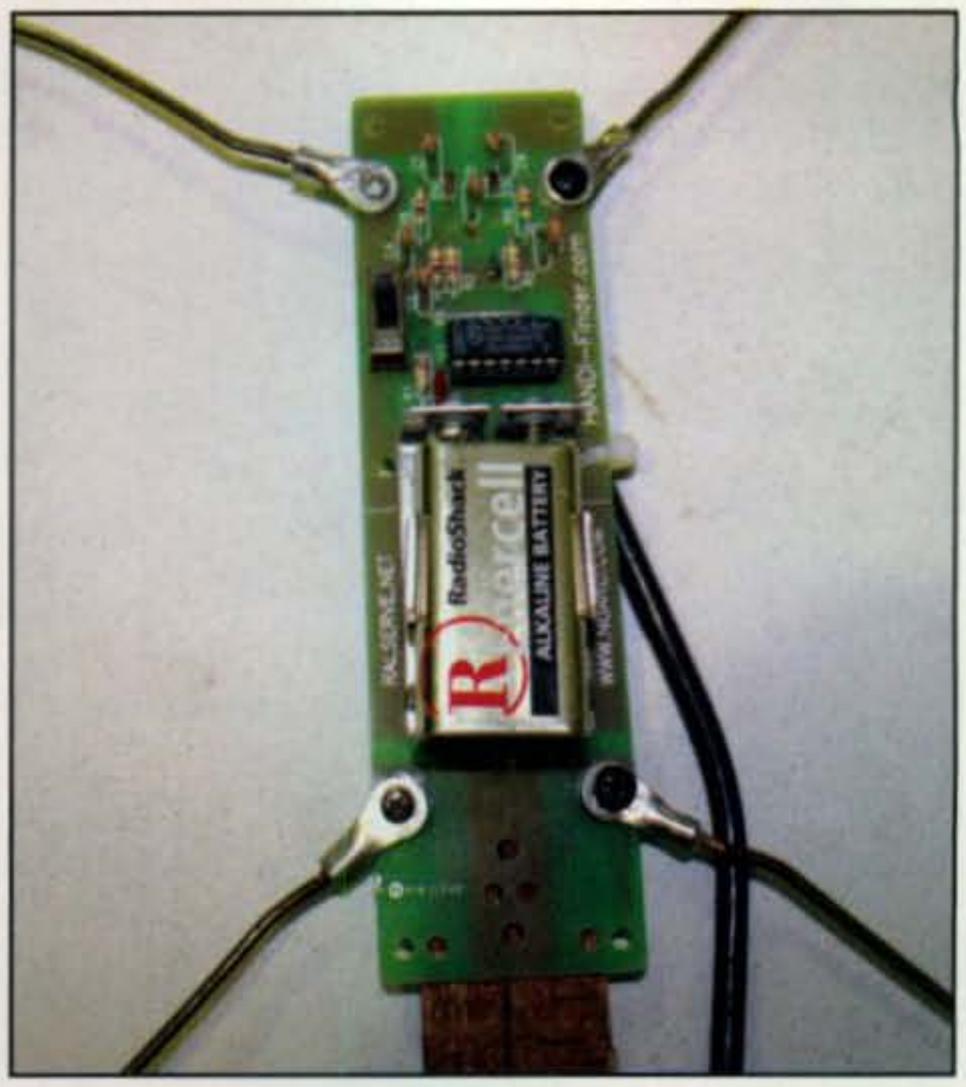


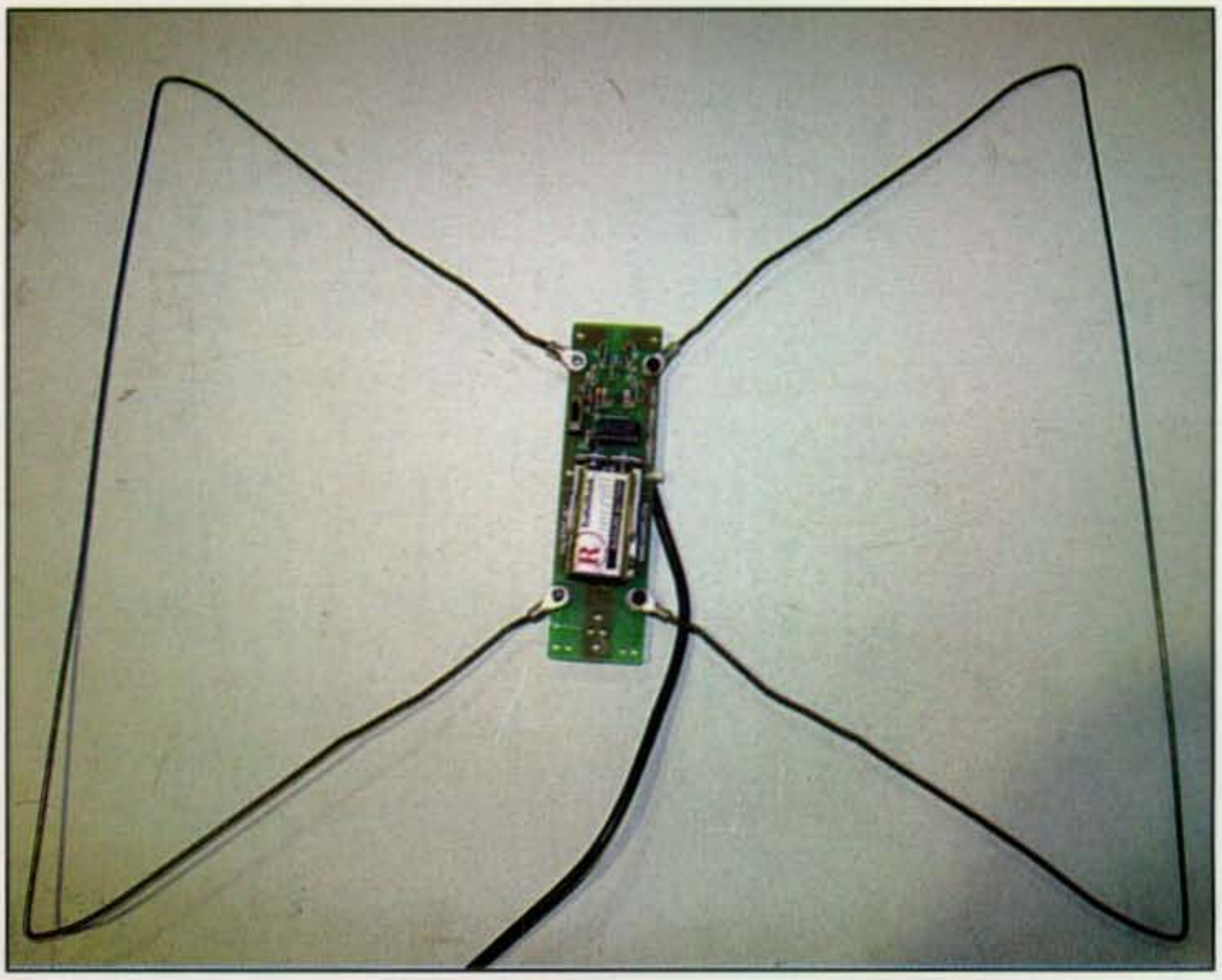
Interior view of the Retro-75.



The Handi-Finder "fox-hunting" kit, as assembled by Lelia Garner, WA0UIG, a irst-time kit builder.

tion finding (RDF), better known as *fox hunting*. This direction-finder kit is very simple, inexpensive, and can be built quickly. It is ideal for a group kit-build experience and typically can be assembled in less than an hour.

It is called the "Handi-Finder" from Rick Wells, K8SCI, is available on the web at <http://www.handi-finder.com> . There are discounts available for group purchase. I counted six resistors, seven capacitors, two diodes, and one 14-pin IC with socket, as well as a 9-volt battery holder and a switch, all mounting on the single-sided PC board. Don't forget to put in the short wire jumper as



The Handi-Finder, including the coat-hanger antennas. (See text for details.)

called for in the directions! In addition to what is supplied in the kit, you will need a short length of RG-58 or RG-174 coax and a connector for your HT, as well as something to use for a handle and a 9-volt battery. The handle options are also listed in the manual, with things such as a broom handle or paint-roller handle as possibilities. Also, you will need two wire coat hangers to form the antenna. The circuit compares the phase of arriving waves and produces a tone that is nulled out to find the direction of the signal. When the antenna is perpendicular to the signal, the tone nulls out, indicating the signal is in front of or behind the antenna. It works equally from both directions, so moving and taking another reading will help you to zero in on where the RF is coming from.

This kit works with any VHF/UHF receiver, such as those in HTs or handheld scanners from 45 to 450 MHz. It can also be used to find any carrier or FM or AM signal, including FM broadcast and AM aircraft band signals. This kit is great for finding stuck microphone switches or other interfering signals on a repeater as well as for organized fox hunts. It is very handy to have around during public service events should interference to your repeater become an issue.

Building this kit as a group not only will help your club teach kit-building, but also encourage direction finding and help keep repeater jammers at bay. According to the manual, it only draws 1.7 ma from the battery, giving it very long life in the field. This is also the reason why there is no LED pilot light, as the LED would draw 10 times what the circuit itself draws. Just be sure to turn it off when you are done using it. Even a 1.7-ma current draw will eventually drain the battery. Connecting it to an outside power supply is not recommended, as it would require a lot of noise filtering to keep power-supply noises from interfering with the circuit. Hats off to Rick, K8SCI, for this fine kit!

Kits from China?

Lately I have seen a lot of new Chinese-made multiband transceiver kits advertised and have not seen one in person, so I am turning to my readers. Please e-mail me if you have had any experience with them and how they work. I am especially interested in finding out how easy it is to follow the directions and how easily they go together.

Until next month, 73 de KØNEB

qrp

BY CAM HARTFORD,* N6GA

Recycling Radios, Seeing Spots and Raindrops

This time we have several topics to cover: some hardware, some software, and just some general chewing of the rag, so let's get right to it.

SOTA

Last month we joined up with Ian Maxwell, MMØMXW, during his hill-topping activities in Scotland. He wrote, "I was up on the summit of Black Hill in southern Scotland (GM/SS-167 in the SOTA scheme)." The reference to the SOTA scheme caught my eye. I had seen mention of SOTA (Summits on the Air) in the past but hadn't paid much attention. I dug into the SOTA website (http://www.sota.org.uk) and was surprised to find an extensive worldwide organization devoted exclusively to portable radio operating.

Started by a couple of Brits back in 2002, the program came into being to encourage portable radio operations in mountainous areas. It offers awards for those who operate from summits ("activators") and for those who work the activators from home ("chasers"). This makes it possible for everyone to participate, as one doesn't have to be a mountain goat to get involved. Those familiar with the IOTA (Islands On The Air) program will notice a certain similarity between the two.

The structure of SOTA includes a parent organization and several local associations. In Europe, the local associations tend to be countries, while here in the USA, they are call areas. Each local association has a manager who is responsible for maintaining the lists of summits in his/her geographic locale. Because the organization began in Great Britain, it took hold there first, followed by Europe. The first association to start up in the USA was the W2 area in March 2007. Since then the W1, W3, W5, W6, W7 and WØ areas have joined in.

There's a ton of information available on the SOTA website. Besides the necessary information on the structure and management of SOTA, there's info on how to get involved; a list of the associations where you can find out about your local area, its manager, and qualifying summits; lists of honor rolls of activators and chasers; a database where more info than you could ever need is accessible; and a separate site called SOTAwatch2, which includes notifications of upcoming activations and spots of current activities, as well as an e-mail reflector.

Feeling a bit overwhelmed, I put in a call to Stu Schreiber, KI6J, the W6 association manager. My immediate impression of Stu was that he is both an avid mountaineer and an avid radio guy. One of Stu's duties is to decide which peaks qualify as valid for the purposes of SOTA. I'd been looking over the lists of qualifying summits on the website and thought I'd identified a few that were missing. Stu explained that the rules regarding what qualifies a site as a valid summit are well defined. He started his tenure by listing the most obvious couple of hundred peaks in the state, but said that if anyone wants to activate a peak not already on the list to let him know and he'll add it as long as it makes the grade.

Judging from the number of activations that have taken place in European countries over the past eight years, I can only think that this operating activity will grow substantially on this side of the pond. Here are a couple of numbers from the SOTA Database Facts and Figures page: Number of registered users, 2822; Registered summits, 28,076; Number of activations, 49,691! Not listed in the database, but probably just as important, is how many hams have been motivated to get out, take a hike, burn some calories, and make some portable Qs.

Seeing Spots, QRP Style

As I'm writing this, I see WGØAT has popped up on QRPSPOTS.com. Think I'll give him a call and see if he took home a new Yaesu hat from the Dayton Hamvention® and if so, whether it has become a snack yet for Rooster or Peanut.

Terry, WAØITP, sent me a note describing this website which is hosted by the Four State QRP Group. It works like a DX spotting net but is set up for the benefit of QRPers. It's really simple to use.

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

Photo A– Bill Prats, K6ACJ, sent along this photo of a nifty little accessory box he made as a companion to his older 706 and some simple QRP rigs. It contains a set of touch paddles, a NESCAF filter, and a K1EL K10 keyer, as well as all the batteries.

If you hear a fellow QRPer calling CQ, the first thing to do is call him or her and make the contact. The second thing to do is go to this website and post his call, frequency, your call, and any comment you'd like to make.

Self-spotting is also encouraged on this website. This allows you to tell the QRP world that you're on the air looking for contacts. I've found it can be very lonely on 14.060 MHz on a weekday afternoon, especially if you've gone out for a hike with your radio gear only to find no one to talk to. A self-spot might alert someone who's sitting in front of his computer (instead of his radio, where he should be) that you're going to be out in the wilderness looking for Qs.

If you're already out on the trail, away from your computer and want to let the QRPSPOTS world know you're radioactive, your cell phone can make the link for you. Check out (http://qrpspots.blogspot.com/). QRPSPOTS.com can be accessed through Twitter, so if you're not too far out there you can drop a spot to the website.

Thanks, Terry, for the info. QRP SPOTS is located at <http://www.qrpspots.com>.

AZ SQRPions Ft. Tuthill FDIR

The AZ SQRPions staged its annual Ft. Tuthill FDIR on the weekend of July 30–31. No, that's not a typo. If the QRP ARCI can have its annual FDIM (Four Days in May), the Tuthill boys can have their annual FDIR (Four Days in Rain). Damn the thunder boomers; full speed ahead!

So what if it's monsoon season in Arizona? They need all the rain they can get. Actually, the only people who were affected by the rain were the ones who chose camping over motelling. And among the campers, it was a problem only for the few who chose tents as opposed to vehicles with hard sides and leak-proof tops. Just sayin'. We knew who we were.

On the bright side, it didn't rain all day Saturday when we were inside listening to the presenters. The all-star roster of speakers hit on a good variety of topics, to wit: Ward Harriman, AE6TY, shed some light on what it takes to roll your own software defined radio; Ned Stearns, AA7A, a veteran of DXpeditions to Africa, showed us an easy path to designing effective antenna couplers with the help of a VNA (vector network analyzer); Jim Duffey, KK6MC, covered the landscape of putting together a successful QRP Field Day effort; Ade Weiss, WØRSP, waxed eloquent about propa-

Photo B – Ken LoCasale, WA4MNT, shows off his latest copper-plumbing sculpture to Mark, W2OR, at Ft. Tuthill.

gation; and Mike Baker, K7DD, showed off some bandpass filters suitable for Field Day that looked good both in person and on the spectrum analyzer.

The flea market/swap meet was a little subdued due to Mother Nature's liquid offerings, but the Saturday evening picnic dinner barbeque lived up to its billing. More importantly, QRPers gathered, stories were swapped, and friendships were made and strengthened. We'll be back.

N2CQ Contest Calendar

If you are involved in QRP contesting or want to become involved, the calendar maintained by Ken Newman, N2CQ, is a valuable asset you should know about. Ken updates his calendar weekly and posts it to most of the popular QRP websites and e-mail lists such as QRP-L, Elecraft, QRP ARCI, and NJQRP. Some of the webmeisters only include the calendar bi-weekly or monthly, but all the info is still available.

Besides listing the date, time, and sponsoring website of each contest, Ken gathers the contests into three basic types. These are "QRP contests," which are sponsored by a QRP organization; "QRP Category," which is a contest sponsored by a non-QRP organization but which includes a QRP class of operations; and a "QRP entries are noted" contest wherein the sponsoring organization doesn't score the QRP entry any differently than anyone else, but does note "QRP" in the results.

In addition to posting his calendar on various websites, Ken sends out his calendar via e-mail to a list of subscribers. If you'd like to receive the calendar by e-mail, just let Ken know by sending him a note at <N2CQ@comcast.net>.

One Man's Trash . . .

This is the first of what I hope to be a regular series on recycling radio gear. The SWR bridges that appear in photo C are typical of ones that you occasionally see at swap meets. My guess is that they were originally intended for 11-meter use and that they were made by one company far across the sea and were sold under several names. We have a Quement and a Siltronix in the picture, and I have another one at home that was sold by Midland.

I bought the top one in the photo at a swap meet for $5.00. From the condition of the meters it looks like it was dropped on its head, but the meters cleaned up and they work well. The bottom one has been resting comfortably in Charlie Lofgren, W6JJZ's closet for several years and looks like it's brand new. I like his unit better because the coax connectors are on the back, not on the sides. That makes it easier to place it on a desk next to other pieces of gear, especially when you are using RG-8 coax.

The reason I was attracted to this meter is that cross-needle meters make me go cross-eyed. It struck me that separate forward and reverse meters would be very valuable on Field Day. Once you

Photo C– Two versions of the same SWR bridge. The top one appears to have had a harder life than the bottom one, but it cleaned up nicely and works well after a little surgery.

got your rig and antenna tuned, you could set the pot so that the forward meter was reading full scale. After that, an occasional momentary glance would tell you that your output power was up to par and the SWR wasn't messed up. As you pounded the brass or shouted into the mic, one meter would bounce up and down and the other wouldn't move, meaning that nobody has kicked the coax, tripped on a guy wire and knocked down an antenna, or done something stupid like turn down the power while thinking he was adjusting the audio filter bandwidth. (Guilty as charged, your honor, but it was a new K3 and I hadn't committed the manual to memory yet.)

On the way home from the swap meet where I made this purchase, Charlie (W6JJZ again) said he thought these meters were designed for a higher power

Photo D– This is Charlie Lofgren, W6JJZ's SWR meter after transplantation of his homebrew Manhattan-style Stockton Bridge.

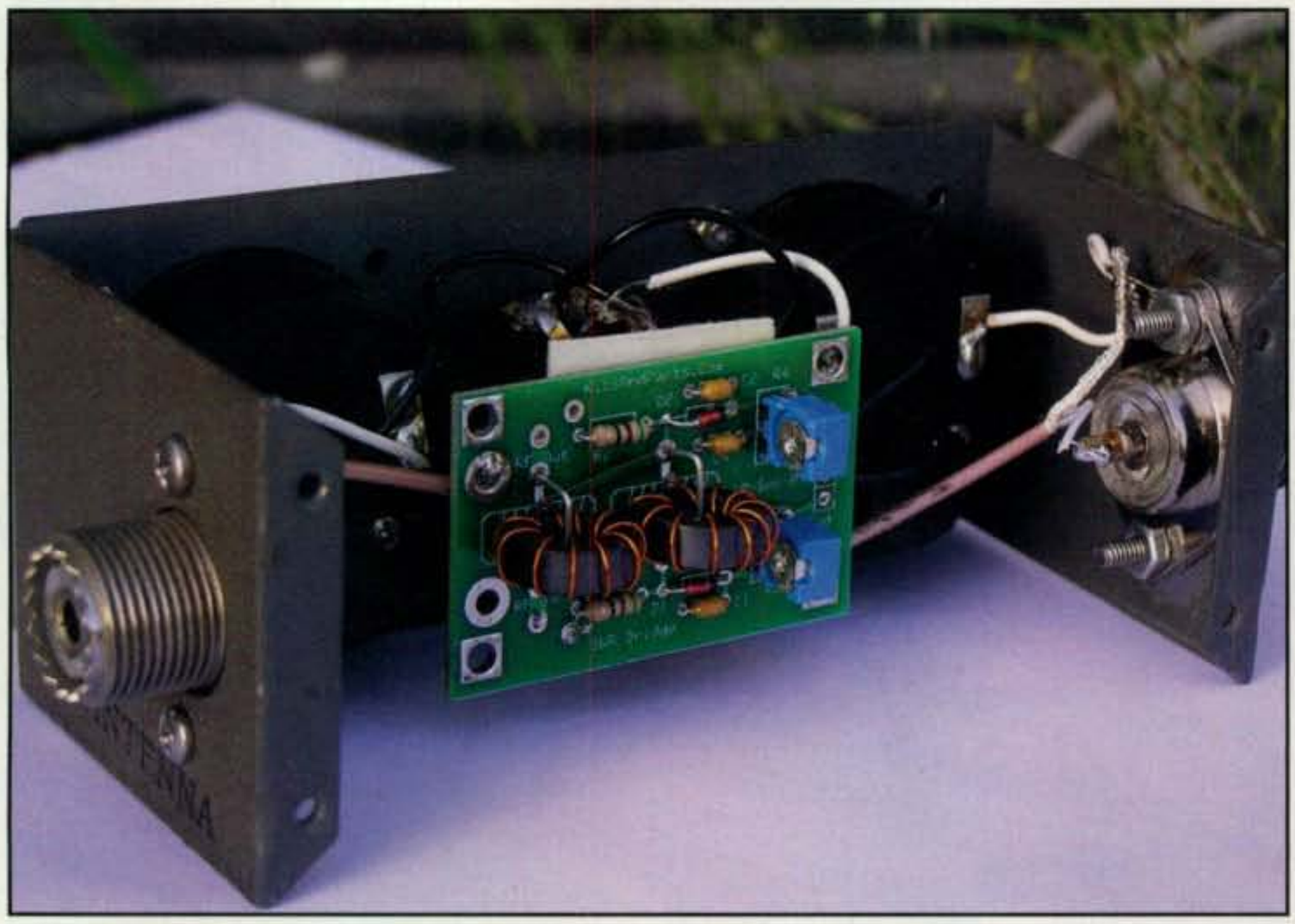


Photo E– The author took the easier road and ordered up a kit from Diz at Parts and Kits Dot Com. (See text for details.)

level than was typical in QRP operations and that they may have used a Monimatch type pick-up. Back home I checked out mine and he was correct. On the lower bands, it was fairly deaf and needed plenty of watts for a full-scale reading. We each pulled ours apart and found the Monimatch lurking inside. After pondering the situation, Charlie suggested that a Stockton bridge is much more sensitive and could probably be substituted. We then attacked our units with the appropriate tools and soon the Monimatches were gone.

Charlie proceeded to build a Stockton unit from scratch, Manhattan style (photo D). This circuit has shown up often in the ham literature, Charlie taking his design from *W1FB's Design Notebook* (ARRL, 1990). It was originally described by D. Stockton, G4ZNQ, in the Winter 1989 edition of *SPRAT*, the journal of the G-QRP club. I took the easier route and ordered a kit (photo E) from Diz at Kits and Parts Dot Com (http://kitsandparts.com/). There was plenty of room inside the case for the new boards, and we both used some double-stick tape to affix the boards to the back of the ganged dual pots.

The end result is we now have SWR bridges sensitive enough for QRP work, and I have a slightly higher level of peace of mind during Field Day. I especially like this bridge at night when folks walking around in the dark are more likely to trip or become entangled in the spider webs we weave in the daytime. As an added benefit, a couple of older pieces of gear were repurposed and saved from a possible toss in the bin.

Repurposing a Softrock

A radio person would have had to be living under a rock lately to have missed hearing of software defined radios (SDRs) or Softrocks. In his December 2007, column Dave Ingram, K4TWJ (SK), described the SDR revolution in general and the Softrock radios specifically. About a year ago, I stopped to check out the Softrock website and promptly fell down the SDR rabbit hole. Be afraid, be very afraid.

It's only natural for us to be lured by the temptation of new radio technology. We're hams. We are a curious and creative lot, and we don't like new technologies to pass us by. That, along with a price tag of $20 for a monoband receiver kit, certainly helped to whet my appetite. I built the Softrock and was amazed at what this tiny little board could do. Well, more precisely, the tiny little board plus the help of the 100 million or so transistors inside my Dell Dimension. But let's not get bogged down in details.

After experiencing amazement at the capabilities of the tiny board, most Softrock builders follow a natural progression and move on up to a multiband receiver or transceiver. After using my monoband Softrock for a couple of months I found my way back to Tony's website and fell prey to a Softrock RXTX V6.3-Xtall. That's a big name for a tiny multi-band transceiver. This one has plug-in boards for the receiver and transmitter bandpass filters and a dip switch to change the frequency of the SI-570 programmable oscillator. It's lots of work to change bands, but the radio works like magic. (Softrock kits are sold by Tony Parks, KB9YIG, at <http://www.kb9yig.com/>. Building instruc-

Photo F– The author's K2 with Clifton Laboratory's buffer amp installed. The board is mounted on a threaded standoff which replaced a very conveniently located screw on the main circuit board.

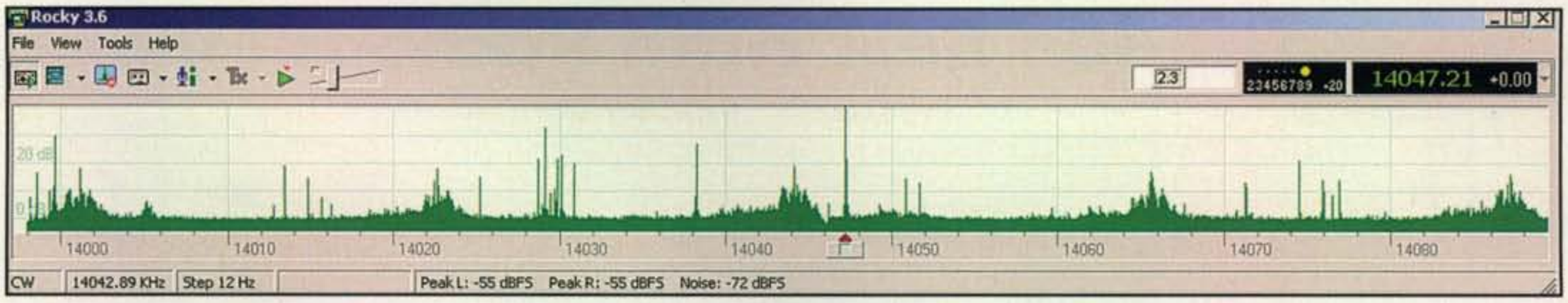


Photo G– Rocky pressed into service as panadapter display for the K2. With a sound card capable of 96K sampling rate, a 96-kHz chunk of the spectrum is available for display. Here we're listening to W1AW code practice at about 14047 kHz. The five skuzzy-looking humps are a new noise source that's just shown up in the neighborhood. Argghh.

tions and general information are at <http://www.wb5rvz.com/sdr/>. A very lively and helpful group of interested builders can be found at the Softrock40 Yahoo Group, <http://groups.yahoo.com/group/softrock40/>.

At this point, now that the multiband rig was working, I'd normally retire the monoband Softrock to the box marked "Been There, Done That." We all have those boxes, the ones filled with the natural detritus of upwardly mobile technological hobbyists. I hated to consign the very capable little receiver to the bone pile, but it had been superseded.

Or had it? A series of e-mails on the Softrock 40 Yahoo group suggested that the board could be converted and used as a panoramic display driver for the IF of another receiver.

I e-mailed Tony and found that he did indeed have the proper crystal to shift the Softrock to receive on the K2 IF frequency. For a very modest sum he sent me the crystal and some replacement toroids. One evening's work and the Softrock could now hear what was going on inside my K2 and display it on the computer.

I was now presented with a new hurdle, which was to choose a good place to pick off the K2 IF signal without upsetting the IF. The answer also came from the Yahoo Group, where I was pointed in the direction of Clifton Laboratories, (<http://www.cliftonlaboratories.com/>; 7236 Clifton Road, Clifton, VA 20124; telephone 703-830-0368). Jack Smith, W8ZOA, is the proprietor and has a very informative website. I ended up buying his Z10000B Buffer Amp. The kit comes with an excellent board, all the parts, a complete assembly manual, plus a separate set of instructions for installing the amp inside a K2. Jack also makes buffer amps for use in radios with IF frequencies different from the K2.

Installation of the buffer amp board in the K2 was surprisingly easy (photo F) There is a convenient space available toward the back of the K2 box. The output cable supplied with the kit has an SMA connector already installed on it. I chose to drill a hole in the back panel of the K2 for the connector, since the only other holes available are for connections to a transverter. With the buffer amp installed in the radio, the only thing left to do was to run a cable from it to the newly converted Softrock and then run an audio cable from the Softrock to the computer sound card.

I've used this Softrock as a panadapter with several pieces of software, but my favorite is Rocky. Rocky is a free download from Afreet Software (http://www.dxatlas.com/). I can adjust the window so it shows as a small strip across the top of my screen with other program windows open below it (photo G). Typically, I'll have the K2 set on 15 meters so I can keep an eye on the band while I'm allegedly doing something else, like writing this column. Anytime a blip shows up I can point and click on it to see who's there.

Mission accomplished. Softrock board rescued from the bin and repurposed for another useful life, and my K2 now has a panoramic display.

If you've been successful in saving or converting an unused or older piece of radio gear, please let me know. I'd like to hear what you've been able to do with your discards and share that information with the other readers as well.

72/73, Cam, N6GA

The Ten Best Ham Radio Moments

BY JEFF REINHARDT,* AA6JR

Hollywood has its Oscars; TV has the Emmys; the recording industry has the Grammy Awards. Until *CQ* develops "The Hammies," I've compiled a list of noteworthy stuff.

Actually, in considering persons and accomplishments worthy of recognition, I pondered creating star-studded evenings with men donning black tie tuxedos and YLs showing off their expensive designer gowns on network TV, complete with red-carpet entrances of ham luminaries exiting tinted-window limos (bedecked with multiple antennas, of course).

On the other hand, perhaps a more subtle tongue-in-cheek "Mr. Blackwell" approach would be good—one that proffers a dry-witted critique on some of the "worst" to be found in terms of ham attire or even (gasp) certain on-the-air practices shared with the nation on a couch across from Jay Leno.

Fear not. This column has no retribution axes to grind (at least not this month). It also lacks the financial resources for the big awards show. I think Editor Rich, W2VU, misplaced my memo requesting the seven-figure budget for the "big" event. Too bad – I believe Managing Editor Gail, K2RED, and the CQ YL crew all were ready to go gown shopping.

So in deference to the many hundreds, thousands, fifty, or ten best TV shows that commemorate sports plays, animal tricks, police chases, wedding dresses, barbecue recipes, and perhaps heroic drain-clearing efforts by plumbers, I offer up my own list of the ten-best exquisite events in which your average ham radio operator may have had the honor to revel.

Fellow hams everywhere, here's my take on the Ten Best moments you may experience as a practitioner of the radio arts, presented in descending order to keep you riveted to this column and to gratuitously increase my reader ratings.

Number Ten

Building your own antenna that is actually resonant on the desired frequency. Extra "points" are awarded if you saw that perfect 1:1 SWR reading the first time you tuned up, perhaps thinking that you actually weren't transmitting. You still get points if it took a few trips to trim some wire off the dipole. You lose a few points if you had to add wire onto the dipole. You get extra points if you had a friend doing the outside tuning while you were in the shack reading the meter.

Number Nine

Getting your Worked All States award. Granted, not all hams are "paper chasers," but c'mon, face it: The first time you worked a station across a state line you were pretty thrilled. The 49th time you do it is way cool. You get extra thrill points if your home QTH is Hawaii. That's a hard-earned WAS award! (It requires strange hours and favorable conditions for a Hawaiian ham to work any of the gajillion New England states.)

Number Eight

Becoming an Elmer. OK, I still don't like the term "Elmer" (which set off a round of comments the last time I said that), but I really do like and appreciate what the term represents. Kudos to all those who have taken it upon themselves to school others in the many different facets of our radio pursuits. Take a bow! And no offense to anyone named Elmer. I just think the term as applied to mentoring someone in the radio arts is a bit obtuse. However, this time I'll bow to the tradition in honor of those who fill the role.

Number Seven

Field Day. It's a great activity open for thousands to experience each year. There are a lot of great things to say about Field Day, and many will feel it should have been placed higher in rank. Among its virtues are that it is best enjoyed with others and there are many "side shows"—such as "the feed," collaborating on setup and takedown, the public interaction, media coverage, adverse weather, overcoming the inevitable glitches, and more.

Number Six

Joining a club. This is where you find kindred spirits among our ranks, support for your "how to" projects, the nucleus of your Field Day effort, group

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activities such as classes and VE sessions, links to the community through activities such as Jamboree On The Air, communications exercises at community events, and hopefully, training for emergency communications. Clubs are a major asset to the hobby. Strong clubs are comprised of members who share their talents and the workload.

Number Five

Participating in communications supporting a genuine emergency event. This can be Skywarn, ARES, Red Cross Disaster Services, affiliation with local police or fire agencies, or general disaster relief. The adrenaline flows, the equipment is in use, plans get knocked off-track and workarounds must be implemented. . . . It's exhausting, exhilarating, sometimes perilous, intense, sometimes boring, but always worthwhile. When you "stand down" it's something you'll never forget. And you know that next time, you'll be better prepared based on the experience gained.

Number Four

If you've ever had the thrill of building a project, you know the sweet agony or ecstasy that occurs a nanosecond after you try to make the first use of your creation. Conjure up that memory of Dr. Frankenstein shouting "It lives!" and you get a small bit of identification with the triumph in bringing a previously inert group of parts into a combination of wire, solder, controls, and a source of power that brings your project into the realm of being something useful, or at the very least, entertaining. From kit building to designing your own gear, building something that works has a big reward. (Sniff . . . what's that smell?)

Number Three

Nothing against builders who "roll their own," but I'll bet you have not forgotten the moment you first went to "the candy store," hamfest, or to a friend selling a radio and bought your first rig. It doesn't matter if it was last week or decades ago, you remember the make, the model, where you first used it, and every knob, dial, and display on that object of ham affection. You probably remember what you paid for it as well, and of course you got a great deal!

Number Two

Few things in your ham radio history book will top the thrill, excitement, nervousness, and awkward moment you experienced during your first contact. You probably remember the callsign of the other party—and maybe the name of that person—but you may have forgotten exactly what you said or sent in that first "key down" experience. I hope you got a QSL card.

Number One

Can anything top the very first time you saw your name next to a genuine callsign issued by the Federal Communications Commission of the United States of America?

That call is unique to you, earned as a result of your interest, study, practice, and successful completion of a test document. Seeing your very own call—learning it, using it phonetically, perhaps sounding it out in Morse Code, framing the license document to be displayed with pride in your shack—was the culmination of a serious effort and it stands as evidence of your achievement. That document opened a new world to you with hundreds of possibilities from voice to digital to DX to QRP to moonbounce to ATV to APRS to CW, to FM repeaters . . . to who knows what else? It's often referred to as a "ticket" and rightfully so. It's your official document entitling you to take a daily ride on the "Magic in The Sky."

73, Jeff, AA6JR

BY JOHN WOOD,* WV5J

Extending Your Human Capabilities

One of the fascinating things about a radio is that such an appliance can expand your senses. It enhances your basic human aural capabilities so that you can hear sounds that you would normally never know existed. Such is the benefit of the various items we examine in this month's "What's New." The items covered this month can't claim to help your sense of taste or smell, but we do have a sampling of new products that can extend your hearing range, give you a few things to look at, and exercise your sense of touch.

Parabolic Dish Antenna Kit

If you've ever dreamed about owning an ultrasonic receiver so you could listen for noisy power poles, big bats chatting and hunting at night, or simply check out your house or workshop for its many sources of ultrasound, your dream can now become a reality thanks to your ham friends at the Xtal Set Society.

Your fellow electronic aficionados at Xtal Set have developed not one, but two ultrasound kits that can work as portable receivers. There's the Ultra-RX1 and an Ultra-RX2 kit and both will work with the Xtal Set's newest product, a parabolic dish kit (photo A).

Consisting of an 8-inch diameter, clear-plastic dish with a 6-inch focal length, this kit can be attached to either receiver to track down AC interference sources, listen to active bats, or separate multiple biological sources at a distance. In other words, you will be able to hear the things that dogs and cats have always been able to hear, and that's what is known as ultrasonic sound.

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

Photo A– Why should dogs, cats, and bats have all the fun? Listen to the world of ultrasonic sound with a parabolic dish kit connected to one of the Xtal Set Society's two receivers.

Technically, the dish kit is designed to work with a 400SR 16 or similar piezo transducer (PZT), to achieve a pressure gain over the sensor alone at 40 kHz of 18 to 22 dB, and narrow the field of view from 50 to less than 3 degrees. This way, you can hear a typical weak spark generated by 400 volts on an AC power distribution line or monitor bat transmissions producing pressure waves with an RMS pressure of roughly .5 to 5.0 Pa (75 micro-psi) at 10 feet. In other words, the dish pinpoints the source location and the added receiver (sold separately) provides for recording and/or headphone reception.

The RX2 PCB (5.68 by 3.16 inches) fits snugly in its clam-shell case (6.16 inches long, 3.677 inches wide, and 1.378 inches tall), along with a 9-volt battery and ships with its own 400SR016 PZT. The circuitry expands on that of the Ultra-RX1 receiver by including automatic gain control for the 40-kHz preamplifier, a selectable passive attenuator for strong signals, audio line out for attachment of a recording device, and an 8-ohm output for headphones. Time for the experienced kit builder is less than two hours. Through-hole parts are used throughout.

Both the Ultra-RX2 receiver kit and the parabolic dish kit sell for $119.95. For more information about the receivers and the dish, visit <www.midnightscience.com/ultrasonics.html> or call 405-517-7347.

MFJ Matching Network

The folks at MFJ Enterprises tell us that their new MFJ-2910 matching network (photo B) can improve the efficiency of popular 43-foot vertical

Photo B– Expand the range of your 43-foot vertical to include 80 and 160 meters with MFJ's new 2910 high-efficiency matching network mounted at the base of the antenna in a weatherproof PVC cabinet.

antennas on 160 and 80 meters by eliminating SWR-related coax and unun (unbalanced to unbalanced) mismatch losses.

When fed with a 1:4 unun, the 43-foot antenna functions as a reasonable compromise on 60–10 meters, but is virtually impossible to match from the shack for 160- and 80-meter operation because of low radiation resistance. By installing the MFJ-2910 matching network at the base of the antenna, it can help eliminate power losses in the coax and bad antennas mismatches caused by ununs.

Priced at $249.95, the MFJ-2910 comes housed in a 3" × 11" × 3" weatherproof PVC cabinet and includes a remote power injector and a switch for 160 meters, 80 meters, and off positions. It can handle up to 1500 watts PEP and is covered by the MFJ "No-Matter-What" one-year warranty.

For more information about the MFJ-2910 antenna matching network, call MFJ at 800-647-1800; write to MFJ Enterprises at 300 Industrial Park Road, Starkville, MS 39759, or visit <www.mfjenterprises.com> on the web.

Ham Radio Saves Lives

To appeal to your sense of sight, the folks at HamTestOnline™ are giving away their popular "Ham Radio Saves Lives" bumper stickers (photo C) free of charge to individual hams, VE teams, and amateur radio clubs across the U.S. and Canada.

"We give away the bumper stickers partly to show our support for ham radio, but mostly to call attention to our website," explained John Cunningham, W1AI, the company owner and creator of the website <www.HamTestOnline.com>. "When we mail the bumper stickers, we include product fliers so hams can learn about our courses," he added.

Photo C– Yes, it's true that "Ham Radio Saves Lives" and you can share that truth with your fellow drivers by requesting a bumper sticker just like this one from the friendly folks at HamTestOnline.

Individuals wanting one or two bumper stickers should send a self-addressed, stamped envelope to Harold Pugh, K1RV, 123 Wyman Rd., Abington, MA 02351. VE teams and clubs that want a supply of bumper stickers are asked to make the fliers available to everyone taking a bumper sticker. The cooperating clubs are also asked to add a link on their club website to <www.hamtestonline.com>. Details of the offer are available at <www.hamtestonline.com/bumper.htm>.

HamTestOnline™ provides online, interactive courses for the ham radio exams. Its study methodology integrates study materials, question drills, and a cyber-tutor that tracks your progress and focuses on your weak areas. The courses are so successful that they offer a money-back guarantee: If you fail the exam, you get a full refund.

TCB-iP4

This unit may not qualify strictly as amateur equipment, but for hams who have a sense of community and might be called on to participate in an area-wide disaster drill or search-and-

rescue event, it might be good to be familiar with the following product.

Link Communications just recently unveiled its TCB-iP4, a VoIP integrated, local and computer controllable, four-port radio interoperability system (photo D). The unit, priced at $9995, has built-in 5-watt VHF, UHF, and 800-MHz secure APCO P-25 radios, a full dispatch interface, and provides support for Nextel™ and Verizon™ Push-to-Talk phones on the Verizon Wireless™ Nationwide Network.

The TCB-iP4 is housed in an IP-57 certified Pelican™ 1490 briefcase; it is waterproof with the lid closed, plus water resistant with the lid open. The TCB-iP4 remains operational with the case open or closed. The powerful LinkTDS™ dispatch suite is pre-loaded on the integrated PC with color Intel Atom™ touchscreen providing both local control and, if a network connection is available between them, control and patching for radios connected to other TCB-iP4 units. An integrated USB AirCard port provides network connectivity virtually anywhere via a secure Wi-Fi access point and router plus an integrated GPS. The FIPS 140-2 compliant encryption algorithms ensure that network communications remain private.

PTT coverage can also be extended far beyond the range of any LMR system using Verizon™ or Nextel™ PTT systems. Simply snap in a PTT phone and begin dispatching or even patch an LMR channel to a PTT talk group for unified communications between the two systems.

The iP4 package includes antenna connectors for each radio on the back of the case. A single-antenna option is also available. An integrated power supply means that the system requires only a standard AC or 12-volt power cable, so no bulky external supply is required.

Photo D– Expected to be seen soon at your next disaster drill or actual community emergency is the TCB-iP4 computer controllable, four-port, radio interoperability system which has built-in 5-watt VHF, UHF, and 800-MHz secure APCO P-25 radios.

Photo E– P1dB, through its RFMW, Ltd. sales arm, is making things small things easier to manage for engineers as well as hams with its .034- and .047-diameter assemblies with SMA connectors.

Established in 1989, Link Communications provides cutting-edge electronic design, engineering, and state-of-the-art manufacturing while specializing in communication product design and development. It equips federal and state organizations with advanced direct and VoIP communication products. For more information about Link Communications design, development, and/or manufacturing call 406-245-5002 or visit the company website at <www.link-comm.com>.

Coaxial Pigtails

RFMW, Ltd. of San Jose, Calif., is now selling coaxial, semi-rigid, pigtail cable assemblies with SMA female connectors (photo E). Primarily designed with engineers who design and test RF and microwave circuits up to 6 GHz in mind, these assemblies can be a big help to amateurs who might be checking antenna design, PCB circuit isolation, component evaluation on board, doing preliminary testing, or verifying design integrity of a project.

The assemblies are manufactured by P1dB of San Jose, California, in .034-diameter semi-rigid and .047 semi-rigid with 2-inch standard pigtails, but are available in custom length and custom terminations.

For more information, go to <www.rfmw.com>, or call RFMW at 877-367-7369 or 408-414-1450.

DigiKEYER II

Micro-HAM U.S.A. is now marketing its new DigiKEYER II (photo F), an all-in-one USB interface for amateur radio digital-mode operation including RTTY, PSK-31, MFSK, Olivia, WSJT, etc. It also works with the CW mode in case you want to exercise your sense of touch.

Micro-Ham says that the DigiKEYER II combines the performance of the original DigiKEYER, the enhanced control and interfacing capability of microKEYER II, K1EL's WinKey CW keyer, and MicroHAM's support for F1 digi p-FSK/q-CW and cocoaModem's OOK modes. It plugs into your computer via a USB cable; provides fully integrated sound; radio control; true FSK, CW, and PTT; and does not require a computer sound card. MicroHAM folks say that DigiKEYER II has an integrated control port for all radios and supports dual receive with transceivers from Elecraft, ICOM, Kenwood, Ten-Tec, and Yaesu.

For more information, visit <www.microHAM.com> or <www.microHAM-USA>.

Book Corner

ARRL Publications. To appeal to your sense of sight and to satisfy your curiosity, our friends at the ARRL have been busy publishing books and have released some new versions of some old favorites, while also introducing some new titles to attract your attention and fulfill your needs.

Sure, summertime is over, gas prices are up, and you're probably not doing as much traveling by car, but that doesn't mean you don't need the latest 2010–2011 edition of the *ARRL's TravelPlus for Repeaters* Version 14.0 (photo G). This is a product on CD that I try to acquire every time a new one comes out, since it gives me an up-to-date list of the entire ARRL repeater database on my computer and tells me where the machines are located along whatever route I choose to drive. Information like this can make a trip a lot

Photo F– From microHAM comes the DigiKEYER II, an all-in-one USB interface for amateur radio digital-mode operation including RTTY, PSK-31, MFSK, Olivia, WSJT, and, of course, CW.

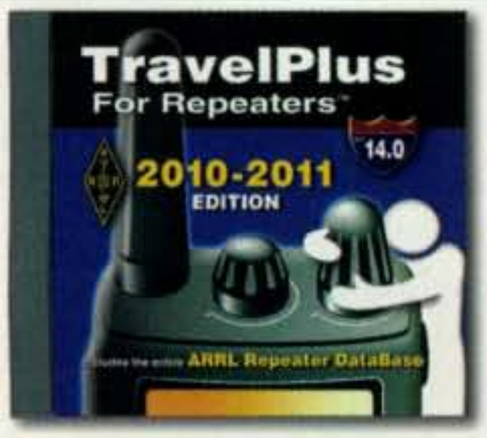

Photo G– The 2010–2011 edition of the ARRL's TravelPlus for Repeaters *Version 14.0.*

more fun while also providing a communications option should you encounter heavy traffic, car problems, or have an accident.

The ARRL has also released its third edition of the *RFI Book* to provide you with practical cures to radio frequency interference. From automotive to television, from computers to DVD players, the ARRL's team of experts has compiled the best advice available on the subject of RFI. If the marriage of your new mobile rig and your new car is off to a rocky start, this book can give you a step-by-step process for eliminating problematic interference. In 19 chapters the book also addresses some of the new problems being encountered as we step into the world of digital TV, and that includes interference sources that are cable based or coming in with over-the-air signals. Just take comfort in knowing that if you have run into an RFI problem that is souring your ham radio hobby, there is an option and help is available in the ARRL's newest version of the *RFI Book.*

A new title from the ARRL is *Remote Operating for Amateur Radio.* This is the book that can answer your questions about setting up a complete ham radio station at a remote location and operate it via the internet whether its across town or 2000 miles away.

Retail prices for the three ARRL items I mention here are $39.95 for the *TravelPlus for Repeaters* on CD, $29.95 for the *RFI Book*, and $22.95 for the *Remote Operating for Amateur Radio* book. All titles mentioned can be ordered from the ARRL by calling 860-594-0200 or by visiting the ARRL website at <www.arrl.org>.

Books from K1NSS. And now for something completely different, Jeff Murray, K1NSS, author of *lid, kid, space cadet – First Book of DASH! The Dog-Faced Ham,* which was first published last year, has now released his second book in the series entitled *Sky BUDDIES – Second Book of Dash! The Dog-Faced Ham.* (See photo H.)

Photo H– The two unique books by Jeff Murray, K1NSS, are about coming of age in the electromagnetic world in the 1950s and 1960s. Both books are illustrated with comic-book art that helps tell the story.

First shown publicly at this year's Dayton Hamvention®, Jeff says this new book is similar to the first book in that both are about coming of age in the electromagnetic age in the 1950s and 1960s. Both books are illustrated with comic-book art that helps to tell the story while also bringing back some wonderful memories of radio and how it was in 1950s when childhood discovery of the medium was aided through crystal radio receivers, local AM broadcasts, and Remco Radio Stations. If you grew up with radio during the 1950s and 1960s, or are just discovering amateur radio today, you'll probably be able to relate to this Dash! series of unique publications.

Both books may be ordered at <www.lulu.com>. For more information about the books and author Jeff, K1NSS, visit <www.dashtoons.com>.

Website of the Month

If you already have your computer warmed up and you're in the mood to explore, why not check out the recently activated web ite <http:online.voacap.com> to get an idea of what's up propagation-wise. This website, brought to you by hams Jari Perkiömäki, OH6BG, James Watson, HZ1JW, and Juho Juopperi, OH8GLV, empowers you to easily generate a point-to-point propagation predictions based on the Voice of America Coverage Analysis Program. When you enter the URL and hit return, you'll see a form. Enter the information requested about the location of the transmitter and the receiver along with the year, month, antenna, band, and power output, and then click on the button "Run The Prediction." Jeri tells me that you will quickly see a circuit reliability graph that shows the probability of achieving a CW-grade transmission quality between the transmitter and the receiver, or from a more personal perspective, the propagation between you and that rare DX station you've been seeking. It's just that easy to do at <http:online.voacap.com>.

That's it for this month. If you have a new product you would like to see featured in this column, please contact me at the snail-mail or e-mail address shown on the first page of this column.

73, John, WV5J

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

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BY JOE LYNCH,* N6CL

Paul Perryman, WA5WCP EME Salesman

I first became aware of Paul Perryman, WA5WCP, when he was mobiling through the upper western states in his cab-over camper and towing his 10-foot TVRO dish. Operating on 23 and 13 cm EME (Earth-Moon-Earth), he supplied Al Ward, W5LUA, with QSOs for a couple of his last states for 23-cm WAS (Worked All States), which enabled Al to be the first to achieve that award on that band. Here is some of the text from the September 2007 *CQ* "VHF Plus" column:

It all started more than 30 years ago. To be precise, it started on January 25, 1977, when Al Ward, then WB5LUA, now W5LUA, made his first 1296-MHz contact with Leroy May, W5HN. Leroy is a Silent Key now, not having lived long enough to witness what he started and what Al ended in early September when he contacted Paul Perryman, WA5WCP/7, in Idaho. With that contact, Al went into amateur radio history for having completed the first-ever WAS on 1296 MHz.

Those of us who subscribe to the Moon-Net reflector were aware of certain states being activated on 1296 MHz during August and September. However, it remained to be known only to a few that Al was on his final pursuit of that WAS award. First it was North Dakota in early August when Ron Roche, KØALL, with a major assist from Barry Malowanchuk, VE4MA, came up for several QSOs on that band. One of those QSOs was with Al, thereby giving him is 47th state.

Then, between August 29–30, Paul activated Wyoming on 1296 and 2304 MHz. Paul's QSO with Al gave Al his 48th state on 1296 MHz. On September 1, Paul activated Utah and made contact with Al, thereby giving Al is 49th state. Finally, on September 4, Paul activated Idaho and again made contact with Al, thereby completing Al's historic quest.

When Al received Paul's QSL cards for those three contacts, he almost immediately jumped into his car and drove from his home in Allen, Texas, to Little Rock, Arkansas, to meet with ARRL President Joel Harrison, W5ZN, so that he could verify Al's cards and complete the WAS paperwork. "Verifying QSL cards from 30 years of activity brought back a lot of memories of several stations active on 1296 MHz, many who are Silent Keys now," Harrison commented in the *ARRL Letter* of September 8, 2007.

Al freely admits that he could not have achieved his goal without help from his friends in the weak-signal community. It was that all-important assist from Barry that got Ron on the air from North Dakota. Al and Barry have accomplished a number of firsts over the years, so it was a natural outcome of their friendship that Barry would assist Ron in making it possible for Al to make his North Dakota contact.

Next, it was Paul's turn to help Al complete his quest. Paul, whose home QTH is Arlington, Texas, is no stranger to portable EME operations. His previous portable EME activation was from Belton, Texas, for an EME demonstration at that city's hamfest a year ago last month. Previously, Paul gave out contacts from New England in August 2006.

e-mail: <n6cl@sbcglobal.net>

VHF Plus Calendar

Oct. 1	Last quarter Moon
Oct. 2–3	First round of ARRL 50 MHz to 1296 MHz EME Contest
Oct. 3	Very good EME conditions
Oct. 6	Moon perigee; The 432 MHz Fall Sprint
Oct. 7	New Moon
Oct. 8	*Draconids* meteor shower
Oct. 8–10	AMSAT Symposium
Oct. 14	First quarter Moon
Oct. 10	Moderate EME conditions
Oct. 16	The Microwave Sprint
Oct. 17	Poor EME conditions
Oct. 18	Moon apogee
Oct. 21	*Orionids* meteor shower
Oct. 21–24	Microwave Update Conference
Oct. 23	Full Moon
Oct. 24	Poor EME conditions
Oct. 31	Excellent EME conditions
Oct. 30	Last quarter Moon
Oct. 30–31	Second round of ARRL 50 MHz to 1296 MHz EME Contest

—EME conditions courtesy W5LUU

Paul Perryman, WA5WCP, tows this dish to conferences and states around the country. (All photos by N6CL)

Looking over Paul's shoulder at his station inside the cab-over camper.

For Paul's August-September 2007 DXpedition, he arranged vacation time to cover the approximate weeklong venture. Interspersing family time with EME activities, he operated from Wyoming on August 29–30, from Utah on September 1–2, and from Idaho on September 4–5.

Paul was at this year's EME conference, where he presented a talk on his DXpedition exploits. He also related a few humorous stories of events that occurred during one of his travels. One person, eyeing the dish, asked Paul if he could simply use his cell phone. Paul replied that he could not, because where they were there was no cell phone service. Additionally, he informed his critic that he was sending his signals to the Moon, after which his critic asked, "Are there people on the Moon?"

If one thinks about it, one could reason that the critic's question was reasonable, considering that Paul was sending signals to the Moon. Why else would he do so?

Along with his presentation, Paul demonstrated EME in the hotel parking lot. During Friday afternoon he made several QSOs, as well as invited others to also make their first EME QSO. Later Paul related that one lucky operator, who moments before did not know how to use a keyer or how to make a sequential QSO, made his first EME contact with a British station.

Paul has made it his goal to set up his station at hamfests and conferences as much as possible so as to attract attention to the art of EME QSOing. He says that he wants to do his part to introduce the younger generation to our wonderful hobby. Perhaps soon he will be at a hamfest in your area.

History Detectives Solves an Amateur Radio Mystery

The opening episode of the eighth season of the acclaimed PBS *History Detectives* featured Chuck Roedel, WA2MXR, of Beverly Hills, Florida. It seems that Chuck had made a chance contact with Dwight "Doc" Saxmann, W3HNT, in October 1978. A few weeks after the contact Chuck received a QSL from Doc along with a piece of aluminum-coated Mylar™ that Doc said was from the Echo 2 satellite.

More than 30 years later, Chuck decided to contact the *History Detectives* to see if his piece of Mylar™ had ever flown in space. Into the picture comes Tukufu Zuberi, one of the show's detectives. Zuberi takes on the challenge of discovering if this piece of Mylar™ fell out of the sky by first looking up Doc's callsign on an old list of amateur radio callsigns. After finding Doc's old address and learning that he had died in 1983, he then places a number of phone calls in an attempt to locate one of Doc's relatives.

Next, Zuberi investigates the Echo satellite program. He contacts NASA and is put in touch with Ron Muller, a former satellite engineer. In a conversation with Ron, he learns about the Echo program and its less than altruistic secret project of photographing Echo as it passed overhead at various portable telescope locations around the globe. It turns out that before Echo, it was impossible to know the exact distance for targeting the Soviet missiles. Photographing Echo and measuring the distances between the various portable telescopes gave the necessary calculations for such targeting.

In order to learn whether or not the Mylar™ probably was from the program, Zuberi gets a referral from Muller, Margery Sovinski, and her colleague Debbie Thomas, whom he then contacts. With Chuck's permission Thomas cuts a small sample from the piece and

then scans it with an electron beam microscope.

Thomas's scan gives the measurements that Sovinski checks against the official Echo 2 specifications. She confirms to Zuberi that the piece was very likely material that could have been used for the Echo 2 satellite.

The next step was to learn how it was that Doc got the piece that he sent to Chuck. Zuberi gets a phone call and the caller identifies himself as Milton Saxmann, Doc's son. Zuberi meets Milt at his home, where he shows him his father's pocket knife with his callsign engraved in the handle.

Milt informs Zuberi that his father worked for Westinghouse, a NASA contractor charged with the Echo 2 project. The project was housed in the Lakehurst Naval station's hangar, which once housed the Hindenburg.

Milt explained that his father, who was known at the "Antenna Doc" (hence the Doc nickname) was one of the employees who worked on the Echo 2 project. He added that the techs performed a number of tests, with the last one being a burst test, or static inflation test.

Milt explained that the satellite/balloon was filled with gas until it burst. When it did burst, pieces, or debris, landed everywhere in the hangar. Naturally, Doc gathered his share of the debris—and eventually sent one of the pieces to Chuck. Mystery solved, thanks to the *History Detectives*.

For more information on this story, see the following website: <http://

Dr. Sandra Magnum, KE5FYE, was the banquet speaker at this year's CSVHFS conference.

Monika and Michael, DL1YMK, Kohla fascinated the EME conference participants with their stories of operating EME from rare and unique countries.

www.pbs.org/opb/historydetectives/investigations/801_satelloon.html>.

Dr. Sandra Magnus, KE5FYE, CSVHFS Conference Speaker

Among the highlights of the Central States VHF Society Conference this past July was Dr. Sandra Magnus, KE5FYE, who was the banquet speaker. As a NASA astronaut, Sandra spent 4 1/2 months onboard the International Space Station as part of a long-endurance stamina test. As part of her talk, she told of her experience and occasionally operating from the ISS. She expects to go on the ISS on a future mission, as well.

Current Contests

The first round of the **ARRL 50 MHz to 1296 MHz EME Contest** is October 2–3. The **432 MHz Fall Sprint** is October 6, from 7 PM to 11 PM local time. The **Microwave (902 MHz and above) Fall Sprint** is October 16, from 6 AM to 12 PM local time. The second round of the **ARRL 50 MHz to 1296 MHz EME Contest** is October 30–31. The **50 MHz Fall Sprint** is October 30, 2300 UTC to October 31, 0300 UTC.

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 Southeast VHF Society URL: <http://www.svhfs.org/2010fallsprintrules.pdf>.

Current Conferences and Conventions

The 2010 **AMSAT-NA Space Symposium and Annual Meeting** is to be held October 8–10, in Elk Grove Village at the Elk Grove Holiday Inn Hotel. For more information, see the AMSAT URL pertaining to the symposium at: <http://www.amsat.org/amsat-new/symposium/2010/Hotel.php>.

The 2010 **Microwave Update** conference will be held in Cerritos, California the weekend of October 21–24 at the Sheraton Cerritos Hotel. For further information, please check the Microwave Update website: <http://www.microwaveupdate.org>.

Meteor Showers

The *Draconids* is predicted to peak somewhere around 2245 UTC on October 8. The predicted ZHR (zenith hourly rate) varies, but never rule out the remote possibility of a storm level peak. The *Orionids* is predicted to peak on October 21. The full Moon will obliterate any visual sign of the shower.

And Finally . . .

In the middle of August I was fortunate to be able to attend a couple of days of the 14th EME conference held in Irving, Texas. It was an incredible conference, both in the quality of presentations and the excellent hospitality extended to the participants. The hefty-size *Proceedings* is available from the ARRL.

Led by Al Ward, W5LUA, his group of volunteers did everything to make sure that every participant's needs were met. I have seen a number of posts to the various reflectors that echo my feelings about the hospitality. I want to say a very big thank you to Al and everyone who worked so hard to produce the very successful conference.

Until next month... 73 de Joe, N6CL

learning curve

BY RICH ARLAND,* K7SZ

DXing Basics

The month of October signals the start of the contest season. For that reason, over the next few columns we will spend some time exploring the topics of DXing and contesting. If you are new to the HF side of ham radio, hopefully these columns will put you on the right track to having some globe-spanning fun.

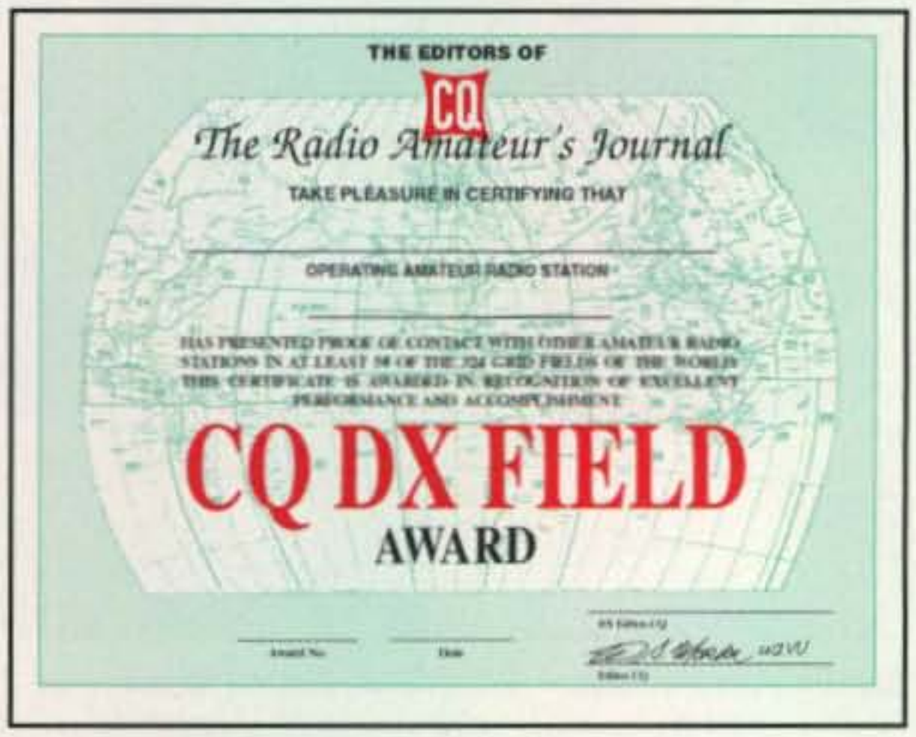
Let's ask the question: "Why do hams spend so much time and money trying to talk to and confirm contacts with places they have never been and people they have never met?"

There is no simple answer to that question other than to say, "It's in the blood!" DXing is one of the oldest and consequently the most time-honored of ham radio traditions. In the hobby's infancy, ham radio operators doggedly tried to communicate with fellow hams, first locally and then all over the globe. In order to appreciate the difficulty of this task, you need to understand that the equipment of the day was extremely crude and the frequencies involved were quite low, making effective long-haul communications difficult. As the equipment evolved, hams' understanding of HF propagation expanded, and slowly but surely, hams were able to establish long-haul international communications circuits.

Today the joy of contacting ("working") distant ("DX") stations has not subsided. Quite the contrary, DXing has evolved into one of the most exciting facets of the radio hobby, culminating in one of the most coveted trophies in all of hamdom—The DX Century Club (DXCC) award. This award, administered by the ARRL, is presented to any radio amateur who can provide proof of contacting a minimum of 100 countries, otherwise known as "DX entities." DXCC is the first milestone in the world of DX. In addition to the basic award for working the initial 100 countries, there are endorsements that the ARRL gives out for working additional DX entities up to and including the DXCC Honor Roll, for those fortunate few who have worked 'em all! *(CQ offers similar recognition with its CQ DX Award, CQ DX Field Award, and the very prestigious Worked All Zones, or WAZ, award.—ed.)*

DXers (those who practice the art and science of DXing) are recognized as the "senior statesmen and women" of the ham radio hobby. Theirs is a different world than the majority of mainstream ham radio operators. DXers operate on a world-wide stage. Many DXers have made lifelong friends with their counterparts in other countries. DX stations have contributed to a better understanding of life, culture, and customs in other lands.

So exactly how does one become a DXer? For starters, fire up your HF rig and get on the air! That's almost too simple, huh? Garden-variety DX



The CQ DX Field Award is issued in four categories—Mixed, CW, SSB, and Digital—for confirmed two-way contacts with 50 or more Grid Fields (there are 324 Grid Fields covering the entire world). The rules for this award, as well as CQ's other award programs, are on the CQ website (www.cq-amateur-radio.com).

is almost always available any time of the day or night on one or more of our HF bands. Depending upon your location, you should be able to work ten to twelve DX entities in your first foray into DXing! Don't forget to keep a log of these contacts so you can swap QSL cards with the foreign hams and have the necessary proof to qualify for the DXCC award. There are a number of great logging programs available on the internet. My favorite happens to be those written by Scott Davis, N3FJP, (www.n3fjp.com). Scott has a great selection of specialized contest logging software in addition to his All Contacts Log.

Your choice of HF bands contributes greatly to your success as a neophyte DXer. In order of importance these bands are as follows: 20 meters, and 40 meters, followed by 30 meters, 17, 15, 12, and 10 meters, in that order. Although not listed as prime DX hunting grounds, 160 and 80 meters also have their share of DX stations showing up when the bands are open during the long hours of darkness over the winter months.

For our purposes, 20 meters is the bread-and-butter band for DXing. Antennas for 20 meters are relatively small and easy to erect. The band stays open from late morning to well after dark (local time). When the sunspot cycle starts to pick up, and all indications are that it is, we will enjoy nearly 24 hours per day of outstanding propagation on 20 meters, so get that 20-meter antenna in the air now!

Now is the time to do your self a *really* big favor: call the CQ Bookstore and order a copy of *The Complete DXer* by Bob Locher, W9KNI. If you don't read another book on ham radio, read this one, cover to cover, several times! Seriously, it is the best book ever written on the topic of DXing.

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

CQ Books & CDs

VHF Propagation

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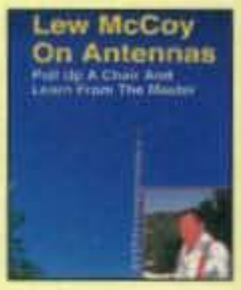
McCoy on Antennas



by Lew McCoy, W1ICP

Unlike many technical publications, Lew presents his invaluable antenna information in a casual, non-intimidating way for anyone!

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33 Simple Weekend Projects

by Dave Ingram, K4TWJ

Do-it-yourself electronics projects from the most basic to the fairly sophisticated. You'll find: station accessories for VHF FMing, working OSCAR satellites, fun on HF, trying CW, building simple antennas, even a complete working HF station you can build for $100.

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W6SAI HF Antenna Handbook

by Bill Orr, W6SAI

One of ham radio's most respected authors, W6SAI was known for his easy-to-understand, down-to-Earth, writing style. In keeping with this tradition, this book is a thoroughly readable text for any antenna enthusiast, jam-packed with dozens of inexpensive, practical antenna projects that work!

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NEW!

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Computer Programs for Impedance Matching
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The Quad Antenna

by Bob Haviland, W4MB

A comprehensive guide to the construction, design and performance of Quad Antennas.

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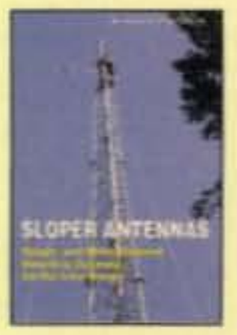
By Weigl, OE5CWL



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Bob is a long-time DXer and was inducted into the CQ DX Hall of Fame at the Dayton Hamvention® in 2010.

Bob's latest book, *A Year of DX*, shows what can be done with outstanding operating skills, first-class equipment and antennas, and an understanding spouse. This book is also a must-read for anyone wishing to expand his or her DX skill set. Together these two books will provide an unbelievable amount of information on how to become a world-class DXer. Buy the books and tell *CQ* I sent you!

Is Anyone Out There?

One of the primary skills in DXing is learning how to listen, followed closely by getting to know your equipment and how it functions. Let's look at each one individually.

Listening . . . sounds simple. However, there is a lot more to becoming a good listener than just turning on the rig and spinning the dial. First you must pick a band; let's go with 20 meters. OK, the rig is fired up on 14.000 MHz and the transmatch has been peaked up. Grab the headphones (commonly called "cans" by Old Timers) and get comfortable. Serious DXers use headphones for several reasons. First the headphones direct the audio from the receiver directly into your ears, greatly reducing external noise pick-up, which allows you to concentrate on what you are hearing. Some DXers state that the ritual of putting on the cans isolates them so they can become one with the band. For whatever reason, start using headphones, as it will definitely make you more cognizant of what you are hearing in the receiver.

Start tuning up from the bottom edge of the band, stopping to identify the bigger signals as you tune across them. This is called "band scanning" and is a rudimentary skill every successful DXer has become adroit at doing. Band scanning accomplishes two things: First, it allows you to hear what various stations are on the air and with whom they are in contact. Second, band scanning lets you get the "feel" of the band, how the propagation is flowing, the ebb and flow of the pile-ups (provided the DX station is working a pile-up), and in so doing you become familiar with your band of choice. Being able to "read" the band conditions will go a long way toward working the various countries needed for your DXCC award.

Although we started at the low end of 20 meters, which is the CW segment of that band, those wanting to engage in phone contacts need to start tuning about 14.150 in the phone section of 20 meters, using the same tactics as someone starting at the CW end of the band. Tune and ID, tune and ID. Pretty soon a picture emerges of exactly how the band is propagating and whether or not you will have a chance of working some of the needed countries for your award.

There is absolutely *no* substitute for time in front of the radio—period. Not knowing or understanding the capabilities of your equipment places a severe handicap on your operating skills. Being able to adjust receiver parameters to minimize or eliminate noise, splatter, etc., will make the difference between logging a choice DX contact or going home empty-handed.

Equipment and QRP

Let me provide a real life case, me. It is no secret that I like—no, make that *love*—QRP. That's right; I am an avid low-power communicator and I love making DX contacts using 5 watts or less RF power output. One nice thing about QRP is that it dovetails very well with homebrewing your station equipment, whether it is a simple SWR meter, a transmatch, or a full-blown HF transmitter/receiver.

Homebrew radios have one common flaw: They are inherently simple in design, resulting in low parts count. Elecraft radios notwithstanding, the *average* homebrew radio set is long on fun but painfully short on bells and whistles. Those bells and whistles may seem trivial, but a little digital signal processing (DSP) in the receiver IF strip goes a long way toward reducing interference and making a marginal signal into a Q-5 copy. Multiple IF crystal filters found in commercial QRP rigs can also make short work of interference and generally upgrade your receiver's performance.

This is not to say that a well-thought-out design coupled with tender loving care on the part of the builder can't dig out the weak signals on the bands. Care in designing and fabricating a homebrew receiver is paramount if you are going to really chase DX with your station.

For well over 30 years I have had a love affair with Ten-Tec. Why? Simply because it was first on the scene with a commercial QRP rig in the late 1960s. Its PM series of low-power transceivers were cute, well-designed, and fun to operate, even with the less-than-adequate direct-conversion receiver.

Team Ten-Tec followed the PMs with the Argonaut Model 505, a nicely styled, cream-colored box with wood grain end panels, that featured good ergonomics, a broadband RF final amplifier, true superheterodyne receiver, crystal filtering in the IF strip, *and* single-sideband mode of operation. Several years later the 505 morphed into the Model 509, and finally into the Model 515. These three "analog Argonauts" have a huge following within the QRP facet of our hobby, so much so that when a 509 or 515 appears on one of the internet auction sites it often sells at a dollar value close to the original purchasing price!

I have actually lost count of how many Argonaut 509s I've owned. They keep following me home. I give them some tender loving care, and out the door they go to another QRPer's shack. However, the 509 I currently have I'm going to keep. It's a rather involved story, so suffice it to say that I will be spending a lot of time on this radio aligning it to factory specs, adding an eight-pole 2.1-kHz IF crystal filter, etc.

I love a good challenge, so for this year I have given myself a goal of working 100 DXCC entities using my Ten-Tec Argonaut Model 509 and CW! This self-imposed challenge resulted from a conversation I had with Jim Stafford, W4QO, the Dayton Hamvention®'s 2010 Ham of the Year. He thought it would be a grand idea to approach DXCC from a different perspective: Put a 365-day time limit on the challenge, and open it up to anyone who wanted to climb aboard and have some fun operating. *(The CQ DX Marathon is based on a similar concept, with competition lasting all year and beginning again at the start of a new year—ed.)*

Far too many QRPers spend all their time building rigs and accessories and not operating, which, after all, is the reason we got into this hobby in the first place. To date I have 48 countries worked with the 509 and wire antennas! My RF output was never above 3 watts, and thanks to several contests, I was able to make a sizable dent in the 100 needed DXCC contacts.

My personal goal for undertaking this challenge is to show others that you don't need the latest high-dollar offering from commercial radio outlets to get on the bands, have some fun, and work toward a meaningful goal. So far, even with a limited operating schedule, my personal 2010 challenge is progressing nicely.

While I do not claim to be a "DXpert," I have played the ham radio game long enough to realize that with good listening skills coupled with knowledge of my radio and how it works, I can work DX whenever I feel the need. This is not to

say I don't want a brand-new Elecraft K3, but my little 509 does pretty well for itself despite the 30-plus year disparity in design.

Sources of Information

Learning how to listen and developing your operating skills by spending time in front of the radio (TIFOR) will provide a good, solid foundation for becoming a DXer. However, an active DXer does not live in a vacuum. Quite the contrary, he/she lives in a cyber world of hectic activity. Prior to the internet, DXers had weekly, bi-weekly, and monthly DX newsletters that were written by dedicated DXers and mailed out to the DX faithful on a regular basis. These newsletters had the latest info on DXpeditions, who the operators were, the bands and modes to be used, and length of stay. Additionally, they were crammed full of the latest DX news from around the world, announcing which countries were active, when and by whom, along with the modes in use.

All this changed dramatically with the advent of the internet. Now it seems that DXers are buried in information regarding their portion of the hobby. There are subscription based cyber-newsletters for the active DXer, along with DX reflectors such as VE7CC and DX Summit. I prefer VE7CC, as it seems to be the easiest to use, although I have used DX Summit to some extent and am excited by the possibilities that this site offers. Either site will provide a wealth of information for both beginning DXers and Old Timers alike.

Becoming a skilled listener and learning how to maximize the functions of your radio gear are only the beginning. This will take time, and for that you will have to make time to actually get on the air! In order to find out what DX is active, you'll need input from one or more DX bulletins (the ARRL has a free DX bulletin, provided you are a member), and subscribe to either VE7CC or DX Summit.

Probably the one of the most important things you can do to further your DX education is to join a DX club. In my instance the Southeastern DX Club (SEDXC) gets my vote for a super bunch of folks who warmly welcome new members. There are a number of SEDXC members who are on the Honor Roll. Additionally, there are several hundred years of DX experience among the members of the club that will most definitely help you get started and stay focused on DXing. Several of the SEDXC members regularly go on world-class DXpeditions. After they return, the club is always treated to an in-depth power-point presentation of their recent escapades. SEDXC also sponsors a monthly challenge open to all the members for working the most DX in a 30-day period. Plaques are given out by the club at each monthly meeting for entries in the High Power >100 watts, Low Power under 100W, and QRP 5 watts or less classes. Once you win in one category you cannot win again until the next year. The plaques are really nice looking additions to the shack "I Love Me" wall! All this club activity is geared to help club members become more proficient DX operators.

While we have started examining DXing, we have only scratched the surface of what it takes to become a seasoned DXer. In the next installment we'll take a closer look at some things that will increase your prowess as a DXer. Until then . . .

Vy 73 es Gud DX, Rich, K7SZ

SUCH A HAM

This has to be the nicest QSL card you've given me for our anniversary, Stan.

dx

BY CARL SMITH,* N4AA

New Entities: The Netherlands Antilles

I can't believe I am writing this for the month of October. It really is true, you know. . . . The older one gets, the faster the time seems to go by. Of course, we know that can't be—can it? Whatever it is, it is.

So, let's see what is going on in the world of DX. The nasty old solar flux just didn't seem inclined to move very much for most of this year, but here in early August, as I write this, there was a burst of energy from the sun that boosted the flux number to near 90. While there is no guarantee, we can certainly hope this is good news for the coming contest season.

Upcoming DXpeditions

We have a few DXpeditions on the horizon that are worthy of mention this time.

The Netherlands Antilles. The biggest news item is the all-time new ones that will be created from the Netherlands Antilles. At this writing I cannot give as absolute fact which of the islands will be designated as *new*. The best guess here in early August is that we will find *two* new countries created by the establishment of independent governments on those islands. It appears that St. Maarten (PJ7) will be one of those, and there are at least two groups who have announced they will be on the air from there as of October 10th (that is the expected date the islands will become "independent"). The effective date for DXCC purposes still has to be determined. It appears that Curacao will also be a *new one*. There will be activity from there for sure, as that's the location of the major contest station PJ2T. The status of the other islands in the Netherlands Antilles will not be affected by these changes. It is anticipated that the DXCC Desk will announce the status and effective dates for these news ones when the necessary paperwork has been signed, etc.

CYØ Sable Island. This one will see action October 22–31. The team will consist of AA4VK, AI5P, NØTG, VE1RGB, and WA4DAN, who have been planning this trip for several months now. In fact, they even did a trial run to the coast of North Carolina, which happened to have a stretch of beach similar to what they will encounter on Sable Island. Note that the dates of the operation include the CQ WW DX SSB Contest. The team plans to be active during the contest with emphasis on providing the CYØ country multiplier, rather than to generate a "big score" for themselves. The "operating plan" during the contest will probably consist of one operator on the contest bands and other operators on CW and SSB/CW on the WARC bands.

ZS8M Marion Island. Pierre, ZS1HF/ZS8M, has been pretty active during the limited time he has to be on the air and with the antennas he has had to work with. Many DXers have been able to work him on 40 meters around 0500–0600Z. One of the SteppIR Big Vertical antennas has been sent to Pierre and he should have it up and on the air well before you read this. It appears that Pierre has quite a sense of humor, as evidenced by the paper entitled "ZS8M News" that he has started circulating. It includes some insight into how he managed to be on the island and many of his activities while there. Many photos of the animals (seals and albatrosses), as well as some of the members of the crew, are included. Another paper on the island's activity says a crew will be coming in to do some construction, and they are expected to be there for about four months. This is not one of your typical DXpedition locations. Pierre is there on a work assignment, but he certainly appears to making the most of the spare time he has available and enjoying it.

ZL8X Kermadec. The German DXpedition to Kermadec, ZL8X, in November is on track according to Chris, DL1MGB. From the ZL8X website, in May Chris reported, "We signed the charter contract to sail with the *MV Claymore II* to Raoul Island in November 2010. Nigel Jolly, owner of the well-known *Braveheart*, purchased this ship in 2009. Originally built in 1966 in Wilhelmshaven, Germany, she mainly serves now the route between Mangareva and Pitcairn Island to deliver cargo supplies to Pitcairn Island and to carry passengers between the islands. While the *Braveheart* will carry out another DXpedition at nearly the same time, we are proud to be the first DXpedition to use the *MV Claymore II*. Though the ship isn't

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

Marion Island, three wise men! Left to right: Simon, Mayor of Marion Island and Minister of Medical Affairs (Team Leader and Medic); Vincent, Minister of Energy Affairs and Organised Labour (Diesel Mechanic and Handyman/Busted-pipe fixer); and Pierre, Minister of Telecommunications (Radio/Electronics Technician). (Photo courtesy of Pierre, ZS8M)

CQ DX Awards Program

SSB

2554.....EA5BY

CW

1110 .....IØWOK 1111.....EA5BY

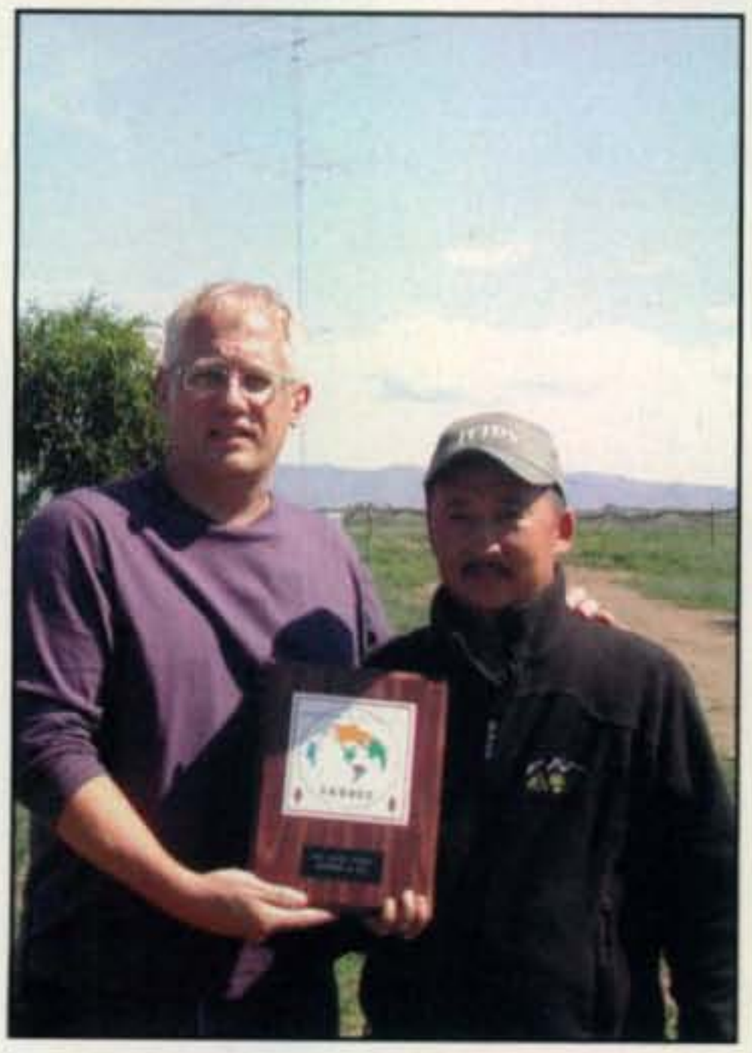
SSB Endorsements

330.....K9MM/338 300.....XE1MEX/312
320 .....KD5ZD/326 300 .....K4EI/308

CW Endorsements

320.....EA5BY/328 300 .....K4EI/298

The basic award fee for subscribers to *CQ* is $6. For non-subscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 339 active countries. Please make all checks payable to the award manager. Photocopies of documentation issued by recognized national Amateur Radio associations that sponsor international awards may be acceptable for CQ DX award credit in lieu of having QSL cards checked. Documentation must list (itemize) countries that have been credited to an applicant. Screen printouts from eQSL.cc that list countries confirmed through their system are also acceptable. Screen printouts listing countries credited to an applicant through an electronic logging system offered by a national Amateur Radio organization also may be acceptable. Contact the CQ DX Award Manager for specific details.



Ken, K4ZW (left), with Naran, JT1BV, proudly showing his 5BDXCC plaque. Licensed since 1988, Naran received his first DXCC in 1990. His paper logs from 1990 to 2000 include over 100,000 QSOs. Since 2000 his computerized logs include over 40,000 Qs. Obviously, he is very active on the air. (Photo courtesy of Ken, K4ZW)

The WPX Program

CW

3250 ..... LA5MDA

SSB

3077 ..... KB4SAD 3078 ..... MUØGSY

CW: 800 LA5MDA. 2400 NN8BJQ. 5650 K2VV.
SSB: 750 MUØGSY. 1200 AA1VK. 1800 N8BJQ. 2150 W6AFA. 4900 K2VV.
Mixed: 1300 DH5MM. 3050 NN8BJQ. 4100 WB2YQH. 6450 K2VV.
Digital: 1050 N8BJQ.

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, N3XX, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, NN1N, HB9AUT, KC6X, N6IBF, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, KØDEQ, DKØPM, SV1EOS, UAØFAI, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UT9FJ, UT4EK, K9UQN, UR5FEO, LY2MM, N3RC, OH3MKH, RA3CQ, UT3IZ, S55SL, RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE.

160 Meter Endorsements: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, N3XX, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, NN1N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, KØDEQ, DKØPM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI, UR5FEO, N3RC, UT3IZ RU3ZX, YO9HP, RA3DNC, K8ZT, KE5K, JH8BOE.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage for airmail) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will now accept prefixes/calls which have been confirmed by eQSL.cc. Other electronic QSL confirmation means are not accepted.

*Please Note: The price of the 160, 30, 17, 12, 6, and Digital bars for the Award of Excellence are $6.50 each.

used to the special needs and habits of amateur radio expeditions, the crew definitely knows what they are doing. Nigel and his son Matt have access to several experienced seamen who all took part in demanding expeditions (of course, also DXpeditions such as ZL8R, ZL9CI, FT5XO, VP8GEO/THU, and VP6DX)."

In late June Chris reported, "Preparations go on. We have worked out an antenna layout to produce decent signals on all bands from 160m to 10m as well as to listen loud. Except on 160m we can run two stations on each band. And we will do so where necessary.

"On the low bands (160–30m) we use only vertical antennas. On 80m, 40m, and 30m we even have 4-squares to beam with some gain to desired directions. For receiving on the low bands we plan set up two 2-wire beverages into the directions NE-SW (North Amerika vs. VK/ZS) and NW-SE (Europe vs. South America).

"For the high bands (20–10m) we will mix horizontally and vertically polarized

What is your favorite CW keying device? Members of the East Tennessee DX Association (ETDXA) recently met for lunch and members brought their favorite for others to see. (I prefer my old Vibroplex single lever, or my ZACH heavyweight, since I tend to "push it across the table."—ed.) (Photo courtesy of David, K4PZT)

5 Band WAZ

As of August 1, 2010, 824 stations have attained the 200 zone level and 1691 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:
OH3GD

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40)
IK1AOD, 199 (1)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
RU3FM, 199 (1)
N3UN, 199 (18)
W1JZ, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
N4NX, 199 (26)
N4MM, 199 (26)
EA7GF, 199 (1)
N6HR/7, 199 (37)
JA5IU, 199 (2)
RU3DX, 199 (6)
N4XR, 199 (27)
HA5AGS, 199 (1)
VE3XN, 199 (26)
N5AW, 199 (17)
JH7CFX, 199 (2)
K7LJ, 199 (37)
RA6AX, 199 (6 on 10m)
RX4HZ, 199 (13)
KØGM, 199 (17)
S58Q, 199 (31)
KQØB, 199 (2 on 10)
K9OW, 199 (34 on 10)
G3NKC, 199 (31 on 10)
K8PT, 199 (26)
IN3ZNR, 199 (1)
EA5BCX, 198 (27, 39)
G3KDB, 198 (1, 12)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K4CN, 198 (23, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
F5NBU, 198 (19, 31)
OE2LCM, 198 (1, 31)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)
W7VJ, 198 (34, 37)
W9RN, 198 (26, 19 on 40)
W5CWQ,198 (17, 18)
I5KKW, 198 (31&23 on 20)
IV3MUC, 198 (1&31 on 40)
UA4LY, 198 (6&2 on 10)
IK4CIE, 198 (1, 31)
JA7XBG, 198 (2 on 80&10)
HB9ALO, 198 (1, 31)
JA3GNN, 198 (2 on 80&40)

The following have qualified for the basic 5 Band WAZ Award:

DL9MRF (151 zones)

5 Band WAZ updates:

KU4BP (187 zones)
JA3GN (198 zones)

***Please note: Cost of the 5 Band WAZ Plaque is $100 shipped within the U.S.; $120 all foreign (sent airmail).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

The WAZ Program

30 Meter CW

97 .....K2UU

160 Meters

354 .....DL4YY (37 zones)

All Band WAZ

Diamond Jubilee

053.....DL2SUB
054 .....SM5BRG
055.....N4BAA
056 .....W4VIC
057.....W6BBS

Mixed

8723 .....NN3RS
8724 .....N4KZ
8725 .....MØBUI
8726.....VK4BUI
8727 .....DL5BCQ
8728 .....KZ5J
8729 .....K4RSU
8730 .....W2PA
8731.....WA1PMA

CW

599 .....K2DRN
600.....K4KCS
601.....IK3PJX
602 .....JA9NUN
603.....ND4V

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, P.O. Box 449, Wiggins, MS 39577-0449. The processing fee for all *CQ* awards is $6.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

antennas. Compared to VK9DWX, our QTH isn't located directly at the beach anymore but on a plateau about 40m above sea level. But the antennas can still see the salt water (distance to the cliff is about 20m to 50m). Because it is hardly possible to simulate the antennas with this terrain, we decided to use the vertical dipole arrays which performed so well at VK9DWX, as well as monoband Yagis at about 10m height."

Follow the progress of this DXpedition on the group's website: <http://www.kermadec.de/index.php>.

The "Magic Band" is Active

Six meters has been very active this year and continues to provide some good opportunities for DXing. It is the "Magic Band," though, and you have to be alert to catch these openings when they happen.

SWODXA DX Dinner in May

A special announcement came from the Southwest Ohio DX Association (SWODXA) the first of August concerning its annual DX Dinner during the Dayton Hamvention®. In case you have not seen/heard about it, I'll post it here.

From: Don DuBon, N6JRL, President Southwest Ohio DX Association:

"Southwest Ohio DX Association (SWODXA) is happy to announce plans for the 26th annual DX Dinner™. This dinner, which is held in conjunction with Dayton Hamvention®, will be held on Friday, May 20, 2011. Because we realize many attendees make their plans well in advance, we want to let you know that our location for the dinner has changed. It will be at the Dayton Marriott located at 1414 S. Patterson Blvd., Dayton, OH 45409.

"We are excited about our new venue. While it is less than five minutes from our previous location, it has a much larger capacity, has been recently renovated, and we will have a new menu selection. Other advantages are that there are no steps, as the dinner will be held on the ground floor, and there is ample, free, on-site parking. In our planning meetings, the staff of the hotel has been

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	K4MQG 338	K9BWQ 337	K9OW 337	K2JLA 334	W4UW 332	F6HMJ 328	W6YQ 316	XE1MD 280
WB4UBD 338	W8XD 338	N4MM 337	K2OWE 336	F3AT 334	K8SIX 331	YU7FW 328	WA4DOU 316	4Z5SG 279
K3UA 338	K2TQC 338	W7OM 337	K8LJG 336	PA5PQ 334	W7IIT 331	EA5BY 328	YO9HP 316	W2JLK 277
K9MM 338	N7RO 338	W7CNL 337	K9IW 336	NC9T 334	K1FK 331	WG5G/QRPp 322	ON4CAS 314	K4EQ 277
W4OEL 338	F3TH 338	WØJLC 337	W4MPY 336	G4BWP 334	N7WO 330	IKØTUG 321	WD9DZV 312	WA2VQV 275
EA2IA 338	DL3DXX 338	VE3XN 337	K5UO 336	W1JR 334	W6OUL 329	W9IL 321	KØKG 310	
OK1MP 338	WK3N 338	K4JLD 337	K7LAY 336	I4LCK 334	KE3A 329	OZ5UR 320	KT2C 304	
N7FU 338	N5FG 338	N5ZM 337	N6AW 336	G3KMQ 334	K6CU 329	CT1YH 320	HA5LQ 304	
N4JF 338	YU1AB 338	N4AH 337	KA7T 336	K6LEB 333	W1DF 329	W9IL 319	K4IE 298	
K4IQJ 338	K4CN 338	N4CH 337	K3JGJ 336	K5RT 332	KA3S 328	EA3ALV 319	N2LM 297	
K2FL 338	UAØMF 338	PY2YP 337	HB9DDZ 336	JA7XBG 332	IKØADY 328	RA1AOB 317	N2VW 283	

SSB

K4JLD 339	K4MQG 339	N5FG 339	PY2YP 338	W4UW 337	K5RT 334	KD5ZD 326	RA1AOB 312	AD7J 300
EA2IA 339	N4MM 339	YU1AB 339	K9OW 338	K1UO 337	WA4WTG 334	W1DF 326	N2LM 312	W4EJG 295
XE1AE 339	K9MM 339	K4CN 339	EA5BY 338	HB9DDZ 337	ZL1BOQ 334	PY2DBU 325	G3KMQ 312	W9ACE 294
IN3DEI 339	OZ5EV 339	UAØMF 339	VE3MR 338	K8SIX 336	W9IL 334	KE4SCY 325	XE1MEX 312	AE9DX 294
NØFW 339	VE2PJ 339	K5TVC 338	VE3MRS 338	KE3A 336	VE4ACY 333	W4MPY 325	KD2GC 311	W6MAC 292
DU9RG 339	K3JGJ 339	KZ2P 338	XE1L 337	K9IW 336	K9PP 333	K6GFJ 324	RW9SG 310	W5PVE 288
K3UA 339	N5ZM 339	W6BCQ 338	OE3WWB 337	N2VW 336	YV1KZ 333	TI8II 324	IØYKN 310	HB9DQD 285
K6YRA 339	N7RO 339	W7OM 338	N6AW 337	W2CC 336	F6HMJ 333	YO9HP 324	XE1MW 309	VE7HAM 285
IK1GPG 339	KE5K 339	K9BWQ 338	IK8CNT 337	N7WR 336	YV1AJ 332	KW3W 324	AA1VX 308	N8LIQ 284
DJ9ZB 339	IØZV 339	W8AXI 338	EA4DO 337	JA7XBG 336	VE4ROY 332	W6OUL 322	W5GT 308	N3RC 280
N7BK 339	OE2EGL 339	W9SS 338	CT3BM 337	K3LC 336	YV1JV 331	XE1RBV 321	K4IE 308	WA5UA 278
4Z4DX 339	W4ABW 339	VK4LC 338	K8LJG 337	PA5PQ 335	K7HG 331	WØROB 321	4Z5FL/M 306	HSØ/EA4BKA 276
WB4UBD 339	DL3DXX 339	K7LAY 338	W3AZD 337	XE1VIC 335	N5YY 331	VE7SMP 320	K7SAM 305	K9DXR 275
OZ3SK 339	I8KCI 339	WS9V 338	KØKG 337	NC9T 335	N1ALR 330	ON4CAS 319	I3ZSX 304	
OK1MP 339	VE1YX 339	W6DPD 338	W2FKF 337	CT1EEB 335	W9GD 329	LU3HBO 317	JR4NUN 303	
K2TQC 339	N4CH 339	VE3XN 338	W7FP 337	W1JR 335	K4DXA 328	N8SHZ 316	W4PGC 302	
K4MZU 339	EA3BMT 339	K9HQM 338	YU3AA 337	I4LCK 335	SV3AQR 328	IV3GOW 316	EA8AYV 302	
N4JF 339	IKØAZG 339	K2FL 338	W7BJN 337	ZL1HY 335	VE7EDZ 328	W6NW 314	4X6DK 301	
W4WX 339	K4IQJ 339	VE2GHZ 338	AB4IQ 337	K5UO 335	XE1MD 327	KU4BP 314	WD9DZV 301	
K5OVC 339	WK3N 339	AA4S 338	W4UNP 337	WØYDB 334	YV4VN 326	KA1LMR 312	K7ZM 300	

RTTY

WB4UBD 337	NI4H 336	N5FG 335	N5ZM 333	K3UA 332	OK1MP 330	UAØMF 320	G4BWP 320	K4CN 316

very receptive and is anxious to meet the needs of our attendees and graciously welcomes SWODXA.

"The Marriott is a large hotel with many room choices. Should you need accommodations, the phone number is 937-223-1000 or the website is <http://www. marriott.com/hotels/travel/dayoh-dayton-marriott). When tickets become available, more information will be posted on our website at <http://www.swodxa.org/>.

"We look forward to seeing everyone at the DX Dinner™ at the Marriott and at the Hamvention®. Good DXing!"

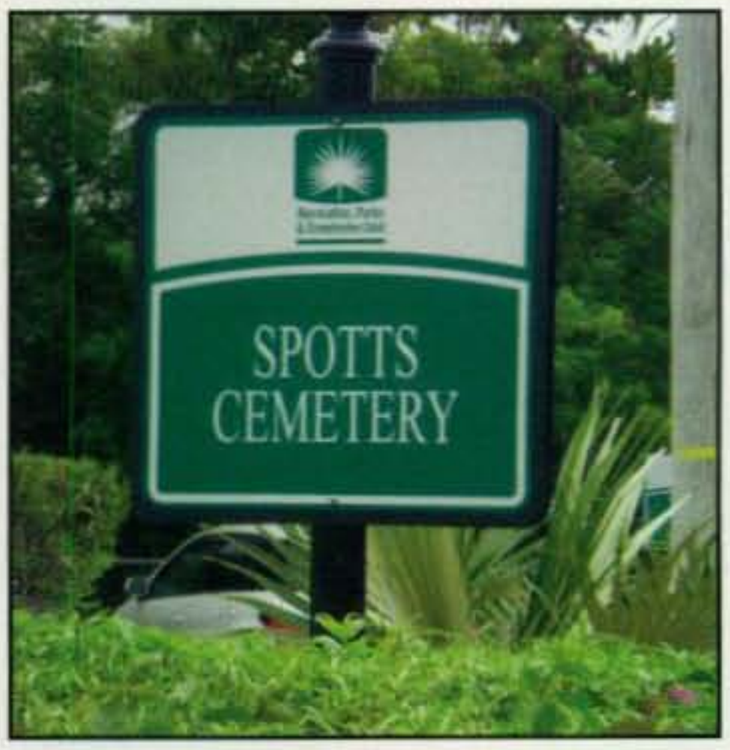
I hope you got all your antenna projects done before the contest season starts this year. I've managed to make a few improvements (at least I hope they are improvements) that will help me work a few more on 160 and 80 this year. Time will tell.

Until next time, enjoy the chase and please Have Fun! 73, Carl, N4AA

QSL Information

C21TI via EA4ATI
C3/5P1M via OV1A
C3/OV8FM via OV1A
C3ØLY via DJ9ZB
C31/IK2CIO via IK2CIO
C31/OE5BVM via OE5BVM
C31CT via EA3QS
C31LY via DJ9ZB
C37DXU via EA3BB
C37NL via EA7KW
C37URE via EA5BZ
C43T via YU1FW
C4I via LZ2HM
C4M via W3HNK
C4N via W3HNK
C4Z via G3SWH
C56/GWØETF via GWØETF
C56ETF via GWØETF
C56KR via OZ8KR
C56SMT via SM1TDE
C56VZ via G3SWH
C5AAN via DJ6QT
C5ABH via DJ6QT
C6A/DL1DA via DL1DA
C6AAA via via N4AA
C6AMP via DL2NCY
C6AOC via DL3OCH
C6AQC via W3HNK
C6ARI via DL3OCH
C6AWL via RX3RC
C6AYL via W8GEX
C6DX via W8GEX
C91BA via ZS6TAF
C91F via AA4NN
C91FC via ON4CJK
C91J via ZS5J
C91J via NI5DX
C91LW via UY5LW
C91NN via AA4NN
C91VM via IK1RAE
C92IO via ZS6HB
C9RJJ via NI5DX
CE/ON4BBQ via ON4BBQ
CEØ/YV5IAL via YV5IAL
CEØFQU via DJ9ZB
CEØXT via CE6TBN
CEØY/SM6CUK via SM6CUK
CEØY/SQ8X via SQ8X
CEØY/SV2KBS via SV2KBS
CEØZ/DL1DA via DL1DA

(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/>.)



When on a DXpedition, one is always on the lookout for odd or unusual items to photograph and talk about later. Here Joe, W6VNR/ZF2AH, came across this sign on Cayman Island. His comment: "People always wonder where the "spots" go after a contest." Could this be the answer? (Photo courtesy of Joe, W6VNR/ZF2AH)

New State Counties Awards

BY TED MELINOSKY,* K1BV

The July column included a list of states that need a sponsor for their own "All Counties Award." Thanks to the volunteers who jumped at the chance to fill in the spots for New Hampshire, New York, and Pennsylvania. I'm including the NH and PA rules in this column, and NY awaits only the official okay from the club that will offer it under its name. The complete rules for all the state-sponsored county awards is available at <http://www.dxawards.com/>.

Work All New Hampshire Counties

Work and confirm a QSO with each of the 10 counties of New Hampshire using all bands and modes. The award is available to all amateur radio operators. Mobile and portable QSOs are allowed. No use of repeater, digipeater, or any relay contacts count for the award.

A QSO from NM1JY, the Submarine Museum, will count as a contact from Rockingham County. Cards are not needed as long as you have the QSLs in your possession. Have two General class or higher amateurs not related to the applicant sign the application verifying that they have seen your QSL cards. If you are unable to find two witnesses, you may send your QSL cards and they will be returned with your award. Endorsements are available for CW, Digital, or Single Band. There is no extra cost for endorsements.

Send GCR list and fee of US$1 for North American amateurs (U.S., Canada, Mexico) and US$4 or four IRCs for DX to Stephen Hans, KC2VUE, 25 Delamater Way, Troy, NY 12180.

If cards are to be returned, the sponsor will use the address on QRZ.com to send the award and QSL cards back to you, unless you specify otherwise. E-mail: <kc2vue@yahoo.com>; internet: <http://kc2vue.angelfire.com/NHcountyaward.html>.

The Pennsylvania "67" Challenge

This award is sponsored by the Holmesburg Amateur Radio Club for confirmed QSOs with all 67 counties in the Commonwealth of Pennsylvania. QSL cards must be in the applicant's possession. QSL cards can be paper or electronic. Logbook of The World (LoTW) will also be accepted. The basic award is issued at 20 counties. A separate certificate will be awarded at the 40 and 70 counties levels. An endorsement will be given when all 67 counties are worked. Endorsements are also available for single band or mode. All bands and modes may be used for the award.

Contacts made using repeating devices such as FM repeaters, amateur satellites, moonbounce, and keyboard-to-keyboard through digipeaters/nodes are valid, because these QSOs are made in real or near-real time. Contacts using IRLP, Echolink, or D-STAR are valid as long as a radio is being used by both operators. All contacts must be made from the same county.

Contacts made by storing messages on BBS-type stations (whether terrestrial or on board satellites) or by forwarding messages through a network of such BBSs are not valid.

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

USA-CA Special Honor Roll

Robert N. Herrell, AJ5C
USA-CA All Counties #1199
June 28, 2010

Jerry France, K7LY
USA-CA All Counties #1200
July 12, 2010

USA-CA Honor Roll

500

AJ5C 3509
SP5SA 3510
K7LY 3511
DL5XL 3512
K7LY 1512

1000

AJ5C 1798
OZ1ADL 1799
K7LY 1800

1500

AJ5C 1511

2000

AJ5C 1397
K7LY 1398

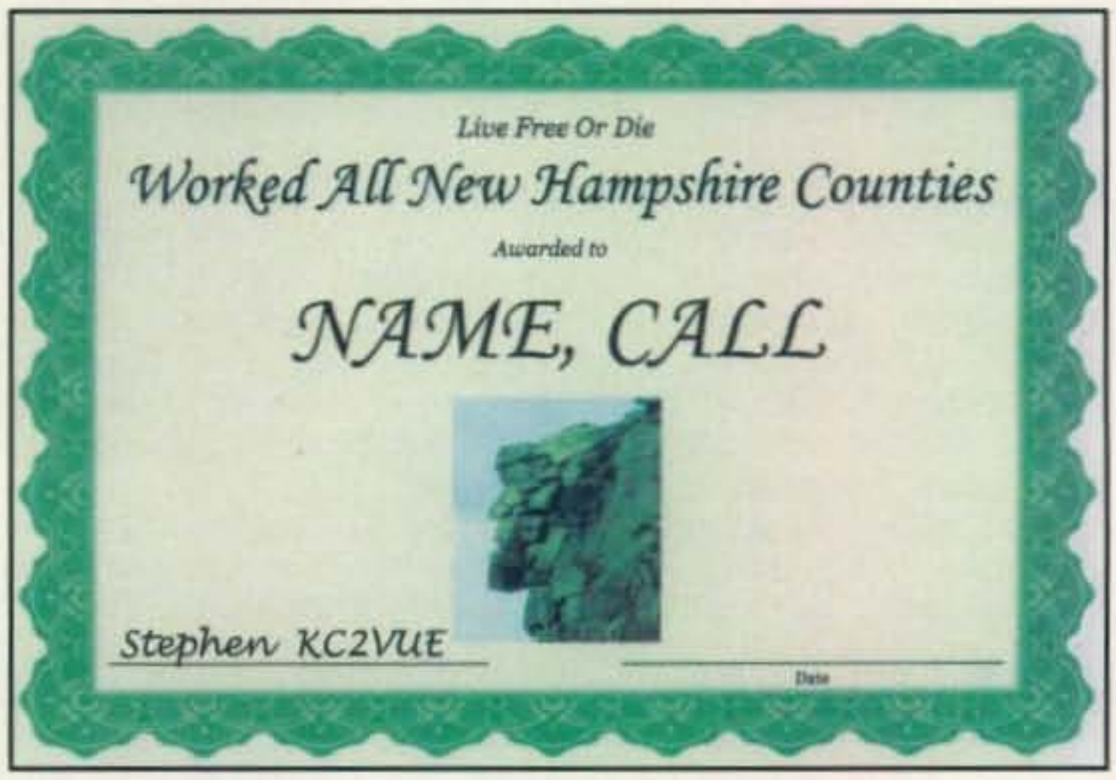
2500

AJ5C 1314
K7LY 1315

3000

AJ5C 1225
K7LY 1226

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.



Work and confirm a QSO with each of the 10 counties of New Hampshire to earn the Work All New Hampshire Counties award.

The Pennsylvania "67" Challenge award is sponsored by the Holmesburg Amateur Radio Club for confirmed QSOs with all 67 counties in the Commonwealth of Pennsylvania.

Applicants must submit a list of QSOs, alphabetized by county, showing the following QSO data: county, callsign of station contacted, band, mode, date, and UTC time. The name and callsign of the applicant should be printed clearly, exactly as they are to appear on the certificate. QSOs made under different callsigns of the same operator are permitted. The callsigns should be indicated on the application.

QSL cards and the application are to be presented to one of the following for checking and verification: (a) the president of a ham radio club, or (b) an official of the ARRL or DX applicant's national amateur radio society. If cards are mailed to the award sponsor, sufficient postage or IRCs should be included to cover return shipping.

The following statement, or equivalent language, should appear on the application: "I have examined QSL

Bob Herrell, AJ5C
USA-CA All Counties #1199, June 28, 2010

The time was 1955 and I was in my uncle's garage. He had an old military-style HF receiver. I enjoyed listening to all the stations I could hear. Then I found this contraption—a paper tape reader that played this funny noise. I had found the Morse Code. I began to play with this and soon was learning the code.

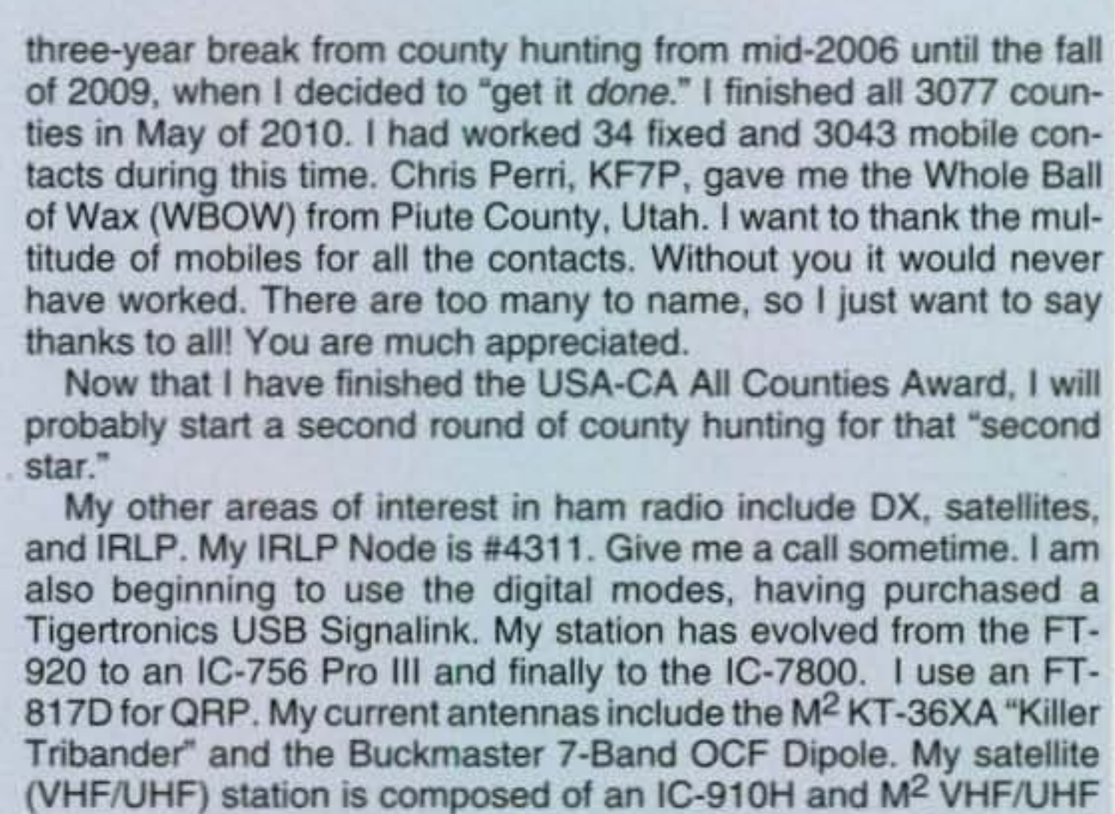
In 1957 I was 14 years old and began to study for my Novice license. I soon passed the exam and was granted the call KN6VKC. It would be years later when I actually became active in ham radio. I upgraded to Technician and my new call was now K6VKC. During this time, 1959–61, I was a Cadet in the Civil Air Patrol. I loved communications and became a CAP radio operator at the Group 13 HQ in Norwalk, California.

After graduating from high school in 1961 I entered active duty in the U.S. Air Force. During my Air Force career, I was mostly inactive on the ham bands, but was very active in the MARS program. It wasn't until 1970 that I built a Heathkit SB-102 and became active on HF. My call at that time was WB4TCZ and I had upgraded to General. Another move in the service brought me to Louisiana and my call was then changed to WB5PTO. I upgraded to Advanced and finally to Extra Class.

I retired from the Air Force in 1982 and went to work for the Federal Aviation Administration in Las Vegas as a Radar/Electronics Technician. Shortly after this time I met another ham, KN7I, Bob Williams. He had been hired as a technician in our unit. He found out I was a ham and sort of gave me the "kick in the pants" to get active once again. He also told me about this thing called "county hunting." I had upgraded my equipment and was now running a FT-920 and a KLM KT-34A antenna. I began listening on 14.336 and 7.188 for the mobiles running counties. I found this interesting but wondered if I could ever achieve working all 3077 counties. It seemed an impossible task.

Bob suggested to me that I get a vanity call and the FCC granted me NK7I. Now that was fun. Bob, KN7I, and me, another Bob now NK7I, would find ourselves both active at the same time on the county hunting nets. Talk about a little confusion! Yes, we did get a few of each other's MRCs by mistake. KN7I operated mostly mobile giving out the counties, while I operated as a fixed station.

On June 19, 2004, I began my search inn earnest to collect all the counties. In 2005 I retired from the FAA and began working the radio 10–12 hours a day. Boy, the counties seemed to be flying in left and right. In 2007 I moved from Las Vegas to a small town in the Ozarks—Harrison, Arkansas (Boone County). I had a roughly



Bob Herrell, AJ5C, USA-CA All Counties #1199, June 28, 2010.

three-year break from county hunting from mid-2006 until the fall of 2009, when I decided to "get it *done*." I finished all 3077 counties in May of 2010. I had worked 34 fixed and 3043 mobile contacts during this time. Chris Perri, KF7P, gave me the Whole Ball of Wax (WBOW) from Piute County, Utah. I want to thank the multitude of mobiles for all the contacts. Without you it would never have worked. There are too many to name, so I just want to say thanks to all! You are much appreciated.

Now that I have finished the USA-CA All Counties Award, I will probably start a second round of county hunting for that "second star."

My other areas of interest in ham radio include DX, satellites, and IRLP. My IRLP Node is #4311. Give me a call sometime. I am also beginning to use the digital modes, having purchased a Tigertronics USB Signalink. My station has evolved from the FT-920 to an IC-756 Pro III and finally to the IC-7800. I use an FT-817D for QRP. My current antennas include the M^2 KT-36XA "Killer Tribander" and the Buckmaster 7-Band OCF Dipole. My satellite (VHF/UHF) station is composed of an IC-910H and M^2 VHF/UHF satellite beams. I am also active on the OMISS nets trying to work 5-Band WAS. All we need now is a few more sun spots to improve the propagation. I hope to work you all in the future.

73 de AJ5C

cards for all the listed contacts. The information is accurate as listed." The person who checks the cards should sign this statement and also clearly print his or her name and position title.

Award fee and return envelope: Applicants in the USA should enclose a check for $3.00 for each award/endorsement level, payable to Holmesburg ARC. DX applicants (including Canada), please send 1 IRC. All applicants should include their mailing address for an 8" × 11" (21.5 × 28 cm) certificate.

Mail the completed application to: Holmesburg Amateur Radio Club, 3341 Sheffield Ave., Philadelphia, PA 19136. E-mail: <wm3pen@arrl.net>; internet: <http://www.harcnet.org/pa67.htm>.

India's VU2UR Awards Series

B. L. Manohar, VU2UR, has released details of a very colorful series of awards that feature popular themes from his country. Here are two of the awards, which are representative of the excellent design and typographic work. The fees for all of the series are quite low, because the awards are delivered to you not by slow mail from the other side of the world, but by e-mail as PDF documents that you can print in your shack. VU2UR is aware of the problems of mail pilferage and neatly sidesteps the problem from his side. From our side, he recommends payment in IRCs sent by Registered Mail. (You still have to keep your fingers crossed.)

I like VU2UR's first sentence from the e-mail that announced the certificates: "Here is a set of easy awards from India, for the island hunters." Easy?? A few years ago, awards for working multiple QSOs from the Andaman Islands would make you look at the cover of the magazine to see if this was an April Fool's Day joke. However, over the last few years, expeditions to many of these previously off-limits islands have changed the picture entirely. The awards are both beautiful and inexpensive, which is a great combination.

General Requirements: SWL OK. No date limit. All bands and modes including WARC bands count. Please read the requirements for each award. Due to postal security problems, fees in Euros or US$ must be sent as Demand Draft from a bank payable to "B. L. Manohar, at. Bangalore" *or* IRCs sent by Registered Mail only. Endorsements are available for mode and band. The awards are "A4" size (210 × 297 mm), and are multi-colored. Send application and fee to: B. L. Manohar, VU2UR, MIG-6, 80 Feet Road, Kengeri Upanagara, Bangalore 560 060, India. (Please do not send any green stamps or Euros via snail mail, which are likely to be stolen during transit.) E-mail: <vu2ur2009@rediffmail.com>.

Worked Andaman Islands (WAI) Award. Work different Andaman Island stations as follows. For Basic award, 4 different Andaman QSOs. For First Class award, 8 different Andaman QSOs and For Excellence Class award, 12 different Andaman QSOs. Fee is only 2 IRCs. Submit GCR list.

The Worked Andaman Islands Award is sponsored by VU2UR.

Worked Bengaluru Award is issued for working any two different stations in this city in India.

Worked Bengaluru Award (Worked Silicon City Award). The city of Bengaluru (also known as Bangalore), the capital city of the State of Karnataka (KA), is known as the Electronic City, Garden City, Silicon City, or IT City of India. The city has over 1500 amateur radio license holders QRV on HF, VHF, UHF, Satellite, CW, SSB, and Digital modes. The very active stations from this city were/are: VU2PTT, VU2LBW, VU2ZAP, VU2WAP, VU2RMS, VU2BGS, VU2UR, VU2LX, VU2GUR, VU2VNK, VU2LYX, VU2LCI, VU2JHM, VU2FI, VU2POP, VU2GSM, VU2IIH, VU3GFF, VU3ITI, among others. Requirement: Work any two different stations in this city. No QSLs required. No date limit. All bands and all modes OK. Endorsement for single mode, single band can be given. Send 1 IRC. Submit GCR list.

We're always interested in hearing from clubs, special interest groups, and individuals who sponsor an award. Please contact me at the e-mail address shown on the first page of this column.

73, Ted, K1BV

BY JOHN DORR,* K1AR

Has the 48-Hour Contest Outlived Its Original Intent?

October's Contest Tip

If you want a great resource to keep informed on what's really happening with "Ole Sol," check out <www.spaceweather.com>. Keeping track of solar activity is a great way to help you plan your contest strategies in advance by leveraging the strengths and minimizing the weaknesses of your station against upcoming conditions.

Calendar of Events

All year	**CQ DX Marathon**
Sept. 25–26	**CQ WW RTTY DX Contest**
Sept. 25–26	Texas QSO Party
Oct. 2-3	California QSO Party (CQP)
Oct. 9–10	Pennsylvania QSO Party
Oct. 9–10	Scandinavian SSB Activity Contest
Oct. 9–10	Makrothen RTTY Contest
Oct. 10	North American RTTY Sprint
Oct. 16–17	Worked All Germany Contest
Oct. 17	Asia-Pacific CW Sprint
Oct. 17–18	Illinois QSO Party
Oct. 30–31	**CQ WW DX SSB Contest**
Nov. 6–7	Ukrainian DX Contest
Nov. 6–8	ARRL CW Sweepstakes
Nov. 13–14	Worked All Europe RTTY Contest
Nov. 13–14	JIDX Phone Contest
Nov. 13–14	OK/OM CW DX Contest
Nov. 27–28	**CQ WW DX CW Contest**

There was a stretch during an especially boring presentation at a local convention forum I was attending, when I tried to approximate my cumulative operating time in contests over the years. In rough terms, the answer came to 8000 hours, or 330+ days. In other words, if I started a contest on January 1st, I would need to operate continuously until approximately November 30th to reach that number!

Needless to say, many of us have invested significant time in preparing our stations and engaging in actual on-the-air operating. The majority of this operating time investment has come from the traditional 48-hour weekend contest. The concept of 48-hour DX contests has been around for decades. The very first CQ WW, for example, specified: "The contest period is 0200 GMT, October 30 to 0200 GMT, November 1 for Phone and 0200 GMT, November 6 to 0200 GMT, November 8 for CW." I'm sure many of you remember the "two-weekend" ARRL DX Contests, where commitment was defined as giving up four out of seven weekends every February and March. As I look back at those times, I must have been nuts to do that!

The operating time habits of single operator winners in the major DX contests, many operating the full 48 hours available to them, have truly been an exercise resulting from necessity rather than desire in many cases. Although we may not universally support it as a group, we have historically accepted it as the cost of obtaining victory. The debate over this matter has continued to increase. What follows are some views for you to consider.

Maintaining the 48-Hour Contest Format

Supporters of the 48-hour contest period tend to be traditionalists. What has worked in the past should continue in the future. The 48-hour contest allows for more opportunity to avoid brief declines in propagation. Contest weekend conditions beginning at the end of a solar-storm period frequently can recover by Sunday. Often considered both a pro and con, the full contest weekend (e.g., no required off-times) eliminates the "good-luck" variables created by one operator selecting a better choice of operating times than another. To be fair, many call this *operating strategy* and are of the opinion that it differs very little from simply choosing appropriate sleep times.

As if this is not enough, there is the matter of contest records. Existing major contest records are based on a 48-hour operating period. If a change was made to a different operating period, it is likely that many of these records would never be broken.

Fundamentally, proponents of change in operating times tend to support the concept of a 36- or 24-hour contest standard. Unfortunately, until recently, contest administrators have never really been able to enforce the use of off-times. That being said, while there are relatively easy ways to verify on-the-air operating time, few checking techniques exist to prevent the unauthorized use of off-times (e.g., to line up needed multipliers while listening). This could be particularly important in a closely contested DX contest where multipliers are so important to the final result. The example of the mysterious appearance of a VY1 in an ARRL Sweepstakes log within minutes of beginning a new operating period also comes to mind.

The negativism that comes from 48 hours of operating is essentially limited to the Single-Operator, All Band Category. Proponents of the full 48-hour period suggest that this operating class is not for everyone, as is the case with QRP or Packet/Unlimited categories. Instead, 48-hour contests offer other categories for competitors to compete, such as Multi-Op or Single Band entries which usually require less operating time.

Eliminating the 48-Hour Contest Period

The list of opposing positions regarding the 48-hour concept is equally compelling. For starters,

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opponents question the fundamental reason for "torturing" ourselves in the way a runner feels with one mile to go in a marathon race. A contest, they say, should be fun and not result in the drudgery that comes from sitting in front of the radio for an entire weekend. While on that point, a reduced operating period may also allow participants to enjoy other aspects of their weekend, while simultaneously maintaining the ability to be competitive.

The experiences we have gained from other "non 48-hour" operating events seem to further support the sanity of less operating time for major contests. The CQ WW WPX Contest, for example, has grown tremendously in popularity even though it only permits 36 hours of operating for single operators. There are other contests that illustrate this point as well, including the Worked All Europe, ARRL Sweepstakes, and many others. One of the frequent observations in the soapbox comments from the recently reported North American QSO Party contest results was the popularity of the short, 10-hour format.

A recurrent circle of advocates for shorter contest operating periods is the older and busier of our contesting clan. For me, contesting is harder both mentally and physically than it was when I was in my 20s. Furthermore, as I become more involved with personal commitments, the ability to devote an entire weekend to contesting becomes an ever greater challenge. I suspect that I'm not alone on this one.

The Bottom Line

So, I suspect you are wondering where I stand on this issue. Even as I write this month's column I find myself waffling from one side to the other. I think of the feelings I have about contesting as the alarm sounds on Saturday night after only one or two hours sleep. On the other hand, I think about the excitement I've experienced from a full 48-hour contest as the bands percolated around the clock with fast runs to Europe and Asia. Under those conditions, the issue becomes the identification of the few precious hours I can miss which will produce minimal impact on my score. Also, in the spirit of full disclosure, I've only operated a full 48 hours twice. Both experiences were "memorable" in many ways.

When all the dust settles, I believe that contesting is ultimately a personal challenge. There are few competitors who will ever get the coveted winning prize, and that is true even if the contest were only 10 hours long. The beauty of contesting is its diversity of operating events (take a look at this month's calendar). In a similar way, it's impossible to design contests that provide the best fit for everyone's preferences and personal situations. That is, perhaps, one of the principal reasons why we have so many contests.

I like the challenge of the 48-hour event. It is a challenge that demands the highest physical and mental preparation in our hobby. Major-league 48-hour DX contesting boils down to four weekends a year (CQ WW and ARRL DX) for the serious competitor. While my intellect tells me that reduced operating times might make sense, my gut tells me we should have it the way it is. The sponsorship of 48-hour DX contest weekends should continue! What do you think?

Final Comments

Well, this column has made me tired, not because I worked on it for 48 hours, but because it's only 5:30 AM at the moment. Can you believe that the CQ WW SSB Contest is only a few weeks away, followed by the CW leg in November? As conditions continue to improve, I'm optimistic that we're going to have a much better contest season this year than ones in the recent past. Let's all keep our fingers crossed! See you in the next contest!

73, John, K1AR

propagation

BY TOMAS HOOD,* NW7US

Fair Conditions Predicted for CQ WW DX SSB Contest 2010

A Quick Look at Current Cycle 24 Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, July 2010: 16
Twelve-month smoothed, January 2010: 9

10.7 cm Flux
Observed Monthly, July 2010: 80
Twelve-month smoothed, January 2010: 76

***Ap* Index**
Observed Monthly, July 2010: 6
Twelve-month smoothed, January 2010: 5

One Year Ago: A Quick Look at 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

High-frequency radio enthusiasts celebrate the arrival of the fall DX season. From October through November 2010 we will see a steady improvement in the DX bands. During the CQ WW contests taking place in both months (SSB in October and CW in November, the last full weekend of each month), we should experience fairly good success.

The 2010 CQ WW DX SSB Contest (http://www.cqww.com/) will start at 0000 UTC, Saturday, October 30, and run through 2359 UTC Sunday, October 31. Looking at the 27-day rotation of the sun, taking into consideration the current solar activity at the time of writing this column in mid-August, propagation should be fair on both days. Expect conditions to be comparable with conditions from the 2004 or 2005 contest weekend.

Predictions for one 27-day rotational period are far more accurate than for three 27-day rotational periods. Be sure to carefully check conditions on October 3 and 4, 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 this 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 shows the smoothed sunspot count during previous WW DX Contest periods since 1999, and what's predicted for the 2010 contest. 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 long windows of 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.

The information in this month's column is designed to help you make the most of propagation conditions during the contest, if you participate. Even if you are not a dedicated contester, you should give it a try. If you are trying for your DXCC

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LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for October 2010

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 1-2, 6-12, 14-16, 19-23, 28-29	A	A	B	C
High Normal: 3-5, 13, 18, 26-27 30-31	A	B	C	C-D
Low Normal: 17, 24	B	C-B	C-D	D-E
Below Normal: 25	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 Sept. 1st through the 6th, fair to poor (C-D) on the 7th, fair (C) on the 8th, 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.

	1999	2000	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10
October	108	115	114	91	58	36	26	14	6	2	5	*35
November	111	113	116	85	57	35	25	13	6	2	4	*39

** Predicted values expected during the 2010 contests.*

Table I– Smoothed sunspot numbers recorded during CQ World-Wide DX Contests since 1999 (Oct. SSB, Nov. CW).

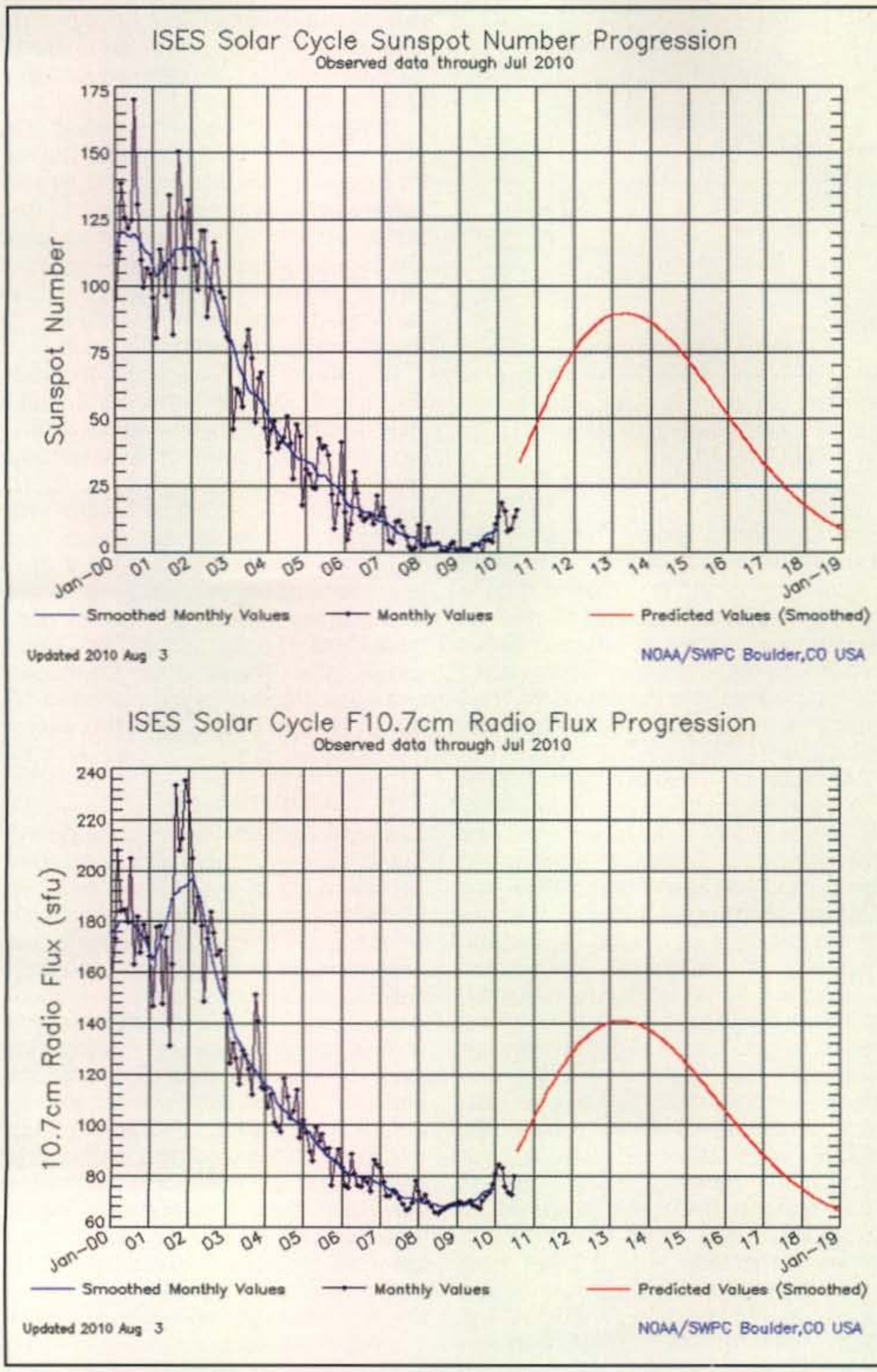

Fig. 1– Sunspot Cycle 24 progression charts showing the definite rise in both monthly observed sunspot counts since the last months of 2009, as well as the rise in the 10.7-cm flux monthy figures (Source: Space Weather Prediction center [SWPC]/ The National Oceanic and Atmospheric Administration [NOAA])

Looking Ahead in CQ

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

- A Mystery Boatanchor
- A Tale of Two Field Days
- Communicating Under the Noise, Part II
- *CQ* Interviews: Dr. Bill Baker, W1BKR

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>.

Oops...

In his September "Public Service" column, KI6SN referred to a new digital mode gaining popularity among emergency communicators, NBEMS, as Narrow *Beam* Emergency Messaging System. The correct name is actually Narrow *Band* Emergency Messaging System. For more on NBEMS, see this month's "Public Service" column.

or other award, this is the contest 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 WW contest weekends. Next month's column will update this summary.

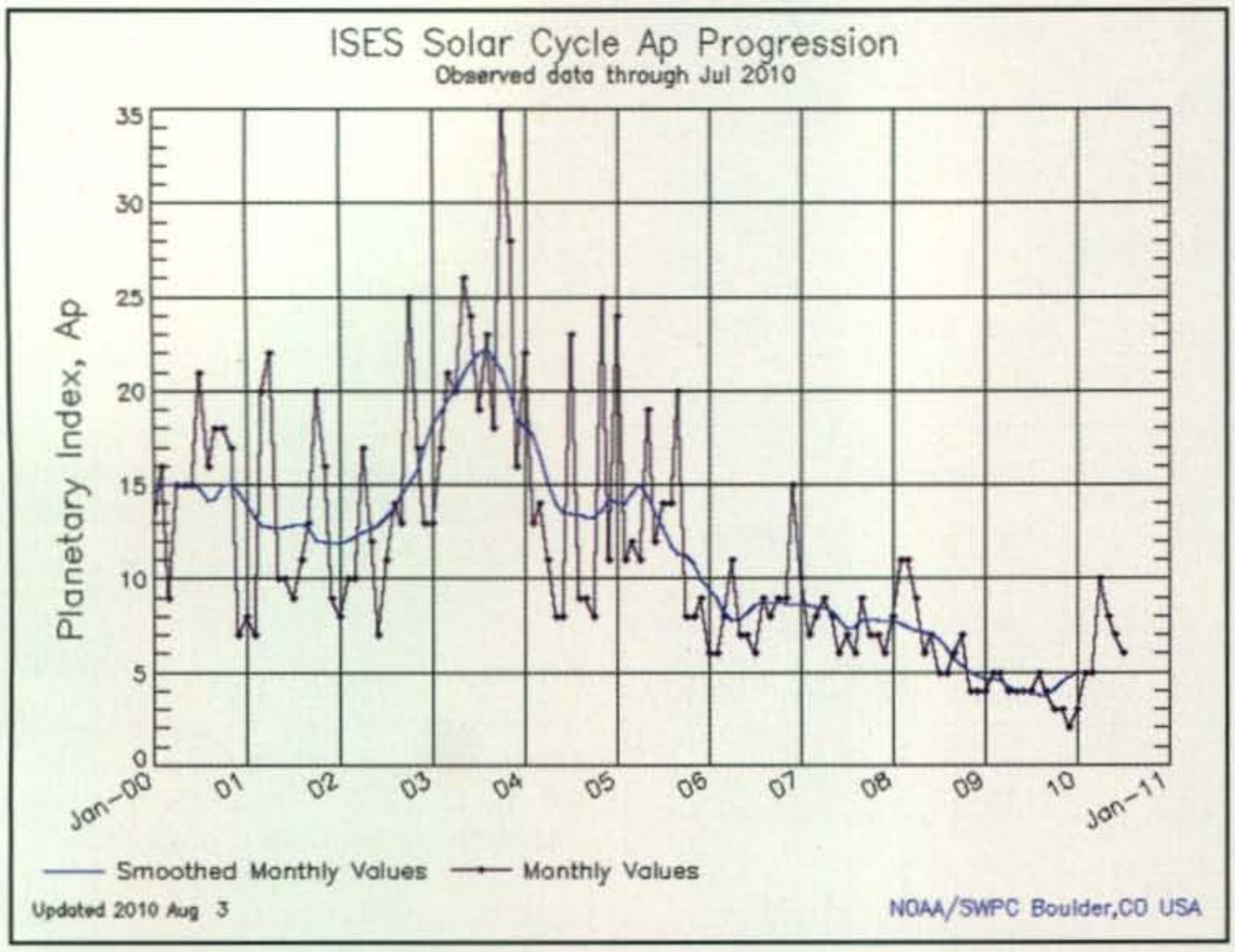

Fig. 2– This graph of the monthly and smoothed planetary A*-index (*Ap*) reveals that we are seeing an increase in geomagnetic activity now that sunspot Cycle 24 is getting under way. (Source: SWPC/NOAA)*

160 Meters: Considerably decreased static levels, 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 into 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 website 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 toward Europe and in a generally easterly direction around midnight. For openings in a generally westly 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 the hours of darkness, as the seasonal static levels are lower than 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.

20 Meters: DX openings should be possible on this band both day and night. Conditions should peak from 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 gray 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 play more often as a DX band. During the daylight hours, this band should see some significant action, better than the last few years. Fair to good conditions are expected 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 10 yet. By next year this band will become a significant resource for contesting. With the continued rise in solar activity, this band comes alive. Those in the Caribbean and other tropical regions will find 10 meters a more 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 it will be 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*, active between October 6 and 10 and expected to peak on the night of October 8 or 9 (some forecast the earlier peak, while others call for an even weaker period on the ninth). The shower is expected to be weak this year. 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 mode (*Ms*) propagation openings on VHF and UHF. Predictions are indicating that the only interaction with these meteors will be from a thin wispy trail of debris that will intersect Earth's orbit this time around.

Check out <http://www.imo.net/calendar/2010> for a complete calendar of meteor showers in 2010.

Current Solar Cycle Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 79.9 for July 2010, up from June's 72.6. The 12-month smoothed 10.7-cm flux centered on January 2010 is 75.5, up from December's 74.9. The predicted smoothed 10.7-cm solar flux for October 2010 is about 93, give or take about 7 points.

The Royal Observatory of Belgium reports that the mean monthly observed sunspot number for July 2010 is 16.1, up from June's 13.5. The lowest daily sunspot value during July 2010 was eight on June 1–3 and 7–8. It is a welcomed development in this new cycle to see a full month with daily sunspots. The highest daily sunspot count for July was 30 on July 24. The 12-month running smoothed sunspot number centered on January 2010 is 9.3, one point higher than December's 8.3. A smoothed sunspot count of 35 is expected for October 2010, give or take about 8 points.

The observed monthly mean planetary *A*-index (*Ap*) for July 2010 was 6, and for June 7 (adjusted down one point from the initial report of 8 for June). The 12-month smoothed *Ap* index centered on January 2010 is 5.0, about the same as December. Expect the overall geomagnetic activity to be active to stormy during October. Refer to the "Last-Minute Forecast" for the outlook on what days this might occur.

I welcome your thoughts, questions, and experiences regarding this fascinating science of propagation. You may e-mail me or catch me on the HF amateur bands. Please come and participate in my online propagation discussion forum at <http://hfradio.org/ forums/>. If you are on Facebook, check out <http://tinyurl.com/fbswx> and <http://tinyurl.com/fb-nw7us>. Speaking of Facebook, check out the *CQ* Amateur Radio Magazine fan page at <http://tinyurl.com/fb-cqm>.

Now that the new solar cycle is active, I'll be keeping my ears to the radio, hoping to hear you on the air. Happy DX!

73, Tomas, NW7US

our readers say

Mobile Installation Advice

The following letter was sent to Mobiling Editor Jeff Reinhardt, AA6JR:

Dear Jeff:

I have read your columns in *CQ* magazine about mobiling with great interest. Always informative and quite interesting. Thank you!! I have a 2002 Buick Rendezvous in which I would like to put an HF system (Yaesu FT-100D, FT-857, or Kenwood TS-2000, ATAS antenna, tuner). Have you any pictures, ideas, diagrams or suggestions for such an installation? I would like not to drill noticeable holes or make disfiguring cuts if at all possible. Thanks for any help that you can give me.

Herman Saul, NØHLS

AA6JR replies:

Thank you for the nice note and for reading the column.

I do not have any information specific to the Buick Rendezvous, other than it's a very nice crossover vehicle. Based on photos I've seen, you might look at purchasing a transceiver with a remote-control head and locating the main unit in the rear compartment of the vehicle, perhaps behind a trim panel or in a storage compartment, provided there is a good ground and adequate air circulation around the unit. The control head could then be located below the center control stack or perhaps in the center console if you desire total concealment.

To be sure, newer cars require great care when routing power wires, control head cables and antenna coax. If there's good news, I believe GM cars are among the more "radio friendly" vehicles in terms of lower levels of electrical interference.

Here's a link to a GM set of guidelines on installing radio gear in its cars. I hope you find it helpful: <http://service.gm.com/techlineinfo/radio.html>.

If you do an installation, please photo-document your project and consider sharing it with me and our *CQ* readers.

73, Jeff, AA6JR

Still "Successfully Dying"

Editor, *CQ*:

I would like to voice my opinion to you about the "state of ham radio." I personally don't think HR is dying. However it is not as wonderful as you would lead your readers to think (August issue, page 8). It is obvious that you and Dave Summer, K1ZZ, over at the ARRL drink the same water.

About 10 years ago, I called the ARRL and they gave me some stats about the license class of their members. This was back when the only No Code license class was a Technician. My exact findings have long since been deleted; however, the main thrust of the information was that 50% of *all* Extras were League members, 25% Advanced and 25% General class. And a whopping 3% were the famous No Code Technician.

Where the percentages are today, since I don't have any data, could be much different! We do know the numbers of Extras and Generals have skyrocketed because CW was dropped.

Just having a piece of paper saying you're a licensed Amateur really doesn't prove anything. And it sure doesn't make you a Ham. I agree the number on QRZ.com doesn't tell the story. However, I think you and *QST* hold some data that might be more revealing about the state of ham radio.

What is that information? *It's your readership*, how many and what percentage of the general ham population they represent. You stated there were 227k hams in the 1960s. Now 700k. That's a three times increase. Now the question: Has your readership gone up three times?

HR may not be dying, but it is changing, and when another 65 years have passed, will *CQ* exist, or *QST*? I would hope so, but since HR has become *a consumer product*, probably not!

I would like to add, I enjoy your magazine, and in many ways it's better than *QST*, so keep up the good work.

John Wilson, KØIP

W2VU replies: John, I don't have our circulation figures from 50 years ago handy, but what we are seeing today is that newer and younger hams don't naturally gravitate to print magazines in the way us old-timers did and do. We are seeing many younger hams on places such as Facebook, and it is up to us as the organized ham radio community to go where the newer people are, rather than just waiting for them to come to us.

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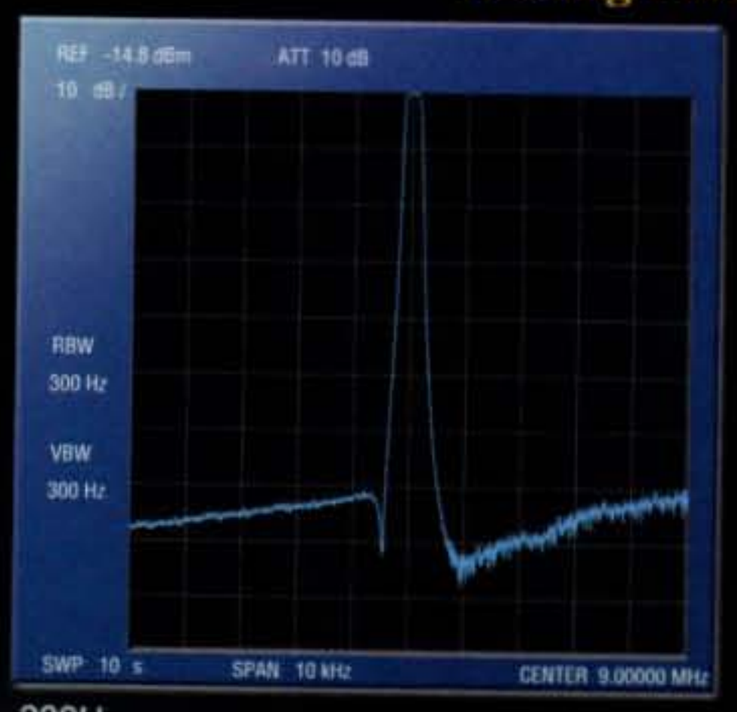

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