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COMMUNICATIONS & TECHNOLOGY

JUNE 2001

CQ

VHF SPECIAL!

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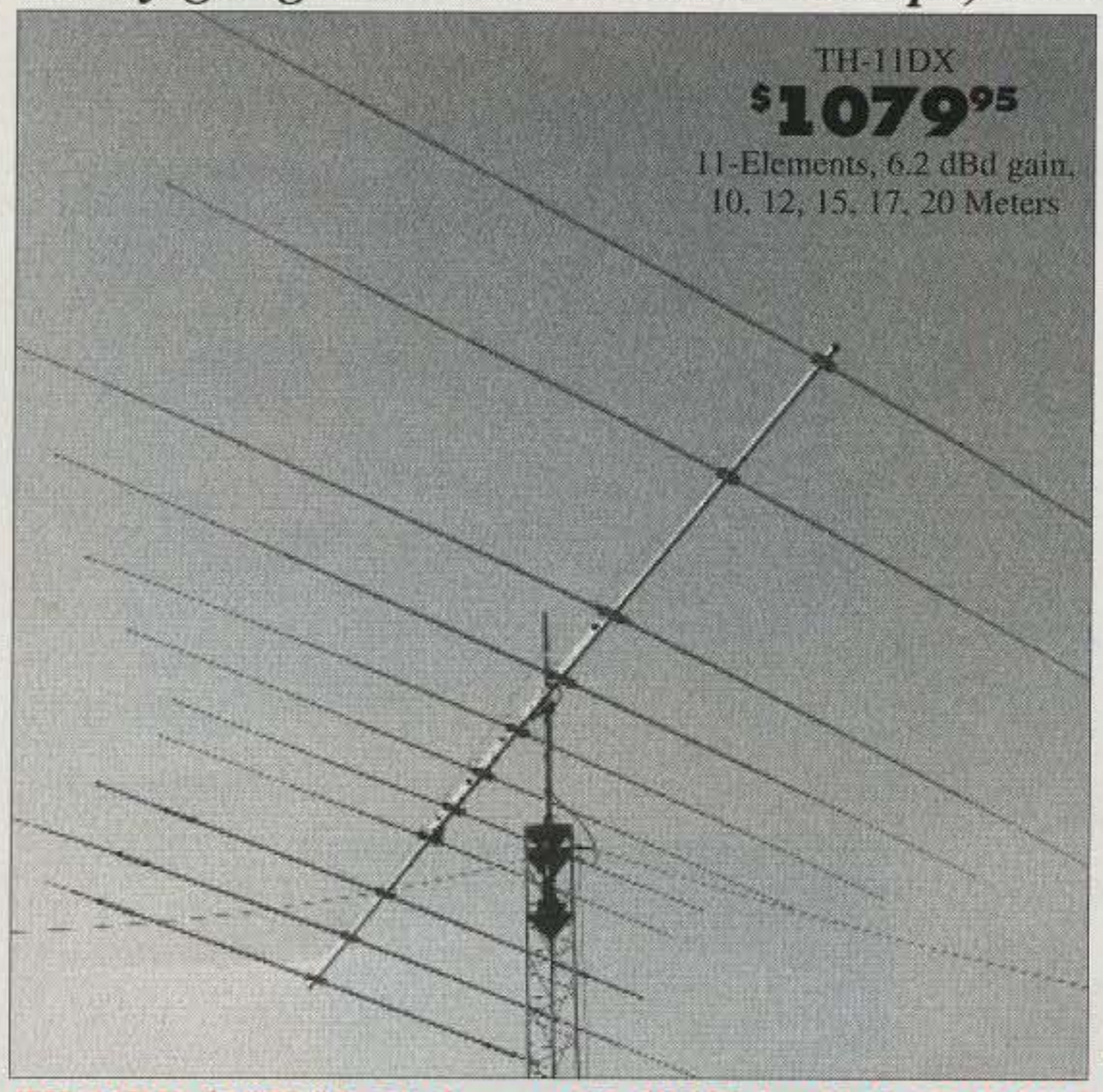

TH-11DX
$1079.95
11-Elements, 6.2 dBd gain,
10, 12, 15, 17, 20 Meters

TH-11DX, $1079.95. 11-element, 6.2 dBd Gain, 10,12,15,17,20M

The choice of top DXers.

With 11-elements, 6.2 dBd gain and 5-bands, the super rugged TH-11DX is *the "Big Daddy" of all HF beams!*

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

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

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TH-7DX, $819.95. 7-element, 6.57 dBd Gain, 10,15,20 Meters

7-Elements gives you an incredible avg *6.57 dBd gain -- the highest* of any Hy-Gain tri-bander!

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

Uniquely combining monoband and trapped parasitic elements give you an excellent 27 dB F/B.

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TH-5MK2, $699.95. 5-element, 6.1 dBd Gain, 10,15,20 Meters

The broadband *five element* TH5-MK2 gives you an outstanding 6.1 dBd average gain.

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

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

TH-3MK4, $439.95. 3-element, 5.9 dBd Gain, 10,15,20 Meters

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

You get an impressive 5.9 dBd average gain and a whopping 25 dB average front-to-back ratio. Handles a full 1500 Watts PEP. 95 MPH wind survival.

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

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

TH-2MK3, $339.95. 2-element, 3.4 dBd Gain, 10,15,20 Meters

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

For just $339.95 you can *double* your effective radiated power and hear *15-20 dB* (=F/B) better!

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

EXP-14, $549.95. 4-element, 5.9 dBd Gain, 10,15,20 Meters

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

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

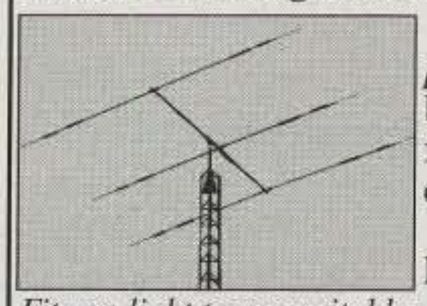
BetaMATCH™ provides DC ground to eliminate static. Includes BN-86 balun. Easily assembled.

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

QK-710, $169.95. 30/40 Meter option kit for EXP-14.

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

For limited space . . . Installs anywhere . . . 14.75 ft turning radius . . . weighs 21 lbs . . . Rotate with CD-45II, HAM-IV



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

TH-3JRS, $329.95. Hy-Gain's *most popular* 3-element 10, 15, 20 Meter tri-bander fits on most lots! Same top performance as the full power TH3MK4 in a compact 600 watt PEP design.

Excellent 5.8 dBd gain and 25 dB F/B let *you* compete with the "big guns".

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

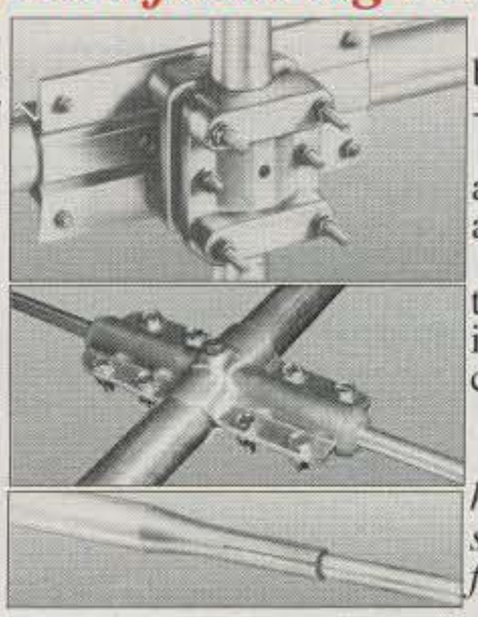
Model No.	No. of elements	avg Gain dBd	avg F/B dB	MaxPwr watts PEP	Bands Covered	Wind sq.ft. area	Wind (mph) Survival	Boom (feet)	Longest Elem. (ft)	Turning radius(ft)	Weight (lbs.)	Mast dia O.D.(in.)	Recom. Rotator	Retail Price
TH-11DX	11	6.2	22	4000	10,12,15,17,20	12.5	100	24	37	22	88	1.9-2.5	T2X	$1079.95
TH-7DX	**7**	**6.57**	**21**	**1500**	**10, 15, 20**	**9.4**	**100**	**24**	**31**	**20**	**75**	**1.5-2.5**	**HAM-IV**	**$819.95**
TH-5MK2	5	6.1	20	1500	10, 15, 20	7.4	100	19	31.5	18.42	57	1.5-2.5	HAM-IV	$699.95
TH-3MK4	**3**	**5.8**	**25**	**1500**	**10, 15, 20**	**4.6**	**95**	**14**	**27.42**	**15.33**	**35**	**1.9-2.5**	**CD-45II**	**$439.95**
TH-3JRS	3	5.8	25	600	10, 15, 20	3.35	80	12	27.25	14.75	21	1.25-2.0	CD-45II	$329.95
TH-2MK3	**2**	**3.4**	**15-20**	**1500**	**10, 15, 20**	**3.25**	**80**	**6**	**27.3**	**14.25**	**20**	**1.9-2.5**	**CD-45II**	**$339.95**
EXP-14	4	5.9	25	1500	10,15,20 opt. 30/40	7.5	100	14	31.5	17.25	45	1.9-2.5	HAM IV	$549.95

Tooled Manufacturing . . . Highest Quality Materials

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

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

3. Thick-wall *swaged* aluminum tubing



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

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

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

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CQ Amateur Radio

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FEATURES

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DEPARTMENTS

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Built-in Auto Tuner
Built-in TNC
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Cross Band/ Cross Mode Operation
Satellite Functions
1.2 GHz Optional Band

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Ham Radio News

From The CQ Newsroom

License Renewal Rate Jumps

The rate at which amateur licenses are being renewed jumped to nearly twice the average in January and February of this year, according to FCC statistics gathered by the *W5YI Report.* Since August 1999, the average renewal rate for expiring amateur licenses has been approximately 47% (meaning that 53% of hams whose licenses expired during the period had either died, lost interest in the hobby, or forgotten to renew). In the first two months of 2001, however, the renewal rate jumped to 92.9% and 90.3%, respectively.

W5YI cautions that direct month-to-month correlations are not accurate, as licenses may be renewed anytime from three months prior to two years after expiration. And it is too early to know if this higher renewal rate is a fluke or a trend. It is noteworthy, however, that both months are within the three-month renewal window for the first group of codeless Technician licenses, which were issued beginning February 14, 1991. If this is the beginning of a new trend, it could indicate that hams licensed under the new program are renewing in much greater numbers than their pre-no-code counterparts. We will continue to watch the numbers.

Space Station Ham News

Space Station Expedition 2 crew members have been heard occasionally on the ham bands, mostly using the station's US callsign, NA1SS. There have been three school contacts as of press time, plus at least one random contact—the first with Randy Shriver, KG3N, who also made the first random contact with the Expedition 1 crew (see Feb. 2000 *CQ*, p. 29)—and some packet activity. For details, see this month's "Amateur Satellites" column.

Also, controversial "space tourist" Dennis Tito, who is paying Russia $20 million to send him to the space station for 10 days over NASA's objections, has gotten a ham ticket. He is KG6FZX. There's no indication of his plans for using ham radio from orbit, when and if he gets there.

FCC Hangs Tight on Restructuring

The FCC ruled in late March on several petitions related to its 2000 license restructuring decision, and the only request it granted was to maintain a separate designation in its database for *some* Technician Class licensees who have passed their code tests. Those hams who hold or held "Technician Plus" licenses that are renewed as Technician licenses will have an indication in the FCC database that they previously held a Tech Plus license. However, Techs who pass or passed their code tests after April 15, 2000, will not be noted in the database, as that information is never passed on to the FCC by the Volunteer Examiner Coordinators. Code credit and HF operating authority for these hams are based solely on their VEC-issued Certificates of Successful Completion of Examination.

Additional requests, for reinstatement of higher speed code exams, lifetime exam credit for anyone who has previously passed a code test, automatic upgrade to Extra for pre-1951 holders of Class A licenses, and other changes to the FCC's restructuring decision, all were denied.

Three FCC Commissioners Named

President Bush has named three new members of the Federal Communications Commission, Republicans Kevin Martin and Kathleen Abernathy, and Democrat Michael Copps. According to the *ARRL Letter,* Martin is a telecommunications attorney and former advisor to departing FCC Commissioner Harold Furchtgott-Roth; Abernathy is also a lawyer and a former aide to ex-Commissioner James Quello; and Copps is a former Assistant Secretary of Commerce and former aide to South Carolina Senator Ernest "Fritz" Hollings. All three are subject to Senate confirmation. No more than three FCC seats may be held by members of the same political party.

ARRL Will Not Accept Printed "E-QSLs"

The chairman of the ARRL's Membership Services Committee says the electronic QSL verification plan being developed by the ARRL will *not* include acceptance of computer-generated electronic QSL cards. Hudson Division Director Frank Fallon, N2FF, says in a division newsletter that it's too easy to forge such cards and that the ARRL's yet-to-be-announced "Log Book of the World" program will focus on accepting electronic logs from DX stations and DXpeditions as it now accepts contest logs online. Award applicants claiming QSOs with those stations will receive credit as long as their contact is found in the DX station's log. Fallon also says the program could be online within a year, although no firm date has been set.

New "WOLF" Mode Used on LF

After the first successful transatlantic QSO on 136 kHz was made using *very* slow-speed CW (the QSO took two *weeks* to complete), Stewart Nelson, KK7KA, has developed a new digital mode he says will work just as well but without the long transmission times needed for LF CW contacts. According to "Newsline," the new mode is called "WOLF" (Weak-signal Operation at Low Frequency). On March 19, WOLF signals sent on 136 kHz by MØBMU in England were successfully decoded by W1TAG in the US. For more information on WOLF, see <http://www.scgroup.com/ ham/wolf.html>.

UK Designates Internet Voice Link Frequencies

Hams in the United Kingdom may apply for special licenses to operate simplex internet voice links and the country's Radiocommunications Agency has designated certain 2-meter and 70-centimeter frequencies where linking will be permitted, according to the Radio Society of Great Britain's *RadCom* magazine. The latest agreement between RSGB and the RA resulted in the first 2-meter frequencies being allocated for internet linking, along with additional 70-centimeter frequencies. All such operations are pursuant to "Notices of Variation," the RA's equivalent to the FCC's "Special Temporary Authority" or STA.

AO-40 Update

As we went to press, the OSCAR-40 satellite was back in "hibernation" as its orbit had moved it out of direct sunlight. This was an intentional move to conserve power at times that the batteries could not be recharged, according to the AMSAT News Service. Reports that the 2400-MHz beacon had been operating sporadically prior to the hibernation period were explained as safety measures by the onboard computer, which shuts down transmitters if battery voltage drops below a certain level, as would happen in poor sunlight. Additional system checks made before the hibernation period began indicate that the backup "IHU-2" computer and the on-board camera are working properly. Four photos of the Earth were taken over the Gulf of Mexico and downlinked to controllers. They may be accessed from the AMSAT-DL webpage at <http://www.amsat-dl.org/journa/adlj-p3d.htm>, but don't plan on seeing much more than the curvature of the Earth.

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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Hy-Gain's world famous Bell Shaped Rotator™ design is the standard that other rotators are measured against.

Its bell construction gives you total weather protection for super reliable operation. Its super heavy duty steel gear drive gives you years of superior and trouble-free performance. Many Hy-Gain rotators still provide excellent service after over 25 years of outstanding performance.

The last thing you want to fall apart is your rotator that's mounted on the top of your tower. You won't make any compromises when you buy and install high quality Hy-Gain rotators.

And we're the only manufacturer to offer a full line of rotators that are completely MADE IN THE USA.

HAM-IV, $529.95. *The heavy duty Ham-IV is the most popular rotator in the world!* It is designed for medium size antenna arrays up to 15 square feet wind load area when mounted in-tower, or 7.5 square feet when mast mounted with an optional lower mast bracket. New alloy ring gear gives extra strength up to 100,000 PSI for maximum reliability. New low temperature grease permits normal operation down to -30 degrees Fahrenheit. New wire-wound potentiometer gives reliable and precision directional indication, new ferrite beads reduce RF susceptibility, new Cinch plug connector plus 8-pin plug at control box (no screwdriver needed). Dual 98 ball bearing race for load bearing strength. Strong electric locking steel wedge brake prevents wind induced antenna movement. Easy-to-use Control Box has illuminated directional meter with North or South center of rotation scale, separate snap-action brake and rotation switches. Uses low voltage control for safe operation. Accepts masts up to 2 1/16 inches diameter. Rotator size is 13 1/2Hx8D inches.

T-2X, $619.95. *Extra heavy duty Tailtwister antenna rotator!* For large antennas up to 20 square feet wind load when mounted in-tower, or 10 square feet when mast mounted with optional support bracket. Triple 138 ball bearing race, strong electric locking steel wedge brake. Control Box has an illuminated directional indicator with North or South center of rotation scale, separate snap-action brake and rotation control switches. Accepts masts up to 2 1/16 inches diameter. Rotator size is 14 1/16Hx9 3/16D in.

CD-45II, $369.95. *Medium duty antenna rotator.* Handles antenna arrays up to 8.5 square feet windload area when mounted in-tower, or 5 square feet when mast mounted with supplied lower support. Dual 48 ball bearing race, disc brake system. Control Box has an illuminated directional indicator with North or South center of rotation scale, separate snap-action brake and rotation control switches with disc brake release. Accepts mast sizes up to 2 1/8 diameter. Includes light duty lower mast support, Rotator size is 17 3/8Hx8 D inches.

AR-40, $269.95. *Lightweight antenna rotator.* Handles smaller ham antennas and large TV/FM antennas up to 3.0 square feet windload area when mounted in-tower, or 1.5 square feet when mast mounted using the supplied lower support bracket. Dual 12 ball bearing race, disc brake system. Silent, automatic control box -- just dial and touch for desired direction. Accepts mast sizes up to 2 1/8 diameter. Includes light duty mast support. Rotator size is 17 3/8Hx8D inches.

Call your dealer for your best price!

Rotator Specifications	T2X	HAM-IV	CD-45II	AR-40
Wind Load capacity (inside tower)	20 sq. ft.	15 sq. ft.	8.5 sq. ft.	3.0 sq. ft.
Wind Load (with mast adapter)	10 sq. ft.	7.5 sq. ft.	5.0 sq. ft.	1.5 sq. ft.
Turning Power (in pounds)	1000	800	600	350
Brake Power (in pounds)	9000	5000	800	450
Brake Construction	Electric wedge	Electric wedge	Disc brake	Disc brake
Bearing Assembly/How many	Tripl race/138	Dual Race/96	Dual race/48	Dual race/12
Mounting Hardware	Clamp plate	Clamp plate	Clamp plate	Clamp plate
Control Cable Conductors	8	8	8	5
Shipping Weight (pounds)	28	24	22	14
Effective Moment (in tower)	3400 ft/lbs.	2800 ft/lbs.	1200 ft/lbs.	300 ft/lbs.

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Zero Bias

BY RICH MOSESON, W2VU

An Editorial

Simple Pleasures

My friend and colleague, *Popular Communications* Editor Harold Ort, N2RLL, recently upgraded his ham license to General and has been having a wonderful time discovering the joys of HF DXing. Just the other day, he was telling me about the fun he was having, working into various European and Caribbean countries, all with 10 watts and a dipole antenna. (Actually, he sounded like the proverbial kid in a candy store!) There's nothing quite like working DX for the first time, but for me, at least, the thrill never fades, even after 30 years.

Every month, we feature stories of unusual activities, such as DXpeditions or unexpected DX contacts. The unusual makes news, and that's what magazines and other news media thrive on. But these things don't happen to everyone all the time. If they did, they wouldn't be news. In order to remain interested in a hobby, though, there's got to be something worthwhile happening regularly for each of us. And in ham radio, it's the simple pleasure of everyday contacts, perhaps with interesting people in interesting places, that makes us stick with it when there's nothing unusual going on. And it's these simple pleasures, along with the occasional "special one," that keep the hobby vital. For me, sometimes these everyday contacts are more memorable than the "biggies."

In looking over my log for the past few months, I see that I'm in a pattern right now of getting on the air maybe two or three times a month (although I listen quite a bit more often), and I've made about five dozen contacts in about 20 countries over a three-month period. I haven't worked any of the big DXpeditions, because I haven't had the time or patience required for a guy with 100 watts and a vertical to get lucky in the pileups. But I have worked a fair amount of decent DX, from Kuwait and Morocco to Kaliningrad and Kazakhstan. My most memorable recent QSOs, though, were with a teacher and some of his students in Gary, Indiana; and with a guy named Jim on a boat in the Caribbean. Jim's descriptions of the stars filling the ink-black sky (no land lights were visible) and of the iridescent sea life in the crystal-clear waters made me feel like I was there on the boat with him. To me, this is one of the things that makes ham radio so special and unique ... its ability to transport you from wherever you happen to be to wherever the person you're talking to happens to be.

Testing, Testing

One of my favorite excuses for getting on the air (especially when I'm supposed to be working) is to test new equipment that occasionally makes its way across my desk (see, Dick, I *am* working!). And the great fun here is that you never know who you'll find to help you with your tests. Last summer, when I first put my Cushcraft R8 vertical on the air, I went looking for signal reports — and ended up working all continents (except Antarctica) in a single evening! More recently, I was testing some of Bob Heil's new crop of amateur microphones (see "World of Ideas" in last month's issue), and received very helpful reports from a VP5 (Turks & Caicos), a 9K2 (Kuwait), a TE8 (Costa Rica), and an N7 in Wyoming. All I wanted to do was get audio reports, but I ended up having conversations with hams all over the globe, and even an all-time new country for me (Kuwait).

While I was working on this column, I stumbled across a 10-meter repeater with a 30-over-S9 signal and popped in to find out where it was. Turns out the system has pieces scattered all over the metropolitan New York area, and is linked to 222 and 440 MHz as well. The guy I talked with was on 222 and only a few miles away — well within HT-to-HT range through just a 220 repeater. But then the fun began, as stations checked in from Alabama, Arizona and Colorado. *(Yep, I'm still hard at work!)* Again, nothing special for 10 meters. But consider this: I can walk down the street (or ride my bike) with my 222 HT on my belt, and work stations all over the US or all over the world, depending on band conditions on 10. Now *that's* fun! I can tell you from first-hand experience on a different system several years ago, as I was driving through Pennsylvania one morning and working Germany on my 2-meter HT (!) — via a Harrisburg repeater with a 10-meter link. The experience was special enough that I still remember it nearly 10 years later. Yet I wasn't expecting anything special, just some local QSOs to keep me company on my drive. It's things like this that keep the hobby from getting boring.

Hot Times on VHF

In late March and early April, the VHF bands were anything but boring, especially for weak-signal operators. A series of massive solar flares (see this month's "VHF-Plus," "DX" and "Propagation" columns) that essentially shut down HF communications set off auroras seen much farther south than usual and opened the door for exceptional Aurora contacts from 6 meters all the way up to 70 centimeters. These bands were anything but local when the aurora came rolling in. Plus, 6 meters is still benefiting from the peak solar conditions with regular transcontinental openings ... all of which rolls right into our introduction for this month's special focus on VHF and UHF.

We start out with the results of last year's revamped *CQ* World Wide VHF Contest, along with the rules for this year's running of the event. Response to the new structure was excellent. A gallon of thanks to Gene Zimmerman, W3ZZ, for taking over this contest and getting it back in shape. We look forward to even more participation this year. Next, VHF Editor N6CL provides details on the solar flares and auroras that headline this issue, and Contributing Editor WB2AMU has woven together a pair of reports on 6-meter-only DXpeditions.

June is traditionally the start of the VHF DX season, with summertime sporadic-*E* openings on 6 and sometimes 2 meters creating band openings of several hundred to several thousand miles. And as Contributing Editor WB6NOA reports this month, summertime *tropospheric ducting* also creates incredible VHF/UHF paths extending 2500 miles or more. Gordon describes the annual California-Hawaii duct that permits HT-to-HT contacts across half the Pacific Ocean, as well as similar ducts across the Gulf of Mexico and from Florida into the Caribbean.

Is there one across the Atlantic? Chances are the answer is yes, but the

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beginning and ending points haven't yet been found. Maybe this summer... and the Irish Radio Transmitters Society has a pair of beautiful crystal vases known as the Brendan Trophies waiting for the two stations that make the first successful transatlantic contact on 2 meters (not including EME or satellites; for more information, see the IRTS webpage at <http://www.irts.ie/brendan.htm>). And as I was writing this, Mark, EA8FF, in the Canary Islands posted a note on various e-mail reflectors, looking for a potential partner between Florida and Brazil for an attempted transatlantic tropo contact on 432 MHz (see "VHF-Plus" for details). Anyone out there who's bored with ham radio and looking for a new challenge ... it doesn't get much bigger than being the first to open a band to transatlantic communication.

Of course, we've got a few non-VHF articles for those of you whose interests lie solely below 30 MHz, including a great story on ham creativity by K8WPI, an introduction to the newest members of *CQ*'s DX and Contest Halls of Fame, and your favorite columns.

Speaking of columns, Amateur TV Editor Ed Manuel, N5EM, has found that job and family obligations are making it impossible for him to continue producing regular columns. Thank you, Ed, for your hard work and dedication to ATV and to your columns in both *CQ VHF* and *CQ*. Because our surveys have shown that only a tiny minority of *CQ* readers are active in ATV, we have decided to drop the ATV column, and bring you ATV-related features by Ed and others as they become available, as part of the overall mix of feature articles highlighting the full spectrum of our hobby.

CQ On the Radio

Speaking of Spectrum, that's the name of a weekly radio program devoted to hobby radio on shortwave station WWCR. In addition to occasional appearances as a guest on the program, for the past several months, *Popular Communications* Editor Harold Ort and I have been providing listeners with monthly sneak previews of each forthcoming issue of *PopComm* and *CQ*, respectively. If you want to know what the next issue of *CQ* will bring you, even before the new issue is posted on our website, tune in to Spectrum on the fourth Saturday of each month at 11:00 p.m., Eastern time (0300 UTC during Daylight time; 0400 UTC during Standard time). You'll find WWCR at 5.070 MHz.

Also, I understand I'll be on the Internet twice during the Dayton Hamvention®, first in a Saturday afternoon interview as part of Kenwood's webcast (check Kenwood's website at <http://www.kenwood.net>), and then later that same afternoon in a live webcast of the Newsline "Ham Radio Town Meeting," on which I'll be one of the panelists. Look for the Town Meeting audio on TAPR's website at <http://www.tapr.org>. Other *CQ* columnists will also be speaking at various Dayton forums, although I don't have a complete program in hand right now.

Finally, we just barely had time last month to squeeze in the announcement that *CQ* Propagation Editor George Jacobs, W3ASK, is being honored as Dayton's 2001 Amateur of the Year. (George will also join me as a panelist at the "Ham Radio Town Meeting.") All of us are very proud of George and feel it is particularly appropriate that the 50th Hamvention® honors W3ASK as he celebrates his 50th anniversary as *CQ*'s Propagation Editor. Congratulations, George, from all of us at *CQ*. And congratulations, also to the Dayton Amateur Radio Association on the 50th anniversary of the greatest hamfest of them all!

73, Rich, W2VU

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Announcements

WW2DDM, from dedication of National D-Day Memorial, Bedford, Virginia; Old Dominion Chapter 202 QCWA and area clubs; 1700–2400Z June 6–10 on 7.050, 7.250, 14.050, 14.230, 21.050, 21.230, 28.050, 28.350, 50.222, 144.222. Send SASE for QSL or certificate to Charlie Beckwith, K4BSF, 563 Buzzard Rock lane, Rocky Mount, VA 24151-4844.

W3GR, commemorating Electronics in the D-Day invasion of Europe, Baltimore, Maryland; Historical Electronics Museum ARC; 1400Z June 2 t0 2100Z June 3 on 7.115, 14.250, 21.245, 28.440 MHz. Send two stamps for certificate to HEMARC, W3GR, P.O. Box 746 MS 4015, Baltimore, MD 21203.

W4L, from American Cancer Society "Relay for Life" event, Ashland, Virginia; Central Virginia Contest Club; 2100Z June 8 to 1100Z June 9 on 7.270, 14.270, 21.370, 28.370 MHz. For commemorative QSL send SASE via Ronnie Bolton, WU4G, 12491 Ashcake Road, Ashland, VA 23005.

KSØJC, to honor Marshall Ensor, W9BSP, code teacher, Ensor Museum, Olathe, Kansas; Johnson County ARES; 1800–2200Z June 2 and 3 on 28.400, 18.150, 14.250, 10.125 MHz. QSL to Dan Reed, 29545 West 152nd Ter., Gardner, KS 66030 (large SASE for certificate or business-size for QSL).

WØC, from special event to promote amateur radio, Kansas Cosmosphere and Space Center; RCKARA; 1500Z June 2 to 0300Z June 3 on 14.250, 21.350, 28.400 MHz. *(No QSL route given.)*

WØNOZ, commemorating 30th anniversary of Little House on the Prairie, DeSmet, South Dakota; Huron ARC and Lake Area Radio Klub; 1600–0200Z June 30 and 1600–0100Z July 1 on 7.265, 14.265, 21.365, 28.465, 50.165 MHz. For certificate, QSLs: Huron ARC, P.O. Box 205, Huron, SD 57350.

VB3RC, celebrating 175 years of the Rideau Canal; June 29 to July 2 on 14.258 or 7.258 MHz. For more information about VB3RC visit their website at <www.falls.igs.net/~scalver> or e-mail <ve3uuh@rac.ca>.

VE3MIS, from 29th Streetsville Founders Bread & Honey Festival, Streetsville, Ontario, Canada; Mississauga ARC; 1400–2000Z June 2 and 3 on 7.230, 14.240, 28.340 ±QRM. QSL to MARC, c/o Michael Brickell, 2801 Bucklepost Crescent, Mississauga, Ontario, Canada L5N 1X6 (US postage stamps cannot be used to send mail from Canada to US); e-mail info <ve3mis@rac.ca>; web <www.marc.on.ca>.

• The following hamfests are slated for June:

June 1–3, **Rochester Hamfest,** Monroe County Fairgrounds, Rochester, New York. Contact Jack Tripp, N2SNL, 51 Musket Lane, Pittsford, NY 14534; e-mail: <info@rochesterhamfest.org>; <www.rochesterhamfest.org>. ***See us at the CQ Booth!***

June 2, **Sagamon Valley RC Hamfest**, Cooperative Extension Building, Illinois State Fairgrounds, Springfield, Illinois. Contact Ed Gaffney, KA9ETP, 13977 Frazee Road Box 14A, Divernon, IL 62530 (217-628-3697; <egaffney@family-net.net>). (Talk-in 146.685 MHz –.600; exams 9 AM)

June 2, **IRA Hamfestival**, Hudsonville Fairgrounds, 2 miles west of Grand Rapids, Michigan. Contact Kathy Werkema, KB8KZH, 616-698-6627 (4–7 PM EDST); web: <http://www.iserv.net/~w8hvg>. (Talk-in 147.16; exams 10:30 AM)

June 3, **Hall of Science ARC Hamfest**, NY Hall of Science, Flushing Meadow, Queens, New York. Contact Stephen Greenbaum, WB2KDG, 718-898-5599 (evenings), e-mail: <wb2kdg@bigfoot.com>. (Talk-in 444.200, PL 136.5, 146.52 simplex; exams 10 AM, info W2LJM, 718-323-3464, e-mail: <lmenna6568@aol.com>)

June 3, **Manassas Hamfest**, Prince William County Fairgrounds, Manassas, Virginia. Contact Mary Lu, KB4EFP, 703-369-2877, e-mail: <mblasd1638@aol.com>, <http://www.qsl.net/olevahams>. (Talk-in 146.97, 224.660–, 442.200+; exams contact Ruth, KU4WH, 703-331-1234, e-mail: <frizzy2@aol.com>)

June 3, **Chelsea Ham & Antique Radio Swap**, Chelsea Fairgrounds, Chelsea, Michigan. Contact Bill Altenberndt, WB8HSN, 19501 Bush Rd., Chelsea, MI 48118; e-mail: <WD8IEL@hotmail.com>. (Talk-in 145.450–)

June 3, **Starved Rock Radio Club Hamfest**, Bureau County Fairgrounds, Princeton, Illinois. Contact Starved Rock RC, P.O. Box 198, Leonore, IL 61332; e-mail: <w9mks@arrl.net>. (Talk-in 146.955, 103.5 PL)

June 8–9, **Knoxville Hamfest & Electronics Fleamarket**, National Guard Armory, Knoxville, Tennessee. Contact David Bower, K4PZT, Radio Amateur Club of Knoxville, P.O. Box 50514, Knoxville, TN 37950-0514 (865-670-1503; e-mail: <d.bower@ieee.org>; <http://www.kormet.org/rack>). (Talk-in 147.300/224.500, 444.575; exams 2 PM ET Sat.)

June 8–10, **HAM COM 2001**, Arlington Convention Center, Ft. Worth, Texas. Call 214-361-7574; <www.hamcom.org>. (Exams) ***See us at the CQ Booth!***

June 9, **Albany Swapfest 2001**, Potter Community Center, Wildfair Rd., Albany, Georgia. Contact Bob Smith, K4PHE, c/o AARC, P.O. Box 70601, Albany, GA 31708-0601 (229-883-9633; <k4phe@isoa.net>). (Talk-in 146.82)

June 9, **North Central Missouri Hamfest**, Macon Vocational Technical School, Macon, Missouri. Contact Dale Bagley, KØKY, P.O. Box 13, Macon, MO 63552 (e-mail: <kØky@arrl.net>; <www.istmacon.net/~kfoster/hamfest.htm>).

June 9, **Winston-Salem Hamfest**, Dixie Classic Fairgrounds, Winston-Salem, North Carolina. Contact Paul Jordan, Box 11361, Winston-Salem, NC 27116-1361 (336-723-7388; <http://www.w4nc.org>). (Talk-in 146.64, 145.47)

June 9, **Franklin ARRA Picnic & Tailgate**, Bronco Club, Franklin, North Carolina. Contact Ralph Atkinson, WB4ZNB, 30137 Country Club Rd., Courtland, VA 23837 (757-562-5710). (Talk-in 147.30/.90)

June 10, **LIMARC Outdoor Hamfest**, Briarcliffe College, Bethpage, Long Island, New York. Call LIMARC 24-hour infoline: 516-520-9311; e-mail: <hamfest@limarc.org>; <http://www.limarc.org>. (Talk-in 146.85, 136.5 PL)

June 10, **Six Meter Club of Chicago Hamfest**, DuPage County Fairgrounds, Wheaton, Illinois. Contact Joseph Gutwein, WA9RIJ, 7109 Blackburn Ave., Downers Grove, IL 60516, or 24-hour infoline 708-442-4961. (Talk-in 146.52, 146.37/97 [107.2]; exams 9–11 AM, call infoline to preregister)

June 10, **Indiana Hamfest & Computer Show**, Wabash County 4-H Fairgrounds, Wabash, Indiana. Contact Wabash County ARC, c/o Ralph Frank, 4010 N. 700 W., Wabash, IN 46992 (219-563-8487 days, 765-833-7372 evenings, e-mail: <wia1@netusal.net>. (Talk-in 147.03/147.63, 442.325/447.325)

June 10, **Goodyear ARC Hamfest**, Wingfoot Lake Park, Suffield, Ohio. Contact Don Longshore, 330-733-7989. (Talk-in 146.985-, 146.520; exams)

June 16, **Raritan Valley RC Hamfest**, Columbia Park, Dunellen, New Jersey. Contact Doug Benner, W2NJH, 732-469-9009, e-mail: <wb2njh@aol.com>. (Talk-in 146.025/625, 447.250/ 442.250, PL 141.3, 146.520 simplex)

June 17, **Dad's Day Hamfest**, Lake County Fairgrounds, Crown Point, Indiana. Contact Lee Raue, WD9GQO, 6401 Kentucky Pl., Merrillville, IN 46410 (219-980-8030; e-mail: <leeraue@msn.com>). (Talk-in 147.00, 146.52; exams)

To place a item in the "Announcements" column, send the specifics about your special event or hamfest to CQ Announcements, 25 Newbridge Road, Hicksville, NY 11801; fax 516-681-2926; or e-mail: <hamfests@cq-amateur-radio.com>. Deadline is the first of the month that is two months prior to the event date (i.e., May 1st for a July event).

A publication of

CQ Communications, Inc.
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Offices: 25 Newbridge Road, Hicksville, New York 11801. Telephone: (516) 681-2922. FAX (516) 681-2926. E-mail cq@cq-amateur-radio.com. Website:http://www.cq-amateur-radio.com. CQ (ISSN 007-893X) is published monthly by CQ Communications Inc. Periodical postage paid at Hicksville, NY and additional offices. Subscription prices (all in U.S. dollars): Domestic—one year $31.95, two years $57.95, three years $83.95; Canada/ Mexico—one year $44.95, two years $83.95, three years $122.95; Foreign Air Post—one year $56.95, two years $107.95, three years $158.95. U.S. Government Agencies: Subscriptions to CQ are available to agencies of the United States government, including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed.

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- TX 160-10M, 6M, 2M, 440
- Compact 5.3" x 1.5" x 6.5", 2.6 lbs
- 9.6v Nicad or 8 AA battery capable

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Call Now For Low Pricing!

expires 6/30/01

FT-2600M 2M Mobile

- Compact 2M 60W mobile • 12000/9600 baud
- 4 selectable power levels • Built-in CTCSS/DCS
- 175 mems, 8 character alpha-numeric display
- Low intermod Rx, Rugged

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- Alpha Numeric Display
- CTCSS/DCS built-in

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2M/440mHz Compact HT

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- Alpha numeric display
- Wide Band receive
- Battery Saver • 112 Memories
- Mil-Spec • HiSpeed scanning

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- 100w HF/6M, 50w 2M/430 mHz
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- DSP, Auto-Notch • 99 Memories
- Computer controllable, CAT System

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FT-8100R 2M/440 Mobile

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- Backlit mic • Remotable front panel w/opt. YSK-8100

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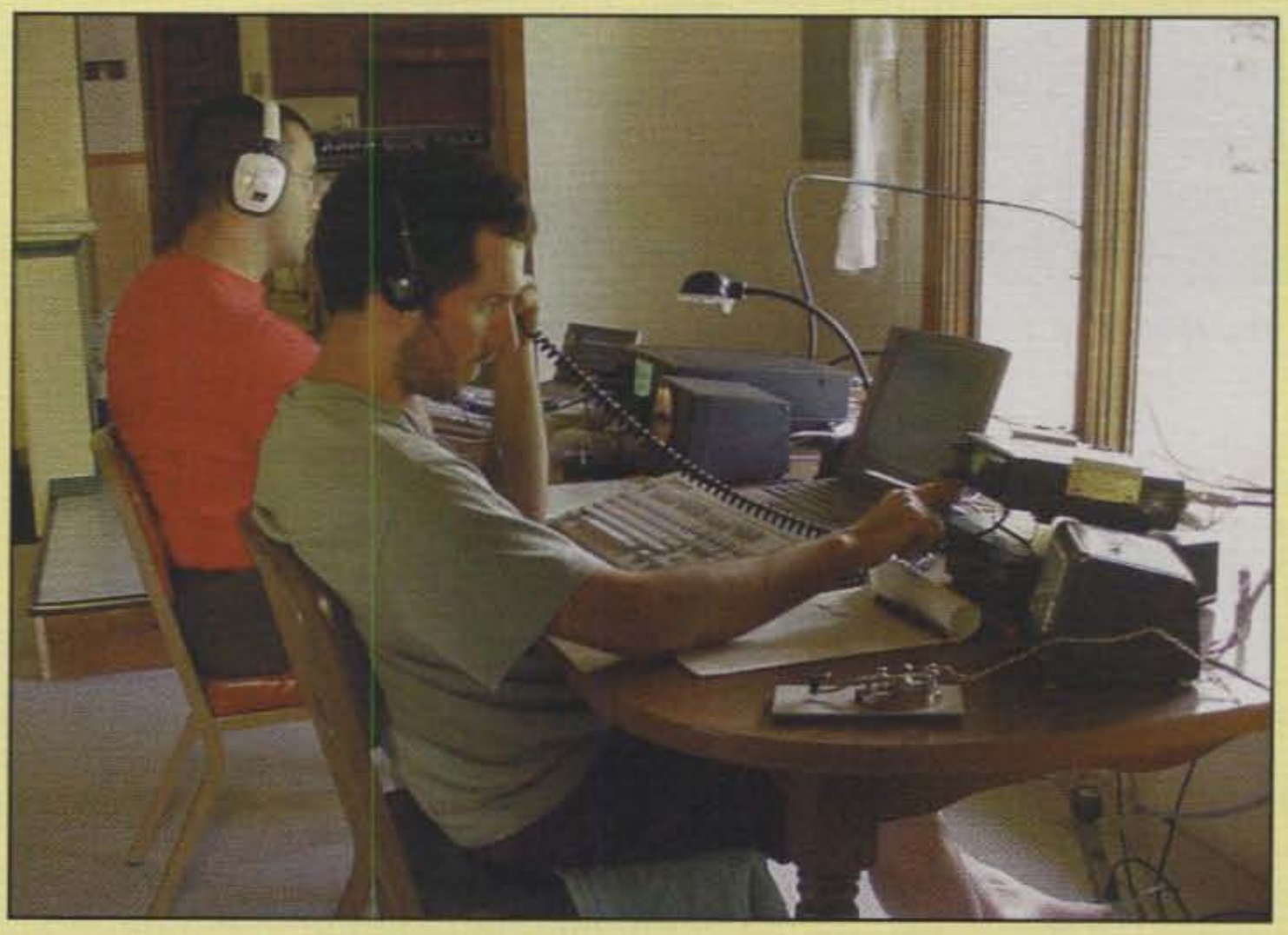
Results of the 2000 CQ WW VHF Contest

BY GENE ZIMMERMAN,* W3ZZ

The CQ WW VHF Contest returned last year with a vengeance. We have revised the contest and gratifyingly, the VHF community has responded. We received 111 logs this year, equivalent to the activity level in the mid-1990s. When 6 meters was open, it was crowded all the way to 50.200 MHz and above, but contacts were scarce when the skip disappeared. Our friends in Europe seemed to have much better conditions than we did here in North America. Once again, as had been the case throughout last summer, openings between the U.S. Midwest and the West Coast were more frequent and longer than were those to the East Coast.

As Dickens said, "It was the best of times; it was the worst of times." So too for the year 2000 running of the CQ WW VHF Contest. Whether the contest was a treat or a treatment depended on where you were. To be sure, almost no one was completely shut out of the propagational goodies, but there were certainly favored locations. The second weekend of July typically can produce some barnburner sporadic-*E* openings on 6 meters and even 2 meters on occasion. Two meter tropo openings are not unknown either. During the contest weekend the timing was almost exactly wrong. For an entire day prior to the contest here on the U.S. East Coast the band was wide open on 6 meters. The opening continued for a few hours more, but then died a rapid death here, although results elsewhere were much better. To add insult to injury, almost immediately after the contest ended 6 meters opened for multiple-hop E_s to Europe, producing perhaps the best such E_s of the summer. Stations well into the Midwest U.S. worked into western Europe. What might have been? Ah, well, there's always next time!

Meanwhile, there were certainly many bright spots. The contest started well with widespread E_s almost everyplace from which we received logs. The E_s continued strong between the Midwest and the West Coast well past dark. The next day was very slow here on the East Coast, but E_s returned to the Midwest, the South, and the West Coast. The Midwest also enjoyed a strong 2 meter tropo opening extending from around the Mississippi River eastward to the Appalachian Mountains. There was no sign of that east of the Appalachians. While contest activity in Europe was low, conditions looked to be top notch. Look particularly at the huge 6 meter QRP score from AN6SA in the Balearic Islands. The YMØHA multi-op in Asiatic Turkey encountered a short but intense 2 meter E_s opening around 10Z on Sunday.



N1MU and K2LDT at the 2 meter and 6 meter operating positions of K2MDS multi-op. (WS2B photo)

The Victors

There were a number of outstanding scores in this contest. In the U.S., Wes, W3SE, in southern California was the top all band single op, easily outdistancing the fine second-place effort of Bob, K2DRH, in Illinois. A big 6 meter E_s score was the deciding factor. K2DRH used the good 2 meter tropo conditions to run up a strong 2 meter total. The story was the same in a close race in the QRP category. Bob, KA5GLX, edged out Ax, N8XA, by a small margin by emphasizing 6 meters. Ax had a fine score on 2 meters.

Jay, KØGU, an accomplished HF contester, established the high U.S. 6 meter only score. The band was open for almost the whole contest out there in Colorado. Second place went to perennial Dallas powerhouse Tom, WD5K. On 2 meters Wayne, K5ZG, found conditions to his liking in western Ohio and had the leading 2 meter only score. Right behind him was Dick, KØMQS, who was at the western end of the tropo opening. Veteran rover Ted, W4VHF, and his wife Itice, K4IRG, piloted W4VHF/R to the number one rover score. In a close battle for second, Paul, N6DN/R, edged out Gene, NØDQS/R. NØKE dominated the U.S. multi-ops.

DX activity was not very great in this contest, but several stations turned in notable logs. Ralph, VE4KX, had the best all band single op score, emphasizing the generally good conditions at high latitudes in North America. Carlos, TI5KD/2, graced many logs and had the highest 6 meter only score. However, the most unusual logs were in the QRP and multi-op categories. AN6SA in the Balearic Islands had an astounding 6 meter score—over 500 contacts in over 160 grids with only 10 watts. The overall high score in the contest was set by multi-op YMØHA in Asiatic Turkey.

Propagation from Asia Minor was superb, with 6 meter single- and double-hop

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The NØDQS rover mobile with the 5-element 6 meter beam deployed.

contacts and even some 2 meter E_s. Three Thailand stations waged a spirited multi-op battle on 2 meter FM. When the smoke cleared, E2ØSJO wound up on top by dint of a larger multiplier total over E2ØRJJ and HSØAC. Each of these stations had in excess of 700 contacts, which bodes well for ham radio in Thailand. Hopefully, next year we will see some of the individual logs from HS.

Format

We continue to study the format of the CQ WW VHF Contest to derive a competition that is both fun and practical for the participants at this time of year. The year 2000 format featured a 6 and 2 meter contest to take advantage of the short-skip propagation that is so prevalent at this time of year and a limited number of bands in recognition of the other major events which precede this contest—the June ARRL VHF contest, ARRL Field Day, and the European Field Day. This format also makes it practical to operate from one's home station and opens the competition to the many hams who have recently acquired HF/VHF rigs. For those who wish to go portable or in the U.S. operate as a rover station, the amount of equipment is limited because only two bands are involved. In general, most of those who have commented on this format like the idea, and we expect to keep it for the 2001 contest.

We have also listened to the request of the rover stations and returned to the original rover scoring rules. There was a significant amount of rover activity noted in the logs. I hope the rovers will use this contest as a pleasant excuse to check out some new locations unencumbered by the dozen bands they normally have to take. One contestant seemed to think that portable operation was forbidden by the rules. That is clearly not the case. Portables, rovers, single band, multiband, QRP, or full power, all are welcome and encouraged to participate. Finally, as a worldwide contest, we reiterate that there are no restrictions on what countries you can work. DX can work other DX or W's or vice versa.

A Matter of Dates

This contest traditionally has been held on the second full weekend in July. From a propagation standpoint, this should be an ideal weekend. Yet while conditions this year were better than in the past few years, they still were not outstanding in many places. Received mail has raised several objections to this weekend. European activity is low primarily because the European Field Day is the previous weekend. As one member of the Blacksheep Reflector reminded me, this situation is not ever likely to get better unless the contest is moved up one week. The current weekend also competes with the IARU contest. Even when WRTC (World Radio Team Championships) is not going on, the IARU is a popular contest that siphons off many potential VHF contest competitors.

Stacked up against a change is the fact that by the third weekend in July the incidence of E_s is starting to diminish rapidly. Since this contest is so dependent on having good skip conditions on 6 meters, having it on the third weekend in July is a risky move. Thus, I need input from the readership. Is my empirical observation correct? Are the chances for E_s on the third weekend of July significantly less than on the second weekend? Would there really be a lot more participation from Europe if the contest moved one week? How many IARU HF contestants would participate in the CQ WW VHF Contest if there was no time conflict?

And Now for 2001

The announcement for the 2001 CQ WW VHF Contest appears elsewhere in this issue and on the CQ website: <http://cq-amateur-radio.com/vhfcontest.html>. We expect to have a .pdf version of the log sheets and a summary sheet available at the site for printing. You can help me and save yourself some money by sending your electronic logs to <cqvhf@kkn.net>. I know the robot broke down, but for a trivial reason at a critical time last year. That shouldn't happen this year; we won't let the robot's owner go to Slovenia this time! The contest this year will again be the second weekend in July but will occur later in the month, on July 14th and 15th. I'll be there and I hope to see you all.

73, Gene, W3ZZ

Forward Scatter

Good propagation via sporadic-*E* on the Magic Band and very short via TE propagation. Thanks for the activity in the VHF contest . . . **AN6SA**. Was only able to spend a very short time Sunday morning to work the contest. It was really fascinating to be able to work 22 stations from no less than 19 grid squares! . . . **CO2KK**.

TOP SCORES

WORLD

All Band

VE4KX	16,356
VE9AA	5,978

6 meters

TI2KD/2	5,712

QRP

AN6S	83,398

Multi-Operator

YMØKA	103, 934
VE7DXG	31,902
E20SZO	27,396
E20RJJ	18,396

USA

All Band

W3SE/6	75,990
K2DRH	57,129
K9HUY	37,846
W6OAL/Ø	36,840
K8TQK	34,985
KB8U	31,304
K2SMN	27,887
W1XX/2	26,676
NJ2F/4	25,070

6 meters

KØGU	96,220
WD5K	46,580
N2ODU	35,056
NW5E/4	13,674

2 meters

K5ZG/8	9,384
K0MQS	6,642

QRP

KA5GLX	5,376
N8XA	4,326
WØKFG	3,139

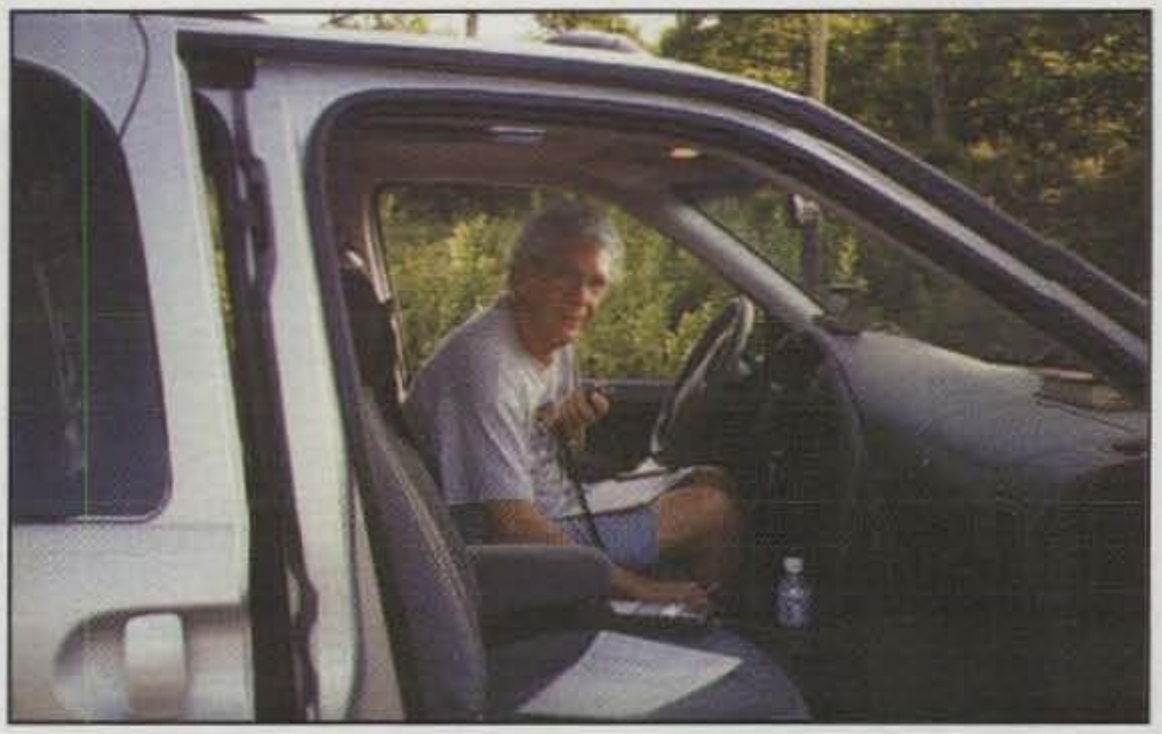
Rover

W4VHF/R	28,634
N6DN/R	15,928
NØDQS/R	14,960
N4OFA/R	8,650

Multi-Operator

NØKE	66,930
NØVSB	28,896
K6FQ	18,873

KE6GFI having fun in the fresh air of DM13.



Ted, W4VHF, rovering in North Carolina.

Down here the contest was very slow and erratic. Saturday I heard nothing. Not a single whisper. Even the Florida stations on 2 meters—just nothing!! Listening to the "white noise," one storm came in all of a sudden and I had only time to unplug the antennas. Lightning hit a power pole in front of my QTH before I could unplug the computer and the rigs from the power and the telephone line from the modem. Now I have no modem at home, but I feel I am a lucky ham because at least the computer and the rigs survived. On Sunday I got on the air about 1400 UTC (10 AM local time) and the *E* clouds on 6 meters seemed to be everywhere and nowhere at the same time. I was running less than 5 watts, and between 1400 and 1700Z I worked stations all around the US: FM02, FM28, FN07, EN41, CN96, DM44, DM13, EL07, and inside that circle, many other stations in the EM grids. All openings were very short. Worked one or two stations in one area, and five seconds later the opening moved to other places. Best DX was K7AD in DN06 and a little farther, W7FHI in CN96, for two new grids and the state of Washington for the first time ever. K7AD was S9+. For the specialists were those QSOs double hop or F2? I ended the contest with a modest score but had a lot of fun. Thanks for such a contest, a contest where all participants have the same opportunities!. . . **CO2OJ**.

A lot of fun but we were really tired by the end. . .**YMØKA**. My first time ever in a VHF contest. Carrying all the gear to the top of the mountain was quite a chore (good thing I am a hiker!) and the cold, wet, wind-driven rain that moved in around 1730Z on July 9th was no fun with wind chill in the 30s F, but I had a ball!! Can't wait for the next one! . . . **W1KMH**. Hope this grows every year! It was nice to just have two bands to keep an eye

The following comments (reprinted from the Stanford VHF reflector) from Gabor, VE7DXG, organizer of the VE7DXV multi-op effort, represent what all of us would like to see in a VHF contest —an active, weak-signal operator taking a group of non-weak-signal operators to a mountaintop location and introducing them to the wonders of VHF propagation. Yes, Virginia, there is something beyond the local repeater!

The CQ WW VHF Multi-Op from Mt. Brenton, CN88

By Gabor, VE7DXG

VE7DXG (plus Richard, VA7AA, Dale, VE7DDK, and my nephew Peter) made a multi-op effort from Mt. Brenton, CN88bv with 150W on both 6m and 2m SSB/CW and some 50W FM rigs for 2m FM. QTH is 4000 ft. on Vancouver Island, clear shot, except to the NW. Our club has a solar-powered repeater on the mountaintop, with a nice shack (including a kerosene heater!) that we inherited from a phone company about ten years ago. This year the snow melted on time and we were able to get to the building with vehicles. I have been the lone ranger for VHF mountaintopping in the past in this area, but this year I had some interest from other hams so we decided to give it a shot as multi-op. What a difference! We were able to get the antennas up properly on time for the start of the contest without the usual touchdowns resulting in broken elements and masts. We also sat inside the shack on real chairs at a real table, which was most welcome after the June contest, which I spent under a tarp by the tailgate of the pickup in the rainstorm of the decade. For the past years I have been running QRP/p and the power made a huge difference. I remember the June contest's Sunday morning MS *(meteor scatter—ed.)* openings on 6 meters where I heard at least 25 grids popping in and out without being to make a single DX contact.

It started out pretty slow. In the first hour we worked the 20 or so locals who were around. Then just as I started to apologize to the other operators for dragging them up the hill for this boring stuff, the first DX popped in. I answered a local's CQ on 50.125, and by the time he finished saying my call and his call we completed with K7CA from DM37 on a nice MS burn. That got us going for a while as I eagerly explained to the guys what a grid square map was and how to find DM37 on it.

Then nothing again for an hour. We chased 2m FM stations waiting for them to finish their QSO's and then politely calling them for a QSO. At 21:11 it started: In 15 minutes we netted a dozen W6's from DM04, 12, and 13. It ended as abruptly as it started, and we were back to chasing FMers on 2m. At 23:15 it popped open again. This time 30 minutes yielded 16 W6's from DM12, 13, 14, 15, and 22. Now my buddies started to like it! We just sat on 50.125, called CQ every couple of minutes, and then all of a sudden they just started coming. Now we figured it might be a good contest after all.

We opened another beer and I explained to them about the beacons. Bingo! K6FV started coming in from the San Francisco area. We went to .125. Sure thing, there was a CM88 going at it. I invited the rest of the world to join me on 50.140 and they came—about 40 minon this time. Only disappointment was that it ended before 6 opened up again. As I predicted, 10 minutes after the contest ended, Europe came in on 6. Murphy! Maybe ending at 8 PM would have been better (that would be 0000Z) . . .**K2SMN**.

Band conditions were great just before the start of the contest and then averaged around fair to lousy for the rest of the contest. Six meters to EM72 and the Bahamas opened just as the contest was ending, but we couldn't get through. We had a great time though, and we'll be back next year for sure! Hopefully more people will be on . . . **K2MDS**. Worked the contest as single op single band "50 MHz." The band was in and out. Sunday afternoon the operation was shut down due to thunderstorms and rain static, running at times 20 over. Wish to thank everyone who gave me a point in the contest. Also wish to thank everyone for their patience, exchanging reports, as the noise level was very high and much QSB. . . **N2ODU**. Conditions were poor here. I started with 5 watts to an indoor attic dipole but had to go up to 25 watts to be heard. I averaged only one contact per hour. The DSP on the ICOM 706 MkIIG was very helpful. Managed to work six new grids and snagging TI5KD/2 in EJ89 during the last half hour of the contest was a nice treat! . . . **N3AWS/5**. Just wanted to support your resurrecting the contest. Good luck . . . **WA2HFI/Ø**. Not a bad contest. Wish 6 meters had been better . . . **AD4F**.

I operated from two grids this contest—EM85, Mt. Mitchell, NC, and EM86, Roan Mt., NC/TN—as N4OFA/R. My fellow rover Ted, W4VHF, and his wife Itice, K4IRG, were on Roan Mt. while I was on Mt. Mitchell to start the contest. Saturday evening we exchanged places, and I had the pleasure of a short visit with them in Spruce Pine, NC. I came to the conclusion that Ted must have something special going for him to have such a lovely wife. What a wonderful contest for me. The mountains were so beautiful and the weather was not a problem except for the fog Saturday night that got into my 726R while I slept. Had to use the 706 all Sunday and had no microwave bands to hand out grids with. Ah, but that brings me to the wonderful propagation on Saturday night (while I still could get on the higher bands). Tropo, fantastic tropo, with the highlight of working K8TQK, Bob, EM89, on 1296, and then Glen, WØDQY, EM48, on 2, 432, and 1296. Wow, was that fun!. . . We even had a breaker, N9WQP, from EM69 find us on 432. Glenn was his first contact ever on 432 and I was his second. Signals were outstanding, and even on 1296 we worked easily on voice. EM86wc *to* EM48rs —498 miles! My first real DX on 1296, what fun! And this is my theme for the CQ VHF Contest: "The Fun Contest." Only two bands and plenty of time to chat and even give out some grids . . . original rover rules. My sincere thanks to the contest sponsors at *CQ* magazine for a really good time. And also to Bob, K8TQK, for all his help during the contest . . . **N4OFA/R**.

Had a blast! . . .**KA5GLX**. Would love to have worked more. The band just wasn't open my way. Had fun trying. Love to work 6 meters . . . **KJ5RC**. Missed about the first 24 hours due to seriously competing in the IARU HF Championship, including no sleep. You should move this contest from the weekend that the IARU occurs. . . . For me, I would definitely make more of an effort if it were on a different weekend . . . **N5NJ**. Well, modest result and setup in Erie CO DN70. Using my rover gear. Worked some from noon to 6 PM on Saturday, results kinda modest. However, Sunday morning was much better. I did not find any great openings and I missed XE2 . . .**W5JAK/Ø**. Heard W3ZZ early in contest but didn't get to work him. Enjoyed operating in a casual on and off sort of way. The openings seemed quite random most of the day Sunday. Many times I was hearing the East Coast working the West Coast. Double-hop, single-hop, and short skip all happening at the same time. Most worked grid square was DM79 (7). Best DX was FN75 and CN88. Need more CW ops. Many thanks to all and looking forward to next year. . . **W5USJ**. Too many family and church obligations to devote much time to the contest . . . **WA5KBH**.

Terrific to have 6 meters open up during the otherwise slow contest. Worked almost

utes of northern California; 30 QSOs from 11 grids. Then the opening started shifting to the east—first Arizona and New Mexico, then Colorado and even Texas. At around 0330 we were working stations from a straight line between DM59 and EM10. Seemed like a long and narrow footprint. I turned the antenna left and right, but they only came from this direction. So I gave the guys another lesson in propagation. They thought it was pretty cool, because they had read about it somewhere before. I kept calling CQ around .140 like crazy and they just kept on coming. I scanned the band and didn't hear the rest of the locals. Then a station 50 km away asked me what was going on cause he couldn't hear the DX I was working with such ease. We concluded that being on the mountain was a good thing. I recommended to him that he save up for a 4×4.

The rest is history. Six meters stayed open until 2 AM local time, when I went to get some sleep to be ready for the morning meteor scatter. At 4 AM I fired up the generator and hooked up the computer for 2m HSMS skeds. I called CQ for two hours with not a single QSO. Should've slept.

At 1331 we completed with VE5UF (DO61) on 2m, then proceeded for our 6m sked. Nothing, or a few maybes out of him on 50.190. The rocks were very sparse on 2m; probably had a total of 1s reflection from VE5UF in four usable pings, but at 6000 lpm it was plenty for a QSO. Sked on 2m with KA7V (DN14) yielded nothing. Back to 6m: no rocks there either.

At 1420 *Es* started again: KC5OAO/EL39—that seemed to be double hop. Went to .140, called CQ, and indeed EN10 and EL95 answered me at the same time. Once again a quick lesson in propagation given to the newbies.

For the rest of Sunday 6m seemed to be open most of the time, shifting from southern California to west Texas. At 18:34 another double hop to XE2HWB/DL44. Boy, it was hard to break through the Californians calling him. That's when I realized that if there is a chance of double hop one, should ask the single hop guys to stand by once in a while. I hoped when I had three or four stations answering my CQ and I picked the strongest one from the crowd there wasn't an East Coast station buried under them.

Shortly after noon, with two hours left, we packed it up. Had to leave room for improvement next year!

Going from 10W to 150W made a huge difference. In the past when the band was open on 6m I called CQ to no avail. All I could do was answer the CQs of the dozen or so big guns. I was very surprised at the number of Los Angeles area stations. I was running 25–30 of them per hour for several hours. A lot of them were very weak despite the strong *Es*, but my elevation and lack of noise helped me pull them out. Seems like I worked everybody down there—guys from the LAX parking garage, another one with 1W to a G5RV, and even handhelds. *I have never had so much fun on 6m!*

On the other hand, 144MHz seemed like a weekday evening. I called CQ endlessly, and only worked the hard- core stations that were toughing it out and the ones I could get up from 6m. VE7DDK did a heck of a job getting points on 2m FM to boost the score. Wish more of the locals were aware of this and other contests. Our local club's net had over 40 check-ins Sunday morning and only six of them bothered to give us a point despite "heavy advertising" for days before the contest.

I'd like to thank *CQ* magazine for running the contest despite all the flack they received. Having only two bands really made it a simple contest to get in—two bands with significantly different characteristics. I also run 222 and 432 for the ARRL contests, and I'll bet 90% of the QSOs are "running the bands" after we hook up on 6 or 2. I understand the need for sustaining activity on the higher bands so we don't lose them, but getting away with half the aluminum sure made this contest attractive just after Field Day. I also like the idea of double points for 2m, because it actually made me go to 2m in the middle of a 6m opening to get those "2 pointers." Moving the contest to a week later? Yes! Many of the hard-core guys were working the IARU contest, which added to the poor 2m activity. I would also like to encourage everybody to hook up the computer to the radio (it was a 10-minute job), download WinMSDSP, and get on 2m HSMS. It's amazing how easy it is to work DX on meteor scatter. We spend months sitting on 144.200 waiting for *Es* that may never come, while running HSMS skeds will give you a better than 50% (at least in my case) chance of actually making a DX QSO.

Sorry for the bandwidth. Most of my VHF contesting is done by pure grit sitting by the radio trying to work the locals who turn on the rig for a few minutes to give us a point or two. This time it was different.

two dozen new grids and a couple of new states. (I've avidly been chasing 6m grids for only 3 years now.) Thanks for sponsoring the contest! . . . **KF6GYM**. Thanks for a great contest. Conditions were great, with 6 meters open much of the time. Tropo on 144 was poor, but who needed it with 6 meters open? I'll definitely be back next year. . . **N6DN/R**. Had a good time Saturday working 6 meters from CM87 in the San Francisco Bay area. Best DX was FN02, N2ODU, Dave. Popped up out of nowhere and we made the contact, and he disappeared and I heard no one else from there. I started late and missed the double hop but worked late into the evening and was still working stations in VE6 and 7 and Washington state until 2 AM in the morning. Heard only one station on 2 meters. Where the heck were all those guys?? Had a good time. . . **W6GYD**. Thought 6 meters was fair (propagation). Two meters was rather disappointing . . . **W6OAL/Ø**.

I guess the West Coast was working double hop to the East Coast but didn't hear any double hop here in Wyoming. A good new contest. Contests emphasizing 6 meters are fun . . . **AC7AF**. It's been a few years since this VHF enthusiast has entered a contest score, but *CQ* can count on it this year. In making rules, and modeling the contest for success, this group listens to the ones who are participating and deserves our support. I encourage everyone who participated to send in their log. Small and large scores indicate participation. There is almost no other way to demonstrate our level of activity to those outside of the hobby. Due to a TVI complaint, operating time was limited to about 12 hours . . . **N8NQS**. Low, low activity and conditions not so hot. We seem to have lost many of the old reliable QSOs from the Techs. They upgraded to General and are on the low bands . . . **N8XA**. Potentially a very good contest but only if you really promote it . . . **K9AKS**. *(Most certainly agree, Curt—ed.)*

Hope everyone had as much fun in the contest as I did. We didn't score a lot of points, but it was still fun. We only got to operate for a few hours, with low power and small antennas, so the score is not surprising. I actually made most of my contacts on FM this time! We activated three grids: EM69, EM79, and EM78. Some of the high points were working VE5UF in DO61, and NJ2F in EL96 on 6 meters. With 5 watts to my 2 meter mag-mount antenna! Had some good tropo Sunday morning, but there didn't seem to be many on. I did manage to catch N4OFA in EM86 on 2 meters (10 watts into a 4-element Yagi at 20 feet!). The low points were mostly not enough time. Also, sensing that 6 meters was open (everyone disappeared from 2), I tried to raise my homebrew 3-element Yagi along with my 2 meter Yagi and rotor by myself. I knew it was too heavy, but I tried anyway and managed to crash my 6 meter beam, so I had to finish the contest with the 2 meter mag mount—yuck. Later, I heard CO2OJ, but with 5 watts and the whip I just couldn't make the QSO. Next time out: better antennas and more power, ARRR! . . . **N9RLA/R**.

I was only been able to work the contest for about 5 hours. In that time I filled about a logbook page, and in the process worked a bunch of new grids on both 6 and 2 meters. Six was open here late the last night, and so I was able to hand out some points and also work VE9AA, VE2PEP, and VYØRR, with nary a nasty phone call. On 2 meters I worked a bunch of new grids and worked all the way down to KU4WW in EM54. Some of the stations south of here were working all the way into Louisiana. Those signals were not audible up here and eventually I hit the sack. I have never sent in a contest log, but I sure am this time. My efforts may be rather pitiful according to the standards of the professional contesting fraternity, but I had a great time in the process. I salute Gene, W3ZZ, and *CQ* for reactivating this one . . . **WA9JML**.

Put in about 22 hours of operating. Except for about two hours on Saturday afternoon the band was open somewhere all the time. We had the best W6 opening I think I've ever heard. It was wide open for hours both days. I worked N6DN/R in six different W6 grids over two days. Saturday at the start we had about an hour to the upper Midwest and

Sunday a good Texas opening. The rest of the time the footprint of the openings was very small and it was slow going. . . **KØGU**. I sure enjoyed the contest a lot, though I had to quit early—thunderstorm. The activity level the first day surprised me; it was much more than expected. It went way down the second day from what I saw of it . . . **KØMQS**. The contest was a lot of fun and glad to see some activity. I do plan on a better effort this year. I activated EN20, 21, 22, 23, 12, 13. The activity fell off on Sunday about noon local time. I operated three other VHF and above contests in 2000 and activated 14 and 15 grids each time. I would like to do that with this contest if the activity increases. I like the timing (July) for the prop. Heard Colorado several times while in EN21, but could not get their attention with my 160 watts . . . **NØDQS/R**.

NØDQS reported hearing us on 2 meters in EN21 and EN22 on his loops. Our best 2 meter DX was NØKQY in DM98. We did hear someone giving EM55, probably meteor burn, as MUF not good in that direction. On 6 meters it was quite a surprise to have K1TOL answer a CQ after midnight local time. Too bad everyone else was in bed with the rigs off! We are already trying to figure out how to improve for next year. It's too bad

QSO Leaders by Band

USA

50 MHz	QSO	144 MHz	QSO
KØGU	566	K2SMN	124
W3SE/6	400	K8TQK	120
NØKE[M]	399	K2DRH/9	111
WD5K	340	W1XX/2	110
N2ODU	313	K5ZG/8	102
K9HUY/4	256	KØMQS	81
W6OAL/Ø	255	KB8U	81
K2DRH/9	189		
NJ2F/4	188		
NW5E/4	155		

DX

50 MHz	QSO	144 MHz	QSO
YMØHA[M]	602	E2ØRJJ[M]	789
AN6SA[Q]	518	E2ØSZO[M]	761
VE7DXG[M]	273	HSØAC[M]	717

[M] *multi-operator*
[Q] *QRP*

Multiplier Leaders by Band

USA

50 MHz	Grid	144 MHz	Grid
KØGU	170	K8TQK	55
W3SE/6	138	K2DRH/9	49
WD5K	137	K5ZG/8[Q]	46
NØKE[M]	126	KØMQS	41
K9HUY/4	119	KB8U	36
N2ODU	112	K2SMN	33
W6OAL/Ø	112	W1XX/2	33
NJ2F/4	105		
K2DRH/9	90		
NW5E/4	86		

DX

50 MHz	Grid	144 MHz	Grid
AN6SA[Q]	161	E2ØSZO[M]	18
YMØHA[M]	140	YMØHA[M]	17
VE7DXG[M]	68	E2ØRJJ[M]	12

[M] *multi-operator*
[Q] *QRP*

the IARU is the same weekend. Maybe try and do both if the date stays the same. Thanks to all who took the time to work us . . . **NØKE**. Had a great time! Made my first 6 meter contact just a couple of minutes before the contest started. A friend of mine, KC2JO, loaned me an MFJ-9406 the night before, and about one hour before the contest started I built a dipole and mounted it vertically about 16 feet up the side of my tower. I hope to have my own setup the next time around! . . . **NØPLB**.

Multi-Op Station Operators

E2ØSZO: E2ØSZO, E21ZCE, HS7XMN, E2ØTOG & club members. **E2ØRJJ**: E2ØRJJ, E2ØLCH, E21YXV, E2ØOQT, E2ØNRI, E2ØNXA, E2ØFZ, E2ØUSZ, HS6PQZ/1. **F4AJS**: F4AJS, F4ARM. **HSØAC**: E2ØGMY, E2ØJTW, E2ØMFO, E2ØNPW, E21EIC, HS1CKC, HS2ZIU. **K4RF**: K4RF, K4SZ. **K6FQ**: K6FQ, NF6L. **NØKE**: NØKE, KØCL, WØDET. **NØVSB**: NØVSB, WBØRUA. **VE7DXG**: VA7AA, VE7DDK, VE7DXG. **YMØHA**: JE9IKG, TA1E, TA2DS, TA1ZZ, TA1ZK (HB9SUL).

Number groups after call letters denote the following: Class (A = all band, 6 = 6 meters, 2 = 2 meters, Q = QRP, M = multi-operator, R = rover), Final Score, Number of QSOs, Grids, State/ Province (USA/Canada only), Grid Locator or Number of Grids Activated (rover only). Rover grids are listed on the line following the rover score. Award winners are in boldface.

RESULTS 2000 CQ VHF CONTEST

NORTH AMERICA

UNITED STATES

W1KMH	Q	288	18	8	VT	FN33
K2SMN	**A**	**27,887**	**229**	**79**	**NJ**	**FN20**
W1XX/2	**A**	**26,676**	**241**	**76**	**NY**	**FN21**
W2SJ	A	1,083	40	19	NJ	FM29
WW2CQ	A	840	40	15	NJ	FN20
N3EMF	A	602	29	14	NY	FN31
N2ODU	**6**	**35,056**	**313**	**112**	**NY**	**FN02**
WB2AMU	Q	54	9	6	NY	FN30
N2GKM/R	R	5,406	71	51	NY	10
		FN02,03,11,12,13,20,21,22,30,31				
K2MDS	**M**	**8,008**	**105**	**52**	**NY**	**FN13**
(N1MU, K2LDT, K2LDU, KB2PYA, N2TYQ, WS2B)						
W3ZZ	**A**	**24,288**	**203**	**96**	**MD**	**FM19**
N3II	A	8,281	128	49	MD	FM19
N3XJX	A	400	25	16	PA	FN10
AJ6T/3	A	187	14	11	DE	FM28
W3GN	A	171	17	9	MD	FM19
K9HUY	**A**	**37,846**	**270**	**127**	**FL**	**EL86**
NJ2F/4	**A**	**25,070**	**209**	**109**	**FL**	**EL96**
KD4EVB	**A**	**11,470**	**110**	**62**	**KY**	**EM78**
W4KXY	A	3,510	71	39	GA	EM84
N4MM	A	2,784	64	32	VA	FM09
KU4WD	A	1,980	49	36	FL	EL98
KE4BVP	A	1,118	33	26	VA	FM08
AD4F	A	800	38	16	TN	EM75
NW5E	**6**	**13,674**	**159**	**86**	**FL**	**EL98**
W4VHF	**R**	**28,634**	**199**	**103**	**NC**	**4**
						EM85,86,95,96
N4OFA/R	**R**	**8,650**	**168**	**50**	**NC**	**2**
						EM85,86
W4EUH/R	R	969	35	19	VA	6
			FM07,08,09,19			EM86,97
K4RF	M	4,472	84	43	GA	EM84
N5NJ	A	4,944	100	48	TX	EM13
N5BA	A	740	27	20	TX	EL29
W5UWB	A	475	21	19	TX	EL17
WD5K	**6**	**46,580**	**340**	**137**	**TX**	**EM12**
N5HHS	6	5,115	93	55	TX	EL29
W5USJ	6	1,536	48	32	TX	EM22
KB5OAI	6	1,305	45	29	TX	EM22
KJ5RC	6	540	27	20	MS	EM42
WA5KBH	6	180	15	12	LA	EM30
KA5GLX	**Q**	**5,376**	**96**	**56**	**TX**	**EL29**
KB5ZSK	Q	1,400	50	28	NM	DM84
N3AWS	Q	100	10	10	MS	EM50
W3SE	**A**	**75,990**	**455**	**149**	**CA**	**DM04**
KF6GYM	A	7,812	119	62	CA	CM87
K6TSK	A	1,892	53	22	CA	DM03
KF6JBB	A	1,593	44	27	CA	DM12
KE6GFI	A	722	31	19	CA	DM13
N6ZE	A	200	16	10	CA	DM04
WA6GYD	6	1,325	53	25	CA	CM97
K6YK	6	1,308	71	48	CA	DM97
KC6ZWT	2	192	12	8	CA	CM98
N6DN/R	**R**	**15,928**	**141**	**88**	**CA**	**7**
			DM03,04,05,12,13,14,15			
K6FQ	**M**	**18,873**	**213**	**81**	**CA**	**DM13**
K7AD	**A**	**19,928**	**211**	**94**	**WA**	**DN06**
N7EPD	**A**	**17,544**	**227**	**68**	**WA**	**CN87**
NW7O	A	5,184	108	48	NV	DM26
WB7DHC	A	2,976	81	31	WA	CN97
W7PW	A	192	16	12	NV	DM09
W7USA	6	1,550	50	31	AZ	DM33
AC7AF	6	900	36	25	WY	DN51
K8TQK	**A**	**34,985**	**213**	**105**	**OH**	**EM89**
KB8U	**A**	**31,304**	**219**	**104**	**MI**	**EN71**
N4SC/8	A	3,552	58	48	MI	EN72
N8NQS	A	3,042	63	39	MI	EN72
K8KFJ	6	621	27	23	WV	EM98
K8MR	6	759	33	23	SC	EM84
K5ZG/8	**2**	**9,384**	**102**	**46**	**OH**	**EN70**
N8XA	**Q**	**4,326**	**63**	**42**	**OH**	**EM79**
K2DRH/9	**A**	**57,129**	**300**	**139**	**IL**	**EN41**
N9GH	A	2,592	55	32	IL	EN51
W9FX	A	2,160	41	27	IL	EM57
W9OBG	A	902	41	22	IL	EN40
WA9JML	A	608	21	16	IL	EN51
N9NDP	A	250	13	10	WI	EN62
K9AKS	**6**	**9,975**	**133**	**75**	**IL**	**EN41**
N9YJJ	6	476	28	17	WI	EN44
N9RLA/R	R	682	32	11	IN	3
						EM69,78,79
W6OAL/Ø	**A**	**36,840**	**277**	**120**	**CO**	**DM79**
WØAH	**A**	**16,275**	**195**	**75**	**CO**	**DM78**
W5JAK/Ø	A	3,828	58	31	CO	DN70
NEØP	A	2,765	69	35	IA	EN41
WBØULX	A	1,976	50	38	SD	EN04
KØVSV	A	1,080	43	20	IA	EN41
W7XU/Ø	A	630	30	21	SD	EN13
WA2HFI/Ø	A	496	23	16	MN	EN34
KØGU	**6**	**96,220**	**566**	**170**	**CO**	**DN70**
K4SSO/Ø	6	336	21	16	MO	EM47
KØMQS	**2**	**6,642**	**81**	**41**	**IA**	**EN31**
NØUK	2	224	16	7	MN	EN34
WØKFG	**Q**	**3,139**	**73**	**43**	**ND**	**DN96**
NØPLB	Q	480	24	20	MO	EM47
NØDQS/R	**R**	**14,960**	**176**	**85**	**IA**	**6**
						EN12,13,20,21,22,23
KØYB/R	R	3,502	72	34	CO	5
						DM77,79,87,88,89
NØKE	**M**	**66,930**	**442**	**138**	**CO**	**DM69**
NØVSB	**M**	**28,896**	**258**	**112**	**CO**	**DM79**

CANADA

VE9AA	**A**	**5,978**	**95**	**61**	**NB**	**FN65**
VE2PIJ	A	756	33	21	PQ	FN35
VE3OIL	A	1,188	40	22	ON	EN93
VE4KX	**A**	**16,356**	**179**	**87**	**MB**	**EN09**
VE7HPS	A	988	42	19	BC	CN89
VE1SKY	Q	1,247	43	29	NS	FN74
VE7DXG	**M**	**31,902**	**341**	**78**	**BC**	**CN88**

COSTA RICA

TI5KD/2	**6**	**5,712**	**119**	**48**	**EJ89**
TI2ALF	2	240	30	4	EJ89
TI2CJJ	2	4	2	1	EJ89

CUBA

CO2OJ	**6**	**2,050**	**50**	**41**	**EL83**
CO2KK	6	418	22	19	EL83

EUROPE

BALEARIC ISLANDS

AN6SA	**Q**	**83,398**	**523**	**161**	**JM19**

FRANCE

F4AJS	**M**	**11,100**	**148**	**75**	**JN16**

ASIA

JAPAN

JF2SKV	6	4	2	2	PM84

THAILAND

E2ØSZO	**M**	**27,396**	**761**	**18**	**OK03**
E2ØRJJ	**M**	**18,936**	**789**	**12**	**OK03**
HSØAC	**M**	**14,310**	**717**	**10**	**OK04**

TURKEY

YMØKA	**M**	**103,934**	**632**	**157**	**KM29**

MOBILE DX MASTER

Since its introduction over a year ago, Yaesu's FT-100 HF/VHF/UHF Transceiver has been widely acclaimed for its outstanding performance and flexibility. Now the FT-100D builds on this success story, adding the convenience of factory-installed modules for today's Ham on the go!

FT-100D HIGHLIGHTS

The FT-100D is a high-performance, ultra-compact transceiver operating on the 160-10 meter HF bands, plus the 50, 144, and 430 MHz VHF/UHF bands. Known for its outstanding receiver performance, the FT-100D's easy-to-access DSP system is the cornerstone of the outstanding receiver capability. Providing Noise Reduction, Auto-Notch, and Narrow-Bandwidth Filter selection, the DSP system also includes a Microphone Equalizer for the transmit side.

The new and enlarged speaker of the FT-100D (ϕ66 mm) provides spectacularly clean audio output, to help you dig out those weak signals.

Whether at home or away, the fantastic new FT-100D is The Choice of the World's Top DX'ers. Step up to the FT-100D, and enjoy the thrill of the sunspot peak in style!

MICRO MOBILE

FT-100D

Ultra-Compact HF/VHF/UHF Transceiver

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Real Performance for the Real World!

Today's elite-class operators demand the best RF weaponry available. Yaesu's exciting new MARK-V FT-1000MP answers the call, with an expanded array of receiver filtering, 200 Watts of power output, and Class-A SSB operation capability for the cleanest signal on the band. Enhanced front-panel ergonomics on the front panel save you seconds in a pile-up or a contest "run," and Yaesu's HF design and manufacturing know-how ensures that no short-cuts have been taken in our effort to bring you the best HF transceiver money can buy. For more QSOs in your log, and more awards on your wall, there is only one choice: the MARK-V FT-1000MP from Yaesu!

I. Interlocked Digital Bandwidth Tracking System (IDBT)

The IDBT feature greatly simplifies SSB operation by matching the bandwidth of the DSP (Digital Signal Processing) system to the net bandwidth of the 8.2 MHz and 455 kHz IF stages. The IDBT system accounts for the settings of the IF WIDTH and SHIFT controls, and automatically sets a DSP bandwidth which matches the analog IF bandwidth.

IDBT: A Breakthrough in Selectivity!

II. Variable RF Front-End Filter (VRF)

Protecting the MARK-V's receiver components from strong out-of-band signals, the VRF system acts as a high-Q "Preselector," located between the antenna and the main bandpass filter networks, providing additional RF selectivity on the 160-20 meter Amateur bands for multi-operator contest teams, DX-peditions, or for operation near MW/SW broadcast stations.

VRF Features Large, High-Q Coils and High-Quality Relays

VRF Typical Bandpass Response (3.5 MHz)

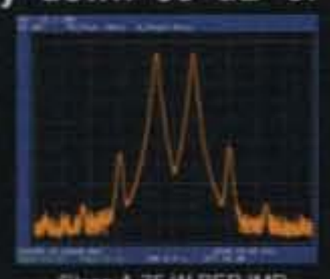
III. 200 Watts of Transmitter Power Output

Utilizing two Philips® BLF147 Power MOSFETs in a 30-Volt, push-pull configuration, the MARK-V's transmitter puts out up to 200 Watts of clean output power, thanks to the conservative design of the PA section.

T-Configuration Heat Sink

IV. Class-A SSB Operation

Exclusively available on the MARK-V FT-1000MP, a press of a front-panel button engages Class-A SSB operation of the transmitter, at a power output level of 75 Watts. Class-A operation produces incredibly clean signal quality, with 3rd-order IMD typically suppressed 50 dB or more, and 5th- and higher-order products typically down 80 dB or more!



Class A 75 W PEP IMD

V. Multi-Function Shuttle Jog Tuning/ Control Ring

The immensely-popular Shuttle Jog tuning ring, which is concentric with the Main Tuning Knob, has a new look in the MARK-V: it now includes the activation switches for the VRF (left side) and IDBT (right side) features, so you don't have to move your hand position to activate these important circuits during contest or pile-up situations!

Access VRF and IDBT Features via Shuttle Jog Dial

Features

■Frequency Coverage: (RX) 100 kHz–30 MHz; (TX)160–10 m Amateur Bands ■Dual In-band Receive w/Separate "S" Meters ■Ten Pole Collins® Mechanical Filter Built-in ■RX DSP Noise Reduction and CW Peaking Filter ■High-speed Automatic Antenna Tuner ■Two TX/RX Antenna Jacks plus RX-only Jack ■TX Microphone Equalizer ■RF Speech Processor ■Direct Digital Synthesis ■CW Spot and Two Key Jacks ■Two Headphone Jacks (1/4" and 3.5 mm) ■Low-Level Transverter RF Drive Jack ■Separate FP-29 Power Supply (30 V/13.8 V DC Output)

Photo shows optional MD-100A8X Deluxe Desk Microphone

HF 200 W All-Mode Transceiver

MARK-V FT-1000MP

EXPAND YOUR DX HORIZONS WITH THE FTV-1000 50 MHz TRANSVERTER!

- 50 MHz Transverter with 200 W PEP Power Output
- Class-A Bias Selection for Low TX IMD (PO: 50 W)
- High-Performance Receiver Front End
- Automatic, Effortless Operation with MARK-V FT-1000MP
- Upgrade to High Power with VL-1000 Linear Amplifier

Specifications

Frequency Range: 50-54 MHz
Antenna Impedance: 50 Ohms
Power Output: 200 Watts PEP
Spurious Emissions: At least 60 dB down
Power Source: DC 30 V and 13.8 V
(supplied by FP-29 Power Supply of MARK-V)
Dimensions: 9.6" x 5.4" x 13" WHD (243.5 x 136.5 x 331 mm)

FTV-1000
200 W 50 MHz Transverter

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VHF Plus

BY JOE LYNCH, N6CL

All About The World Above HF

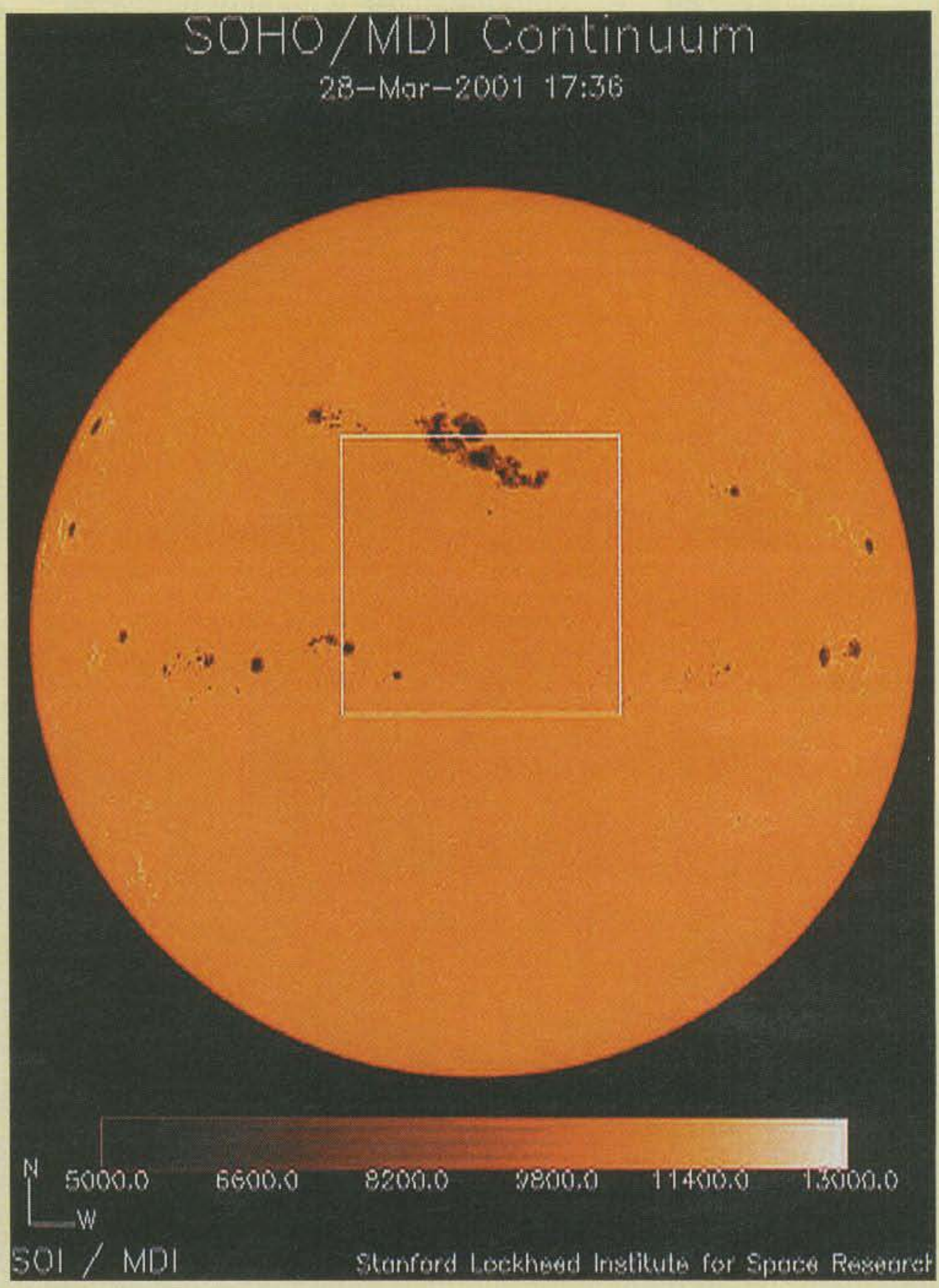
Here Came the Sun!

Monster Solar Eruptions Touch Off Huge Auroras

VHF Plus Calendar

June 3	Moderate EME conditions
June 6	Full Moon
June 8	Lowest Moon declination
June 8-10	Ham-Com Convention *(See text for details)*
June 9	*Arietids* and *Zeta Perseids* meteor shower peaks
June 9-11	June VHF QSO Party *(See text for details)*
June 10	Poor EME conditions
June 11	Moon apogee
June 13	Last quarter Moon
June 16-17	SMIRK 6-meter contest *(See text for details)*
June 17	Moderate EME conditions
June 21	New Moon
June 22	Moon perigee and highest Moon declination
June 23-24	Field Day *(See text for details)*
June 24	Excellent EME conditions
June 27	First quarter Moon
June 28	*Delta Aquarids S* meteor shower predicted peak
June 29	*Beta Taurids* meteor shower predicted peak

• EME conditions courtesy W5LUU



A giant sunspot 13 times the size of Earth crosses the solar disk on March 28, as seen in this image from the SOHO satellite. (Courtesy NASA)

It was like the George Harrison (of Beatles fame) song, *Here Comes the Sun*, was being played out in the solar system the beginning of this past spring. We were told that the peak of the current sunspot cycle had already occurred. In this column two months ago you read about the polar flip of the Sun. According to NASA's Space Flight Center's Dr. Tony Phillips, it was just this past mid-February when the Sun underwent a flip in its magnetic field. Then in late March, as Harrison's song describes it, "Sun, sun, sun, here it comes."

It was March 27 when SpaceWeather.com gave those of us who subscribe to its e-mail service our first clue of what would be a roller-coaster two weeks that is still going on as I am preparing this column.

From the March 27 e-mail we read the following: "In recent days the Boulder sunspot number has rocketed to 339, its highest level since July 2000. At least one large sunspot group has a complex magnetic field that could harbor energy for powerful solar flares. Forecasters estimate a 20% chance of an X-class eruption during the next 24 hours."

To alert us further of the Sun's activities, it also reported the following: "An interplanetary shock wave buffeted Earth's magnetosphere Tuesday morning [March 27] and another may be following close behind. A coronal mass ejection that left the Sun on March 25th will arrive late Tuesday or Wednesday and possibly trigger additional geomagnetic disturbances. In recent days Alaskan sky watchers have enjoyed some of the best auroras of the current solar cycle."

The very next day SpaceWeather.com sent the following alert: "The largest sunspot in ten years is crossing the solar disk. The fast-growing spot, called AR9393, covers an area of the Sun equivalent to the total surface area of 13

P.O. Box 73, Oklahoma City, OK 73101
(phone 918-627-6625; fax 918-835-9785)
e-mail: <n6cl@cq-amateur-radio.com>

Earths!" With this size sunspot cluster, we sun watchers anticipated something big. We were not to be disappointed.

What gave us a major clue was an additional report in that same e-mail that stated: "An eruption near sunspot region 9393 hurled a coronal mass ejection toward Earth on Wednesday. Forecasters estimate a 15 to 25% chance of severe geomagnetic storms when the expanding cloud buffets our planet's magnetic field, most likely on Friday."

And did it hit! The rolling *K*-index went ballistic, shooting up to an average of six for the first three hours of March 31 (all times UTC). The next three hours the average was at nine, which is the top of the scale. The following three hours it was back down to six, followed by six hours at seven. Again, the average dipped to six for three more hours before settling down to four during the first three hours of April 1.

That wasn't the end. The *K*-index shot up to five for three more hours, then back up to six for three more hours before going to three for three more hours.

During the ensuing hours of the storm, aurora was observed as far south as Mexico. Art Moe, KB7WW, has some excellent pictures on his website of the aurora as he observed it in Arizona. You can view them at <http://www.psiaz.com/Schur/astro/aurora3-01.html>.

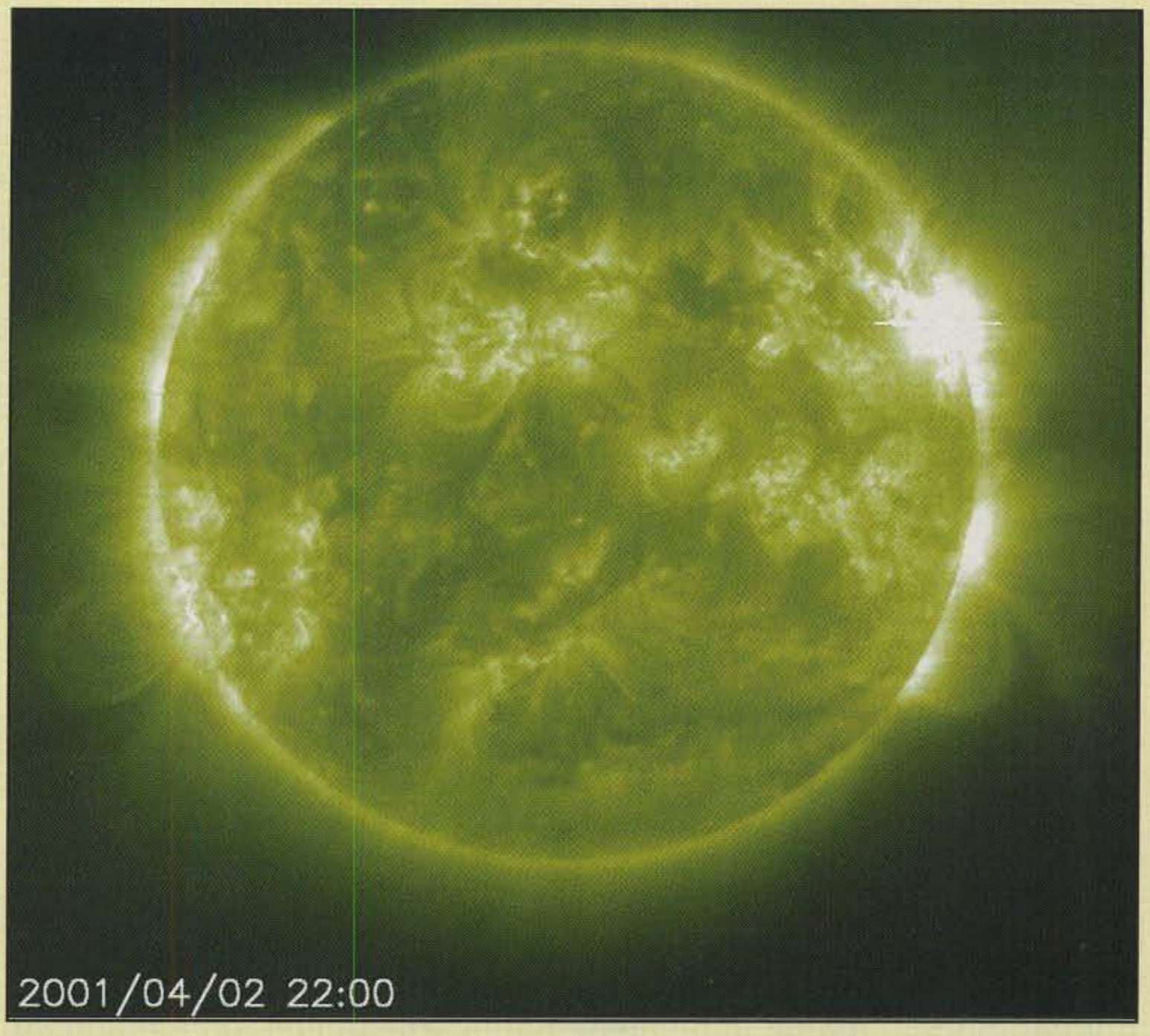
While there was plenty of activity, it did catch some people by surprise because of the time of day in which it occurred. Reports of some of the activity can be found elsewhere in this article.

Even with the intensity on March 31 that was only the beginning. On April 5 the European Space Agency (ESA) reported that on Monday April 2 at 2151 UTC, the Sun unleashed a major solar flare near its northwestern (upper right-hand) side. Originally classified as an X17 flare, it was later upgraded to X20 and appears to be the biggest flare yet on record. A photo of the flare taken by the Solar and Heliospheric Observatory (SOHO) satellite can be seen at <http://sci.esa.int/soho>.

This particular flare is the strongest since August 16, 1989 when the last X20 flare occurred. It also was more powerful than the famous March 6, 1989 flare, which caused the disruption of the power grids in Canada. According to ESA, the flare occurred in the active region 9393, the same active region responsible for the previous days' intense auroral activities.

Yet because of the Sun's rotation, Earth did not feel the full brunt of the blast, which is a good thing because there would have been a likelihood of power outages and damage similar to that which occurred in March 1989.

Interestingly, Tom Ashcraft, an amateur radio astronomer (Tom is not a ham but is an avid radio observer of solar activity.) charted the sun's activities on three different frequencies—20.2 MHz, 29 MHz, and 50 MHz. He observed the following to me in an e-mail: "The X20 April 2, 50 MHz chart shows a slight line depression prior to the big bursting...and I'm not sure if this is rare to see a flare effect at VHF frequencies. There was a noticeable dropout at 29 MHz. I did not post that specific chart on my website."



SOHO satellite image of the X20 class solar flare that erupted from the solar surface on April 2. This may be the largest solar flare ever recorded, and it is definitely the strongest since the last X20 flare in August 1989. (Courtesy NASA)

Commenting on the flare, Ashcraft said that it began to appear on his charts at 2134 UTC as a sudden ionospheric disturbance (SID). According to him, "On the 20.2 MHz chart there is a steep dropout of the chart line indicating an X-ray flare in process."

You can view the charts Ashcraft has posted on his website at <http://www.heliotown.com>. Also available at his website are .wav files of what this solar activity sounded like on the bands—as if we needed to be reminded!

As region 9393 rotated around the Sun, other active regions came into visibility. These also produced some interesting fireworks during early April.

On April 7 SpaceWeather.com reported the following: "Solar activity remained high on Friday [April 6] as active region 9415, a sunspot group about the five times the size of Earth, unleashed a powerful X5-class solar flare. The explosion hurled a coronal mass ejection (CME) into space—and somewhat toward Earth. Friday's CME joins another one already en route toward our planet."

On April 9 the Sun erupted again, this time with what Ashcraft described as "...a very strong solar flare and coronal mass ejection beginning at around 1527 UTC. The initial shock wave from this flare hit abruptly and caused my chart recorder needle to go off scale for a few minutes during the onset of the bursting." His approximately 2-minute long .wav file of what it sounded like on 50.022 MHz is quite impressive.

More solar activity was on its way. The next day SpaceWeather.com reported, "A powerful X-class solar flare erupted Tuesday morning, triggering radio blackouts and a minor radiation storm. The explosion also hurled a coronal mass ejection (CME) toward Earth. Today's CME joins another already en route to our planet."

On Wednesday, SpaceWeather.com reported the following: "A strong solar wind disturbance hit our planet's magnetosphere between 1300 and 1400 UTC on Wednesday, April 11th, triggering a severe geomagnetic storm." Commenting on the ensuing aurora, they stated, "A pair of coronal mass ejections that hit Earth's magnetosphere on April 11th sparked an intense display of auroras. Sky watchers in the United States saw 'Northern Lights' as far south as the New Mexico-Texas border."

On Friday SpaceWeather.com also re-

ported yet another burst of solar activity: "An interplanetary shock wave struck Earth's magnetosphere early on Friday the 13th and triggered a strong geomagnetic storm."

This chronology brings me to today, Sunday, April 15. Today SpaceWeather.com reported the following: "One of the most powerful solar flares ever recorded (an X14-class explosion) erupted near sunspot group 9415 today, climaxing a two-week spate of X-class flares from that active region. The source of the explosion is near the Sun's western limb, so the blast was directed mostly away from Earth." Initial reports showed no appreciable change in propagation as a result of this flare.

This is quite a chronology of two weeks of solar activity. While not every event on the Sun triggered a corresponding event on Earth, it was interesting to note each of them as they occurred. It is important to document this activity as a way of preserving it, particularly for learning purposes.

Aurora not Boring in Boring, Oregon

Dave Bernhardt, N7DB, in Boring, Oregon (CN85), shared the following with the VHF reflector: "Now this was a serious auroral opening! This was one of those openings which will be talked about for some time into the future. For those who missed this one, you may kick yourself now!

"Each solar cycle brings a few large aurora openings; for Cycle 23, this was one of them. From the perspective of this operator, the duration has been the most distinguished attribute of this one. This was a bit of a surprise considering how weak Cycle 23 has been. Certainly we are on the trailing side of the cycle; the fact that most of the active areas on the sun are at mid-latitudes would also confirm the stage of this cycle. For those who do not watch the face of the Sun much, the 'spots' during much of this cycle have been bright as opposed to the dark areas of the last two cycles. The recent run up in solar flux levels has been noteworthy.

"Having missed the auroral activity last week, this operator was primed to watch for activity when the NOAA forecasts indicated some significant geomagnetic activity. The data indicated fast particles from a CME event early Thursday morning (1015 UTC). Although strong aurora flutter was noticed here on the RS-12 downlink (10M) around 0245, it was not until later in the evening that the aurora was usable here. First contact here was with VE7DXG (CN88, 55A) at 0426 on 6 meters followed by W7GJ (DN27, 55A) at 0434. First 2 meter contact was with K7IEY (CN88, 55A) at 0455.

"Although 2 meters was concentrated on more, here are some of the other stations worked on 6: WA7SDI (CN84, 54A, 0510), WB7REL (DM49, 54A, 0537), VE7SL (CN88, 59A, 0723), W7KQU (CN87, 57A, 0801). Went to bed and figured that would be it. Hah! K7OFT (CN87, 52A, 1633), W7MEM (DN17, 52A, 1633), W7CCY (CN96, 52A, 1635), KO7N (CN84, 57A, 1733), KG7FU (CN84, 54A, 1735), N7WX (CN88, 59A, 1807), and K7CW (CN87, 59A, 1830). Although the times were not listed in the log, a number of stations in this grid were 59+A this morning on 6 meters.

"Continuing on with 2 meters: KD7TS (CN87, 57A, 0505), W7GLF (CN87, 54A, 0515), VE7SL (CN88, 59A, 0521). About this time there was a suspicion by this operator that the aurora curtain was moving south and so it did: N6YM (CM88, 59A, 0549), KB7DQH (CN87, 52A, 0553), K6AAW (CN80, 59A, SSB no less! 0606). QRM became intense for a little while until everyone spread out. This was probably one of the first aurora openings this operator can recall that SSB was usable on 2 meters. Those of us in the higher latitudes noticed how we had to chase SSB stations each transmission from those to the south of us. It was a little amusing once we figured out why the stations kept mov-

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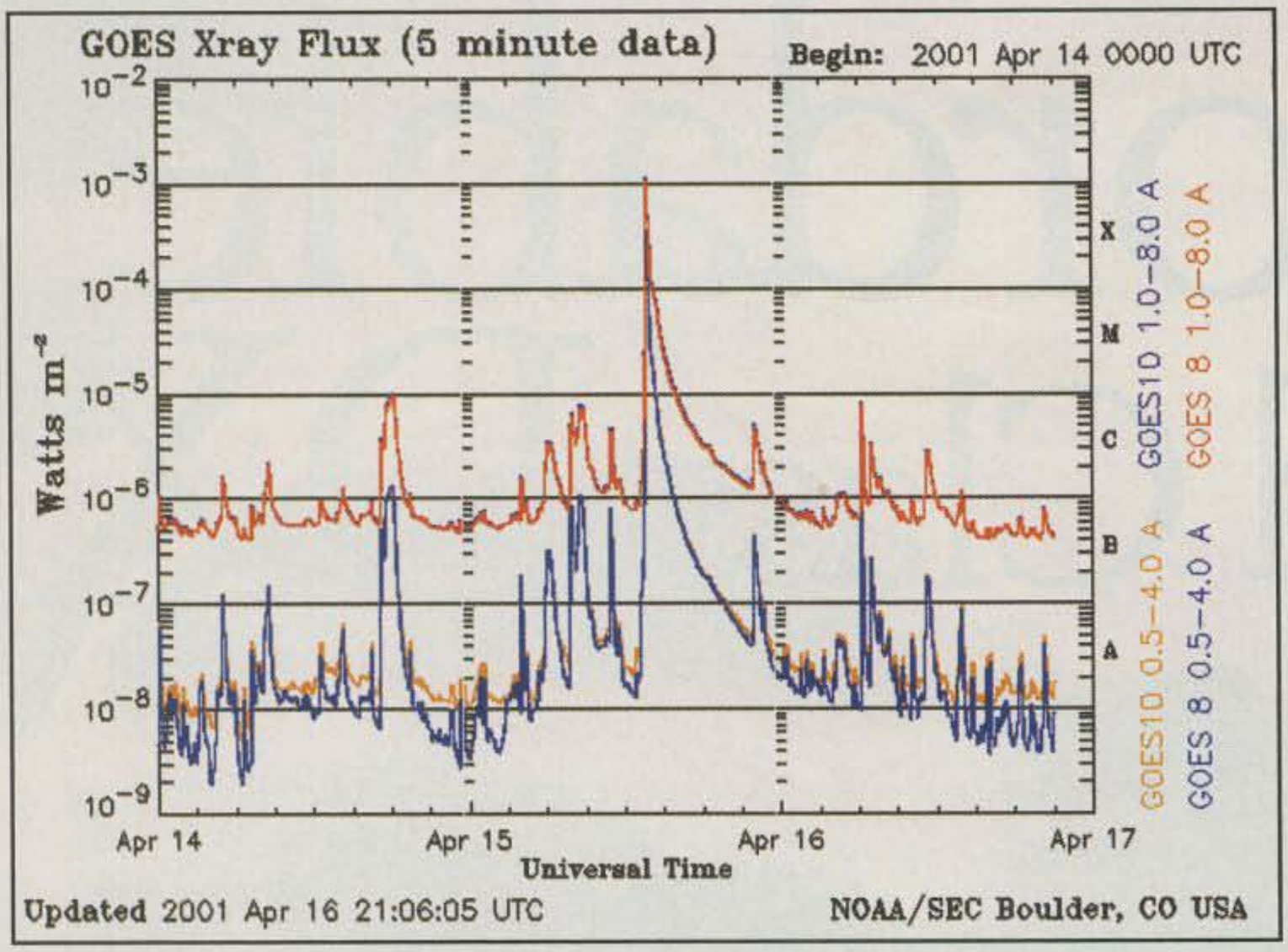

Graph showing huge jump in solar flux on April 15, coinciding with another giant solar flare. (Courtesy NOAA Space Environment Center)

ing (for those to the south, that low raspy voice sound is normal for aurora signals).

"Continuing on: K7QXA (CN80, 59A SSB, 0607), NZ6N (CM89, 55A SSB, 0608), WJ6T (DM05, 52A, 0618 best DX south on this one), K7VS (CN82, 52A, 0624), N9JIM/6 (CM87, 59A, 0649) thought there was aurora-*E* until he sent the /6!). W6OAL (DM79, 55A, 0704) was the best DX to the east (I chased Dave around for maybe 20 minutes then he called me on my CQ!) W7MEM (DN17, 59A, 0706), WJ7S (CN84, 52A, 0711). Again Saturday morning here is more: KG7HQ (CN88, 57A, 1642), VE7KED (DN09, 55A, 1646, he was 57-59A at times this morning), K7GS (DN17, 57A, 1717), W7RJR (DN17, 59A, 1720), and WI6Z (CN84, 55A, 1755).

"Other stations heard last night but not worked include: KØGU at 0700 (good signal here too) and KE7NS (UT). Missed Tim, K7XC, on 2 meters this morning; aurora faded back before a QSO could be made. (KB7WJL?) was active last night on 6 from CN74. Very rare grid so this station did not work him so that others could pick up the grid (this grid is but a sliver of dry land).

"Shep Shepherd, W7HAH, was heard this morning on 6 meters. Although there were reports of transcontinental aurora-*E* from station from Seattle north, no transcon or other aurora-*E* noted here. Also, no reports of anything north of lower VE7. Other reports include some contacts via aurora on 222 and 432. The aurora has to be pretty intense to see any aurora contacts on 432 out here—pretty unusual.

"The aurora seemed weak by 1851, although there was still a strong auroral flutter on WWV 10 MHz at 1921.

"Beacon report: Yes, there were some beacons heard on 6 meters during this aurora: KA7BGR/b (CN82, 53A 0545), W7HAH/b (52A, DN28, 1651), VA7SIX/b (CN89, 52A, 1701), KA7BGR/b (52A at 1703), W7HAH/b (51A 1751), W7HAH/b and KA7BGR/b (both 51A at 1813).

"Reports received here say that this was a spectacular visible aurora. We wouldn't know, as this area was overcast last night. Some locals thought they could see some red through the clouds, but were not sure. Even at this QTH in the country, it was hard to tell if it was light from the aurora or city/town lights in the clouds. The moon was partially visible out here through the clouds, then it was totally covered up.

"The ongoing *A*-index of 140 made this one of the larger aurora events one can experience. Might be an interesting kick-off for the summer E season!—73 de Dave, N7DB"

Commenting on the April 11 opening, Dave wrote: "Got home a little after 2300 UTC. The first aurora I heard was W7HAH/b 51A at 2319. This was the only beacon I heard that evening.

Six meters was primarily a relatively strong northwest aurora, into OR, WA, VE7, and ID. Signals were up to 57A to 59A. WØLD was weakly heard at this QTH.

The aurora was strong enough for a few easy contacts on 2 meters. First contact was with N7TGF (57A, CN88, 2333). Again a number of signals up to 57A to 59A. Signals were strong enough for a few SSB contacts. Grids worked here also include CN96, DN07, CN97, CN82, DN13, DN17, and CN73. At one point the aurora was peaking at 90 degrees. I suspect there may have been some propagation across the border to CA, but no stations were heard here.

"This was a clear evening in the northwest, but the aurora was gone before the skies darkened.—73 de Dave Bernhardt, N7DB."

Gene Mitchell, NØDQS, reported the following: "Had fun working the aurora yesterday while I was mobile in EN 12, EN01, and EN02. The biggest problem I had was not making errors while moving from one grid to the next (my CW skills are not very good!). Tried to get to EN03 before it died but got there about 15 minutes too late. Maybe next time. 73, and look for you all this summer from EN22 or someplace else in the mobile."

Incidentally, Gene made some interesting comments concerning my column on South Dakota's proposed ban on cell phone usage while driving. He stated, "If they are going to put a ban on their use then they need to go a step further and cure a problem that I think is worse. They need to close all drive-thrus at the fast-food places, remove cup holders from all vehicles, and outlaw the manufacture of cups and other containers designed for use in automobiles. These problems do not get any attention but can you imagine the problem while driving down the road eating your McDonald's Quarter Pounder and the pickle falls on your lap or some ketchup drips on you. What is a person's first reaction? Or what about when you spill the hot coffee or sticky cold drink on your console and try to wipe it up while driving through traffic?

"I cannot believe that they want to limit use of these items, which are major public-safety and security devices. I operate a lot of VHF and up as a rover/mobile and am well aware of the potential problems, but I am also well aware of the other problems I mentioned and would gladly give up the food or cup coffee in the auto but have the mobile communications."

Jeff Klein, K1TEO, shared the following: "Enjoyed the aurora Friday night and Saturday from CT. It was definitely a good aurora, although not as strong as the auroras last July and August. From what I could tell, there was only a brief period when the southern US stations could be worked, while the summer auroras had lengthy periods of activity to the deep South.

"In total, I worked 65 stations on 2 meters in about 2 hours of operating spread across Friday night (starting 0430 UTC) and a couple of tries between family activities Saturday afternoon (first around 1800, then again about 1945).

"There was a clear western edge to what could be worked from my QTH, as I worked quite a few in the "30's" but noth-

ing further: EM35, 37, 38, 39, and EN31 and 33. To the south I worked EM55, 66, 75, 86, 94, and FM04. To the northwest I worked EN54, 53, 52, and EN96.

"I only tried 6 meters once Saturday afternoon and worked about 30 stations in 25 minutes, all on SSB. First time I've ever had that many stations calling at once on an aurora while operating SSB. I now have a better appreciation for how tough it can be to pull out calls of equal strength on aurora SSB.

"While I listened at other times on 6 meters during the aurora and heard some fairly clear SSB, at this particular time the SSB was pretty distorted, making copy rougher. Of course I hadn't put on any headphones, as I thought I was just going to listen for a moment on 6 meters before heading back to 2 meters. I did hear a lot of interesting stuff on 6 meters early Saturday morning (0500), but opted not to transmit to keep the family from waking up (baby monitor in use!).

"One disappointment was not being able to try on 222 meters. I have an ant problem on that band that I need to fix. Could hear locals working aurora, but nothing on aurora for me with my 4:1 SWR.—73 de Jeff, K1TEO."

Chip Margelli, K7JA, reports that the 31 March aurora was clearly visible in the Los Angeles area, but despite repeated CQ calls he had no aurora contacts.

Art Holmes, W1RZF, reports the following stations worked on 11 April: 144 MHz, K4QI FM06, VA3ST FN03, WA8CXI EM99, K8MR EN91, K8MD EN82, VE2BKL FN48, KC2AOA FN22, NY2Z FN12, NR8S EN83, VE2JCW FN25, K9MRI EN70, and K9UU EN62 (heard only); 222 MHz, VE3AX FN02, K8MD EN82, K9EA EN71, and K2AXX FN12; and 432 MHz, VE2JWO FN35.

Commenting on aurora on 222 MHz, Peter Shilton, VE3AX, the VHF editor for *Radio Amateur of Canada,* wrote the following to Art: "Au on 222 is almost as common as 144 MHz and distances are similar. For example, I worked NØLL in EM09 on 144 MHz [on 10 April]. We QSYed to 222 MHz right away and worked with almost as good signals, except Larry only has 120 watts on 222 MHz (at least that's all he had last time we worked in August 2000—also on aurora!). That's a 1000 mile path! Not bad! Unfortunately, many people think 222 au is less common because of the fewer people on the band.

"Back in the 1980s Terry, WØVB, and I noted that we could often work on 222 MHz *after* the 2 meter aurora signals had disappeared. That may have been a "northern thing," as I was living in EN86 at the time. It makes sense that as the auroral oval retreats north in its waning stages, the more common "southern" stations would lose the aurora on 2 meters, leav-

ing us 'northerners' with a path still open on both bands."

The MBA is Going Away

In mid-March Dave Blaschke, W5UN, stunned the EME community with the following announcement: "The rumor is true. W5UN and the Mighty Big Array will be QRT in May, and the antenna will be taken down. Anyone wanting to do something special on 2 meter EME with W5UN before the QRT date should contact me soon."

After being inundated with e-mails, Dave followed up with an explanation that he and his wife were moving from Houston to northeast Texas, and that it would take a couple of years to get everything set up again. Dave also noted that his EME website and software would continue to be available.

Current Contests

Here it is: Summertime begins with three contests, all providing VHF plus operating opportunities.

ARRL June VHF QSO Party: The dates for this contest are 9–11 June. Complete rules are in the May issue of *QST*. Many are making plans to activate rare grids. For the latest information on grid expeditions, check the VHF reflector (vhf@w6yx.stanford.edu) on the internet. This is by far the most popular VHF contest. For weeks in the run-up to the contest postings are made on the VHF reflector announcing rover operations and grid expeditions. It is a contest that will create plenty of opportunities for you to introduce the hobby to your friends who are not presently working the VHF-plus bands or who are not hams. Perhaps the most fun I have had in the hobby was when I operated Rover with a partner. One year it was with Jim Rudniki, NZ7T, and the next it was with Oscar Morales, CO2OJ. Both times were fun for me but were inspirational for the other fellow. Jim went back to Utah and for a number of years was active on the VHF-plus bands. To date Oscar continues to put out plenty of contacts from Cuba, being the country's most active VHFer at present.

SMIRK Contest: The SMIRK 2000 QSO Party, sponsored by the Six Meter International Radio Klub, will be held from 0000 UTC June 16 until 2400 UTC June 17. This is a 6 meter only contest. All phone contacts within the lower 48 states and Canada must be made above 50.150 MHZ; only DX QSOs may be made between 50.100 and 50.150. Exchange SMIRK number and grid square. Score 2 points per QSO with SMIRK members and 1 point per QSO with nonmembers. Multiply points times grid squares for final score. Awards for top scorer in each ARRL section and country. Please send a legal-size SASE for a copy of the log forms. Log requests and logs should be sent By August 1 to Pat Rose, W5OZI, P.O. Box 393, Junction, TX 76849-0393. For more information see their URL at <www.smirk.org>. Incidentally, the 1999 SMIRK Contest results also can be found at <www.smirk.org>. K5IUA, W4WRL, and AA5XE posted the top three scores.

Field Day: ARRL's classic, Field Day, will be held on 23–24 June. Complete rules for this contest can also be found in *QST*. New rules this year were discussed in last month's column. In years past tremendous European openings have occurred on 6 meters. Also, as happened in 1998, tremendous sporadic-*E* openings can occur. Certainly, this is one of the best club-related events to involve new people in the hobby. I cannot remember the number of Field Days I have been on, or adequately describe the amount of fun I had participating in each one of them.

I do remember my first Field Day, however. I was with the South Bay Amateur Radio Society in Chula Vista, California. At that time they did not have the club call K6QM, so it was the privilege of the newest General class operator to use his or her call for the Field Day operation. I was the newest. At age 13 I was quite enthralled to hear my fellow hams use my callsign (WA6PDE) on all the bands, including 6 and 2 meters. It was really exciting for me to hear guys work up the coast on 6 meters during the annually expected sporadic-*E* opening. For this young teenager, my first Field Day operation made an indelible impression. You, too, can make an indelible impression on someone new to the hobby by inviting him or her along for the fun of Field Day.

Considering the excellent predicted EME conditions for this weekend, anybody game for an EME FD QSO?

Current Conference

Ham-Com is scheduled for the first weekend in June in Dallas. As usual, the gang from the North Texas Microwave Society will present their programs Saturday afternoon between 2–5 pm. Other programs related to weak-signal communications also will be presented.

For more information about registration at Ham-Com, contact them at P.O. Box 12774, Dallas, TX 75225-0774 (voice/message/fax 214-361-7574; web <www.hamcom.org>. A number of hotels within easy driving distance are priced between $30 (Motel 6) and $149 (Wyndham) per night. Also available within easy driving distance are RV accommodations.

Current Meteor Showers

Between 3 and 11 June the *Arietids* meteor shower will again occur. This is a daytime shower, with the peak predicted to occur around 0900 UTC on 9 June. Activity from this shower will be evident for

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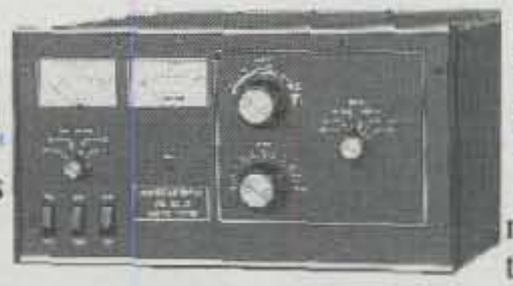

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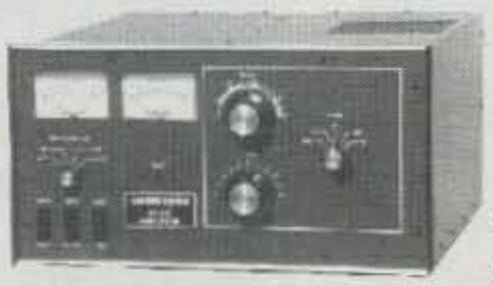

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around eight days, centered on the peak. At its peak you can expect around 60 meteors per hour traveling at a velocity of around 37 km/sec (23 miles per second).

On 9 June the *Zeta Perseids* is expected to peak at around 0900 UTC. At its maximum it produces around 40 meteors per hour. On 28 June the *Delta Aquarids S* shower is expected to peak. On 29 June the *Beta Taurids* is expected to peak at around 0800 UTC. Because it is a daytime shower, not much is known about the stream of activity. However, according to the book *Meteors* by Neil Bone, this and the *Arietids* are two of the more active *radio* showers of the year. Peak activity for this shower seems to favor a north-south path.

As you can see, there are plenty of showers from which to choose.

Transatlantic on 432?

Mark, EA8FF, has issued the following challenge: "I am looking for a sked partner to try transatlantic tropo on 432 MHz. I am absolutely sure the Atlantic path opens up a few times a year and the problem is to find a sked partner to try this out.

"At the present time I have EME-capability, and with a similar station there is a possibility to make it across the Atlantic. However, with the new modes such as PUA43, people with DSP-10 and GPS-locked standards could dig deeper into the noise than what's actually possible.

"I am actually building a DSP-10 and accessory equipment. So if you have 25 or 100 watts and a single Yagi and you have a view without severe obstruction to the Atlantic, we could try it. I am thinking about stations from the Florida coast to the coast of Brazil.

"My station: 16 × 13 elements cross Yagi, 1000 watts, 0.3dB NF, DSP-10 in preparation with GPS-frequency lock, 400 ft. ASL, Atlantic view. You may contact me via e-mail at <ea8ff@arrakis.es>."

ARCOS 2 Meter KW Amp Schematic Needed

Harry Graziano, W9HRQ, asked me to relay the following request: "I am looking for a schematic or any information on an Arcos 2 Meter KW amp designed and built by Fred Merry, W2GN. Any help would be most appreciated. Thanks, Harry, W9HRQ." You can reach Harry via his e-mail at <a1137@gna.net>.

Shep, W7HAH, Recovering

Shep Shepherd, W7HAH, is home recovering from a broken hip as well as dealing with bone cancer. His health problems have seriously limited his VHF-plus activities. A QSL card or get-well card sent to his home QTH will do a lot to cheer him up. When I talked to Shep in April, he indicated to me that he was hoping to be well enough to travel to Arlington for the CSVHF Society conference next month—and we hope to see you there, Shep!

Mike Brown, W8DJY, SK

John Walker, WZ8D, reports the following: "Mike Brown, W8DJY, passed away in mid-March of this year. He had cancer. Mike was a very active VHFer and UHFer over the last 40 years. He also loved the 160 meter band, as many VHFers do. We have sure lost many of these fine 6 meter hams over the last few years. Please remember his family in your prayers. Thanks, John WZ8D."

And Finally . . .

This month's reporting has been very exciting for those of us who are interested in the effects of the Sun on our ham bands. With the proliferation of information and charts on the World Wide Web, lots and lots of data are being gathered from a variety of angles. Hopefully, we will be learning more about the effects of the Sun and thus be able to plan for better communications using this information. Please keep your reports of your activities coming. Until next month . . .

73, Joe, N6CL

YAESU

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Announcing:

The 2001 CQ World-Wide VHF Contest

Starts: 1800 UTC Saturday, July 14, 2001
Ends: 2100 UTC Sunday, July 15, 2001

I. Contest Period: 27 hours for all stations, all categories. Operate any portion of the contest period you wish.

II. Objectives: The objectives of this contest are for amateurs around the world to contact as many amateurs as possible in the allotted 27-hour period, to promote VHF, to allow VHF operators the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF Maidenhead grid locators for awards credits.

III. Bands: All authorized amateur radio frequencies on 50 MHz (6 meters) and 144.00 MHz (2 meters) may be used as authorized by local law and license class.

IV. Class of Competition:

For all categories: Transmitters and receivers must be located within a 500 meter diameter circle or within the property limits of the station licensee's address, whichever is greater. All antennas used by the entrant must be physically connected by wires to the transmitters and receivers used by the entrant. Only the entrant's callsign may be used to aid the entrant's score.

1. Single Op—All Band. Only one signal allowed at any one time; the operator may change bands at any time.

2. Single Op—Single Band. Only one signal allowed at any one time.

3. Multi-Op. A multi-op station is one with two or more operators and may operate 6 and 2 meters simultaneously with only one signal per band.

4. Rover station. A rover station is one that is manned by no more than two operators, must travel to more than one grid locator, and must sign "rover" or /R. The spirit of this class is to encourage operation from rare grid locators by persons who are inclined to do so. It is not the intent of this class to encourage one operator to move from one super station to another super station in another grid locator in order to compete in this category.

5. QRP station. Anyone operating a station running 25 watts output, or less, is eligible to enter this category. There are no location restrictions. You may operate from your home QTH or from the highest mountain you can find.

Stations in any category except rover may operate from any single location, your home location, or any protable location. Rover stations by definition must operate from portable locations in at least two grids.

V. Exchange: Callsign and Maidenhead locator grid locator (4 digits, e.g., EM15). Signal reports are optional and need not be included in the log entry.

VI. Multipliers: The multiplier is the number of different grid locators worked per band. A "grid locator" is counted once per band. Exception: The rover who moves into a new grid locator may count the same grid locator more than once per band as long as the rover is himself or herself in a new grid locator location. Such change in location must be clearly indicated in the rover's log. It is required that rover category operators maintain separate logs for each grid locator location.

A. The rover who changes location during the course of the contest is free to contact as many other stations as he or she wishes. The rover becomes a new QSO to the stations working him or her when that rover changes grid locator.

B. The grid locator is the Maidenhead grid locator to four digits (FM13).

VII. Scoring: One (1) point per QSO on 50 MHz and two (2) points per QSO on 144 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times total number of grid locators (GL) worked. Rovers: For each new grid locator visited, contacts and grid locators count as new. Final Rover score is the sum of contact points made from each grid locator times the sum of all grid locators worked from all grids visited. The intent is to mirror the original Rover scoring rules.

Contest entrants may not transmit on 146.52 MHz, or your country's national 2 meter FM simplex calling frequencies, or commonly recognized repeater frequencies for the purpose of making or requesting contacts. Contacts made within your own country, in the DX window of 50.100–50.125 MHz, are discouraged. Contacts made on the SSB calling frequencies of 50.110 MHz, 50.125 MHz, and 144.200 MHz are discouraged. Contest participants are required to use UTC as the logging time.

Example 1: W1XX works stations as follows:

50 QSOs (50 × 1 = 50) and 25 GL's (25 multipliers) on 50 MHz.

35 QSOs (35 × 2 = 70) and 8 GL's (8 multipliers) on 144 MHz.

W1XX has 120 QSO points (50 + 70 = 120) × 33 multipliers (25 + 8 = 33) = 3,960 total points.

Example 2: W9FS/R works stations as follows:

From EN52: 50 QSOs (50 × 1 = 50) and 25 GL's (25 multipliers) on 50 MHz

From EN51: 40 QSOs (40 × 2 = 80) and 10 GL's (10 multipliers) on 144 MHz

From EN52: 60 QSOs (60 × 1 = 60) and 30 GL's (30 multipliers) on 50 MHz

From EN51: 20 QSOs (20 × 2 = 40) and 5 GL's (5 multipliers) on 144 MHz

W9FS/R has 230 QSO points (50 + 80 + 60 + 40) × 70 multipliers (25 + 10 + 30 + 5) = 16,100 total points

VIII. Awards: Certificates suitable for framing will be awarded to the top-scoring stations in each category in each continent. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Certificates will be awarded to top-scoring stations in each category in geographic areas where warranted.

Geographic areas include states (U.S.), call areas (Japan), provinces (Canada), and countries, and may also be extended to include other subdivisions as justified by competitive entries.

IX. Miscellaneous: An operator may sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location.

A station located exactly on a dividing line of a grid locator must choose only one grid locator from which to operate for exchange purposes.

A different multiplier cannot be given out without moving the complete station at least 100 meters.

X. Log Submissions: You may request log sheets from: CQ VHF Contest, 25 Newbridge Road, Hicksville, NY 11801. Include an SASE with your request.

Completed logs must be postmarked no later than September 1, 2001 to be eligible for awards. All logs should be mailed to: CQ VHF Contest, 25 Newbridge Road, Hicksville, NY 11801.

We encourage logs to be submitted on disk or sent via e-mail. We prefer an electronic log. If you submit your log in electronic form, we prefer one of the commonly available logging programs. Since this contest is not yet supported by the Cabrillo format, please also submit an electronic summary sheet.

Disks: If you use a computer, please send your IBM, MS-DOS compatible computer disk. A disk containing your files may be submitted in lieu of a paper log. All disks **must** be accompanied by a **paper** summary sheet satisfying all logging instructions. Label your disk clearly with your call and category.

You may submit your electronic log via e-mail to **<cqvhf@kkn.net>**. Questions may be sent to **<questions@cqww.com>**.

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Why would someone mount a DXpedition to operate on just one band? Especially when that band is 6 meters, where openings can be fleeting, unpredictable, and bracketed by hours of nothing but noise? A tale of two trips provides some answers.

Inside a 6-Meter-Only DXpeditions

BY KEN NEUBECK,* WB2AMU; JON K. JONES,† NØJK; MARIO KARCICH,‡ K2ZD; AND JIM HOLT,§ K4BI

Contributing Editor WB2AMU has pulled together two separate stories of 6-meter-only DXpeditions conducted last summer. While the locations and circumstances were different, the experiences were similar … and with peak sunspot conditions expected to continue this summer, there may be additional opportunities in the coming months. We'll start with WB2AMU's overall introduction. — W2VU

This article illustrates the reasons why some hams conduct special DXpeditions that focus only on 6 meters. Perhaps the biggest reason is that in the past, some of the bigger multiband expeditions did not assign a full-time operator to 6 and checked the band only occasionally. More often than not, they checked when the band was dead!

For example, Mario, K2ZD, relates that some years ago he donated an IC-551 and a 3-element 6 meter beam to a group going to a rare Caribbean island. When he inquired about the 50 MHz station with an operator from the group on 28 MHz, he was told that it was scanning and they didn't have time to pay much attention to it. Unfortunately, you will find that this is the attitude of many operators who are not familiar with (or dedicated to) the 6 meter band, and thus the band is related to secondary status despite its great potential when it is open.

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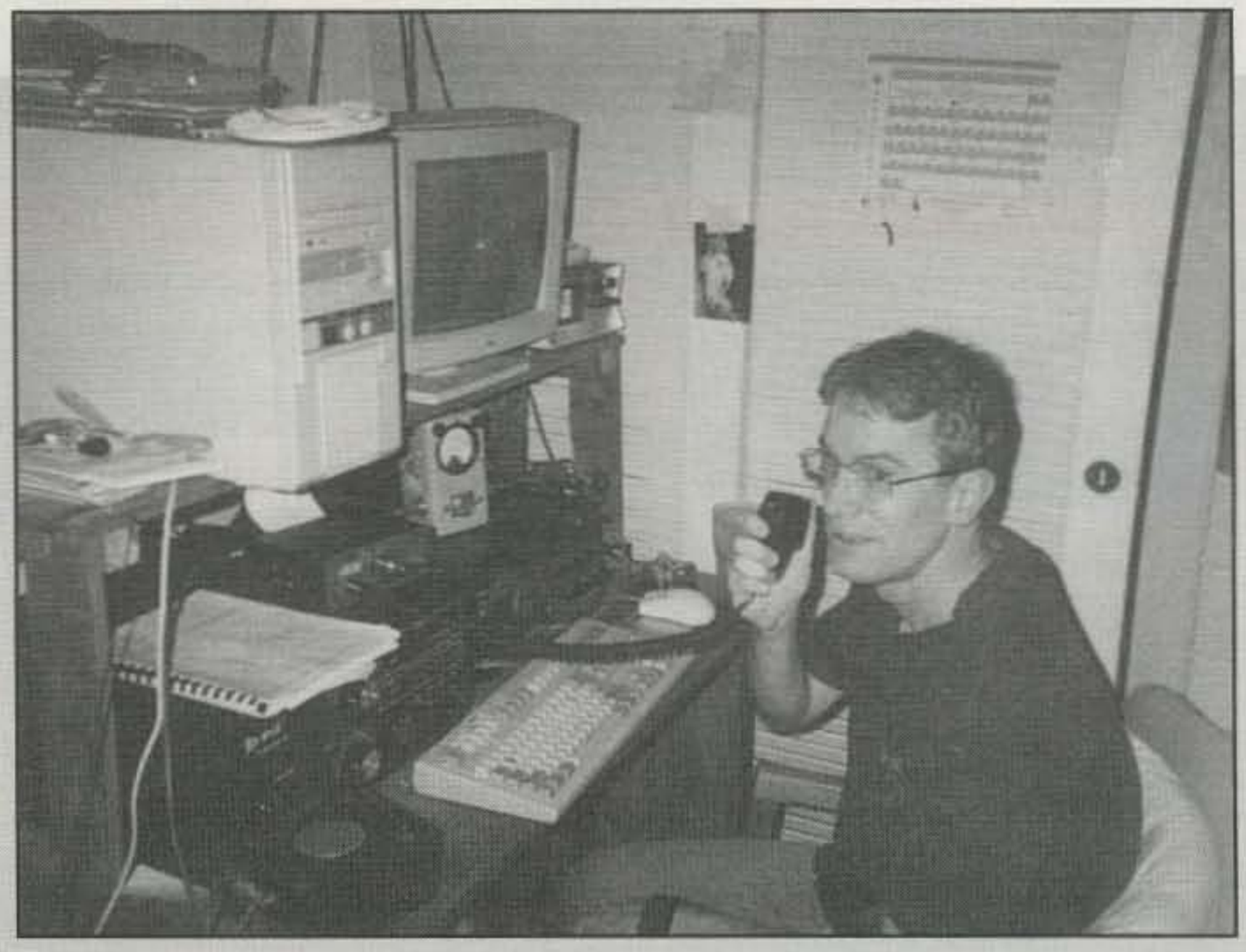
‡ *311 Liberty Ave., Hillsdale, NJ 07642; e-mail: <k2zd@arrl.net>*
§ *5096 Oak Grove Dr., Sugar Hill, GA 30518; e-mail: <n3ahi@ix.netcom.com>*



Co-author Jon Jones, KH8/NØJK, operating 6 meters from American Samoa using his "backup" MFJ-9406 radio. The rig is dwarfed by the computer equipment in the shack, which belongs to Don, KH8/N5OLS. (NØJK photos)

The nature of the 6 meter band is such that propagation can come and go in a matter of minutes. Thus, the general consensus of veteran 6 meter operators is that during a DXpedition, a dedicated and experienced operator should be assigned to manning the 6 meter station full time. Since this doesn't happen often, specific 6-meter-only DXpeditions are conducted by knowledgeable 6 meter operators who know how to read propagation indicators as well as use all available resources. Not many of the HF-oriented expeditions have operators who want to listen to hours of white noise and then only work a handful of stations! But as Jon, NØJK, points out, these 6 meter excursions are conducted for the few as opposed to "the masses"—i.e., quality vs. quantity. Several similarities to 160 meter DXing can be drawn, where crowds are smaller and a good understanding of the band's "personality" is often an essential element of success.

There is a different *theme* in operating just 6 meters on a DXpedition as opposed to operating the HF bands plus 6 meters. It is just not about the total number of QSOs that are made while sitting on a rock! It is more about taking advantage of propagation and making

as many contacts as possible in the limited time you have during an opening. This is a different type of skill from that needed for the typical HF DXpedition, and this will be shown in detail in this article describing the two 6 meter DXpeditions that took place during 2000. These two trips, one to American Samoa and one to Barbados, were among several 6-meter-only expeditions that took place last year. (Others included the Falkland Islands and the British Virgin Islands.)

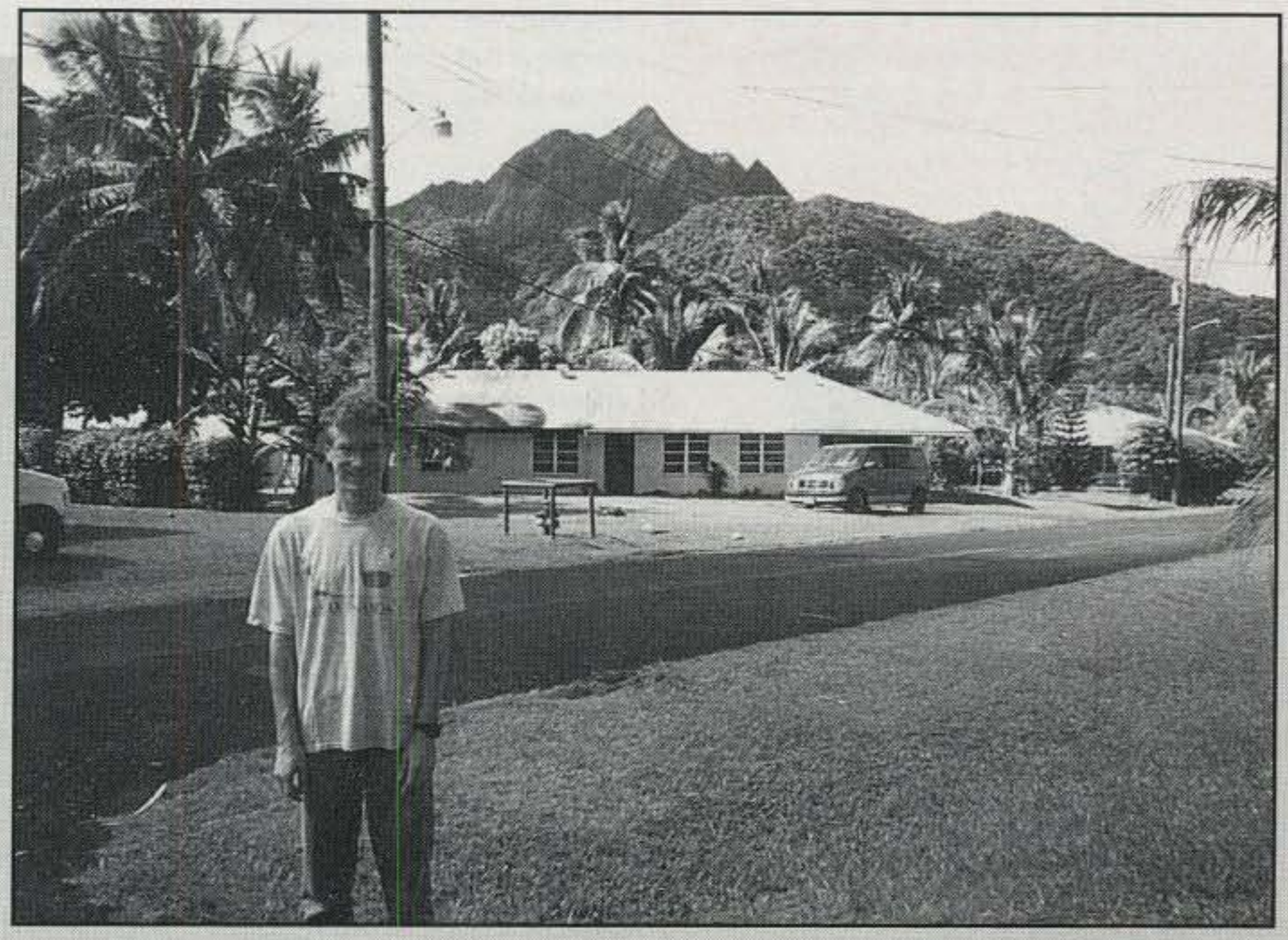
A number of points are emphasized in this article that were mentioned previously in the article, "A Vacation DXpedition," by WB2AMU in the May 2000 issue of *CQ*, where several lessons were learned from operating 6 meters from Bermuda. These include:

1. Sporadic-*E* propagation makes the summer an excellent time for 6-meter-focused DXpeditions.

2. Some DXCC countries that are not rare on HF are rare on 6 meters.

3. You don't need elaborate equipment or large antennas to make contacts on 6 meters if conditions are right!

It was also seen that there are a number of resident hams in these DX locations who are ready to jump on the band after they see 6 meters in action for the first time. Glen, VP9ID, joined the ranks shortly after WB2AMU's trip. The following stories by Jon, NØJK, Mario, K2ZD, and Jim, K4BI, reemphasize these points while sharing other vital lessons (some relevant to HF trips as well) that were learned during their 6-meter-focused DXpeditions.



Jon, KH8/NØJK, in front of Mount Matafao in American Samoa.

Six Meter DXpedition To American Samoa

Saved By a QRP Backup Radio!

By Jon K. Jones, NØJK

"Hello, CQ six meters, this is Papa Two Nine Kilo Fox Sierra," said the voice booming out of the speaker of the little MFJ radio. "You don't hear this everyday on 6 meters in Kansas," I told my host, Don KH8/N5OLS, who was in the room and listening in. Here I was, active on 6 meters from American Samoa as KH8/NØJK in what ended up being a 6 meter QRP DXpedition. But there is more to this story than meets the eye.

The wheels started turning in my head for a 6 meter DXpedition when my friend Don KH8/N5OLS, invited me down to operate 6 meters during the first week of April 2000. I made the necessary travel arrangements and packed a brand new IC-706 100 watt transceiver and a 3-element M^2 Yagi for the trip. These would be flying as "checked" luggage. At the last minute I threw my MFJ-9406 into my carry-on bag that would be stowed under the seat, just in case the checked luggage didn't arrive. This proved to have been a very important decision, as events later on would show.

The all-day flight began in Kansas at 7AM on March 31. I arrived in Pago Pago, American Samoa at 11PM local time (3 AM April 1 CST!) While American Samoa is a US Territory, it requires a passport to enter and it is in many respects a foreign country. Don was there to meet me at the airport and all checked-in luggage arrived intact ... or so I thought.

The next day I put together the 6 meter Yagi, and Don and I put it up on his crank-up tower. Our first encounter with Murphy came when Don's rotor broke and we had to use the "Armstrong rotor" method. Don had twine tied to his tribander Yagi and we would walk tugging on the twine to turn the antennas, then tie down the twine.

Then I unpacked the IC-706 and connected it to the power supply. I turned it on and it made a loud buzzing noise, then went dead! My heart just about stopped. There was dead silence in Don's shack. I turned the radio off and tried turning it back on. Still nothing. Using a Fluke voltmeter, the power supply checked out alright at 14 volts output. The problem appeared to be with the new IC-706 itself, possibly damaged by a voltage spike, yet the fuses were not blown. Here I was all set to operate 6 meters and the radio wouldn't work. There were no local repair facilities and no other working 6 meter radios on the island. I sat around depressed as I saw my 6 meter DXpedition go down in flames. "Oh well," I thought, "I guess for this trip I will end up doing some sight-seeing and snorkeling," both of which are great in American Samoa.

Backup Rig to the Rescue

I was still feeling down the next day when I remembered the carry-on bag. I opened it and got out the MFJ-9406. It had received some dents from the plane ride, but otherwise looked okay. We connected it to the power supply and it worked. Finally, I was on 6 meters, but with only 10 watts! Would I be able to work anyone from here running QRP on 6? I tuned around and heard Peter, PY5CC, calling CQ. At 2033Z Peter went into the log of KH8/N0JK as 6 meter QSO #1. Then Fred, PY2XB, called in after I finished working PY5CC and gave me a "59." Both QSOs were via *F2* propagation. (Fred e-mailed me after I got home: "That little tiny radio is worth what you paid for it. Good DXing audio!")

The band was open towards South America and over the next hour I worked into Argentina and then into Australia. At 0116Z on April 3, Louis, HP3XUG, from Panama popped up at 59 plus. I also worked Jose, HP2CWB, and five Costa Rican stations. I had worked HP3XUG from Kansas and the Galapagos Islands with the MFJ-9406, and now from American Samoa. The Panamanian stations were in for about an hour and then faded. At 0815Z I started hearing a beacon from Okinawa. At 081 Z I worked JR6MI on 6 meters! Signals from Japan were coming in but were not too strong and CW would help. But my particular MFJ-9406 did not have the CW module installed, as I had planned to use the 100 watt radio on CW. However, I was able to "send code" by holding the microphone up to the speaker of Don's TS-950 and using the keyer to send "tone CW." Twenty-six JA QSOs were made over the next hour using this clever way to send CW!

Later in the day, starting at 2100Z, there was an opening into New Zealand and Australia Then, at 1037 on April 4th, I was able to work Peter, H44PT, who was doing a 6 meter DXpedition from Guadalcanal in the Solomon Islands. He had one of the loud-

est signals I have ever heard on 6 meters! It pegged the meter and there was no QSB. It reminded me of loud 2 meter tropo back in Kansas. Don, KH8/N5OLS, also worked Peter and we compared propagation notes. After signing with him, the band opened again to Okinawa.

April 4 also brought another opening to South America, starting at 2045Z with LU2FFD, who was very loud. He got some other LUs on the air, so I added LU9AEA, LU6DRV, and LU1DMA to the log. I also worked VP6BR on CW at 2055Z. The YV4AB beacon was coming in for about 45 minutes after 2030Z, yet no YVs were worked. H44PT was back in also.

Then there was a very strong opening to VK—worked over 60 VKs in all districts (except for VK6) from 2200–2300Z. I believe I worked every VK that was on the air, including several mobile stations running 10 watts and verticals. Many said I was their first KH8 on 6 meters. In the evening there was again a weak opening to Japan. The VKs and H44 seemed to be doing much better to JA. Every evening we would copy the P29PBL 6 meter beacon for hours. However, no one seemed to be active from Port Moresby.

On April 5 at 2043Z I heard a weak CW station calling CQ on 50.110. The Yagi was aimed about 75 degrees to the Caribbean. It took a few minutes to get the call—5H3US in Tanzania! I called Dave on CW. He came back QRZ NØJ? No—"Don't turn your antenna toward the states," I thought as I called. I sent him a 449 report but he never seemed to get my call straight. (Don, N5OLS/KH8, would work 5H3US on April 19 on 6 meters and told him of the near-QSO). 5H3US is over 26,000 km (16,000 miles) long path from American Samoa.

Next the XE1KK beacon started coming in from Mexico, and it looked like this might be the day for North America. I worked V31PC at 2151Z, followed by HR1RMG at 2310Z. The band dropped. Then I got YV5LIX at 0027 April 6 for the only YV QSO. Then finally there was an opening to the states. At 2106Z K2RTH/4 went in the log for the first USA QSO, followed by W4RCC. The signals were very weak, either by forward or side-scatter. I am truly amazed that these gentlemen heard my 10 watts. The band shifted to Texas, and W6JKV/5 and W5UWB were logged, with W5UWB coming up to 559 at times.

I had originally planned to call CQ on 50.105 if there was a stateside opening, but that was before I lost the IC-706 with its digital frequency readout. Anyone familiar with the MFJ-9406 knows it has very coarse frequency readout; it is marked in 25 kHz steps! After the ride in the carry-on bag even that calibration was suspect. If I was CQing even a few kHz off 105 with an "EME weak" signal, I feared people might never find me. So I used a technique that many "little pistol" DX stations use on 160 meters—answer strong stateside stations calling CQ. I managed to make QSOs this way, but frustrated some stateside DXers who didn't want me to move off 50.105. It was frustrating for me as well, as I got no replies to CQs and wasn't even sure where I was. I worked every US station that I copied on that day.

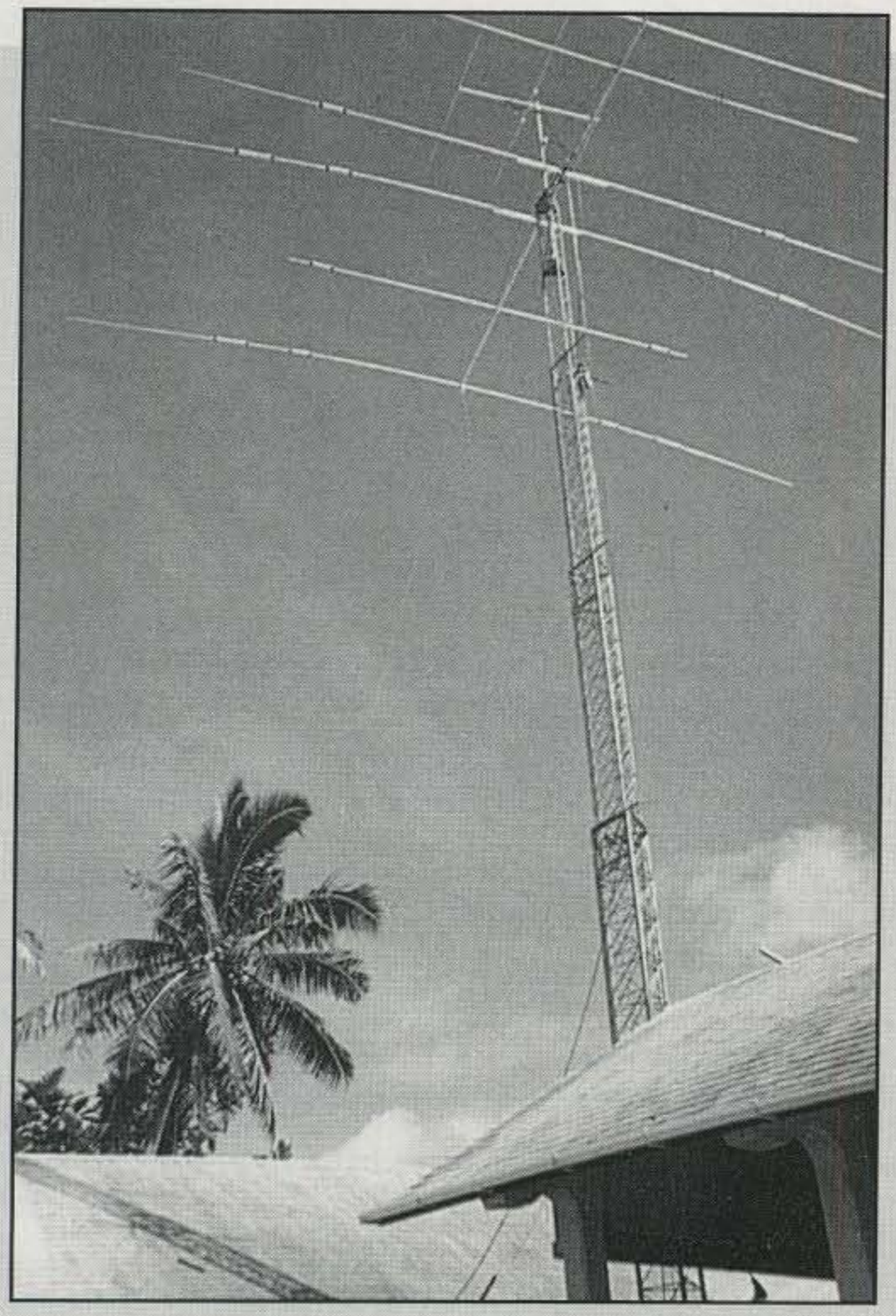
Help from the Internet

I was fortunate to have internet access while in American Samoa, and I monitored the "prop logger" and was alerted to a big solar storm which would push the *K* index up to 8 on April 6th. But there was little enhancement from the storm on 6 meters at our location in KH8-land. There was a brief *F2* to *TEP* (Trans-Equatorial Propagation) opening at 0045Z, and I made QSOs into LU and ZP. The South Americans had the distinctive "TE flutter" that I first heard when working South America from Barbados. I could hear some of the South Americans, such as PY5CC, working into the states. Here in the South Pacific, though, 6 meters behaved more like the other HF bands, with the solar storm shutting things down at 0100Z. There was no "regular" evening opening to Japan and the P29 beacon was gone. The next day would be interesting.

I was up early the next morning (April 7th) to see if there would be a "morning after the storm" *F2* opening. I saw spots that VP6BR was working a big opening into the states. There was nothing into American Samoa until 1815Z. Bruce, K2RTH, was heard calling CQ and I worked him at 1822Z. Bruce was much stronger that day, with a solid 559. Maybe this would be the day for a big stateside opening.

After I signed with Bruce, I thought I heard a "Y9N" calling. I figured it was a "PY9," as the band was also open to Brazil. I went QRZ and heard "KH8/NØJK de JY9NX K." I went back and sent a 579 report and received 539. I really didn't think much about where the station was as I sent the report, and then it dawned on me: This is Jordan! Koji, JY9NX, was using 100 watts into a 4-element Yagi, and he posted the contact on the DX Summit with the word "WOW!" on the end of the posting. Koji later sent me e-mail noting "Honestly, I thought I was working with a pirate, but immediately after the QSO K2RTH put the QSO on cluster and I found it was real. I could not believe it. No one else around here, like 5B4, SV, 4X, was able to find you, so it seems that it was a very, very selective opening. "

After I signed with Koji my hands began shaking. I couldn't believe whom I had just worked! I got up and had to go walk outside for a few minutes. Koji's grid is KM71xw. Using NØUK's Maidenhead Grid Distance and Bearing Calculator, I figured the distance between AH45DQ and KM71XW as 16,592 km (10,370 miles), bearing 309.7 degrees. I estimated the long-path distance to be about 23,408 km (14,545 miles). Not bad for 10 watts, and it was a major highlight of my trip! Later in the day I had QSOs with K9HMB (EN52), who was the most northerly US QSO made from KH8, and with a very loud FOØTOH in the Marquesas. Both FOØTOH and H44PT were working W6s during this time frame. I listened very hard when H44PT worked the stateside stations but could hear no one.



Antenna system at KH8/N5OLS, where Jon was operating. Note the 3-element 6 meter beam at the very top of the tower that Jon brought with him and installed. The beam was left behind for Don's continued use.

April 8th was my last day in American Samoa and my flight would leave at 1000Z. Don and I worked P29KFS at 0202Z. We took my luggage over to the airport and checked it in ahead of time. The plan was to operate as long as possible up to departure. At 0825Z 6 meters opened to Japan. This was the best and most widespread JA opening while I was at KH8 (figures!). Had a huge pile-up from all over Japan calling. The MFJ-9406 does not have a RIT or CW filter, so Don helped in pulling out callsigns. I put 50 more contacts in the log and then went QRT at 0930Z. We raced to the airport with my MFJ radio in my carry-on bag. I made it in time and settled in for the 16-hour flight home to Kansas.

Lessons Learned KH8

With just the 10 watts from the MFJ radio and the 3-element M^2 Yagi, I made 266 QSOs in 28 countries on 6 meters, which was pretty good considering the circumstances. I can safely say that the radio and the antenna both gave good accounts of themselves. QRP is not necessarily a handicap on 6 meters!

I am very grateful to Don, KH8/N5OLS, and his XYL, Melissa, for letting me stay with them for a week. After watching me operate, Don got the 6 meter bug, and with the Yagi on the tower that I left him, along with a new FT-847, he has since made over 1000 QSOs on 6 meters from American Samoa. The majority of the contacts have been into Japan, along with contacts with 5H3US, Hong Kong, Korea, and a number of US stations in Texas. Larry, AH8LG, has since fixed his microphone and is active as well. It seems that DX stations pick up the banner for 6 meters after they are exposed to the Magic Band.

The big lesson I learned is that it is always a good idea to bring a backup radio on an important DXpedition. In retrospect, I should have checked out the IC-706 before the trip, but did not. As Michael Douglas said in his movie *Ghost and the Darkness* regarding lion hunting in Africa: "Don't go into battle with an untested weapon." The MFJ-9406 radio, while nowhere near the sophistication of the 706, proved to be a suitable replacement under the circumstances, and I was able to give many of the deserving "a new one." Any radio on 6 was better than having none!

A Six Meter DXpedition To Barbados During The Summer Sporadic-*E* Season

By Mario Karcich, K2ZD,
with Jim Holt, K4BI

One of my main passions is to conduct 50 MHz DXpeditions. The last time that my friend Jim, K4BI, and I did one was in July of 1988, when we activated PJØM on Saba Island and made three solid QSOs into the UK and a score of QSOs into the US. Late in 1999 we decided that it was time for us to get together again and plan another trip.

When I was in Barbados on business in 1999, I acquired the callsign 8P9JM. As I had two business trips planned there again in 2000, and 8P6 was high on the list of most wanted countries on 6 meters in Europe and the US, Jim and I decided on a Barbados 50 MHz DXpedition. Jim would eventually obtain the callsign 8P6BI for the trip. My job in the meantime was to find a suitable operating location for us that had a clear path into both Europe and the US.

My business associate, Michael David of Communications Advantage in Bridgetown, had prime real estate where his paging towers were located, but unfortunately the house that I had planned to use on the mountaintop would not be renovated in time for our trip in July. Then I remembered reading about the trip made by Jon, NØJK, to Barbados last year, and I sent him an e-mail asking from where he planned to operate. Jon informed me that he had rented the contest station 8P9Z in St. Peters Parish. A subsequent call to Mike confirmed that it was an ideal location for our needs. We were able to secure our reservation for July 1 through 9.

We arrived on the island late on July 1 and began setting up our 6 meter station. The station consisted of two Yaesu FT-100s, one to be used on 6 meters, initially with a beacon running on 50.095, and the other to monitor 28.885—the 6 meter "liaison" frequency —and act as a back-up rig, if needed (more on this later). Our plan was to replace the existing 3-element beam on the 60 foot tower with a 5-element M^2 beam. Early Sunday morning, Mike arrived with his tower climber, Neil, and the new beam was set in place at 60 feet.

Our automatic beacon used a message line similar to the one that I operate in New Jersey (K2ZD/B), where there is a series of "V"s followed by the callsign (in this case 8P6JM) and then 20 seconds duration of silence. However, unlike the New Jersey beacon, which uses 20 watts into an omnidirectional Ringo Ranger antenna, the Barbados beacon used 100 watts into the 5-element beam. This beacon was also a little bit different from a regular beacon as it was set up in the high end of the CW band as opposed to the normal beacon portion (typically from 50.050 to 50.080) because we were looking for break-in stations. A beacon is "broken" by another station when that station sends its call during the 20 second quiet period. When the beacon is "broken," a live operator comes on to complete the contact. This procedure saves a lot of excessive CQs and wear and tear on the operators.

On July 2 the beacon was activated beaming northeast and Jim made announcements on 28.885 and the internet to the UKSMG (UK Six Metre Group) website. What an invaluable tool this was for us in following the 50 MHz propagation worldwide! I got on the air as 8P9JM at 1400Z, and by 1610Z observed a weak video carrier on 48 MHz that may have been from Europe. Finally at 1800Z, after several hours of listening, I heard a station with a very weak signal breaking the beacon. Only a partial call (T8??) was copied. However, at 1822Z, W4UDH from Mississippi broke the beacon and became

the first 50 MHz QSO for 8P9JM. Shortly thereafter I worked KØGU from Colorado and K4LQ from Kentucky.

Based on a posting on the UKSMG website, where VP2V/W6JKV in the Caribbean is posted as working into Europe, I beamed Europe and at 2111Z, SP6GZZ broke the beacon for our first European QSO. The opening lasted 91 minutes until 2201Z with 66 QSOs in 14 countries logged. All signals were very weak with deep QSB. Many partial callsigns were heard, but there was too much time wasted by stations requesting grid locators!

On the 3rd, Jim, using his 8P6BI callsign, operated the beacon all morning with no results. Weak 48 MHz TV video was observed in the early afternoon with signal strength gradually increasing. Finally, at 2004Z SP6GZZ broke the beacon again and Jim logged 86 QSOs in 11 countries in over two hours. Again, all signals were very weak with deep QSB. Many partial callsigns were copied as a result, with time again being wasted on grid locators.

On July 4, beginning at 1242Z, I made a number of contacts in the southern US, logging K4AR, WA4NJP, and N4JJ. But then later in the morning, disaster struck as the FT-100 and the keyer were hit by a voltage spike! Not only was one rig damaged, but the beacon was lost. Thank God for the spare FT-100! The station was then reconfigured, and we started operating manually on 50.095 instead of using the automatic beacon. This was done just in time, as by 1850Z a major opening occurred to the US and I operated on SSB, logging 182 QSOs in all call areas except W6 and W7. Again, valuable time was wasted with operators asking for grid locator and QSL information. After almost three hours the band closed to the US. Later Jim worked G4IGO, G3KOX, and G4HBA in the UK, and then the band shifted toward the US again. He worked 101 US stations in all call areas except W6 and W7 in an hour's time until it closed.

On the 5th I was able to hear some 48 MHz TV video during the morning and even the CU3RA beacon at 163 Z. However, no QSOs were able to be made into Europe. Then at 1731Z I heard the VO1ZA beacon from Newfoundland, and at 1735Z the OX3VHF beacon from Greenland! I had the phone number for the control operator of the beacon and I attempted to call Greenland from Barbados, but it turns out that there is no long-distance service between them. At 1740Z I managed to work the only amateur station heard on 6 meters, VO1PJN from Newfoundland. Later in the afternoon the TV video on 48 MHz was heard again, and by 2000Z both of us started working more stations in Europe, including Spain, Portugal, and the UK. We even heard GIØOTC for the second time during our trip but were not able to work him. By 2200Z I started working into North America on SSB and made another 53 QSOs. By 2236Z the band closed for good. There would be no usable propagation over the next three days (July 6 through 8), and our expedition was completed. This is the way it can go with the Magic Band, where no propagation may exist for a few days. HF operators on a DXpedition may be spoiled by the fact that propagation generally exists on many of the HF bands on any given day.

Our final tally was 506 QSOs in 22 countries, including 331 with US stations, the most (81) being made with the W4 call area. We were not able to work any stations from the 6th and 7th call area of the US. Twenty-six contacts were made into Canada, along with 17 different countries in Europe, including 36 stations worked in Germany and 25 in Poland! Looks like 6 meters is becoming very popular in Central Europe.

Lessons Learned /8P6

In working a pile-up it is very important to follow the instructions of the DX station. We tried operating split on the first opening on July 2, but stations did not call up 5 kHz as requested. In order not to waste valuable time, we switched back to simplex mode.

In all the openings to the U.K. and the rest of Europe, we experienced very weak signals coupled with local QRN. Stations were requested numerous times not to give grid locators; we asked for only callsigns (very important) and a signal report. We copied many, many partial callsigns, but those stations unfortunately did not make it into the log. Grid locators were not logged by us or written down, and they just deprived many stations of a new country when operators kept asking for them! The grid number can be found on the QSL card!

Stations that continued to call after one particular station was acknowledged caused needless QRM and a reduction in the QSO rate. This is an age-old problem that is common with all DXpeditions, whether on 6 meters or HF. What made it worse on 6 meters was that slowing down the QSO rate was generally fatal to someone's chances of working new DX, as band openings are of limited duration!

My first opening into Europe lasted 91 minutes when I made 66 QSOs in 14 countries. The next day Jim got an opening for 149 minutes in which he worked 86 stations in 11 countries. This is not bragging, but it shows what experienced 6 meter operators can do in a limited amount of time that is set by the duration of a particular sporadic-*E* opening.

Also, as can be seen from our experience as well as what happened to Jon, NØJK on his trip, having a backup radio saved our DXpedition after the first radio failed on the third day of operating. Having the backup radio allowed us to work the major openings into the US and Europe on the 4th and the 5th. This is particularly important during short trips like these, and when one travels to areas where there are no readily available repair facilities.

Our goal from the onset of this 6 meter DXpedition was to give a new country on 6 meters to as many stations as possible in the limited time each opening allowed. By the number of QSL cards that we have received, Jim and I are very happy that we put some stations over the 100 country mark for 6 meter DXCC and gave many more a new DXCC country.

Special "thank you's" to the gang at the 8P9Z contest station for allowing us the use of their magnificent station; to Mr. Michael David of Communications Advantage for his hospitality and technical assistance; and to all of you who patiently waited your turn in pile-ups. Thank you for an exciting experience. Both Jon, NØJK, and I feel that a QSO on 6 meters means so much more than a QSO on any other band. The thrill is not gone! ■

6-Meter-Only DXpeditions Continue During Spring 2001

Several DX trips with 6 meters as the primary focus were conducted from the end of March to the beginning of April of 2001. These trips were planned for this time of year to take advantage of north-south *F2* paths and Transequatorial Propagation (TEP) that is more common during the equinoxes.

Jack, N6XQ, Chip, N6CA, and Roman, XE2EED, went to Juan Fernandez Island as 3GØZ from March 28th to April 2nd. Arliss, W7XU, and his XYL Holly, NØQJM, went to Easter Island (CEØY) from March 28th to April 8th.

Some very good results were achieved by both groups. CEØY/W7XU was worked by many stations in the US during the days following the major geomagnetic activity that occurred at the end of March. On April 3rd Arliss was able to work not only into Florida on 6 meters via TEP, but also into the northeast US via TEP plus a sporadic-*E* link. WB2AMU, WA3SIX, N3ZTZ , K2ZD, N4AR, and AI3Z were just a few of the stations that were able to work Arliss on CW or SSB during a 30 minute period around noon local time. The operation of CEØY/W7XU provided country #100 to Bud, K2YOF, and Larry, NØLL.

Stations in other parts of the world have been also working CEØY/W7XU, including Indian stations running QRP power. Some stations, such as Raj, VU2ZAP, were able not only to work Arliss using QRP, but also via an unusual long path going over the North Pole, which has many hams wondering!

Many of these stations are on 10 meters to coordinate activity and if 6 meters is quiet. However, the main focus, just as discussed in this article, is on 6 meters!

What You've Told Us...

Our April survey asked about QRP, or low-power, operating. First of all, 95% of the readers who responded said they do operate on the HF ham bands, where most traditional QRP activity takes place. Of that group, 81% have operated QRP at least once, although most respondents do not do so regularly. While a still-impressive 22% said QRP is their favorite way to operate, 59% said it's "fun to do once in a while." Another 7% said they'll operate QRP if it's the only way they can get on the air, and 12% said they're not interested in QRP at all.

What's your main motivation behind QRP operating? A whopping 62% said it's the operating challenge, while technical challenges came in a distant second, at 15%, followed by "other" (11%), and a tie between "limitations on high-power transmitting" and the camaraderie among QRP ops (6% each). Two-thirds of you (66%) chose CW as your favorite QRP operating mode, while SSB placed second at 29% and digital was just 5%.

The vast majority of you who operate QRP do so mostly from home (81%), while 13% prefer going portable, and only 3% go QRPing in their cars. There was no overwhelming favorite regarding types of radios used for QRP. The largest group—44%—uses standard commercial HF rigs with the power output turned down, while 30% each use QRP-only radios built from kits and commercially built QRP-only rigs, and 16% have built their own rigs from homebrew designs. Overall, though, 46% have built their own QRP rigs. A majority of QRPers (53%) use a permanent wire antenna as their primary QRP antenna, while 24% use a Yagi on a tower, 17% use a temporary wire antenna, and 7% use a mobile antenna. Finally, 24% of you said you belong to QRP-oriented clubs, while 76% said "no."

This month's winner of a free one-year subscription to *CQ* is Al McChesney, N2ZHS, of Scotia, NY. As always, thank you to all who responded to our survey.

Reader Survey June 2001

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 Reader Service Card and returning it to us (we've already paid the postage). As a bit of an incentive, we'll pick one respondent each month and give that person a complimentary one-year subscription (or subscription extension) to *CQ*.

This month, in honor of our VHF/UHF special, we have some questions about your VHF/UHF operating habits.

Please indicate... **Circle Survey Card #**

1. Which choice below (select only one) most accurately describes your VHF/UHF operating:

Exclusive VHF/UHF operator....26
Operate VHF/UHF more than HF....27
Operate VHF/UHF and HF about equally....28
Operate HF more than VHF/UHF....29
Do not operate VHF/UHF at all....30
Not currently licensed....31

2. Which of the following pieces of VHF/UHF amateur radio equipment you own:

Single-band FM handheld....32
Dual/Multi-band FM handheld....33
Single-band FM mobile rig....34
Dual/Multi-band FM mobile rig....35
Multimode VHF/UHF mobile rig....36
Multimode VHF/UHF base rig....37
Multimode HF+VHF/UHF mobile rig....38
Multimode HF+VHF/UHF base rig....39
VHF/UHF transverter used with HF rig....40
No VHF/UHF equipment....41

3. Your *primary* activity on VHF/UHF (select only one):

AM operation....42
APRS (Automatic Position Reporting System)....43
Experimenting/building....44
FM simplex operation....45
Packet radio (general)....46
PacketCluster (DX spotting)....47
Repeater operation....48
Satellite operation....49
"Weak Signal" operation (CW)....50
"Weak Signal" operation (SSB)....51
Not active on VHF/UHF....52

4. Which VHF/UHF band(s) you use regularly (choose as many as apply):

6 meters (50–54 MHz)....53
4 meters (70 MHz—Europe only)....54
2 meters (144–148 MHz)....55
1.25 meters (222–225 MHz)....56
70 centimeters (420–450 MHz)....57
33 centimeters (902–908 MHz)....58
23 centimeters (1240–1300 MHz)....59
Frequencies above 1300 MHz....60

Thank you for your responses. We'll have more questions for you in our next reader survey.

MFJ 24/12 Hour Clocks

Shown actual size

Dual 24/12 hour LCD Clock

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MFJ-108B dual clock has separate 24 hour and 12 hour displays. Lets you read both UTC and local time simultaneously. Features huge high-contrast 5/8 inch LCD numerals that makes it easy to read across the room. Mounted in solid brushed aluminum frame with sloped face for easy viewing. Synchronizable to WWV for split-second timing. Quartz controlled for excellent accuracy. Long life battery included. 4½Wx1D x2H in. MFJ's famous *No Matter What*™ one year limited warranty. *$6 s&h.*

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MFJ-105C, $19.95. *World's most popular ham radio wall clock!* True 24 hour Quartz movement. Huge 12 inch black face with large white numerals give excellent visibility across room. Attractive gold colored hour, minute and seconds hands.

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MFJ-118, $24.95. 24/12 hour clock has jumbo 1¼ inch LCD digits. Displays 24 or 12 hour time, year, month, date, and day of week. 100 year full calendar. Hang on wall or desk mount. 5¾Wx2½Hx½D in.

MFJ-107B, $9.95. 24 hour UTC Clock has large 5/8 inch LCD numerals. Synchronizable to WWV. Solid brushed aluminum frame lasts for years. Long life battery included. 2¼x1x2 in.

MFJ-112B, $24.95. 24/12 Hr World Map LCD Clock displays time in *every time zone in the world*. Selected time zone flashes on LCD world map. Displays 24 or 12 hours, minutes, seconds, year, month, date, day, time zones, cities. Single button accesses pre-set second time zone. Alarms for two time zones. Adjusts for daylight savings time.

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MFJ-116DC, $19.95. 12 VDC, plugs in cigarette lighter. Big bright 5/8 inch green LED digits. 9 min. ID timer, battery back up.Black. *Great for motorhomes and truckers!* 12 hour only.

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2500 miles on your handheld? It happens every summer on the West Coast, says WB6NOA, and you can also enjoy great VHF/UHF DX this summer, if you know what to look for.

Tropo Ducting: Predictable DX Openings on VHF/UHF Bands

BY GORDON WEST,* WB6NOA

Every July and August the VHF and UHF bands above 10 meters may magically support extraordinary long-range contacts well beyond typical line-of-sight distances. Among the primary causes of these "band openings" are widespread *temperature inversions,* usually associated with static high-pressure systems. The *tropospheric ducting* that results from these inversions may cause co-channel repeater stations over 300 miles away to actually *override* the regular repeater you normally use just 40 miles away. VHF and UHF single-sideband operators will start listening for CW identifiers of 10 watt beacon stations more than 600 miles away. Your local packet repeater is nearly wearing itself out trying to relay VHF/UHF signals coming in from 700 miles away. And when one mobile station in Maine goes "QRZ 52" on 146.520 MHz simplex and gets a response from another mobile station in the Florida Keys, the VHF and UHF bands have now come alive with long-haul tropospheric-ducting DX.

Tropospheric-ducting range enhancement is not mode specific. Six MHz wide amateur television (ATV) signals have been captured for days between Hawaii and California. Wide-band commercial FM stations, plus VHF and UHF commercial TV signals, have easily been received over 1000 miles away in the midst of a widespread temperature inversion. FM simplex and repeater communications on 2 meters, 220 MHz, 440 MHz, and even up at 1.2 GHz will sometimes span over 1000 miles, running up and back along the boundary of a well-defined cold front.

Tropospheric ducting is not limited to just VHF, UHF, and microwave frequencies either. It may also extend well into the visible spectrum, creating unbelievable optical illusions.

"I could see the green rotating light on the Los Angeles breakwater 200 miles out" when returning home from a trans-Pacific yacht race, reports William Alber, WA6CAX.

"I was picking up the Los Angeles VHF weather station almost 400 miles away," adds Alber, pointing out that he was also talking through Los Angeles mountaintop repeaters at 300 miles out, well beyond their normal 70 mile line-of-sight range.

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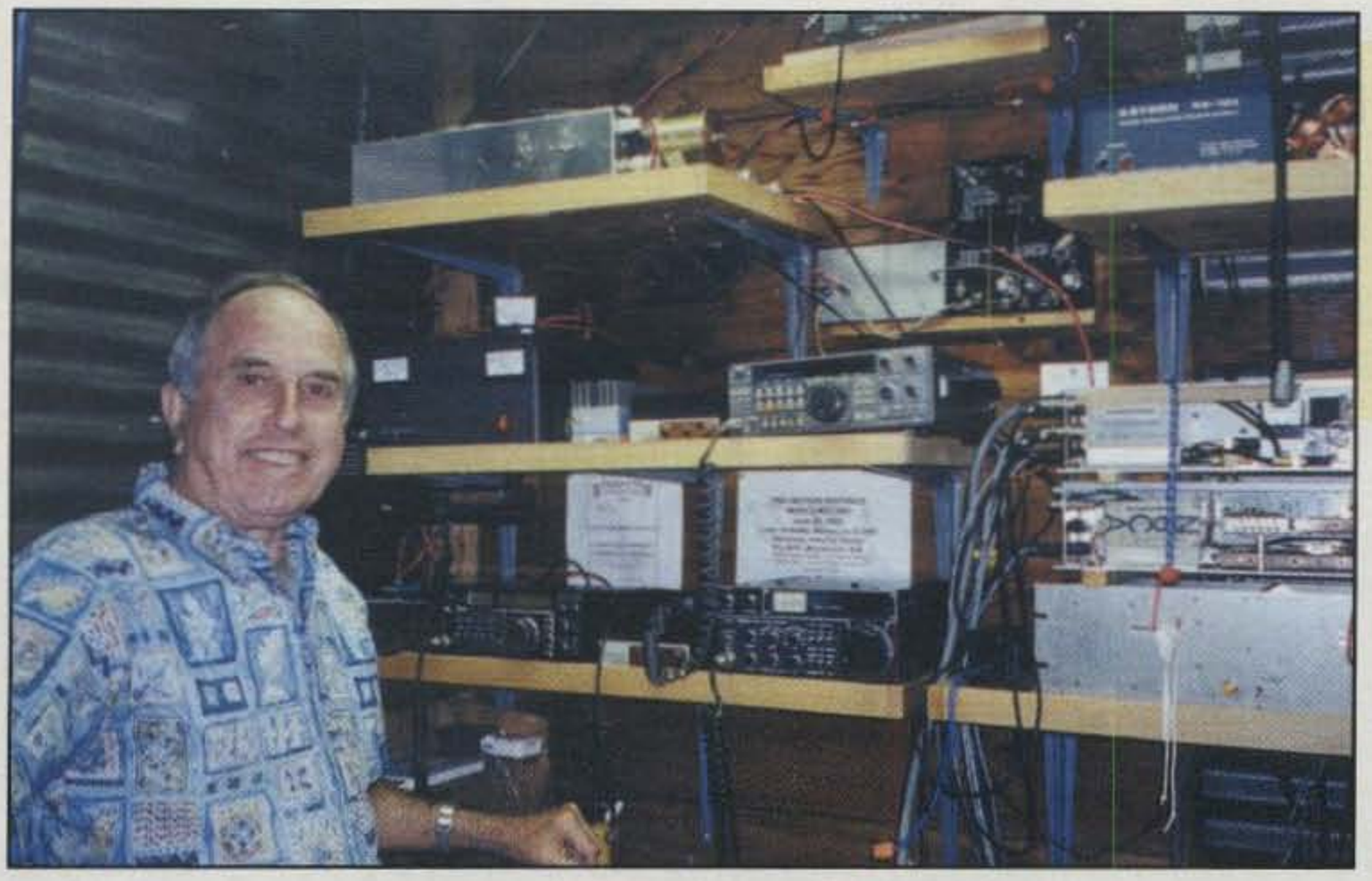
The Mauna Loa volcano in Hawaii, seen here covered in clouds, is just the right height to reach inside the tropospheric duct that forms each summer between Hawaii and the US West Coast. (WB6NOA photo)



Paul Lieb, KH6HME, operates a variety of VHF, UHF, and microwave beacons from the slopes of Mauna Loa and has made many record-breaking contacts from this location via tropospheric ducting. This summer he plans to operate 2 meter FM as well as SSB. (KK7IO photo)

"When the sun set, it went down like a squished tomato with horns on each side of it, and there was absolutely no wind and our local barometer was sky high," Alber notes, sitting in the middle of the famous Pacific high that sparks record-breaking tropospheric ducting conditions.

VHF, UHF, microwave, and light waves normally travel in a straight line with a slight 22% bending over the horizon. This usually gives us a radio range of 4/3 when calculating how far you might expect your local repeater or base station signal to go. This basically means that radio line of sight is generally about 25% greater than visual line of sight, so if you have a 10 mile view to the horizon, you can expect your "line-of-sight" radio signals to travel about 12½ miles on an unobstructed path. Plus, of course, the signal's "view" begins at the antenna, not ground level.

You can do the calculations in your head. Simply take the square root of your antenna height, in feet, and this gives you the approximate line-of-sight radio range, in miles. If your base-station antenna is up 25 feet, the square root of 25 is 5, and that is your approximate range to the horizon. If your local repeater has its antenna system atop a building 144 feet high, the square root of 144 is 12—12 miles to the horizon. Now add repeater range of 12 miles to your range of 5 miles, and you could expect solid results into the repeater for about 17 miles. Next calculate 22% more for the normal refraction of radio waves over the horizon, and your range will be about 20 miles to the repeater.

However, what the heck is happening when you are able to access your repeater from your mobile *100 miles away* on that hot, windless day—the same kind of day on which you can see "water" shimmering on the roadway ahead? That "water" is really a mirage, a super-refraction showing you the blue sky above as you look *down* the road.

A Mirage in the Sky

During tropospheric ducting on the radio bands, the mirage is usually above us—around 1000 feet—sometimes visualized as the stratification of smoke and smog, abruptly ending at nice, clean, clear air above. Tropospheric ducting of radio waves occurs right at this sharp boundary between warm air below and cool air above.

During regular weather conditions, the radio refractive index of air, symbol n, is slightly above 1—around 1.000345 to 1.000301. When calculating the radio refractive index of normal air, the quantity is given in the upper-case symbol $N = 10^6 (n–1)$.

Air pressure normally decreases with height in a logarithmic manner at 1 mb (millibar) for every 10 meters in altitude. Temperature also decreases, at a rate of 20° Fahrenheit for every mile of increasing altitude, up to around 40,000 feet.

As we watch pressure and temperature drop logarithmically as altitude increases, water vapor content *also* drops. Thus, when you go outside on a "normal" day with a light breeze, you look out at the horizon and it uniformly transforms from very light blue near the surface of the Earth to nice, dark blue when looking straight up. You could almost draw a straight line depicting the visual color change.

Sometime this summer, though, you're going to step outside on an ex-

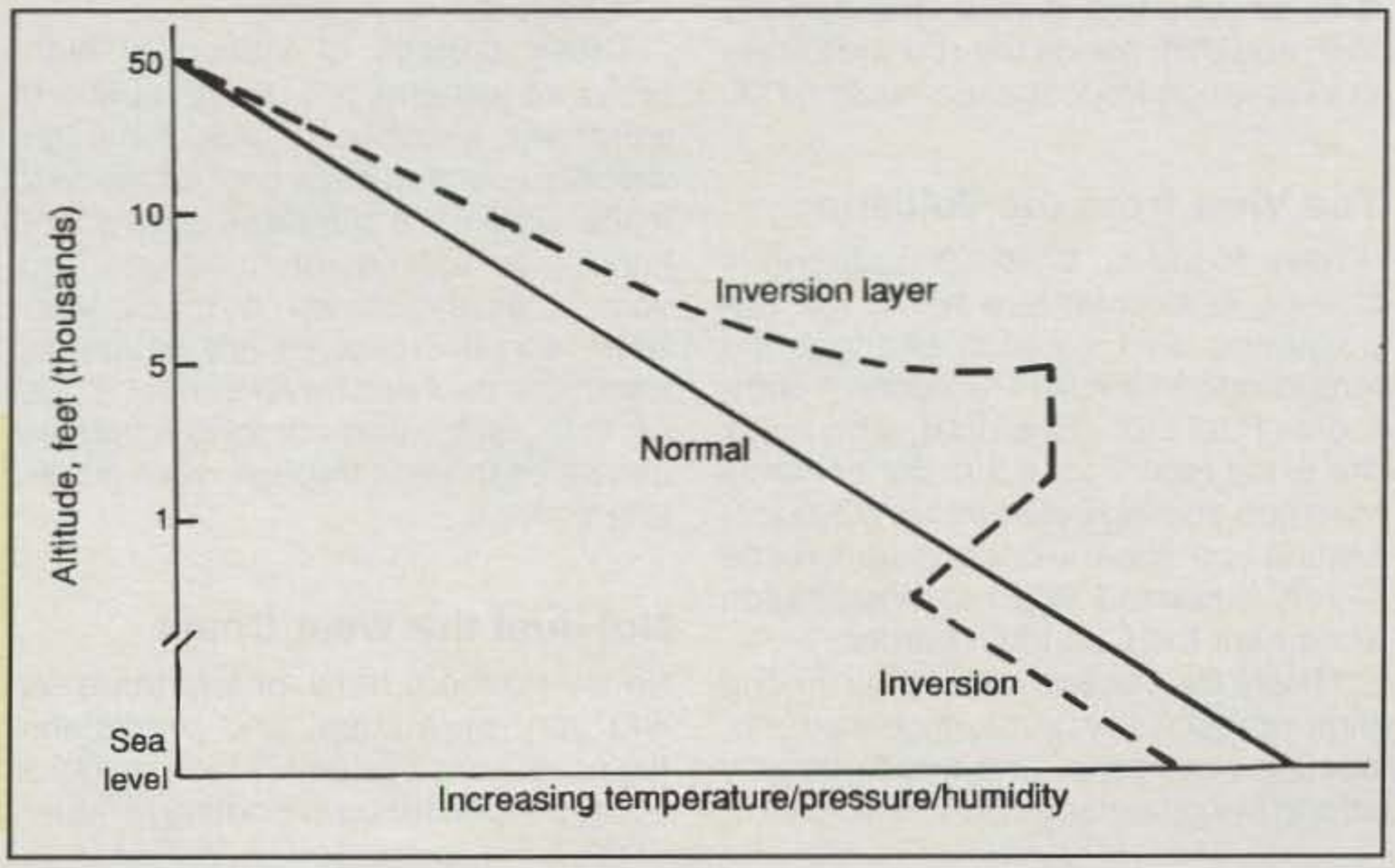
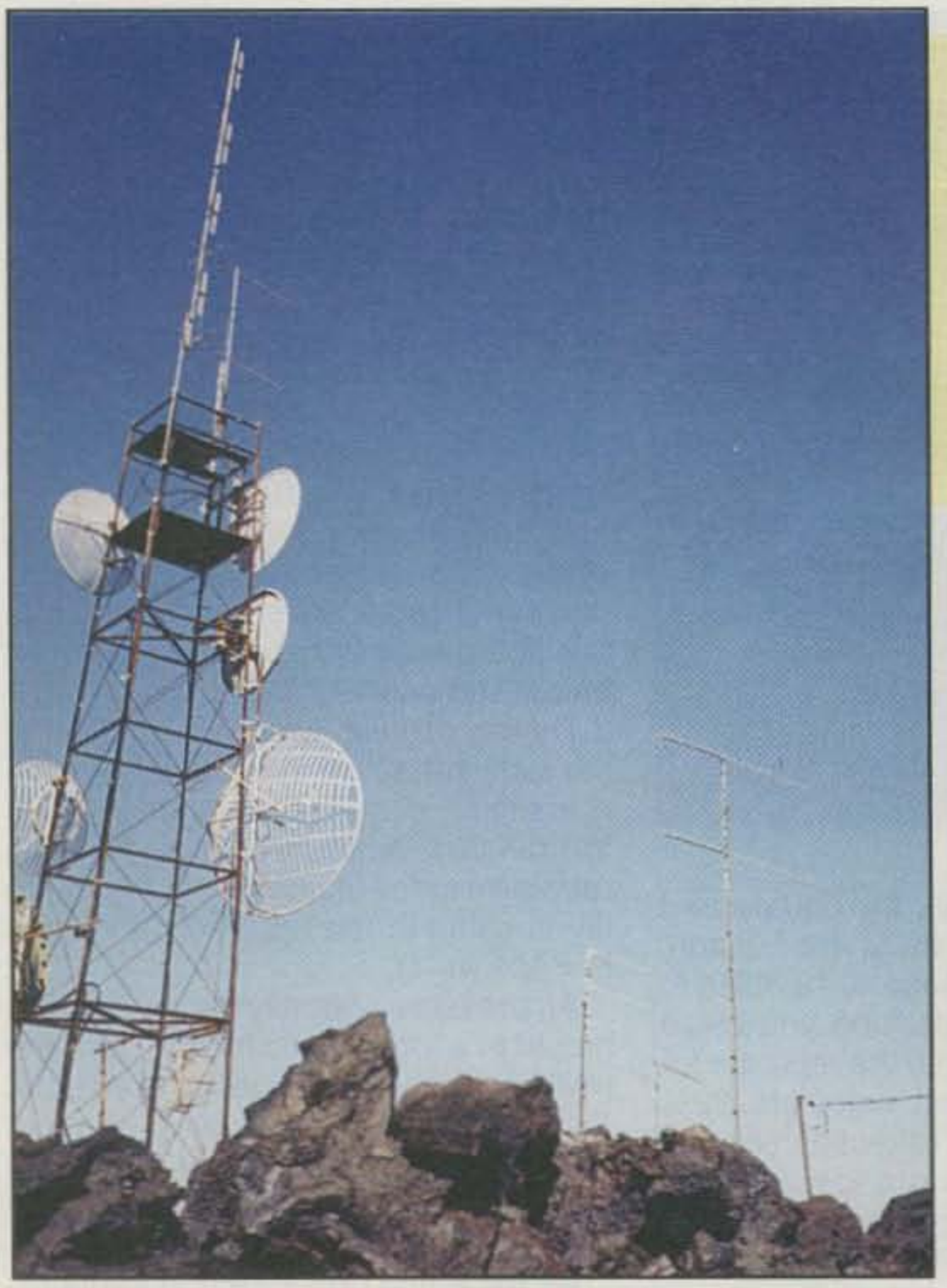


Fig. 1– Nomograph of changes in temperature, pressure, and humidity with increasing altitude. Normally there is a logarithmic decrease in all three measures as altitude increases (to a certain point). When there is an inversion, warmer air is trapped between cooler layers and can result in a "duct" for radio signals.



These towers on the 8200 foot Mauna Loa volcano support antennas for all of KH6HME's beacon transmitters. When the band is open to the West Coast, Paul disconnects the beacons and starts making contacts. The 8-element collinear atop the near tower will be used this summer for 2 meter FM contacts. (WB6NOA photo) ←

This amateur television signal from KH6ME in Hawaii was received by the author at his station in California. (WB6NOA photo) ↓

tremely hot, windless day, and you might see a slightly different picture. Instead of a gradual change in colors, you may see a band of trapped smoke and some really lousy-looking brown air just hanging over the horizon, stratified in a thin layer with a very pronounced layering. Your local weather forecaster may explain that this is the *ozone inversion layer,* and that the air outside is unhealthy to breathe. The forecaster usually predicts one or two days of stagnant air, and this is your clue that the VHF and UHF bands may be wide open to long-range tropospheric-ducting DX.

The View from the Volcano

"I have found an 8° to 10° Fahrenheit change in temperature within the tropospheric duct capable of triggering long-range VHF/UHF reception," comments Paul Lieb, KH6HME, who holds the world record for a 2 meter contacts via tropo ducting between his 8200 foot Mauna Loa volcano beacon station and a very surprised W7FI in Washington state near the Canadian border.

"There is a positive correlation among high-pressure systems, tropospheric-ducting conditions, and extraordinarily strong band openings on VHF and UHF frequencies between Hawaii and the mainland, a distance of over 2500 miles," explains Lieb. "And it's relatively easy to predict days in advance when the band might open by simply observing the movement and the stalling-out of widespread high-pressure cells," Lieb adds, pointing out that the infamous Pacific High usually drops into place between the West Coast of the United States and Hawaii and holds steady for many weeks in early July and late August.

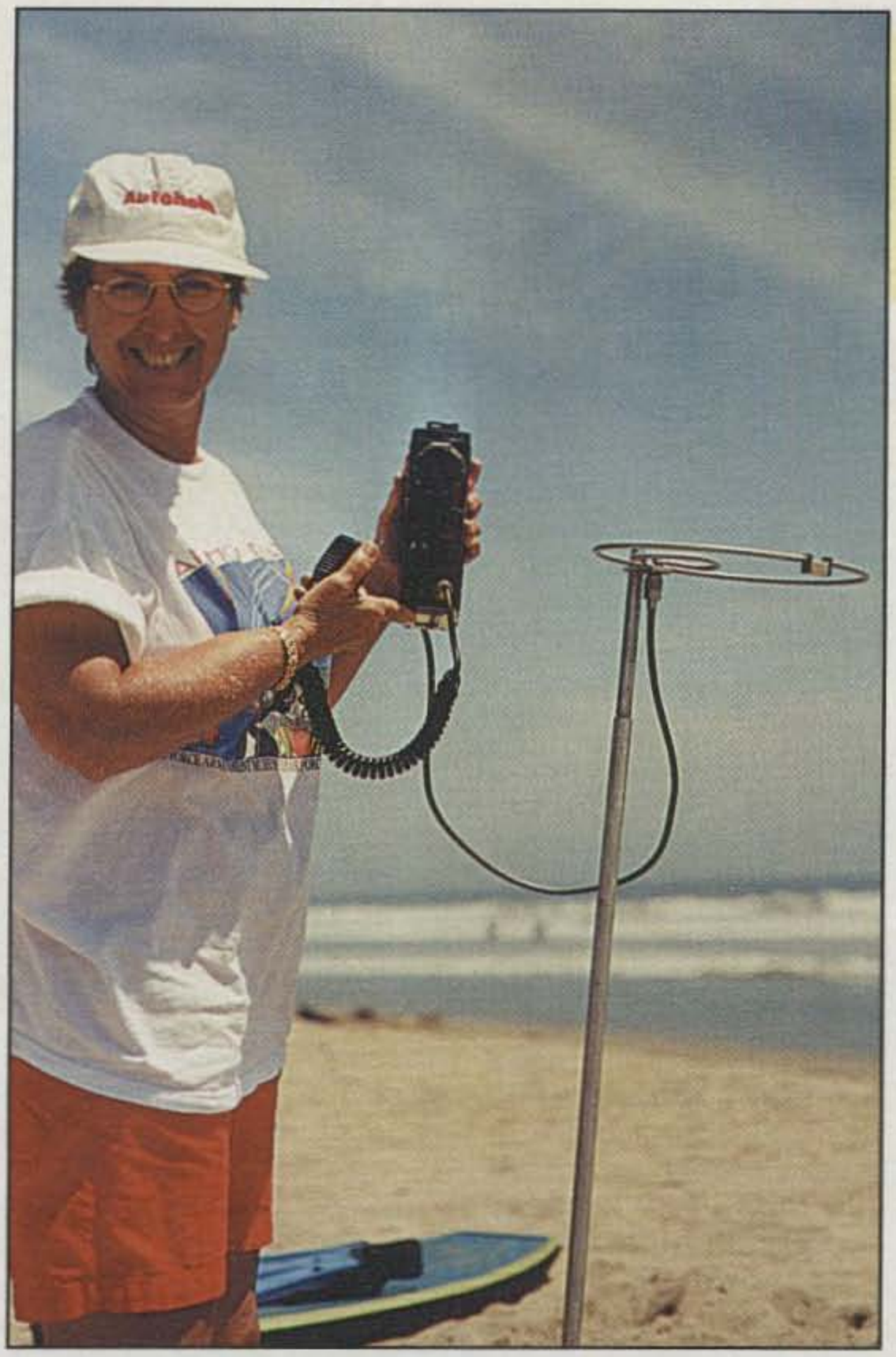
These periods of stationary high-pressure systems will create a band of warm air associated with the high, which "caps" and traps cool air below it. If the winds are gentle, the inversion layer may extend for hundreds, and sometimes thousands, of miles. VHF, UHF, and microwaves are caught up within this duct and travel through it, just as VHF, UHF, and microwave signals can be channeled through wave guides to antennas.

Not Just the West Coast

"In the northern hemisphere, there are two very permanent and predictable high-pressure systems which combine all the parameters contributing to super-refractivity and tropospheric ducting ... the Pacific high to the north and east of Hawaii, and the East Coast high of the United States where the Gulf Stream brings warm water north along the coast," comments Bruce Eggers, WA9NEW, an expert on the study of super-refractivity. Bruce continues, "And in the southern hemisphere, there are some interesting potential tropospheric ducts, from the most southern islands in the Pacific to Chile and Peru, and also a known path between St. Paul and Perth, over the Indian Ocean."

July and August are also prime times for tropospheric ducting to occur across the Gulf of Mexico between Texas and Florida, allowing even handheld-to-handheld 2 meter FM simplex exchanges. Another well-known tropospheric-ducting path is between the Great Lakes and Texas as the high-pressure system begins to build up and move east, and then between the Great Lakes and South Carolina—sometimes Florida—as that same high-pressure system stalls over the Midwest.

There is also a tropo duct that forms nearly every July between New England and the Florida Keys. Many times mobile operators trying to access their local New England repeaters end up



Working through a duct does not require sophisticated gear. Here the author's wife, Suzy, N6GLF, holds the 2 meter multimode rig, used along with the loop antenna stuck in the sand, to make tropo contacts with far-away stations. (WB6NOA photo)

chatting through some of the Miami building-top repeater systems, well over 1000 miles away.

Tropo experts agree that there *must* be an occasional path between the East Coast and Europe during periods of Bermuda high and Atlantic high weather conditions. Yet no one has made the grade—*yet.* (*There have been occasional attempts to use these conditions to cross the Atlantic on 2 meters. I [W2VU] participated in an unsuccessful effort a few years ago in North Carolina and I'm told the same group is planning to try again this year.—ed.*)

The West Coast tropo duct between California and Hawaii was discovered over 45 years ago when John Chambers, W6NLZ, made a successful 2 meter contact with Ralph Thomas, KH6UK. This record-breaking contact was *after* a 2540 mile QSO on the 220 MHz band two years earlier.

A year later, Louie, WB6NMT, made the tropo record to Hawaii on the 440 band, and in 1983 Chip Angle, N6CA, worked Paul Lieb, KH6HME, on 1296 MHz over the 2400 mile path. Chip and Paul have continued to set even higher band records with 10,000 MHz the next one to conquer.

Which Mode is Best?

Two years ago I was able to clearly receive amateur television signals on the 440 MHz band sent by Lieb over the 2400 mile path to my home QTH in California. However, many tropo experts contend that single sideband (upper sideband by convention) and CW are the best bets for working long-haul tropospheric ducting. While I agree, relatively few of today's active hams (less than 5%, by some estimates) possess 2 meter or 440 MHz SSB equipment. Luckily, ICOM America with its IC-706 and IC-746; Yaesu with its brand-new FT-817, FT-847, and FT-100; plus Kenwood with its new TS-2000; MFJ QRP rigs; and a newcomer from Ten-Tec offer a growing number of choices in multi-mode equipment capable of 2 meter and 70 centimeter SSB operation. But what about the 95% of the operators *without SSB*?

"This year Paul will be transmitting and receiving on 144.330 MHz, *frequency modulation*," comments Chip Margelli, K7JA, who donated a Yaesu 50 watt 2 meter FM transceiver that hooks into the KH6HME 9 dB gain collinear vertical antenna system.

"This will allow thousands of West Coast hams to establish communications with Lieb on normal FM equipment, vertically polarized," adds Margelli. Paul is quite excited to begin operating on 144.330 MHz simplex FM, after the band opens up and he has worked the very strong single-sideband signals. We know that frequency modulation will certainly go the distance, because we have made numerous contacts with Paul using the conventional FM mode over the 2400 mile path.

The Western States Weak Signal Society and many other weak-signal VHF/UHF organizations encourage all 2 meter operators to consider a simple 2 meter SSB transceiver (in addition to the HF/VHF multimodes listed above, MFJ and Ten-Tec, among others, offer low-power, single-band SSB rigs for 2 meters), and to switch their beam from vertical to horizontal polarization. On 144, 432, and 1296 MHz almost all polarization for long-haul tropo work using SSB is horizontal, and not vertical. For FM communications, almost all work *is* vertical.

For those of you *with* a 2 meter SSB transceiver, try listening for beacons between 144.275 and 144.300 MHz, and for activity centered on the 144.200 MHz SSB calling frequency. For those of you *without* SSB capabilities, but who have a nice outside vertical 2 meter FM antenna, find those days when the weatherman is predicting an inversion layer, and then start tuning around to those repeater channels where there is no local repeater on—you know, the channels that normally are absolutely dead. You may be surprised to find that repeaters over 500 miles away are coming in loud and clear, and if they are open carrier with no sub-audible tone, anything you can hear you should be able to work with at least 10 watts of power.

This summer try to exceed any "personal best" long-range contacts you have ever made on 2 meters, 432, and 1296 MHz. Wait for the right weather conditions, and stand by for tremendous range enhancement with little attenuation, thanks to an inversion layer associated with a high-pressure system, resulting in tropospheric ducting. Many times a hurricane pushing warm, moist air in below the tropospheric duct will even add more long-range excitement to your communications path. But remember to take proper precautions if the hurricane is heading for you! ■

Congratulations to the newest members of two of ham radio's most exclusive clubs—the CQ DX Hall of Fame and the CQ Contest Hall of Fame.

Four Amateurs Inducted into CQ DX and Contest Halls of Fame

Four new members are being added to the *CQ* DX and Contest Halls of Fame, among the most prestigious honors in amateur radio. Selection committee Chairman Bob Cox, K3EST, announced that Robert Allphin, K4UEE, of Marietta, Georgia, and Robert Eshleman, W4DR, of Midlothian, Virginia, were named to the CQ DX Hall of Fame, while Algis Kregzde, LY2NK, of Lithuania, and Ron Sigismonti, N3RS, of Glenmoore, Pennslyvania, will be added to the roster of the CQ Contest Hall of Fame.

Bob Allphin, K4UEE, CQ DX Hall of Fame inductee 2001.

DX Hall of Fame Inductees

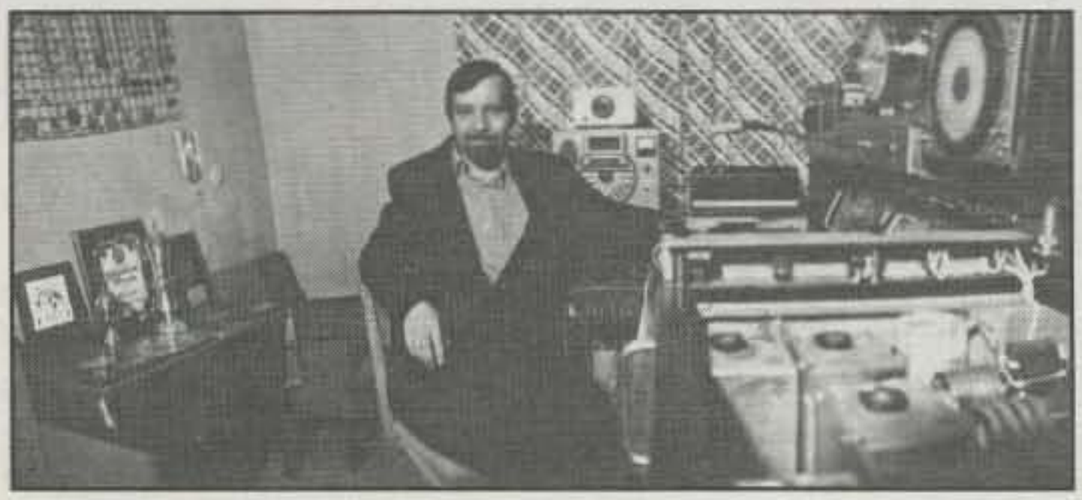
DXer Robert Allphin, K4UEE, has operated from 34 different DXCC "entities," and has been part of two dozen DXpeditions, including trips to Heard Island, Bhutan, and Kingman Reef. Bob was also a member of the US team in the 1996 and 2000 World Radio Team Championships. He has spoken widely on DXing and DXpeditioning and has mentored dozens of newcomers to the activity. He was nominated by the Southeastern DX Club.

Also named to the DX Hall of Fame was Robert Eshleman, W4DR, of Midlothian, Virginia. Bob has been a ham and an active DXer since 1950, and has been participating in DXpeditions since a 1954 operation from Navassa Island. In 1967 he became the first and so far only American to legally operate from Rio de Oro (as EA9EJ), and holds 5-Band DXCC Award #1. He has confirmed over 300 countries and all 40 CQ zones on all bands between 80 and 10 meters, is closing in on the same for 160 meters, and has 113 countries and 27 zones on 6 meters (as of June 2000). Bob has also served as a member and past chairman of the ARRL's DX Advisory Committee, is active in public-service communications, and was one of the leaders of a successful effort to get Virginia to liberalize its antenna laws. He was nominated by the Tidewater DX Club, the Flanders DX Club, and UBA (Belgium's national amateur radio society).

Newest Contesting Honorees

Algis Kregzde, LY2NK, holds several world and continental records in a variety of amateur radio contests, and is a longtime coach, leader, and coordinator of the Lithuanian National HF Team. He also led the development of two new contests in Lithuania, one focused particularly on young people. Algis has been president of the Lithuanian Radio Sports Federation since 1990, is editor of the LRSF journal, and also serves as vice president of the international European Radio Sports Federation. Algis was nominated by the LRSF and Kaunas University of Technology Radio Club.

Ron Sigismonti, N3RS, has been contesting for four decades, generally winning or placing in the top five of whatever category and contest he enters. "Sig" is a longtime member and past president of the Frankford Radio Club, which nominated him, and has traditionally opened his home station to new as well as experienced contesters, providing a



Algis Kregzde, LY2NK, CQ Contest Hall of Fame inductee 2001.

Ron Sigismonti, N3RS, a 2001 CQ Contest Hall of Fame inductee.

start to many of today's prominent contesters. His station has also been a testbed for all sorts of new equipment and software.

Induction ceremonies will be held, respectively, at the Dayton DX and Contest banquets. Additional information on all four inductees is in the May/June issue of *CQ Contest* magazine. Congratulations to all!

CQ Halls of Fame Nomination Guidelines

1. The person must be nominated by a well-known club or national organization. The club should submit a complete summary of why their nominee is worthy of induction into a Hall of Fame. The letter of nomination must be written on club stationary or submitted via internet under the signature of a club or national organization officer.

2. The nominee must have contributed on a broad basis to the sport of Contesting or DXing. Being very active in contests and DXing is only part of the pre-requisites and by themselves not enough to be considered. Since each person has unique qualifications, it is difficult to specify what constitutes contributions on a broad basis. Contributions should be more than just on a local level. As a partial guideline to nominating clubs or national organizations, persons who have been inducted in the past into a Hall of Fame have contributed in some or all of the following ways: brought new people into the hobby, formed radio clubs, organized DX funding, written books or articles about the sport, unselfishly given their time to judge contests, acted in a leadership role to organize DXpeditions, pioneered the early development of the sport, or acted as an acknowledged role model for their sport.

3. The deadline for nominations is March 1st. Nominations received after the deadline will be held over to the next year.

4. All nominations should be sent before the deadline to: CQ Hall of Fame, c/o Bob Cox, K3EST, 1816 Poplar Lane, Davis, CA 95616 USA <k3est@cqww.com>.

5. A maximum of two (2) persons can be inducted into each Hall of Fame per year.

6. Successful nominees will receive their plaque of induction into the CQ Hall of Fame at the Contest or DX Banquet held at the Dayton Hamvention or another appropriate venue.

The rules can also be found on the *CQ* website: <http://www.cq-amateur-radio.com>. ■

Wind and sun and a day at the beach aren't normally associated with ham radio. However, that's the whole point behind K8WPI and WD8AXA's look at two non-traditional approaches to having fun with amateur radio.

Antenna in the Sky . . . and Power From It

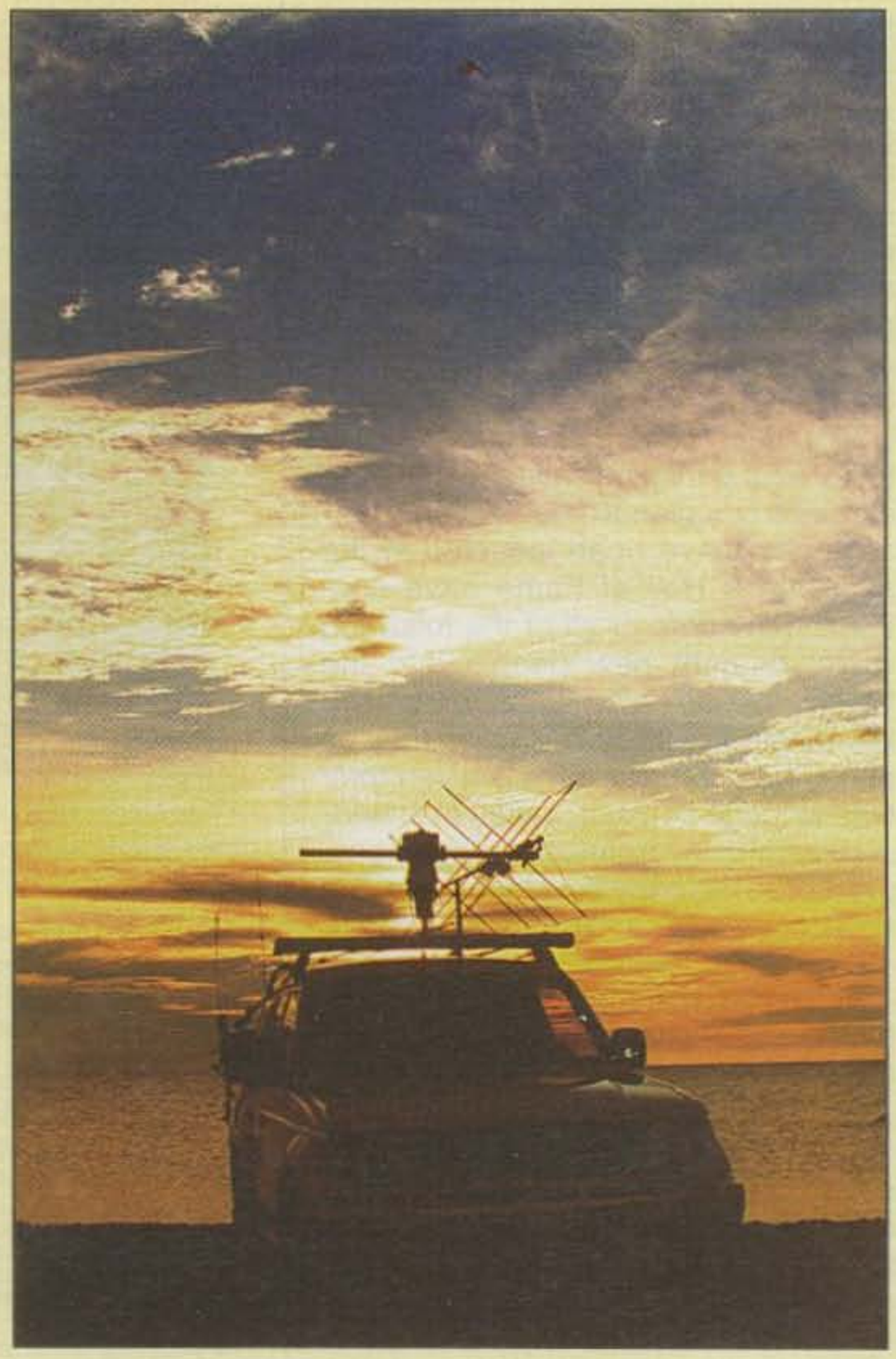
BY JAMES R. "JeRB" BUCHANAN,* K8WPI
AND CHARLES AGOSTI, WD8AXA**

As soon as I mounted an SGC QMS mobile antenna system on my vehicle in 1994, I started thinking of ways to abuse it and have some real fun. In earlier years, I often thought of flying a kite-antenna, and had read comments in an antenna manual about the practicalities of such wire antennas. I was undaunted, however, and decided the concept was in the spirit of exploring ham radio. The QMS would be an ideal tuner for such an antenna, I felt, and this foray could lead to great things. If only I had known!

If you are unfamiliar with the QMS, it's heart is the famous SGC-230 automatic antenna tuner. This tuner hits any frequency between 1.5 and 30 MHz with enough memories to find any previously used frequency in a couple of milliseconds; new frequencies are tuned in just a bit more time. The tuner is housed in an anodized cabinet with a very effective shock-mount antenna base attached, and is usually fed into the SGC helically- wound wire-tape 9 ft. antenna. The tuner, of course, can load into almost anything, including kite line. QMS is short for "Quick Mount System," as the entire assembly is held in place with suction cups and straps, so it can be attached in just a couple of minutes to cars, vans, boats, tanks, helicopters, and just about anything else you can think of. Yes, it really works. Mine has over 150,000 miles of exposure.

I looked in earnest at a few hamfests for the proper accouterments to make a magical flying machine that would launch radio signals directly into the upper levels of the atmosphere where mortals seldom have antennas. It wasn't long before I saw an antenna reel from a World War II aircraft lying in a box on the floor beneath the (perceived) "good stuff," which occupied the valuable table space. In my best hamfest demeanor, I casually looked at the reel, eventually picking it up and giving it the ol' evil eye. This maneuver is used to lower the asking price of the (any) object in hand. When the ham on the other side of the table said, "You want that? Take it!" I knew once again the teachings of Yancy Derringer were serving me well.

I took stock of the project at hand, trying to determine how to marry a relic from before I was born (just barely), to the latest high-tech mobile antenna system. I mean, the whole point is to mix technologies, not metaphors, right? The QMS would undoubtedly load into anything I could attach to it; the



The kite-tenna over Eagle Harbor, Michigan, on Lake Superior. It requires about 3 minutes to assemble the kite, and another minute to exchange the QMS whip with the special kite-stick. Clip on the leader, pull out about 50 ft. of line, and let it go. Depending on conditions, the full ascent to 500 ft. may take between 2 and 10 minutes. My biggest kick so far has been working a DL4/M aboard a military vessel in the harbor at Hamburg, Germany. About 15 countries have been worked with the kite-tenna.

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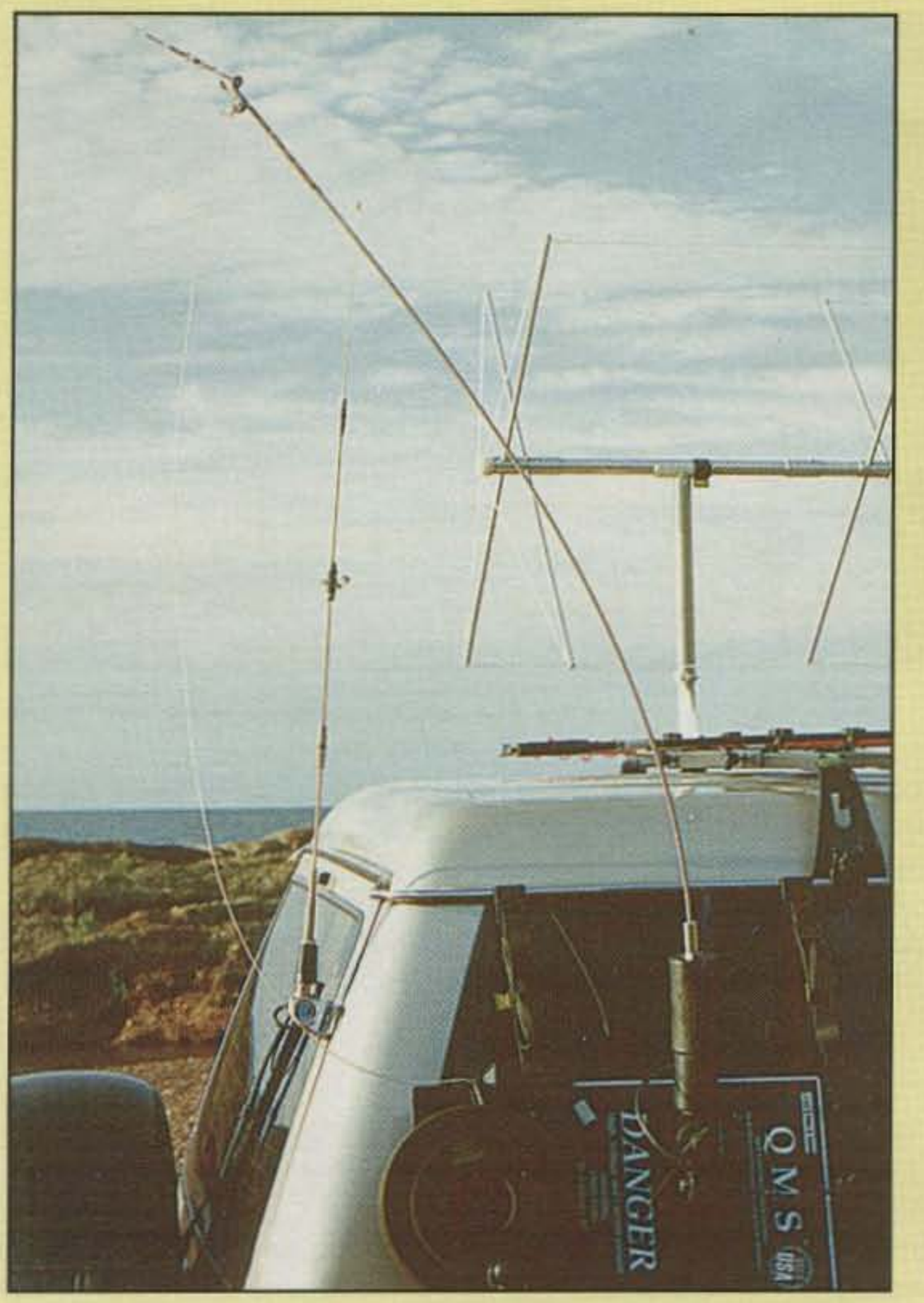


The "business" end of the kite-tenna. A solid whip cut to about 3 ft. long makes a good tensioner and keeps the antenna line clear of the vehicle. A nut welded to the end of the whip accepts a thumb screw with two fender washers holding the antenna wire at any desired length while making direct connection to the QMS tuner. An insulated tether from the end of the antenna line to the wire spool keeps the kite permanently attached. Metal strips within the antenna reel short out any stored wire so the entire length does not need to be deployed.

A set of counterpoise wires sometimes helps improve radiation. 300-ohm twinlead cut to length offers two-band operation on each wire. One conductor is full length for the lower frequency (i.e., 80 meters), while the second conductor is cut for the higher frequency (i.e., 40 meters). Four bands of counterpoise are available on these two units. Usually a vehicle body is large enough for good radiation efficiency on frequencies above 14 MHz. Conveniently stored on extension cord spools, these counterpoise elements are quickly deployed and don't take much storage space. Leaving about 2 inches of bare wire on one end allows quick attachment to the vehicle frame (ground) with a set of dual alligator clips. Marking the counterpoise with labels covered with clear heat-shrink tubing makes finding the right set of wires easy the first time.

trick was to make the attachment useful, practical, effective, and something I could live with on the side of my vehicle. Well, I guess after sticking a QMS on the side, the appearance wasn't such a big deal, so I replaced that criterion with something which would be deployed easily.

As springtime arrived I started cruising local hobby stores looking for a suitable kite. There wasn't a kite application guide for such matters, and it was suggested I contact the local kite club for wisdom. As it happened, there was a spring kite-flight the following weekend at a county park, so the next Saturday I headed off in search of counsel. Ten dollars of admission charge later, I found myself in a huge field, surrounded by dozens of kites of all colors zipping through the sky like demons on steroids. I was quite impressed. As it turned out, this was a competitive kite- flight; no one flies a kite for fun anymore, it seems. There must be a challenge, a winner, and everyone else deemed a loser, and for goodness sake, kites must have many strings to control them! I could tell this wasn't the place for me. I didn't want to control the kite; I just wanted to let it go into the sky...and have it stay there.

Back I went to the hobby store to purchase the biggest single-string kite available. That choice was a 9 ft. delta wing with composite rods and rip-stop nylon fabric, guaranteed not to rot. I didn't even know kites could rot. I must admit, this kite set me back more than twice the price of my first transmitter. Yeah, I know, times change.

I had previously assembled the wire spool, complete with original braided antenna wire, onto a 1/4 inch solid aluminum plate which mounted to the QMS, and rigged other components I thought would be necessary. On a nice breezy spring

day I headed off to launch my kite-tenna. Well, about an hour into the project it became painfully obvious that there was either not enough lift or the load was too heavy. I decided to address the load issue.

Being in Michigan where deep-water fishing is common, I thought of down-rigger fishing line as an alternative for the 50-year-old copper weave. Visiting a local sport shop, I realized there are more varieties of down-rigger line than 2 meter handhelds. I eventually decided upon a 60 lb. woven stainless steel line. It was quite flexible and very lightweight, and I figured it would be strong enough to hold in any wind. Standard packaging put the length at about 200 ft., which sounded fine to me. While there, I purchased a good selection of leader fixings, swivels, and anything else that looked like it could be useful. I then stopped by the lumber yard and purchased a spool of mason's line to be used as leader.

My next trip to the big field down the road met with better success. About 300 f.t of nylon leader attached to the kite let it rise to a good elevation where winds were steady before it started pulling up the load of the wire antenna line. I quickly learned that with 500 ft. of material played out into the sky, it was quite easy to find air currents which offer tremendous stability for hours. Suffice it to say, one must be very cautious about the launch location and surrounding area. I believe a great deal of damage could be done with such a rig, so common sense is the watchword. A check on weather predictions is also in order. I fear not so much the Ben Franklin syndrome, but images of Christopher Lloyd in *Back To The Future* come to mind *(not to mention the potential danger to aircraft; make sure you are not on a flight path used by small planes—ed.)*.

After convincing myself the sky would not fall, I fired up the rig on 30 meters and worked a number of stations, each offering extremely good signal reports. Everyone was quite interested in the "kite-tenna" and a lot of time was spent explaining what I was doing.

Over the past five years I have improved implementation of the kite in the sky, which is now a regular item in the arsenal of antennas in my car. I have worked the world mobile (actually, I think it qualifies as portable) with 100 watts, and this was before our current great sunspot-induced propagation. Fortunately, I can switch between the kite-tenna and a more traditional mobile antenna from the operating position for quick signal comparisons. Usually the kite-tenna offers significantly more signal in both directions, and effectively eliminates QSB as a predominant condition.

Rapidly deployed photovoltaics (solar cells) for vehicle battery charging. If you are concerned about security, placing the cells on the dashboard works almost as well. Output usually diminishes with increasing temperature of cells, so the added heat of being under glass may reduce total power available. Still, panels such as these two will provide over an amp of output, which is more than the average drain of a couple of radios in receive mode, and perhaps a small dome light. The small panel is a flexible unit, while the large panel is encased in Plexiglas and hinged in the center, folding for storage and protection of the cell surfaces.

I have also learned a few things. Mountains are not a good place to try to fly such an antenna. Air currents are quite irregular, and gusts can be very forceful. I have enjoyed the best success on shorelines of the Great Lakes. The strong, steady breezes have allowed me to keep the antenna flying for up to 12 hours at a time. Whenever I am on the road, I keep in touch with my friends back home, and this antenna has been just marvelous at providing great signals. We call it our 40 meter intercom. The kite has been used with equal success on everything from 160 to 10 meters. Field Day 1998 was a very casual event. I operated from my car, flying the kite-tenna until the VHF tent complained that the kite tether kept attacking their tower-mounted Yagi. To keep peace, the kite came down and the remainder of Field Day was spent with just a mobile whip on the QMS.

From Michigan to Georgia, I have done empirical studies of antenna wire length versus frequency and determined that with a good tuning system such as the QMS offers, the DXer's #2 rule applies: The higher the antenna, the better. Don't worry about odd quarter wavelengths or the "magical" 5/8-wave radiator. Put out as much wire as possible and don't worry about the radiation pattern. Call anyone you hear; he/she will return the call.

As we are led to believe, more is always better, so two kites are better than one. There are times when the breeze is too strong for such a large kite, and a smaller kite, perhaps a box kite, would be more suitable. I have dumped the kite once, into Lake Superior. Now if you think landing a 30 lb. Coho is a chore, try reeling in 500 ft. of line with a submerged 9 ft. kite attached. It's like trying to pull up China.

Flying a kite-tenna is not a stealth activity, no matter where you are. It is a great attention-getter, and you must be prepared to take time to deal with the general public, as well as every ham within driving distance. More than once I've seen a child's eyes light up with wonder and desire, regardless of age.

Fun in the Sun

About the time I started playing with my kite, my friend Chuck Agosti, WD8AXA, noticed that whenever he attended an all-day ham event the battery in his vehicle would eventually be exhausted. It didn't take rocket science to figure out what was happening, just a casual observation. Such events always call for multiple radios being left on all day, and then there are the dome lights, dash indicators, and all sorts of other stuff that doesn't show, eating away the charge

Operating on 40 meter phone. A KWM-2A draws less than 10 amps on receive from the 12 volt power supply. However, making toast requires 80 amps of DC. RFI is kept to a minimum using 110 volt line filter on the output of the inverter and ferrite chokes on the DC input.

on the car battery. By the end of the day there is not enough power left to start the engine.

Chuck's insight is far brighter than mine, and it didn't take long to realize that a simple solar voltaic panel lying on the hood, roof, dashboard, or wherever, and plugged into the cigarette-lighter jack would nicely "top off" the battery. Chuck and other members of the local gang have been doing this for a number of years, and by now we just expect to see a solar panel hanging from every ham's car at all events. Check your particular vehicle, though, as some turn off the auxiliary power sockets when the ignition switch is off and another route to the vehicle battery must be found.

Chuck's interest in solar energy is sincere, and he often takes his ambitions to extremes. Preparations for the supposed Y2K problem (which, of course, turned out to be nothing more than a worldwide emergency preparedness drill), along with a general interest in alternative energies, inspired a quest for a level of self-sufficiency. Along the way, Chuck thought it would be neat to have a solar-powered rig. Again, we all have read articles about solar-powered QRP stations, and even solar charging systems used for repeaters in difficult to access locations. In Chuck's words, "kid's stuff!" When I was first approached with the idea of a solar rig for Field Day 1999, I thought it would be a good idea. I mean, I wasn't going to run it. I work CW and Chuck runs phone, so I gave him all the encouragement I could. What followed was a little unnerving.

Chuck spent the latter months of spring making preparations, purchas-

Two solar panels which deliver approximately 7 amps in full sunlight. The vertical panel is a single crystal type. The horizontal panel is a triple junction solar panel with each layer absorbing a different spectral color band (red, blue, or green) of sunlight. Triple junctions provide better operation in shade and indirect or low light conditions. The panels are equipped with "disco" green cables about 15 feet long with locking connectors which plug into the side of the battery-pack inverter, allowing the batteries to be charged with the "power cooler" lid sealed.

A view of the silent 1KW generator, aka Power Cooler. Two 125 amp, sealed absorbed electrolyte technology (SAT) batteries (no gas-no spills), coupled to a highly efficient 1000 watt modified sine-wave inverter. The batteries are protected with a 100 amp fuse panel located on the left bulkhead. The charge controller adjusts the output of the solar panels for maximum charging to the batteries and monitors the voltage and current of the entire system. This is located on the bottom left corner of the lid of the unit and can be remotely located outside the box. The 110 volt output is supplied to a four-outlet GFI and surge-protected outlet box, seen on the right. All this is neatly packaged in an Igloo rolling ice chest. All items, except the solar charge controller (including the ice chest), were purchased at local hamfests for pennies on the dollar of new equipment pricing.

ing cells, arrays, large coolers, and odd- shaped pieces of aluminum. I had faith in the project, but I wasn't adequately prepared.

Field Day arrived, and I was sitting under a canopy running CW on 40 on an extended double Zepp, this year opting for a more traditional antenna to keep the VHFers at bay. Chuck walked up, and at a break in exchanges, indicated that there wasn't a phone station on 40, and would I mind lending him an antenna for an hour or so, as he wanted to fire up his solar rig. Fine, I thought I could use a break, and it is always a fun time when Chuck shows up.

Chuck pulled his pick-up under the feed line of the antenna, saw it was balanced, and asked to also borrow an antenna tuner. "Sure," I responded, thinking, "This is getting better all the time." He flipped down the tailgate and quickly set up some solar panels, aiming them in favorable light by reading their output from the charge controller connected to two humongous storage batteries secured in a roll-around enclosure. I now knew what the cooler was for—yup, heavy-duty, made to hold some real weight, a retractable handle for convenient storage and wheels to make the behemoth mobile. Close the lid on this non-organic cooler and it will keep any hazardous material spills in check. With the array and power pack in place, I was caught completely off guard when Chuck asked me to get the radio out of the front of the truck. I opened the door and peered in. All I could see that wasn't permanently mounted was his Collins carrying case..."Hey, Chuck, did you forget the radio?"

"Just grab it and get back here," came a terse response. Not knowing what he had stowed in his beloved case, I delivered it to the tailgate, whereby Chuck opened the case and retrieved his KWM-2A!

"Huh?"

"Haven't you ever seen a solar powered 20 tube radio?"

Well, the banter continued on for a few minutes while the rig warmed up, and the anticipation grew. A quick tune and it was off to the races. "CQ Field Day, CQ Field Day, this is WD8AXA." As should be expected, the first call resulted in points, and of course, each additional station called responded. It makes no difference the source of power, as long as the power is there.

I looked at the setup for a while and couldn't help but notice the solar battery array was powering a 1 KW inverter generating 110 VAC, which in turn was driving the KWM-2's 110 VAC supply. Thinking about this for a minute caused me to wonder, and eventually I asked. The truth is, today's high-efficiency inverters and a time-proven transformer-operated power supply are more energy efficient than a single inverter-type 12 VDC power supply of the 1960s. I know, the pure engineers out there will insist noticeable efficiency improvements could be made by directing the tube's filaments directly to the storage battery, reducing filament drain on the inverter, as well as picking up the losses of the power transformer re-generating 12V. The significant item here is that Chuck had a fully functional off-the-shelf transceiver on the air, running from solar power. Monday morning quarterbacking has nowhere near the kick of actually playing the game, even if you lose.

This solar-powered KWM-2A is a great mix of technologies and has been a lot of fun for Chuck and the rest of us. Proving the point of solar energy for such an arcane piece of equipment makes a statement you must interpret for yourself.

Putting It All Together

While flying my kite-tenna on vacation last summer, I had

the fun of working Chuck's solar KWM-2A. I figured if he could go through all of this effort to prove a point, I could at least pack a microphone to be able to acknowledge his efforts.

We made contact by chance. He was on a weekend outing in the woods with the "Radio Boys." The contact was solid, even though at the time he was running a low-power SGC 2020 rig. We commented on his peanut-whistle rig and my big antenna. After a few minutes I couldn't stand it any longer and asked him to fire up the solar KWM-2A. Within a minute or so he responded. Sure, the KWM-2's audio was better than the little rig, but quite frankly, it would be hard to tell the difference under typical conditions. The kick was in knowing what was on the other end of the conversation. Realizing the contact was with a one-of-a-kind labor of love, and a mix of technologies just for the sake of doing it, made it all the more special. Chuck said the same!

Chuck currently is thinking about an alternative-energy demonstration trailer—a portable solar array, solar oven, and wind generator which can demonstrate the practical capabilities of non-fossil fuel energy sources. Capturing free, renewable energy and putting it to some good purpose is a noble challenge.

There are many venues which could be interested in such a demonstration. Beyond the county fair, there are school classroom demonstrations and technological interest clubs, and even local emergency management teams sometimes need a "show and tell," not only to explain concepts to which they have been exposed, but to put theory into practical application.

It is sometimes forgotten that a relatively small portion of today's society can connect the dots and actually draw a picture. Most of us see only a fragmented line. Those who "see the picture" are the hope of the future. We all have a responsibility to try to show the picture to others. If they see it, the world may benefit indirectly from our activities.

If your radio club is like mine, there is a lot of time spent bemoaning "there is nothing to do" in the hobby. I think there is a lot that can be done, and it doesn't have to be grand or expensive. Great fun may be had, friends met, and the hobby furthered by showing others that there *is* something to amateur radio other than, to quote a line from an old issue of *CQ VHF*, a "bunch of old men making lunch plans on the repeater." ■

Math's Notes

What's New And How To Use It

BY IRWIN MATH, WA2NDM

Optical Isolation—Part II

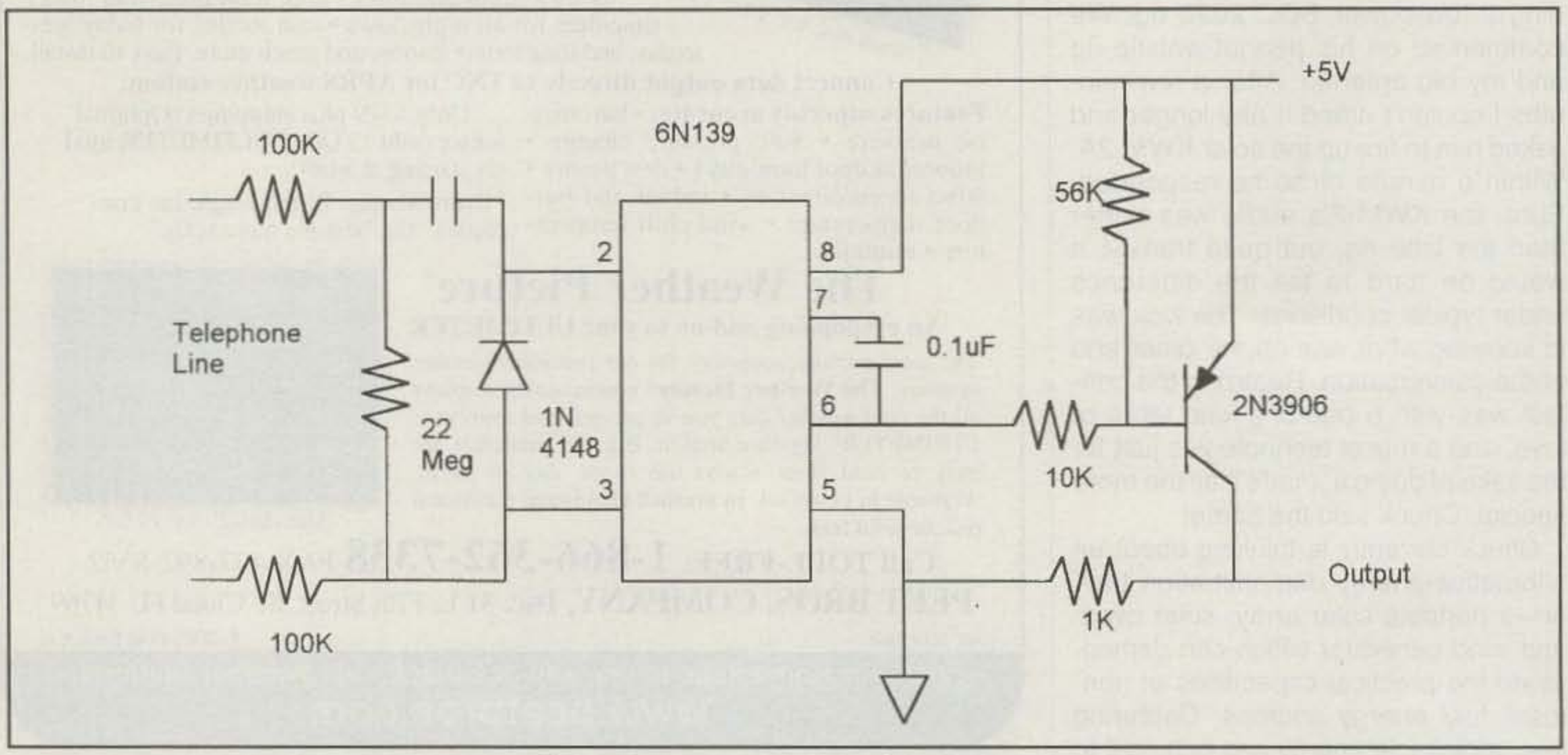


Fig. 1–A simple telephone-ring detector.

Last month, as you will recall, we looked at how the opto-isolator works and some of the more common uses for this versatile device. This month we will look at a few unique applications. Remember, the main benefit of this component is the total electrical isolation between input and output.

Fig. 1 is a simple telephone-ring detector. This circuit will allow the ringing signal from the telephone line to activate external circuitry with no actual electrical or metallic connection to the line from any additional circuitry you may wish to connect. In addition, all power on the telephone-line side comes from the telephone line itself, so you will not upset any balance or cause any problems with your service if you inadvertently mess up your circuitry.

As you can see from the schematic, the two 100K and the 22 megohm resistors provide a high DC impedance to the line so that the normal 48 volt idling voltage is not loaded, or for that matter, not even detected by the central office. When in the normal talk mode, the 12

c/o CQ magazine

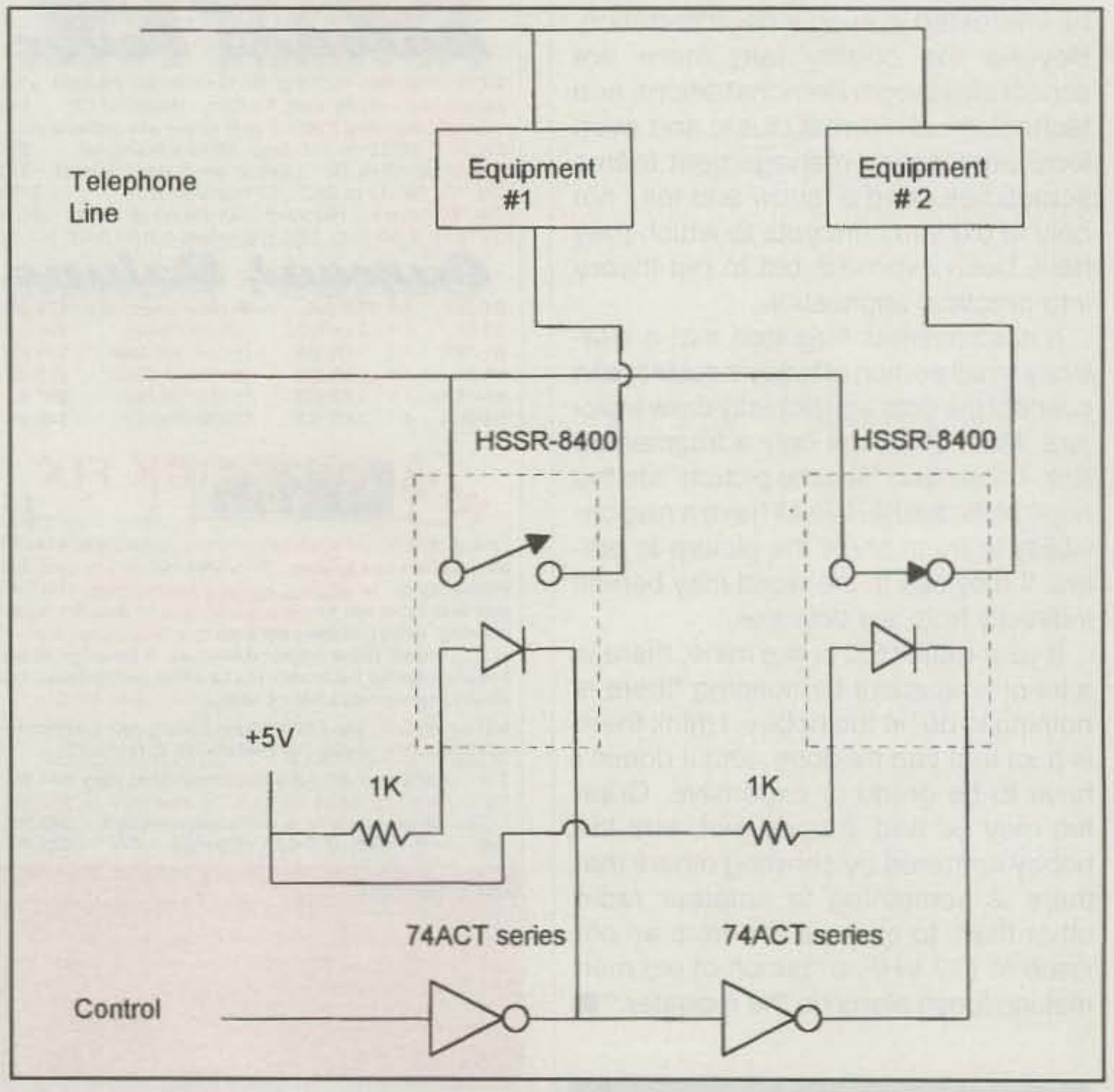
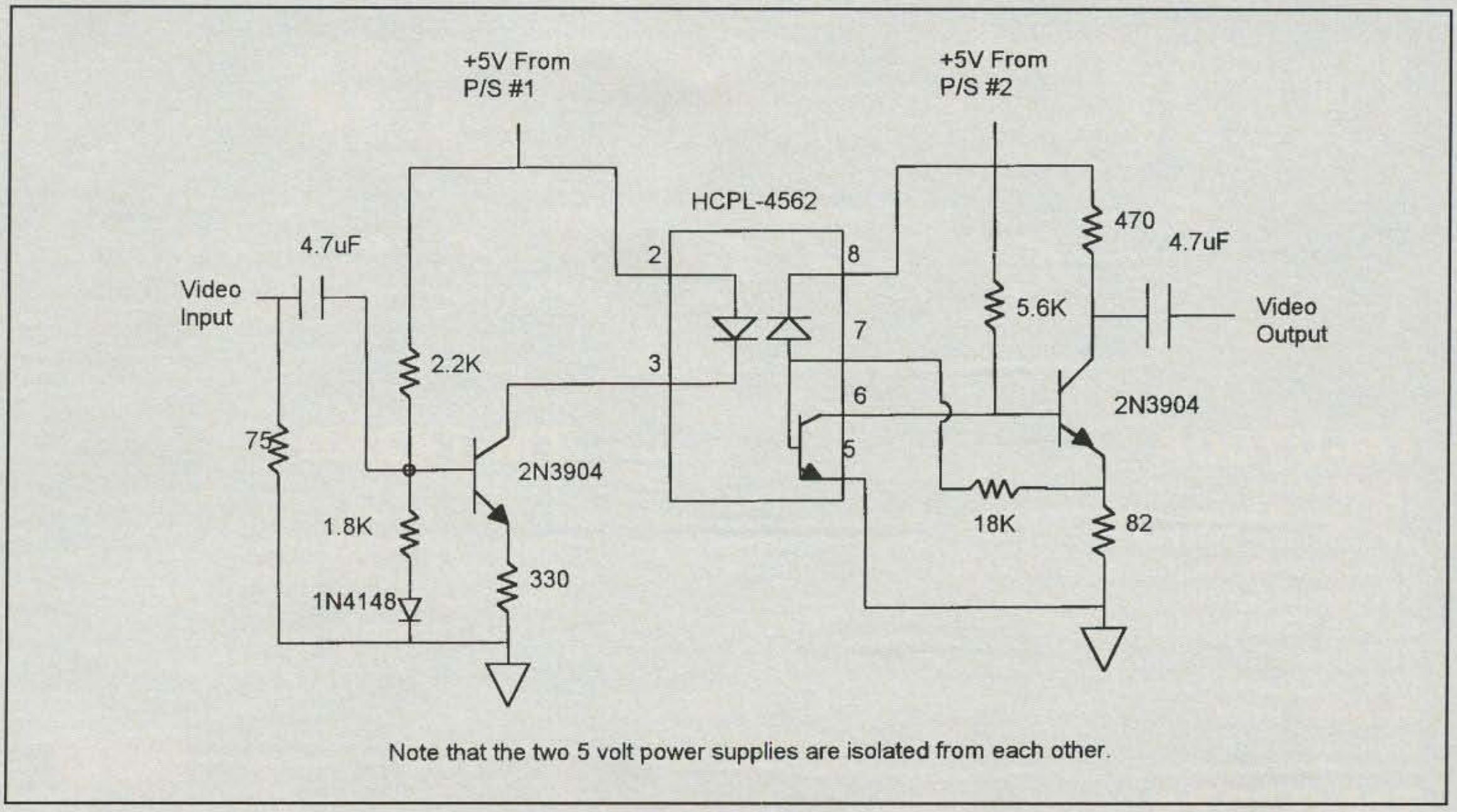


Fig. 2– Telephone line switch.



Note that the two 5 volt power supplies are isolated from each other.

Fig. 3– Opto-isolator used for video isolation. Note that the two 5 volt power supplies are isolated from one another.

volt nominal DC is also not affected. As soon as a 20 to 60 Hz AC ringing voltage is present, however, the .02 µF capacitor passes the signal and the positive peaks light the LED in the opto-isolator. This causes the photodiode to turn on, driving the collector at pin 6 low (at the 20 to 60 Hz rate). Now the 2N3906 conducts, and a positive output results. The positive output voltage can then be used to trigger additional circuitry. The reason for the 0.1µF capacitor is to slow down the circuit so that the 20 to 60 Hz variations are smoothed out, giving a steady output level for as long as the ringing voltage interval is present. The 1N4148 prevents the LED from being reverse biased by the incoming negative peaks.

Fig. 2 is a way to switch two separate pieces of equipment onto a single telephone line (one at a time, obviously). The opto-isolator, in the form of a solid-state relay, is used here to allow TTL level voltage developed by external circuitry (your design) to control what is connected to the line instead of a mechanical switch. Such a circuit is useful for automatic FAX selection, modem connections, and similar applications. You will note that two Hewlett Packard HSS-8400 devices are used, and they are switched by means of a 74ACT series gate or inverter element. Other optical solid-state relays can be

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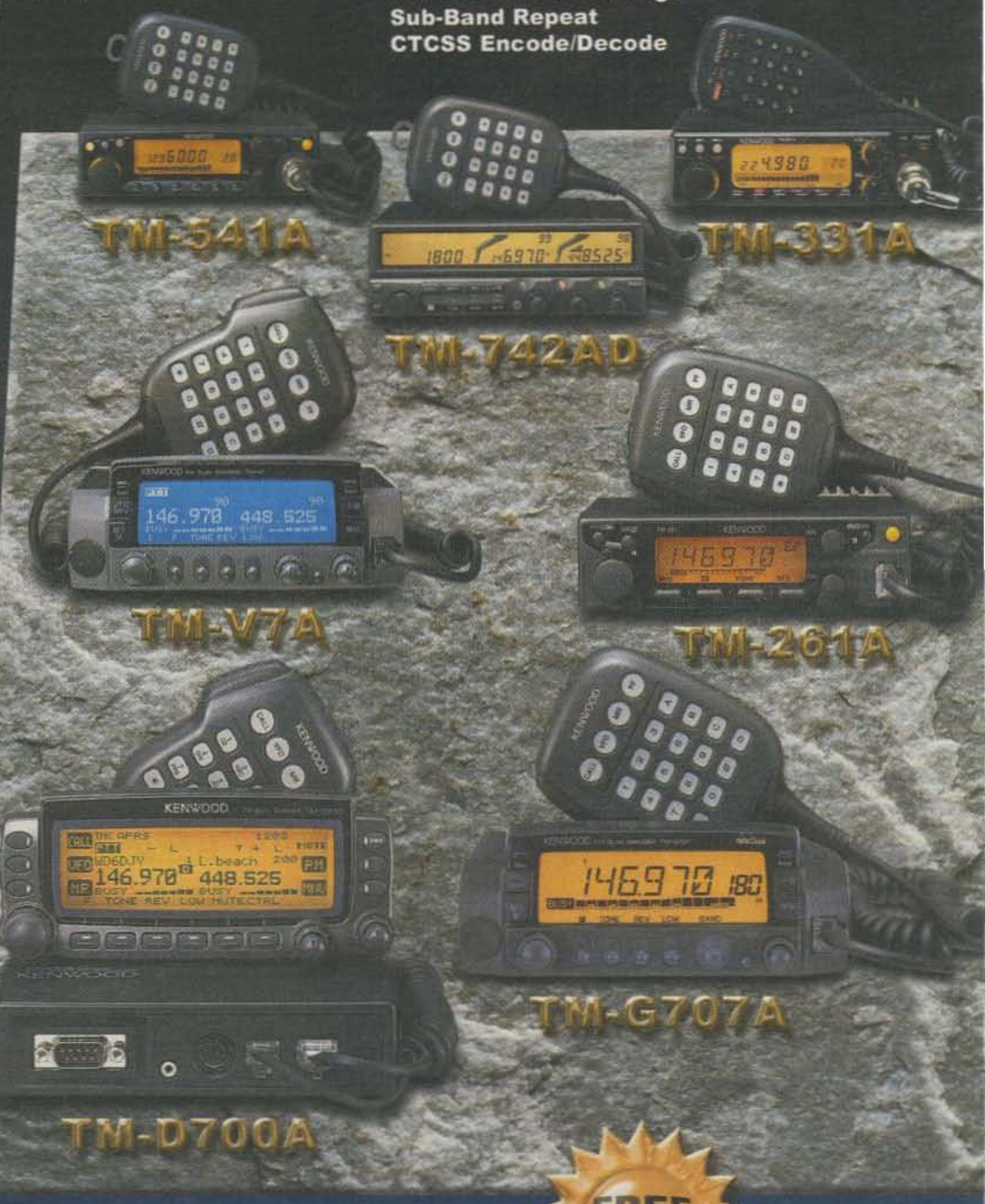

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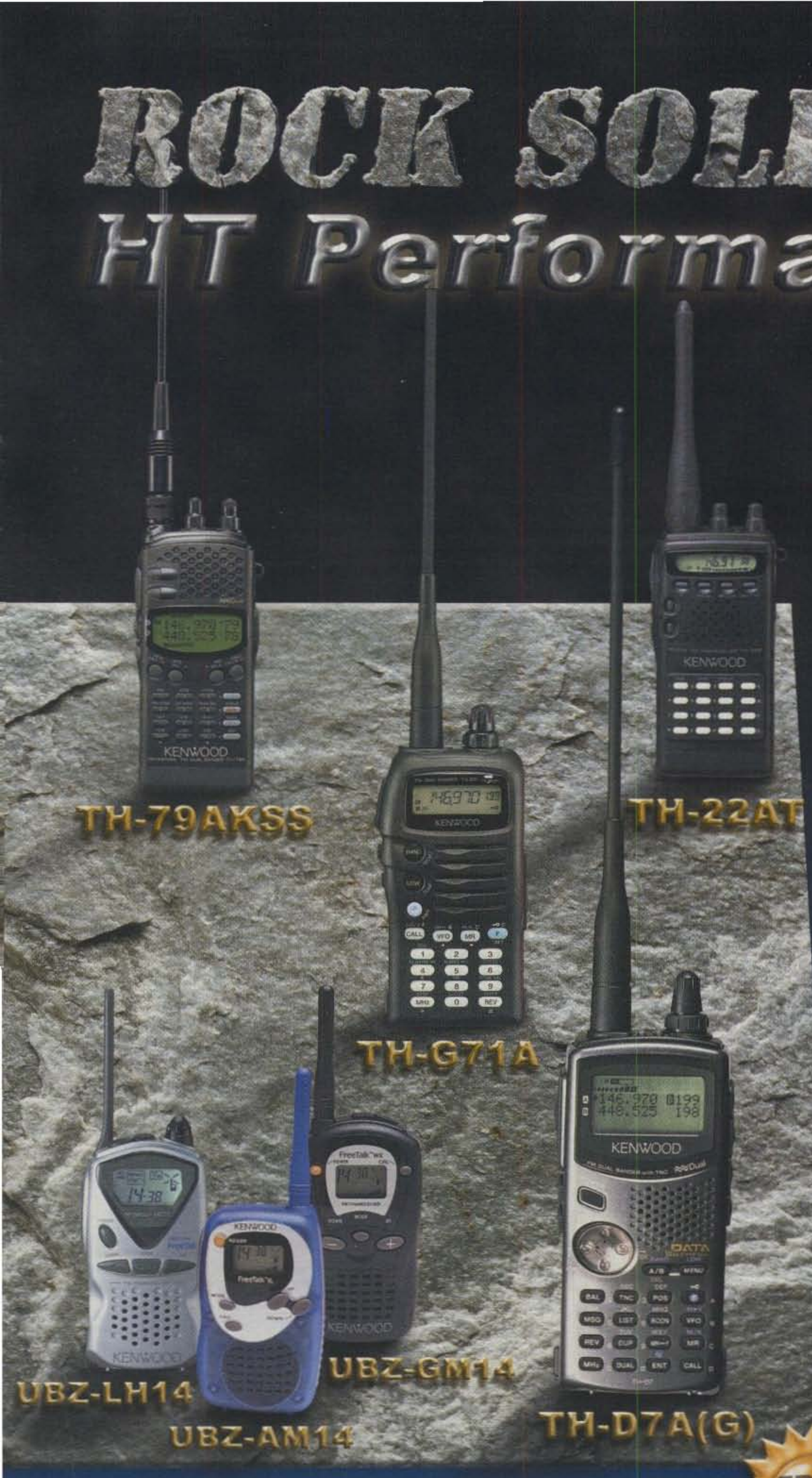

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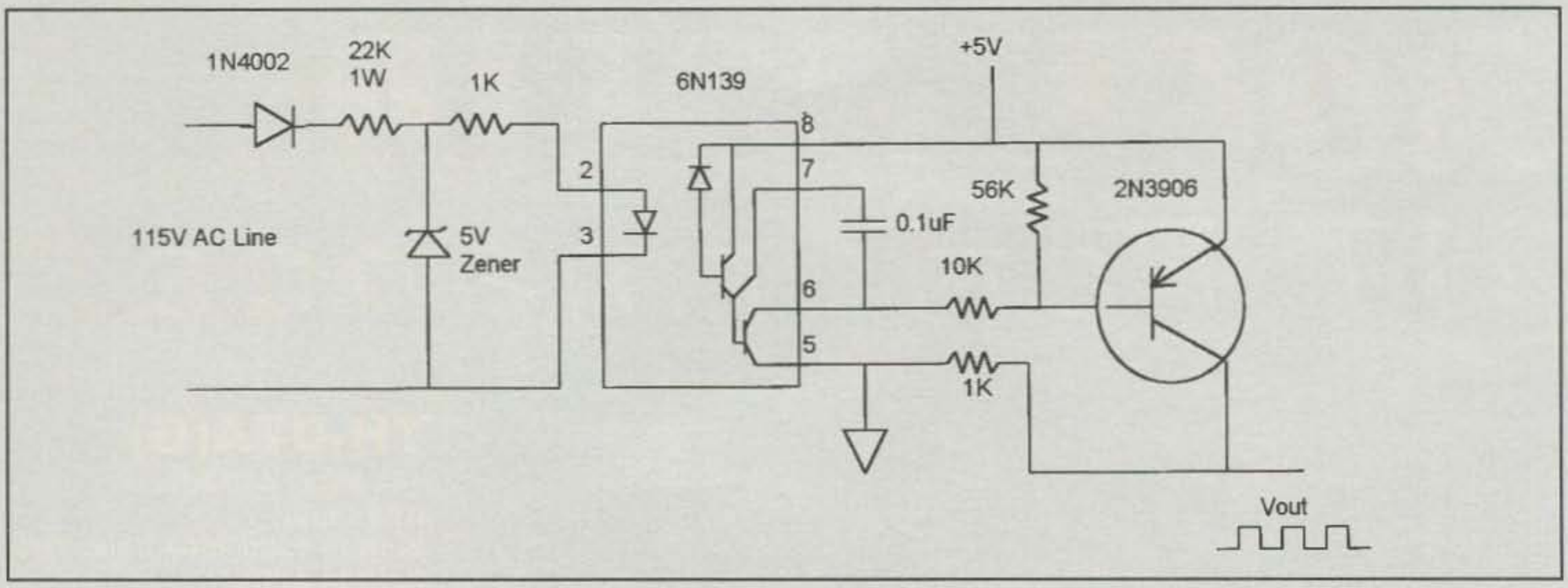

Fig. 4– Simple AC-line 50 or 60 Hz clock pulse source.

used as well, as long as their "on resistance" is a few ohms. The 74ACT logic series is used because of its high current (25 ma per gate) capacity. You will note that the circuit should be configured so that while one switch is on, the other is off. You may have to "play" with the values of the solid-state-relay LED dropping resistors to achieve reliable operation.

Fig. 3 is an opto-coupler used to isolate a common composite video signal. The advantage of such a circuit is that since there is no electrical connection between input and output, there is no possibility of induced ground loops. Ground loops in a video circuit, which are caused by differences in ground potential between video devices, are responsible for hum bars. These bars appear as horizontal black lines that slowly move through the picture. If the ground loop is bad, the bars can be so dark that they even block the picture completely. The traditional way to eliminate them is to assure a good zero voltage ground at each end of the link, or to use a wide- band isolation transformer. The optical isolator does the job just as well and is a lot less expensive than a 5–10 MHz video transformer.

As you can see from the fig. 3, the video is applied to the first 2N3904 stage which inverts it and drives the opto-isolator's LED. The stage is biased so that the entire video signal falls within the linear range of the transistor as well as the linear portion of the LED. The 1N4148 is used to prevent temperature drift of this stage. The resulting light from the LED is coupled to the photodiode and then to the second 2N3904 stage. This stage re-inverts the recovered video and provides the output. The HCPL-4562 was chosen for this application, as it is an inherently linear device and will not distort the video signal significantly. By the way, if you change the 75 ohm input resistor to a 600 ohm resistor, the circuit will work with audio as well.

Fig. 4 is a way to obtain timing pulses from the AC line where accurate 60 Hz (50 Hz in Europe) pulses are required, such as for digital clock applications. In this circuit the 115 volt (230 volt in Europe) AC line is rectified and used to drive the opto-coupler. The zener diode does the clipping of the input sine wave, and the 22K driving resistor (use 47K as a starting point in Europe) can be varied to change the width of the output pulse from the opto-isolator. Whatever width is finally chosen, the repetition rate (or frequency) will remain at 50 or 60 Hz with the accuracy of the AC line.

Some of the examples were derived from Hewlett Packard's *Designer's Guide to Isolation Circuits*, which is why we use HP opto-isolators. There are many other manufacturers of these unique devices, and any time you need good isolation from one side of a circuit to the other, keep them in mind.

73, Irwin, WA2NDM

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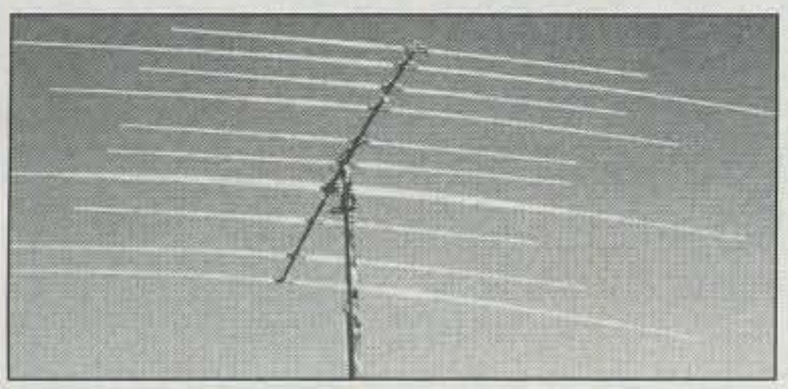

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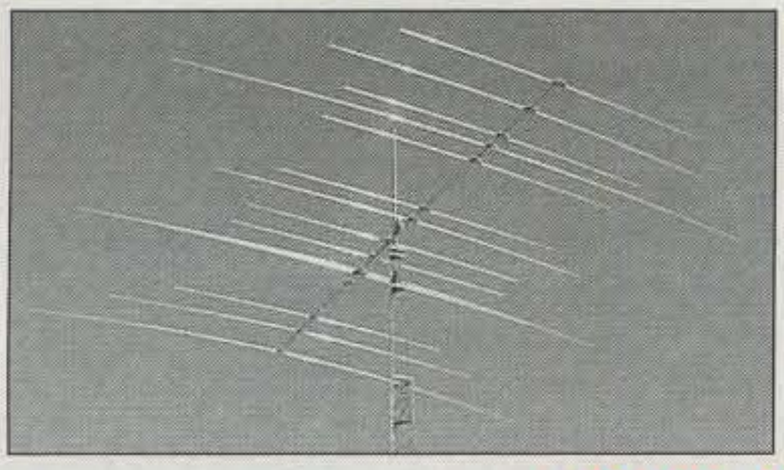

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The 20-15-10 Leader
31' boom: wide spaced 3 element on 20 mtrs
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10.7 sqft windload, 82 pounds
100 mph standard rating and 120 mph optional
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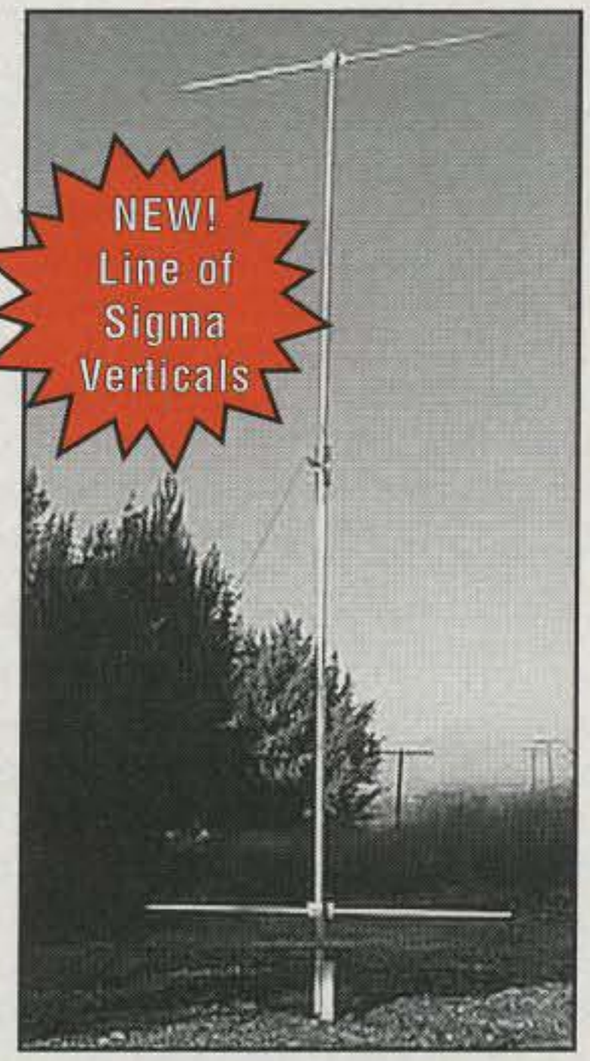

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MAGNUM 340N

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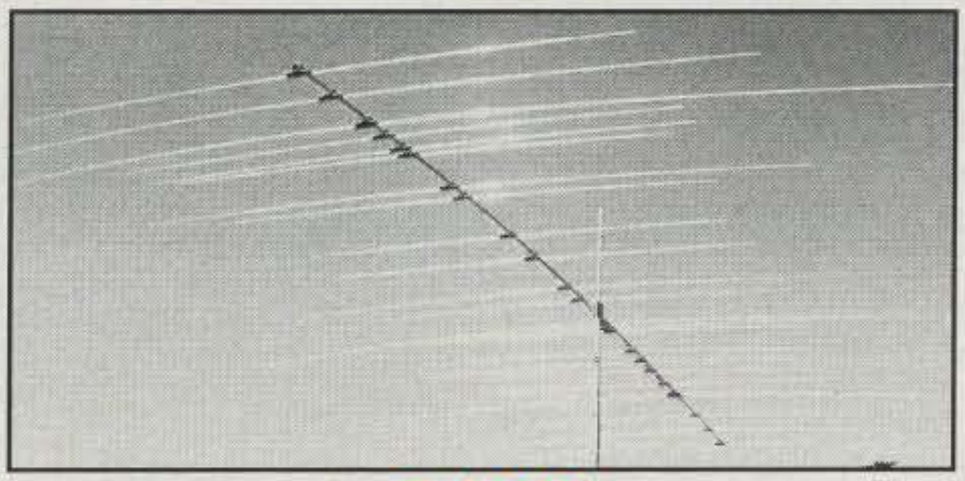

C-49XR

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World Of Ideas

BY DAVE INGRAM, K4TWJ

A Look At The World Around Us

Like New Adventures? Check out 10 AM and FM!

Does investigating various areas of special interest sound like a great idea, but exotic pursuits such as moonbounce and/or digital ATV seem slightly beyond your reach? Like to try something above and beyond the usual and a bit easier to handle, so to - speak? Well, friends, two unique and almost free for the asking opportunities are as close as your fingertips.

As you probably have surmised, I am referring to AM and FM operation in the low- power-favoring range of 29.0 to 29.7 MHz. Thanks to high sunspot counts supporting terrific band conditions, both modes presently are blowing wide open with big-time fun and excitement—fixed and mobile. Every enthusiastic amateur who holds a General or higher class license is welcome to join in the action. All you need to get started is some friendly encouragement and helpful guidance, and that is precisely the focus of this month's column.

Unfamiliar with 10 meter AM and 10 FM? Relax. You can start slowly by previewing the action right now. Just punch up AM- or FM-mode operation on your base or mobile HF transceiver (photos A and B) and use the general 10 meter bandplan shown in fig. 1 as a "get acquainted" guide. On AM you will hear fellow amateurs using classic transmitters and receivers with famous names such as Johnson, Heathkit, and Collins; some operators using modern all-mode transceivers; and some folks mobiling with good results. On FM you will hear both "direct" and repeater-type operations, tone-controlled remote systems, and 222 or 440 MHz to 10 meter crossband links. The general concept is similar to 2 meter FM except it is more specialized in nature and the communications range is worldwide.

The best band openings for both AM and FM typically occur when the sun is midway in a path. That translates to working eastern and European areas during the morning, north/south American areas around noon, and Australia and Japan during late afternoon or early evening. Also, a large number of transceivers include all-mode squelch, which is dandy for silent monitoring and catching good band openings. Furthermore, many amateurs are seemingly unaware of 10 AM and FM activities; thus the number of operators is low and QRM is negligible. These "upper HF" pursuits are also a QRPer's dream. Indeed, you will be amazed at how well stations "work out" using only 5 or 10 watts on 10 AM or FM—fixed and mobile. The only logical reason I can cite here is a rising MUF (Maximum Usable Frequency) favors 29 MHz signal propagation more than 28 MHz signal propagation.

Photo A– Like to experience new fun and excitement with your old rig? Check out AM operation in the 29.000 to 29.100 MHz range. You will be pleasantly surprised, and joining the action is also a treat!

Photo B– The range of 29.5 to 29.7 MHz is included in most HF transceivers, and it is alive with worldwide FM activities, both "direct" and via repeaters.

Are we piquing your interest yet, friends? Ten AM and FM are big-time radio pursuits, but they are not so big that you get lost in the crowd. Everyone is special on 10 AM and FM, and being a big fish in a small pond rather than vice-versa just makes life worth living. Try it and see for yourself.

A Closer Look at AM

As most old-timers will agree and newer amateurs must experience first hand to fully appreciate, nothing beats the "real radio" sound of a genuine AM signal. Realizing that fact, many folks enjoy restoring and using classic high-level/plate-modulated transmitters and similar (large!) size vacuum-tube receivers on 10 AM. The signals sound absolutely fantastic, especially when copied on a large, full-range speaker. This "pursuit within a pursuit" is gaining momentum on almost a daily basis, and rig restorations are not overly difficult. Usually retubing and a mild realignment are all that's necessary to put a rig back in good shape.

What about using your existing home or mobile transceiver for a few "getting started" contacts on 10 AM or for mobiling? A number of folks take that approach and it works out fine, and mobiles on 10 AM are real attention grabbers. A few associated factors, however, should be kept in mind for both success and survival.

First, remember that unlike SSB, AM and FM are full-duty-cycle modes. That means every transmission is comparable to holding your rig's CW key down/

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

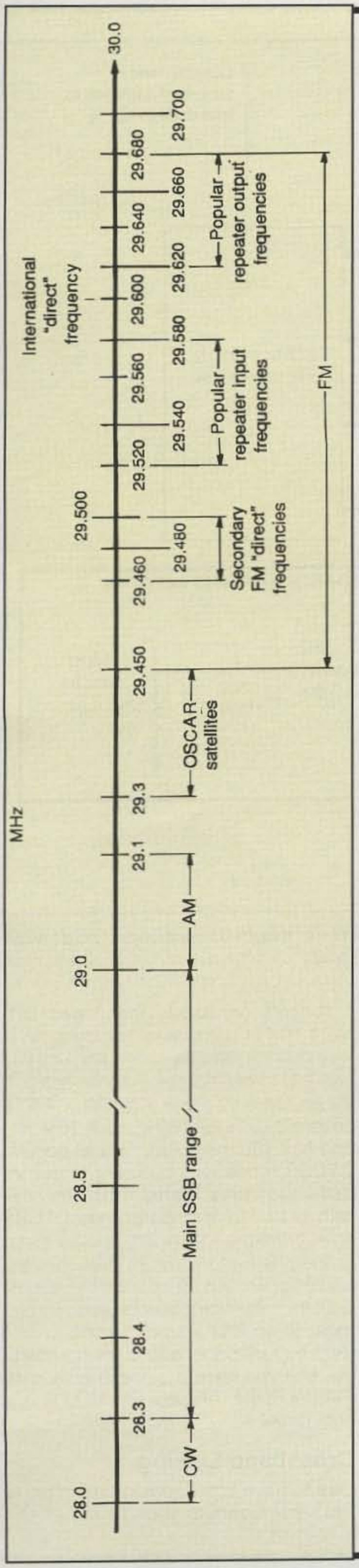


Fig. 1– General bandplan and frequency ranges of various 10 meter activities, including 10 AM and 10 FM.

closed the full time. Most modern SSB transceivers and power supplies are not designed for such stress (and a higher-than-normal SWR resulting from up-band operation does not help matters). Consequently, running your transceiver at its lowest possible output—such as 5 or 10 watts rather than 20 or 25 watts—is a good idea. Can you work many stations at that low power level? Yes indeed! Folks do it every day in the U.S. and throughout the world, and they have a ball DXing in the process. If you prefer more power, incidentally, you can always switch your station's big linear amplifier to brief use. It should run cool and comfortable with 5 or 10 watts of drive and 50 or 100 watts output (which is plenty of power for DXing here).

I should also remind you to keep a close watch on your antenna's SWR in the 29.0/upper range of 10 meters and strive to avoid lengthy transmissions. Switch in your rig's tuner if the SWR is above 1.5:1. The combination of full duty-cycle operation, long transmit times, and even mediocre SWR can cause rapid overheating of RF amplifier stages. A tuner (and even an extra cooling fan) are not frivolous "extras"; they are justifiable operating accessories.

Sounding Great

If you want to really stand tall on both 10 AM and 10 FM, consider adding one of the new super-sounding Heil microphones (photo C) to your setup. The Goldline version is a dual-element desk mic with one element producing marvelous broadcast-grade audio that absolutely sparkles on AM and FM. The other element (which is selected by a switch on the mic's side) produces a more concentrated audio response that is especially good for SSB DXing. In other words, it is two microphones in one case.

For mobiling, Heil's HMM hand mic is a winner. It, too, has switch-selectable elements. One is wide range (but not quite as wide range as a Goldline) and one is narrow range. A low-to-high impedance-matching transformer is also available so the microphones can be used with classic vacuum-tube rigs.

The microphones (and more details) are available direct from Heil Sound Ltd., 5800 North Illinois, Fairview Heights, IL 62208 (618-257-3000).

The 10 meter FM Scene

One of the best ways I know to quickly describe 10 FM is it combines the long-range communications abilities of 10 meters with the "squelched rig" operating convenience of FM and repeaters. It is a unique and fascinating diversion from usual SSB activities, especially when mobiling, and getting started in the fun is easy.

As illustrated in fig. 1, FM's range of 29.500 MHz to 29.700 MHz is informally divided into channels. Repeaters utilize 100 kHz "splits," with inputs normally on 29.520, 29.540, 29.560, and 29.580 MHz, and outputs on 29.620, 29.640, 29.660, and 29.680 MHz. In the middle is 29.600 MHz, the internationally-accepted "direct" frequency. An alter-

Photo C– A key element for a great-sounding AM or FM signal is a new Heil microphone. Shown here is the full-range/broadcast-grade Goldline mic, which fits on an optional desk stand or boom, and the new dual-element hand mic. Both items are available with a pre-installed plug to fit most modern transceivers. (Details in text.)

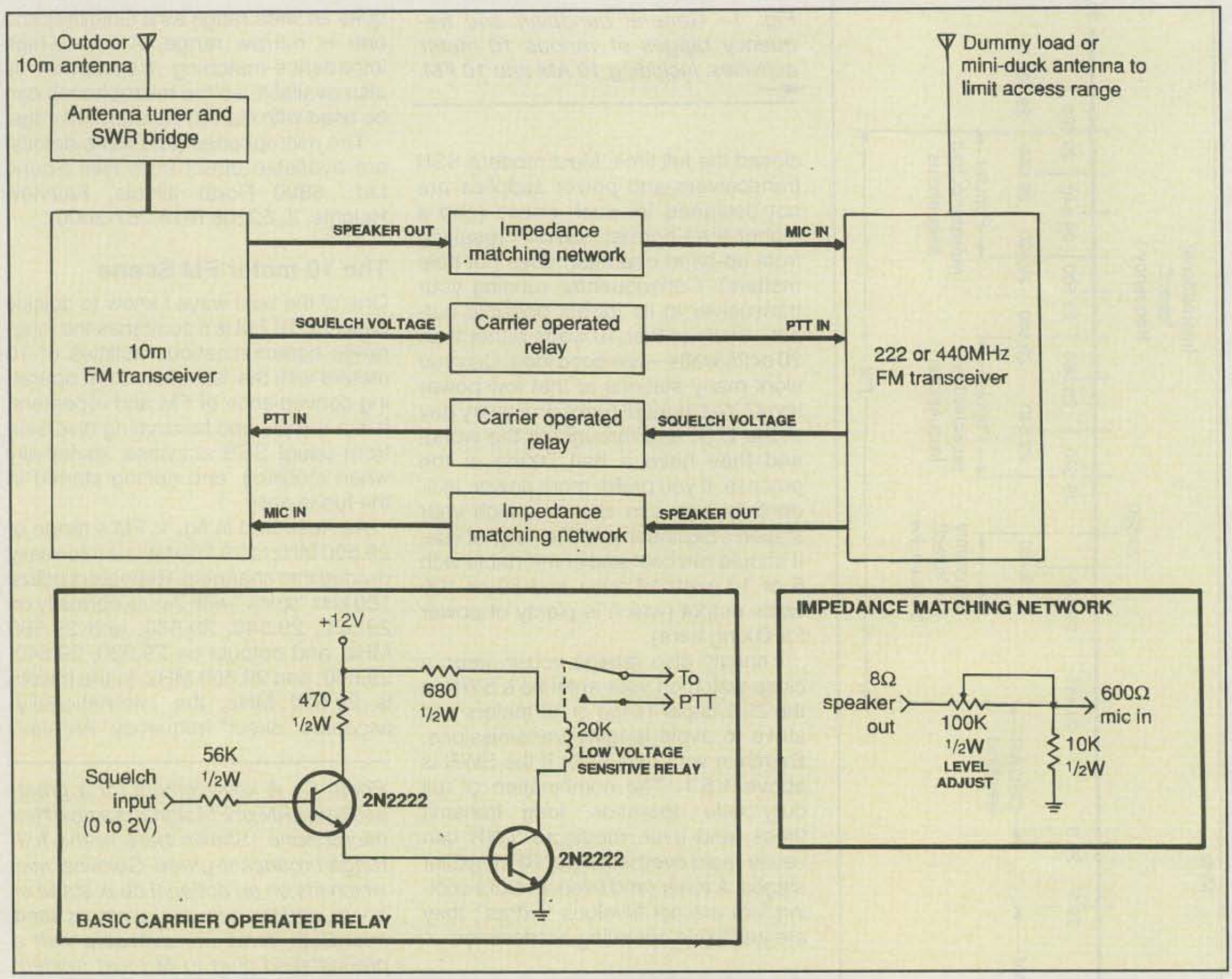


Fig. 2– Conceptual outline of a 10 meter to 222 or 440 MHz crossband link for limited use. If both transceivers include VOX operation, COR may be dropped. (Discussion in text.)

nate "direct" frequency of 29.480 MHz, incidentally, is also becoming popular when 29.600 MHz is overly busy. The greatest amount of 10 FM activity occurs during daylight hours on weekends. Typically, you will hear both North and South American stations calling CQ on 29.600 MHz (yes, CQs are quite acceptable on 10 FM), a European station working through a New England repeater, or an Australian on a West Coast repeater. You may also hear tone control systems switching remote setups or rotating beams and double-squelch tails as both individuals and specific-area groups use crossband links to talk worldwide. Overall, it is a quite exciting pursuit.

Basically, the easy ways to get started on 10 FM are by using your existing multimode HF rig or by purchasing an ultra-compact 10 FM mobile transceiver such as Alinco's neat DR-MO3 shown in photo D. When using your existing HF rig, remember to reduce its output to a comfortable low level on FM. Check your rig's manual: Most transceivers cut output to 20 or 25 watts on AM, but leave FM at a smoldering 100 watts. That should cook their final amplifier stages in short order, especially if the antenna's SWR is near 2:1!

The easy way to operate through 10 FM repeaters is by using one of your transceiver's dual VFOs for transmitting, the other for receiving, and activating the rig's "split" function. Most modern transceivers are loaded with memory, so programming four of them with repeater inputs, four with repeater outputs, and two with "direct" frequencies will allow you to quickly reset VFOs for FM operation. Remember that you are a guest on a repeater; keep your transmissions reasonably short. Share "air time."

Alinco's previously mentioned DR-MO3 10 FM transceiver, incidentally, is an excellent horizon-expanding unit you can add to any home or mobile setup. It measures only 1.5"H × 5.5"W × 4.5"D, covers 28.0 to 29.7 MHz, runs 10 watts, and has 100 memories plus all popular CTCSS tones for accessing tone-controlled repeaters. Program the memories with all the 10 FM repeater pairs, CTCSS tones, direct frequencies, and 10 meter propagation-monitoring frequencies, and you can remote-operate the little rig right from its microphone's up/down buttons. Strap it to a small 13 volt, 3 or 4 amp battery pack, add a roll-up antenna, and you have a globe-spanning 10 FM handheld. Alinco's DR-MO3 is one cool radio!

Crossband Linking

Like to have some real radio fun on 10 FM? Interconnect your 10 meter and

Photo D– Like to take your mobile activity in an exciting new direction? Alinco's DR-MO3 ten meter FM transceiver gives you the global range of 10 meters and the easy channeled operation of FM in a unit small enough to fit in any car's interior. This little economically priced gem makes traveling fun! (Photo courtesy Alinco, Inc.)

222 or 440 MHz transceivers to make a crossband link, then use your FM handheld to access the setup and work the world. (This is technically auxiliary operation, permitted only on 222 MHz and up, so don't do this with a 2 meter rig.) Most folks naturally assume such crossband systems are fancy and difficult to assemble (and they may be correct for a full-featured system), but I am referring to a simple, "bare bones" setup for private use. Its VHF or UHF access range will be limited to a one or two block radius of your house (or vehicle, if used mobile), and all control functions must be handled manually, but that is all you need for private use. There are, however, a couple of basic considerations you should keep foremost in mind.

First, monitor the setup continuously when it is set for crossband repeating and stay close enough to it so you can deactivate the link if a "surprise" signal or interference causes exceptionally long and/or undesired operation. Second, use only "direct" frequencies on "both sides" of your link. *Do not* interfere with repeaters. A good choice for 10 meters is 29.600 MHz and a discretely picked, overlooked, and unused frequency in your area is suggested for 222 or 440.

A simple crossband setup is outlined in fig. 2. Output of the 10 meter FM transceiver should be limited to 10 watts or less than the rig's full power to avoid overheating during heavy use (and remember you will be out of arm's reach to check that heat). Likewise, retuning your antenna or using an antenna tuner to ensure a low SWR is encouraged. The VHF/UHF FM transceiver should also be operated at low power—preferably below .5 watt—and I suggest connecting it to a dummy load rather than even a mini-duckie antenna to restrict its access range. This is an experiment and dink project, but that is the true essence of amateur radio.

Continuing our discussion of fig. 2, audio from the speaker output of one transceiver to the microphone input of the other transceiver is matched in level and impedance by a basic resistor network. If desired, 8 ohm to 600 ohm transformers may be substituted here.

A pair of no-frills Carrier Operated Relays are used to sense an open-squelch voltage between 0 and 2 volts on one transceiver and close the other transceiver's PTT line. This voltage usually can be sampled from a transceiver's "receive" LED. A pair of two-minute timers can be included with the CORs to avoid long crossband repeat times, or manual control as previously discussed may be employed. Just remember that *you alone* are responsible for maintaining an interference-free link. Always consider and respect your fellow amateurs.

You say crossband linking sounds neat, but dinking with technical circuits does not fit your lifestyle? If your HF and VHF rigs include VOX in their operating features, try acoustic coupling. Just position each rig's microphone near the other rig's speaker, activate each rig's VOX, then set their volume for reliable operation without false tripping. Use plenty of VOX delay so each rig does not switch back to receive mode during brief pauses, and enjoy the results.

Conclusion

That winds down our discussion this time, friends, and I trust it inspired you to give 10 AM or 10 FM, or QRP, or DXing, or any other on-the-air activity a good old college try. I have said it before and I will say it again: All the HF bands are in top shape and QRM is lower than it has been in many years (probably because the number of active, on-the-air U.S. hams is so frighteningly low!). Get on the air and have fun. You do not need a fancy rig or a big antenna; you just need a little enthusiasm. Go for it!

73, Dave, K4TWJ

Public Service

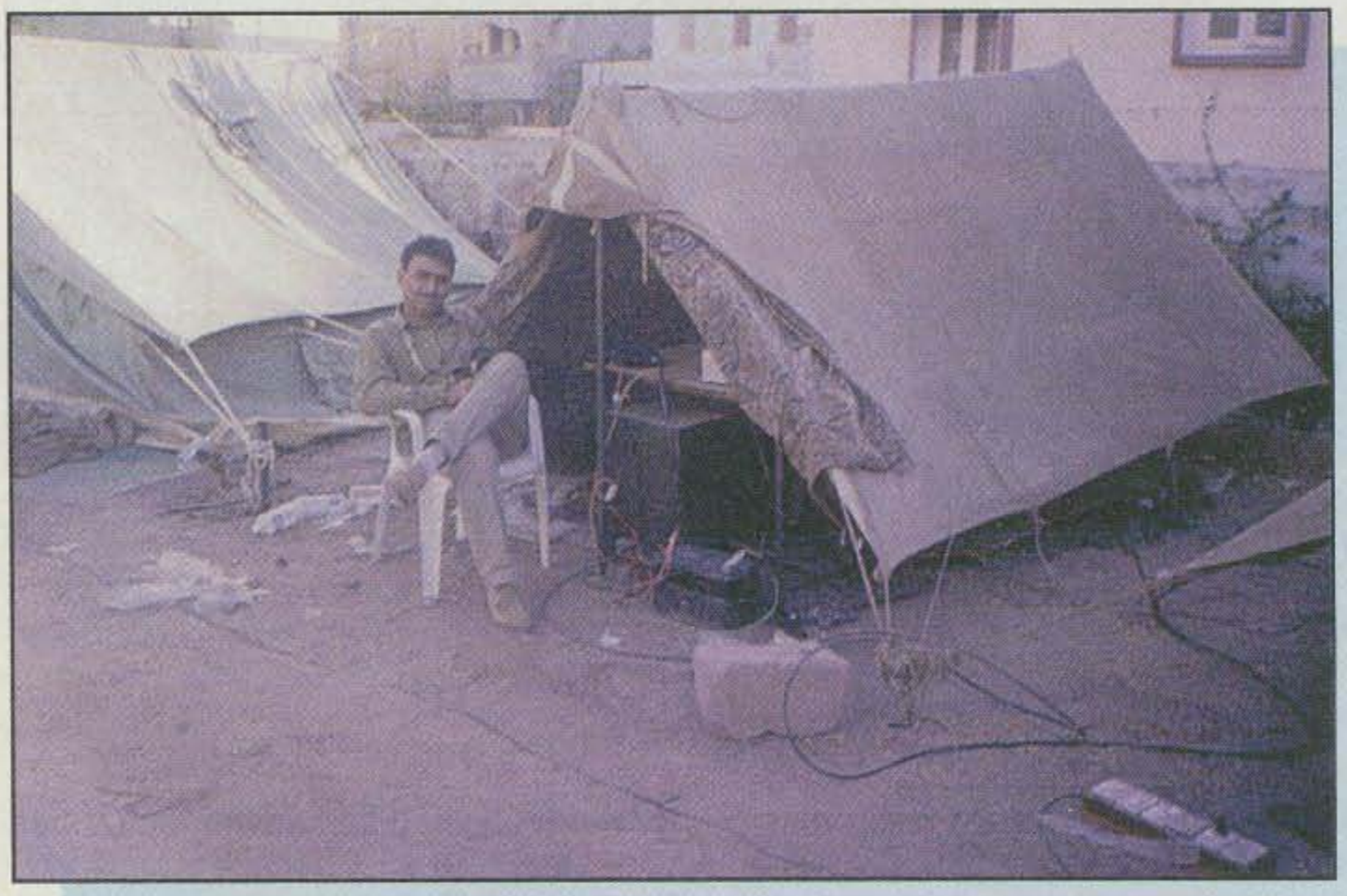
BY BOB JOSUWEIT, WA3PZO

Public Service and Emergency Communications

Another High-Seas Rescue

Amateur radio operators assisted in a high-seas rescue operation for the second time after pirates attacked a private sailing vessel March 20 off the coast of Venezuela. The skipper was shot, and his wife summoned help via the Maritime Mobile Service Net on 20 meters. The victim was reported to be recovering in a Trinidad hospital. The incident in the Caribbean occurred some 3200 km east-southeast of a similar pirate attack which happened nearly a year ago when Willem van Tuijl from the Netherlands, who was sailing with his parents, was shot.

The ARRL reported via Coast Guard Lt. Jose Diaz, KP3J, of the Rescue Coordination Center in San Juan, Puerto Rico, that the 44 foot ketch *Lorna,* of Swedish registry, was enroute to Trinidad and Tobago when pirates attacked some three nautical miles offshore. The husband was shot once in the abdomen. The pirates destroyed the VHF radio, so the woman activated an emergency locator transmitter (ELT). The San Juan Rescue Coordination Center received ELT "hits" from the Lorna and notified Venezuelan authorities.



While many of us may think of this as Field Day conditions, amateurs in India were set up to provide emergency communications. (Photo courtesy VU2RCR)

The ARRL Picks Up the Report

Some 90 minutes later word of a distress call from the Lorna *on 14.300 MHz from the Maritime Mobile Service Net's Mike Pilgrim, K5MP, arrived at the Miami Coast Guard. The Coast Guard forwarded the information to the San Juan rescue center. Diaz, KP3J, tuned to 14.300 MHz, where Bobby Graves, KB5HAV, Dave Dalziel, N4ICE, and Jim Hirschman, K4TCV (a physician who had assisted in the van Tuijl pirate attack last year), already had activated an emergency net. An amateur in Trinidad, Eric Mackie, 9Z4CP, also assisted in communications.*

Among those standing by on frequency were Ed Petzolt, K1LNC, in Florida, and Hector Godoy, HR3HGB, in Honduras, both of whom were instrumental in the van Tuijl rescue operation a year ago. The amateurs on 20 meters were able to calm down the woman aboard the sailboat and also provide medical counseling.

Diaz got permission from Venezuela to allow a vessel from Trinidad to assist, and a Venezuelan Navy vessel arrived on the scene at the same time as a Trinidad Coast Guard fast boat, with medical personnel. Trinidad medical personnel and crew took control of the sailboat from the shaken and exhausted victim's wife.

Diaz credited amateurs with doing "a tremendous job" helping to keep the injured man's wife calm, relaying information from the US Coast Guard to her, and maintaining order on frequency.

Learning to Serve

For the past two months we have been reporting on the amateur radio response to earthquakes around the world. While the amount of damage and loss of life was considerably different, there was preparedness in both disasters. In the photos many of the hams looked as if they could have been operating a Field Day station, yet they put their skills to use to supply vital communications.

Just think about it: The hams in India packed up their radios and carried their entire station. They did not have the luxury of taking two or three spare radios, extra antennas, power supplies, computers, etc. They had to make sure the equipment they did have was working when they packed it and set it up. To quote a popular saying, "First time, every time!" Some may think that India's hams are used to portable HF operation. However, they are not allowed to operate mobile, so they have to pack up their radios and stop the vehicle, string up an antenna, and hook up the radio to a battery to get on the air.

This month we take a look at how we can become better prepared to serve in the public interest.

Drill Time

One obvious way to sharpen your skills is to participate in emergency-management-sponsored drills. Alameda County, California hams participated in a county-wide emergency-preparedness exercise on a recent Wednesday afternoon. Jim Tiemstra, K6JAT, said the objective of the drill was to test the ability to communicate without landline telephones (including 911) or cell phones under intermittent power interruptions.

c/o CQ magazine
e-mail: <wa3pzo@cq-amateur-radio.com>

Ham radio played a major role in providing critical communications links for various agencies.

"The scenario contemplated a 5.5 earthquake occurring on the north segment of the Hayward Fault with an epicenter near the San Leandro city border," said Tiemstra. All of the city of Oakland would be affected in this case, along with other parts of the county.

"Some of the functional roles assumed by amateur radio operators included communications from field operations to the EOC, intra- and inter-agency communications, disaster assessment, fire-station communications, and shadows for designated officials." Because this was a drill, amateurs had time to prepare—time to get all of their equipment together and time to work out the "bugs." Captain Whitman, KQ6TW, of the Oakland Police Department, stationed at least two operators with a district sergeant at the mobile command post and another two operators at the Police Operations Center. The Police Department added an 800 MHz failure to their portion of the scenario.

The other roles for amateur radio were less clearly defined, but the group will add them as they arise. Slow scan TV may play a role in disaster assessment and, of course, the radio room at the EOC will be activated by several operators. Links were planned from there to other EOCs serving the county, state, and hospitals.

Field Day

Here's your chance to practice just about every form of ham radio you ever heard about! Your first thought might be to do what you do best, whether it's putting up a dipole, assembling a beam, or anchoring the ground rods for the HF gear. Why not? It's whatever you are comfortable with. But since Field Day is at least partially an emergency-preparedness exercise, why not use the opportunity to learn something new?

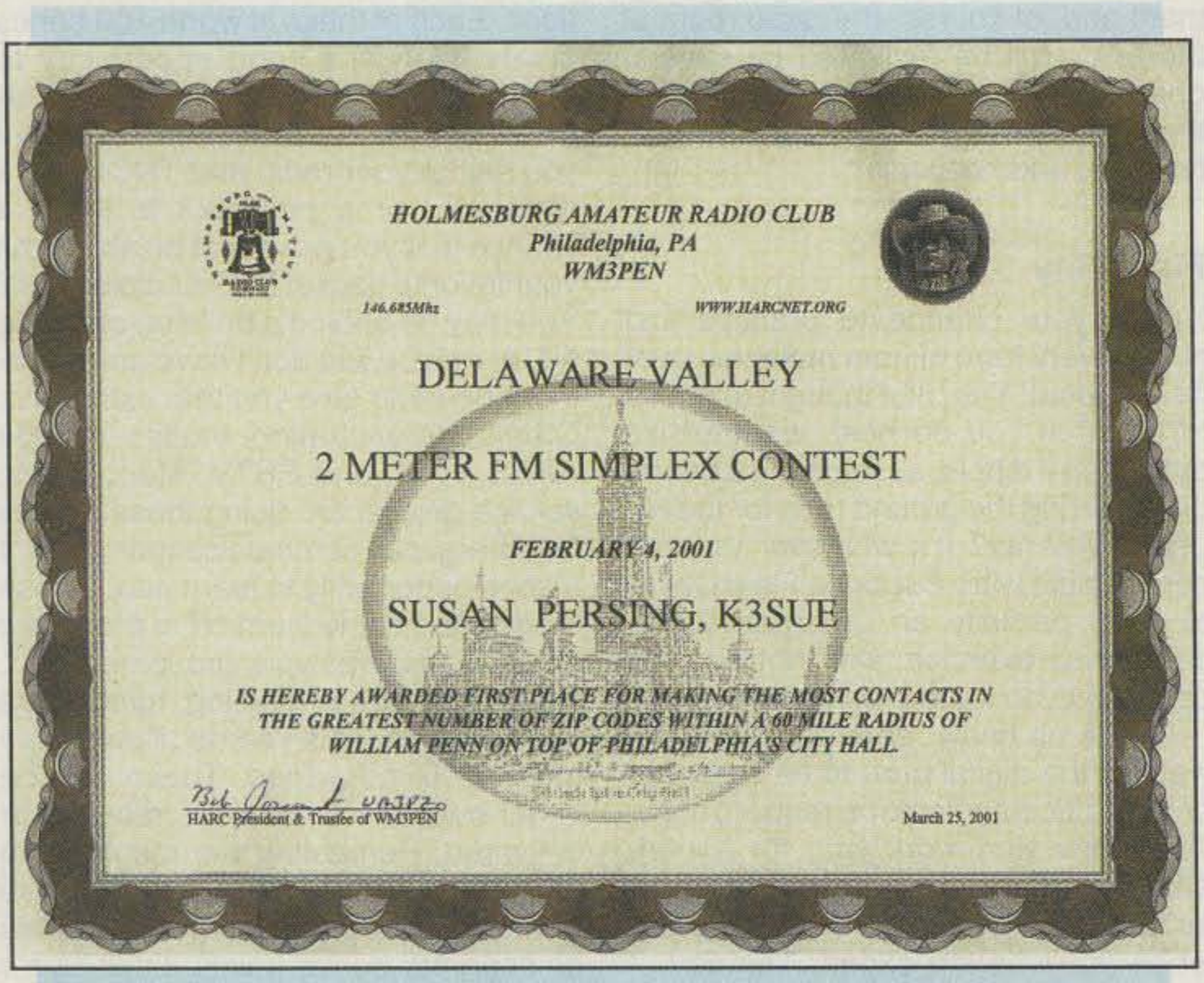
As we all know, emergencies don't wait for the digital guru to be available or the traffic handler to be ready to copy. Take time and work with an experienced person to learn how the particular task is done. There may come a day when *you'll* be the expert. The day of the disaster is not the day to pick up the instruction book!

Let's take a look at some of the interesting things you can get involved with.

This year the Field Day rules allow you to set up three demonstration stations. Each of these is worth 100 bonus points. Here's a good opportunity to learn. One of the demonstration stations could be a packet network. Have you set up your radio and TNC to be a digipeater or a mailbox? Is there a chance that you would not be able to hit your favorite packet BBS or digipeater? You may be behind a building or over a hill, or maybe you don't have an 11-element beam to give you that extra gain. Other demonstration modes include APRS, ATV, and SSTV. Many public service groups are using these modes for emergency communications. Here's a good opportunity to learn about these modes and show them off to the public and the agencies your group helps.

The message-handling rules have been changed this year to allow you to handle 10 messages. These can be either originated, received, relayed, or delivered. Remember the message to your ARRL Section Manager or Section Emergency Coordinator already counts as separate bonus points. Looking for someone to send a message to? Send one to me. If you're not sure how to send a message, check out my June 2000 column or the ARRL Field Day rules.

Here's one plan that may help you get some Field Day contact points and also

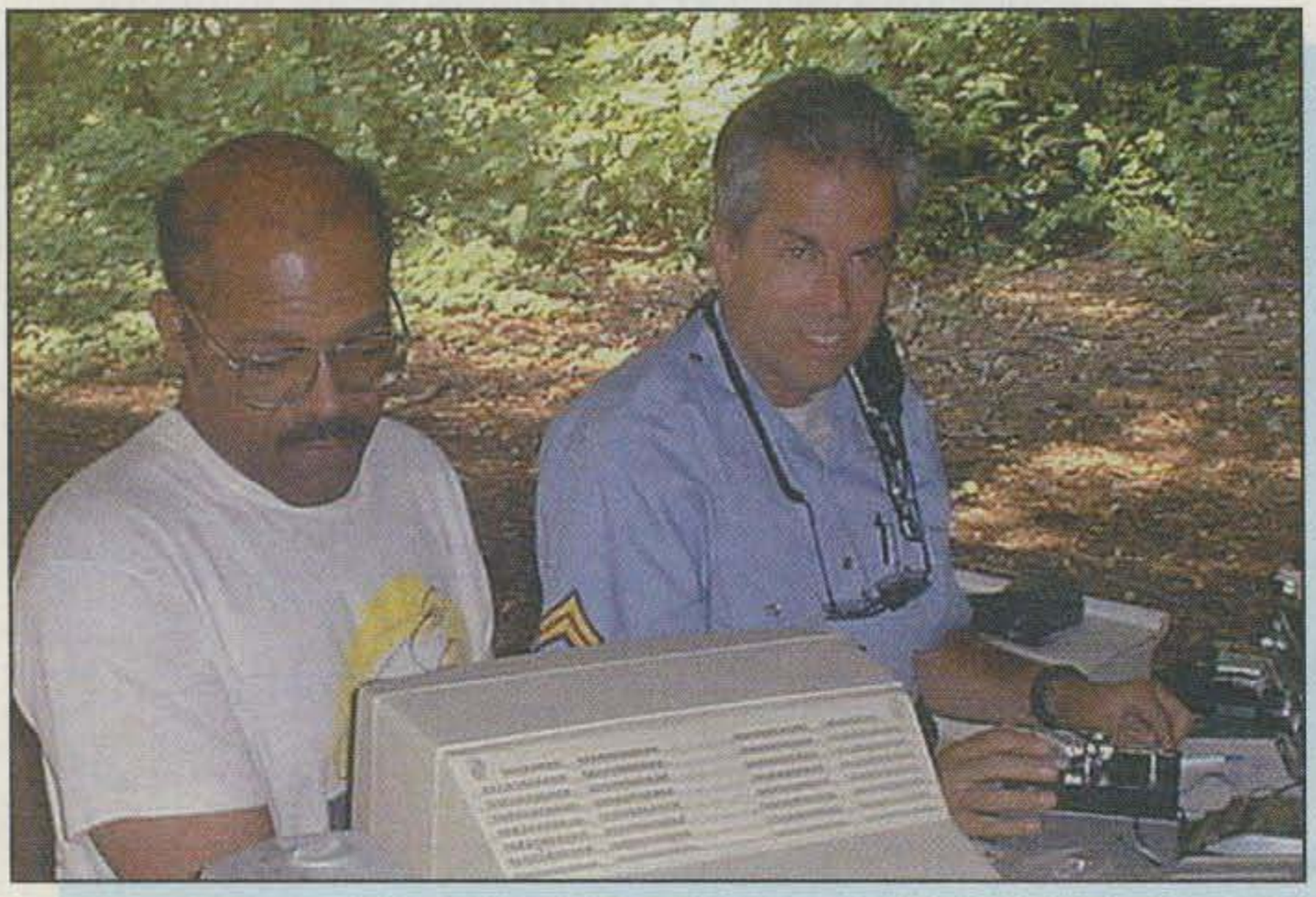


A local contest allows public-service-minded hams to learn about their capabilities without a repeater. (Photo via WA3PZO)

help with the bonus message-handling points. Let's make an assumption that your VHF station might be a little slow. Spread the word that you'll be on a certain VHF frequency at a certain time to exchange a Field Day contact and to relay messages. Gather up the messages and then relay them on your section traffic net or to someone who is not participating in Field Day who can send the messages on their way.

Power sources should be considered in any emergency. Batteries only last so long without being charged, and you may not be able to go to a local gas station to get more fuel for the generator. Remember that most, if not all, gasoline fuel pumps require electricity. What are the options? The ARRL suggests solar, wind, methane, or water power.

Finally, make sure you invite Emergency Management, Weather Service, Red Cross, or other officials of the agencies for which your group supplies communications. By having them visit the site, you qualify for additional bonus points. More important, they will have the opportunity to see hams in action away from the comfort of a meeting room. If they are looking at the demonstration stations, this may be a good opportunity to talk about how a particular mode of operation would be beneficial to the community and how your group could provide these services with a little extra funding.



Inviting public officials to Field Day is very important in helping promote the image of hams serving in the public interest. (Photo via WA3PZO)

Has Your Group Become Repeater Dependent?

This is an interesting question for a public-service group that is pressed into service when communications fail and the power goes out.

Amateur radio clubs in Pennsylvania sponsored separate 2 Meter FM contests to spark some interest on the band. The concept was simple. Take a 4 hour period on a Saturday night and make as many contacts as you can within either a 150 mile radius of Pittsburgh, PA or a 60 mile radius of Philadelphia, PA. The exchange included a contact number and location. Pittsburgh used a town and county for the location. Philadelphia used zip codes. The Washington Association of South Hills and the Holmesburg Amateur Radio Club both reported outstanding success with the event. In the Philadelphia area the contest was won by Susan Persing, K3SUE, of Trooper, PA. She won by one contact!

Why talk about a contest in the public-service column? The top three stations in the Philadelphia area were all members of their local RACES or ARES group. According to Bob Lees, W3ZQN, Montgomery County, PA RACES Radio Officer, the contest gave participants the chance to see what they could do without the use of a repeater. Rich Shivers, KB3FGJ, of Philadelphia, submitted an entry using 1 watt.

"Being new to the hobby, this was my first contest, and I really enjoyed myself," said Rich. "I learned a lot about my equipment's capabilities, and it has given me ideas for improving my station efficiency. I also learned more about operating practices."

Think about it. This may be a simple contest, but the benefits are worthwhile. Here's an opportunity to learn about your station's capabilities and your

group's capabilities in serving your community if the day comes when the local repeater doesn't work. It's also an opportunity to publicize your group and show that you can have fun while learning at the same time.

Towers in the Name of Public Service?

A problem between a ham and his neighbor was brought to my attention. The neighbor was upset over a case of interference to his stereo system and the sight of a 75 foot tower in the ham's backyard. One of the first claims was that the ham's station was available to serve the community in the public interest. While it was clear that the ham would make the station available, a question that has to be raised is whether a 75 foot tower is necessary to serve the local community. With much public-service work being done on VHF or 75 meters, the need for local or state support with a 20 meter beam could be questioned. The issue, however, is not whether or not this particular individual could or could not justify the need for a 75 foot tower. The issue is to make sure you are on solid ground with public-service work in your area the next time there is a tower problem.

Does the Public Know You are There?

How many events does your group provide communications for? A walk-a-thon? Bike-a-thon? Marathon? Even if the answer is just one, the more important question is how many participants know that amateur radio is providing a valuable service in the public interest.

Recently the March of Dimes offered one Philadelphia area club the opportunity to place a flyer in each participant's registration package. The Holmesburg Amateur Radio Club flyer will go to some 700 participants in the walk-a-thon. The brochure talks about the exciting world of ham radio and the activities of the club, and extends an invitation to learn about and join an exciting hobby. The walk had not taken place at deadline, but it sounds like a neat idea to help spread the word about ham radio.

Public-Service Training

The ARRL announced that the classroom version of their Emergency Communications Course is now available. To find out where a class is being offered in your area, contact your ARRL Section Manager and/or Section Emergency Coordinator. The classroom course registration fee is $50 for non-ARRL members and $20 for ARRL members. Those wishing to take only the Certification Examinations (on the basis of their experience, rather than taking the course) must pay an exam administration fee of $5. Course manuals are $10. Manuals must be ordered in advance and currently are not available except through the ARRL Certification and Continuing Education Program. The ARRL is continuing to offer their course on-line. Watch their bulletins for updated information. Address any questions to <cce@arrl.org>.

A Lot Going On

Through the various reports this month you can see there is a lot going on in the world of public service. We want to hear about how you are providing public service in your area. Have you been involved with a drill, a "thon," a disaster? Are you using technology to enhance your value in public-service communications? We want to hear about all of these. Drop me a note or an e-mail. Until next time... 73, Bob, WA3PZO

Amateur Satellites

BY PHILIP CHIEN, KC4YER

Ham Radio in Space

Mars Odyssey on Its Way—UHF Tests Due June 4

The Mars 2001 Odyssey (April *CQ*, page 56) was launched on its first attempt on April 7, 2001 at 11:02 am EDT (15:02 UT). The UHF radio, which operates in the 70 centimeter ham band*, will be turned on for its tests with the 46 meter dish in Stanford, California during the week of June 4th.

The UHF relay is not a critical part of the Mars Odyssey mission, but it does enhance future surface exploration missions. Martian landers typically will have two methods of returning data to the Earth—a highly directional direct microwave signal plus an omnidirectional UHF relay. The omni antenna will be used whenever one of the operational relay orbiters (Mars Global Surveyor, Mars Odyssey, or future spacecraft in orbit around Mars) is over the lander's horizon. The spacecraft on the Martian surface (or conceivably even a balloon or airplane cruising through the Martian atmosphere) would need only a relatively low power transmitter to send its data to the nearby orbiter. The orbiter would then use its much more powerful transceiver and directional antenna to relay the data back to Earth. It's a significant improvement.

Dr. Firouz Naderi, the Mars Program Manager at the Jet Propulsion Laboratory (JPL), said, "Odyssey will serve as a relay for the Mars 2003 twin rovers. They can double the volume of data they can bring back if they use Odyssey as a relay." In addition, the relays can be used to monitor spacecraft as they enter Mars's atmosphere. If everything goes right, the data isn't very important, but if things go wrong, as Mars Polar Lander's entry did in 1999, an engineering beacon (if there is one) may be able to explain why the spacecraft failed. Regrettably, Mars Polar Lander didn't have a beacon because it entered on the far side of Mars, out of view of the Earth.

Rise [UTC]	Transit [UTC]	Set [UTC]	Elevation [deg]	Range [km]
20010604.055400	20010604.064200	20010604.073100	10.78	19266677.4
20010605.054300	20010605.063800	20010605.073500	11.03	19726912.1
20010606.053300	20010606.063500	20010606.073800	11.29	20194534.2
20010607.052400	20010607.063100	20010607.074000	11.54	20669004.6
20010608.051500	20010608.062800	20010608.074200	11.79	21151100.6
20010609.050700	20010609.062500	20010609.074300	12.04	21640612.9
20010610.045900	20010610.062100	20010610.074500	12.28	22137312.2

Table I– Preliminary information for Mars UHF relay test from Stanford, California for the week of June 4th.

Relay tests for the earlier Mars UHF relays occurred shortly after launch when their spacecraft were much closer to Earth. However, Mars Odyssey's unique launch profile results in an extremely southern trajectory which doesn't come above Stanford's horizon until now. Hams interested in listening for Mars Odyssey's signals should tune to 437.100 MHz during the week of June 4th. See Table I for specifics on when to listen and where to look. Also, check out the Mars Odyssey UHF test website at <http://mars.jpl.nasa.gov/UHF/>.

Space Station Alpha Update

During their post-flight debriefings and interviews the Expedition 1 crew confirmed what had been anticipated ahead of time and deduced by those following the progress of the ham radio rig aboard the space station.

The ARISS (Amateur Radio on International Space Station) team had always planned to mount a set of HF, VHF, UHF, and microwave antennas on the exterior of the Russian Service Module, but the antennas were not ready in time for the STS-106 mission in August 2000. Thus, an interim solution was developed using the existing Sirius antenna on the FGB (Functional Cargo Block). The key disadvantage is that the FGB doesn't have any windows. While this may not seem like a problem, it is for the crew, because most space travelers note that the most beautiful thing about being in space is looking at the Earth. Putting the ham rig in the FGB automatically reduced the amount of interest in using it.

The external antennas have finally been completed and are scheduled to fly to Alpha on the STS-105 mission next month (July). Once they're mounted on the exterior of the Service Module by the Expedition 3 crew, the ham rig can be installed in the Service Module next to one of the windows.

Even more important is the crew's schedule. Expedition 1 Commander Bill Shepherd, KD5GSL, noted that the crew had less than 10 full days off out of their 141 days in space, the equivalent of continually working 13-day weeks! They did get small pieces of leisure time each day and watched several movies. Hams always have to remember that the space station crews were sent into space to build a space station—not sent on a DXpedition!

Overall the crew was extremely complimentary about the quality of communications via ham radio. Many times Shep commented that the quality of the signal on the ham rig was far better than their "official" radios, VHF radios through Russian ground stations, and S-Band internet-like video conferencing via the U.S. Early Communications system.

Sergei Krikalev, U5MIR, said, "We were surprised with the good quality of ham radio. At times the link on ham radio was even better than the link with mission control. Maybe part of it [was that] we had a pretty tight squelch on this radio. On the other hand, we were not able to talk with small and weak radios as we did on Mir, where we could manually adjust the sensitivity of our receivers."

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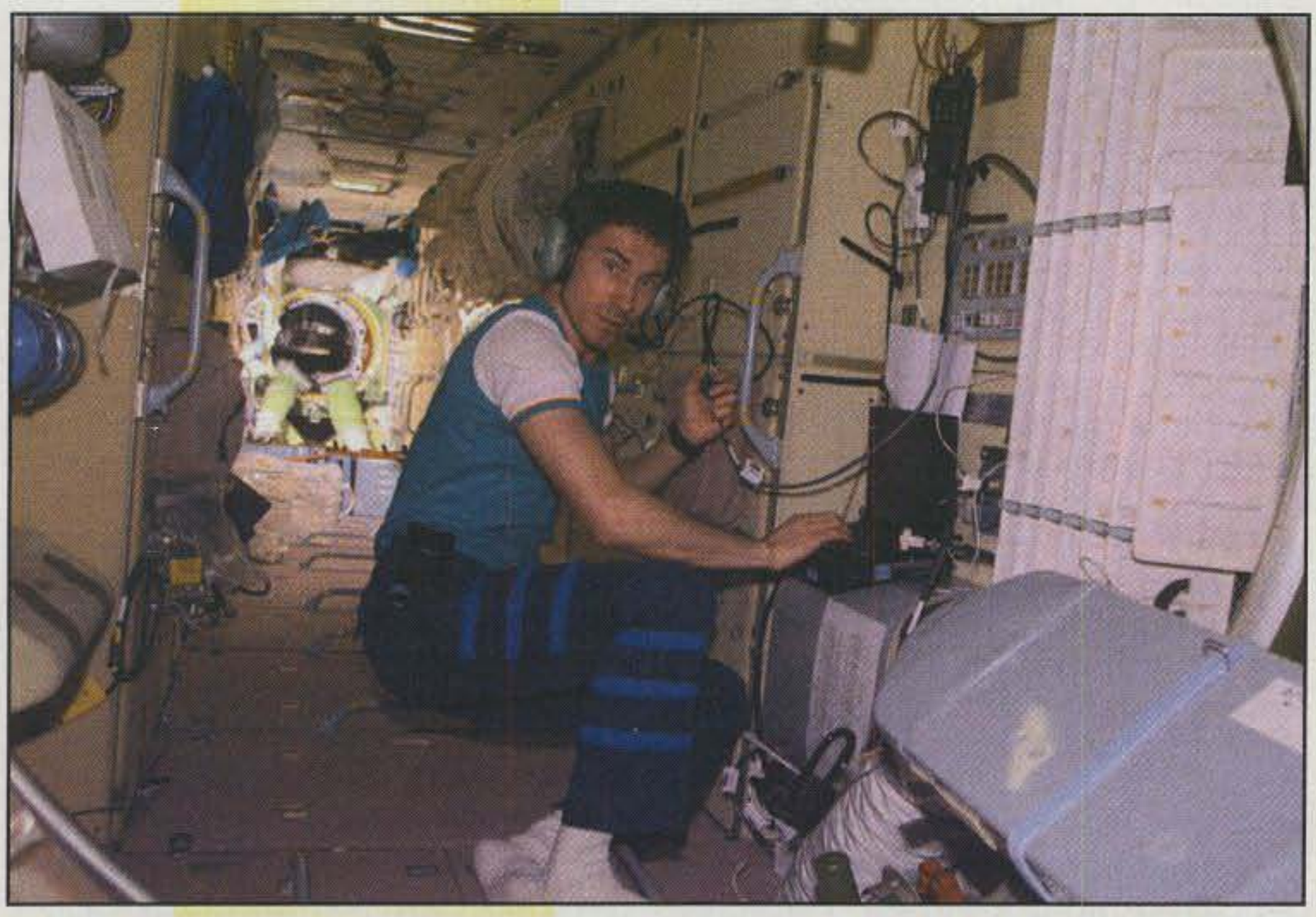
** Note: Before anyone protests the use of "ham frequencies" for this purpose, there are two things to remember: (1) The amateur radio allocation on the 70 centimeter band is secondary to government uses. This actually protects ham radio use of the band. As long as government agencies such as NASA feel this band is essential for their purposes, it is highly unlikely that it will become "auction fodder" by the FCC; (2) FCC allocations apply only in places within the FCC's jurisdiction. There are no "ham bands" in interplanetary space or (as far as we know) on Mars.—W2VU*

Closeup of the Mars Odyssey UHF quadrafilar helix antenna (NASA photo)

Testing the Mars Odyssey UHF antenna. (NASA photo)



Sergei Krikalev, U5MIR, making a rare ham radio contact from the space station. (NASA photo)

It would have been nice if the packet rig could have been left operating in an unattended mode, but unfortunately, technical problems conspired to prevent that from happening. The rig was checked out on the ground in early 2000 before it was shipped to the space station. The lithium battery which maintained the settings should have lasted for several years, but for some reason it appears the battery failed. This battery stores the parameters whenever the packet module isn't powered. The battery isn't necessary as long as power is available to the packet module. Even with a failed battery there's a simple solution: hook up a laptop computer to the packet module and download the correct parameters. The problem is paperwork and crew time. Each time a computer is moved from one module to another it has to be documented and approved by ground controllers. There is no dedicated space station ham computer, so one of the other notebook computers has to be borrowed for that purpose. Regrettably, the crew never had the time to complete the task.

In early April, after the Expedition 2 took over on the space station, a "fudge" was put in place to get some use out of the packet rig and to permit the ham community to use Alpha. The crew was asked to make sure that they left the packet module and radio powered on whenever possible with the frequencies set for the packet mode (145.80 MHz down / 145.99 up). This way, the packet module could be use in UNPROTO mode to permit hams to transmit one-line messages to each other. It worked, and within a couple of days hundreds of hams were making contacts via space station Alpha. The default callsign in the packet module is NOCALL, but fortunately the FCC rules specifically exempt amateur satellites from any callsign requirements.

By the time you read this article the Expedition 2 crew hopefully will have had the opportunity to hook up a laptop computer and reset the packet module with the correct parameters, including the space station's callsign. At least the general worldwide ham community can finally contact the International Space Station.

Space Station Myths

Some dangerous myths and half-truths have been spread about how the space station maneuvers. Contrary to popular opinion, the space station does not maneuver often as that wastes propellant.

The space station is an extremely large vehicle and it has a lot of drag. At Alpha's altitude periodic reboosts are necessary to stay within the proper altitude range. In the space station international agreement propellant is a Russian responsibility, to be launched to the space station on the automated

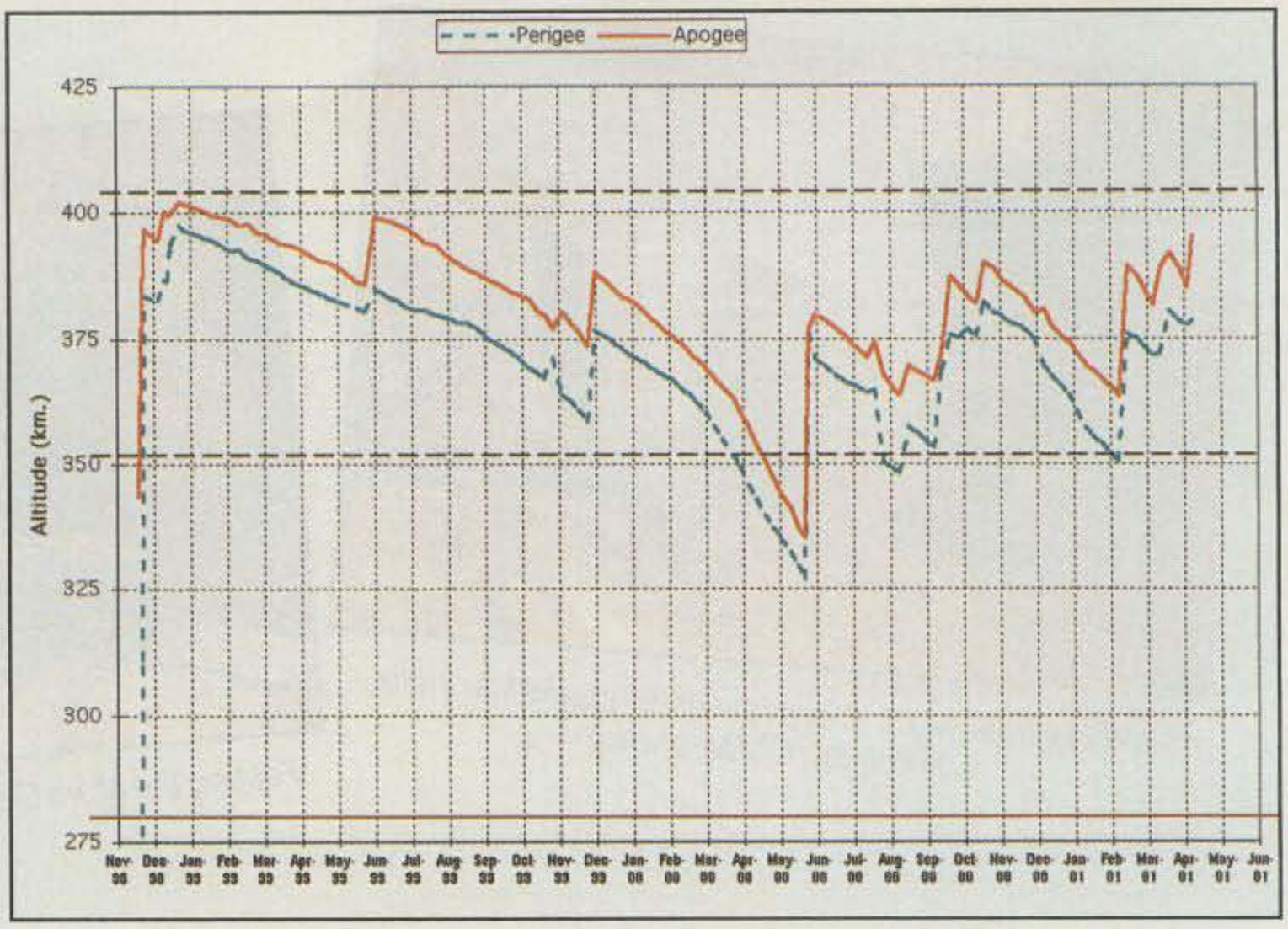


Fig. 1– The space station's altitude vs. time curve.

Progress freighters. Each kilogram of propellant on Progress is an extremely valuable space station asset, especially due to the Russian economic situation. On the other hand, once a shuttle mission re-enters, any excess propellant is worthless. In fact, it's a hazardous substance which is dangerous and expensive to get rid of. The logical solution is, whenever practical, to use excess shuttle propellant to reboost Alpha. A typical shuttle flight has enough excess propellant for about 18 km (11 miles) of reboost. Having the shuttle perform reboosts minimizes the amount of propellant the Progresses need to launch. This translates into either replacing propellant with more cargo on the Progress or needing Progresses less often. In some cases shuttle reboosts are not performed for operational reasons (e.g., a reboost would result in too high an altitude for the next shuttle arrival).

Besides reboosts to make up for orbital drag, there are a couple of additional reasons for space station maneuvers. Dodging orbital debris is a very real threat, but it doesn't happen often. To date, only one reboost has been performed with the space station's thrusters to avoid space debris coming too close. A couple of additional reboosts to avoid debris have been performed by the shuttle while it's been docked to Alpha. In rare cases the space station's altitude is lowered. When the Russian Service Module was launched, the FGB-Node combo already in orbit lowered its altitude to meet the Service Module.

In addition, "phasing" maneuvers tweak the space station's orbit relative to the ground. The key reason for these maneuvers is the Russian Soyuz. The Soyuz is a fairly small, cramped spacecraft. It's desirable to keep the crew inside for a maximum of three days, so launch dates are chosen for minimum duration rendezvous profiles. Maneuvering Alpha to the correct orbit minimizes the length of free-flight time for the Soyuz. The shuttle is a bit more flexible and doesn't require phasing maneuvers by Alpha. It's normally highly desirable for the shuttle to do a flight day three rendezvous (docking with Alpha about two and a half days after launch), but under certain circumstances a flight day four rendezvous may be required, giving the shuttle crew fewer extra resources for their on-orbit docked period. In other words, yes, it is rocket science!

Fig. 1 shows the apogee (high side of the orbit) and perigee (low side) of Alpha since the launch of the FGB in November 1998. Note the "sawtooth" shape of the curve and each of the reboosts while the shuttle was docked. The dashed lines indicate the desirable "floor" and "ceiling" of the desirable range. Note that in May 2000 it went below the floor due to the delays to the Russian Service Module, a high solar cycle, and delays to the STS-101 shuttle mission.

Washington Readout

BY FREDERICK O. MAIA, W5YI

Regulatory News In The World Of Amateur Radio

UK Looks Ahead to Ham Radio Without Morse Code

"If amateur radio is to survive, we need to encourage more people, particularly youngsters, into the hobby. The Agency believes that there should be a relatively simple entry point into amateur radio to get people started (a Foundation License). This entry point would require minimal qualifications and allow newcomers a first taste of amateur radio. Our initial thoughts are that applicants will need to have completed a short competence based practical course which would cover the basics of amateur radio; safety, operating techniques (including on-air training under direct supervision), basic license conditions and basic technical knowledge. At the end of the course, a simple multiple choice examination would be conducted by the course tutor. Ideally these courses would be run through approved amateur radio clubs." [Excerpted from a Public Notice posted to the UK Radiocommunications Agency website]

A novel amateur radio restructuring proposal is now under serious consideration by both the Radio Society of Great Britain and the UK's Radiocommunications Agency (RA). The RSGB is the United Kingdom's national amateur radio society. The new license structure is the result of a "Future of Amateur Radio Examinations Working Group" chaired by RSGB Council Member Richard Horton, G3XWH. The new concept is basically an "apprentice" type licensing process. The purpose of the Working Group was two-fold:

1. to have a plan for amateur radio after the anticipated removal of the international Morse testing requirement at the 2003 World Radio Conference, and

2. to encourage more people to join the hobby, especially youngsters.

The RSGB Working Group said any recommended qualifications for a ham ticket "...must be 'long term' since the historic 'shelf life' of UK Amateur Radio qualifications...has been 20+ years to date...." G3XWH said, "The objective is...to produce a competent and safe Amateur motivated towards self training in radio communications."

The RA, the United Kingdom's telecom and licensing agency, is already publicly supporting the new lineup, which involves the introduction of a new entry-level license called the "Amateur Radio Foundation" license. Martin Cain, who heads up the CB and Amateur Radio unit at the agency, has been actively promoting the new concept. He said the proposed new license "...is intended to provide an easy entry into the hobby, without the need for extensive technical knowledge currently required to pass the Radio Amateur's Examination (RAE)." He added, "It is hoped that as their interest grows, 'Foundation' license holders will, in due course, progress to a 'Full' Amateur Radio license."

The RAE is a two-section multiple-choice examination held twice yearly at City & Guilds Examination Centers. It tests electronic theory, license regulations, interference, and operating procedures. There is also an NRAE, a 30-hour Novice course and exam, administered by the RSGB and run at local radio clubs and schools. The RSGB network also administers the 5 wpm and 12 wpm code exams.

The Radio Society of Great Britain initially published information on the new Foundation license proposal in the December issue of its monthly journal *RadCom,* with additional input from their membership requested in the February 2001 issue.

It appears, however, the Radiocommunications Agency's initial concept of the new Foundation license is somewhat different from that of the RSGB. The RA mentioned on its website that "As qualifications are minimal, operation would be limited to the VHF amateur bands and only commercially produced equipment would be permitted. Power would be limited to 25W with antennas restricted to omnidirectional dipoles."

On the other hand, the RSGB Working Group firmly believes that HF access should be available to all license classes, including the Foundation license, and that operation with non-type-approved equipment and systems—that is, the ability to "home brew" gear—must be included.

The committee feels that the advent of inexpensive wireless telephones "...has made low power VHF entry level Amateur Radio qualifications less interesting to newcomers..." and they believe "...additional motivation is needed to attract newcomers into the hobby via practical work, especially through 'hands on' HF experience."

While agreeing that VHF/UHF experimentation "...affords excellent challenges for the more technically oriented amateur, this activity normally falls outside the competency of newcomers," the Working Group strongly feels, "...in order to encourage the 'self training' aspect, an HF entry route is needed."

The responses from the RSGB membership have now been examined and another document has been prepared for submission to the RSGB's leadership and the RA for their consideration. Following is a capsule version.

Future of Amateur Radio Exams—The Next Step

The Working Group re-emphasized that any new licensing structure "...needs to be *'future proof'* and reflect a future of rapidly changing technology." The new scheme provides for only two license classes, Foundation and Full, and includes a novel provision for supervised radio operation and specialized study in areas that the candidate selects.

The RSGB committee considers the two-tier model simpler and more logical. However, there are several factions (including the UK Radiocommunications Agency), that believe a three-class system may be better. One group has a level inserted between Foundation and Full. "If a three-tier structure were favored, separation could be based on power; for example: Foundation 10W, Intermediate 100W and Full 400W," they said.

The RA's Public Notice suggested a new three-class lineup might be called Foundation, Intermediate, and Advanced. "All would require the basic competence course, while the Intermediate and Advanced would require additional qualifications," RA said in its website notice. "Providing there are sufficient callsigns, we would prefer to

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retain different callsigns for each class. It would be necessary to transfer existing licensees into the new classes...," the Regulatory Agency said.

The RA mentioned that "Consideration was given to making [the Foundation license] a short-term license, meaning that after three years the individual would be required to move on to the next level. However, this idea was rejected because it was felt that it was better to keep people in the hobby rather than forcing them to give up if they did not wish to progress to a more advanced level." The RA added, "It should also be recognized that Amateur Radio should provide an element of choice and some people may be quite happy to stay at this basic level."

At present, Great Britain has four license levels: Novice (there are two variations—Novice "A" requires 5 wpm code and Novice "B" is a no-code version), Class B (no code), all-band Class A (12 wpm code) and the new Class A/B (5 wpm code). All except the VHF/UHF Class B tiers requirs telegraphy proficiency. Class A, B, and A/B licensees get station callsigns with a "G" or "M" prefix; Novice callsigns begin with the numeral 2.

The RA lineup proposal envisions that current UK Novices would automatically qualify for the new Intermediate Class, with existing Full Class A, Class A/B, and (no code) Class B progressing to the new Advanced license.

Another possibility being evaluated by the RSGB is a new "top-of-the-line" Extra Class license positioned above the proposed Foundation/Full structure with a higher power authorization of perhaps 1 KW. This would require a higher level of proficiency (for example, more EMC/RFI subject matter), which would be verified through an examination or interview.

Amateur Radio Requirements

The UK Working Group believes that the amateur radio qualifications of the future should be based on three ingredients: a knowledge segment, a functional segment, and a safety segment:

1. The **Competent Element** suggests constructional and operational expertise, as well as basic theory knowledge centered around a "need to know about" approach.

2. The **Safe Element** refers to EMC knowledge, necessary license conditions as well as electrical safety, plus general non-interference principles with regard to other spectrum users.

(*Note:* EMC stands for ElectroMagnetic Compatibility, or the ability of receiving and transmitting equipment to coexist with each other without mutual interference. In the United States, EMC problems are usually referred to as RFI, Radio Frequency Interference.)

3. The **Practical (or constructional) Element** should be based on an established, relevant, simple project which will produce an affordable but useful end product—for example, the construction of a QRP transceiver, an item of instrumentation, an antenna, or even software. "In a sense we are saying that a 'hands on,' learning-by-doing approach is likely to lead to higher levels of interest.

"One of amateur radio's strengths over the years has been its great variety of specialized interests. This variety needs to be reflected in the candidate's preparation to hold a license. We believe, therefore, that while the safe element, including as it does such topics as EMC, regulations, and so forth, should be a compulsory element, the competency element should reflect the candidate's personal interests. There should, therefore, be a number of possible ways this part may be achieved.

"...Actual amateur radio operation under the supervision of a license holder should be an integral part of all training courses. There are two aspects to this. The first is the maintenance of the level of interest of the candidate, but the second is to provide an opportunity for every radio amateur to work to bring new radio amateurs into the hobby."

The UK Foundation License

The RSGB envisions that the key elements of the Foundation license would be a 10 watt power limit on all current amateur radio bands, a practically-based training course, operation under supervision of a licensed amateur, and construction of a simple kit. The "modular route" involves completion of a series of compulsory and elective modules, with possible exemptions based on prior accomplishment (such as the completion of a science project).

Compulsory Foundation Modules include safety, international and national regulations, and resolving interference. Basic knowledge of radio and electronic theory would be covered together with practical station operation under supervision.

Elective Foundation Modules are chosen by the candidate and could cover topics such as additional construction projects (i.e., antennas), specialized emissions and techniques (i.e., ATV, satellite, digital, etc.), Morse code,

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software and interfacing, advanced RF techniques, contesting under supervision, .and the like. Emphasis would be on learning by doing.

A Foundation license course workbook would be made available and would cover all compulsory and potential selected modules. It would be signed off by the instructor when the required competency level has been reached. Tutors would come from the RSGB instructor network. The Working Group has already drafted a sample competency-based study workbook for use by the candidate and instructor.

UK's Proposed Full License

The RSGB said the Full license examination would not include topics that have already been covered in the Foundation licensing process. It would be equivalent to the current Class A license, which allows 400 watts and all privileges on all bands. Passing the Foundation license would be a prerequisite to holding a full license. The higher level competency examination would consist of a revised and shorter syllabus than the current RAE model, since there would be no need to duplicate the Foundation elements.

Foundation License Operation Prior to WRC-2003

The Working Group suggested that as an interim measure a "Foundation Certificate in Amateur Radio" could be implemented sooner than 2003 if...

a. The applicant has a tested knowledge of the individual Morse code letters, but not at a particular code speed. This would satisfy the current international regulations which require manual recognition of Morse code signals as a pre-requisite to HF access;

b. The on-the-air operation is under the direct supervision of a licensed amateur who would be responsible for the Foundation licensee's transmissions.

The Foundation Certificate in Amateur Radio would permit 10 watt operation on all bands if the applicant has already passed the written RAE theory exam (or Novice NRAE course). Otherwise the operation must be under an amateur's supervision during the certificate course.

When operating under supervision, the instructor's callsign would be used together with an appropriate appended suffix. Once the applicant earns a regular Foundation license, a new callsign from a different series block would be issued.

The Working Group believes that this

"bridging solution" will be capable of rapid—almost immediate—implementation and will satisfy the desire for an attractive "hands on" introduction to the hobby and lead smoothly into the longer term proposed license structure.

We now understand that a meeting has taken place between the RA and the RSGB with the agency acknowledging that "...a way may been found to possibly allow use of the HF bands by Foundation licensees" and that "...the International Radio Regulations do not specify the speed of the tests, but rather require that 'a knowledge of Morse' is sufficient." The RA acknowledged that it is "...looking at what we can do before [the Morse requirement is dropped]" and at allowing other than omni-directional antennas. It was also announced that the RSGB is contacting commercial radio organizations "...to sponsor private funding of amateur radio to stimulate the increase of radio engineers."

Western Europe Adopts 5 wpm Code Standard

In unrelated news, the Conference of Postal and Telecommunications Administrations (CEPT) has agreed to reduce the Morse code requirement across western Europe. The amateur radio telegraphy requirement was first discussed at a Working Group meeting held January 24–28, 2000 in Helsinki, Finland.

CEPT, created in 1959 by 19 European countries, is a federation of postal and telecommunications authorities. It seeks to have uniform regulations and procedures across the continent. Today it consists of administrations from 43 European countries.

Its recommendations document T/R 61-02 covers the examination requirements for the Harmonized Amateur Radio Examination Certificate (HAREC). CEPT members across Europe recognize HAREC holders as being qualified for long-term amateur radio operation in their respective countries. Until recently, these requirements included 12 words-per-minute Morse proficiency, even though many CEPT and non-CEPT countries required lower speeds. For example, CEPT members Denmark and Sweden require 5 wpm as their top speed. It was further understood by CEPT that there are administrations which are considering not requiring any Morse code test at all in the future.

At a recent meeting in The Hague (Netherlands), CEPT's Radio Regulatory Working Group (WGRR) adopted a revision of Recommendation 61-02 to include a new 5 wpm Morse code sending and receiving standard of 3 minutes duration with a maximum of four uncorrected errors. The European Radiocommunication Office (ERO) published the revised version of T/R 61-02 on March 6, 2001.

The revision establishes the telegraphy requirements for HAREC, which confirms that the holder has successfully passed an amateur radio examination which complies with the Examination Syllabus for the HAREC level A (full privilege license) or B (VHF/UHF).

It was not necessary to change the requirements in T/R 61-01, since no particular Morse code exam speed is mentioned in that document. Recommendation 61-01 covers short-term visits to other CEPT nations.

In other CEPT news, the United Kingdom was elected as the next president of CEPT to take effect October 1, 2001 when the term of Norway's presidency expires. Portugal will take over the presidency after the UK.

The CEPT member countries are Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, The Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia, Turkey, the Ukraine, and the Vatican.

Ripple Effects?

While all of this month's news comes from "across the pond," ripples from events there could affect US hams. First of all, the CEPT's decision to reduce code requirements to 5 wpm will make it easier for US hams operating in Europe under CEPT reciprocity, as there is no longer a conflict between the US 5 wpm requirement and the old 12 wpm rule in Europe. Longer term, if the UK's "Foundation" program is adopted and successful, it could provide a blueprint for the FCC to consider something similar in the future.

73, Fred, W5YI

QRP

BY DAVE INGRAM, K4TWJ

The Art of Low-Power Hamming

Real Radio Fun!

If there is one area of amateur radio that is downright fun, fun, fun, it has to be QRP. I say that because QRP gear is small and affordable, QRPers are a terrific group, on-the-air QRP activities are endless, and QRP is a homebrewer's haven. As our opening photo also illustrates, QRP blends with every imaginable form of personal creativity and expression. Ah, you ask, but does QRP go the distance? Yes indeed, and that fact is being proven in on-the-air QSOs almost every day. Only one weekend before writing this column, for example, I logged several pages of solid contacts from South Africa to western Australia while running a scant 5 watts of power in the ARRL DX Contest. Furthermore, a fair number of stations I worked were also running QRP—and their signals were surprisingly strong.

The fireside SSB contest sponsored by the QRP Club International was held the previous weekend, and it too was a big event for low-power action. Even amidst numerous 20 meter sideband signals, QRPers worked each other like they were running big rigs. In particular, I noticed a VE doing very well while using a classic Ten-Tec Argonaut at 2 watts with no speech compression. Again, while running only 5 watts I worked every station I called, and my antenna for both contests was a Hy-Gain AV-640 vertical with its base only 5 feet above the ground.

Are my words of encouragement blinking your lights yet, friends? Real radio fun is alive and well in QRP, and right now is the most favorable time ever to be on the air with low power. Stop wasting precious time. Fire up your favorite mini rig and have a ball QRP'n to the max!

Boot Scootin' QRP

It was destined to happen, especially considering the high popularity of scooters and the extreme portability of QRP. The only real question was should the scooter be motorized or manually powered. Now Megan Stubbs rolls out the answer with the cool-going boot scootin' mobile QRP setup in photo A. Yes, and it is big-time radio fun all the way with a new MFJ-9340W "Cub" transceiver plus MFJ-550 hand key strapped to the handlebar, an 8 foot MFJ-1640T "Ham Tenna" whip, and an MFJ-342 mirror-type antenna mount. A small power pack built around MFJ Ni-MH batteries

Photo A– Boot Scootin' QRP! Megan Stubbs, daughter of Lori and Richard, KC5NSZ, Stubbs (MFJ's main Customer Service Representative) shows us how to roll out the QRP fun anywhere, anytime. The high-tech scooter is equipped with an MFJ "Cub" transceiver, MFJ hand key, MFJ mobile Ham Tenna and mount, and custom-brewed power pack made with MFJ Ni-MH batteries. (Photo courtesy Richard Stubbs, KC5NSZ) →

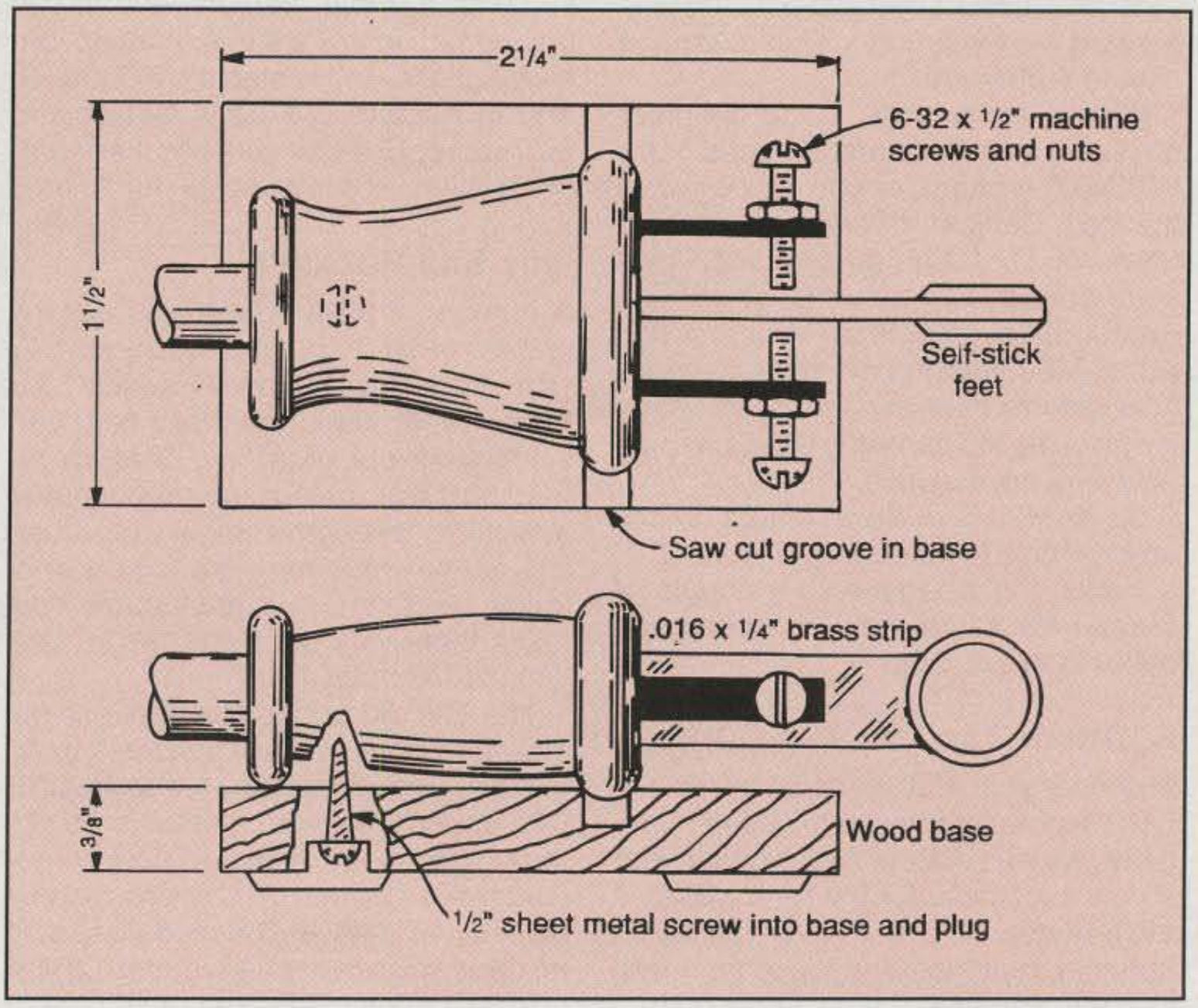

Fig. 1– Assembly outline of the N1UIY power-plug paddle. Even if you could resist making your own copy of this gem (which I doubt!), I'm sure you will never look at an AC plug the same way again!

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Photo B– Hot off the R & D bench at MFJ is this new, optional "Tuner top" for the popular Cub transceiver. It contains a small antenna tuner that matches everything from dipoles to random-length wires plus a power/SWR meter for easy in-field use. Note: Tuner top shown is the prototype of Martin Jue, K5FLU; the final production unit (which should be available very soon) may look slightly different. (Photo courtesy KC5NSZ and MFJ)

Photo C– MFJ's ever-popular '90 series CW QRP transceivers exhibit good sensitivity and selectivity and a solid 5 watt output signal. Units sport adjustable QSK and RIT top-mounted speaker and are well on their way to being classic. (Photo courtesy KC5NSZ and MFJ)

is fitted into the handlebar section. Since the scooter is metal, its frame makes a good counterpoise or ground plane for the setup. Neat!

We have been trying to keep track of this spiffy little speedster, but it's been difficult. At last report, Papa Stubbs (KC5NSZ) had commandeered the scooter, loaded it with snacks, and was headed west wearing a T-shirt reading "Route 66 Bound!"

Megan, incidentally, is the daughter of Lori and Richard Stubbs, Jr., KC5NSZ. Richard, as you may know, is the main Customer Service Representative of MFJ Enterprises, Inc. That should help explain why everything except the scooter is an MFJ product. An all-MFJ setup is not too surprising here, as this ever-expanding company is one of the top names in amateur radio gear and accessories.

Since MFJ is in the spotlight, this is an ideal time to take a look at their QRP goodies. Let's begin with a couple of brand-new items making their grand debut in this column.

A "Tuner Top" for The Cub

The neat little Cub transceiver on the QRP scooter continues to rise in popularity among QRPers near and far, and a new accessory for the gem makes it even better. As shown in photo B, an optional replacement top cover with integral antenna tuner, SWR bridge, and power meter is now available for the Cub. The new tuner matches everything from short dipoles to random-length wires, and it is super-handy for making the Cub a stand-alone and go-anywhere rig. As you may recall, the Cub debuted in this column slightly over a year ago. Since then I have used mine successfully in several QRP contests and heard many more on the air. It has a sensitive, selective receiver with enough audio output to drive a small speaker, a 2 watt transmitter that can be hopped up to 4 watts with an optional transistor, and a stable VXO circuit. The monoband CW rig is available in 80 through 15 meter versions, kit or pre-assembled, and is just plain fun to use.

'90s Still Rockin'!

A number of folks continue to ask my opinion of MFJ's popular 90 series CW QRP transceivers and 94 series SSB transceivers, and I must say both versions work out great and hold up remarkably well. In fact, their widespread availability through amateur radio dealers nationwide, easy switch-on-and-enjoy operation, and reasonable cost make them very good choices for getting started in QRP.

The CW 90 series transceivers (as shown in photo C) are available in 40 through 15 meter versions, and the SSB 94s (photo D) are available in 75 through 6 meter versions. Add an optional MFJ-726 narrow CW filter to a 90s rig or an MFJ-415B CW module to a 94 rig , and you are set for big-time QRP'n in style. I particularly like the MFJ-9420 SSB 20 meter "travel radio," as it works well for both QRP'n and mobiling. The little rig pumps out a 12 watt signal and also has a quite effective speech compressor, giving it the "talk power" comparable to a larger (and more expensive) transceiver. I have seen both 90s and 94s banged around horribly, operated into improper antennas, etc., and they just keep on working!

Another item everyone should find attractive is the 13 volt/1.2 amp MFJ-4110 wall-adapter-type power supply (photo E). This two-piece unit is hefty enough to power any of the MFJ QRP transceivers and most other 5 watt transceivers with solid voltage stability. The giant wall wart also supports my own personal philosophy that a power supply really should not be larger than the rig it powers, or the beauty and portability of QRP is lost.

If you appreciate total flexibility in a QRP rig, incidentally, consider gearing up with a complete/integrated MFJ mini-station as shown in photo F. It consists of a selected monoband transceiver, wide-range antenna tuner, dipole antenna, and 13 volt/1.2 amp AC power pack that can also be loaded with D cells for stand-alone use in the field or at the beach. Nice!

So what is the bottom line? Fun—sheer QRP fun and lots of it. Also, as our overview of time-proven and always popular MFJ gear illustrates, you need not be a techno-whiz or invest a small fortune to join the game. Give QRP a go. You'll love it!

Power Plug Paddle

Remember the old adage give a positive thinker a lemon and he or she will make lemonade? Well, someone gave

← *Photo D– MFJ's '94 series SSB transceivers are widely used by QRPers and light-traveling mobileers alike. Units sport an effective speech compressor, 8-pole 2.3 kHz filter, top-mounted speaker, and solid reliability. (Photo courtesy KC5NSZ and MFJ)*

Photo E– Here is a very small, attractive power supply for QRP—the MFJ-4110. It delivers 13.8 volts DC at 1.2 amps and fits in your coat pocket! (Photo courtesy MFJ Enterprises)

Photo F– Looking for a compact, go-anywhere station complete with power pack, charger, antenna tuner, and SWR bridge? Consider MFJ's mini-station like that shown here. It's a winner!

Roger Allen, N1UIY, an AC power plug without an attached rig, so he turned it into a single-lever paddle for his QRP keyer. Now that's what we call clever creativity supreme! Big-hearted Roger even passed along details on how to homebrew one of the "Plugaplex" paddles yourself. That's right, you can take this unique conversation piece right from magazine description to reality in your own shack in only a couple of hours. Assembly notes in Roger's own words follow.

This single-lever mini-paddle is shown in photos G and H and outlined in fig. 1. It is built around an Eagle-brand "Snap Action," quick-wire, two-blade, non-polarized, 120 volt AC power plug like those used on lamp cords and found in numerous variety and hardware stores.

Assembly begins by removing the plug's core and blades, just as you would do to fit it on an AC line cord. Drill and tap the blade tips to accept 6-32 × 1/2 inch machine screws. Use a thin-blade knife or X-Aacto® razor saw and cut the core vertically into two exactly equal parts. This will allow a .016 × 1/4 inch brass strip, available from hobby shops, to be center-installed between the blades. It will serve as the paddle's main arm.

Next direct a two-conductor shielded cable into the back of the plug's body. Solder one lead to each blade and the shield to the end of the (middle arm) brass strip. Place one half of the plug's cut core on each side of the brass strip and install the blades. Fit the plug's cover in place, then check for shorts. Install the 6-32 × 1/2 inch machine screws with nuts into the blade tips, and then trim the brass strip to a comfortable length and mount two self-sticking rubber feet on the strip to make a fingerpiece. Add a drop of super glue to secure the brass strip and blades to the core and eliminate loose "play."

That completes the paddle's mechanism. Now fabricate the base. You can make it from a piece of wood approximately 2 1/2" × 1 1/2" × 3/8" or use an Altoids tin filled with coins for weighting, as desired. Position the plug-paddle on the base with its blade tips even with one end. Cut a shallow groove into the base where the ridge on the front of the plug contacts the base. Cut it just deep enough to prevent side-to-side movement of the plug. Install a 1/2 inch sheet-metal screw into the base and plug to secure the plug. Attach self-sticking feet to the base, connect the paddle to your keyer/rig, and enjoy!

Options? Finishing touches? Small guitar picks make neat fingerpieces. For real flash you can add a "custom built by [your call]" brass nameplate and dual-color pinstriping to the base. For mobiling, you could mount the mechanism to an inverted (and empty!) 4 ounce size Spam-spread can wrapped with tape so it fits snugly in a center console's cup holder. Think creatively like Roger did, and you too will be a winner. If you have questions or encouraging comments, incidentally, I am sure Rog-

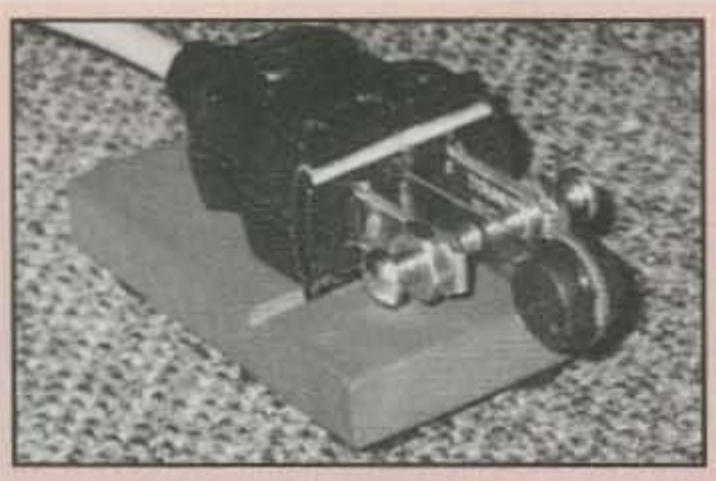

Photo G– Check out this miniature single-lever paddle homebrewed by Roger Allen, N1UIY. It is built around an Eagle-brand, removable, core-type AC power plug mounted on a tiny wood base, and it is a heartthrob. If an Eagle plug is not available, a clam-shell-type GE plug sold at Wal-Mart can be substituted. The GE plug needs only minor trimming to work as a paddle. (Photo via N1UIY)

←

Photo H– The N1UIY power-plug paddle (a Plugaplex?) sits atop Roger's K1 transceiver for size comparison. Roger says the paddle works so well he is considering designating it as a family heirloom.

Photo I– Here is Don Lemley, W8DL, at the helm of his QRP station in Charleston, West Virginia. The QRP rig (which Don favors and has used to work over 75 countries in his spare time) is the 5 watt Ten-Tec 556 Scout to the left of the IC-746 on the top shelf.

er would enjoy hearing from you (P.O. Box 133, Athol, MA 01331). He is a real "Good Guy of Amateur Radio."

Wrap Up

We are almost down to the closing wire, but let's briefly squeeze in one final eye-opening view before sign off.

Many times when folks say they are QRP, unfamiliar onlookers instinctively visualize them as "little guns" running simple "bare bones" gear. Such is not always the case, however. Recently while working Don Lemley, W8DL QRP to QRP, for example, I invited him to share with us a view of his setup. Check out Don's gear in photo I, and you too will say wow! Where is the QRP rig? It is the Ten-Tec 556, or 5 watt version of the 50 watt Scout on the left side of the upper shelf between the rotor's box and the IC-746. Don has an arsenal of neat gear, but says his most favored and memorable activities center around QRP. That makes sense. Two really good DX contacts with QRP give the same adrenaline rush as 50 DX contacts with QRO.

Again I emphasize that *right now* while sunspots are optimum and band conditions are great is the time to be on the air having fun with QRP. Do it—and listen for me weeknights on 30 meters. I will be the weak one running QRP.

73, Dave, K4TWJ

Beginner's Corner

BY PETER O'DELL, WB2D

For the Newcomer to Ham Radio

Ground

There's ground, and then there's ground. And finally, there's ***ground.*** *Right? Confused? You should be, but read on and WB2D will sort out what all this means and what you need to do to protect yourself.* —ed.

Remember the old TV ad for chunks of fried chicken: "Parts is parts"? A lot of people think that "Ground is ground." Not so. As hams we have three separate concepts that we call *ground*. They are not equivalent, but they all are critical. Let's take a look at what is going on and what you need to do to maintain your ham shack safety.

To be safe, there are three general areas for which we have to ground our equipment: AC power line (or DC), lightning, and RF. What do we mean by being safe? The government requires manufacturers to make electrical and electronic equipment safe to use, right? Therefore, things pretty much should take care of themselves, shouldn't they? All my equipment has three-prong power cords. What else is there? Some hams amaze me. They will spend thousands of dollars on antennas and equipment but balk at simple grounding equipment and procedures. You hear them talk about it being too complicated or expensive.

The energy contained in a single bolt of lightning is truly amazing. Let me tell you a couple of stories. I have a friend up north who had a tower in his backyard. It wasn't properly grounded. One day the tower took a direct hit. Instead of standing 70 feet high, only about 30 feet of the tower remained standing. The top four sections blew apart where they were bolted together and/or at welds. However, there was about five feet of it that we never found. Our assumption was that it simply disintegrated from the heat of the 200,000 amps or so flowing through it.

Then there was the repeater housed in a concrete block building up on the hill. Lightning came in on the power line in this case. I don't know for sure, but I doubt that the installation met code. Anyway, what happened was this: The fuse box which had been bolted to the wall exploded off the wall with such force that it hurled through the opposite wall like a cannonball. We found the crumpled, burned box about 30 feet out from the building, and there was this 15 inch diameter hole in the concrete wall. Oh, yes—I forgot to mention that all the equipment was fried.

Enough on lightning? It's serious stuff.

RF ground may not seem as serious to you as lightning ground. After all, no one is going to die of RF burns, are they? To be honest, I have never heard of it, at least not at the level of operation of ham equipment. However, over the years I have gotten my share of RF burns, mostly on my hands and arms. As a rule, faulty RF grounds have resulted in microphones that tickle and other minor symptoms of RF hot spots. There were a couple of times when I got a more serious injury.

I've operated from a lot of apartments and places where it is difficult to get good RF ground. In one case, I had been working CW. After the contact I leaned forward and reached across the antenna tuner for something. I was touching the tuner case and didn't notice that the ground wire had come loose. As I leaned forward, my other hand brushed the "dah" paddle on the keyer. My wrist happened to be touching the case and the ground wire. The resulting burn was about 3/4 inch long and about 3/16 inch wide. Doesn't sound like much, except it was one of the most painful injuries I have ever suffered in ham radio, and it literally took several weeks to heal. I'm sure that after this column appears, I will hear from a bunch of you with your own horror stories of faulty RF grounding.

Of course, AC power grounding is also a life-and-death issue. *Faulty wiring* is the term the news media uses to describe the accidents attributable to electrical problems. It can range from fires to electrical shocks to death itself. K. B. Warner, a ham pioneer who worked for the ARRL back in the '30s, died in just such an accident while working on equipment in his home station.

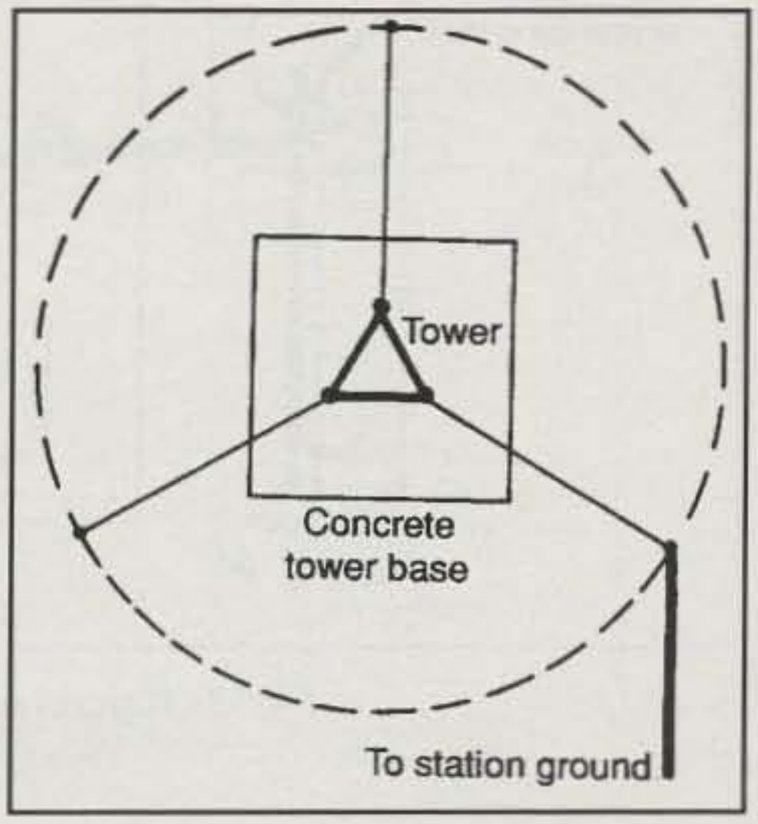

Fig. 1– Properly grounding your tower is an important consideration. (See text for details.)

In a sense, the AC-power ground is the easiest, because the National Electrical Code specifies very exact procedures for grounding any and all electrical equipment. Virtually all equipment sold in this country is designed to conform with the requirements of the NEC. If your home meets code, then it should be safe enough. How do you know if your home meets code? The best way is to have a qualified electrician check it out. I know that seems to go against the do-it-yourself philosophy of ham radio, but the truth of the matter is that wiring a house is more complicated than most people think.

Here's one point that you can check, though. The service-entrance panel should be grounded via a substantial ground rod. Thus, you should be able to locate a large-diameter wire or wire strap coming from the service panel and going to a nearby ground rod about 1 inch in diameter. What you won't be able to see is that it will be about 8 feet long. (You can forget the 3/8 inch diameter by 3 feet long "ground rods" available at your local stereo store/hobby electronics shop; those things are pretty much worthless.) You may find other ground wires attached to this rod, because NEC requires all household grounds to be tied together to create a common voltage reference. Therefore, these ground

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e-mail: <wb2d@cq-amateur-radio.com>
† Figures are based on diagrams in the ARRL Handbook.

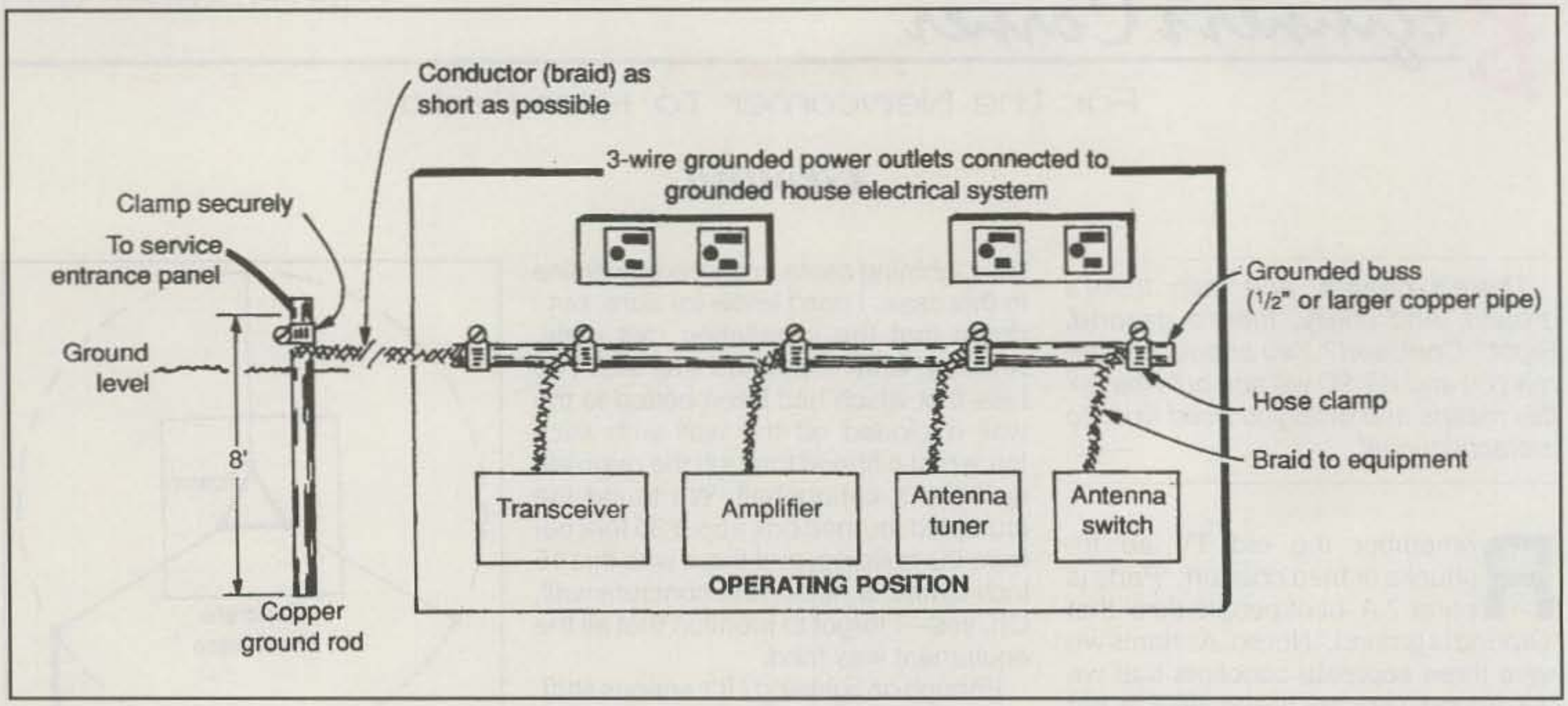

Fig. 2– A good method for approaching station ground. (See text for details.)

wires could be coming from the telephone entrance, cable entrance, etc.

One house I owned seemed to have the ground wire but no rod. When I noticed this it just happened that a crew from the power company was in the area. I asked one of the workers to take a look at it. He found the rod about 8 inches below the surface. Apparently, the previous owner had knocked the ground wire loose by bumping it with his lawnmower. If you have any questions about your electrical service installation, contact an electrician immediately—or grab a guy from the power company if he is in the neighborhood!

Grounding for lightning is another story. Every antenna feedline coming into your shack should have a lightning arrestor on it as well as the rotator cable. Obviously, the lightning arrestors should be located just outside the house and grounded to a good ground. In other words, you probably are going to need to purchase at least one good grounding rod from a local electrical supply house. It should be an inch in diameter or more and at least 8 feet long. Also, it should be connected to the main grounding rod at the service-entrance panel with large-diameter wire or braid. Several *CQ* advertisers offer lightning-protection equipment. Follow the installation directions of the equipment you purchase.

If you have a tower, you need to properly ground it, too (fig. 1†). Each leg of the tower has its own ground rod (1" × 8'), and the ground rods are connected together via a buried loop of copper strap. This ground system is also joined to the main ground at the service entrance and the station ground. You are probably getting the idea that you are going to end up with more buried copper than what you have hanging in the air. That's about the size of it!

A couple of caveats: If your tower is galvanized, you will need to use stainless-steel hardware to connect the tower legs to ground. Copper reacts to galvanized steel when moisture is present—not a good thing. Also, do not solder any ground connections. Why? In the heat of a lightning strike, solder evaporates, leaving you with a poor connection or no connection, forcing the lightning energy to take a different path —probably into your house.

Grounding the station equipment itself is another art form. Fig. 2† gives you a good method for approaching your station ground. Start with piece of copper pipe about an inch in diameter—certainly nothing less than 1/2 inch—and the same length as your operating table/desk. Using short pieces of tinned braid, ground everything to the pipe. By the way, coax braid does not work that well because there is enough surface corrosion to make it a poor conductor. The braid should be attached to the pipe with hose clamps. Copper flashing can be substituted for the pipe and braid, but it is usually hard to find and expensive.

Connect the pipe to a ***nearby*** earth ground via another grounding rod, which, of course, is connected to the service-entrance rod. For RF grounding, the operative word here is *nearby.* That means less than 10 feet! That is possible if you are on the first floor or

basement, but if you are on the second floor or higher, it becomes impossible.

RF grounding for HF becomes very problematic, particularly if you are in an apartment building. I've known hams who have used two different means to provide a good RF ground for such stations. First, you can run 1/2-wave (or multiples) of coax between the station and ground. At the station end, you connect the center conductor, but leave the braid unconnected to the station. At the ground end you connect both the center conductor and the braid. This gives you a low-impedance path to ground at the station, because for a half-wave the impedance at one end mirrors the impedance at the other.

The second method is to use a counterpoise. Here, you simply attach a quarter-wavelength of wire for each band you want to operate. It is sort of like the radials you use with a ground-plane antenna, but here the wire is then positioned wherever it fits. It does not have to be in a straight line. I usually string it around the baseboard of the room I am in and maybe into a hallway or other room for 40/80 meter operation. Since you are likely to have hot spots along it, I would suggest using insulated wire. This is the method I have always used in apartments to get rid of RF problems. If RFI problems develop, you may have to experiment by relocating the legs of the counterpoise. Also, you may get "static" from others living with you, particularly if your wire gets caught in the vacuum cleaner. Once you figure out where it is going, tack it down to prevent these unwanted domestic encounters.

Ground is ground. However, if you value your life, your body, your equipment, and even your home and it possessions, you would do well to spend some time making sure that your station is properly grounded. This will do more for your safety and comfort than anything that I can think of.

73, Pete, WB2D

Call for Photos and Stories

We'd like to hear from you about your experiences as a newcomer. If you have questions, we'll try to incorporate them into future columns. If you have photos (color prints or slides okay) of your station or antennas, please send them along and we'll publish the best ones. If you have a solution to a common problem that new hams experience, we'd like to hear about it so we can pass it along. You can contact me at <wb2d@cq-amateur-radio.com> or Peter O'Dell, WB2D, Beginner's Corner, 123 NW 13th St., Suite 313, Boca Raton, FL 33432.

Computers and Internet

BY DON ROTOLO, N2IRZ

Ham Radio's Online Connection

Building Your Own PC

As hams, many of us are interested in technology. Are you the type who takes that new piece of equipment apart as soon as you get it home to see what's inside before even powering it up? Join the club. But even if you're not, this month's column is for you, as we explore the "guts" of a modern personal computer (PC).

First, we'll look at all the various parts, with an emphasis on selecting the type that's right for you. Then we'll talk about putting them all together. Yes, I mean assembling your own computer!

My primary goal is to ease your fears: The insides of a computer are not nearly as complicated as you might think. We really have a half-dozen or so building blocks which all are joined together by fool-resistant connectors. If you can read and can use a screwdriver, you can assemble a PC yourself. Let's take a look at the major building blocks

Whether the latest Pentium 4 or the old '386 seen here, the basic architecture of a computer has not changed much since the early '90s. Here we see each of the major parts of a desktop system, essentially the same as the newest systems being built today. The main difference is a lower level of integration on the motherboard. Note the 16-bit ISA slots and soldered-in CPU.

We're on The Case

The first item to consider is the case, or cabinet, in which everything is housed. Newer PCs use "Type ATX" cases, which are physically and electrically different from the older "Type AT" cases. Although your choice of motherboard and power supply will depend upon the case type, for a new PC, ATX is the only real choice.

Most cases come with a power supply. Get one rated for at least 200 watts. Select the size that fits at least the number of drives you want—at least three in any case. Cheap cases are spot-welded together, have sharp edges inside, and are made of thinner metal. Premium cases have nice features such as slide-out motherboard carriers, so you can work on the innards without having to remove any of the option cards. If you plan on working inside the PC often, get one of the better cases.

Processor and Motherboard

The next consideration is the motherboard and processor combination, the heart of the system. Make no mistake, the performance of the processor is highly dependent upon which motherboard is being used. Your best bet is to research your choices online (see Resources) or in one of the trade magazines such as *Computer Shopper.* When choosing a motherboard, look for higher bus speeds (100 or 133 MHz) and at least 256 kB onboard Level 2 (L2) cache. Also check out how many ISA and PCI slots it supports (count up your adapter cards, and consider future expansion). Insist on an AGP slot: This slot is used for the video adapter card, and the performance improvement gained over a PCI slot video adapter is considerable.

Your choice of processor is not nearly as critical as your choice of motherboard. Some prefer the well-known Intel processors, but lately both AMD and Cyrix have been producing processors that are superior to the Intel processor of the same clock speed. Verify that the processor and motherboard are compatible; chip socket type, voltage, and speed are key factors. The best way to avoid problems is to buy the motherboard and processor at the same time and have whomever you buy them from configure the jumpers for you. Get a good cooling fan for the processor, too.

With a processor (Central Processing Unit, or CPU), don't waste your money on the very latest and greatest, since the increase in performance as compared to what's more reasonably priced is not that great. For example, a 1 GHz Pentium 4 is available for $1300 as I write this, but a better buy might be the 733 MHz Pentium III for $245. Don't be fooled into thinking that the 1.42 times faster processor offers 1.42 times the performance. It doesn't, even though the price is more than five times (!) higher than that of the slower chip.

Remember the Memory

Buying memory is very simple. Consider the memory form factor and speed your motherboard uses and then buy as much as you can afford, with 64 MB being the absolute minimum and 128 MB strongly suggested. Any less, and performance surely will suffer with any modern software.

Drives: Hard, CD, and Floppy

Hard-drive selection is also simple. Stick to IDE drives, unless you understand and really need a SCSI drive.

545 Baylor Ave., River Vale, NJ 07675
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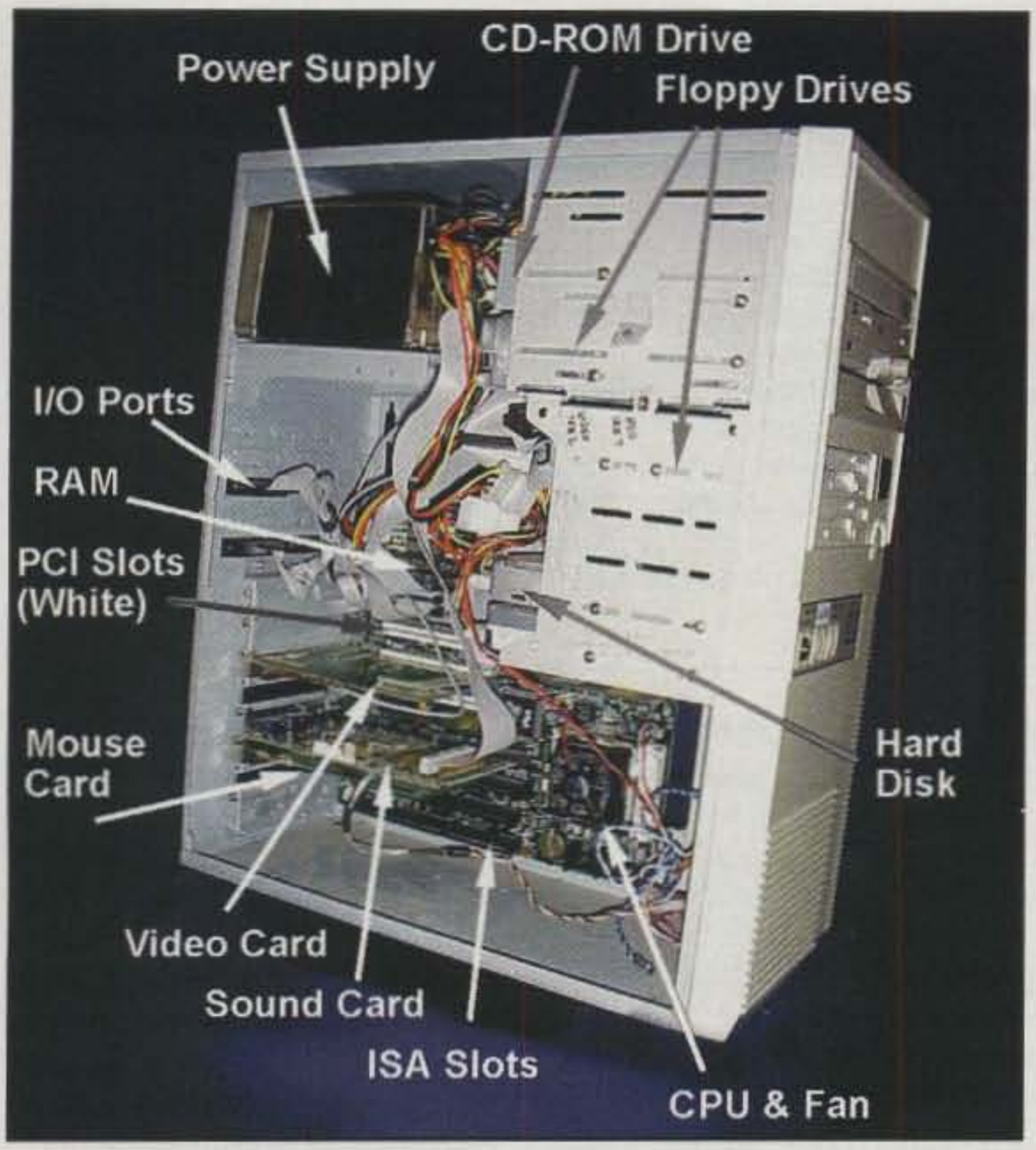
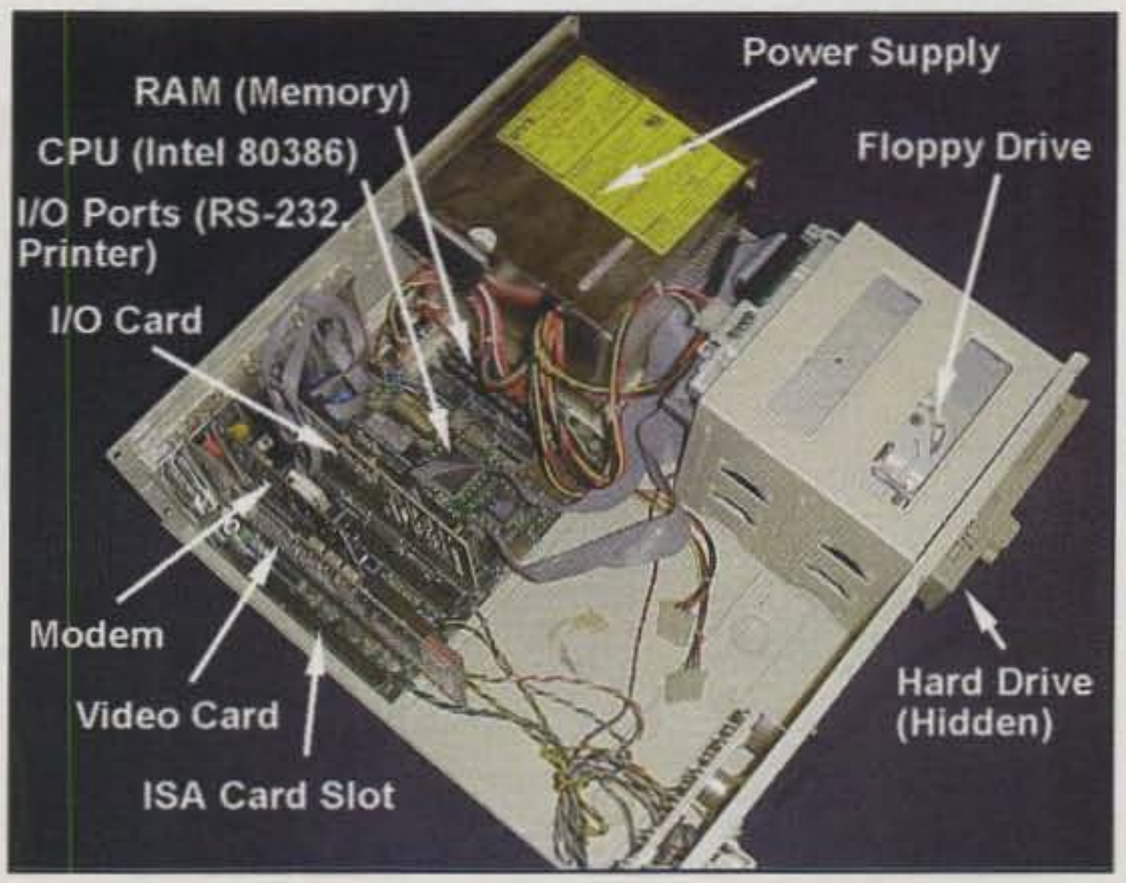


A 100 MHz Pentium, which is considered obsolete, in a mid-tower case. This system works just fine under Windows 3.11 and is used as a printer server. This was one hot machine ten years ago. The motherboard sports both ISA and PCI slots.



A positively ancient Zenith Z158 running DOS 6.22 on a 6 MHz 8088 processor and sporting 640 k of RAM and a 20 MB hard drive. Yes, 20 MB, about 14 floppies' worth. I use this computer for all my packet work. Note that computers of this vintage are not modular like modern PCs. Those two large "cards" in the center are the CPU and memory boards, and there's a disk controller, as well as video, mouse, and I/O cards. All these cards are interconnected with a passive backplane. Note that all the chips are socketed! This beast cost over $3500 in 1985.

Enormous IDE drives are available for a pittance. Twenty GB is a typical size, costing just over $100, and this should be plenty for a while. Buy something big enough, but remember you can buy another one later if you run out of space. The important factors to consider are the disk speed (in RPMs) and access time, both of which influence performance, with higher RPMs and lower access times being better (and more expensive).

These days, CD-ROM drives slower than 20x are hard to find and cost a few tens of dollars. Nearly all software comes on CD these days, so you definitely need one. Consider an upgrade to a CD reader/recorder (CD-R or CD-RW) so you can archive data or record your own music CDs. A CD-R drive can write once onto a recordable CD, but the CD cannot be erased and re-written. A CD-RW drive can write onto a special re-recordable CD and erase and re-write, much like a floppy. These are a better choice, at under $150. You can also get a CD drive that plays DVDs—useful if you are into games or DVD videos. For videos, you'll have to view them on your computer, unless your video adapter has a Video Output connection.

You probably should get a floppy drive. A 3½ inch, 1.44 MB floppy drive

Web Resources

One of the best listings of web resources is found at <http://www.netspace.org/~dwb/www-authoring.html>. Some of the links are outdated, as explained on the home page, but the ones that work are great.

A great introduction to HTML is found at <http://www.cwru.edu/help/introHTML/toc.html>. This is a comprehensive guide to the HTML language. Remember, as a pure-text language, you can write HTML using any simple ASCII text editor, but you might want to use an HTML editor to maintain your sanity.

A useful and very, um, insistent guide to web page design is found at <http://www.mcs.net/~jorn/html/terrorist.html>. Jorn, *aka* the HyperTerrorist, has put together a really comprehensive guide to what makes good and bad web pages, and tells the story with a bit of humor. Also at this site is a checklist for good page design: <http://www.mcs.net/~jorn/html/net/checklist.html>.

Finally, a search for related topics on any of the web search engines will yield a bounty of links.

costs about $20 and can come in handy for sharing data with others. This also provides backwards compatibility for older software and simplifies making an emergency start-up (boot) disk.

It's in The Cards

Now we need to consider the adapter cards. Most motherboards come with the IDE Hard Disk Drive (HDD) and Floppy Disk Drive (FDD) circuitry on board, as well as the standard two serial ports—one parallel port and one game port. USB ports are also handy, but only if you're running Windows 98 or higher. That leaves only the modem, sound card, and video adapter, and perhaps some specialized cards.

These days, a 56 kB telephone modem costs less than a case, so buying anything less is ill-advised. I suggest an internal modem, although an external modem is not much more expensive, and can be much more versatile. Most modems today include fax and voice mail capabilities. You might omit this item if you have a cable, ISDN, or DSL modem.

With sound cards, I haven't found much differences among them. I tend to stick with name brands, for their better support and compatibility, especially with many amateur radio programs. If you anticipate using the MIDI capabilities of the sound card, get one with a larger number of "voices" or instrument simulations. If you get a sound card, don't forget speakers and perhaps one of those headset microphones.

Video adapter cards come in a myriad of styles and prices. I suggest simply picking one that has the features you need—AGP slot support, a certain screen resolution (e.g. 1024 × 768), perhaps a video output (or input!) jack—and then looking for a reasonable price. The amount of memory on the video card does not influence performance much; it has a greater effect on the number of colors that can be displayed at higher resolutions. Some video cards are optimized for business use—displaying spreadsheets and charts—and some are optimized for high-performance games.

As we discussed in the March 2001 column, one adapter card you might consider is an Ethernet NIC (Network

Resources

Tom's Hardware Guide <http://www.tomshardware.com/> has lots of information about hardware, including reviews and tests. This is the site I use when researching hardware of all types and looking for the lowest on-line price. Lots of PC Industry news and original content.

Planet Hardware <http://www.planethardware.com/> is another site devoted to helping you select hardware, with reviews and recommendations. Be sure to check out their do-it-yourself guides.

The Rockville Living Computer Guy's guide to building your own PC <http://www.rockvilleliving.com/cg990610.html> offers detailed advice on selecting components and assembling them into a working computer. Slightly outdated, but valuable nonetheless.

Motherboard Homeworld Guides <http://www.motherboards.org/guides.html> are detailed guides to selecting components and building your own computer. Motherboards are a specialty.

PC Mechanic's "Build Your Own" Guides <http://www.pcmech.com/build.htm> include a detailed guide to assembling a computer, as well as building a server or a home network. On this latter topic, be sure to read "Computers & Internet" in the March 2001 issue of *CQ*.

Interface Card). You can connect all your computers together and share resources such as hard disks and printers. If you have Windows 3.11 or later, networking is included with the operating system. I recommend 10/100 BASE-T types, which can be had for under $30.

Accessorize!

Last are the accessories—keyboard, monitor, mouse, and maybe a printer or ZIP drive. Your selection depends heavily on your personal preferences, your available cash, and what you already have. I like my Microsoft Internet Keyboard and Logitech Scroll Mouse, both of which make web browsing a lot more convenient and have the right "feel" for me. With monitors, you'd be insane to get one smaller than 17 inches or with a dot pitch greater than 0.28; your eyes will thank you. Avoid flat LCD monitors because of their relatively large pixel size. At the very least, look at one before you make a decision to spend all that money.

Summary

If you're really planning on putting together one of these, do your research first. Check out the Resources box, talk to people who know a little about PCs, and go to a local computer show (much like a hamfest) or small PC shop and ask them any questions you might have. I advise staying away from the large computer stores, as they specialize in assembled systems. Open the PC you have now and see how it all fits together. Maybe stop at the bookstore and buy a book on the subject. There are many.

With this information and our overview of all the parts in mind, make some tentative selections for each item and write down the brand, model, and price for each vendor. If it's still too expensive, make some compromises, or wait a month for prices to fall some more. Read the on-line reviews of each item. Finally, pick a day, compare prices on what you want to buy, and get each part from the vendor with the lowest price. You can also go online and find the best mail-order vendor (remember shipping charges!). Get it all home, assemble it, load the software, and have fun!

As usual, if you have any questions, don't hesitate to write. In the September column we'll explore the world of Data Acquisition—how it's being used in the world of amateur radio and how you can get involved. Until then . . .

73, Don, N2IRZ

On the Cover

Dave Booth, KC6WFS, of Saugus, California, has been a ham for only 10 years, but his heart is in the 1950s … and on 50 MHz. A big fan – and regular user – of vintage 6 meter AM gear, Dave's shack will warm the hearts of any ham who "grew up" on 6 meter AM in the mid 20th century.

Starting at Dave's left is a Swan 250 AM/SSB transceiver, followed by his only concession to 21st century technology, a laptop computer that he uses for logging 6 meter QSOs. To the right of the laptop are a Heathkit "Sixer" and a Gonset G-50, both 6 meter AM transceivers, sitting atop a pair of Clegg classics, the Zeus transmitter (on the left), which puts out 120 watts on AM and CW, and the Interceptor B receiver, featuring Nuvistors instead of tubes. Finally, microphone enthusiasts will recognize the Shure 444D, connected to the Swan, and the ever-lovely Astatic D-104 on the TU-9 stand.

Dave says he discovered 6 meter SSB about six years ago, and after he'd been on for several months, neighbor and "Newsline" producer Bill Pasternak, WA6ITF, suggested he look into AM. Dave bought the Gonset G-50 and was hooked as soon as he heard the superior audio quality of AM over SSB. He says one of his favorite activities now is to listen for the beacon operated by Dave Clingerman, W6OAL, in Colorado, and make AM-to-AM contact with him whenever the band is open between them.

KC6WFS's interest in vintage 6 meter AM gear has grown to the point where he has earned the ARRL's VUCC award for 6 meters, and he has even devoted a webpage to his passion, <http://www.geocities.com/Hollywood/5860/50am.html>. Dave says many hams use his guestbook to note whom they've contacted where via 6 meter AM. Dave and his website were featured in the January, 1998, issue of *CQ VHF* magazine. (Cover photo by Larry Mulvehill, WB2ZPI)

DX

BY CARL SMITH, N4AA

News Of Communication Around The World

Solar Flares!

Observers said this was the largest solar flare in 25 years or more, and it happened in late March. The "big one" was followed by more, less-intense solar activity in early April which affected HF propagation. There was a positive side to all of this, however, with 6 meter ops having a virtual field day working lots of long-haul DX, and auroral displays being viewable for many who are unaccustomed to such sights. Thus, while the HF DX gang complained, the "Magic Band" gang was elated. Such is the nature of our world of communicating via the ionosphere. We can control a lot of things, but we have no control when it comes to those blasts of energy from the Sun.

Do you have a 6 meter radio? It can be a lot of fun when these things happen. That's why they call 6 meters the "Magic Band."

New Magazine from CIS

Editor Yuri Funkner, RN3FX, has announced that the new magazine *CQ from CIS,* subtitled "The Radio Amateur's Journal of the Commonwealth of Independent States," will be published in English each month beginning in July 2001. Yuri provided me with a detailed listing of the various topics planned for the new magazine, and it appears to be very broad in its coverage of all aspects of amateur radio. Awards, contests, DXing, QRP, computing, history, and technical articles are only some of the items on the list.

For more information, contact the Funkner DX Family, P.O. Box 50, Moscow 109439, Russia, or via e-mail: <fdx@ada.ru>.

HamCom 2001

This annual event, sponsored by the Lone Star DX Association, will feature a bigger than ever show this year. It will be held in Arlington, Texas, June 8–10. There will be an all-day DX program on Saturday with some of the greatest DXers and contesters in the world, such as Martti Laine, OH2BH; John Devoldere, ON4UN; Jeff Steinman, N5TJ; and many more. Information is available on the web at <www.hamcom.org> or <www.dxer.org/lsdxa>, or you can contact Herb Blair, K5AT, the Information Director.

Hamfest India 2001

For anyone who might be traveling in the area, or other interested parties, the National Institute of Amateur Radio invites all radio amateurs to attend Hamfest India 2001 to be held in Nagpur, India, October 28 and 29, 2001. This will be the 11th National Hamfest of India, and has particular significance following a major earthquake that struck Gujarat on January 26, 2001. The rescue and relief operations witnessed participation by a large number of Indian and foreign amateurs.

Interested persons should contact NIAR, Raj Bhavan Road, Hyderabad 500 082, India, or you can get further details via their website at <www.niar.org>, or contact them by e-mail at <niarindia@hotmail.com>.

Sitkinak Island

Sitkinak Island, part of the Trinity Islands group, NA-053, will be activated in August. Using the call KL7AK, they expect to be on the island from August 9th until approximately the 14th. The main station will be a Yaesu FT-900 HF transceiver with an Ameritron AL-80A amp. The antenna will be a Hy-Gain TH2Mk3 10-15-20 Yagi on a 30 foot mast, with two G5RVs mounted as inverted-Vees atop the 40 foot mast facing east/west

What does a DXpedition team do when all of the operating is done and all the gear is back on the ship? Well, it looks as if they just have to take a break by the office water cooler! Here is the Kingman Reef (K5K) team (left to right) discussing the operation over a "cool one": Garry, NI6T; Joe, KO4RR; Mike, KH6ND; Alan, K5AB; Bob, K4UEE; and Katsu, JH7OHF. (Photo via Bob, K4UEE)

The WPX Program

SSB

2792 .....IV3IIM 2793.....WR2R

CW

3065 .....K7ZYV

CW: 1200 F5YJ. 1250 AA1KS.

SSB: 350 IV3IIM. 550 G3TSZ. 1150 CP2DL.

MIXED: 1250 WZ4P. 2700 N4UH.

40 meters: G3TSZ

Europe: G3TSZ

Award of Excellence Holders: K6JG, N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, IØ JX, WA1JMP KØ JN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØ DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØ AJU, N5TV, W6OUL, WB8ZRL, WA8YM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØ DXM, DK4SY, UR2QD, ABØ P, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØ G, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1PO, K9LNJ, YB0TK, K9QFR, 9A2NA, W4UW, NXØ I, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MC, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØ DAQ, I1WXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD, IØ RIZ, I2MQP, F6HMJ, HB9DDZ, WØ ULU, K9XR, JAØ SU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, KZ1R, CT4UW, KØ IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, I7PXV, S57J, EA8BM, DL1EY, K Ø D E Q , KUØ A, DJ1YH, OE6CLD, VR2UW, 9A9R, UAØ FZ, DJ3JSW, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØ FU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT.

160 Meter Endorsement: K6JG, N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF N4NX, SMØ DJZ, DK3AD, W3ARK, LA7JO, SM0AJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØ DXM, UR1QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF,

P.O. Box DX, Leicester, NC 28748-0249
e-mail: <n4aa@cq-amateur-radio.com>

5 Band WAZ

As of February 28, 2001, 554 stations have attained the 200 zone level and 1195 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:
K8MFO PY2YP AA4S

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

N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
WØPGI, 199 (26)
W2YY, 199 (26)
VE7AHA, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
ABØP, 199 (23)
KL7Y, 199 (34)
NN7X, 199 (34)
IK1AOD, 199 (1)
DF3CB, 199 (1)
F6CPO, 199 (1)
W3UR, 199 (23)
KC7V, 199 (34)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W6SR, 199 (37)
W3NO, 199 (26)
K4UTE, 199 (18)
K4PI, 199 (23)
HB9DDZ, 199 (31)
RU3FM, 199 (1)
HB9BGV, 199 (31)
N3UN, 199 (18)
OH2VZ, 199 (31)
K2UU, 199 (26)
W1FZ, 199 (26)
UT4UZ, 199 (6)
SM7BIP, 199 (31)
K4ZW, 199 (23)
W9RPM, 199 (19)
EA5BCX, 198 (27,39)
G3KDB, 198 (1,12)
KG9N, 198 (18,22)
KØSR, 198 (22,23)
UA4PO, 198 (1,2)
JA1DM, 198 (2,40)
9A5I, 198 (1,16)
K4ZW, 198 (18,23)
LA7FD, 198 (3,4)
K5PC, 198 (18,23)
VE3XO, 198 (23,23 on40)
K4CN, 198 (23,26)
KF2O, 198 (24,26)
W6BCQ, 198 (37,34on40)
G3KMQ, 198 (1, 27)
W5BOS, 198 (18,23)
N2QT, 198 (23,24)
OK1DWC, 198 (6,31)

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

NØAH (193 zones)
W9RPM (199 zones)
9A7C (161 zones)
RU9TO (190 zones)

Endorsements:
W3UR (200 zones)
K7ABV (192 zones)
K8RR (197 zones)
K4IQJ (200 zones)
K3NW (200 zones)
K4ZW (199 zones)

****Please note: Cost of the 5 Band WAZ Plaque is $80 ($100 if airmail shipping is requested).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Paul Blumhardt, K5RT, 2805 Toler Road, Rowlett, TX 75089. 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 Paul Blumhardt. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. K5RT may also be reached at e-mail: <k5rt@cq-amateur-radio.com>.

and north/south as back-up. The back-up radio will be a Kenwood TS-50S. I found that during my previous Alaska island DXpeditions 20 meters is the optimum band in Alaska.

According to KL7AK, "We normally have propagation up to 20 hours a day. When Stateside fades out, Europe comes in. When Europe fades out, the South Pacific comes in, etc. So our plans are to mainly operate on or near the IOTA frequency of 14.260 MHz. We will make CW contacts upon request (pile-up permitting). The QSL Manager is Fred Stenger, N6AWD, good in the Callbook/internet databases."

Summary

I'll be doing something the end of May I have always wanted to do—operate with a multi-multi group in a major contest. Rick, NQ4I, extended an invitation to me to operate the CQ WPX CW Contest from his outstanding station near Atlanta, Georgia. It will be a new experience for me, and I must say I am looking forward to the challenge!

I would also like to thank all those who sent e-mail, letters, etc., commenting on my previous remarks about operating ethics, etc. While I haven't been on the air that much recently, it does appear

The WAZ Program

Single Band WAZ

10 Meter SSB

520 ..... PY2YP 521 ..... K4JLD

15 Meter SSB

550 ..... PY2YP 552 ..... JA6RZW
551 ..... JN1WHW

17 Meter SSB

25 ..... GWØMOI

20 Meter SSB

1075 ..... PY2YP

10 Meter CW

163 ..... PY2YP 164 ..... K8ER

15 Meter CW

287 ..... PY2YP

20 Meter CW

512 ..... PY2YP 513 ..... DL3GA

40 Meter CW

214 ..... PY23YP 215 ..... N4MM

20 Meter RTTY

50 ..... K7NTW

160 Meters

98 ..... K4ZW (36 and 37 zones)

All Band WAZ

SSB

4636 ..... NØAH 4642 ..... WA6DAW
4637 ..... JT1BV 4643 ..... JG1IWH
4638 ..... AA3TH 4644 ..... PA3GCV
4639 ..... NIØC 4645 ..... OE2SCM
4640 ..... K8WV 4646 ..... IK7VJO
4641 ..... AK6I

Mixed

8023 ..... K1ZN 8028 ..... DL6UAA
8024 ..... W9BOK 8029 ..... IK1QHB
8025 ..... JL3TEM 8030 ..... HL4RBR
8026 ..... EA7GDP 8031 ..... G3ZMS
8027 ..... 4Z5LL

All CW

232 ..... NØAH 236 ..... S53ZL
233 ..... K1PQS 237 ..... DK5IF
234 ..... AB4I 238 ..... DL5CF
235 ..... JG6CDH 239 ..... IK3TZB

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, Paul Blumhardt, K5RT, 2805 Toler Road, Rowlett, TX 75089. 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 Paul Blumhardt. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. K5RT may also be reached via e-mail: <k5rt@cq-amateur-radio.com>.

THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

MIXED

4922 9X2AA	3652 VE3XN	3091 WA8YTM	2849 4N7ZZ	2469 YU7GMN	2256 K5UR	1877 OZ1ACB	1443 KØKG	1154 EA2BNU
4302 W2FXA	3624 9A2NA	3029 YU7BCD	2835 W2WC	2464 K2XF	2170 W4UW	1842 I2EAY	1436 N1KC	1147 W2CF
4034 W1CU	3606 N4MM	3027 YU7SF	2831 IT9QDS	2455 N6JM	2093 W7OM	1745 AA1KS	1429 W2EZ	1082 OK1DWC
4030 F2TT	3523 SM3EVR	3026 K9BG	2800 JH8BOE	2424 W9IL	2028 WB3DNA	1670 W7CB	1418 WT3W	1040 PY1NEW
4027 K6JG	3513 I2PJA	3010 WB2YQH	2798 IK2ILH	2372 S58MU	2019 HA9PP	1651 I1-21171	1408 NG9L	1020 KU6J
3960 EA2IA	3458 YU1AB	2974 I2MQP	2787 KØDEQ	2314 W6OUL	2012 JN3SAC	1642 Z35M	1343 VE6FR	1006 VE9FX
3772 UA3FT	3333 N5JR	2970 S53EO	2773 W2ME	2305 W8UMR	1939 PY2DBU	1613 YU1ZD	1337 VE6BMX	1006 K67XO
3762 N6JV	3144 PAØSNG	2945 I2EOW	2743 HAØIT	2281 9A4W	1916 DJ1YH	1572 VE6BF	1165 KX1A	937 N3KR
3736 N4NO	3118 W9HA	2903 KF2O	2597 HA5NK					

SSB

4306 IØZV	2968 EA8AKN	2500 4X6DK	1975 K5UR	1655 K5IID	1525 IKØEIM	1273 NG9L	1051 EA3EQT	781 N3DRO
3845 ZL3NS	2909 N4NO	2488 I8KCI	1972 W4UW	1643 W6OUL	1514 W2ME	1222 LU3HBO	1005 DL8AAV	717 F5RRS
3730 K6JG	2888 I4CSP	2412 WA8YTM	1860 N6FX	1631 HA5NK	1493 IK2AEQ	1179 KI7AO	990 HA9PP	716 KX1A
3549 F6DZU	2877 9A2NA	2404 KF7RU	1860 K2XF	1631 K3IXD	1483 DF7HX	1165 EA5DCL	972 AI6Z	699 KU6J
3503 I2OJA	2758 PAØSNG	2381 YU7BCD	1767 LU5DV	1626 W7OM	1444 SV3AQR	1154 WT3W	932 LU4DA	680 OK1DWC
3172 CT4NH	2739 I2MQP	2325 EA1JG	1748 YU7SF	1617 I3ZSX	1427 N3XX	1153 K4CN	890 AG4W	652 F5LIW
3168 N4MM	2706 I2EOW	2305 CX6BZ	1717 W9IL	1599 DK5WQ	1421 W2FKF	1141 IKØJMS	877 JN3SAC	634 F5UTE
3056 EA2IA	2672 CT1AHU	2134 IN3QCI	1707 I8LEL	1591 IT9SVJ	1410 T30JH	1092 N1KC	855 VE9FX	609 VE7SMP
3019 OZ5EV	2515 LU8ESU	2038 OE2EGL	1698 EA7TV	1568 CT1BWW	1385 I3UBL	1064 I2EAY	783 VE6BMX	605 KE4SCY
3019 F2VX	2515 EA5AT	2033 HAØIT	1667 KS4S	1548 K8MDU	1318 N2SS	1064 NH6T		

CW

4045 WA2HZR	3005 EA2IA	2288 W2WC	1996 G4SSH	1706 JN3SAC	1485 9A3SM	1268 4X6DK	1121 EA2BNU	832 WT3W
3634 N6JV	2699 LZ1XL	2238 JA9CWJ	1946 I7PXV	1672 IK3GER	1480 K5TSS	1257 EA2CIN	1060 W4UW	787 WA2VQV
3365 VE7CNE	2566 9A2NA	2198 EA7AZA	1923 K2XF	1572 W9IL	1466 IK2ECP	1248 AC5K	987 K6UXO	750 KX1A
3291 K6JG	2548 N4MM	2159 KA7T	1866 LU2YA	1555 I2EAY	1393 EA6AA	1244 I2MQP	935 VE6BMX	732 N1KC
3149 N4NO	2534 W2ME	2105 G3VQO	1821 K5UR	1546 W7OM	1339 LU3DSI	1154 LU7EAR	926 PY4WS	668 KU6J
3043 K9QVB	2437 YU7BCD	2016 N6FX	1779 IT9VDQ	1488 VE6BF	1310 I2EOW	1150 DF6SW	898 JK1AJX	612 F5RRS
3021 YU7LS	2396 WA8YTM	2000 OZ5UR	1762 W6OUL					

Bob, LX1RQ, has been licensed since 1984. He says his favorite band used to be 80 meters, but now he enjoys working all bands. He adds that although he had to learn CW for his license, he rarely uses it and works mostly SSB, but has also been active on SSTV. Bob likes contests and has worked some signing calls such as LX9DX, LX9SW, and LX5A. (Photo courtesy John, KDØJL)

Paperwork Assist for CQ DX Award

CQ DX Award Manager Billy Williams, N4UF, reports that current award holders who have qualified for endorsements may submit a copy of their ARRL-certified DXCC printout (itemized by country) in lieu of QSL cards. In addition, if there are no CQ award checkpoints nearby, Billy advises that any certified ARRL DXCC field checker may also approve cards for the CQ DX Award.

CQ DX Awards Program

SSB

2337	S51ST	2339	EA3KB
2338	KZ6N	2340	EA6TC

CW

1019 KZ6N

SSB Endorsements

320	4N7ZZ/333	310	WR5Y/315
320	XE1AE/333	275	K7ZM/292
320	EA3KB/330	200	S51ST/211
320	W5RUK/330	150	EA6TC/185
320	NI5D/325	3.5/7 MHz	S51ST
320	K1EY/325		

CW Endorsements

320	W7CNL/333	320	I2EOW/326
320	F3AT/333	310	WG5G/QRPp/315
320	K2JLA/333	275	KD8IW/288
320	4N7ZZ/330		

RTTY Endorsements

300 I2EOW/291

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. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 333 active countries. Please make all checks payable to the award manager.

QSL Information

3D2HY to JAØSC
3D2XU to PA3AXU
3E5ØØBYS to HP1RCP
3V8SM to DL1DBF
3W2LWS to WA1LWS
3W2NY to JH1MZG
3W7CW to SP5JTF
3W9HRN to DL1HRN
4L5T to LY2MM
4L7O to DL7BY
5A24PA to PA1AW
5R8GT to DK8ZD
5U2K to I2YSB
5U3T to I2YSB
5WØDA to F6EPY
7Z1AB to WD6CVB
7Z1AC to WA4JTK
8P5A to W2SC
8Q7DD to W4WET
8S7A to W3HNK
9K2ZZ to W8CNL
9K9X to 9K2HN
9MØM to K7XN
9M2DB to KD6WW
9M6A to N2OO
9N7RB to W4FOA
9Q5FH to EA1FFC
9U/EA1FH to EA1FFC
A35SC to JAØSC
A51AA to F2VX
A52CO to UA9DD
AF4LX/KH2 to JA6HJP
AH7X to JP1NWZ
AH7X/WH2 to JP1NWZ
AM8CI to EA8AKN
AN6AEQ to EA6AEQ
AY8A to LU8ADX
BV9O to BV8BC
C21AN to DF8AN
C21XU to PA3AXU
C6AKK to AA7X
CC4A to CE4USW
CQ1CV to CT1ETE
CWØZ to EA5KB
CW6V to W3HNK
DJ7ZG/HI9 to DL7AFS
DL/TA3YJ to TA3YJ
DSØLT to KU1CW
E44A to K3IRV
EA5/JI6KVR to EA5KB
EA8AH to OH1RY
EA9/JI6KVR to EA5KB
EP2MKO to RU6FZ
EY8MM to K1BV
FK/F2CW to ZL3CW
FOØARE to HA8IB
FS/W3HNK to KU9C

(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," P.O. Box 3071, Paris, TN 38242; phone 901-641-0109; e-mail: <golist@wk.net>.)

that at least most of the pile-ups I am hearing seem to be better "behaved" than in the recent past. The frequency cops don't seem to be as vocal either. Let me say, for everyone, *thank you* for being a bit more considerate and perhaps thinking before saying unnecessary, unpleasant things.

Until next time, Good DXing . . .

73, Carl, N4AA

Contesting

BY JOHN DORR, K1AR

News/Views Of On-The-Air Competition

When is Single Operating Really Single Operating?

June's Contest Tip of the Month

Those of you who use remote footswitches should pay close attention to this month's contest tip. Consider using a rug (any kind as long as it still has structural integrity and acceptable aesthetic appeal) and cut a hole in it that is slightly larger than the footswitch itself. Place the rug under your operating desk with the footswitch inside the freshly cut hole so that the device's control wire goes under the rug and up to your transceiver. This technique will help keep the footswitch in tact for the entire contest, reducing operating fatigue, while providing the added benefit of a comfy surface for your "off foot" to rest on, too. *(Thanks to Nat, WZ3AR)*

Calendar of Events

May 19-20	Baltic DX Contest
May 26-27	**CQ WW WPX CW Contest**
June 2-3	IARU Region 1 CW Field Day
June 9	Portugal Day Contest
June 9-11	ARRL June VHF QSO Party
June 10	Asian-Pacific SSB Sprint
June 10	West Virginia QSO Party
June 16	Kid's Day Operating Event
June 16-17	All Asian CW DX Contest
June 23-24	Marconi Memorial HF Contest
June 23-24	ARRL Field Day
July 1	RAC Canada Day Contest
July 14-15	**CQ WW VHF Contest**
July 14-15	IARU HF World Radio Championship
July 15	Colombian Independence Contest
July 21-22	North American RTTY QSO Pty
July 21-22	Georgia QSO Party
July 28-29	IOTA Contest
July 28-29	Russian RTTY WW Contest

I'm sure many of you can remember those late-night hamfest conversations with other contesters discussing the bounds of what defines a single operator. When you look at the question from the standpoint of contest rules, the answer is actually quite simple. It's the implementation that sometimes can be troubling.

When discussing this recently in one of those famous "on-line e-mail threads" we all seem to love, I had a good laugh over one response. This individual's "tongue in cheek" thought was that a *true* single operator should build his own equipment and antennas. He should have absolutely no help in any way, developing his own equipment designs while single-handedly manufacturing his own integrated circuits from the comfort of a wholly-owned silicon foundry in his backyard. The antennas should use metal products produced from his own mining operations and shipped via his own transportation company. The house used by the station should be built by hand with no assistance from subcontractors or other outside vendors. Actual contest operation refreshments should include foodstuffs that have come from his land and animals hunted completely within the location's property boundaries.

Well, it's kind of humorous to think about single operator contesting from this perspective, but there are gray areas worthy of debate that I'd like you to think about this month.

2 Mitchell Pond Road, Windham, NH 03087
e-mail: <K1AR@contesting.com>

What are the Gray Areas of Single Operating?

As I considered this subject in a bit of depth, I identified quite a few categories for you to ponder. Here's a sample list:

• Where does the role of a host operator begin and end? For example:

Should they cook and serve your food during a contest?

Should they be allowed to wake you up or check for times when you oversleep?

Should the host operator provide the role of fixing equipment that breaks? What about antennas? . . . all while you continue to operate.

Should the host operator even be allowed to sit in the shack with you while you operate? Is his influence, camaraderie, and encouragement an unfair advantage?

Should a host operator be allowed to operate on another band while you operate, potentially providing intelligence on the productivity of a band you are not using?

• Is there any room for the use of packet radio/internet instant messaging—not for DX spotting or even propagation information—as a way to stem the inevitable boredom of a single operator effort?

• Should on-air inquiries be allowed with other competitors? For example:

"Is 10 meters open to Europe for you guys?"

"What's your rate meter up to?"

"Have you heard HC8A on this band?"

"How many countries do you have on 160 meters?"

As you can see by these questions and many like them, the cut-and-dry definition of single operating, as defined in most contest rules, is not that simple. For example, here's what the ARRL rules say about the single operator category:

Single Operator—One person performs all transmitting, receiving, spotting, and logging functions as well as equipment and antenna adjustments.

What is the Answer?

As with many aspects of real life, I'm a big fan of common sense. And while everyone may not agree, let me attempt to put some stakes in the ground on this subject. The first step when operating as a single operator is to ensure you're operating within the well-understood guidelines defined by the rules. For example, if DX spotting is not permitted, don't use it—period. If there are defined limitations for operating times, stay within them. As an aside, almost everyone will agree (and the rules are starting to specify this point) that listening time is operating time. Thus, when you're off the air, you're off the air. Use the time instead to see how that semiconductor foundry facility is running in your backyard.

Well, so much for the obvious. Now let's move on to the grayer areas of this discussion. The purist interpreters will take a very hard line about self-generated operating and support for the single operator category. To be honest, I admire that position. However, I can also see the other side as well. For example, if I'm operating at someone else's station where I have little or no familiarity with the design and implementation, it seems unfair that I should be left entirely (and that's the key word) to my own ingenuity to fix it when/if it breaks. The issue here isn't so much maximizing operating time as it is having the ability to solve problems in the first place. It is also probably reasonable to assume help should be available

from the host who constructed the station when something goes wrong. On the other hand, I have never asked a station host to wake me up or save me time by making food for me. A reasonable goal is to eliminate nearly every difference possible between operating at home or at someone else's shack.

I'm sure quite a few of you have some strong opinions on this subject and I'd like to hear them. Feel free to drop me a line. Pure single operating is just one of many areas of contesting that we need to carefully monitor and apply peer pressure where needed. I believe that for the most part, there are very few, if any, real examples of abuse out there. That's one of the great strengths of our sport and its competitors.

Kid's Day is Here Again!

Kid's Day has been a highly successful and nationally recognized operating event intended to encourage young people (licensed or not) to enjoy amateur radio. It can give young people hands-on, on-the-air experience so they might develop an interest in pursuing a license in the future. It is also intended to give hams a chance to share their station with their children. If you haven't taken advantage of this one, you're really missing out on something. Here's a brief summary of the rules:

Date: June 16, 2001

Time: 1800 to 2400Z—no limit on operating time.

Suggested exchange: Name, age, location, and favorite color. You are encouraged to work the same station again if an operator has changed. Call "CQ Kid's Day."

Suggested Frequencies: 28350–28400 kHz, 21380–21400, 14270–14300 kHz, and 2 meter repeater frequencies with permission from your area repeater sponsor. Observe third-party traffic restrictions when making DX QSOs.

Reporting: All logs and comments may be posted on the internet at: <kids @contesting.com>. You may review the postings at <http://www.contesting.com/kids/>. Those without internet access may forward comments to the Boring Amateur Radio Club at the address below.

Awards: All participants are eligible to receive a colorful certificate (it becomes the child's personalized sales brochure on ham radio). You can also download this certificate for free or simply send a 9×12 SASE to: Boring Amateur Radio Club, P.O. Box 1357; Boring, OR 97009. More details may be obtained on-line at: <http://www.jzap.com/k7rat/>.

WRTC—Onward to 2002!

The following information is provided courtesy of Ari Korhonen, OH1EH.

The World Radiosport Team Championship, the Olympics of amateur radio, will take place in Finland in the year 2002.

What is the WRTC? The WRTC is organized around an on-the-air competition among two-person teams representing the best contest operators of the world. By bringing the competitors together in one geographical area and providing equal operating conditions (antennas, power, etc.), the variables normally associated with a radio contest are neutralized, thus emphasizing operating skills.

WRTC-2002 – a joint effort. Discussions about where to host the next WRTC actually began during the highly successful WRTC-2000 in Slovenia. Due to a long history and high contest activity, Finland was one of the obvious locations. A common theme in the discussions in Slovenia was: "You guys must do it!" We are pleased to announce that WRTC-2002 will be jointly organized by Contest Club Finland (CCF) and the Finnish Amateur Radio League (SRAL).

The Teams. The team selection process is just about to begin. Participants will be invited from all continents, focusing on their track record in the past contests. Approximately 45 to 50 teams will be selected using a variety of selection methods. These include an open application method as well as encouraging letters directly from the committee. Leading contest clubs as well as national IARU societies will be approached for their assistance. We intend to keep the contest community informed of the selection process on a regular basis.

The Contest. The actual competition will be held during the 2002 IARU HF Championship. In keeping with the original WRTC idea, every effort will be made to secure as equal operating conditions as possible. The idea is to have 45 to 50 operating locations around the Helsinki area, all equipped with identical antennas.

The Finns are considered to be world leaders in the areas of IT and telecommunications. This means that during WRTC-2002 some new, exciting technology will be utilized, something not seen before!

A Social Event. While the WRTC competition is the primary focal point of

WRTC-2002, socializing and camaraderie will be taken care of as well. After arriving in Finland, the competitors and other guests will be taken to the SRAL summer camp. The summer camp is one of the oldest traditions in Finnish amateur radio history, with more than 1500 visitors annually. The summer camp is something like a combination of Field Day and a hamfest, where just about every ham-related activity is present. There's something exciting in the air during these camps—something one has to experience first hand! In addition, there are several other activities planned, such as excursions, parties, and so on.

The WRTC 2002 Management Team. The following amateur radio operators are in charge of the respective tasks and activities:

Jouko Häyrynen, OH1RX, Organizing Committee Chairman

Jari Jussila, OH2BU, Events Chairman & Domestic Publicity

Martti Laine, OH2BH, Competition Co-Chairman

Pasi Luoma-aho, OH2IW, Competition Co-Chairman

Jukka Kulha, OH2MA, Site Design and Management

Veijo Kontas, OH6KN, Wireless and Web Technology

Merja Veisterä, Financial Controller and Treasury

Ari Korhonen, OH1EH, Competitor Correspondence and Publicity

Timo Klimoff, OH1NOA, Competitor Correspondence and Webmaster

Risto Lund, OH3UU, Logging and Scoring Management

WRTC 2002—Preliminary Schedule

Tuesday, 9 July: Competitors arrive in Finland, social get together and registration.

Wednesday, 10 July: Transportation to the SRAL summer camp, official opening ceremony.

Thursday, 11 July: The first official contest meeting, pile-up competition, and evening party.

Friday, 12 July: The second contest meeting and transportation to the contest station locations.

Saturday, 13 July: WRTC-2002 competition begins at 1200 GMT.

Sunday, 14 July: WRTC-2002 competition ends at 1200 GMT. Late-night "after the contest" event in Helsinki.

Monday, 15 July: Tour around Helsinki, prizes, and closing ceremonies.

Tuesday, 16 July: Departure.

The contest community can stay abreast of the progress of WRTC-2002 through various methods. The best way

to keep informed is to visit the website <http://www.wrtc2002.org>.

Amateur Radio in Finland. Finnish Amateur Radio League (SRAL) membership stands at 5000, representing more than 95 percent of all OH licensees, the highest participating percentage in all of Europe. To this end, the League employs some highly advanced initiatives, probably being the only national society with experience in recruiting new members through nationally broadcast television commercials. SRAL is professionally run, with its efforts supported by the Finnish Ministry of Education.

Front-row contesting and DXing have a long history as two of the outstanding segments of amateur radio in Finland. Adding to many domestic and regional highly spirited sub-groups, country-wide activities are also well organized under the leadership of the Contest Club Finland (CCF) with a membership of 160 as well as the OH DX Foundation (OHDXF) with its 216 members.

Located at 62 degrees north, Finland is the KL7 of Europe on exactly the same latitude as Anchorage, Alaska. Within the auroral zone, Finns seem to believe that by hoisting their antennas higher and adding more elements, they can close the propagation gap they have with the rest of Europe. In Finland rotatable 140-footers are an everyday thing. With 70 feet you would barely get recognized in this highly competitive contesting area.

It's no wonder: When the conditions shift north, OHs are right there to fight for victory. However, some of them cannot wait, so they move south to build up a competitive edge in many of those equatorial contesting "hot spots"! Upon your arrival in Finland, you will be surprised to see that the OH2AQ DX Summit Website of international fame and the global network of web-based DX spotting have been expanded domestically into a new horizon of innovation. The DX Summit is connected to a Finnish nationwide teletext TV network. Thus, switching on your TV set anywhere in Finland, in any household, will always put you in touch with DX and contest happenings on the bands!

State-of-the-art technology is also in use by many OH hams in their daily lives as employees of leading companies in several modern high-tech sectors, including the companies involved with WRTC-2002 such as Elektrobit, Nokia, and Vaisala. Nokia alone employs more than 10 percent of the entire ham population of Finland.

Ultimately, however, the greatest success factor in Finland is the unity of its ham population. While OH DXers and contesters flex their muscles at many competitive events, the next day they are back around the same fireplace planning their next endeavors. Such an event is the WRTC-2002, in which you are welcome to participate and experience the midnight sundancers of the north coupled with the unique feeling of camaraderie and twilight propagation.

Travel Information. Most major international airlines have direct flights to Helsinki International Airport from European capitals and major cities in Europe, the US, and Japan. Helsinki is also easily accessible by boat from Sweden, Estonia, and Germany, and by train from Russia.

Downtown Helsinki can be reached conveniently from the airport by bus or taxi. Finnair buses depart from near the arrivals hall at 20-minute intervals, and the journey to the city center takes about 30 minutes. For more information see: <http://www.finnair.com/offices/citybus.htm>.

Closing Thoughts

As if you needed more confirmation, the power of the internet has proven itself again in the form of your responses to the 2001 *CQ* Contest Survey. In the first hour of announcing its on-line availability, I received nearly 50 replies! Not a bad QSO rate by some contesting standards. Therefore, if you haven't taken the opportunity, check out <http://www. hamgallery.com/survey> and add your two cents via this year's questionnaire. 73, John, K1AR

Awards

BY TED MELINOSKY, K1BV

News Of Certificate And Award Collecting

We start off this month with several items of note for county hunters. Of special interest to USA-CA All Counties award holders is the first item.

New Seal Available! For some reason or another hidden in the history of the USA-CA program the only seals available were for the 1000, 1500, 2000, 2500, and 3000 levels. The certificate itself represented the 500 level. However, there was no seal for All Counties. I've located the original company who made the seal embossers back in the early 1960s and had them prepare a matching special seal for the 3076 level. The seal and an appropriate ribbon are available at no charge to all existing holders of the USA-CA All Counties award. Just send a note to me at the address at the bottom of this page requesting the seal and provide your USA-CA number and an SASE.

USA-CA for SWLs. The question has been raised as to the kind of station identification information needed on the application when an SWL applies. We require that both stations be shown—the station in the county being claimed, as well as the other station working him at the time the SWL logged the exchange.

From Alan Roocroft, VK4AAR USA-CA All Counties #1014 . . .

Well, it's been an interesting and exciting few years exploring the highways and byways of the USA as I followed the numerous mobiles on their journeys. I believe as a result I am now fairly conversant in the geography of the US. My sincere thanks go out to *all* county hunters, whether mobile, fixed, or net control, as each in his/her own way contributed to my getting past the post: Mobiles for their dedication to the needs of people like me sitting in the comfort of their own homes chalking up new ones; fixed stations for their assistance and occasional new ones; and net control stations such as KZ2P and KA1JPR in particular, who showed compassion and patience in the extreme when dealing with the hunters.

At first I wondered if I should mention anyone in particular because there are too many to list, but I thank you all sincerely. Having said that, there are three "bouquets" I must throw, and this doesn't in any way detract from the importance of the hundreds of others not named.

65 Glebe Road, Spofford, NH 03462-4411
e-mail: <k1bv@cq-amateur-radio.com>

USA-CA Special Honor Roll

Carol-Ann Reitman, AB2LS
USA-CA All Counties #1017
March 21, 2001

The first is to Fred Crawford, K5CWR. Fred started doing runs for us here "Down Under" during the daily net we used to have in our afternoon (your late evening of the previous day in the US). From his home in San Antonio, Republic of Bexar, Texas, Fred made several trips around the Lone Star state, sometimes driving all night, other times sleeping in motels. Recently, to suit most VK and ZL needs he compiled a three-day run from Texas through Oklahoma, Arkansas, Mississippi, and Louisiana, and back home again. If I remember correctly, his first run was up the western side of Texas, where he had battery failure. The second was north to the Oklahoma border. The third was to east Texas to the Louisiana border. Next was south for several around Willacy, when a major storm caused a loss of contact when he ran into Brooks. Then there was one across southern Oklahoma to the Collingsworth & Hall county line in Texas, and then the recent three-day trip mentioned. Besides getting counties, Fred has supplied me with various county hunter tools such as Magellan's map book, Willis's KWIN2000 on CD (both will be used for the second time around??), and I musn't forget the half-dozen or so Rand McNally Road Atlases he bought and airmailed around Australia and New Zealand. I doubt that we could ever repay you, Fred.

Eldon Hall, N8STF, and his wife Mary were also instrumental in reducing my wanted list by leaps and bounds. These two good people made several assaults on my needed list and tried to accommodate others at the same time. Fred Crawford was still frantically working to find mobiles who could—and would—get my remaining counties when I was down to a handful, but kept drawing a blank on Nebraska. Mary urged Eldon to help me finish up, whatever it took. Consequently, Eldon took a flight to Lincoln, Nebraska, hired a car, fitted his radio and antenna in the car, and then

USA-CA Honor Roll

500
OM1CW.....3147
HB9DDZ.....3148
AB2LS.....3149

1000
AB2LS.....1569

1500
AB2LS.....1308

2000
AB2LS.....1207

2500
AB2LS.....1130

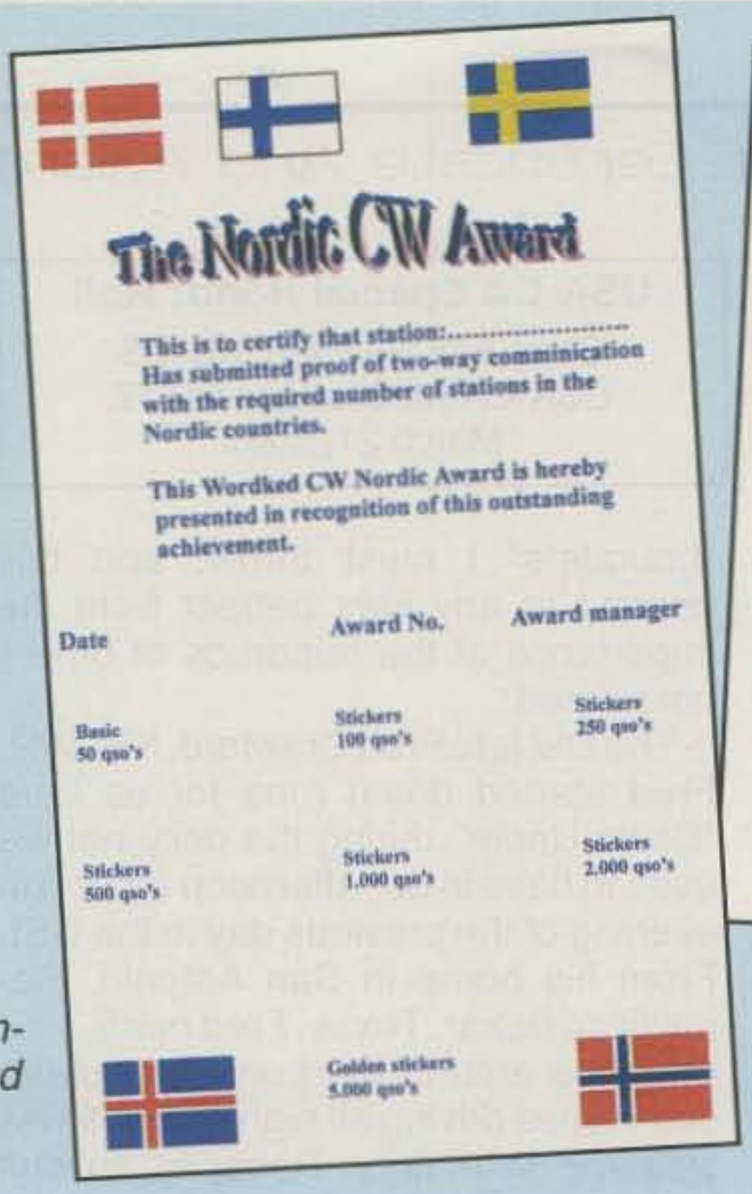
3000
AB2LS.....1036

The total number of counties for credit for the United States of America Counties Award is 3076. 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, 65 Glebe Road, Spofford, NH 03462-4411 USA. DX stations must include extra postage for airmail reply.

Alan, VK4AAR, and his wife Mee-Wah.

Eldon, N8STF, presented USA-CA All Counties Award #1014 to Alan, VK4AAR, on the same day it was announced on the County Hunters Net.

The REF's Diplome des Provinces Françaises award is issued for contacting each of the provinces of France.



The Nordic CW Award. Only 50 contacts with Nordic countries are needed for the basic award. →

The Lithuanians Abroad Award is issued in memory of the late General P. Plechaviius and other Lithuanians who were relocated all over the world.

checked into a motel on Monday, November 13th. Early the next day, after fixing a faulty antenna and with snow on the ground, Eldon drove to get Nance, Nebraska for me at 1354Z, leaving only three to go. From there it was about 45 minutes to the county line of Greeley and Wheeler, where he worked me at 1440Z. Only one to go then. This one, Perkins, was several hours to the west, so he took off to get to the last-needed county by his afternoon, which was outside our window.

After another night in a motel, Eldon was on the spot to work me on the morning of Wednesday, the 15th. However, propagation was terrible, and we had to wait a while, with Percy, KA1JPR, acting as go-between until we could hear one another (thanks, Percy; you've been a big help, too). Finally we were just starting to hear one another and we exchanged the important reports at 1343Z. After that Eldon headed north to get a couple for Rex, VK3MW, and Jim, VK4BS, then southwest to try for Rex's last two in Nebraska before making tracks back to Lincoln and then home. You're worth your weight in gold, Eldon.

I cannot omit from my thank-you list Bob Devine, KC6AWX, the tireless and patient manager for just about all of us Down Under. (I think Bob looks after about eight or more of us.) I say patient, because each of us has his own way of dealing with MRCs and QSLs, so Bob has to be on the ball. A great job well done, Bob.

How did I get started in county hunting? I don't remember exactly, but it was a bit of a start/stop at first. Let's say it was when I discovered 14.336 late one evening in August or September 1988. At the time I was living in Adelaide, South Australia, and I went by the call VK5ZN. I got quite involved and stayed up late many nights until I changed my QTH in early January 1989 and subsequently got married again. My bride is Mee Wah, and she is Chinese, hailing from Malaysia (9M2). I was not active county hunting again until my move to Queensland and a new call (VK4AAR) in late 1993. Three of us who were close to finishing up at that point, plus Jay, K6RLS, decided to start the Down Under County Hunters Net on 20 meters during the US evenings in 1995, I think. Jay became our manager until illness forced him to hand us over to Bob, KC6AWX. I noiticed that Jay got well soon after this, which was great, but it makes one wonder if we were his problem! (Only joking, Jay.) The net served its purpose but needed some changes because the stations we worked were mostly fixed and not county hunters either. Consequently, they didn't appreciate our need for confirmations, causing the QSL return rate to suffer badly.

In 1997 I and a few others also started working on 14.336 when the US was waking up. What a difference! Gradually we left the afternoon net except for a bit of silent monitoring while we were busy with chores in or near the shack. However, by far the majority of my work was done after 1997 on the Mobile, Emergency, and CHers net in spite of the late hours I had to keep until the "window" closed. Here in Queensland 1400Z is midnight (we don't change our clocks for summer like most of the other states), and the window can close as early as 1400/1430Z, but it is usually around 1500/1530Z. I personally never had as good conditions on the long path in the mornings here, but I had too many other priorities at that time anyway.

My equipment? Simple. Just a Yaesu FT-767GX (HF, VHF, UHF) and an FL7000 running 375 watts PEP out into an 8-element log periodic at 40 feet.

I made many solid friendships during these few short years on 14.336, and I will treasure these always. If someone leaves me a bit of cash and our dollar strengthens, maybe I'll get over to the states to catch up with some of you. To all of you, thank you for a fun-filled quest. It was the mobiles who did all the work. I'll take a short break to catch up on a few things and think about the second time around. *—73, VK4AAR*

Operating Awards

Diplome des Provinces Françaises. Continuing the series on the REF

(French version of the ARRL) awards, the next one is for contacting each of the French provinces. Each province is composed of two or more "departments," which were explained in last month's column. The first two digits of the station address are the department number. For example, F6EDW's postal code is 63307. Therefore, a contact with him counts for Auvergne Province #3 shown in Table I. Contacts with stations in departments 03, 15, and 43 also count for Auvergne.

DPF – Diplome des Provinces Françaises. May be claimed for having contacted/heard French amateurs in different provinces. CW, phone, or HF/VHF. On HF 22 provinces are needed; on VHF 16 are required.

5BDPF – Diplome des Provinces Françaises on 5 Bands. Same conditions as DPF, but only for HF bands and using five of the nine authorized bands. A total of 110 cards (22 per band) is needed. The award is a plaque.

Send GCR list and fee of 16 IRCs or $US12 for the regular certificate, or 68 IRCs/$US56 for the 5 Band plaque to Christian Coupas, F6EDW, P.O. Box 83, F-63307 Thiers, Cedex, France.

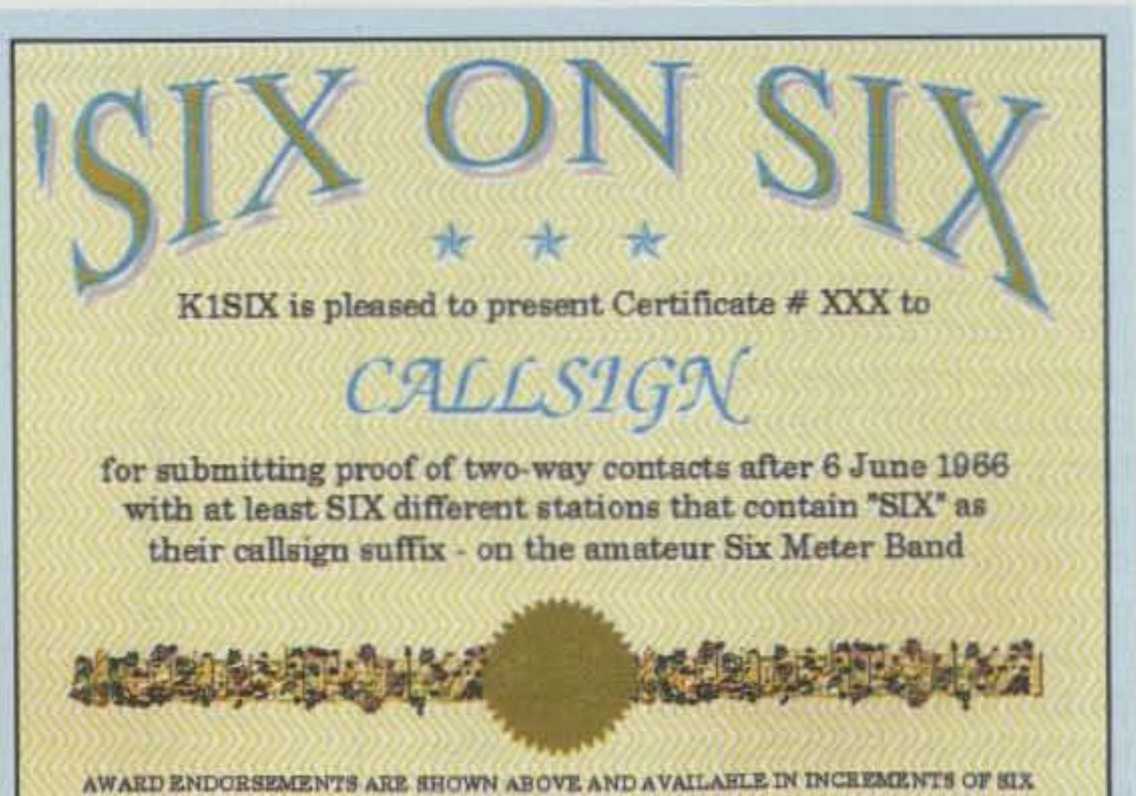
Lithuanians Abroad Award. This award is issued in memory of the late General P. Plechaviius and other Lithuanians, who, because of war or by fate, were scattered all over the world. The award was created by G4BYW, DL1KJS, DL9HQ, and LY3BJ. Ten contacts are needed to earn the award. Two must be with any of the two award creators, three with Lithuanian operators abroad from the list below, plus any five LY stations.

Lithuanian operators abroad: AA1SR, DK1XT, DL2FAT, GØNPI, GM4PCT,

Province Number	Province	Depts/Zip Code Number
1	Alsace	67 68
2	Aquitaine	24 33 40 47 64
3	Auvergne	03 15 43 63
4	Basse-Normandie	14 50 61
5	Bourgogne	21 58 71 89
6	Bretagne	22 29 35 56
7	Centre	18 28 36 37 41 45
8	Champagne	08 10 51 52
9	Corse	2A 2B
10	Franche-Comte	25 39 70 90
11	Haute-Normandie	27 76
12	Languedoc-Roussilon	11 30 34 48 66
13	Limousin	19 23 87
14	Lorraine	54 55 57 88
15	Midi-Pyrenees	09 12 31 32 46 65 81 82
16	Nord	59 62
17	Pays-De-Loire	44 49 53 72 85
18	Picardie	02 60 80
19	Poitou-Charentes	16 17 79 86
20	Provence-Cote D'Az	04 05 06 13 83 84
21	Ile De France	75 77 78 91 92 93 94 95
22	Rhone-Alpes	01 07 26 38 42 69 73 74

Table I– List of provinces/departments for the REF Diplome of the Provinces of France award.

The Icon Painter Award from the Ukraine was established by the Ghuguev Museum of Ilya Efimovich Repin to commemorate the early peri-od of this artist's work



For the Six on Six Award make confirmed contacts on 6 meters with at least six different callsigns that contain the suffix letters "SIX."

GM4PTC, K1AMG, K1BV, K1NCZ, K1WWZ, K3JA, K6LGL, K8SRB, K9WR, KA1ITH, KA3Q, KA4IES, KA9CDH, KA9ITZ, KA9IUA, KA9VPD, KB1PI, KB1TY, KB8HZX, KC8IUM, KD1BJ, KD1SI, N8AUM, N8CVV, NA1I, VE3LBQ, VE3NRE, VE3NYW, W1ECK, W1HNF, W1WHM, W3POA, WA1JZS, WA2BIG.

Contacts are valid on or after 14 July 2000. Send GCR list and fee of $US8 or equivalent to: Zigfridas Orentas, LY3BJ, Zemaites 33-47, Siauliai LT-5400, Lithuania.

Sweden's Nordic CW Award. Here is one for Morse code diehards— like me! Only 50 contacts are needed for the basic level award, and that shouldn't be too hard. There's room for plenty of growth, with the top level requiring 5000 CW contacts. The Nordic Countries Contest is a good place to get loads of the required QSOs.

For the basic award you need 50 contacts with Nordic countries: LA, OH, OZ, SM, and TF on or after 1 January 2000. Endorsements are available for 100, 250, 500, 1000, 2000, and 5000 contacts. You may contact the same station multiple times for credit, but only one contact each day.

Send GCR list and fee of $US10. Endorsement fee is $US2; fee for 5000 contact Golden seal is $US5. Apply to: Leif Lindh, SM3DBU, Malagatan 5, SE-825 31 Iggesund, Sweden.

The Icon Painter Award from the Ukraine. This award was established by the Ghuguev Museum of Ilya Efimovich Repin to commemorate the early period of this artist's work in the town of Ghuguev, the Ukraine. Three famous icons of religious significance are reproduced in full color on the certificate. To earn the award you must contact on any mode or band, after 1 January 1969 (the year of the opening of the museum), at least ten cities where Repin's works are on display. A minimum of five countries must be represented. The cities and countries are as follows:

Armenia	Yerevan
Belarus	Vitebsk, Minsk
Great Britain	London
Germany	Dresden
Italy	Florence
Latvia	Riga
Norway	Oslo
Russia	Irkutsk, Kirov, Moscow, Nizhny Novgorod, Penza, Rostov-on-Don, St. Petersburg, Saratov, Ufa, Khabarovsk.
Romania	Bucharest
USA	Princeton, New Jersey
Turkmenistan	Ashgabad
Ukraine	Kiev, Poltava, Kharkov, Chuguev
Finland	Myantta, Tampere, Turku, Helsinki
France	Paris
Czech Rep.	Gradets Kralove, Nakhod, Prague
Sweden	Stockholm
Estonia	Tallinn
Yugoslavia	Belgrade

Send GCR list to Roslyak Aleksandr Vladmirovich, P.O. Box 13, Chuguev, Kharkov Region, Ukraine 63503. Payment for the award: $US5 to Roslyak Aleksandr Vladimorovich, passport 327915, Region Bank, Kharkiv, Uk - raine, S.W.I.F.T. code REGBUA2K, correspondent account #04-401-960 with Bankers Trust Co., New York.

USA/VHF Six on Six Award. Make confirmed contacts with at least six different callsigns that contain the suffix letters "SIX." The contacts must be made on 6 meters using any mode after June 6, 1966. No use of repeaters allowed; all must be direct contacts. Stations operating portable outside their DXCC entity (e.g., PA1SIX as I2/PA1SIX) will count as a separate callsign. Endorsements for each additional six contacts.

Submit the cards and sufficient funds to return them plus fee of $US2 for USA and Canada ($US3 for other countries). Apply to: Robert R. McMillion, K6SIX, 7115 Barbera Ave., Winton, CA 95388. No IRCs please.

The following 29 "SIX" stations are known to be active: GWØSIX, I2/PA1SIX, JY7SIX, K1SIX, K2SIX, K3SIX, K4SIX, K5SIX, K8SIX, KE4SIX, KL7SIX/VK3OT), PA1SIX, PA6SIX, SO6/PA1SIX, TXØSIX, V47SIX, VA7SIX/VE7VDX, VE1SIX/VE1MR, VE2SIX, VE3SIX, VE9SIX/VE9SM, VK3SIX/VK3OT, VK6SIX, WØSIX/KØFF, W4SIX, W6SIX, W8SIX, XQ3SIX, ZD8SIX/G3WOS.

URL of the Month

Ten meters is hot, which makes sense, since we are just coming off the peak of the sunspot cycle. Check out the 10-10 Group awards at: <http://listserv.lehigh.edu/lists/tenten-l/ awards.html>.

I still need to receive rules and samples of the certificates offered by your club or group. Please send them to me for some free publicity!

73, Ted, K1BV

What's New

BY KARL T. THURBER, JR., W8FX

A New Column for A New Century

Super Summer Stuff

This month we begin the summer hamming season with a new wideband receiver from ICOM and then cover several accessories for the shack plus other items you can use to get the season off to a great start.

Radio Gear

ICOM IC-R3 Pocket Wideband Receiver. Well, let's see. Is it a pocket-size handheld radio, a scanner, a full-fledged communications receiver, or a personal mini-size TV set? Actually, the answer is "a little of each."

What we're describing is ICOM's first pocket, wideband communications receiver with video. It's the IC-R3 (see photo A), which combines a 2 inch TFT (thin-film transistor) color video display with a wideband receiver to bring a visual element to what traditionally has been an audio-only environment.

The IC-R3 not only covers the commercial broadcast TV channels, 2 through 69, and amateur radio UHF ATV frequencies, it also provides a free-tuning AM TV receiver covering from 25.500–2450 MHz, along with FM TV capability from 900–1300 and 2250–2450 MHz. The radio opens up a whole new world of monitoring possibilities.

The IC-R3 also has an extremely wide receive range of 0.5 to 2250 MHz, except of course for the cellular bands, which are blocked. Some 400 memory channels are available, along with 50 scan-edge memories for programming desired frequency ranges.

There are an additional ten video memories available for quick retrieval of your favorite video sources, and there's a band scope for analyzing activity within a specified band. The unit comes with a high-performance Li-Ion (Lithium-Ion) battery that offers up to 27 hours of continuous operation.

For more information and pricing on the IC-R3, contact ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004 (425-454-8155; web: <http://www.icomamerica.com>).

Accessories for the Shack

Time & Again World Time Zone Map Decals. Radio amateurs, shortwave radio buffs, teachers, students, professionals with international clients, military personnel, and many others will find the International Time Zone Decals useful to determine at a glance the local time at distant locations. These attractive decals display the continents in brushed silver and oceans in medium blue, and they are quite easy to read. All 24 time zones and many of the major cities around the world are presented.

The decals have an adhesive backing and are made of durable, high-quality polyester. They're available in two sizes that can fit conveniently on a radio or accessory cabinet, a desktop, or any other location of limited space. The small-size decal offers a stretched projection to enhance readability.

Time & Again proprietor James A. Termini offers the large decal (2 1/4" × 4 3/4", priced at $4), good for large equipment, and the small decal (1 1/4" × 3 3/4", priced at $3), useful for small, portable equipment where space is limited. Jim says that if you order two decals in any combination, you can take $1 off the total. Finally, you can add portability to your decals by affixing them to a magnetic plate; either size plate is $1.

Checks and money orders should be made payable to Time & Again and sent to P.O. Box 306, Dickinson, TX 77539 (e-mail: <jimtermini1@yahoo.com>; website: <http://www.eazylink.com/~timeagain>.

New Powerport WorldPouch Pack. In the January issue we profiled the Powerport VX-5 Radio Glove™ and several other accessory products from Cutting Edge Enterprises. Company president Roger Hall, KC6QLB, recently wrote to thank us for our coverage, and at the same time he mentioned some new products. One is the NEO "Hold-it" neoprene pouch that's available in several sizes to fit most modern radios and in either red or black. The pouch has a catchy motto: "When your radio takes a dive, make sure it's wearing a NEO wetsuit."

Also, by the time you read this, Cutting Edge should have available the WorldPouch™, a combination radio pouch and fanny pack for the new, popular Yaesu FT-817 "mini-mobile" multimode portable transceiver (see fig. 1).

The radio pouch portion of the WorldPouch is constructed of sturdy padded material with pockets for the antenna and a battery. The back of the pouch has two steel belt clips to secure it to the nylon fanny pack, or it can be clipped to your belt as a simple, compact belt pouch. The fanny-pack portion of the WorldPouch has two zippered accessory pouches, multiple tie-down loops, and a microphone clip to support your radio needs. The radio pouch clips securely to the center of the fanny pack, making for a complete station on your hip.

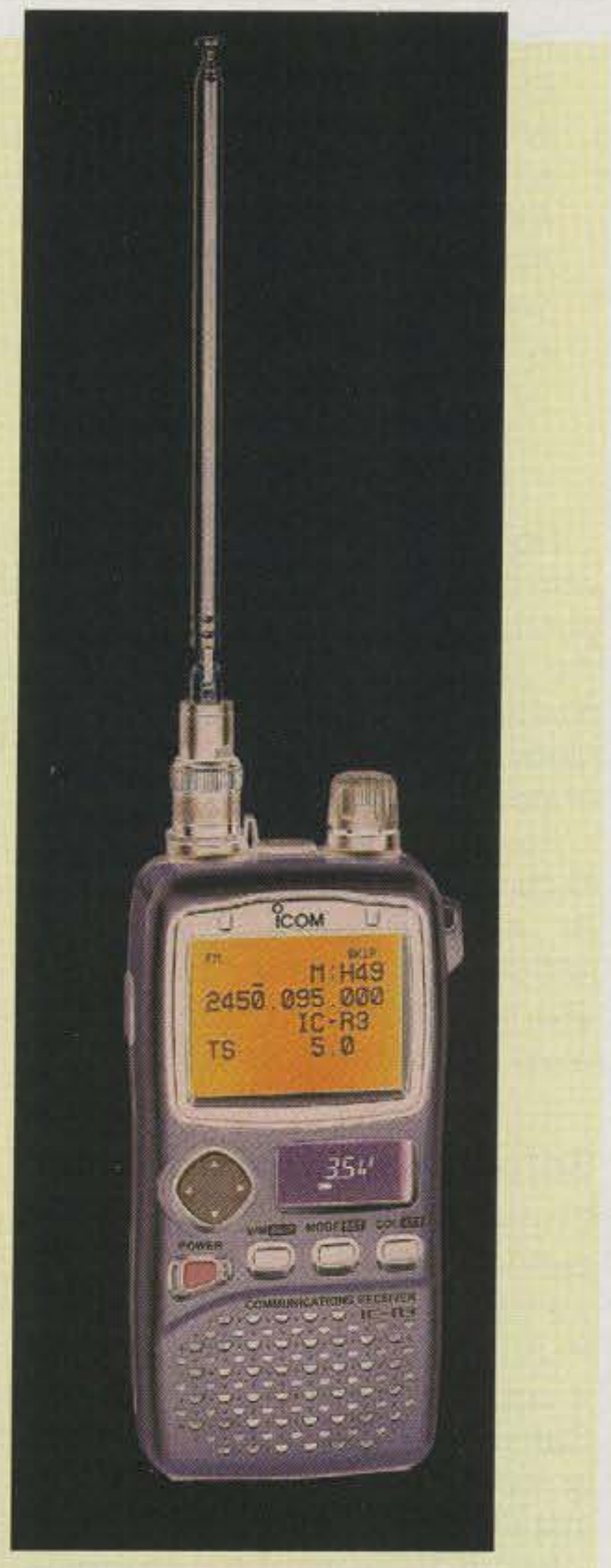


Photo A– ICOM is understandably proud of its first pocket, wideband communications receiver with video. The IC-R3 combines a 2 inch TFT color video display with a wideband receiver to bring a visual element to what traditionally has been an audio-only environment.

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

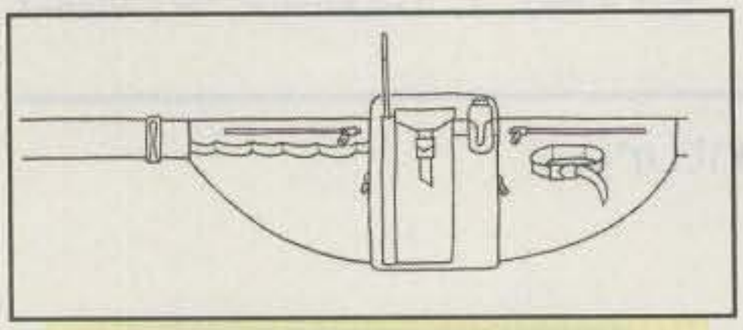


Fig. 1– By the time you read this, Cutting Edge should have available the WorldPouch™, a combination radio pouch and fanny pack for the new Yaesu FT-817 "mini-mobile" multi-mode portable transceiver, as shown in this sketch. The whole idea is to effectively give you a complete station on your hip!

Roger explains that for those of you who already own a WorldPack, you can purchase just the radio pouch portion of the WorldPouch to make the radio fit nicely into your WorldPack, leaving plenty of room for accessories and larger power supplies.

For more details and pricing, contact Cutting Edge Enterprises, 1803 Mission St., Suite PMB-546, Santa Cruz, CA 95060 (1-800-206-0115; e-mail: <info@powerportstore.com>; web: <http://www.powerportstore.com>).

Software and Computers

Copernic.com Text Summary Application. In the September 1999 column we took note of Copernic and Copernic Plus, two of my favorite internet search programs. These programs, from the Canadian firm Copernic.com, are highly customizable searchers that you install on your computer, just like your internet browser. The programs help you find what you're looking for by simultaneously using several user-selected search engines. The programs rank results by relevance, provide summaries, store the results, organize them, and remove duplicates. The basic Copernic®, as we noted, is a free download, while Copernic Plus is $39.95 and the upscale Copernic Pro is $79.95.

I have used all three programs, and frankly, I wouldn't want to search the internet without them being installed on my PC. Now Copernic.com has introduced another interesting new product, Copernic Summarizer™ (fig. 2). It's text-summarizing software that intelligently produces a concise resumé of any web page, wordprocessing document, e-mail message, and many other documents produced by popular application programs. The artificial intelligence technology that's built into the software allows it to "understand" document content and extract concepts in about one second. Copernic Summarizer is priced at $79.95.

For more information on Copernic Summarizer or any of the Copernic programs, contact Copernic.com, 360, rue Franquet #60, Sainte-Foy, Quebec, Canada G1P 4N3 (fax 418-527-1751; e-mail: <sales@copernic.com>; web: <http://www.copernic.com>).

New on the Net

MegaConverter 2. Do you frequently need to convert various measures and parameters? Would you like to perform your conversions using an online application program without the need to download software to your PC to do so? If so, you may be interested in MegaConverter 2, a new version of the popular MegaConverter educational and research website application, which now gives you an easier-to-use conversion interface, complete with more converters, more features, and quicker access.

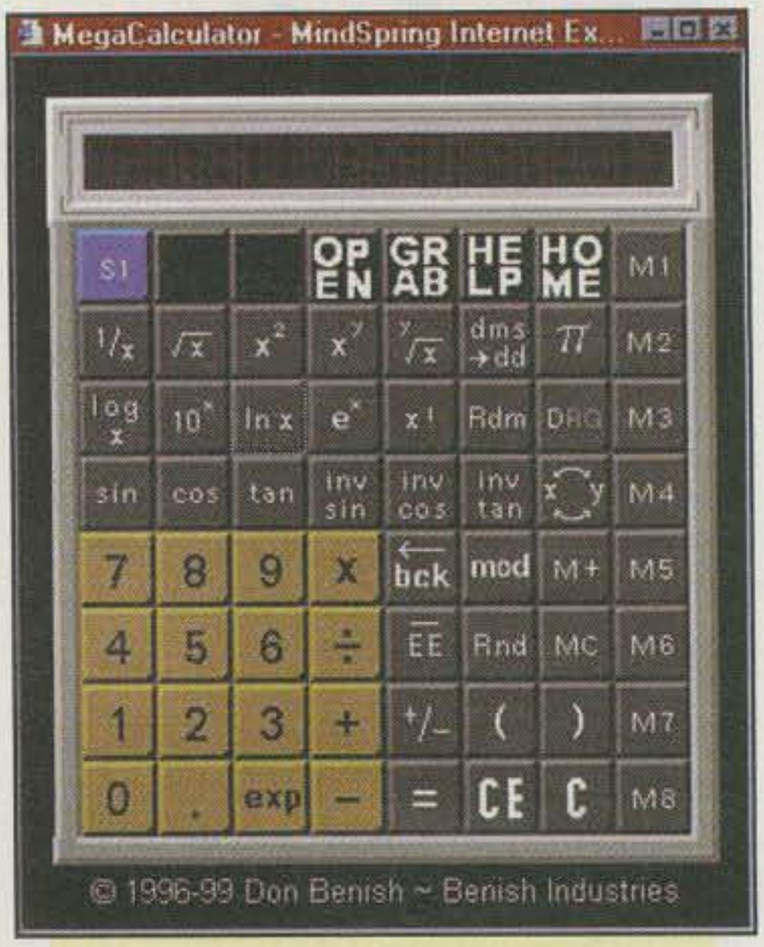


Fig. 3– Shown in this screen shot is the MegaCalculator component of the online web application program MegaConverter 2. The calculator is billed as the web's most powerful online calculator.

MegaConverter 2 is part of the MegaConverter.com website, an ever-growing set of weights, measures, and units conversion and calculation modules. Every module has its own on-line information system built in. For just about anything you can think of, MegaConverter can show you its equivalent. You may find, as I have, that the MegaConverter online application will become an indispensable source for conversions of all types, once you actually try it and put it through its paces.

You can check out the MegaConverter 2 website at <http://megaconverter.com/mega2>. Shown in the fig. 3 screen shot is the MegaCalculator component of MegaConverter 2. It's billed as the web's most powerful online calculator—a scientific calculator capable of practically any common calculator functions (and many uncommon ones, as well).

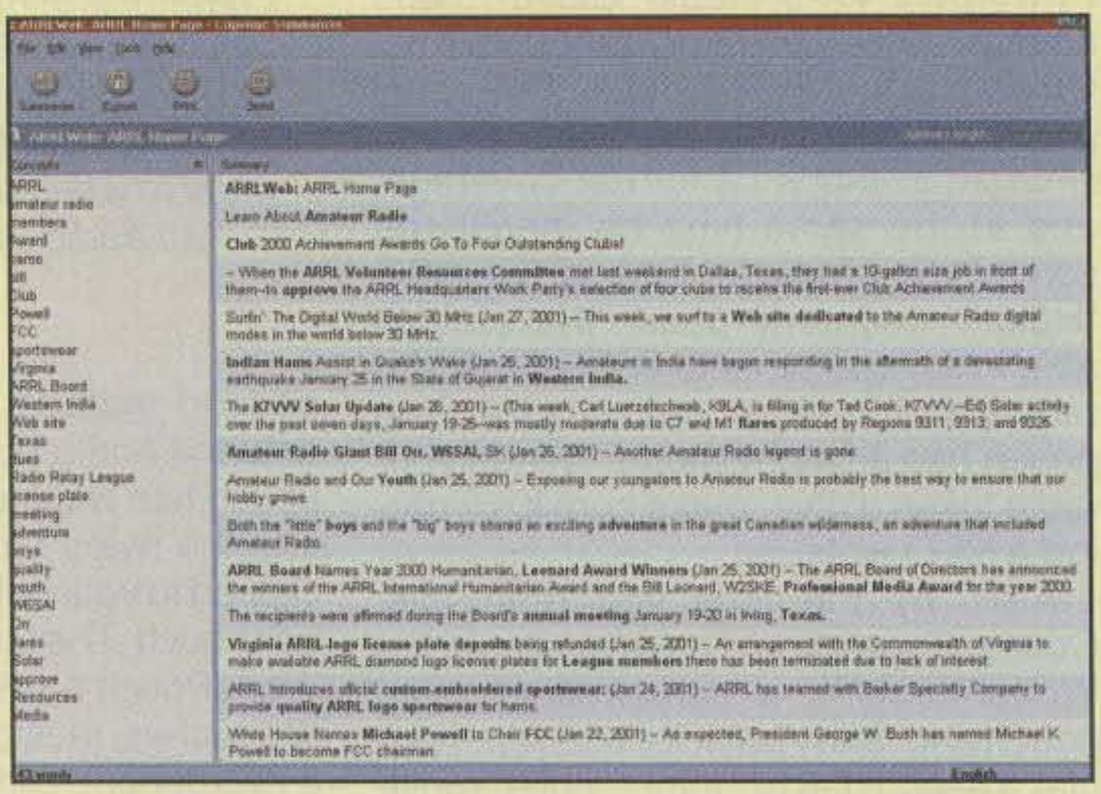


Fig. 2– Copernic Summarizer® summarizes text, intelligently producing a concise resumé of any web page, wordprocessing document, e-mail message, and many other documents produced by popular application programs. The artificial intelligence technology that's built into the software allows it to "understand" document content and to extract concepts in about one second. In this example, we turned the program loose on the ARRL Home Page, letting it summarize it. Neat and useful, indeed!

From the Bookshelf

Cubical Quad Notes. This is another excellent publication from antenna expert L. B. Cebik, W4RNL, noted author of over a dozen books, with authoritative works on antennas for both the beginner and the advanced practitioner. *Cubical Quad Notes, Vol. 1: A Review of Existing Designs,* is available now from the antenneX website; Vol. 2,

Fig. 4– Here's a portion of the opening screen of the antenneX website, which is full of useful, authoritative antenna information—most of which can be viewed for free. Monthly columns include those by L. B. Cebik, W4RNL, author of Cubical Quad Notes, *which we profile in the column this month.*

Fig. 5– Pasternack Enterprises has upgraded its website, most notably bringing the paper catalog online with its "Smart Catalog." This section of the website is designed to assist you in finding any part in the inventory without the need to know any part numbers. Once you find the part, you can view a detailed drawing in one of two formats.

which will be *Rethinking Quad Design,* should appear later this year.

The two-part *Cubical Quad Notes* series clarifies some aspects of quad array performance and codifies some basic elements of quad design. Volume 1 begins with a review of existing quad arrays, ranging from basic 2-element monobanders to large multiband designs. Each of the 12 chapters of the 220-page book is fully illustrated with sketches, graphs, and antenna patterns. In fact, there are about 125 of these illustrations, plus over 80 tables covering performance, dimensions, and parameters for modeling exercises.

The new book is available in a choice of softcover or eBook versions; the eBook is in the popular PDF format and requires the free Adobe Acrobat Reader software. Prices range from $22.95 to $29.95, depending on format and delivery method.

The antenneX website (fig. 4) is sponsored by antenneX Online Magazine, P.O. Box 72022, Corpus Christi, TX 78472 (1-888855-9098; e-mail: <info@antennex.com>; web: <http://www.antennex.com>). If you're into antennas, by all means check out the excellent antenneX website, which is chock full of useful, authoritative antenna information—most of which you can view for free.

***The ARRL Antenna Book* and Antenna Book CD.** One of my favorite ARRL publications is, of course, *The ARRL Antenna Book,* having been *CQ*'s "Antennas & Accessories" column editor for many years. The 19th Edition, at 816 pages and priced at $30, has been extensively rewritten by its contributors and by Editor Dean Straw, N6BV. In fact, about 40% of the material from the previous edition has been revamped.

The newest edition makes use of the latest computer-modeling techniques, which have considerably improved traditional antenna designs. Included are new treatments of broadband antennas; gain and size comparisons for multi-element arrays; and updated information on log-periodic, quad, long-wire, and traveling-wave antennas. A CD-ROM of programs accompanies the book. The CD includes two new Windows® programs (Yagi for Windows and Transmission Line for Windows), thousands of pages of detailed propagation forecasts, and various DOS utility programs—more than we can do justice to here.

You also can obtain *The ARRL Antenna Book* on an easy-to-use, fully-searchable CD-ROM. At your com-

mand is the entire book—every word and illustration, on every single page. The CD-ROM uses the widely popular, free Adobe® Acrobat® Reader to view, navigate, search, and print from all chapters. Priced at $39.95, the CD-ROM includes all the Windows® and DOS software that's included with the printed edition.

Contact the American Radio Relay League (ARRL), 225 Main St., Newington, CT 06111-1494 (1-888-277-5289; e-mail: <pubsales@arrl.org>; web: <http://www.arrl.org>). Also check out the ARRL publications catalog at <http://www.arrl.org/catalog>. There you will find extensive editor's remarks that take the form of a detailed article on just what's new in the 19th Edition.

New Pasternack Enterprises Catalog and Website. In several columns we noted the Pasternack Enterprises catalog, which detailed the company's extensive lines of coaxial-related products. Recently we received a copy of the new Catalog #2001, which at 186 pages is the largest Pasternack catalog ever. It includes thousands of different coaxial related products, along with associated technical data.

The 8" × 10 1/2" hardcopy catalog shows a large selection of adapters, attenuators, breakouts, coax and coax assemblies, inline amplifiers, connectors, switches, patch cords, power dividers, switches, terminations, tools, twinax, directional couplers, DC blocks, and other coax-related items. It's quite easy to use the catalog in that it has both a comprehensive table of contents and index arranged by model number.

The company, in business since 1972, also has upgraded its website (fig. 5), most notably bringing the paper catalog online with its "Smart Catalog." This section of the website is designed to assist you in finding any part in the inventory without the need to know any part numbers. Once you find the part, you can view a detailed drawing in either of two formats. The website also lets you look up any part in the inventory if you know the Pasternack number.

Contact Pasternack Enterprises, P.O. Box 16759, Irvine, CA 92623-6759 (phone 949-261-1920; e-mail: <sales@pasternack.com>; <http://pasternack.com>).

New Universal Radio Communications Catalog. Almost as if on cue, Universal Radio has issued its periodic update to its always well-illustrated, large-format communications catalog. The 104-page 2001 Communications Catalog is an excellent ordering and reference resource that covers equipment for the amateur radio, shortwave, and scanner buff alike. A large selection of accessories also is featured.

Some of the new radio gear covered in the catalog includes the ICOM 910H Amateur Satellite Transceiver, Kenwood TS-2000 Amateur Transceiver, Yaesu VR-5000 Wideband Receiver, and AOR AR8600 Wideband Receiver, to name just a few of the new products.

The catalog is available free on request by fourth class mail, or for $3 by Priority Mail. Outside North America, send five IRCs for postage. For your copy, contact Universal Radio, Inc., 6830 Americana Parkway, Reynoldsburg, OH 43068-4113 (1-800431-3939; e-mail: <dx@universal-radio.com>; <http://www.universal-radio.com>).

Wrap-Up

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

Overheard: Are you making life too complex? In the final analysis, it's the simple things that we remember most fondly. 73, Karl, W8FX

Our Readers Say

Dave Has Fans...

The following letter was sent to "World of Ideas," "How It Works," and "QRP" Editor Dave Ingram, K4TWJ:

Hi, Dave:

I keep meaning to drop you a line to tell you how much that I enjoy your articles in *CQ* and other publications. You are always so upbeat and positive! I don't see how anyone can read your stuff without getting excited about ham radio. I always read your articles first. Keep up the good work !

Dick Hudson, KA4POG

Bill Orr, W6SAI, Remembered

Editor, *CQ:*

What do I remember about Bill Orr? He was my Elmer back in the summer of 1935. He helped me assemble my first 160 meter rig (47 xtal oscillator, 46 buffer, and a pair of 46s in the final with a pair of 46s in class B in the modulator). He lived four blocks away and was very handy when my rig needed to be neutralized, because he really noticed it and came running.

At one point we assembled a 20 meter square loop antenna fed with Bassett concentric cable and mounted on a clothes reel. He wanted to write it up and send it in to *QST*. This was the start of a budding journalism career. He also designed a cartoon-type W2HCE QSL card. That was while he was still in high school.

My last Orr-related project was in 1940 when we put an HY-75 modulated oscillator on 2½ meters in Westwood Village in the Los Angeles area using my completely legitimate W3HFR portable call. The results were truly spectacular.

Shortly after Bill and I had commenced our respective married lives, I asked him how to deal with an XYL who seemed to resent the intrusion of ham radio into her life. "That's easy; give her a hobby," he replied. And so he did—one son and four daughters. His wife Sunny also earned a private airplane pilot's license in her own right.

73 and SK to a great guy.

John L. Clark, WF3Y
(ex-W2IUA, W3HFR, W2MJI, W2DE, W1OE)

Editor, *CQ:*

I was sad after reading the editorial about Bill Orr SK. I am an antenna freak, and I remember reading my dad's (HK1CMX) old, and inherited by me, *CQ* magazines in the small format it had before. Every time I had one of those magazines in hand, the first pages to read were the antenna section of W6SAI. I was very happy when he returned to *CQ* again. It was always instructive and FUNdamental to read his articles.

Bill, I send you my respects and wish you 73 and DX wherever you are now.

David, HK1KXA

Michigan Scanner Law

Editor, *CQ:*

In the January edition there was a small article about the defeat of a "scanner law" here in Michigan and how the Livonia Radio Club was instrumental in getting it stopped. There are a few things that I would like to bring to your attention regarding this "misinformation."

First, the law proposed was simply a re-write of an existing law that Michigan has had on the books for many years. The re-write was meant to enhance the penalties for possession of a scanner without a permit or a ham license. There was a wording problem which changed the whole interpretation of the proposed legislation. Possession of a scanner in a motor vehicle in Michigan continues to be illegal for the average citizen without a permit. Hams continue to be exempted.

Second, hundreds (possibly thousands according to the bill's sponsor) of hams sent e-mail, wrote letters, or made phone calls to the legislature, the state police, and others to stop the ill-worded rewrite of the law. The Livonia club was only a small part of a large effort of hams, emergency managers, and even police to get the legislation stopped. Give credit where credit is due; while the LARC did participate, they were but a small part of a large effort to maintain our amateur radio exemption to Michigan's "scanner law."

Dan Hancock, N8DJP
Dispatcher, Michigan State Police
RACES Officer/
Emergency Coordinator
Wayne County, Michigan

Dan: Thank you for the additional information. What brought the Livonia club in particular to our attention was the fact that it was trying not only to preserve amateur radio's exemption from the law, but to get it rewritten in such a manner that hams would not need exemption, changing the focus from simple possession of a radio to using it in a crimi-

nal activity. This way, only the "bad guys" would run afoul of this law, whether or not they had ham licenses.

An Apology

Editor, *CQ:*

I wish to apologize to the readers and editors of *CQ* magazine and to the entire ham community for my comments that appeared in the December 2000 issue on page 117. My comments related to the designation "E4" for the Palestine entity.

Had I done some research into the subject, I might have learned that these ITU designations do not apply only to "states" and "countries," but also to "entities." I would have learned that "E4," though not belonging to a country or state of Palestine, which does not yet exist as such, is issued to the Palestinian Authority, which is a legally and officially recognized entity.

My apology goes also to the ham (I do not have the name or call at this time) who had been highlighted in a previous edition as having "introduced ham radio to several previously banned countries such as... Palestine." Perhaps the word "country" should not have been used. That is beside the point, however. The point is that my ranting and raving might not have occurred had I done my homework first.

I accused *CQ* magazine of having made a "political statement." I know that politics has no place in ham radio. Of course, I do realize that one of the wonderful aspects of ham radio is that politics are set aside completely. Radio waves do not recognize geographic or political borders. There are no enemies in this hobby; we don't care if the other ham is in another country or the next town down the road. We're all the same.

To all those I may have made angry or uncomfortable by my statements, I apologize.

Mark Lassman, KB6KGX

Mark: I'm sure that anyone who may have been offended by your letter accepts your apology. We at CQ certainly were not offended. Part of our mission is education. There are so many aspects of this hobby, that if you're not an active DXer, you reasonably might not know the fine distinction between a "country" and a "DXCC entity." The most important thing, as you pointed out above, is that ham radio lets us communicate one-on-one with people in other "entities," and discover firsthand our common humanity.

Looking Ahead in CQ

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

Antenna Special in July *CQ!*

- "*CQ* Reviews: Ten-Tec Jupiter Transceiver," by K1BQT
- "*CQ* Reviews: Hi-Q Stealth Mobile HF Antenna," by WB2AMU
- "Ham History Web Server," by N8PB
- "Electricity Everywhere," by W6BNB

Plus:

- "Add Scanning to Converted CB Rigs," by WB9YBM
- "The Station Controller," by AF1US
- "Transforming a Transformer," by VE3ERP

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

Oops...

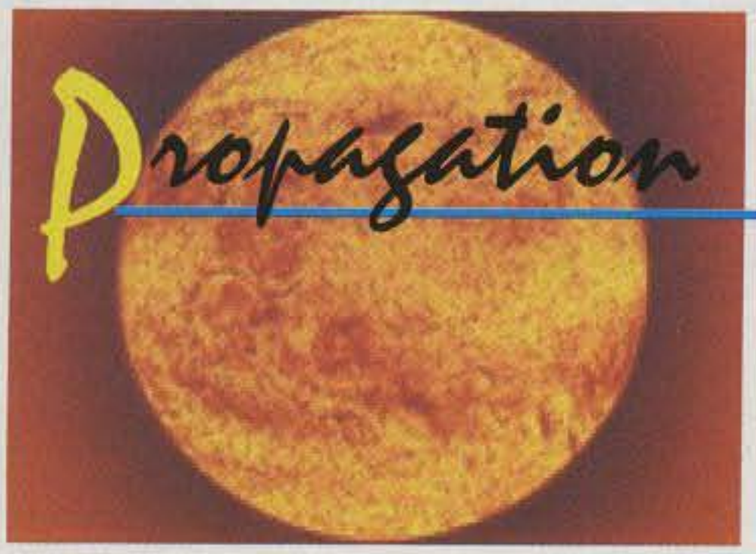
We liked the mistake we made in our April issue so much that we did it again in May. Last-minute advertising changes forced us to relocate the "On the Cover" feature just before each issue went to press, and the new page numbers never got onto the covers. In case you haven't found them yet, April's "On the Cover" is actually on page 89, while May's is on page 85.

Speaking of page 85 in the May issue, a computer-typesetting error caused a strange block of white space to appear in the left-hand column, which, in turn, pushed the closing lines of the "Washington Readout" column off the end of the page and into outer space. The complete closing paragraph is as follows:

"Amateur radio began with a few experimenters in the early 1900s. It has since grown to about 700,000 FCC-licensed operators in the US Amateur Radio Service. Both the operators and the service as regulated in Part 97 of the FCC Rules represent principles of radio communication that have endured and advanced since the early days of the radio pioneers."

For the "Computers and Internet" column in the March issue, Don, N2IRZ, reports the following correction: "When discussing network speeds, I inadvertently wrote MegaBytes per second (MB/s) instead of megabits per second (Mb/sec). These terms are not the same, since a Byte is 8 bits. Thanks to Steve Silberstein, W2JRA, for calling my attention to this error."

We apologize for any inconvenience.



Propagation

BY GEORGE JACOBS, W3ASK

The Science Of Predicting Radio Conditions

Biggest Sunspot of Cycle

Just as I was proofreading the June column before faxing it to *CQ*, several interesting events took place which warranted a last-minute rewrite.

On March 28 the largest sunspot in ten years was reported. It covers an area equivalent to the total surface area of 13 Earths! It is the largest sunspot observed to date in the present solar cycle, Cycle 23, and it is also the largest spot seen since 1991. See photo A for a telescopic picture of this huge sunspot, provided by NASA at the URL <www.spaceweather.com>.

This whopper sunspot, and the group of spots surrounding it, contributed to March 28 having the highest daily sunspot number recorded so far during Cycle 23. The Royal Observatory of Belgium, the world's official keeper of sunspot data, reported a daily count of 258. The official level of solar flux peaked at 274. Both values, as high as they are, fell considerably short of the record daily sunspot count of 355 observed on December 24 and 25, 1957 at the peak of record-breaking Cycle 19. The highest solar flux level recorded was on April 7, 1947 with a count of 457. This corresponded with the peak of Cycle 18.

11307 Clara Street, Silver Spring, MD 20902
e-mail: <george@gjainc.com>

Severe Radio Storm and Widespread Aurora

A severe geomagnetic storm began around 0100 UT on Saturday, March 31, and it continued through early April 1. It may have been the most intense such storm to date in Cycle 23. Its effects were felt worldwide, with daily *A*-indices reported as greater than 79 in equatorial regions and up to 306 in more northern latitudes. Normal levels vary between approximately 2 and 30. The storm played havoc with HF communications, causing near complete blackouts or signal distortion on all amateur bands for more than a day.

Intense and widespread auroral displays associated with the geomagnetic storm were reported from the storm's onset. Data is still coming in as this col-

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for June 2001

Propagation Index.....	Expected Signal Quality (4)	(3)	(2)	(1)
Above Normal: 1, 5-6, 25, 28	A	A	B	C
High Normal: 4, 7-8, 16, 24 26-27	A	B	C	C-D
Low Normal: 2-3, 11-12, 14-15 19-20, 23, 29-30	B	C-B	C-D	D-E
Below Normal: 13, 17-18, 22	C	C-D	D-E	E
Disturbed: 9-10, 21	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 S9, with some fading and noise.

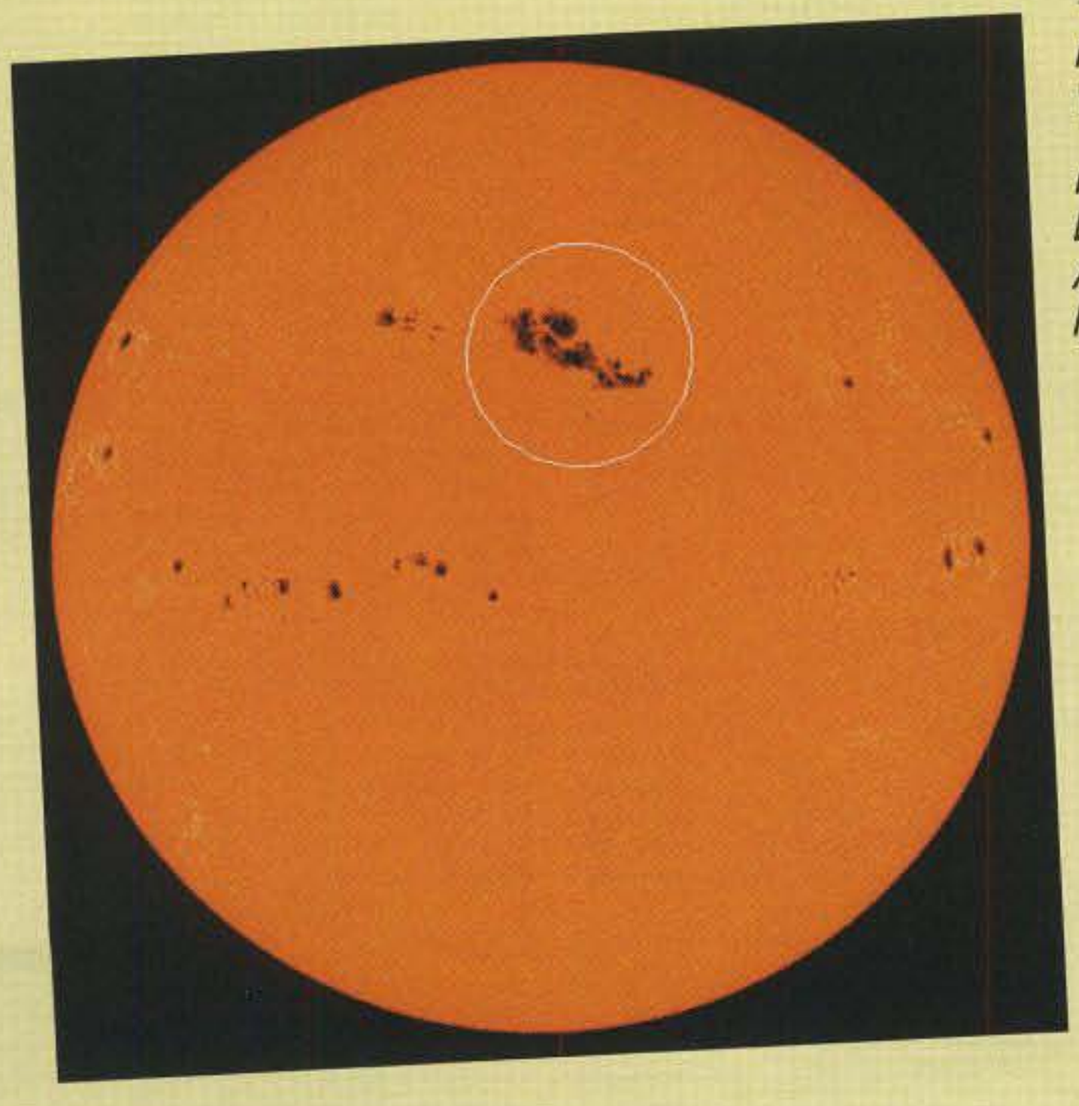
D—Poor opening, with weak signals varying between S1 and S6, with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

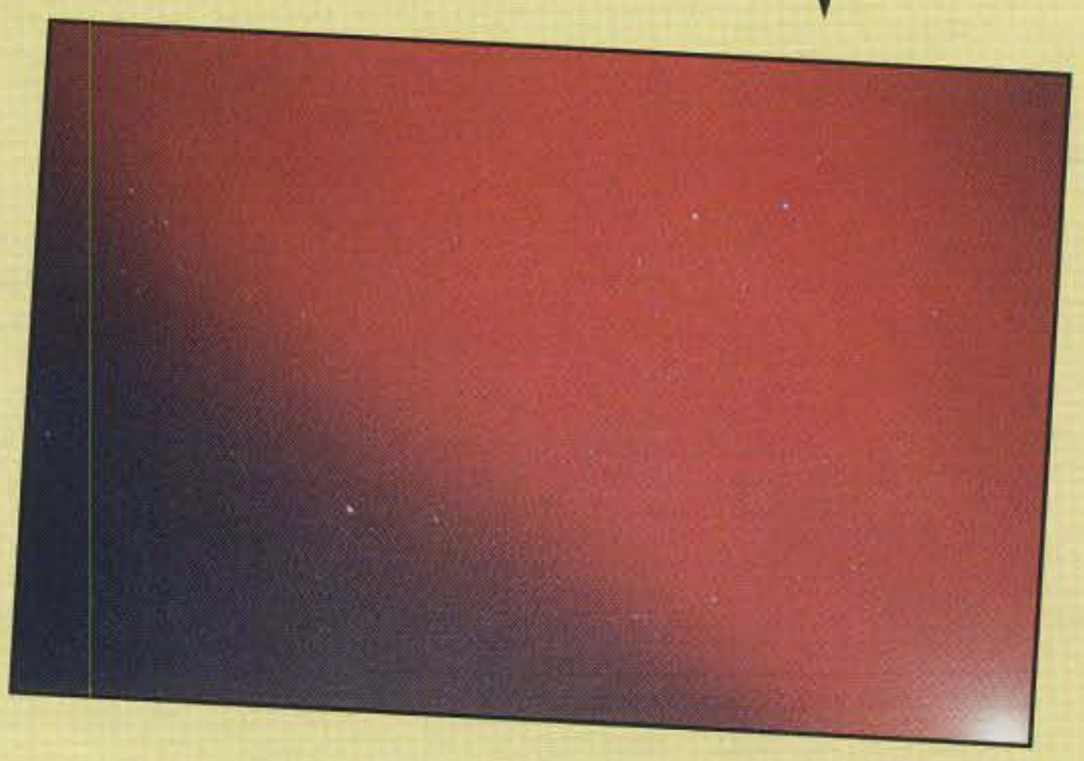
1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing on the following pages.

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 3 will be excellent (A) on June 1st, fair-to-good (C-B) on the 2nd and 3rd, good (B) on the 4th, excellent (A) on the 5th and 6th, etc.



← Photo A– Cycle 23's biggest sunspot to date, 13 times larger than Earth, took place on March 28. (Photo via SpaceWeather.com)

Photo B– Widespread aurora of March 30–31 photographed by Peter Strasser near Sacramento, California on March 30. An aurora seen so high in the sky so far south is an extremely rare event. (Photo via SpaceWeather.com)



HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate *daylight* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

June 15 to August 15, 2001
Time Zone: EDT
EASTERN USA TO:

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80* Meters*
Western & Central Europe & North Africa	16-18 (1)	08-09 (1) 09-12 (2) 12-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	09-15 (1) 15-16 (2) 16-18 (3) 18-00 (4) 00-03 (3) 03-05 (2) 05-07 (3) 07-09 (2)	20-21 (1) 21-22 (2) 22-23 (3) 23-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 21-22 (1)* 22-23 (2)* 23-00 (3)* 00-01 (2)* 01-02 (1)*
Northern Europe & European CIS	15-17 (1)	11-15 (1) 15-18 (2) 18-19 (1)	09-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-01 (3) 01-03 (2) 03-06 (1) 06-09 (2)	21-22 (1) 22-23 (2) 23-00 (3) 00-01 (2) 01-02 (1) 22-01 (1)*
Eastern Mediterranean & Middle East	16-18 (1)	11-13 (1) 13-17 (2) 17-18 (3) 18-19 (4) 19-20 (3) 20-21 (2) 21-22 (1)	12-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-01 (3) 01-03 (2) 03-06 (1) 06-08 (2) 08-09 (1)	20-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Western Africa	11-13 (1) 15-17 (1) 17-19 (2) 19-21 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-23 (4) 23-03 (3) 03-04 (2) 04-05 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-03 (4) 03-04 (3) 04-05 (2) 05-07 (1)	20-22 (1) 22-00 (2) 00-02 (1) 22-00 (1)*
Eastern & Central Africa	17-19 (1)	09-12 (1) 12-14 (2) 14-17 (3) 17-19 (4) 19-22 (3) 22-23 (2) 23-00 (1)	14-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-02 (3) 02-03 (2) 03-05 (1)	21-00 (1)
Southern Africa	10-13 (1)	08-10 (1) 10-11 (2) 11-12 (3) 12-13 (4) 13-14 (3) 14-15 (2) 15-16 (1) 01-03 (1)	23-01 (1) 01-03 (3) 03-05 (2) 05-08 (1) 14-15 (1) 15-16 (2) 16-18 (3) 18-19 (2) 19-20 (1)	21-22 (1) 22-00 (2) 00-02 (1) 23-01 (1)*
Central & South Asia	Nil	09-10 (1) 10-12 (2) 12-13 (1) 17-19 (1) 19-22 (2) 22-23 (1)	17-20 (1) 20-23 (2) 23-03 (1) 03-06 (2) 06-08 (1)	19-21 (1) 04-06 (1)
Southeast Asia	Nil	10-14 (1) 14-16 (2) 16-19 (1) 19-21 (2) 21-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-19 (1) 19-21 (2) 21-23 (1) 23-02 (2) 02-03 (1)	04-06 (1)
Far East	Nil	09-10 (1) 10-12 (2) 12-18 (1) 18-20 (2) 20-22 (1)	06-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 18-21 (1) 21-23 (2) 23-02 (3) 02-04 (2) 04-06 (1)	04-06 (1)
South Pacific & New Zealand	16-18 (1) 18-20 (2) 20-22 (1)	09-11 (1) 14-16 (1) 16-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-00 (2) 00-01 (1)	18-20 (1) 20-23 (2) 23-01 (3) 01-04 (4) 04-05 (3) 05-06 (2) 06-09 (3) 09-10 (2) 10-12 (1)	01-03 (1) 03-05 (2) 05-06 (3) 06-07 (2) 07-08 (1) 04-06 (1)*
Australasia	18-19 (1) 19-21 (2) 21-22 (1)	10-12 (1) 17-18 (1) 18-20 (2) 20-22 (3) 22-23 (2) 23-00 (1)	21-23 (1) 23-01 (2) 01-03 (3) 03-05 (4) 05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1) 16-18 (1)	03-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Caribbean, Central America & Northern Countries of South America	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	08-09 (2) 09-12 (4) 12-14 (3) 14-21 (4) 21-01 (3) 01-03 (2) 03-08 (1)	06-07 (3) 07-10 (4) 10-11 (3) 11-15 (2) 15-17 (3) 17-03 (4) 03-05 (3) 05-06 (2)	19-20 (1) 20-21 (2) 21-23 (3) 23-03 (4) 03-04 (3) 04-05 (2) 05-06 (1) 22-23 (1)* 23-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-21 (2) 21-22 (1)	07-08 (1) 08-11 (2) 11-15 (1) 15-16 (2) 16-17 (3) 17-23 (4) 23-01 (3) 01-02 (2) 02-03 (1)	10-16 (1) 16-18 (2) 18-19 (3) 19-02 (4) 02-04 (3) 04-07 (2) 07-09 (3) 09-10 (2)	20-21 (1) 21-22 (2) 22-02 (3) 02-04 (2) 04-05 (1) 22-03 (1)*
McMurdo Sound, Antarctica	15-17 (1)	16-18 (1) 18-21 (2) 21-22 (1)	17-19 (1) 19-22 (2) 22-03 (3) 03-05 (2) 05-06 (1) 07-09 (1)	02-05 (1)

Time Zones: CDT & MDT
(24-Hour Time)
CENTRAL USA TO:

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80* Meters*
Western & Southern Europe & North Africa	Nil	11-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-20 (1) 23-01 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-18 (3) 18-22 (4) 22-02 (3) 02-03 (2) 03-05 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-00 (1)*
Northern & Central Europe & European CIS	Nil	10-15 (1) 15-17 (2)	02-06 (1) 06-09 (2)	20-21 (1) 21-23 (2)
Eastern Mediterranean & Middle East	Nil	09-11 (1) 11-14 (2) 14-19 (1) 19-22 (2) 22-00 (1)	07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-23 (1) 23-00 (2) 00-01 (3) 01-02 (2) 02-03 (1)	03-05 (1)
Western Africa	Nil	09-11 (1) 13-15 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 20-22 (1) 22-00 (2) 00-03 (3) 03-04 (2) 04-05 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-06 (1)*
Eastern & Central Africa	Nil	10-11 (1) 11-14 (2) 14-19 (1) 19-22 (2) 22-00 (1)	07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-23 (1) 23-00 (2) 00-01 (3) 01-02 (2) 02-03 (1)	03-05 (1)
Far East	Nil	09-11 (1) 13-15 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 20-22 (1) 22-00 (2) 00-03 (3) 03-04 (2) 04-05 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-06 (1)*
South Pacific & New Zealand	14-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-00 (2) 00-01 (1)	17-19 (1) 19-23 (2) 23-02 (4) 02-05 (3) 05-07 (2) 07-09 (4) 09-10 (3) 10-11 (2) 11-13 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-08 (1) 01-04 (1)* 04-06 (2)* 06-07 (1)*
Australasia	16-17 (1) 17-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	14-15 (1) 15-17 (2) 17-19 (1) 19-20 (2) 20-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	22-00 (1) 00-01 (2) 01-04 (4) 04-05 (3) 05-07 (2) 07-09 (4) 09-11 (2) 11-12 (1)	01-03 (1) 03-07 (2) 07-08 (1) 03-06 (1)*
Caribbean, Central America & Northern Countries of South America	10-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	08-09 (2) 09-10 (3) 10-12 (4) 12-14 (3) 14-19 (4) 19-23 (3) 23-01 (2) 01-08 (1)	03-05 (2) 05-07 (3) 07-09 (4) 09-11 (3) 11-15 (2) 15-17 (3) 17-01 (4) 01-03 (3)	19-20 (1) 20-21 (3) 21-23 (4) 23-00 (3) 00-03 (2) 03-05 (3) 05-06 (1) 20-22 (1)* 22-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile,	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3)	07-08 (1) 08-10 (2) 10-14 (1) 14-15 (2) 15-16 (3)	10-15 (1) 15-17 (2) 17-18 (3) 18-01 (4) 01-03 (3)	20-21 (1) 21-22 (2) 22-02 (3) 02-03 (2) 03-05 (1)

Argentina & Uruguay	19-20 (2) 20-21 (1)	16-22 (4) 22-00 (3) 00-01 (2) 01-02 (1)	03-07 (2) 07-09 (3) 09-10 (2)	20-03 (1)*
McMurdo Sound Antarctica	15-18 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	17-19 (1) 19-22 (2) 22-02 (3) 02-04 (2) 04-07 (1) 07-09 (2) 09-10 (1)	02-06 (1)

Time Zones PDT (24-Hour Time)
WESTERN USA TO:

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80* Meters*
Western & Southern Europe & North Africa	Nil	08-09 (1) 09-11 (2) 11-15 (1) 15-17 (2) 17-18 (1) 21-23 (1)	23-01 (3) 01-06 (1) 06-08 (2) 08-14 (1) 14-16 (2) 16-21 (3) 21-23 (2)	20-23 (1)
Central Northern Europe & CIS	Nil	07-09 (1) 13-14 (1) 14-16 (2) 16-17 (1)	13-15 (1) 15-19 (2) 19-00 (3) 00-01 (2) 01-06 (1) 06-08 (2) 08-10 (1)	20-22 (1)
Eastern Mediter-ranean & Middle East	Nil	07-09 (1) 11-15 (1) 15-17 (2) 17-18 (1) 22-00 (1)	13-16 (1) 16-20 (2) 20-22 (3) 22-00 (2) 00-02 (1) 06-08 (1)	20-21 (1)
Western & Central Africa	09-14 (1) 14-16 (2) 16-18 (1)	07-11 (1) 11-13 (2) 13-17 (3) 17-19 (2) 19-21 (1)	13-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-00 (3) 00-04 (2) 04-08 (1)	20-22 (1)
Eastern Africa	Nil	09-14 (1) 14-16 (2) 16-17 (3) 17-18 (2) 18-19 (1) 00-02 (1)	15-17 (1) 17-19 (2) 19-22 (3) 22-00 (2) 00-02 (1)	Nil
Southern Africa	09-12 (1)	08-10 (1) 10-11 (2) 11-12 (3) 12-14 (2) 14-15 (1)	14-15 (1) 15-17 (2) 17-18 (1) 22-23 (1) 23-00 (2) 00-02 (3) 02-03 (2) 03-06 (1) 06-08 (2) 08-10 (1)	20-23 (1)
Central & South Asia	Nil	08-10 (1) 10-12 (2) 12-14 (1) 17-19 (1) 19-22 (2) 22-23 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1)	05-07 (1) 19-20 (1)
Southeast Asia	11-15 (1)	08-09 (1) 09-11 (3) 11-13 (2) 13-16 (1) 20-22 (1) 22-00 (2) 00-02 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	03-07 (1)
Far East	14-16 (1)	09-10 (1) 10-12 (2) 12-15 (1) 15-17 (2) 17-19 (3) 19-21 (2) 21-23 (1)	19-21 (1) 21-23 (2) 23-01 (3) 01-04 (4) 04-06 (3) 06-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	01-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 03-05 (1)*
South Pacific & New Zealand	12-14 (1) 14-16 (2) 16-18 (3) 18-20 (4) 20-21 (2) 21-22 (1)	11-13 (1) 13-15 (2) 15-18 (3) 18-21 (4) 21-22 (3) 22-23 (2) 23-01 (1)	17-19 (1) 19-21 (2) 21-03 (4) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-13 (1)	22-23 (1) 23-01 (2) 01-06 (3) 06-07 (2) 07-08 (1) 23-02 (1)* 02-05 (2)* 05-06 (1)*
Australasia	14-17 (1) 17-19 (2) 19-21 (3) 21-22 (2) 22-23 (1)	07-09 (1) 13-17 (1) 17-19 (2) 19-22 (3) 22-00 (4) 00-01 (3) 01-02 (2) 02-03 (1)	20-22 (1) 22-00 (2) 00-05 (4) 05-07 (3) 07-09 (4) 09-10 (2) 10-13 (1) 13-15 (2) 15-17 (1)	22-00 (1) 00-01 (2) 01-05 (3) 05-06 (2) 06-08 (1) 01-04 (1)*
Caribbean, Central America & Northern Countries of South America	09-11 (1) 11-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	08-09 (2) 09-10 (3) 10-12 (4) 12-14 (3) 14-19 (4) 19-21 (3) 21-00 (2) 00-08 (1)	08-11 (3) 11-15 (2) 15-17 (3) 17-01 (4) 01-04 (3) 04-05 (2) 05-06 (3) 06-08 (4)	19-21 (1) 21-22 (2) 22-00 (3) 00-03 (2) 03-04 (3) 04-05 (2) 05-06 (1) 21-23 (1)* 23-03 (2)* 03-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-12 (1) 12-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	06-07 (1) 07-09 (2) 09-13 (1) 13-15 (2) 15-16 (3) 16-23 (4) 23-00 (3) 00-01 (2) 01-02 (1)	09-15 (1) 15-17 (2) 17-18 (3) 18-01 (4) 01-03 (3) 03-06 (2) 06-08 (3) 08-09 (2)	20-21 (1) 21-00 (2) 00-02 (1) 02-03 (3) 03-04 (2) 04-05 (1) 02-04 (1)*
McMurdo Sound, Antarctica	17-19 (1)	14-16 (1) 16-17 (2) 17-19 (3) 19-21 (2) 21-22 (1)	16-18 (1) 18-19 (2) 19-02 (3) 02-04 (2) 04-06 (1) 06-08 (2) 08-10 (1)	00-23 (1) 23-01 (2) 01-04 (1) 04-06 (2) 06-07 (1)

*Best times to check for 80 meter openings. Openings on 160 meters are likely to occur during times when 80 meter openings are shown with a propagation index of (2) or higher. Openings on 6 meters may be possible at times when 10 meter openings are shown with a propagation index greater than (3). For 12 meter openings, interpolate between 10 and 15 meters. For 17 meter openings interpolate between 15 and 20 meters. For 30 meter openings interpolate between 40 and 20 meter openings.

umn is being written. Reports have been received from as far south as Mexico and the Mediterranean, areas which very seldom see auroras.

Photo B was taken by Pete Strasser at 2001 PST March 30 near Sacramento, California. To see aurora so high in the sky so far south is very rare, but to see a red aurora is even rarer. This aurora was also widespread in the southern hemisphere, with numerous reports already received from New Zealand. Pete's aurora photo appeared in the growing gallery of aurora photos at the SpaceWeather website. Dozens of other pictures of this widespread aurora as seen in various parts of the world were taken. Check out one of nature's most beautiful and awesome events. Also check N6CL's "VHF Plus" column in this issue to see how this intense aurora may have affected propagation on the VHF bands.

Dayton Hamvention®

As I began composing this column in mid-March, I received a phone call from Cathi Hoskins, N8ZCQ. Cathi is the chairperson of the Awards and Banquet Committee for Dayton Hamvention® 2001. She called to notify me that I had been selected this year's "Radio Amateur of the Year." What a surprise!

I am still on cloud nine. I have benefitted so much from amateur radio personally, fraternally, and professionally

Photo C– Radio pioneer Bill Stewart, K6HV (center) celebrates his 90th birthday. He joined Collins Radio in 1935, shortly after the company's founding by Art Collins. Ken Miller, K6IR (left), a previous Dayton Hamvention® Radio Amateur of the Year and W3ASK, this year's honoree, flank Bill.

in the 60 years that I have been licensed, and this award really puts the ice cream on the pie. I am very grateful to those unnamed individuals who considered me for this award, and I accept it with much thanks and humility.

I am looking forward to meeting those readers of this column who will be attending this year's Hamvention® during the weekend of May 18–20. I will, of course, be at the Saturday night Hamvention® banquet, and you may also find me at times at the *CQ* booth.

I also want to thank the readers of this column for the e-mail, snail-mail, and telephone messages of congratulations on my 50th anniversary as Propagation Editor of *CQ*. It may take awhile for me to reply to such the large number of messages received, but every one will be QSLed (see photo C).

Solar Cycle Progress

Based on observations made at a worldwide network of nearly three dozen cooperating observatories, The Royal Observatory of Belgium reports a monthly mean sunspot count of 80 for February 2001. A high of 114 took place on February 9, with a low of 48 recorded on the 24. This results in a 12-month running smoothed sunspot number, upon which the cycle is based, of 119 centered on August 1999. This is a drop of one from the previous month. The very slow decline of Cycle 23 appears to be "stalled," with the smoothed count remaining at 120, plus or minus one, for the past six months. A smoothed sunspot number of 114 is forecast for June 2001 by the National Geophysical Data Center, Boulder, Colorado.

The Dominion Radio Astrophysical observatory at Penticton, British Columbia reports a mean value of 143 for the 10.7 cm solar flux level recorded during February 2001. This results in a smoothed value of 179 centered on August 2000. A smoothed level on the order of 176 is forecast for June 2001.

Summertime Conditions

June marks the changeover from equinoctial to summertime propagation conditions on the HF bands. Solar absorption is expected to be at seasonally high levels, resulting in generally weaker signals during the hours of daylight when compared to reception during the winter and spring months. Thunderstorm activity, and the associated level of static, increases considerably during June and the summer months, and higher static levels should be noticeable on all HF bands, particularly the 40, 80, and 160 meter bands.

Maximum usable frequencies during the daytime hours are considerably lower during June and the summer months than during the other seasons, and considerably higher during the hours of darkness. This changeover should have it greatest impact on the 20 meter band, which during other seasons is a near-optimum daytime DX band, but during the summer months becomes the optimum DX band during the hours of darkness.

Sporadic-*E* propagation peaks during June and the summer months, increasing the number of short-skip openings possible on the HF bands, and often making possible openings up to 1300 miles and sometimes beyond on the 6 and 2 meter bands.

This month's CQ Propagation Charts contain DX predictions for the period June 15 through August 15. Short-Skip Charts for June for openings between 50 and 2300 miles and from Hawaii and Alaska appeared in last month's column.

June Forecast

While fewer east-west openings are expected, 10 and 12 meters should continue to provide excellent daytime propagation, particularly on north-south paths to Central and South America, Africa, Asia, and the Pacific areas. Conditions should peak during the afternoon hours. Short-skip openings, primarily as a result of sporadic-*E* ionization, should be possible between approximately 500 and 1300 miles. While sporadic-*E* openings occur most often during the hours of daylight, some may occur at night as well. Some *F2*-layer openings for distances beyond 1300 miles should also be possible, mainly during the afternoon hours.

The 15 and 17 meter bands will likely be the optimum DX bands during the daytime hours of June. They are expected to open shortly after sunrise, peak during the afternoon hours, and remain open for DX through the early evening hours. During this span openings should be possible to most areas of the world. Conditions will favor paths towards Central and South America and Africa during most of the daylight hours, with signals peaking towards Europe during the late afternoon, and towards Asia and the Pacific areas during the late afternoon and early evening. Don't be surprised if on some days the 17 meter band remains open for DX to as late as midnight! Short-skip openings ranging between 500 and 2300 miles should be possible throughout the daytime hours and well into the evening.

The 20 meter band should open to some area of the world or another for the entire 24-hour period on most days of the month. Signals should peak in all directions just after local sunrise. Intense solar absorption, however, will reduce DX openings considerably from about mid-morning through the early afternoon hours, although fairly good openings still should be possible towards the Caribbean area, Central America, and the northern tier countries of South America. By late afternoon, however, signals should begin to increase considerably, peaking towards the east and the south during the early evening hours. During the hours of darkness propagation should be possible to almost all areas of the world, with signals peaking towards Asia and the Pacific after midnight. Exceptionally high signal levels may often be noted during nighttime openings on this band. Short-skip during the day should extend from 250 to 2300 miles, and during the hours of darkness from 500 to 2300 miles. During the late afternoon and evening hours conditions may often peak for both short and long skip, resulting in an exceptionally high level of interference.

The 30 and 40 meter bands should continue to provide good DX conditions during the hours of darkness despite the higher static levels mentioned earlier. These bands may not sound as good as they did during the spring months, with

some of the long inter-hemispheric openings gone, but the DX will be there, and signals often will be exceptionally strong. Look for openings towards Europe and Africa as early as sunset. Signals should peak towards the east and the south before midnight, and towards the south and the west after midnight. The best bet for DX towards Asia and the Pacific area would be an hour or so before daybreak. Short-skip should be possible out to about 750 miles during the daylight hours. During the hours of darkness short-skip should extend out to the 2300 mile limit.

Look for some DX openings on 80 meters, following the same east-south-west pattern as on 40 meters, during the hours of darkness. Signals should peak from an easterly direction before midnight and from the west before sunrise. Expect considerably higher noise levels and much weaker signals on this band compared to 40 meter openings. Daytime short-skip openings will be limited to approximately 250 miles due to the intense solar absorption, but at night openings should extend out to beyond 1800 miles.

Not much DX is expected on 160 meters until the fall, when static levels should subside and solar absorption decreases. An occasional opening, however, towards the Caribbean, Central America, and the northern tier countries of South America may be possible during the nighttime hours. At best, however, openings will be weak and noisy. Fairly frequent nighttime short-skip openings should be possible over a range of approximately 1000 miles. It is very unlikely that any daytime skip openings will be possible on this band due to very intense solar absorption.

Expect plenty of short-skip openings on the shortwave bands this month. For distances less than 250 miles, try 40 and 80 meters during the day and 80 and 160 meters at night. For openings between 250 and 750 miles, 30 and 40 meters should be best during the day, with 20 meters a close second. Try 80 meters at night, with 40 meters a second choice. Twenty meters should be best for daytime openings between 750 and 1300 miles, with 30 and 40 meters best at night, backed up by 80 meters. Between distances of 1300 and 2300 miles use 20 meters during the day, with 17 and 15 as a second choice. Thirty and 40 meters are expected to be best for this distance range at night. Frequent short-skip openings, resulting from an expected seasonal increase in sporadic-*E* ionization, should also be possible on 10, 12, 15, and 17 meters over distances ranging between approximately 450 and 1300 miles. As its name implies, sporadic-*E* ionization can occur at any time, but it is usually most prevalent between 10 AM and 2 PM and again between 6 and 10 PM local daylight time.

VHF Ionospheric Propagation

June should be a good month for ionospheric openings on the VHF bands resulting from the high level of solar activity, increased sporadic-*E* propagation, meteor showers, transequatorial propagation, and auroral activity.

***F*-layer DX.** Solar activity continues to be high enough that occasional *F*-layer DX openings may be possible on the 6 meter band during the daylight hours. Conditions are best for transcontinental openings, openings between the western states and Hawaii, and openings toward the Caribbean and Central and South America. The best time to look for these openings is during the afternoon hours, particularly when conditions are High Normal or better.

Sporadic-E. Within the normal *E*-layer region of the ionosphere there frequently form "clouds" or "patches" of abnormally intense ionization which are capable of reflecting radio waves of frequencies much higher than those reflected by the regular *E*- or *F*-layers. These clouds usually take the form of thinly ionized areas covering a rather small geographical region approximately 50 to 100 miles in diameter. They occur more or less at random and are relatively short lived, usually dissipating within a few hours. This sporadic ionization usually occurs about 60 miles above the Earth's surface at about the same height as the regular *E*-layer. For this reason it is called *sporadic-E,* or E_s.

Although sporadic-*E* ionization has been studied by scientists and engineers for more than 50 years, its nature and origin still remain largely a mystery. However, some general characteristics about sporadic-*E* behavior are known.

Statistical studies show that a sharp increase in sporadic-*E* propagation takes place at mid-latitudes during the late spring and summer months. During July and August short-skip propagation over distances as great as 1400 miles should be possible in the northern hemisphere for approximately 65% of the time on 15 meters, 35% of the time on 10 and 12 meters, and about 10% of the time on 6 meters. Two meter openings may also be possible during periods of intense sporadic-*E* ionization. While sporadic-*E* propagation can occur at any time of the day or night, it appears to peak between 8 and 11 AM and 6 and 8 PM Local Standard Time.

From most locations in the continental United States 1300 miles E_s openings should extend into both Canada and Mexico. From the southern third of the country it should also be possible to work a rather large number of countries in Central America and the West Indies during 15, 10, and 6 meter sporadic-*E* openings. Long-distance (DX) television reception also improves considerably during the summer months as result of sporadic-*E* ionization. Signals from low-band VHF TV stations (Channels 2–5), which normally cannot be received more than 75 to 100 miles away, suddenly are propagated up to 1300 miles, often with very strong signal levels.

Meteors. Three minor meteor showers are expected during June. The *Arietids* should peak at 09 UT on June 7, the *zeta-Perseids* at 09 UT on June 9, and the *beta-Taurids* at 08 UT on June 28. The hourly meteor rate from these showers is not expected to be high enough to produce sustained ionization for communication. Two elusive meteor showers may also occur during June—the *Lyrids* peaking on June 16, and possibly the *Bootids*, which may peak at 07 UT on June 27.

For updated meteor shower information, check the website of the International Meteor Organization (IMO) at <http://www.imo.net/calendar>.

Transequatorial Propagation. There is usually a seasonal decline in TE propagation during the summer months, but some 6 meter openings may still be possible during June. TE openings must cross the geomagnetic equator at or near a right angle, and the best time for such openings is between 8 and 11 PM local daylight time. Conditions favor openings deep into South America from the Central American and Caribbean areas in this hemisphere, as well as from the southern tier states in the US. At times, however, openings may extend into more northern states as well. Similar north-south TE openings are possible in other areas of the world.

Aurora. Cycle 23 continues at near peak sunspot levels. This means that there still is a chance for intense solar storms, accompanied by widespread auroral displays, to continue through June. Check the Last-Minute Forecast at the beginning of this column for those days during June that are likely to be Below Normal or Disturbed. These are predicted to be the best times to expect auroral-type propagation. Better yet, check <www.spaceweather.com> for up-to-the-minute Aurora Alerts and other geomagnetic and ionospheric data.

For a more complete review of VHF propagation, see N6CL's informative "VHF Plus" column here in *CQ*.

73, George, W3ASK

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Bring Ham Radio along on your next hiking, camping, or business trip with Yaesu's amazing new FT-817 Multimode HF/ VHF/UHF Portable Transceiver!

●ULTRA COMPACT: Measuring just 5.3"x 1.5"x 6.5" WHD (135 x 38 x 165 mm) and weighing about 2 1/2 pounds (1.17 kg. including the supplied antenna and alkaline cells), the FT-817 is small and light enough to take along wherever you're going.

●WIDE FREQUENCY COVERAGE: 160-10 meters on HF, plus the 50, 144, and 430 MHz Amateur bands. Plus FM Broadcast, AM Aircraft, and Public Safety receiver coverage.

●MULTIMODE DESIGN: Ready for action on SSB, CW, AM, FM, FM-Wide (Rx), 1200/9600 bps Packet, and Digital, including dedicated USB and LSB PSK-31 configurations.

●5 WATTS POWER OUTPUT: Using a new-technology all-band MOS FET power amplifier, the FT-817 provides 5 Watts of power output when using a 13.8 Volt DC source. When using Alkaline batteries or the optional FNB-72 Ni-Cd Battery Pack, power is automatically set to 2.5 Watts; via Menu, this can be changed to 0.5 Watt, 1 Watt, or up to 5 Watts.

●WIDE CHOICE OF POWER SOURCES: The FT-817 is equipped with an alkaline "AA" cell battery case, and a 13.8 volt DC cable is also supplied. Available as an option is the FNB-72 Ni-Cd Battery Pack (9.6 V, 1000 mAh), which can be recharged using a 13.8 Volt power supply while the radio is being operated.

●TWO ANTENNA PORTS: A "BNC" connector is provided on the front panel, and a type "M" connector on the rear panel, with Menu selection of which connector will be assigned for operation on HF, 50 MHz, 144 MHz, and 430 MHz.

●OPTIONAL COLLINS® MECHANICAL FILTERS: An optional filter slot is provided, accommodating either the YF-122S (2.3 kHz) 10-pole SSB filter or the YF-122C(500 Hz) 7-pole CW filter. You get "base station" performance even from a mountain top.

●INCREDIBLE MEMORY RESOURCES: You get a total of 208 memories, including 200 "regular" memories which may be separated into ten groups of up to 20 channels each. And you can append an Alpha-Numeric "Tag" to each memory to aid in channel identification.

●A CW OPERATOR'S DREAM MACHINE: You get a built-in Electronic Keyer with adjustable weighting, adjustable CW Pitch, CW Normal/Reverse frequency tuning, and you can even use the microphone's UP and DOWN keys to send CW via the Keyer.

●BUILT-IN CTCSS AND DCS: The built-in CTCSS and DCS Encoder/Decoder systems provide you with the versatility you need for repeater access or selective calling.

●DUAL - COLOR LIQUID CRYSTAL DISPLAY: Select from Blue or Amber display illumination, which can also be switched off to conserve battery life. And while you're away, the Spectrum Scope will provide you with a visual record of activity ±5 channels from your current operating frequency.

ALL MODE PORTABLE TRANSCEIVER

FT-817

HF/50/144/430 MHz Multimode Transceiver

YAESU

Choice of the World's Top DX'ers™

Vertex Standard
US Headquarters
17210 Edwards Road,
Cerritos, CA 90703 (562)404-2700

See the exciting new FT-817 at your Yaesu Dealer's showroom today!

For the latest Yaesu news,
Visit us on the Internet: http://www.vxstd.com

Simultaneous Reception

VHF/VHF | UHF/UHF | VHF/UHF

A New Dual-Band Engineering Milestone:
Introducing the Dual Band Mobile for the 21st Century's Active Ham!

The Yaesu Engineering Team has done it again! The exciting new FT-7100M Dual Band Mobile brings you the ruggedness and operating ease of our single-band mobiles, and the convenience of remote-head mounting capability (optional YSK-7100 Separation Kit required), in an all-new 144/430 MHz Dual Band design!

Providing 50 Watts of power output on 2 meters, and 35 Watts on 70 cm, the FT-7100M has power to spare when you're in a fringe area. For repeater access or selective simplex calling, you get built-in encoder-decoder circuits providing 50 CTCSS tones and 104 DCS (Digital Code Squelch) codes. And the FT-7100M's huge 262-channel Memory System lets you store up to six Alpha-Numeric characters, for easy channel identification.

Operation of the FT-7100M is simple and straightforward, with separate Volume and Squelch controls for each band during dual-band reception, and eight single-function front panel keys provide the easy feature access you need during mobile operation. What's more, you also get three user-definable keys on the microphone to use for important control functions.

Rugged, reliable, and versatile, the FT-7100M provides the highest cost-performance available among Dual Band FM Mobiles. See your Yaesu Dealer today for a test drive!

144/430 MHz FM Dual Band Mobile Transceiver

FT-7100M

FEATURES

- Frequency Range: TX 144-148, 430-450 MHz RX 108-137 MHz (AM), 137-180 MHz, 320-480 MHz, 810-999.99 MHz (Cellular blocked)
- VHF/UHF, VHF/VHF, and UHF/UHF Dual Receive operation*
- Channel Steps: 5/10/12.5/15/20/25/50 kHz/step
- Power Output: 50 Watts (144 MHz) 35 Watts (430 MHz)
- Power Amplifier Type: 2SK3478 Power MOS FET
- Efficient Cooling System: Direct-flow heat-sink and thermostatically-controlled fan
- 262 Memory Channels: 120 "regular" memories, 5 pairs of band limit memories, and one "HOME" channel on each band
- Alpha-Numeric Memory Labels: 6 Characters on lower display field, 5 Characters on upper
- Smart Search™ Automatic Memory Loading System
- 50 CTCSS Encode/Decode Tones
- 104 DCS Encode/Decode Codes
- CTCSS and DCS Search
- ARTS™ (Auto-Range Transponder System)
- Automatic Repeater Shift (ARS)
- TMF Microphone (U.S. version): Includes 16-memory Auto-dialer, and Direct Frequency Entry
- Band Scanning, Band-Limit Scanning, and Memory Scanning
- Three Priority Channel Modes: VFO, Memory, and Home Channel Priority
- RF Squelch: Opens at user-defined signal level
- Tx Time-Out Timer (TOT)
- Automatic Power-Off (APO)
- 1200/9600 bps Packet Compatible
- Battery Voltage Meter
- Compact Size: 5.8" x 1.9" x 6.9" WHD
- Large (0.9" x 2.3") Liquid Crystal Display
- Cloning Capability: To other FT-7100M Transceivers
- Optional YSK-7100 Separation Kit
- Optional CT-39A Packet Cable

*Simultaneous reception on two different Frequencies, in-band or Cross-Band. Cross-band Repeater Function not available.

Actual Size

For the latest Yaesu news, visit us on the Internet:
http://www.vxstd.com

Specifications subject to change without notice. Some accessories and/or options may be standard in certain areas. Frequency coverage may differ in some countries. Check with your local Yaesu Dealer for specific details.

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Choice of the World's Top DX'ers™

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SAVE $150 IC-706MKIIG

Limited time offer. See dealer for details.

SAVE $180 IC-706MKIIG + AH-4

SAVE $200 IC-706MKIIG + AT-180

"With the addition of yet another band (70 cm), more power on 2 meters and the incremental improvements made with each new version of this popular transceiver, perhaps the '706 has reached its zenith. There's not much left to improve."
-*QST*, July, 1999

MORE BANG. LESS BUCKS.

Limited time offer. See dealer for details.

SAVE $200 IC-746

"An impressive transceiver for HF, 50 MHz and 144 MHz work. With loads of those features desirable to the serious HF operator *and* all modes at 100W on both 6 and 2 meters, the IC-746 is a fine choice in a mid-priced rig."
-*QST*, September, 1998

The IC-706MKIIG & IC-746

For a limited time, you can save a bundle on two of ICOM's most popular radios. The IC-706MKIIG, the best selling, most versatile compact multi-band rig ever made, is loaded with features yet small enough to take with you – it's as home in a car as in a den or shack. The IC-746 offers real HF performance *plus 6 and 2 meters*. Enjoy 100W of power on all bands and big rig features like adjustable IF-DSP and Twin Pass Band Tuning (even faint signals can't hide!). Visit your authorized ICOM dealer today, and SAVE!

IC-706MKIIG. Proven Performance.

HF/6M/2M/70CM • HF & 6M @ 100W, 2M @ 50W, 70CM @ 20W • 107 Alphanumeric Memory Channels • CTCSS Encode/Decode with Tone Scan • Auto Repeater • All Mode with DSP • Plug-n-Play Filters • Remote Head Operation*

IC-746. Real HF Performance.

HF/6M/2M • HF, 6M & 2M @ 100W • 102 Alphanumeric Memory Channels • CTCSS Encode/Decode with Tone Scan • Auto Repeater • IF-DSP & Twin Pass Band Tuning • Full Duty Cycle • Internal Antenna Tuner • PC Controllable*

*Optional equipment required.

Find out more!

www.icomamerica.com

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