45241

Amateur Radio

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

COMMUNICATIONS & TECHNOLOGY

OCTOBER 2002

CQ

QRP Special!

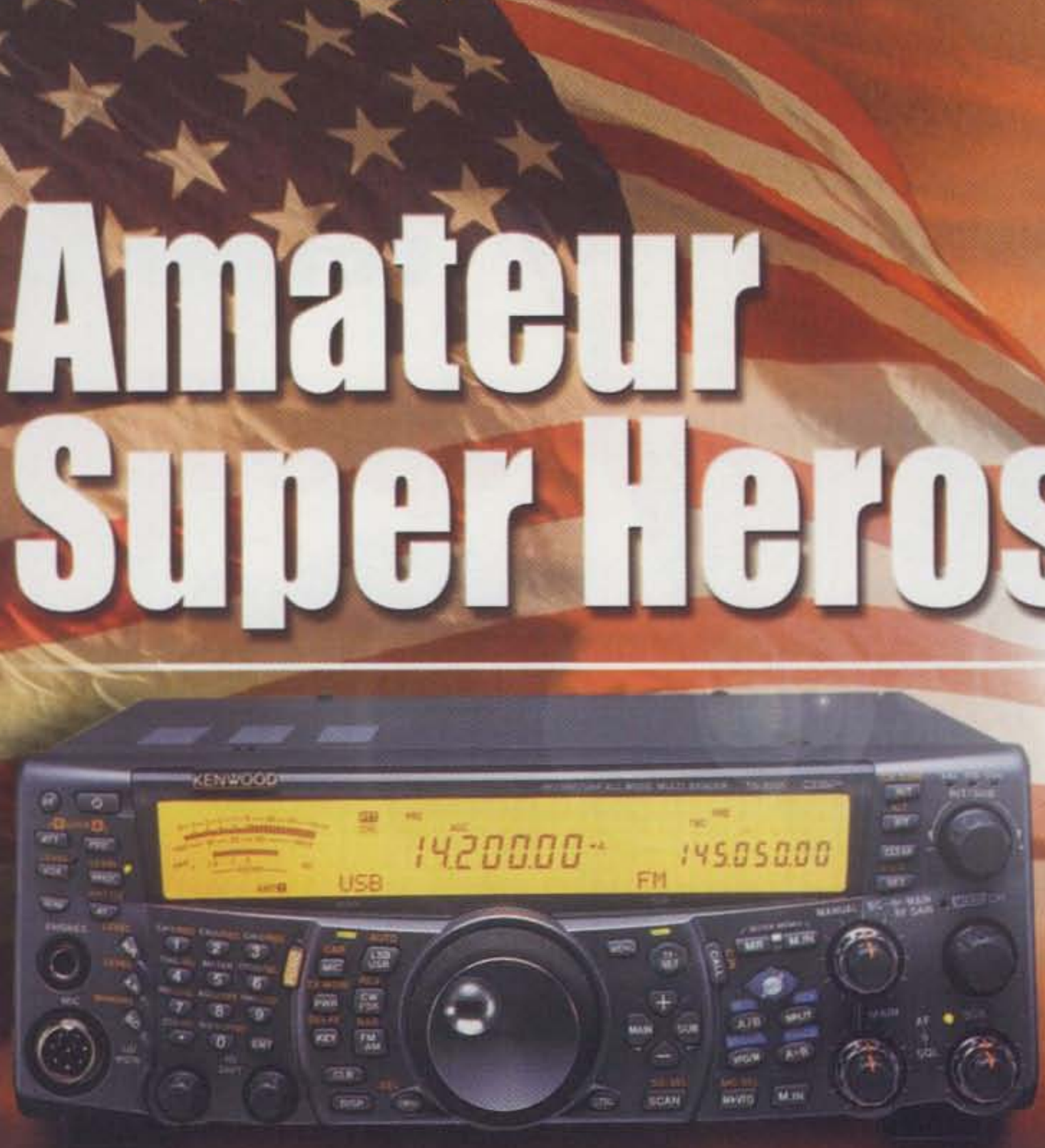
In This Issue

On the cover: Steve White, W4SNW, of Sarasota, Florida, introduces Scouts to Ham Radio. Details and Jamboree-on-the-Air information, p.106

09128 45241

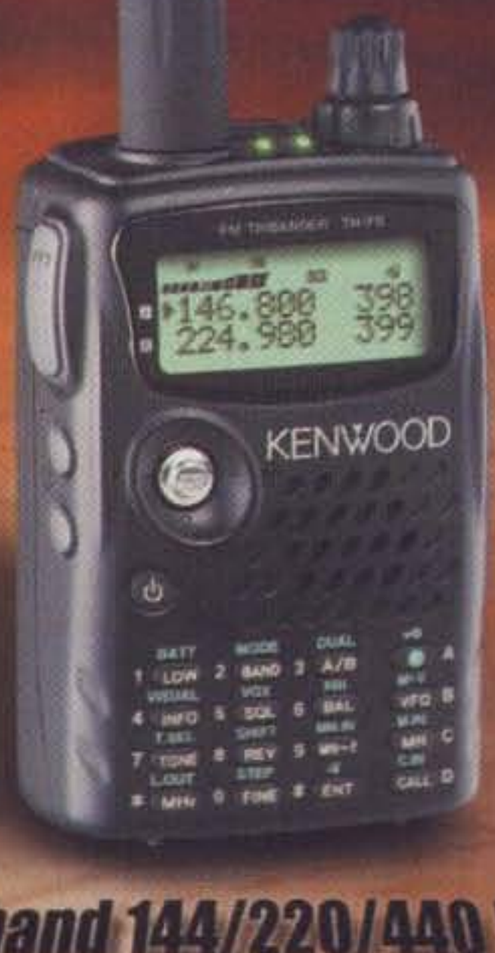
IO AMATEUR'S JOURNAL

Amateur Super Heros



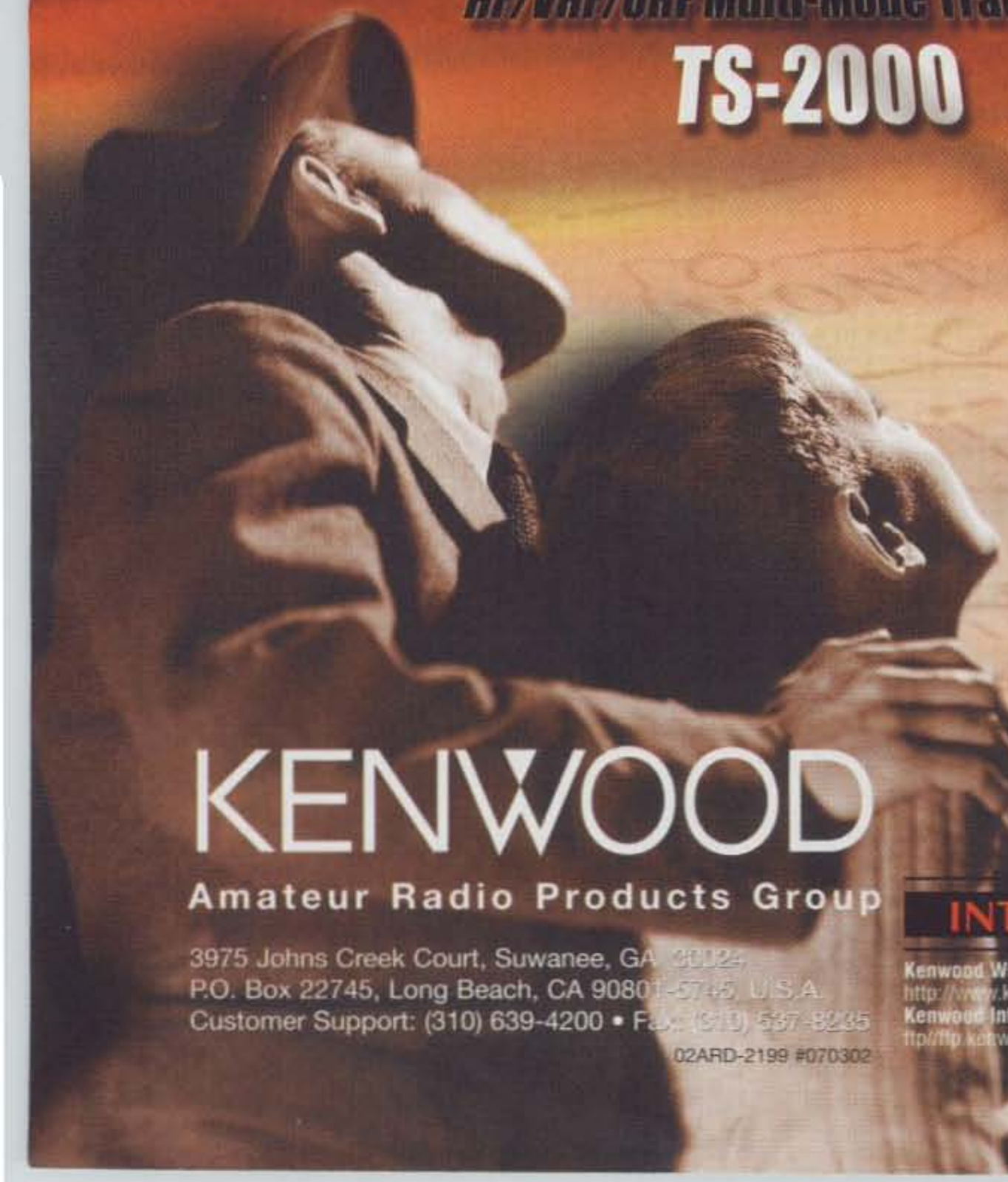
HF/VHF/UHF Multi-Mode Transceiver

TS-2000



Triband 144/220/440 MHz

TH-F6A



KENWOOD

Amateur Radio Products Group

3975 Johns Creek Court, Suwanee, GA 30024
P.O. Box 22745, Long Beach, CA 90801-5745, U.S.A.
Customer Support: (310) 639-4200 • Fax: (310) 537-8235

02ARD-2199 #070302

INTERNET

Kenwood Website
http://www.kenwood.net
Kenwood Information
ftp://ftp.kenwood.net

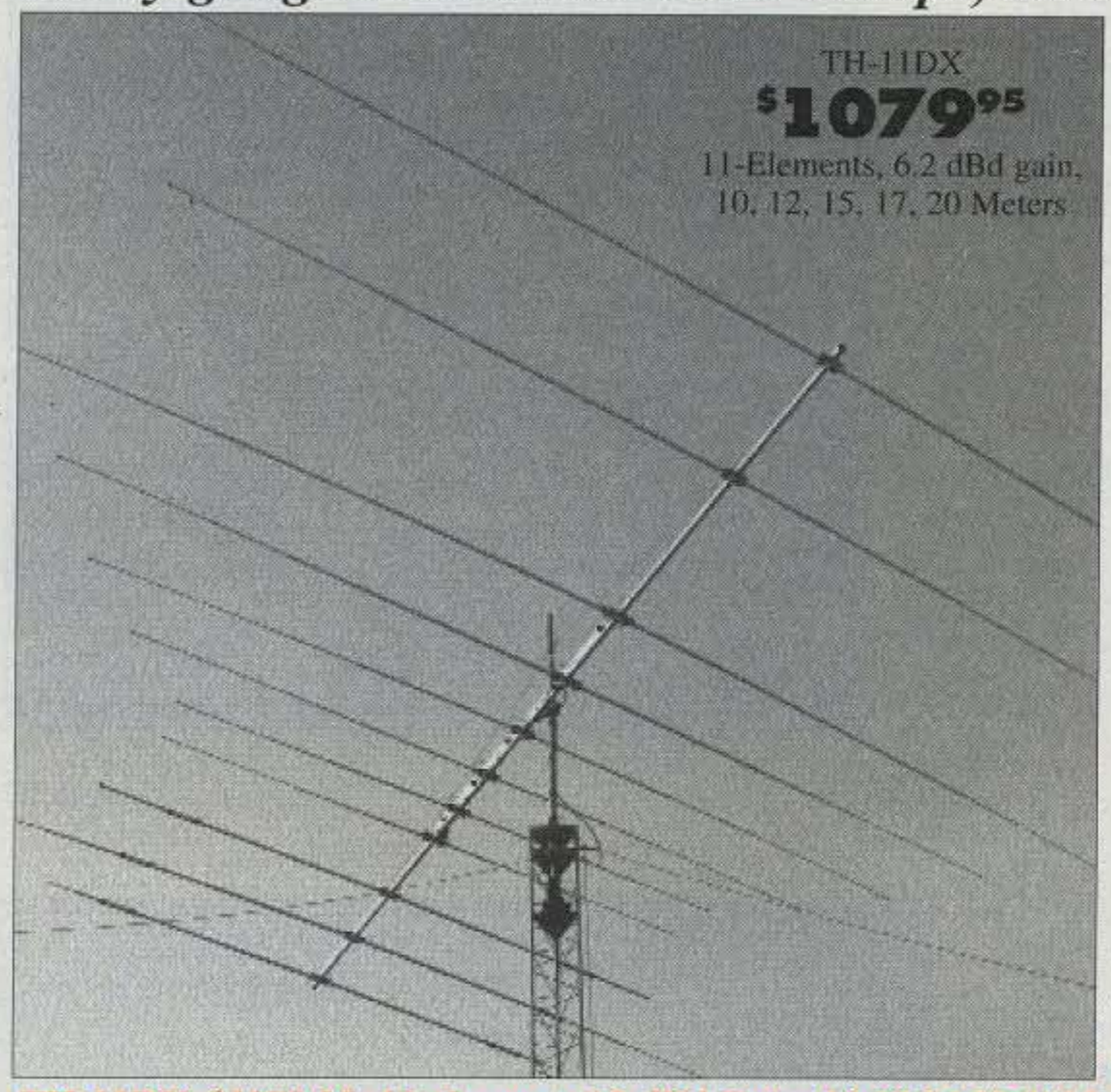
FREE United We Stand Pin with every Radio purchase

Limited time only while supplies last

See your dealer for details

hy-gain® HF BEAMS...

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



TH-11DX, $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!*

Handles 2000 Watts continuous, 4000 Watts PEP.

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

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

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

TH-7DX, $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.

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

TH-5MK2, $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.

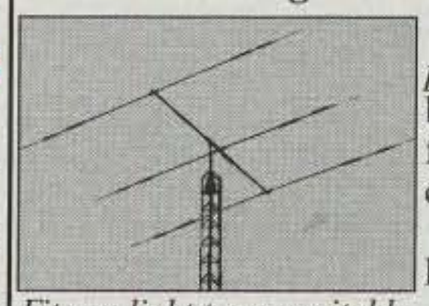
Hy-Gain's *patented* broadbanding *Para Sleeve* gives you less than 2:1 VSWR. 1.5kW PEP.

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.

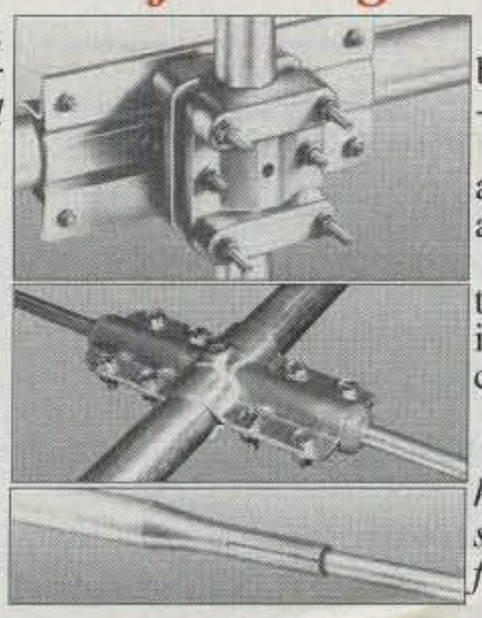
Model No.	No. of elements	avg Gain dBd	avg F/B dB	MaxPwr watts PEP	Bands Covered	Wind sq.ft. area	Wind (mph) Survival	Boom (feet)	Longest Elem. (ft)	Turning radius(ft)	Weight (lbs.)	Mast dia O.D.(in.)	Recom. Rotator	Retail Price
TH-11DX	11	6.2	22	4000	10,12,15,17,20	12.5	100	24	37	22	88	1.9-2.5	T2X	$1079.95
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.

Durable precision injection molded parts.

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

Free Hy-Gain Catalog
and Nearest Dealer . . . 800-973-6572
Call your dealer for your best price!

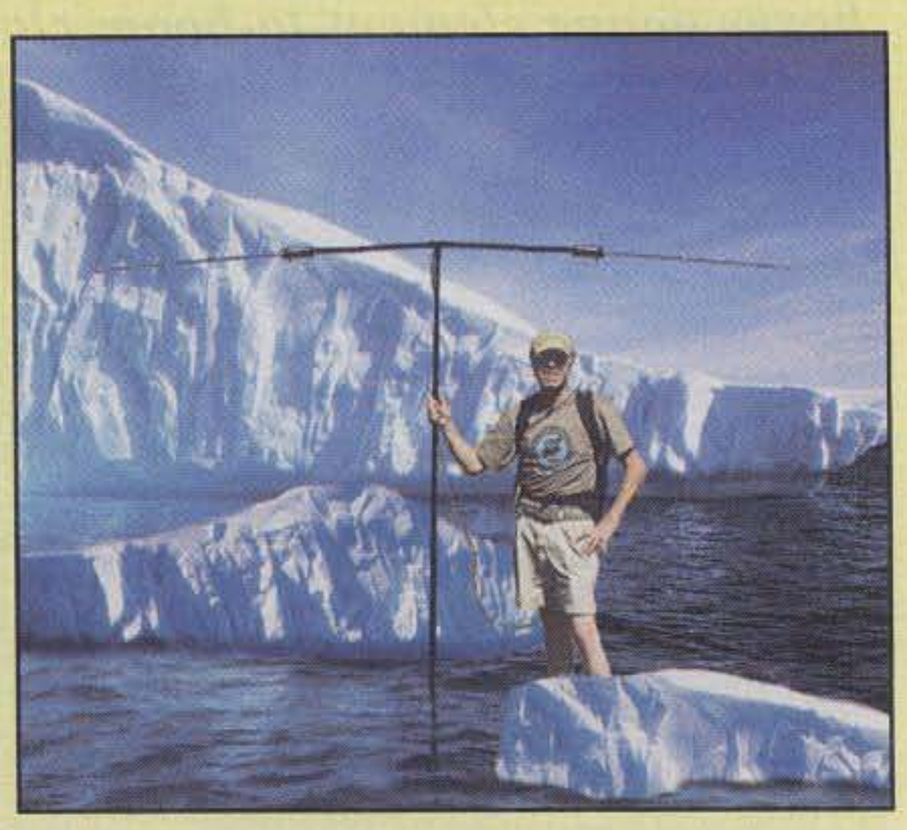
hy-gain®

Antennas, Rotators & Towers
308 Industrial Park Road, Starkville, MS 39759 USA
Toll-free Customer Sales Hotline: 800-973-6572
• **TECH:** 662-323-9538 • **FAX:** 662-323-6551
http://www.hy-gain.com

CQ Amateur Radio

OCTOBER 2002 VOL. 58, NO. 10

FEATURES



page 74

page 22

DEPARTMENTS

Airwave Superiority

5 Watts / All Bands

TH-F6A

- Triband (144/220/440 MHz)
- Receives 2 frequencies simultaneously even on the same band
- 0.1~1300MHz high-frequency range RX (B band)
- FM/FM-W/FM-N/AM plus SSB/CW receive
- Bar antenna for receiving AM broadcasts
- Special weather channel RX mode
- 435 memory channels, multiple scan functions
- 7.4V 1550mAh lithium-ion battery (std.) for high output[2] and extended operation
- 16-key pad plus multi-scroll key for easy operation
- Built-in charging circuitry for battery recharge while the unit operates from a DC supply
- Tough construction: meets MIL-STD 810 C/D/E standards for resistance to vibration, shock, humidity and light rain
- Large frequency display for single-band use
- Automatic simplex checker
- Wireless remote control function
- Battery indicator
- Internal VOX
- MCP software

"Specifications subject to change without notice."

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

KENWOOD
COMMUNICATIONS CORPORATION

AMATEUR RADIO PRODUCTS GROUP
3975 Johns Creek Court, Suwanee, GA 30024
P.O. Box 22745, Long Beach, CA 90801-5745, U.S.A.
Customer Support: (310) 639-4200 Fax: (310) 537-8235

02ARD-2180 #040802

INTERNET
Kenwood Website
http://www.kenwood.net
Kenwood Information
ftp//ftp.kenwood.net

ISO 9001
JQA-1205
Communications Equipment Division
Kenwood Corporation
ISO9001 certification

Ham Radio News

From The CQ Newsroom

AMSAT-DL: Let's Go to Mars!

The German amateur satellite organization, AMSAT-DL, has proposed sending an amateur radio satellite to Mars! As envisioned, the satellite would be a "mother ship" for launching smaller probes that would transmit back information about the Martian atmosphere and surface, as well as a repeater that would beam that information back to Earth. For more information, see this month's "Amateur Satellites" column on page 84, and the AMSAT-DL website at <http://www.amsat-dl.org/p5a/p5a-to-mars.pdf>.

UK Opens 5 MHz for Experimentation

Class A amateurs in the United Kingdom have been given permission to apply for special permits to carry out experimental communications on 60 meters, one of the two new bands the FCC has proposed for amateurs in the United States. According to the *ARRL Letter,* over 200 UK amateurs applied for and received the permits, which require them to report back on their results, and quickly got on the air. At press time it was unclear whether the scope of the US experimental license for 5 MHz, WA2XSY, permits DX contacts on the band, and in any event, band conditions had not yet made it possible.

Meanwhile, *Newsline* reports that Brazil's licensing agency has agreed to grant amateurs there a secondary allocation on 135.7–137.8 kHz, and that similar allocations will also be made in Paraguay and Uruguay. This is the second new band the FCC is considering for US hams. No word as to when the band would become available for use by the South American hams.

FCC Gets Tough with Repeater QRM

The FCC appears to be running out of patience with an ongoing repeater-to-repeater interference problem in Arkansas. In a letter to the trustee of one of the repeaters, FCC amateur enforcement chief Riley Hollingsworth, K4ZDH, issued a September 1 deadline for adding tone control to the repeater and disabling an automatic identifier when there is no traffic on the machine. If those and other steps are not taken by the deadline, Hollingsworth wrote, the FCC will require that a control operator be physically present at the repeater's control point whenever it is in use, and threatened enforcement action against the licenses of the trustee and any users involved in interference. In fact, one of those users was warned to stop causing interference and told that if the matter was not resolved before his license expires next June, "it will not be routinely renewed." Another user whose renewal application is pending was informed that it would be put on hold until the situation was resolved, and that failure to respond to the specific complaints enclosed would result in the dismissal of his renewal application.

In a California case, the FCC ordered the shutdown of a 224 MHz link on a 2 meter repeater that was causing interference to a 220 repeater until the link is coordinated or the licensee submits a detailed, specific plan for preventing interference to the coordinated repeater.

Also in California, a ham accused of malicious interference on a repeater, including threats of sexual assault, agreed to a two-year license suspension; and in New Jersey, another ham who interfered with police and fire communications accepted a one-year license suspension as part of his probation agreement.

FCC Looks to Future Allocations Above 300 GHz

The FCC says it's time to start thinking about frequency allocations in the sub-millimeter bands between 300 and 1000 GHz (1 THz). Currently, FCC Amateur Service rules specify frequency allocations for hams between 1.8 MHz and 250 GHz, plus "all above 300 GHz." Neither the FCC nor the International Telecommunications Union (ITU) has made allocations above 300 GHz, known as the submillimeter-wave band (up to about 3000 GHz). The FCC specifically says the needs of the Amateur Service need to be considered in any planning.

For more information, see the *CQ* website news page at <http://www.cq-amateur-radio.com>. For the complete (and very lengthy) text of the proposal by the FCC's advisory committee for next year's World Radiocommunication Conference (WRC-03), see <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-02-1779A1.doc>.

Young Ham of the Year: CQ Advertising Manager Arnie Sposato, N2IQO, and Vertex-Standard's Chip Margelli, K7JA, present gifts to 2002 Newsline *Young Ham of the Year Josh Abramowicz, KB3GWY, at the Huntsville Hamfest in August. At the far right is award sponsor Bill Pasternak, WA6ITF, Producer of Newsline. CQ and Vertex-Standard co-sponsor the annual award, now in its 17th year, with* Newsline. *(Photo by Joe Eisenberg, KØNEB)*

AMSAT Reviewing Part 15 Use of 2.4 GHz

AMSAT's board of directors has begun a study of the many unlicensed devices —primarily high-speed wireless digital links, according to the *ARRL Letter*—that are operating in the 2.4 GHz band and that may be causing interference to amateur communications there. Unlicensed Part 15 devices are prohibited from causing interference to licensed users and must accept interference from them. However, manufacturers of some 2.4 GHz devices are trying to limit amateur operations in the band in order to reduce interference potential in both directions. Anyone who has experienced interference to amateur signals on 2.4 GHz from a Part 15 device is encouraged to send details to AMSAT-NA President Robin Haighton, VE3FRH, at <ve3frh@amsat.org>.

New Ham Antennas Slated for Installation on Space Station

If all goes according to schedule (a rarity in the space business), the last two of four planned amateur antennas will be installed on the outside of the International Space Station by the

(Continued on page 110)

Return of a Legend

$795

Made in the USA

The name Argonaut has been synonymous with low power operation since Ten-Tec's original Argonaut 505 was released in 1971. Our commitment to offering quality QRP rigs to the hobby continues today with the new Argonaut V HF transceiver. Adjustable 1-20 watts output power, AM/FM/CW/SSB/digital operation, 35 built-in IF-DSP receive filters, legendary Ten-Tec QSK, internal keyer, PSK31 ready (no interface needed!), and solid general coverage receiver performance in a small five-pound package. Like all of our recent rigs, Argonaut V is equipped with Flash-ROM to enable instant upgrading of your rig if future features and bands become available. Call Ten-Tec today or visit our web site for additional information or to place your order.

800-833-7373
www.tentec.com

TEN-TEC

1185 Dolly Parton Parkway
Sevierville, TN 37862
Sales Dept: 800-833-7373
Sales Dept: sales@tentec.com
Monday - Friday 8:00 - 5:30 EST
We accept VISA, Mastercard, Discover, and American Express

Office: (865) 453-7172
FAX: (865) 428-4483
Repair Dept.: (865) 428-0364 (8 - 5 EST)

308 Snap-on Fan Kit $15

705 Desk Microphone $99.95

937 Power Supply $89

S&H cost in 48 states for Argonaut V is $16. With Power Supply, $21.

TCXO High-stability oscillator (installed at time of purchase only), not shown, $54. 46176 5-pin DIN to RCA female cable, not shown, $10.

Zero Bias

BY RICH MOSESON, W2VU

An Editorial

"Nobody Goes There Anymore. It's Too Crowded."

Baseball legend Yogi Berra was talking about a popular restaurant when he made the famous comment we've quoted in this month's title. But he could just as well have been talking about repeaters in the 2-meter ham band. Just ask any ham—the king of ham bands, in terms of overall popularity, is 2 meters. Right? Of course right. In fact, in our June survey (about VHF/UHF operating), 91% of the readers who responded said that they regularly operate on 2 meters, and 64% said they mostly use repeaters. Which leads me to this question about 2-meter repeaters: Where is everybody? Have repeaters gotten so crowded that "nobody goes there anymore"?

I live in metropolitan New York, amid what is probably the largest concentration of hams anywhere. When I drive from my home in New Jersey to the CQ offices on Long Island, my route is covered by dozens of 2-meter repeaters, pretty much one every 15 kHz. Virtually all of them are open-access. Virtually all of them work just fine. Key up, announce your call, and you'll hear a nice strong carrier in response, along with a beep and maybe an ID. But generally speaking, especially outside of morning or evening "drive time," that's all you'll hear. There is only one repeater along my route on which I can pretty reliably find a QSO whenever I get on the air (LIMARC on Long Island).

It's not just a New York problem, either. I've recently had the opportunity to travel through several eastern states, driving through big cities, smaller cities, and rural areas. I was somewhat more likely to find someone to talk with in the smaller cities than either the big cites or rural areas, but the 2-meter band by and large seems to be full of repeaters that nobody's using.

It's not just an east coast thing, either. "Newsline" Producer Bill Pasternak, WA6ITF, lives outside Los Angeles, the other largest concentration of hams anywhere. I asked Bill to scan the 2-meter band on his way to and from work for about a week. Bill, like me, commutes outside of "drive time." Here's what he found:

> I started scanning 144–148 MHz for the last week as you requested. I had not done this in over a decade because I rarely use 2 meters here in "LaLa-Land." My "home repeaters" are on UHF and I rarely wander from the two systems that I use.
>
> That said, I kept an ear on 2 meters for the past week. I was shocked. Hardly anyone on the air. In 1992 or thereabouts, there was a QSO every 15 kHz—around the clock—in both 2 meter repeater subbands. Even 2 meter simplex (direct) was loaded on 146.52 MHz. This past week, I could count the number of QSOs in progress on one hand! In fact, a quick scan of 440–450 MHz—where most repeaters in Southern California classify themselves as "Super-Private" with some even denying their existence (to keep unwanted people away)—showed far more activity than poor old 2 meters.
>
> "Where have all the flowers gone?" Where are all the hams who used to keep the 200+ Los Angeles area 2 meter repeaters hopping all night and day? Did they upgrade and go to HF? Did they migrate to 220? (Few come to 70 cm FM as it is still a strange "by-invitation" band out here—and open repeaters are very much in the minority.) Or, have they just given up the hobby?

My questions are basically the same as Bill's. Where did everybody go? Did the few jammers and other "lids" who seem attracted to repeaters like moths to a light succeed and drive everyone away? Have the old-timers who steadfastly refused to talk to newcomers succeeded in driving them away ... and then moved on themselves because there was no one to talk to?

It's doubly curious that there's virtually no activity outside of "drive time," when hams with 2-meter FM rigs in their cars are driving to or from work. Another bit of information that we learn regularly from our reader surveys is that around half of our readers list their occupation as "retired" (curiously, many more than say they're over 65). Theoretically, they're home during the day, or driving around town without being tied to a full-time job. Why aren't they on the radio? Or if they are on the radio, why have they abandoned 2-meter FM in droves?

Benefits of Repeaters

For those of you who haven't been on a 2-meter repeater in too long a time, let me refresh your collective memory about some of the benefits of operating there:

- Generally strong signals, generally clear audio, especially as compared with SSB on HF
- QSOs that generally go beyond name, QTH and signal report—a real opportunity to ragchew
- The opportunity to meet interesting people: Last week, I met a ham who's responsible for helping me through my commute—he maintains the traffic surveillance and reporting system for the state transportation department; and another who's retired from the retail business and now devotes his time to playing in a band that performs for free at nursing homes and similar facilities. These are just two recent examples.
- Help with travel directions, routes around traffic jams, and suggestions for good places to eat when you're out traveling
- An additional route of access to help in case of an emergency (less direct than a cell phone but also less susceptible to overload)
- A resource for information on a wide variety of technical and operating topics (both ham-related and not)
- Someone to keep you company if you're driving alone, especially at night and if you're tired
- With the advent of IRLP (Internet Repeater Linking Project) and its cousins, the opportunity to contact DX stations as well as locals, using a handheld or a VHF mobile rig

Hams in many places are telling me that IRLP is breathing new life into repeater operations in their areas. If this is the case, I hope it continues to blossom and grow in popularity. I originally titled this month's column, "The Emperor's New Clothes," since like the folk tale, it seems that everyone is afraid that if word gets out that the emperor has no clothes, or in this case, that nobody's using all those 2-meter repeaters, commercial interests will swoop in like hyenas to snatch the band from us. That danger is very real (just look at 220–222 MHz), but denying the problem exists will not help to solve it.

The solution is very simple. When you're in the car, turn that 2-meter rig on to the local repeater. Announce that you're listening. Answer when someone else says he or she is listening. Talk to people. You might even rediscover why 2-meter repeaters used to be so popular to begin with.

Contesting Advice from a "Little Pistol"

If it's October, it must be time for the CQ World-Wide DX Contest (SSB weekend, October 26–27). Usually, we offer advice from "big-gun" contest operators to the "little pistols" on how to maximize their scores. This time, though, I have some little pistol advice for the big guns, some of whom may not remember what it's like trying to work through a pileup with 100 watts and a vertical. Since this month's survey results show that 85% of us fall into the "little pistol" category (with 14% who don't operate contests and only 1% "big guns"), here are some tips for those big gun stations and contest DXpeditions to help keep things moving smoothly (These tips also apply to non-contest DXpeditions and any operation resulting in a pileup.):

1. Give your call often, ideally every QSO. As a search-and-pounce operator always on the lookout for new multipliers, I can't count how many times I've sat for 10 minutes listening to a station running a pileup before he gives his callsign and I realize I've already worked him. How many other contacts did I miss while waiting for the big gun to fire off his call?

2. When you *do* send your callsign, do it s-l-o-w-l-y enough that people can actually understand you. Use standard phonetics. This applies to your prefix as well as your suffix. Again, if you're hunting multipliers, you want to know if it's worth waiting around to work a station or if you've already worked someone in that country. I'm willing to bet that hundreds of "bad" QSOs (in terms of scoring) result from incorrect loggings due to failure to clearly identify.

3. Especially if you're using a special prefix that isn't commonly associated with the country from which you're operating, periodically identify your country, if for no other reason than to let people know where you are. It adds to operating excitement and won't cost you any contacts.

4. If you can't be QSLed via the bureau system, or if you have a QSL manager, periodically give out QSL information. Yes, it takes a few extra seconds, but a whole bunch of people will hear you at once and you might save time in the long run.

5. This one's for the people *in* the pileup—*listen*. Give the station at the other end a chance to talk. If you can't hear that he's talking, you shouldn't be calling. Give others the courtesy you'd expect them to give you when the station at the other end of the pileup finally calls you.

6. This one's for everyone: Remember that all of our frequencies are shared and that not every ham enjoys contesting. Always listen before transmitting to make sure a frequency is not in use; if someone tells you that it *is* in use, be polite and QSY. Adhere to the principles of "good amateur practice" at all times and remember that intentional QRM is illegal. Period. This applies to non-contesters as well as contesters. A little courtesy goes a long way.

End of advice—now get out there, get on the air, whether it's on HF during the CQWW or any other time, or on a 2-meter repeater any time of day or night, get on the air, talk to people. The best way to protect our frequencies is by using them regularly.

73, Rich, W2VU

PS: Updating an item in this space last month, I'm pleased to report that in mid-August the State of New Jersey repealed the most ridiculous of its new restrictions on public information, including the locations of farms and the identities of endangered species.

Announcements

International Pharmacists Ham Group – IPHG, a new ham group with membership open to pharmacists and hams worldwide, has been formed through the efforts of IZ7ECB and IK2UVR. The purpose of the group is to promote radio initiatives, establish friendships, and help those who may need any aid the members can provide. For more information, see <www.malpensa.it/iphg/index.htm>.

ARRL Day in the Park, MFJ 30th Anniversay Celebration – This event will take place October 4–5 at McKee Park, Starkville, Mississippi. Included will be factory tours, DX forum, VE exams (9 AM Sat.), tailgating, luncheon, and more. In celebration of MFJ's 30th anniversary, Special Event station K5MFJ will be on the air from 1100–2100Z on 7.245, 14.245, 14035, 146.52; certificate, commemorative QSL: MFJ Enterprises, Inc., 300 Industrial Park Rd., Starkville, MS 39759. More info: <http://www.mfjenterprises.com>.

• The following other Special Event stations will be on the air during October:

N2UL, JOTA from Patriot's Path Council BSA headquarters, Mountainside, New Jersey; Robert D. Grant United Labor ARA; 1200Z Oct. 19 to 2300Z Oct. 20 on 28.420, 21.375, 14.260 MHz. QSL to RDGULARA, c/o WA2VJA, 112 Prospect St., Nutley, NJ 07110-0716.

N2Y, from Northern NY ARA Hamfest/ARRL Convention, Lake Placid, New York; 1300–1800Z Oct. 12 on 7.245, 14.245, 146.52 MHz ±QRM. For QSL/certificate send SASE to Richard Sherman, WZ2T, 25 Pines Rd., Malone, NY 12953-5600; e-mail: <wz2t@arrl.net>.

K3G, from U.S. Coast Guard Auxiliary 63rd anniversary, Coast Guard Base – Group Philadelphia. Pennsylvania; 1400–2200Z Oct. 5 on 7.270, 21.330, 28.330 MHz SSB. Commemorative QSL via W3DI, 196 Dam View Drive, Media, PA 19063.

W3FRC, from 75th anniversary of Frankford Radio Club, during 2002 PA QSO Party, Oct. 12–13. W3FRC will be the bonus-point station for the contest, worth 200 points, and will operate 160–2 meters. For QSL, domestic stations send SASE (DX will be QSLed through the bureau) to John Lindmeier, 12479 Barbary Place, Philadelphia, PA 19154.

W4M, from Gainesville, Georgia's Annual Mule Camp Days Festival and Georgia Special Olympic Games; Lanierland ARC and GA Baptist Disaster Relief Communications Unit GA 14; 1400Z Oct. 11 to 2100Z Oct. 20 on or near 21.350, 14.325, 7.235, 3.975. For QSL send SASE to Terry Jones, W4TL, 4816 Windwalker Drive, Flowery Branch, GA 30542.

W4YK, from 47th anniversary of Farm City Day, Hendersonville, North Carolina; Blue Ridge ARC; 9 AM to 5 PM on 7.248 and 14.248 MHz ±20 KHz. For certificate send QSL and 9 × 12 SASE to Ronnie Parham, K2SST, 408 Riverwond Dr., Hendersonville, NC 28739.

KA6SPQ, from St. George Reef Lighthouse, Crescent City, California; 1500Z Oct. 19 to 2100Z Oct. 20 on 28.400, 21.300, 14.250, 7.250, 3.875 MHz. QSL via KA6SPQ, P.O. Box 1653, Crescent City, CA 95531.

W8NP, from Massillon ARC diamond anniversary, Massillon, Ohio; 1300Z Oct. 3 to 2200Z Oct. 6 on CW 3.535, 7.035, 10.115, 14.035, 18.075, 21.035, 28.035 MHz, and SSB 3.960, 7.260, 18.160, 21.260, 28.260 MHz. For certificate send QSL and 9 × 12 SASE to MARC, P.O. Box 73, Massillon, OH 44648.

NØCWP, from Anamosa, Iowa Pumpkinfest; Jones County ARC; 1300–1700Z Oct. 5 on 14.260 MHz ±QRM. For certificate/QSL send SASE and QSL to Jim Mc Clintock, NØCWP, 301 Vine St., Morley, IA 52312.

WØW, from commemoration of 104th year of discovery of the Knesington Runestone, Alexandra, Minnesota; Runestone ARC; 0501Z Oct. 1 to 0459Z Oct. 15 on SSB 14.250 plus 40 and 80 meters, CW 20 meters, and PSK 20 meters. For certificate send QSL and 9 × 12 SASE to Bill Klundt, KGØDX, 509 Pine St. South, Sauk Centre, MN 56378.

WØFUN, from Nowhere, Illinois; Iowa Radiosport Society; 1500–2000Z Oct. 13 on 14.243±. QSL via Iowa Radiosport Society, P.O. Box 73, Denmark, IA 52624.

WØUK, from Nowhere, Kansas (in conjunction with WØFUN above); Douglas County ARC; 1400–2100Z Oct. 12 on 14.245, 7.245 MHz. For certificate send SASE and QSL to Ken Blair, KCØGL, 1711 West 19th Terrace, Lawrence, KS 66046.

• The following hamfests, etc., are scheduled for October and late September:

Sept. 28–29, **Virginia Beach Hamfest/ Fleamarket & ARRL Roanoke Div. Convention**, Pembroke Mall, Virginia Beach, Virginia. For more information, see <www.vahamfest.com>, e-mail: <hamfest@exis.net>. Dealers only: <w4blo@hotmail.com>. (Talk-in 146.97–)

Oct. 5, **Jacksonville Free Hamfest**, Jax Raceways, Jacksonville, Florida. Contact North Florida ARS, P.O. Box 9673, Jacksonville, FL 32208; e-mail: <n4uf@nofars.org>; web: <www.nofars.org>. (Talk-in 146.7/444.4)

Oct. 5, **Twin Lakes ARC Hamfest 2002**, Warsaw Community Building, Warsaw, Missouri. Contact 'Fest 2002, c/o Twin Lakes ARC, P.O. Box 1841, Warsaw, MO 65355; call Gene Payne, 660-438-8650 (6–8 PM); e-mail: <gpo@dam.com>. (Talk-in 147.300+; exams 1 PM)

Oct. 5, **York County ARS Hamfest**, Knight's Stadium, Rock Hill, South Carolina. Contact Billy Hallman, KG4GSE, 803-366-6906, e-mail: <bhallman@cetlink.net>. (Talk-in 146.030–600; exams 10 AM)

Oct. 5, **Red Rose Repeater Assn. Tailgate Fest**, West Earl Community Park, Lancaster County, Pennsylvania. Contact Dave, W3CWE, 717-872-6578; e-mail: <jjcd@prodigy.net>; <www.qsl.net/rrra>. (Talk-in 147.015+, PL 118.8)

Oct. 5, **Temple ARC Ham Expo**, Bell County Expo Center, Belton, Texas. Contact Mike LeFan, WA5EQQ, phone 254-773-3590; fax 775-264-1978; e-mail: <hamexpo@tarc.org>; <www.tarc.org>. (Exams 1:30 PM)

Oct. 6, **Medina Hamfest**, Medina County Career Center, Medina, Ohio. Contact Mike, N8TZY, 330-273-1519 (after 7 PM); e-mail: <n8tzy@m3net.net>; <www.qsl.net/m2m>. (Talk-in 147.030+; exams 9 AM, more info Fred, K8FH, 440-236-3477)

Oct. 12, **Northern New York Hamfest & Convention**, Horse-show grounds, Lake Placid, New York. Contact Tom Valosin, WB2KLD, 117 Warrior Way, Middleburgh, NY 12122; 518-827-4800; e-mail: <valosin@midtel.net>; web: <http://www.geocities.com/nnyara>.

Oct. 12, **North Kitsap ARC Hamfest**, President's Hall, Kitsap County Fair Grounds, Bremerton, Washington. Contact Russ Swank, KI7PG, P.O. Box 2268, Silverdale, WA 98383-2268; phone 360-697-6451; e-mail: <nkarc@yahoo.com>; <www.silverlink.net/nkarc>. (Talk-in 146.62–, PL 103.5)

Oct. 12, **Denton Hamfest 2002**, Denton Civic Center, Denton, Texas. Contact Randy Wooten, KD5KJZ, 940-390-5338; e-mail: <kd5kjz@yahoo.com>; <www.dentonhamfest.org>. (Talk-in 146.92, 110.9 PL; exams)

Oct. 12, **Bergen ARA Fall Hamfest**, Westwood Regional Jr./Sr. High School, Washington Township, New Jersey. Contact Jim Joyce, K2ZO, 201-664-6725; e-mail: <k2zo@arrl.net>. (Talk-in 146.19/.79; exams 8–10 AM)

Oct. 12, **Augusta Hamfest & Computer Show**, Evans Middle School, Augusta, Georgia. Contact Jay Samples, KG4LEY, phone 706-651-9504; e-mail: <kg4ley@bellsouth.net>. (Exams 9 AM)

Oct. 13, **Nutmeg Hamfest/Computer Show & ARRL State Convention**, Mountainside Special Event Facility, Wallingford, Connecticut. More info, e-mail: <nutmeghamfest@qsl.net>; <www.qsl.net/nutmeghamfest>. (Talk-in 147.36; exam info Joel, N1JEO, 203-235-6932)

Oct. 13, **LCDRA & CMARC Hamfair**, Lakeside Christian School, East Lansing, Michigan. Contact Mike Rhew, KC8DBP, P.O. Box 27321, Lansing, MI 48909-7321; phone 989-725-1853; e-mail: <kc8dbd@arrl.net>. (Talk-in 145.390–, 100 Hz PL, 146.520; exam info 517-589-5263 or <n8vys@voyager.net>).

Oct. 18–20, **Mt. Diablo ARC Pacificon 2002 Hamfest**, Sheraton Hotel, Concord, California. More info, e-mail: <pacificoninfo@earthlink.net>; <http://www.pacificon.org>. (Talk-in 147.06+, PL100; exams)

Oct. 19, **Oak Ridge Hamfest 2002**, Fraternal Order of Eagle's Building, Oak Ridge, Tennessee. Contact David Bower, K4PZT, 865-670-1503, e-mail: <d.bower@ieee.org>; <www.korrnet.org/orarc/>. (Exams)

Oct. 20, **Lewis & Clark Radio Club Hamfest**, Lewis & Clark Community College, Godfrey, Illinois. Contact L&C Radio Club, P.O. Box 553, Godfrey, IL 62035, phone 618-462-4212. (Talk-in 145.230; exams call Rich, KF9F, 618-466-2306)

Oct. 20, **Hall of Science Hamfest**, NY Hall of Science parking lot, Flushing Meadow Corona Park, Queens, New York. Contact Stephen Greenbaum, WB2KDG, 718-898-5599 (evenings); e-mail: <wb2kdg@bigfoot.com>; web: <www.qsl.net/hosarc>. (Talk-in 444.200, PL 136.5, 146.52; exams 10 AM)

Oct. 26, **St. Louis Halloween Hamfest**, Kirkwood Community Center, Kirkwood, Missouri. Contact Steve Welton, WØSLW, 314-638-4959; e-mail: <slw@partyline.net>. (Talk-in 146.91)

Oct. 26, **Mid-Valley ARS Swap-Toberfest, Amateur Radio Emergency Services Convention**, Polk County Fairgrounds, Rickreall, Oregon. Contact Dean Davis, KL7OR, 503-540-3270; e-mail: <kl7or@arrl.net>; web: <http://www.qsl.net/w7oem/swaptobe.html>. (Talk-in 146.86, 186.2 PL)

Oct. 27, **Massillon ARC Hamfest & Auction**, Stark County Fairgrounds, Canton, Ohio. See <www.qsl.net/w8np>. (Talk-in 147.18+)

Oct. 27, **Mason-Dixon Hamfest**, Carroll County Ag Center, Westminster, Maryland. Contact Steve Beckman, N3SB, <n3sb@qis.net>; web: <http://www.qis.net/~k3pzn/mdhfest2002.htm>. (Talk-in 145.410; 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., October 1st for a December event).

Our Readers Say

The following letter was written to Irwin Math, WA2NDM, long-time author of "Math's Notes" in CQ:

From A Fourth-Generation Ham

Dear Mr. Math:

I just wanted to drop you a note and tell you how I appreciate your articles in *CQ* magazine. In recent times my mind has been going back to my youth in southern California . . . in the late '50s. There was a 2 meter transceiver advertised in *Popular Electronics* that cost $7.95; it used a single 3A5 tube. I can picture the article and even the circuit board. I think they also had a "two-tube version," but don't recall much about it. I've wondered what the name of the company was and what happened to it. Then, in the July issue of *CQ,* you gave me the schematic on page 63. Wow!! I suppose that it would really tear things up to operate a pair of those today, but that is what we had back then.

I remember using Gonset Communicator II's and III's (aka Gonneybirds) on 2 meters. There were only three repeaters (AM repeaters) in LA at that time and they were pretty clogged up. Some guys had surplus SCR-522 radios. Then there were a bunch of crazy folks on 146.94 MHz who played with FM or some such thing . . . never could quite understand them on my AM rig. Anyway, none of us thought that FM would ever go anywhere . . .

Nowadays everyone has a pile of new radios, bought them from AES or HRO using plastic. When they break, they haven't got the guts to even remove the lid! Sometimes I wish that there were still piles of ARC-5 radios available and old TV sets to scrap most of the parts to build a CW rig. I suppose those days are gone.

Anyway, thanks for listening to my ramblings. I am a fourth-generation ham. My great-grandfather started with the call 6BGW, with 7.5 watts and a regen. receiver . . . worked many stations in Europe. I have some of his QSL cards from that time period! I still enjoy making an older radio "play" like they used to. I do realize that today's receivers are so much better than what was available back then, but those old boat anchors still work and I like to play with them. Keep up the good work on your magazine articles!

Ron Butcher, AA6D
Turlock, CA

Reasonable Accommodation

Editor, *CQ:*

I read with interest the comments regarding antenna restrictions in the "our Readers Say" column in the August issue, having asked Maine's U.S. Senator, Olympia Snowe, to press the FCC to preempt CC&Rs as it has done with zoning and other local governmental restrictions. I strongly support congressional action to mandate that the FCC override HOAs and CC&Rs to the point that hams *must* be accorded "reasonable accommodation" in the matter of erecting antennas. I think one or two people, N3CB among them, missed the point: What is sought is *reasonable accommodation,* not blanket permission to erect any antenna and support structure at all.

While I think he missed the target in much of his remarks, I certainly agree with him in that I, too, would not want a one-hundred foot high tower in my neighborhood, and we have neither CC&Rs nor restrictive zoning in the community in which I live. My neighbor *could* erect such a structure, though he might have to get a building permit for it. But, to the best of my knowledge, there is nothing in town code to stop him. Is a hundred foot tower in a residential neighborhood *reasonable*? I would argue most strongly that it is not. Is a tree-mounted dipole or ground-mounted vertical *reasonable*? Here I would argue that both would most certainly be reasonable, and thus should not be restricted, even if it takes legislation at the federal level to mandate this concept of *reasonable accommodation.*

I face some restrictions in the retirement community in Florida where I rent for the winter. The community rules say "no antenna may be attached to a house." But antennas *are* attached to several houses. Satellite dishes are prohibited, yet several homes in the community have them . . . attached to houses, too. I understand that the FCC prohibits restrictions against satellite dishes on the part of HOAs and CC&Rs. This being the case, why penalize hams by denying them *reasonable* antennas? The way I read the restrictions, where I am in winter, I could put up a ground-mounted vertical or dipole. This winter I shall do so, and await complaints with a copy of the rules in hand. I would feel much more comfortable if I could have an FCC mandate requiring reasonableness handy.

David Rotthoff, KA1EAP
Old Orchard Beach, ME

Uniform Ham Vests

Editor, *CQ:*

An item I think worth its time is "Uniform Ham Vests." The vests would make us visible and viable; make us uniform and part of the authority of the function/emergency/activity; give public recognition; promote amateur radio to potential new members; be a public relations booster for ham-staffed events.

The proposed vest would be bright yellow, with a left shoulder pocket to hold a pen and small memo pad. Bottom pockets would be on the front (on each side of

(Continued on page 111)

12 STORE BUYING POWER

HAM RADIO OUTLET®

WORLDWIDE DISTRIBUTION

ANAHEIM, CA
(Near Disneyland)
933 N. Euclid St., 92801
(714) 533-7373
(800) 854-6046
Janet, KL7MF, Mgr.
anaheim@hamradio.com

BURBANK, CA
2492 W. Victory Bl., 91506
(818) 842-1786
(800) 854-6046
Eric, KA6IHT, Mgr.
Victory Blvd. at Buena Vista
1 mi. west I-5
burbank@hamradio.com

OAKLAND, CA
2210 Livingston St., 94606
(510) 534-5757
(800) 854-6046
Mach, K6KAP, Mgr.
I-880 at 23rd Ave. ramp
oakland@hamradio.com

SAN DIEGO, CA
5375 Kearny Villa Rd., 92123
(858) 560-4900
(800) 854-6046
Tom, KM6K, Mgr.
Hwy. 163 & Claremont Mesa
sandiego@hamradio.com

SUNNYVALE, CA
510 Lawrence Exp. #102
94085
(408) 736-9496
(800) 854-6046
Mark, WI7YN, Mgr.
So. from Hwy. 101
sunnyvale@hamradio.com

NEW CASTLE, DE
(Near Philadelphia)
1509 N. Dupont Hwy., 19720
(302) 322-7092
(800) 644-4476
Jim, KA3LLL, Mgr.
RT.13 1/4 mi., So. I-295
newcastle@hamradio.com

PORTLAND, OR
11705 S.W. Pacific Hwy.
97223
(503) 598-0555
(800) 854-6046
Leon, N7IXX, Mgr.
Tigard-99W exit
from Hwy. 5 & 217
portland@hamradio.com

DENVER, CO
8400 E. Iliff Ave. #9, 80231
(303) 745-7373
(800) 444-9476
Joe, KDØGA, Mgr.
John, N5EHP, Mgr.
denver@hamradio.com

PHOENIX, AZ
1939 W. Dunlap Ave., 85021
(602) 242-3515
(800) 444-9476
Gary, N7GJ, Mgr.
1 mi. east of I-17
phoenix@hamradio.com

ATLANTA, GA
6071 Buford Hwy., 30340
(770) 263-0700
(800) 444-7927
Mark, KJ4VO, Mgr.
Doraville, 1 mi. no. of I-285
atlanta@hamradio.com

WOODBRIDGE, VA
(Near Washington D.C.)
14803 Build America Dr. 22191
(703) 643-1063
(800) 444-4799
Mike, N4MDK, Mgr.
Exit 161, I-95, So. to US 1
woodbridge@hamradio.com

SALEM, NH
(Near Boston)
224 N. Broadway, 03079
(603) 898-3750
(800) 444-0047
Chuck, N1UC, Mgr.
sales@hamradio.com
Exit 1, I-93;
28 mi. No. of Boston
salem@hamradio.com

CALL NOW FOR SUPER YAESU PACKAGE DEALS AND EXTRA SAVINGS

YAESU

FT-840

- 100W • 12V DC • DDS
- Gen. Cov. Rx, 100 mem.
- Optional Ext. Auto • Tuners Available

Call Now For Our Low Pricing!

$100. mail coupon — HURRY! expires 9.30/02

FT-817 HF/VHF/UHF TCVR

- 5W @13.8V ext DC • USB, LSB, CW, AM, FM
- Packet (1200/9600 Baud FM)
- 200 mems, built in CTCSS/DCS
- 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

NEW!

Call Now For Low Pricing!

$100. mail coupon — HURRY! expires 9.30/02

FT-847

Ultimate Base Station, HF, VHF, UHF

- 100w HF/6M, 50w 2M/430 mHz
- DSP • Full Duplex Cross-band
- 1200/9600 Baud Packet Ready

Call for Low Price!

$450. mail coupon — HURRY! expires 9.30/02

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

Call Now For Low Pricing!

$60. mail coupon — HURRY! expires 9.30/02

FT-90R

2M/440 Mini Dualbander Transceiver

- 50w 2m, 40w 440mHz
- Wide Rx • Detachable Front Panel
- Packet Ready 1200/9600 Baud
- Built-in CTCSS/DCS Encoder/Decoder
- Less than 4" wide!

Call for Your Low Price!

$50. mail coupon — HURRY! expires 9.30/02

FT-1000MP MKV HF Transceiver

- Enhanced Digital Signal Processing
- Dual RX
- Collins SSB filter built-in
- 200W, External power supply

Call Now For Low Pricing!

FT1000MP MKV field unit 100w w/built-in power supply in stock

$200. mail coupon — MKV Field expires 9.30/02

FT-1000MP MKV expires 9.30/02 — $500. mail coupon

VX-7R

50/2M/220/440 HT

- Wideband RX - 900 Memories
- 5W TX (300mw 220Mhz)
- Li-Ion Battery
- Fully Submersible to 3 ft.
- Built-in CTCSS/DCS
- Internet WIRES compatible

NEW!

Great Price, Call Today!

FT-920 HF+6M Transceiver

- 100w 160-6M, 12VDC
- Built-in DVR, CW Memory Keyer
- DSP, Auto-Notch • 99 Memories
- Computer controllable, CAT System

Call For Low Pricing!

$200. mail coupon — HURRY! expires 9.30/02

VX-5R/VX-5RS

50/2M/440HT

- Wideband RX • 6M-2M-440TX
- 5W output • Li-Ion Battery
- 220 mems, opt. barometer unit
- Alpha Numeric Display
- CTCSS/DCS built-in

Call For Low Price!

expires 9.30/02

$70. mail coupon

FT-7100M 2M/440 Mobile

- Ultra Compact • 50w/35w 2m/440
- 262 memories • V/V, U/U, V/U • CTCSS, DCS, ARTS
- Remotable front panel w/opt. YSK-7100

Call Now For Special Pricing

NEW!

$150. mail coupon

FT-100D HF/6M/2M/70CM Transceiver

- Compact Transceiver w/detachable front panel
- Rx 100kHz to 970mHz (cell blocked)
- Tx 100W 160-6M, 50w 2M, 20W 70CM
- Built-in DSP, Vox, CW keyer
- 300 Memories

Call Now For Low Pricing!

$200. mail coupon — HURRY! expires 9.30/02

FT-50RD

2M/440mHz Compact HT

- DVR, Decode, Paging Built-in
- Alpha numeric display
- Wide Band receive
- Battery Saver • 112 Memories
- Mil-Spec • HiSpeed scanning

Call For Your Low Price!

$50. mail coupon — HURRY! expires 9.30/02

AZ, CA, CO, GA, VA residents add sales tax. Prices,specifications, descriptions,subject to changewithou

Look for the HRO Home Page on the World Wide Web
http://www.hamradio.com

COAST TO COAST FREE SHIPPING
UPS - Most Items Over $100
Rapid Deliveries From The Store Nearest To You!

Getting bored with ham radio? The author was, too, a few years ago ... so he decided to try something new and more challenging.

Musings on an Experiment in QRP

BY BOB LOCHER,* W9KNI

Let me start out with a truism that is too often forgotten: Ham radio is a hobby. That means it is supposed to be fun, or at least rewarding in ways we consider worthwhile. When what you are doing in ham radio no longer meets that test, you should be trying to figure out why, and then make changes until it is fun again.

A few years back, operating was getting a little stale for me. I decided I needed to do something new to relight the fire. In October of 1999 I bought an Elecraft K2 transceiver kit. I had seen this little box operate, had spent five minutes tuning it myself, and had been impressed. The specs looked pretty good, too. I thought something like this would be a lot of fun.

I had no idea!

A New Adventure

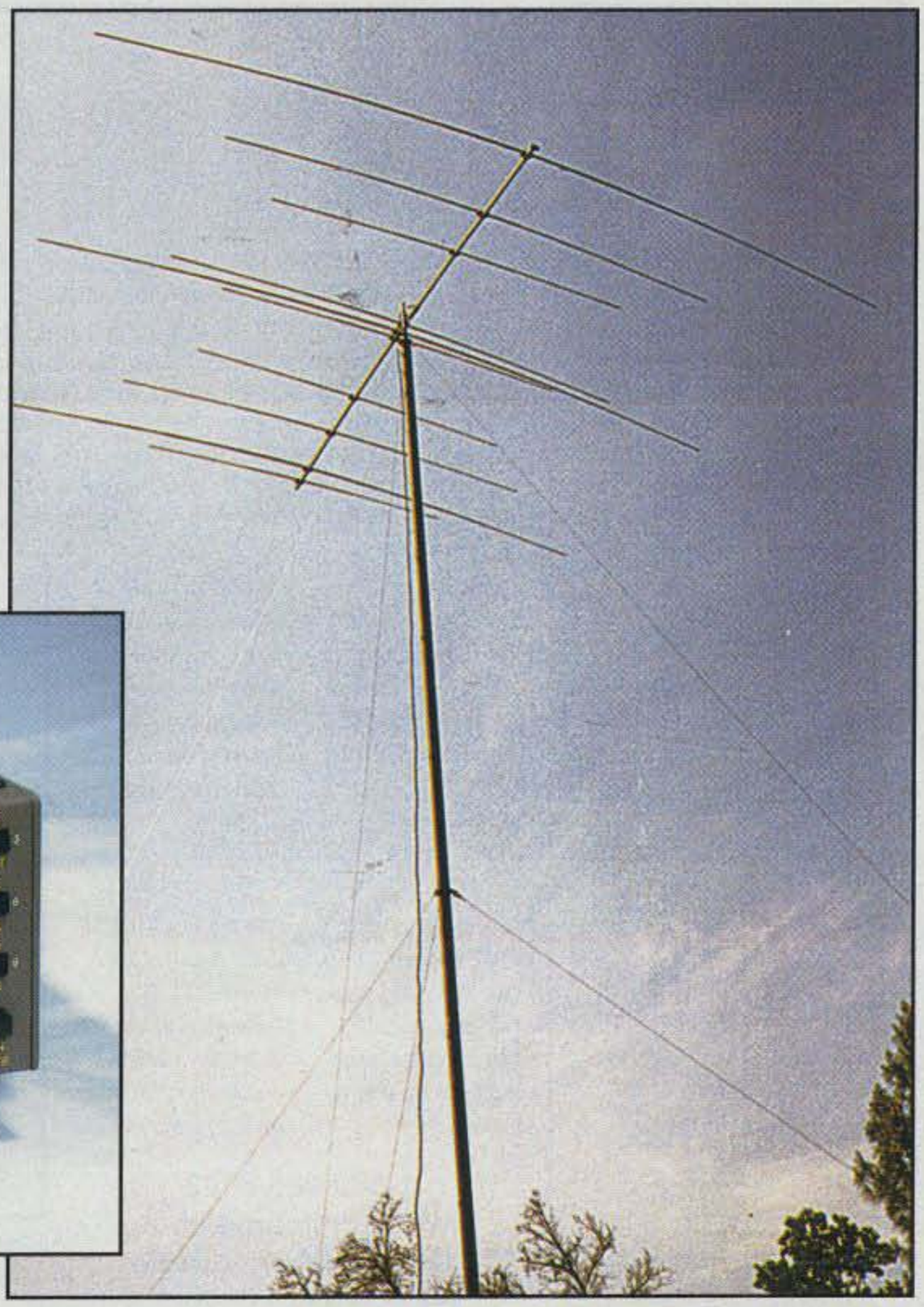
The K2 transceiver went together smoothly, taking just under 30 hours to assemble. On November 5, 1999 my new rig became QRV.

Now let me be frank about something: Many QRP operators limit themselves to 5 watts output, or 10 watts on SSB. Somehow these arbitrary numbers became the official QRP maximums. I do not subscribe to this limitation. When I hooked up the little rig, my wattmeter said I was getting 12 watts out. That worked for me.

My first QSO was with NØSS, who was running a K2 as well. My second was with VP2V/G3TXF, then JW/ DJ3KR, followed by UT2QT. "Hey," I thought, "this stuff is FUN!" I was really hooked.

After many years of operating with maximum legal power always available (although usually at 100 watts), I found myself operating QRP (okay, at 12 watts), with the important point here being that was no easy way to go QRO. I have always been an advocate of operating QRP. I believed back then and I believe now that any operator will learn a lot trying to work stations running QRP. Lots of times in the past I had turned down the output and tried my hand at chasing DX. If I tired of it, or felt the need for more power, it was a simple matter to twist the output knob and start running 100 watts. With the throwing of a couple switches, I could be at 1500 watts output in seconds.

*Box 1025, Geyserville, CA 95441
e-mail: <locher@sonic.net>



The author's QRP setup, an Elecraft K2 putting out 12 watts and a Bencher Skyhawk triband antenna, which provides gain on receive as well as transmit.

Operating QRP, however, with no way to turn up the wick, is different. There is no easy escape. Being forced by choice of rig to operate QRP proved to be a delicious new adventure. Okay, I will confess: One time I did do a panic switch back to the old rig—the transceiver and 1500 watt linear—when I got a phone call about a P5 station allegedly in North Korea, the last country I need. I worked him, but it soon proved to be a pirate station . . . sigh. (I have since worked several other "P5" stations with the QRP rig, but they all were pirates as well.) However, with the exception of that one QSO, all my operating since November 5, 1999 has been with my version of QRP. Thus far I have 281 countries worked with the little rig, both CW and SSB.

The Antenna

Knowledgeable DX stations I work ask what I am using for an antenna, realizing that the signal is a product of both rig and antenna. I use a Bencher Skyhawk tribander 65 feet above the ground. As near as I can figure, in terms of effective signal radiated, this is very similar to running a hundred watt transceiver to a Butternut vertical.

I have been down the DXing road before; this was not my first time. Therefore, it might be allowed that I do know a few of the tricks of the game. All that said, this time chasing countries with a home-built rig running 12 watts has been terrific fun, and all of this with no mandatory QSLing!

For what it's worth, all QRP DX QSOs were made without any kind of help—no running of the big rig, then having cracked the pile-up asking the DX to stand by for my QRP; no calling frantically signing "/QRP." I will readily and cheerfully admit that once I have in QSO a DX station for which I had to beat out a pile-up, I get considerable pleasure in reporting that the rig is 12 watts. Really, though, that is a tribute to the antenna, not the radio.

Anyhow, my experience has given me better understanding of a few things, and that is what I want to share here.

The QRP Mindset

First of all, QRP is a mindset. As referenced above, some feel that it is only true QRP if you are running 5 watts or less on CW, or 10 watts on SSB. Some QRPers feel that using competitive antennas is not proper either, that a true QRP antenna might be a random wire fed with a tiny antenna tuner. Others feel only homebrew equipment really counts, and that considerable virtue is gained by recycling parts, especially non-electronic parts. Many seem to have a WW II spy mentality, taking great delight in making working miniaturized transceivers in tiny containers such as match boxes, cigarette packs, tin cans, or even fountain pens—things that appear to have more mundane uses.

Some QRPers exchange 72's instead of 73's, as near as I can figure because 72 is less. Obviously, some QRPers are masochists. Some are minimalists, some are thrifty by choice or necessity, some run QRP as the only viable solution to RFI problems, some like operating handicaps. Some QRPers do much of their operating from portable locations, frequently places not easily accessible. Some look with disdain at most other forms of amateur radio; they have their own suggested frequencies on which they operate, and largely ignore the rest of the amateur radio community. Some operate primarily or exclusively mobile. As with any other successful and worthwhile avocation, there are also those who are wannabees, who talk the talk but don't walk the walk, and who invariably are the loudest in defense of QRP purity and with suggestions that no one should legally be allowed to run more than 10 watts.

Taken in sum, QRPers are a diverse lot, and certainly include some of the more interesting people in amateur radio. Beyond a doubt, QRPers are one of the most dynamic groups in HF operating today.

But . . .

Operating with 12 watts to a Skyhawk tribander is the approximate equivalent of running 100 watts to a Butternut vertical. My QRP status is reasonably intact if I run 12 watts, but completely gone if I am running 100 watts. Yet the ERP (Effective Radiated Power) is the same. If I tell other hams that I have worked 281 countries in 22 months QRP, most nod with respect. If I tell them I ran 100 watts, the respect ratio is significantly reduced.

Is this fair? Of course not. Frankly, even though the ERP of the two setups might be identical, if I was ever to have to choose, I would take the QRP and the killer tribander every time, thanks to the huge receiving benefit offered by my antenna. (The trade-off does offer a significant penalty on 40 and 80 meters however, where I have a vertical whether I am running 12 watts or 100.

That is where 100 watts would be rather more welcome.)

QRP vs. QRO

Now let's compare some other aspects of running QRP and QRO—full legal power if needed.

My QRP rig has a really hot receiver, and my tribander is extremely effective for receiving as well as transmitting. The result is that there are many times when I can listen to some pretty good DX on a band that is not wide open. There are many paths, especially on 20 meters, and to a lesser extent 15 and 10 meters, where with good equipment and a good antenna a lot of DX stations can be heard, and reliably copied, particularly on CW.

On these secondary and non-prime paths, however, all I am with QRP is an eavesdropper. There is no way I can work these stations. Often they are a solid 539, but they tell their contact that they are running 400 watts or more. If I were running 1500 watts, these stations would be within easy reach. Guess what the chance is that such stations are going to hear a QRP-level signal. Speaking frankly, I did not earn my license and put up a tower and a Yagi so that I could be an SWL station.

When a major path is open on a band, this is not so important. QRP is capable of working stations, and operating can be rewarding. However, there are a lot of times when there is no major open DX path on any band, and thus for the DXer running QRP there is no real reason to be operating. With higher power, operating becomes more realistic.

Another limitation with QRP is ragchewing. I am fond of DX ragchewing with old friends and new, but doing so with QRP power levels is not a very rewarding way to go. For one thing, any QSB can wipe out copy at the other end, or at least make it difficult for the receiving station. What fun is that for him? On top of that, you get very little respect. Too many times have I been in contact with another station and had someone go "QRL?" on the frequency. I responded, "QRL, PSE QSY" and then had the other station immediately open up with a CQ on my frequency. Obviously, the station did not hear me, but it certainly is frustrating. As a result, most DX QRP ragchews are short in duration and often not terribly rewarding.

For ragchewing, if it was readily available I would indeed normally run 100 watts, and more if needed, to hold the QSO. Running a rig that maxes out at 12 watts makes that impractical.

Whether you are DXing or intent on a good ragchew, another problem can be that the station you wish to work suffers from noise problems, either of the atmospheric QRN type or power-line noise. Either can conspire to render weaker signals impossible to copy. Then, frankly, some operators simply are not good when it comes to copying weak stations.

I confess I am at a point where the virtues of operating 100% QRP are waning for me. For one thing, there are not many opportunities left to work new countries on my QRP country list. There are a few on the air that I need, but none of them are easy under any circumstance—stuff such as EP, YI, 9N, J28 (but ask me about nailing YK!!!). Ragchewing is a sometimes thing, and I miss having more solid QSOs with my DX buddies. On the one hand I am ready to move on, but on the other hand I don't want to give up my QRP DX chase either.

That may not be a problem much longer. My rig supplier has promised a 100 watt board for my transceiver, and I certainly will add that. The supplier also indicate that by pressing a button the amp board can be bypassed completely, returning the radio to the present 12 watts output. *(At press time, Elecraft had recently introduced its KPA-100 add-on board for the K2.—ed.)* I really like that. It sounds like an ideal solution for me. I can tune the bands. If I hear a legitimate North Korean station, I can be running 1500 watts in a few seconds. If I come across a buddy and want to ragchew, I can run 100 watts or more as necessary, again in a matter of seconds. If I hear a new one for my QRP DX chasing, I can push a button and run 12 watts again. The only thing I really have to pay attention to is making sure the wattmeter is not in the 25 watt range when I turn on the linear!

Somehow, for me, turning the gain down on a 100 watt transceiver is not the same thing—been there, done that. But pushing a button that makes me QRP or not does work for me. The digital solution! I'm looking forward to it.

Give It a Try

Are you getting bored? The bands seem stale? Give QRP a tumble. There are some superb radios from a number of vendors. Some are kits; some are factory assembled and ready to go. You may or may not exhaust the possibilities of QRP in your personal operating, but either way you are pretty sure to have a lot of fun for a while. ■

So you've bought that new portable QRP rig and there's nothing left in your pocket for power and an antenna out in the field. Ham ingenuity to the rescue!

The Poor Man's Battery Supply and Portable Antenna for the FT-817

BY WILLIAM A. (TONY) BLALOCK,* WN4BML

When I first thought of purchasing a Yaesu FT-817, I thought of it both for portable use and shelter operation during emergencies. My first concern was portable power.

I have a 6.5 AH (amp-hour) battery pack that weighs about 4 pounds and can be used, but I wanted a smaller, yet reasonably powerful pack. I settled on the use of 12 AA nickel metal hydride (NiMH) batteries made up in a pack using a four-battery pack and an eight-battery pack. This gave me about 14.7 VDC from a fresh pack with a capacity of 1700 maH.

I built two of them using the RadioShack #270-391 four AA pack and a RS #270-407 eight AA pack wired together in series and connected to a cable with the 4.0 × 1.7 mm coaxial DC plug on its end. Great care must be taken to wire the plug correctly to prevent damage to the FT-817. I made sure to double and triple check the wiring.

Each pack's construction costs about $5.00 plus the batteries, which ran $3.25/cell, so the total cost for each pack was about $44.00. I use a multiple-cell battery charger to charge the batteries.

A Portable Antenna

My thoughts then went to how to build my own portable antenna, something that could be very compact yet functional. Maldol had not yet released its design, but I was thinking of a base-loaded whip antenna, along the lines of a Hustler model.

I came across GMØRWU's website, which features a program for building an antenna using loading coils.[1] The program produces the value of inductance needed at the base for a given length of radiator. I then had the program calculate the values needed for each band and/or frequency range. All I needed were the dimensions. This same site directed me to one which would produce that data.[2] The data generated are included in this article, as are the websites (see notes). Refer to Table I for the dimensions and number of turns for each coil, based on band and coil diameter. (The table provides data for 3/4 inch and 1 inch diameter PVC pipe as the coil form.)

I settled on 3/4 inch PVC pipe for my coil forms and PVC caps for the ends (see photo A). I chose the flat PVC caps for ease of construction, specifically drilling holes for installing the BNC chassis-mount jacks—one at each end. Here are the construction details:

I installed the jacks on the caps and epoxied the nuts to the inside of the caps, and let the epoxy dry. Next I soldered a piece of copper wire from a piece of RG-6 to the center conductor of each BNC connector. This would be used to attach the coils once they were wound.

I then cut each piece of PVC stock to length by adding together the dimension of the coil length and the depth of each cap and cutting them to length with a hacksaw. I determined where on the form the coil would be located and

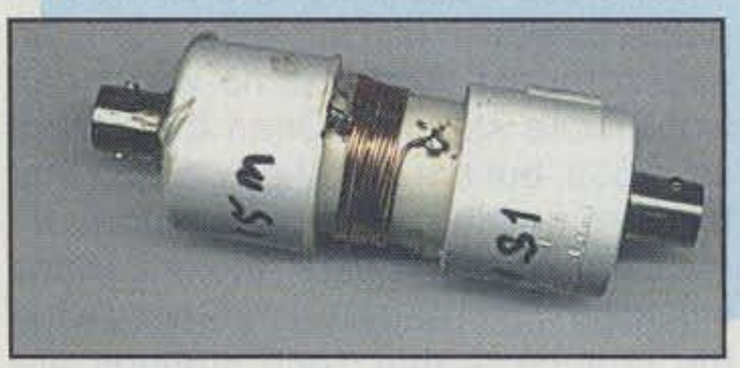


Photo A– This 15 meter coil is typical of the band coils wound by the author for his multiband portable HF antenna. With the proper coil, this antenna will cover 80–10 meters.

Dimensions and Coil Data

Band	Freq (MHz)	Induct/Micro H	#Turns – 3/4"dia.	Length 3/4"	#Turns 1"	Length 1"
10 m	28.4	1.11568	7	.3"	6	.4"
12 m	24.9	1.8917	9	.3"	9	.4"
15 m	21.1	1.687	9	.3"	8	.4"
15 m	21	3.1994	12	.3"	—	—
17 m	18.1	4.75	15	.33"	13	.4"
20 m	14.2	5.94	17	.38"	14	.4"
20 m	14	8.835	23	.51"	17	.4"
31 m	10.1	18.03	39	.86"	28	.61"
40 m	7.2	28.423	57	1.24"	38	.84"
40 m	7.0	39.276	74	1.63"	49	1.08"
60 m	5.5	64.435	114	2.52"	73	1.60"
75 m	3.945	98.985	169	3.72"	104	2.29"
75 m	3.945	126.48	213	4.68"	129	2.84"
80 m	3.5	161	265	5.83"	160	3.52"

Table I– Coil data, including inductance, number of turns, and coil length at a variety of amateur frequencies. Separate listings are provided for 3/4 inch and 1 inch coil forms. Calculations performed on GMØRWU website (see notes for URLs).

**1224 SE 14th Street, Ocala, FL 34471*
e-mail: <blalock_w@popmail.firn.edu>

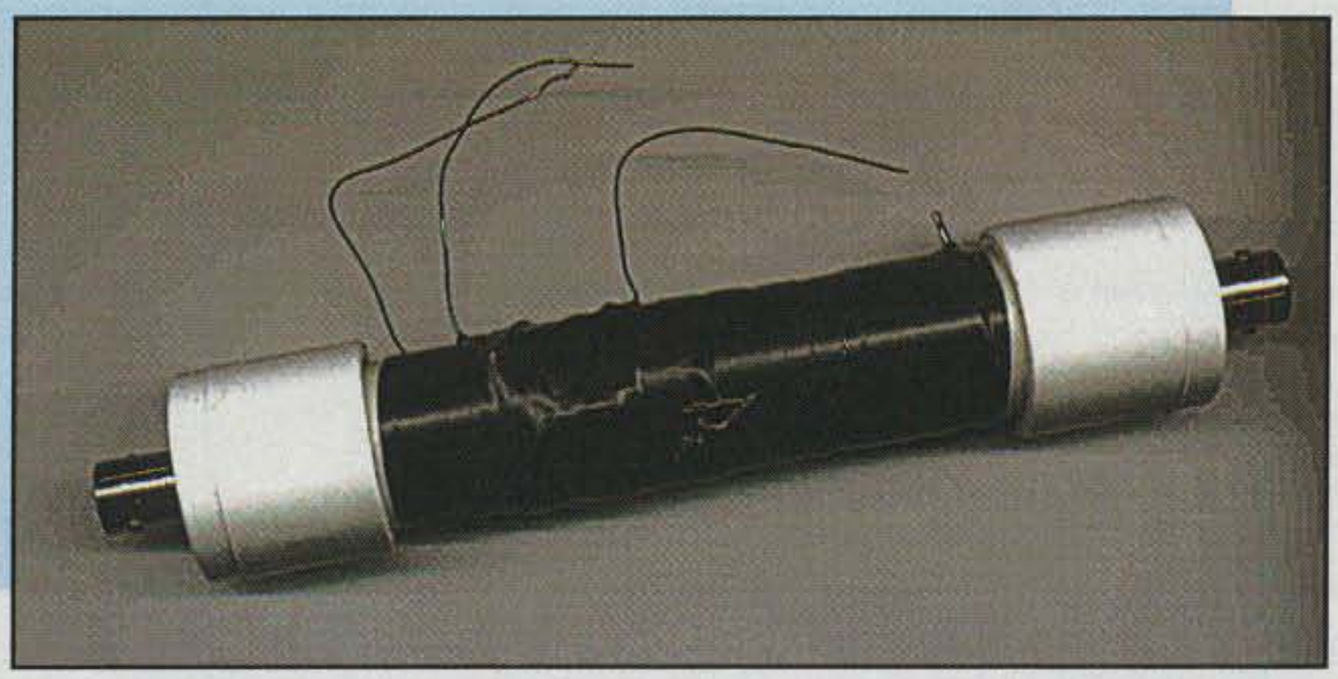


Photo B– The 80 meter coil requires the use of thinner wire—in this case #24 instead of #22—in order to get enough wire on a reasonable-size coil form.

drilled two very small holes where the wires from the BNC connectors would come out. Next I pulled the wires through and installed the caps with connectors on each end of the PVC stock.

Using magnet wire, I then wound the coil on each form according to the size specified in Table I. I soldered only one end of the coil to the protruding wire, being sure to first scrape the enamel insulation from the magnet wire. At the other end of the coil I just scraped off the enamel and wrapped the magnet wire around the protruding wire. I did this for each coil for each band. Next I trimmed the protruding wire so only about one inch stuck out from the wrapped end. I trimmed back the wires at the soldered end to the soldered connection. Tuning would come later! I used #22 wire to wind all the coils for 40 though 10 meters, with #24 wire used to wind the 80 meter coil (photo B).

Whip Construction

The whip antenna was next. I made it from a 72 inch telescoping antenna mounted to a PL-259 connector using a combination of 1/8 inch brass threaded stock and 3/8 inch brass flat stock obtained from a local hardware store (photos C and D). I drilled the flat stock so I could mount the whip to it using brass screws. Next I bent the stock just above the mounting point to which the the threaded stock would be attached. Using a long piece of 1/8 inch threaded stock, I attached the threaded stock to the flat stock, and then ran it into the PL-259 and soldered the threaded stock to the center conductor using a 3/8 inch

Photo C– A 6 foot whip made from a telescoping antenna goes on top of the coil. You may adjust the size of this whip as needed for a good match on your selected band. ←

Photo D– Detail of the connection of the whip portion of the antenna to the PL-259 connector (see text).

Basic Materials

Description	Source	Part #	Price	Quantity
BNC chassis jack	RadioShack	278-105	$1.99	2 per coil
PL-259	RadioShack	278-188	$3.99	1
Magnet wire pack #30	RadioShack	278-1345	$3.99	Spool pack #22, #24,
72" telescoping ant.	RadioShack	270-1408	$4.99	1
3/4" PVC flat caps	hardware store	—	$.35 ea.	2 per coil
3/4" PVC S#40	hardware store	—	$3.00	10' length
3/8" flat brass stock	hardware store	—	$2.00	1
1/8" threaded stock	hardware store	—	$2.00	1
Brass nuts & washer	hardware store	—	$.10 ea.	as needed
5 min. epoxy	hardware store	—	—	as needed

Table II– Materials needed for the poor man's portable QRP antenna. Virtually everything is available from RadioShack and your local hardware store.

nylon spacer to both insulate and keep the stock centered. I then tightened the nuts to the flat stock and soldered them.

Final Assembly and Tuning

The next step was final assembly and tuning of each coil. I first experimented with the 20 and 15 meter coils to get the hang of it. In many cases I found that I had too many turns on the coil—but too much is better. I then built all my other coils, covering all bands with the exception of the 31 meter shortwave broadcast band.

In all cases I got the antenna to resonate below the band. To determine initial resonance I used the MFJ antenna analyzer. It was a big help. I unwrapped a few turns of magnet wire, scraped the insulation off, wrapped the magnet wire around the protruding wire, and checked for resonance. In a couple of cases I had to add windings, so I just soldered additional wire to what was on the coil and added a few turns. Final dimensions are given in Table I.

To tack down the windings after final alignment, I used epoxy and wrapped the coils with tape after soldering and trimming the excess protruding wire. I even made a coil for 80 meters using taps for about 3.940, 3.800, and 3.500 MHz.

Note: I used a needle file to file the male locking rings of the BNC connectors. This made it easier and faster to lock the coils to the adapters.

Operation and Test

I have used these coils successfully on 40, 20, and 15 meters. To resonate the antenna I either shorten or lengthen the whip until it is resonant. I use a counterpoise of about 20 feet of wire attached to the radio with alligator clips. I have checked into nets here in Florida both on amateur bands and MARS frequencies with good results. Many times I have also used a Dentron Jr. tuner to make tuning faster and easier, but both approaches work well.

In photo E you can see the combination of PL-259 adapters and BNC adapters that I use to attach the antenna to the radio and/or tuner. Of course, all of these adapters introduce some loss into the system, but if your goal is to get on the air and get a signal out with a minimum of expense, this approach should be considered.

Notes

1. GMØRWU Loading Coil Design Program: <http://ecosse.org/jack/radiocoil.html>.
2. GMØRWU Loading Coil Calculations: <http://ecosse.org/jack/radio/software/loading.html>. ■

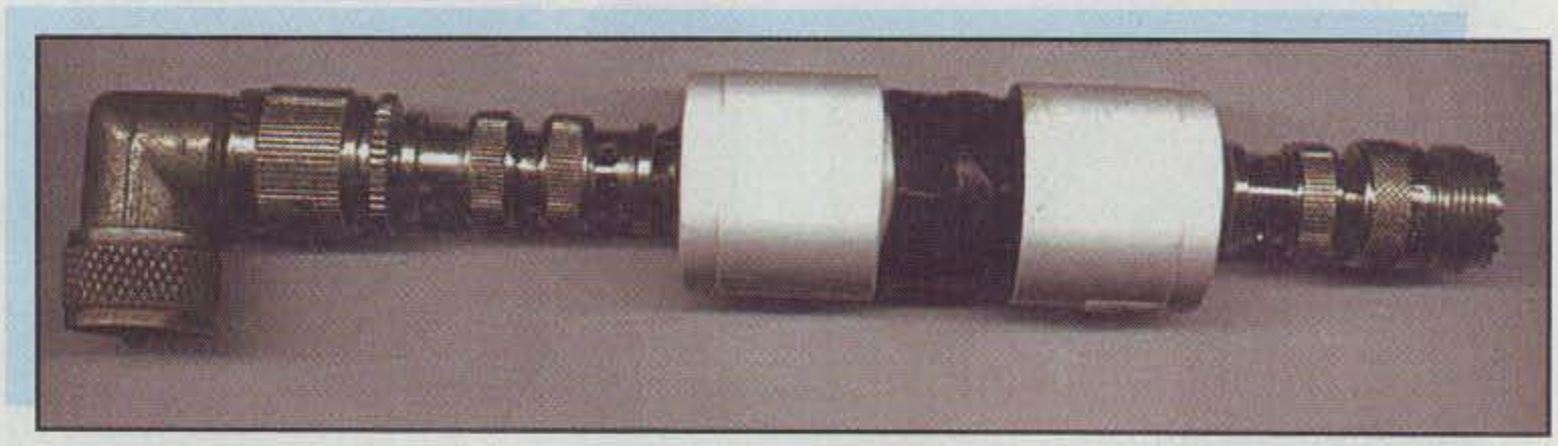


Photo E– The selected band coil goes between a series of adapters and connectors that tie the antenna and radio together. With 1 inch PVC tubing, you might be able to use SO-239 connectors on the coils and eliminate the need for one set of adapters.

hy-gain Rotators

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

Hy-Gain rotators are the first choice of hams around the world!

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, $559.95. *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 $13^{1}/_{2}$Hx8D inches.

T-2X, $649.95. *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 $14^{1}/_{16}$Hx$9^{3}/_{16}$D in.

CD-45II, $389.95. *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 $17^{3}/_{8}$Hx8 D inches.

AR-40, $289.95. *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 $17^{3}/_{8}$Hx8D 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.

HAM IV

$559.95
Suggested Retail

T-2X

$649.95
Suggested Retail

CD-45II

$389.95
Suggested Retail

AR-40

$289.95
Suggested Retail

Free Hy-Gain Catalog
Nearest Dealer/Free Catalog . . . 800-973-6572

hy-gain

Antennas, Rotators & Towers
308 Industrial Park Road, Starkville, MS 39759 USA
Toll-free Customer Sales Hotline: 800-973-6572
• **TECH:** 662-323-9538 • **FAX:** 662-323-6551
http://www.hy-gain.com

Operating away from home has been a major part of the recent explosive growth in the popularity of QRP. But having a place to set up your station in a remote location isn't always easy. AD1B has found a solution in a carrying case that doubles as an operating platform.

A QRP Toolbox

BY THOMAS M. HART,* AD1B

I have two QRP rigs that I use at home, in the car, and in portable operations. Recently, approximately half of my on-the-air time has been from one of these locations with power levels of 5 watts or less. In a clear-cut victory of optimism over common sense, I have even used my QRP station in several 160 meter contests. For some time, an old, portable computer bag has held my rig during my travels. The only major shortcoming of using the bag was the time needed to pack and unpack the gear and connect or disconnect all of the cables. A box of some sort, capable of holding an assembled station, would certainly have saved a lot of time.

Then, while roaming around my local hardware superstore, I saw a plastic toolbox made by Stanley that looked like a good candidate for housing a QRP station. The plastic box is 19 inches wide, 10 inches deep, and 10 inches high, and has a handle for easy transportation. A removable tray, 18.5 by 8.5 inches, sits at the top of the toolbox under the hinged cover and this looked to be a good candidate for modification into a writing surface. In fact, the whole box had to be modified to hold my QRP station (your requirements may vary), but it's a great starting platform (photo A).

My station consists of an MFJ 20-meter QRP rig, antenna tuner, and a gel-cell battery. To hold the rig, the box needed to be seven inches higher, so I had to graft on supplementary side panels. In addition, I needed to add wooden "stops" in the bottom to keep the rig and the battery from sliding around (photo B).

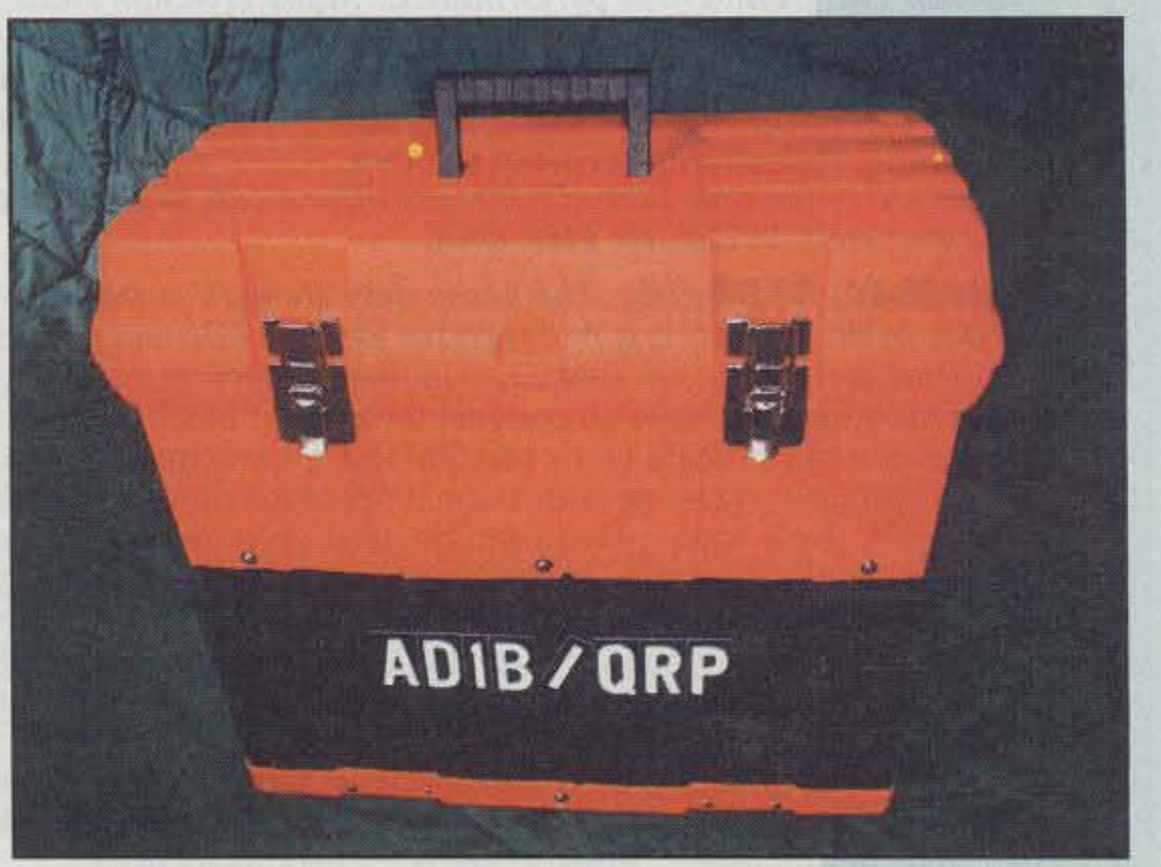


Photo A– AD1B's QRP toolbox. A regular toolbox has been modified to carry the author's complete QRP station and to serve as an operating platform as well.

Modifying the QRP Toolbox

The first step in the project was to remove the toolbox base about one inch above the bottom. In order to get a straight line for a cut, I ran a strip of masking tape around the box and drilled a starter hole for a reciprocating saw. Cutting carefully, the base separated without any problem. Four side panels were cut from some pressed-board stock and mounted with nuts, washers, and bolts. Next I used strips of 1.5 by .75 inch soft pine stock to divide the bottom of the box into compartments for the rig and the battery.

The base of the toolbox needed two sets of wooden chocks to keep the gel cell and rig from rattling around during transportation. The frame that supports the transceiver is notched to allow the rig to sit snugly in place and not rest on the 12 volt power line and coaxial cable attached to the rear panel.

**54 Hermaine Ave., Dedham, MA 02026*
e-mail: <tm.hart@verizon.net>

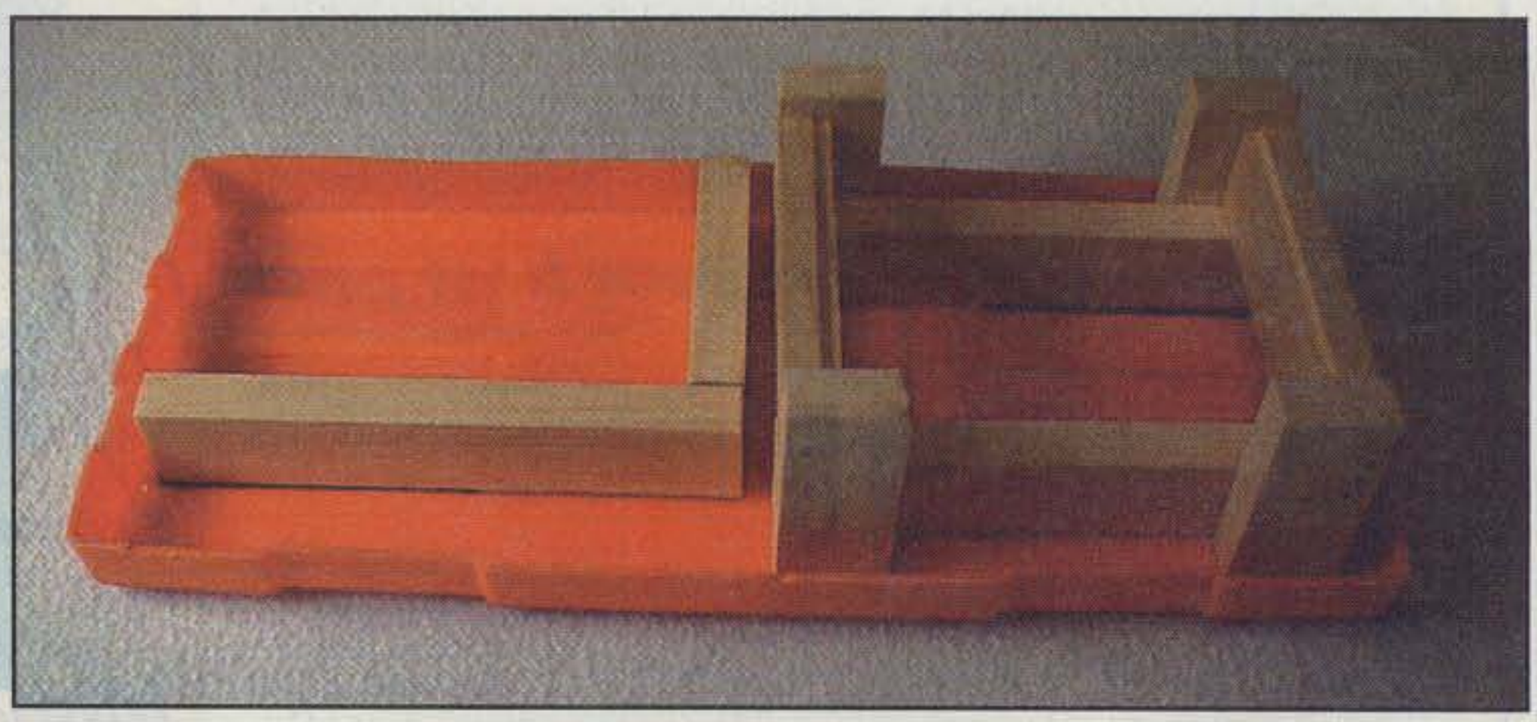


Photo B– Wooden chocks were added to the base of the toolbox to secure (and separate) the rig and the gel-cell battery.

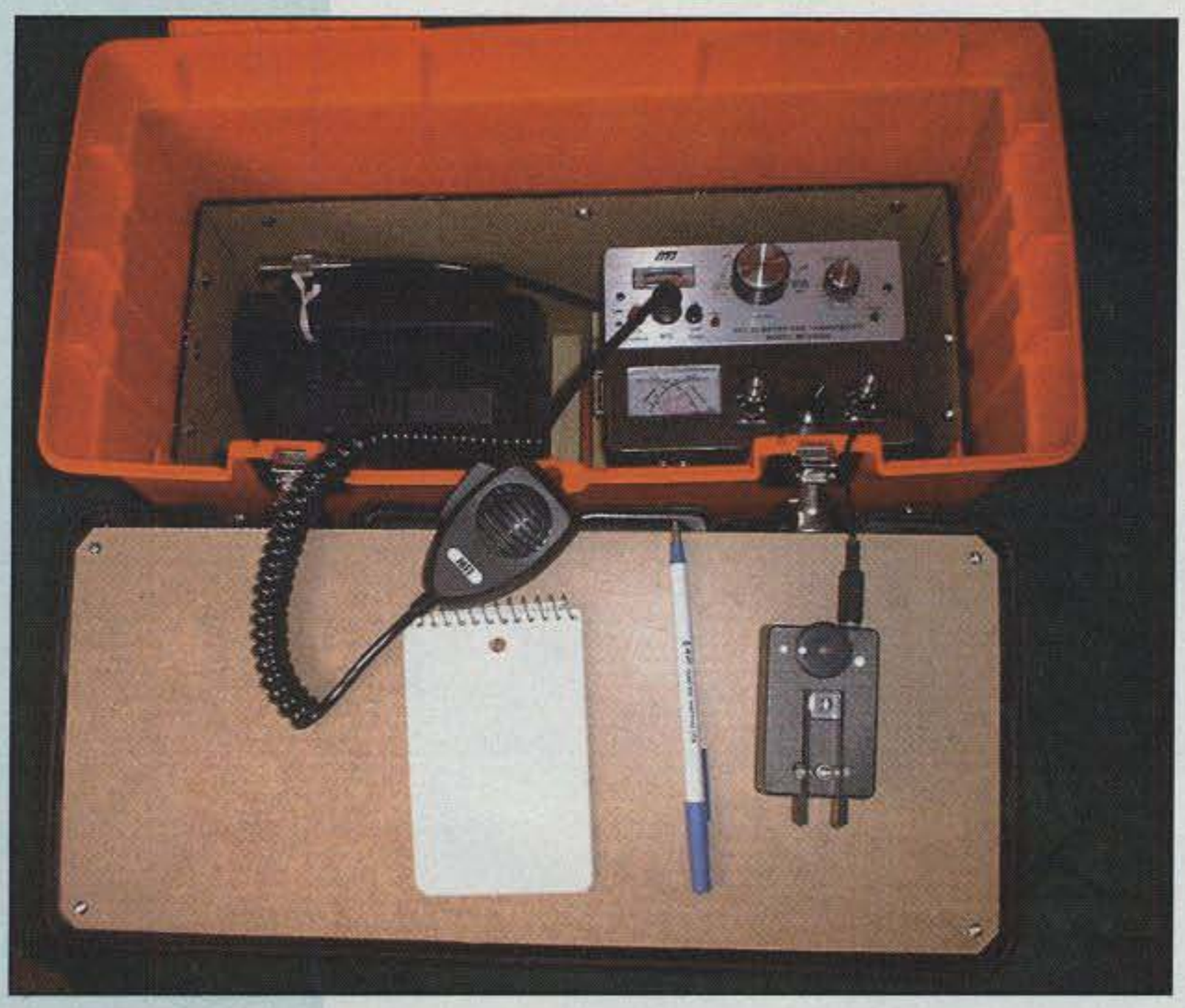


Photo C– The QRP station ready for operation. A pull-out tray, also modified, serves as a shelf for paper, pen, and a keyer.

The wooden guides were glued to the bottom and further secured by wood screws passed through from the outside. Finally, six rubber feet were attached to the bottom, one at each corner and two more midway on the long axis; these prevent the wood screws in the bottom, holding the dividers in place, from scratching the supporting surface.

The fiberboard side panels were cut to fit snugly inside the original box and are large enough to allow sufficient overlap to drill and insert screws, washers, and nuts. All exposed hardware was trimmed to a length that left no exposed ends that might snag anything. The panels were painted black to provide contrast with the orange finish of the original toolbox.

The bottom of the lift-out tray was grafted by means of glue and four machine screws to a 7.5 by 17 inch piece of pressed fiberboard (smooth side up). This makes a reasonable writing surface when turned upside down and offers storage space for pens and other items when right side up. The working surface has more than enough room for a small notebook and keyer (photo C). A bit of foolishness was the addition of my callsign to the outside of the toolbox. The letters, intended to attach to metal mailboxes, are held in place by epoxy.

Good Results

The toolbox modification project has worked very well so far. I can drag the rig to the car and operate at a remote site with no need to assemble or disassemble anything (except perhaps the antenna). All I have to do is open the top, connect the antenna, and I am ready to go on the air. The fully-loaded toolbox weighs in at 14 pounds and balances well when held by the original carrying handle on top.

The QRP toolbox might be a reasonable project for anyone with an interest in portable operation on HF or other bands. It can be sized to specific needs, it certainly saves time, and it provides good organization for the portable station. ■

Reach the HF Summit!

The New MARK-V Field

The world's top DX and Contest operators have lauded the leading-edge performance of the MARK-V FT-1000MP. Now you can experience the Mark-V for yourself in the exciting new MARK-V Field, a 100-Watt all-in one HF transceiver with built-in power supply! With all the great features of the MARK-V: the Integrated Digital Bandwidth Tracking, Variable RF Preselector, Class-A SSB transmission, and bullet-proof front end. . .you'll have all the tools to come out on top in the next pile-up.

The MARK-V Field. From the Yaesu DX Professionals.

HF 100W ALL MODE TRANSCEIVER

MARK-V FT-1000MP *Field* NEW

YAESU
Choice of the World's top DX'ers

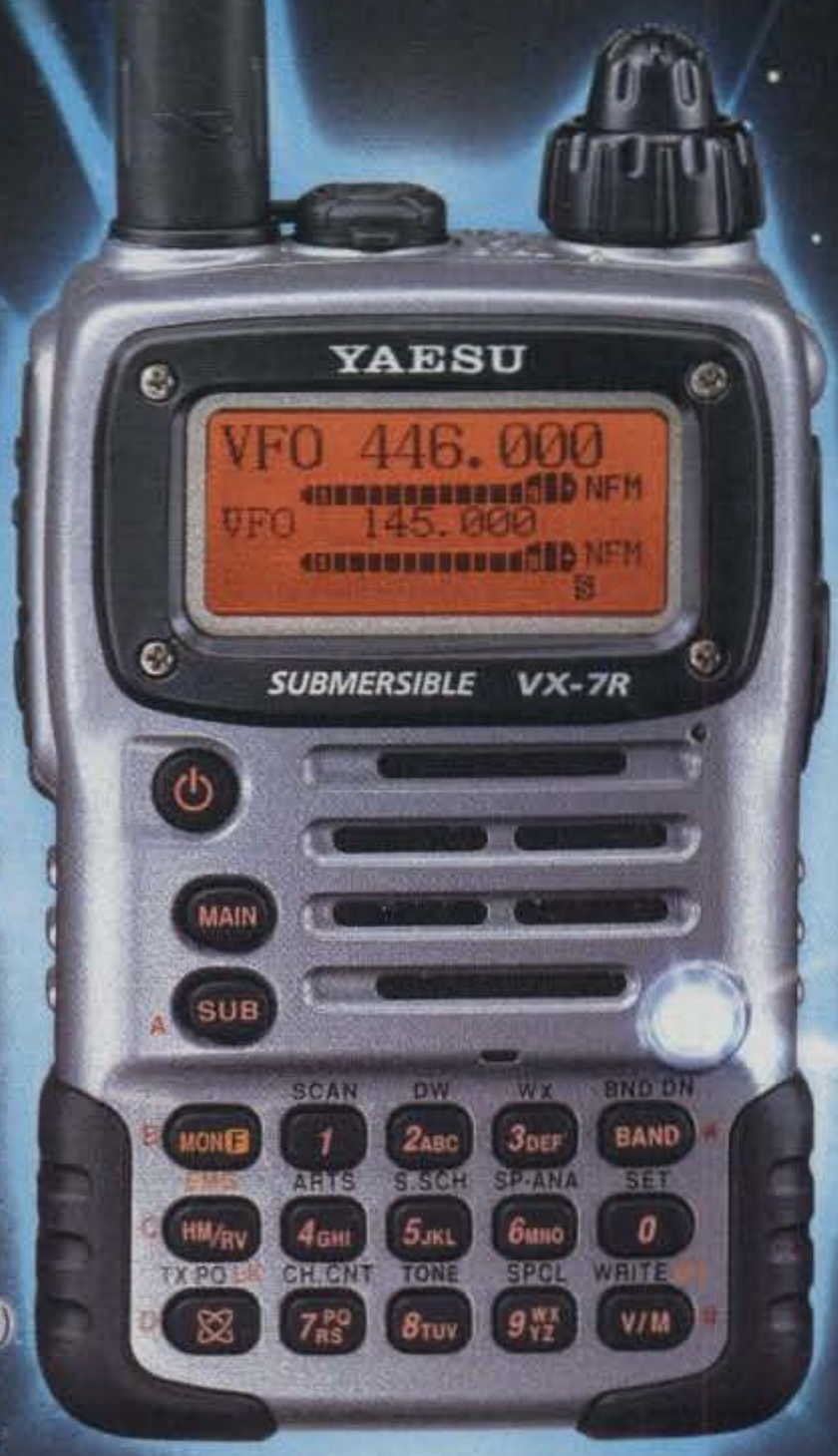
Vertex Standard
US Headquarters
10900 Walker Street
Cypress, CA 90630 (714)827-7600

For the latest Yaesu news, visit us on the Internet:
http://www.vxstdusa.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.

ULTRA-RUGGED, SUBMERSIBLE TRI-BAND MAGNESIUM HANDIE

Own the brightest star in the Ham Radio Galaxy! The exciting new YAESU VX-7R sets new standards in ruggedness, water resistance, and versatility, and its memory capacity is unparalleled. Own the VX-7R, and you'll own the best.



TRUE DUAL RECEIVE (V+V/U+U/V+U/HAM+GEN)

WIDE-RANGE RECEIVER

MAGNESIUM CASE

SUBMERSIBLE (3 feet for 30 minutes)

OVER 500 MEMORY CHANNELS

MIXED TONE (CTCSS/DCS) CAPABILITY

INTERNET KEY FOR ACCESS TO WIRES
Wide-Coverage Internet Repeater Enhancement System

SHORTWAVE BROADCAST MEMORY BANK

WEATHER BROADCAST MEMORY BANK WITH "SEVERE WEATHER" ALERT

MARINE BAND MEMORY BANK

MULTI-COLOR STROBE LED

LOW-POWER 222 MHz TX (U.S. version)

RUBBER CASE PROTECTOR

VX-7R

50/144/430 MHz 5W FM Transceiver

Actual Size

For the latest Yaesu news, visit us on the Internet:
http://www.vxstdusa.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.

YAESU
Choice of the World's top DX'ers™

Vertex Standard
US Headquarters
10900 Walker Street
Cypress, CA 90630 (714)827-7600

One of the "bells and whistles" sometimes missing from QRP transmitters is a CW sidetone monitor. Here's a quick and easy way to "roll your own."

Build a Beep Box

BY DANIEL METZGER,* K8JWR

Sending good, clean code requires that you have a sidetone monitor to hear your weight and spacing, and if you use a bug *(semi-automatic keyer—ed.),* as I do, a monitor is absolutely necessary to count your "dits." However, many QRP projects and popular old "boat anchor" transmitters don't provide the "beeps" to let you monitor your sending.

Photo A– The stand-alone Beep Box with volume and tone controls, built into a 2" × 3" × 4" minibox.

"Enter the Beep Box, a simple monitor that can be connected quickly to any rig and derives all of its power from the RF on the antenna line."

Enter the Beep Box, a simple monitor that can be connected quickly to any rig and derives all of its power from the RF on the antenna line. (In case you're worried about sidetracking any of that precious RF from going out the antenna, the power stolen is on the order of 0.1 watt, quite negligible for all but the most flea-powered QRPp rigs, yet still enough to provide a tone at respectable loudspeaker volume.)

The Beep Box is presented in two versions. The first (fig. 1) is a free-standing box with SO-239 coax connectors that can be inserted in the antenna line of any transmitter. This version has the deluxe options—volume and tone control. The second version (fig. 2) is built into an antenna tuner and, for simplicity, has fixed volume and tone levels.

The circuit is simplicity itself. It consists of a half-wave rectifier and simple capacitor filter supplying DC power to an NE-555 IC oscillator. A 5.6 volt Zener diode keeps the supply voltage constant regardless of the transmitter power and antenna voltage. A three-position toggle switch puts a 470 Ω resistor in the line for low-power (2–10 watts) rigs or a pair of 750 ohm resistors for transmitters with output power up to 50 watts. Power of up to 100 watts can be accommodated simply by placing a third 750 ohm resistor in series,

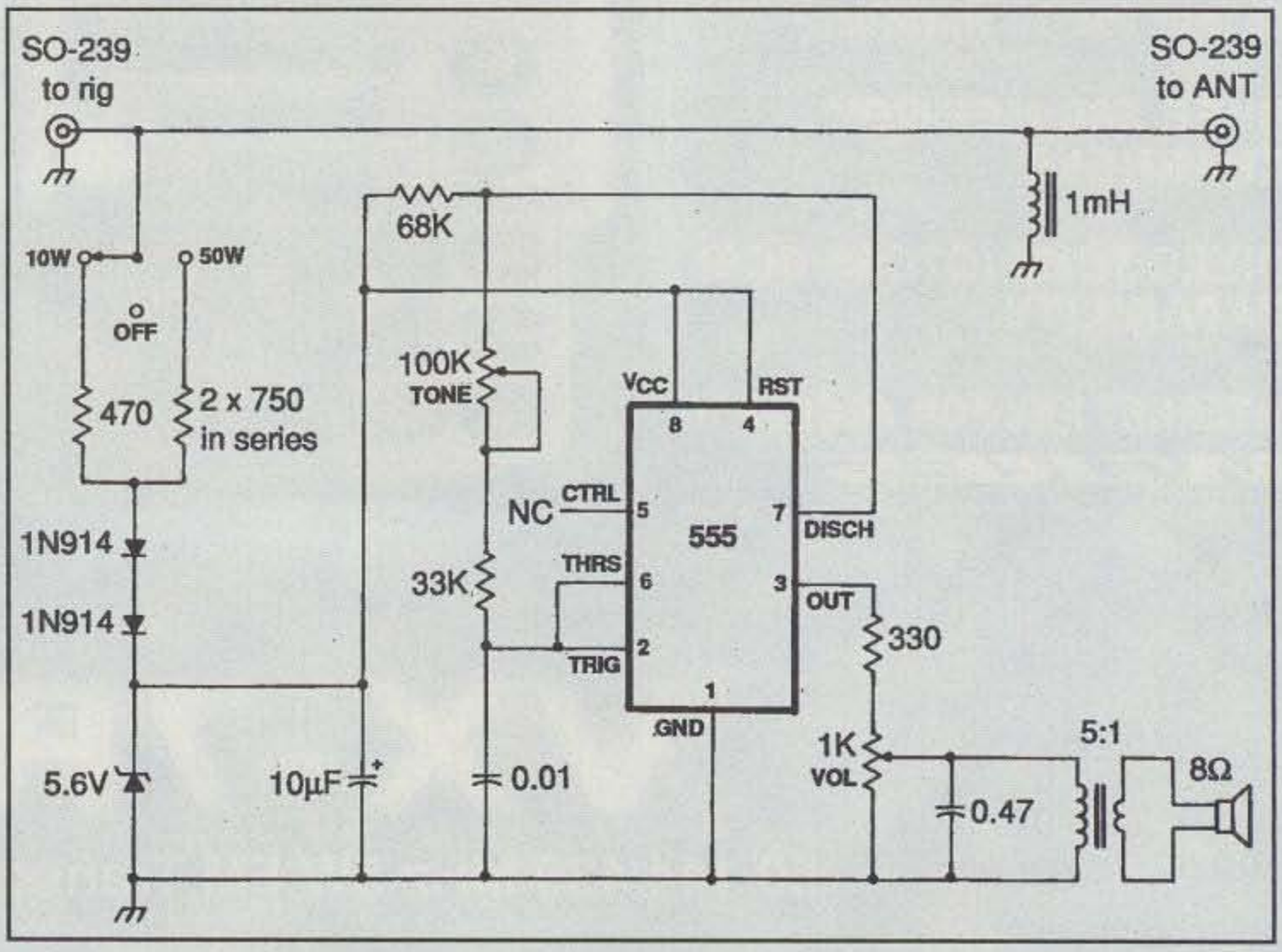


Fig. 1– Schematic of the "deluxe" version of the Beep Box. A standalone model for insertion in the antenna line, it includes controls for volume and tone. See the text for details on the resistors coming off the switch.

**6969 Streamview Dr., Lambertville, MI 48144*
e-mail: <dmetzger@monroe.lib.mi.us>

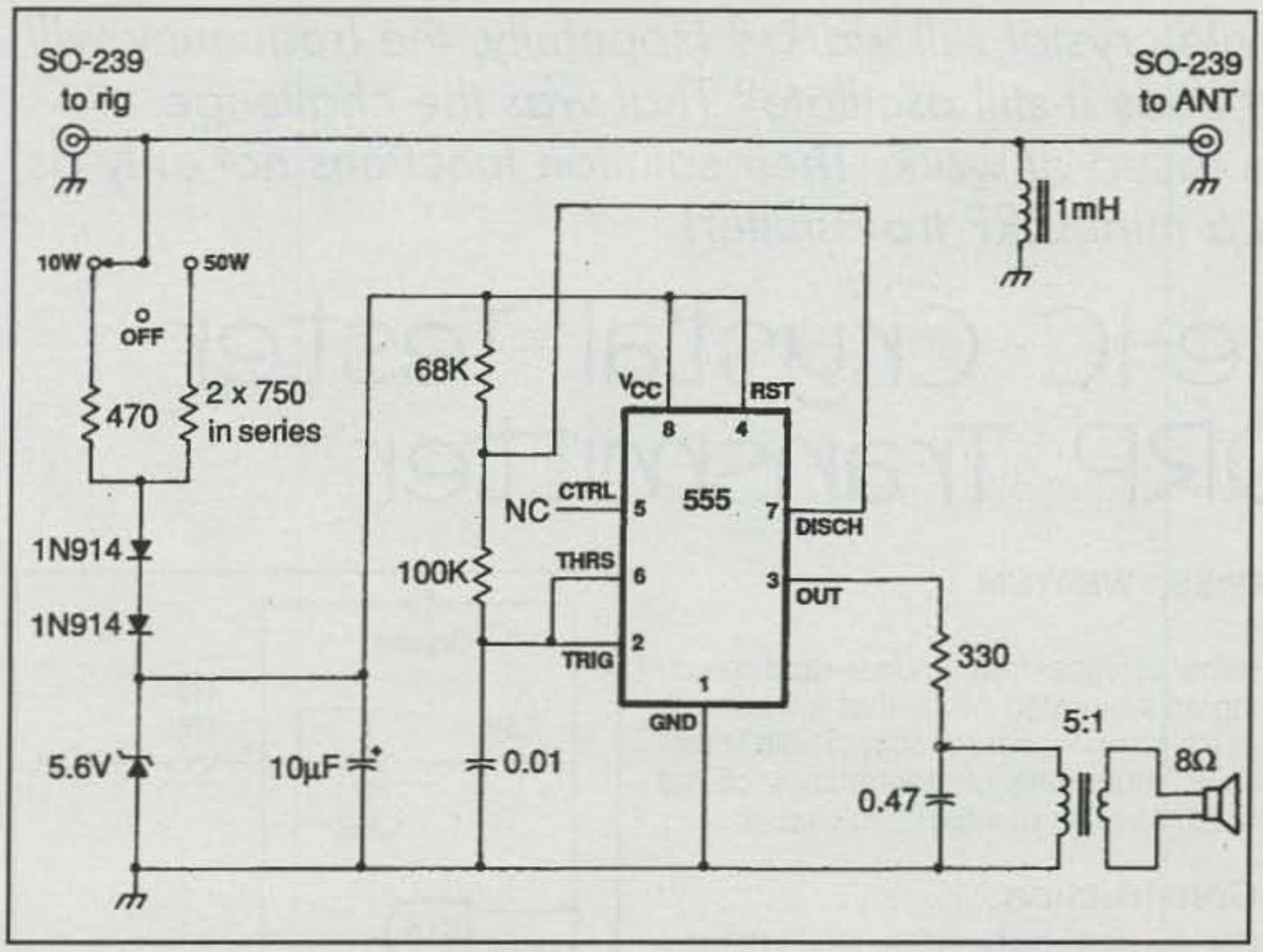


Fig. 2– Schematic of the "bare-bones" version of the Beep Box. This one is designed to be built into an antenna tuner and has fixed volume and tone levels.

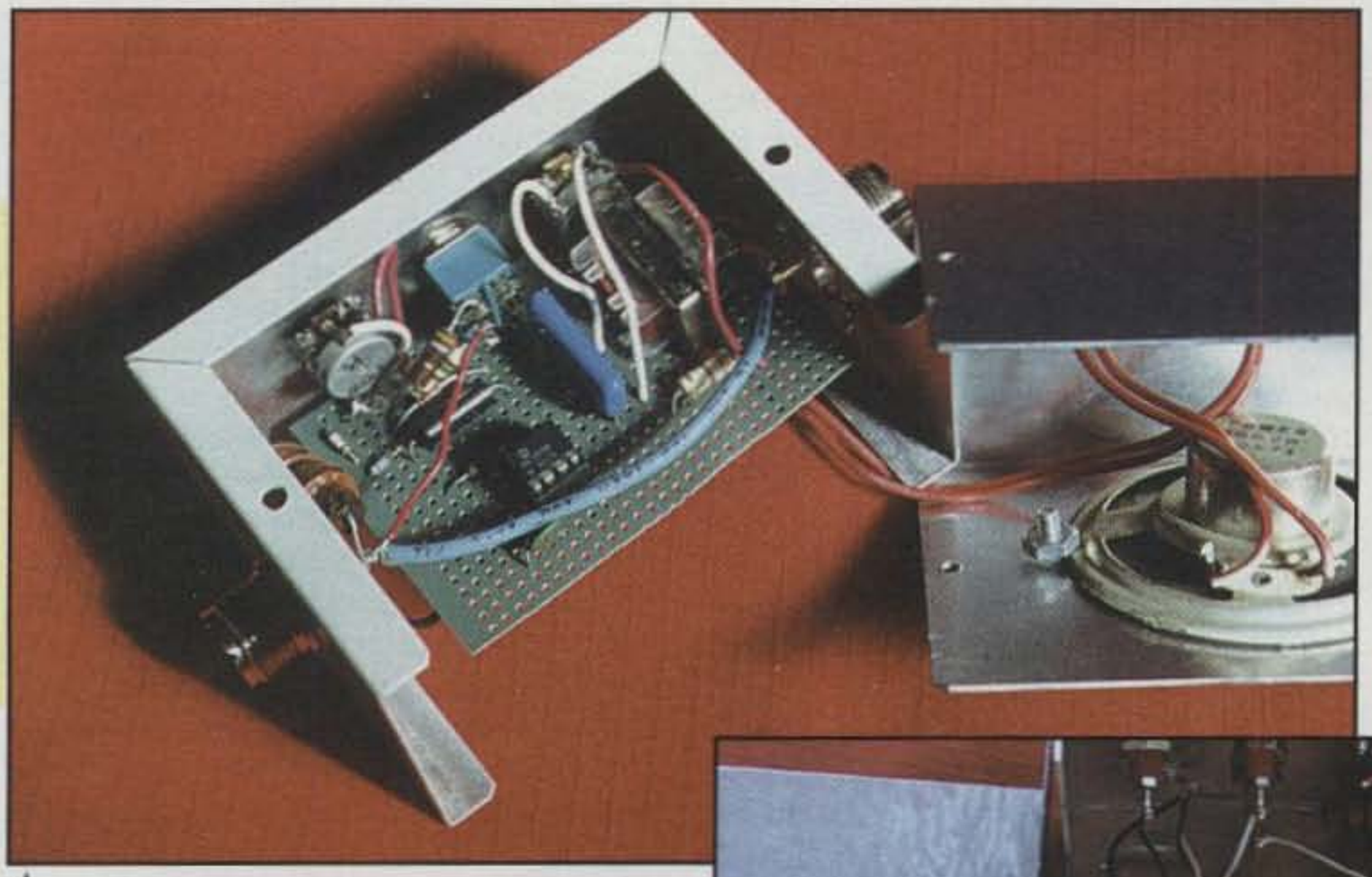


Photo B– The circuit is wired point-to-point on a piece of perfboard. Miniature pots, switch, and audio transformer are used.

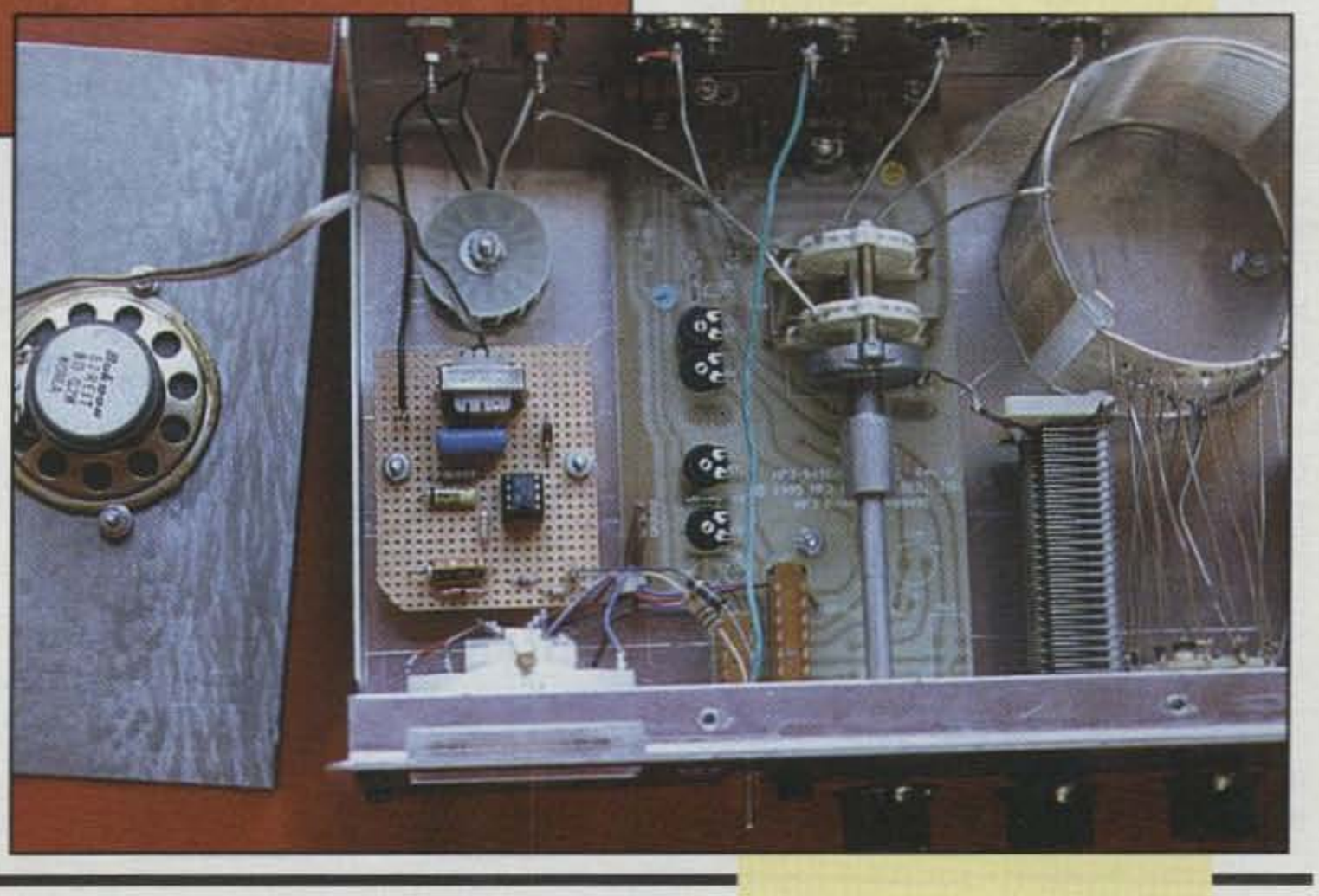


Photo C– The sidetone circuitry fits on a perfboard in an empty space inside this tuner cabinet (an MFJ Versa Tuner II). It connects to the antenna line from the rig and drives a 2 inch speaker. →

but I don't have any 100 watt transmitters, so I left that out of my units. The third (center-off) switch position turns off the beep tone.

The 1 mH RF choke across the antenna line provides a DC return for the power-supply circuit in the event that your transmitter doesn't already provide one. For link-coupled outputs, and rigs that already have an RF choke across the pi-network output, the 1 mH choke can be eliminated. The 0.47 µF capacitor across the speaker transformer smoothes the square-wave output of the oscillator, if not to a pure sine wave, then at least to a mellow-sounding tone.

None of the components is critical, and many substitutions are possible. The diodes must be fast-switching silicon signal types; power diodes such as the 1N4004 will not do. If you don't have a 5.6 volt Zener diode in your junk box, the base-emitter junction of most silicon transistors has a Zener knee at about 6 volts, so use one of those; the base is the anode (arrow end) for an NPN type. The 100 k-ohm and 68 k-ohm resistors, along with the 0.01 µF capacitor, control the tone.

The 10 µF filter capacitor determines the shape factor of the "dits" and may have to be reduced a bit to avoid smearing the dits together if you're a 40 wpm CW expert. The speaker and the transformer can be anything that presents a load of 200 ohms or more. Old pocket transistor radios provide an excellent source for the speaker and transformer.

That's all there is to it. Happy beeping!

How do you find out if an old crystal still works? Hopefully, the frequency will be printed on the case, but does it still oscillate? That was the challenge WB9YBM and a colleague faced at work. Their solution functions not only as a crystal tester, but also as a mini QRP transmitter!

The Single-IC Crystal Tester and QRP Transmitter

BY KLAUS SPIES,* WB9YBM

This project came about when I found a box of old crystals at work, and no one knew if they were still usable. The boss wasn't willing to spend money for test equipment for checking parts we may never use, so a boot-strap solution was needed. With help of the other technician in my department, we developed the single-IC circuit shown in fig. 1. *Bonus:* It also works as a QRPp (very low power) transmitter.

Any IC that provides an invert function (NOR, NAND, or INVERTER) may be used; I ended up using NAND gates, because they were most readily available in the parts bins at work. The potentiometer, R2, controls the feedback loop for the IC. It has to be adjusted to begin oscillation, without going so far as to cause the output amplitude to distort. I used an oscilloscope to monitor the output waveform.

Choosing Components

Component choices are not critical, especially if you'll be using this circuit only for testing crystals, and particularly if the crystals you'll be testing are fairly low in frequency. At higher frequencies, things such as lead lengths become a consideration, and construction techniques for higher frequency should be observed. If you'll be using this as a building block for a QRP transmitter—or are even adventurous enough to use this directly as a QRPp transmitter—installing everything in a shielded box with only power-supply input leads (well bypassed!) and something like a BNC connector for the output exposed will keep stray signals from being superimposed on the circuit's output. Again, for higher frequency operation, things such as short lead lengths and proper construction techniques become important. The only parts that become critical are the potentiometer—smaller is better at higher frequencies—and selecting an integrated circuit that will operate at a high enough frequency. Table I compares operating characteristics of the major families of integrated circuits.

**815 Woodland Heights Blvd., Streamwood, IL 60107*
e-mail: <wb9ybm@juno.com>

Construction

For use as a crystal tester, I found it helpful to scrounge through junk boxes for a few different sockets, which I wired in parallel. This allowed me to test a wide variety of crystals quickly, without breaking stride. If you're planning to use this circuit for a QRP transmitter, I would also recommend a crystal socket, to allow for easy QSY; in case one frequency is busy, it pays to have a second available! If you're going to use this circuit as a frequency standard, a crystal oven may be considered. However, especially if you're using this circuit indoors where the temperature is fairly well regulated, that would be over-kill. Crystals are being manufactured using methods that give them reasonably good stability. The only thing left to do is to tie the inputs of unused gates either to +V or ground: don't leave them floating!

A few additional notes: If you haven't worked with gate ICs before, you'll notice two items in the schematic that may not seem to make sense. First, there are two inputs from the same line, and the voltage source is not shown. Every AND, NAND, OR, and NOR gate has two inputs. For an AND gate to have an output, one input AND the second input must be a logic high for there to be a logic high on the output (the opposite is true for a NAND gate; it's an AND gate with an inverted output). For an OR gate, either one input *or* the other has to be a logic high for a high output. There typically are four logic gates per integrated circuit package; you can pick any one of the gates you want, as they'll all operate

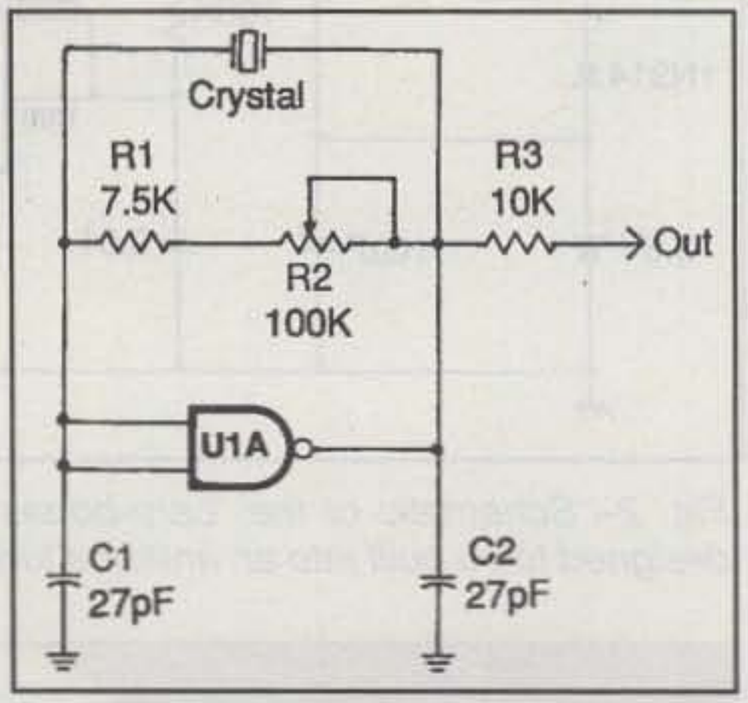


Fig. 1– Schematic of the single-IC crystal tester and QRP transmitter.

Comparative Speed of ICs

IC Type	Designation	+V (max.)	Max. Speed (typical)
CMOS	14xxxx, or 4xxxx	18V	5 MHz, with exceptions
TTL	xxFxxxx xxLSxxxx xxALSxxxx	5V	125 MHz 30 MHz 35MHz
High-speed CMOS	xxHCxxxx	6V	40 MHz
National Semiconductor CMOS	74Cxxxx	15V	5 MHz, with exceptions

Table I– This list compares maximum operating frequencies for the different families of logic chips, along with their operating voltages and keys to look for in part numbers.

the same. Inputs of unused gates should be tied to ground (or if you want to, you can use one IC to build four oscillators).

The power source and connection point is a function of the IC selected, which is why I didn't show it in the schematic. For ICs with a maximum input voltage range of 13 volts and above, you can use a standard 13.8 volt power supply for running a mobile ham rig inside your shack. Five volt ICs can be powered from a 5 volt regulator (Any generic one available over the counter at any parts dealer such as RadioShack is fine; in some stores the back of the packages even tell the users how to wire them up). As for the ICs themselves, pin 14 is typically +V and pin 7 is ground; as a double-check, look for the pin-outs for the part you choose on the back of the package or in any convenient reference book. If you can't find the info for your IC, drop me an e-mail and I'll be glad to look it up for you.

Use as a Transmitter

Obviously, this is not a high-power transmitter circuit! It's really nothing more than a crystal oscillator, but it will work either as an oscillator circuit within a transmitter or all by itself as a QRPp transmitter. Since crystals oscillate at harmonic frequencies as well as their fundamental frequencies, *CQ* Editor Rich Moseson asked how those harmonics would be filtered out if this circuit were used as a standalone transmitter. It really isn't necessary. This circuit, if used by itself, has such low output that I doubt any harmonics would be strong enough to cause problems. Plus, since an antenna is a type of tuned circuit as well, that would further limit any transmitted harmonics, especially if a gain antenna is used. Unlike a quarter-wavelength antenna which becomes a half wave at double the frequency—potentially having enough gain over a quarter-wavelength antenna to make the first harmonic stronger than the primary signal (assuming the first harmonic was as strong as the primary to begin with), an antenna such as a 5/8-wavelength would have such complex patterns across it at harmonic frequencies that a certain percentage would cancel out each other by the sheer nature of the antenna.

Have Fun!

I hope this circuit will be useful to you, either for testing those old junk-box crystals or for inspiring you to put some of them back on the air. Also, if you've never tried QRPp before, this inexpensive and easy-to-build introduction might surprise you as you learn that QRO isn't always the only way to go! ■

If you have more than one or two pieces of equipment in your shack, you're probably using one or more power strips. But most ham rigs today run on 12 volts DC. What about a power strip for them? Or for multi-rig contest or emergency operations away from AC power? West Mountain Radio has solved the problem.

CQ Reviews:

West Mountain Radio RIGrunner

BY GORDON WEST,* WB6NOA

In an emergency, a common power connector is essential for rapid rig deployment or exchanges. The common DC power connection needs to be a national priority. Any emergency team switching personal equipment in and out of a mobile unit or evacuation shelter will heartily agree that a common DC power connector is a *must*. Many municipalities, counties, state agencies, and ARES/RACES groups are recommending the Anderson PowerPole as a common DC connector (see sidebar).

With so many groups settling on the Anderson PowerPole, Del Schier, K1UHF, product designer at West Mountain Radio, saw an opportunity to offer not only Anderson PowerPole connectors and tools, but also an intelligent DC power panel called "RIGrunner." The West Mountain Radio DC panel offers up to 12 Anderson PowerPole outlets for 40 amps total run of amateur radio equipment and accessories. Each outlet has its own ATC/ATO automotive-style fuse with light-emitting diode (LED) open-fuse indicators. These fuses are color coded in values from 1 to 40 amps and generally are available at your local supermarket, drugstore, or auto-parts store.

There's more, though. Remember, we said the RigRunner is "intelligent." Built into the panel are green, yellow, and red LEDs along with an audio alert of safe-, over-, or under-voltage conditions. The LEDs are driven by a 1% precision comparator set to carefully chosen voltage points (11.5 and 15.0 volts). This makes it much more obvious if your radio is happy than trying to read a little low-resolution meter needle.

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

The West Mountain Radio RIGrunner provides quick connect and disconnect capabilities for up to 12 pieces of 12 volt DC equipment, along with warnings of under- or over-voltage conditions.

The best part of the panel, however, is instant selection of different current-capability circuits, plus instant plug-in capabilities to minimize the very common short-circuit problem with binding posts. The RIGrunner is available with optional ready-made PowerPole supply, extension, and adapter cables in many flavors, plus other goodies.

"The RIGrunner offers safe, secure, hot-connected, polarized, color-keyed unisex connections that are the standard of ARES, RACES, and RSGB," comments West Mountain Radio. The power distribution panel may be ordered with 24 connector terminals (12 red, 12 black) and an available (low-cost) crimp-on staking tool from Gardner Bender. (As noted in the sidebar, Anderson recommends crimping over soldering for connecting wires to the connectors.)

Added Benefit

Besides the obvious easy-connection point for emergency communicators, we found out an additional benefit of RIGrunner. Our communications vehicle has two batteries, one in front to start the engine and the other in the back to run the radios. The rear battery comes on line to charge when the vehicle is running. However, when we started the vehicle, we heard the warning beep

The Anderson PowerPole Connector

Many emergency response groups around the country are selecting the Anderson PowerPole DC connector as a standard for radio power connections.

The connectors' highly conductive silver-plated copper contacts allow minimal contact resistance and high-current capabilities. Self-wiping action on make and break keeps conducting surfaces clean. Contact dents keep connectors mated in high-vibration applications, and provide quick-break, snap action for disconnect.

The non-corrosive, stainless-steel leaf springs maintain constant contact pressure—ideal for frequent connections/disconnections, and intermittent overloading. The durable, high-impact resistant, polycarbonate housing with UL94V2 flammability ratings comes in many colors, but red and black are chosen for 12 volt DC traceability and coding.

Housing should be mated with red on the left, black on the right, as viewed from *the contact side*. Tongue should be down, and the little 3/32 inch diameter roll pin 1/4 inch long is to keep the housing from sliding apart.

The 15 ampere contacts are designed for 16-20AWG wire, and the 30 ampere contacts are designed for 12-16AWG wire. The contacts may be soldered or crimped, but crimping with the proper tool is advised over soldering. Many times soldering will leave a small amount of solder on the *outside* of the blade connector, causing the connector never to seat properly in the PowerPole connection. The 15 ampere PowerPole housing is what most emergency communicators use and should be appropriate for most amateur radio applications.

from the West Mountain Radio RIGrunner, indicating a quick voltage drop. This prompted us to check out the voltage-isolator device, and sure enough, it somehow was shorted out, putting both batteries in parallel all of the time. While this is not necessarily a major problem, it did give us a clue when one of the communicators left a power inverter on under a big load, and it significantly pulled down *both* the front and back batteries. The front battery was supposed to be isolated, and the RIGrunner showed us that it wasn't!

For more details on West Mountain Radio products, including the RIGrunner, check out the website: <http://www.westmountainradio.com>, or contact the company at 18 Sheehan Ave., Norwalk, CT 06854 (phone 203-853-8080). Suggested retail price is $99.55 for 12 outlets (Model 4012), and $79.95 for 8 outlets (Model 4008). There is also a 5-outlet version without the LED and audio alerts (Model 4005) for $49.95. ■

If you think electricity is found only in wires and wall sockets, think again. W6BNB walks us through this most basic, but often poorly understood aspect of our hobby and our lives. Here in part one we'll explore what actually goes on inside an atom when it gets energized, and how energy is transmitted from one atom to the next.

Electricity is Everywhere
Part I

BY BOB SHRADER,* W6BNB

Many of us tend to think of electricity as being involved mostly in power lines that operate household, industrial, and radio equipment. Electricity is basically a movement of tiny **electrons** in a circuit, but it is also the *loss* of electrons from atoms and all of the effects produced when the electrons move. Thus, it is just about everywhere.

The invention of the vacuum tube made it clear that those tiny, negatively charged electron particles, when boiled off a hot cathode, were attracted to a positively charged plate of metal. From the plate they moved on through the battery, or whatever charged the plate positive, continuing through the circuit, winding up back at the hot cathode. Charging the plate negative produced no such electron flow. This established the fact that electric **current** (moving electrons) flowed from a negative to a positive charge. Prior to discovering this, it had been assumed that electrical current, whatever it was considered to be in the early days, flowed from a positive (greater?) to a negative (lower?) potential.

Without getting in too deep, what are electrons and those minuscule **atoms** of which they are a part? Trying to find reasonably accurate answers leads to some unexpected, unusual, and interesting facts, even including how future space ships may travel to another star!

In early Greek times **matter** was believed to consist of only earth, water, air, and fire—simple enough. Then the Greeks decided that everything was actually made up of tiny particles they called ***atomos***, meaning little "indivisible" things (and how wrong *that* is), the basis of our modern word *atom*.

Schools teach us that everything is made up of infinitesimally small atoms. Under certain conditions they may cluster together to form somewhat larger multi-atom **molecules**, made up of two or more similar or dissimilar atoms. For example, two nitrogen gas atoms can combine as a nitrogen molecule. Two or more dissimilar atoms, such as two hydrogen (H) and one oxygen (O), may link together to form a molecule of H_2O, or water.

As we enter the 21st century, ideas about matter have progressed a long way from the Greek thinking. Since before the turn of the 20th century it has been believed that all tiny atoms have one or more extremely small **negatively** charged *electron* particles whirling in orbit around a tiny **positively** charged body known as a **nucleus**. Therefore, now there are two different kinds of particles in the Greeks' so-called indivisible atoms—negative electrons orbiting a positive nucleus.

One physical law says **unlike charges attract** one another. It might be assumed that the high velocity of the negative electrons prevents them from falling into the attractive force of the positive nucleus. That may not be the whole story, but electrons orbiting a nucleus are somewhat like the various planets orbiting the sun at different distances or levels. The high velocity of the planets is the only thing that prevents them from being pulled down to the sun by the force of **gravity**. Electrons actually may be mass-wave entities, which prevents them from spiraling down into the positive nucleus.

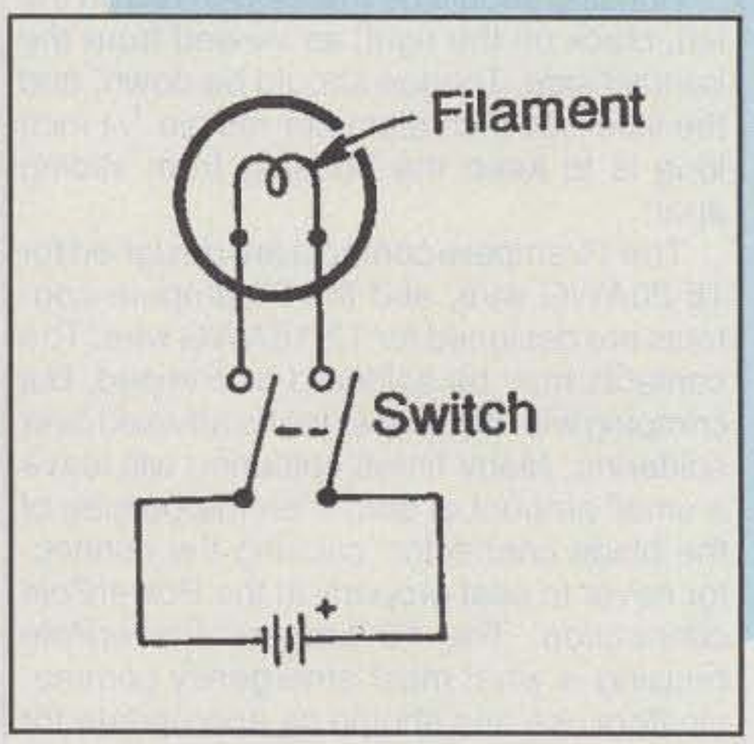


Fig. 1– A very basic electric circuit consisting of a lamp, switch, and battery.

In the nucleus of an atom, the positively charged particle that holds the negative electrons in orbit around it is the **proton** which is just as positive (+1) as an electron is negative (–1). If an oxygen atom has eight protons in its nucleus, it must have eight electrons in orbit around it to maintain its normal overall zero (neutral) **electric**, or more specifically, **electrostatic** charge.

Just as unlike charges attract one another, it is also true that **like charges repel**. Thus, protons will repel other protons, and electrons will repel other electrons. Actually, two protons cannot be forced together, nor can two electrons.

Any solid, liquid, or gas is considered to be matter. However, physicists now tell us that matter consists of only **electrons**, **up quarks, down quarks,** and **neutrinos**. Again, only four things. As simple a statement as that of the old Greeks? It is really not as simple as it may sound. What it means takes more than a little explaining.

*e-mail: <w6bnb@aol.com>

First, as things get colder they become less active. It seems reasonable that similar types of atoms or molecules, if cold enough, might stop having their outer electrons push against one another and might freeze together to become a **solid**, just as water molecules do. If heated, meaning outside **heat energy** is applied to them, the electrons of the molecules of water become more active and push away from one another to some degree, forming an unfrozen, movable mass called a **liquid**. If heated still more, the increased heat energy forces the molecules to repel one another so much that they push each other far apart, producing invisible single particles, or a **gas**, which we call steam. If cooled somewhat in the air, some steam molecules may cling together to form tiny water droplets that become visible as a white cloud. When a source of energy, such as the heat energy in hot water, is applied to dirt in clothing, the heat drives the dirt's now heated molecules farther apart and the dirt loosens more readily. This is also why hot water cleans dishes better. It will be seen that heat energy is the result of electrons in motion producing photons.

Most matter behaves pretty much the same as water, except that atoms or molecules of different materials have different freezing, melting, and boiling temperatures. Then there are some odd-balls—such as iron, glass, and aluminum—which have a **superplastic** state. At some temperature between their solid and liquid states they can be squeezed into desired shapes that are maintained when they cool to normal air temperatures. There are also a few things, such as carbon dioxide, that skip the liquid state entirely and go directly from a solid to a gas.

Besides having positive protons, the nuclei of all but the simplest atom, called hydrogen, contain a number of particles called **neutrons**. The name indicates they have a neutral, or zero, electrostatic charge. A neutron particle is slightly heavier than a proton—1834 versus 1832 times the mass, or weight, of an electron. Now we have at least three particles in the Greeks' indivisible atoms. Although atoms are too small to be visible under any common microscopes, some very large molecules may appear as fuzzy objects with some special microscopes.

When atoms are discussed, it is in a field called **quantum mechanics** or **quantum physics**, meaning that the discussion is about little things that have mass, or have forces, or are waves that carry energy. One of the off-shoots of

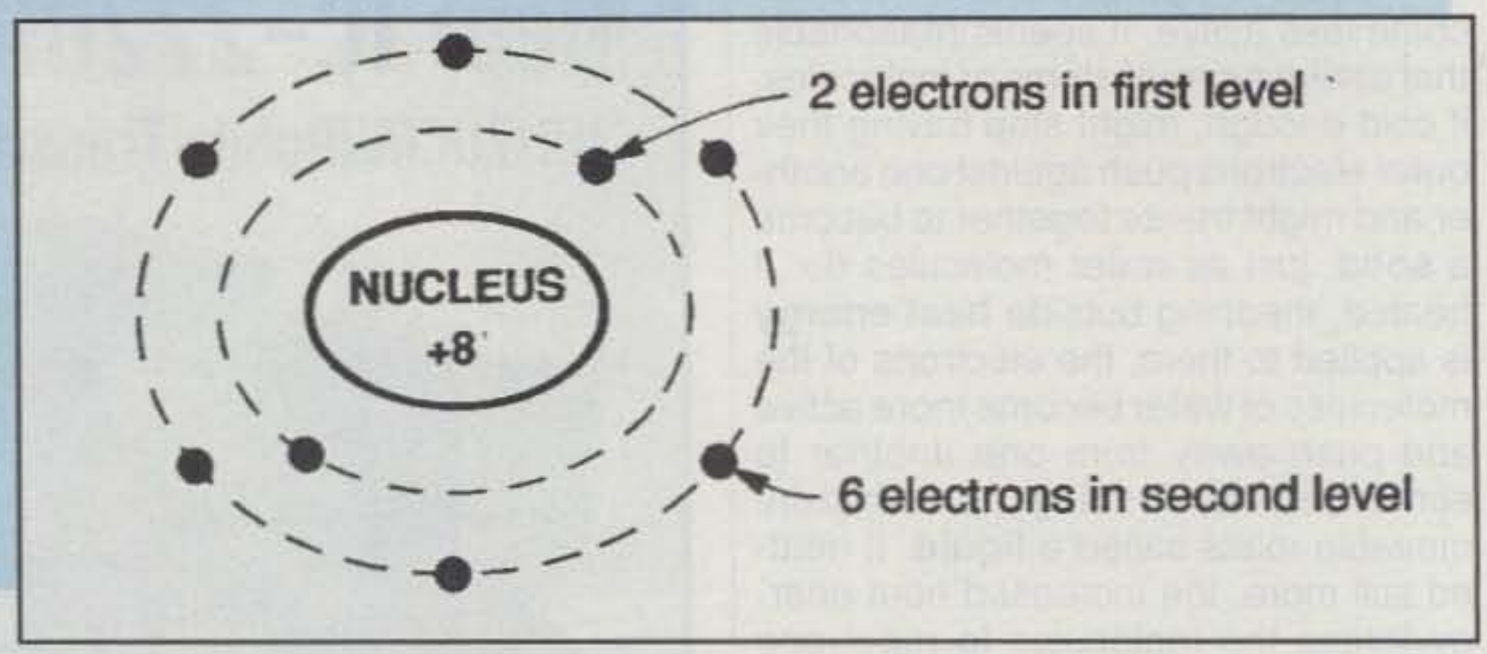


Fig. 2– Electrons orbit in two levels around an oxygen nucleus. The innermost orbit of any atom may hold only two electrons, with up to eight in the next level.

this is the electron theory of electricity.

Consider what happens when a double-pole-single-throw switch is closed to connect the two terminals of an electric lamp across the two terminals of a battery (fig. 1). At the instant the switch is closed, the piled-up electrons that had formed at the negative terminal of the battery by its internal chemical action repel the outer orbital electrons of the billions of nearby atoms or molecules in the metal wire connected to the lamp's filament wire. At that same instant, at the other end of the filament circuit, at the positive terminal of the battery, where chemical action had built up a lack of electrons, a similar number of outer orbital electrons are attracted from the wire molecules at that end of the circuit. As a result, electrons all along the connecting wires and filament wire are being both pushed, electrons against electrons, and pulled from one atom to the next by the attraction of electrons to atoms which have lost electrons (have electron **holes** in them). Any talk of a fictional "hole current" would have it moving in a direction opposite to electron current, but it could not move through a vacuum as electrons can. Electrons flow not only through the filament and its connecting wires, but also through the battery which is providing the electron driving force by its chemical reactions which are now being called into action.

Any flow of electrons, atom to atom, from the negative battery terminal to the positive and through any **load** (a generic term for the lamp in this case) is an electron current and is measured in **amperes**. What is an ampere? Well, if 6,280,000,000,000,000,000 electrons (6.28×10^{18} in mathematical powers-of-10) pass a point in a circuit in one second, the electric current flow is one ampere. (Can a little ammeter really count that many electrons?)

If enough current is flowing through a tungsten-wire filament, it will heat and glow. The negative-to-positive electron-moving force developed by the chemicals in the battery when they are at work is called an **electromotive force**, or electron-moving force, abbreviated **emf**. This force is measured in **volts**. If the emf of the battery is increased (by adding more cells in "series," negative to positive, for example), it will increase the current flow through the filament, causing the lamp to glow more brightly. If the battery voltage is made too high, excessive current will melt the metal filament wire and it will burn apart.

Any hot filament wire is continually boiling off outer-orbiting electrons from its molecules, leaving the hot filament wire positively charged. The positive charge attracts the boiled-off negative electrons back to the filament. A few filament-wire surface molecules may also be boiled off. Not having any electrical charge, they are not attracted back to the positively charged filament. Because of the loss of these filament molecules, filament wires eventually wear thin and burn apart. These boiled-off molecules deposit themselves against the inside of the glass of any long-used lamp bulb and darken it to some degree.

Electrons moving through a load from the negative toward the positive battery terminals are considered to be traveling at the speed of light, approximately 186,000 miles/sec, or 300,000,000 meters/sec. This is believed to be the highest speed at which anything can travel. Actually, any single electron in the wire may only travel a few inches in a second. It is the electrical impulse of one electron being pushed by other electrons behind it and being pulled by holes in front of it that is traveling at essentially the speed of light.

By the mid-20th century it was found

10 Bands -- 1 MFJ Antenna!

Full size performance . . . No ground or radials

Operate 10 bands: 75/80, 40, 30, 20, 17, 15, 12, 10, 6 and 2 Meters with one antenna Separate full size radiators . . . End loading . . . Elevated top feed . . . Low Radiation Angle . . . Very wide bandwidth . . . Highest performance no ground vertical ever . . .

Operate 10 bands -- 75/80, 40, 30, 20, 17, 15, 12, 10, 6 and 2 Meters with this MFJ-1798 vertical antenna and get *full size performance* with no ground or radials!

Full size performance gives high efficiency for more power radiated. Results? Stronger signals and more Q-5 QSOs.

Full size performance also gives you exceptionally wide bandwidths so you can use more of your hard earned frequencies.

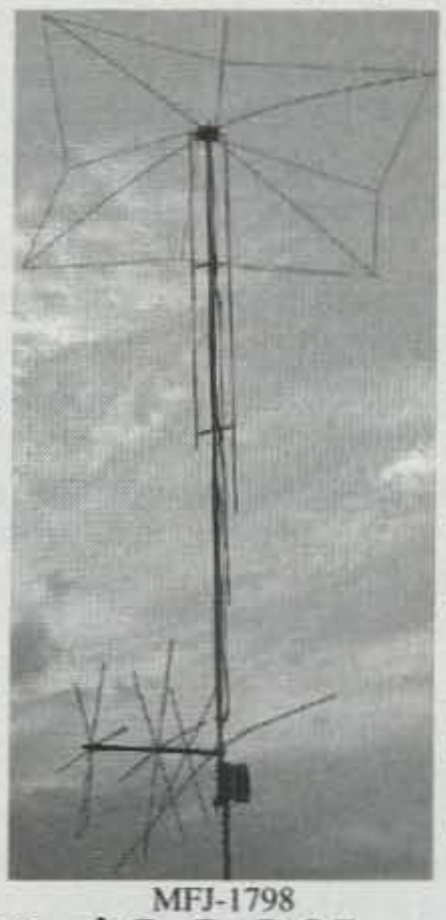
Full size performance is achieved using separate full size radiators for 2-20 Meters and highly efficient end loading for 30, 40, 75/80 Meters.

Get very low radiation angle for exciting DX, automatic bandswitching, omni-directional coverage, low SWR. Handles 1500 Watts PEP SSB.

MFJ's unique *Elevated Top Feed*™ elevates the feedpoint *all the way to the top* of the antenna. It puts the maximum radiation point high up in the clear where it does the most good -- your signal gets out even if you're ground mounted.

It's easy to tune because adjusting one band has minimum effect on the resonant frequencies of other bands.

Self-supporting and just 20 feet tall, the MFJ-1798 mounts easily from ground level to tower top -- small lots, backyards, apartments, condos, roofs, tower mounts.



MFJ-1798
$289.95
Ship Code F

Separate Full Size Radiators

Separate *full size* quarter wave radiators are used on 20, 17, 15, 12, 10 and 2 Meters. On 6 Meters, the 17 Meter radiator becomes a 3/4 wave radiator.

The active radiator works as a stub to decouple everything beyond it. *In phase* antenna current flows in all parallel radiators.

This forms a very large equivalent radiator and gives you incredible bandwidths.

Radiator stubs provide automatic bandswitching -- absolutely *no loss* due to loading coils or traps.

End Loading

On 30, 40, 75/80 Meters, end loading -- the most efficient form of loading -- gives you highly efficient performance, excellent bandwidth, low angle radiation and automatic bandswitching.

MFJ's unique *Frequency Adaptive L-Network*™ provides automatic impedance matching for lowest SWR on these low bands.

Tuning to your favorite part of these bands is simple and is done at the *bottom* of the antenna.

No Ground or Radials Needed

You don't need a ground or radials because an effective counterpoise that's 12 feet across gives you *excellent* ground isolation.

You can mount it from ground level to roof top and get awesome performance.

No Feedline Radiation to Waste Power

The feedline is decoupled and isolated from the antenna with MFJ's exclusive *AirCore*™ high power current balun. It's wound with *Teflon*® coax and can't saturate, no matter how high your power.

Built to Last

Incredibly strong solid fiberglass rod and large diameter 6061 T-6 aircraft strength aluminum tubing is in the main structure.

Efficient high-Q coils are wound on tough *low loss* fiberglass forms using highly weather resistant *Teflon*® covered wire.

MFJ's Super High-Q Loop™ Antennas

MFJ-1786
$379.95
Ship Code F

MFJ's *tiny* 36 inch diameter loop antenna lets you operate 10 through 30 MHz *continuously* -- including the WARC bands!

Ideal for limited space -- apartments, small lots, motor homes, attics, or mobile homes.

Enjoy both DX and local contacts mounted vertically. Get both low angle radiation for excellent DX and high angle radiation for local, close-in contacts. Handles 150 watts.

Super easy-to-use! Only MFJ's super remote control has *Auto Band Selection*™. It auto-tunes to desired band, then beeps to let you know. No control cable is needed.

Fast/slow tune buttons and built-in two range Cross-Needle SWR/Wattmeter lets you quickly tune to your exact frequency.

All welded construction, no mechanical joints, welded butterfly capacitor with no rotating contacts, large 1.050 inch diameter round radiator -- not a lossy thin flat-strip -- *gives you highest possible efficiency.*

Each plate in MFJ's tuning capacitor is welded for low loss and polished to prevent high voltage arcing, welded to the radiator, has nylon bearing, anti-backlash mechanism, limit switches, continuous no-step DC motor -- gives smooth precision tuning.

Heavy duty thick ABS plastic housing has ultraviolet inhibitor protection.

NEW! **MFJ-1788, $429.95.** Same as MFJ-1786 but covers 40 Meters-15 Meters continuous. Includes super remote control.

MFJ-1782, $339.95. Like MFJ-1786 but control has only fast/slow tune buttons.

MFJ-1780, $249.95. *Box Fan* Portable Loop is about the same size (2x2 foot) as a box fan, complete with handle. Covers 14-30 MHz. Control has fast/slow tunes.

MFJ Portable Antenna

MFJ-1621 **$89.95** Ship Code A

MFJ-1621 lets you operate in most any electrically free area -- apartment, campsite, hotel, the beach, etc. DXCC, WAZ, WAC, WAS have been won with MFJ-1621! Work 40, 30, 20, 17, 15, 12 and 10 Meters with a telescopic whip that extends to 54 inches. Mounted on a sturdy 6x3x6 inch cabinet. Built-in antenna tuner, field strength meter, and 50 feet of RG-58 coax cable. Handles 200 Watts.

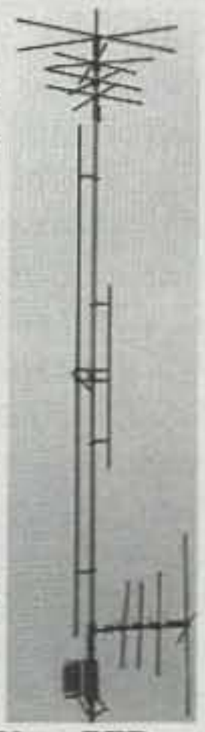
MFJ's G5RV Antenna

$39.95
MFJ-1778, Ship Code A

Covers all bands, 160-10 Meters with antenna tuner. 102 feet long, shorter than 80 Meter dipole. Use as inverted vee or sloper to be more compact. Use on 160 Meters as Marconi with tuner and ground. Handles full legal limit power. Add coax feedline and some rope or other nonconductor and you're *on the air!*

MFJ halfwave vertical

6 bands: 40, 20, 15, 10, 6, 2 Meters . . . No radials or ground needed



MFJ-1796
$209.95
Ship Code F

Only 12 feet high and has a tiny 24 inch footprint! Mount anywhere -- ground level to tower top -- apartments,small lots, trailers. Perfect for vacations, field day, DXpedition, camping.

Efficient end-loading, no lossy traps. Entire length is always radiating. Full size halfwave on 2/6 Meters. High power *air-wound* choke balun eliminates feedline radiation. Adjusting 1 band has minimum effect on others.

MFJ-1792, $169.95. Full size 1/4 wave radiator for 40 Meters. 33 feet, handles 1500 Watts PEP. Requires guying and radials.

MFJ-1793, $189.95. Like MFJ-1792 but has full size 20 Meter 1/4 wave also.

Free MFJ Catalog
and Nearest Dealer . . . 800-647-1800

http://www.mfjenterprises.com

•1 Year *No Matter What*™ warranty •30 day money back guarantee (less s/h) on orders from MFJ

MFJ . . . the world leader in ham radio accessories!

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(662) 323-5869; 8-4:30 CST, Mon.-Fri.
FAX: (662) 323-6551; **Add s/h**
Tech Help: (662) 323-0549

that for every normal existing particle there is an **antiparticle** having an opposite electric charge. If there are electrons, there must be **antielectrons** (called **positrons**, which could produce a positron current). If there are protons there must be **antiprotons**. If there are neutrons there must be **antineutrons**, and so on.

When the "big bang" occurred about 15 billion years ago, it is supposed that nearly equal amounts of matter and antimatter were produced. However, since there is a slight difference in matter and antimatter effects, most of the antimatter has been changed, leaving the universe with mostly matter. Perhaps, though, there are whole galaxies made up of **antimatter** with positron currents. While there is no evidence of this yet, some astronomers think they have sighted clouds of antimatter way out there somewhere.

Flavors and Colors

The thinking about electrons and what is inside of atoms has been changing constantly as stronger atom-smashing machines produce more and more nuclear particles. Physicists have named a whole host of new particles and energy forces inside atoms. They have come up with what they call different **flavors** and **colors** of forces at work in the nucleus! These are names of nuclear forces that differ from our common gravity, electrostatic negative-to-positive, and **magnetic** north-to-south forces. Scientists have now decided that the –/+ electrostatic force and the N/S magnetic force are actually one **electromagnetic force** (not to be confused with the "electro*motive* force, or emf" above). Whenever a –/+ or a N/S force is doing something, the other will be involved in some way.

Physicists have also discovered an important **gluon** force involved in holding, or gluing, particles together in the nucleus. This force is strong enough to prevent protons from repelling one another out of a multi-proton nucleus of an atom.

The simplest and the lightest of the more than 100 known atoms is hydrogen, a very light gas at room temperatures. It consists of one negative electron in orbit around a nucleus which consists of one, assumed to be round, positive proton. Surprisingly, out of perhaps 7000 regular hydrogen atoms, there may be one nucleus with a neutron "gluoned" to its proton. Such a proton-neutron group is known as a **deutron** and forms a dumbbell-shaped hydrogen nucleus. By adding the extra neutron, the mass of this hydrogen atom essentially is doubled. It is said to be an atom of "heavy hydrogen" (H^2), is called **deuterium**, and is readily available in sea water. If a hydrogen atom has one proton but somehow comes up with two neutrons in its nucleus, it is called **tritium** (H^3) and is acquired by breaking down heavy atoms. If heated by an atomic-bomb explosion, deuterium and tritium fuse together, producing **fusion**, the very-high-energy explosive force of the hydrogen bomb.

The next heavier atom is **helium** (He), which is also a gas at room temperatures. As might be expected, it has two protons, two orbiting electrons, and normally two neutrons in its nucleus. These two lightest gases, hydrogen and helium, are used in balloons. When a light-weight plastic bag or other container is filled with hydrogen or helium, the bag will be pushed upward by the much heavier nitrogen, oxygen, etc., **air** molecules, just as a light piece of wood floats to the top of water. The balloons that carry people up into the air today are only filled with hot air. Electrical heat energy in a gas flame directed upward into the balloon heats the inside air molecules, driving them far apart, making the heated air much lighter than the outside cooler air with molecules much closer together, resulting in the balloon floating upward.

Hydrogen, with one proton in its nucleus, has only one electron orbiting it. All other heavier atoms have two (and only two) electrons circling in the first electron energy level around the nucleus. While the first level out from the nucleus can hold only two electrons, the second may have up to eight, and so on (see fig. 2) as you move farther out from the nucleus.

The relative distance from a nucleus to the first orbital electrons is astounding. It has been estimated that if the nucleus were magnified up to the size of a golf ball, the closest electrons would be orbiting at a distance of roughly two miles! Volume-wise, atoms are 99.99+% space! Progressively heavier atoms have increased numbers of nuclear protons and neutrons, with a greater number of electrons orbiting in more and more remote energy levels.

Normal atoms have a neutral charge, but if one outer electron (–1) is removed from it in some way, the atom is left with a positive (+1) charge and is called a positive **ion**. It is said to be **ionized** (has a "hole" in it). Ionization can make things happen electrically and chemically. It might be said that the positive battery terminal discussed above ionized some of the lamp's filament-wire atoms by pulling electrons out of them. Feeding electrons in from the negative battery terminal de-ionized, or neutralized, the atoms. When the switch was opened, the filament circuit de-ionized completely and the battery chemically charged up again, driving excess electrons onto the negative pole and ionizing atoms at its positive pole.

Whenever an electron is moving, it has a **spin** that produces a magnetic field around itself. Some atoms—such as iron, nickel, and cobalt—have so many electrons spinning in the same direction that they can react magnetically. Almost all other atoms have electrons spinning in so many different directions that little or no noticeable magnetic effect results. Protons and neutrons in the nucleus also have spins that help them bind together.

Particle or Energy Wave?

An electron usually is considered to be a tiny particle, but sometimes it may also behave as if it were a wave of energy, allowing it to tunnel through certain barriers that might be expected to stop it. It is interesting that such a tunneling effect can result in 10-times faster operating transistors. To simplify things here, electrons will be considered to be only small negatively charged particles.

We see **uranium** (U) mentioned at times. It is the most complex and heaviest of the normal atoms. It has 92 electrons in orbit around a nucleus of 92 positive protons gluoned to ±235 neutrons. Different forms of uranium may have different numbers of neutrons in their nuclei. Examples are U^{234}, U^{235}, U^{238}, etc. Any atom having any number of neutrons other than its normal number is known as an **isotope** of that atom. Atoms can have from only one to many isotopes.

Very heavy atoms, whether they occur naturally or are produced in particle accelerators, continually lose some of their nuclear particles by **radioactivity**. "Radio" here has nothing to do with radio communication. It means that some parts of these atoms are being *radiated* outward and are lost to the atom. Such ejected particles may be electrons, neutrons, protons, etc. The radioactivity from heavier atoms causes them to decay in various periods of time into atoms of progressively lower weights. Their decay rate is measured in periods known as **half-lives**. A half-life of an atom such as uranium is the time it takes half a group of these atoms

to become some other lighter atom. One known isotope of uranium has a half-life of billions of years, but another has a half-life of only minutes. After many half-lives the heavier atoms eventually become more stable atoms such as lead, with 82 electrons and protons and ±200 neutrons. Geologists are able to determine the age of really ancient rocks by comparing the billion-year-old isotope of uranium against the lead content of the rocks.

When the nucleus of a heavy atom such as uranium or plutonium is split apart (known as **fission**), it can release great quantities of self-regenerating explosive energy, as in an atomic bomb..

In heavier atoms, radiation of a subgroup starting as two protons and two neutrons gluoned together is called an **alpha particle**. It alternately gives off positive, negative, and neutral particles, but usually is considered to be doubly-positively charged. It is found in, among other things, **radon gas**, which makes its way up into many homes from the radioactivity of uranium or radium atoms underground. Alpha particles can attack cells in the human body, possibly developing a cancer in one or more of them.

When driven off of an atom by radioactivity of a proton from the nucleus, an electron is known as a **beta particle**. It may travel at almost the speed of light, but is not known to cause cancer. In fact, beams of electrons are used to kill skin-cancer cells.

The nuclei of heavy atoms are believed to have lumpy football shapes. It is possible that the lumps on the surface of such nuclei result in a weakening of the gluon forces that hold the neutrons and protons together, allowing radioactivity to take place from the nucleus.

When electrons are investigated closely, it is found that they are one of six particles known as **leptons**, meaning "light mass" or "light weight." Leptons occur in three families:

First family—an **electron** particle and an **e-neutrino** (ee-neutrino)

Second family—a **muon** particle and a **μ-neutrino** (mu-neutrino)

Third family—a **tau** particle and a **τ-neutrino** (tau-neutrino).

The second and third families of leptons, the muon and tau particles, always combine with something else to form other particles. Physicists usually find the short-lived leptons only as a result of atom-smashing. The electron, the muon, and the tau leptons all have charges of –1. Muon and tau particles are somewhat like electrons, but they are always combined with something else and are a lot heavier than an electron. The muon is about 200 times the weight of an electron and decays to an electron and a neutrino. Of course, there are also anti-leptons.

All three of the neutrinos have neutral charges, as indicated by their names. Neutrinos are the lightest weight and most abundant particles in nature. It has been estimated that there are a billion neutrinos for every proton and neutron in all of the atoms of the universe! They are so tiny and so nearly massless that for a long time it was thought, being uncharged, they could pass through everything, even the Earth, without hindrance. However, by monitoring a tank of water miles underground it was found that all three flavors of neutrinos do sometimes collide with molecules of water, causing electromagnetic-wave packets to be radiated. This indicates that they do have some mass and therefore some energy. Neutrinos are believed to have about one five-billionth the mass of an electron!

The last neutrino to be found was the tau-neutrino, in the year 2000. New findings indicate that neutrinos not only may have some tiny value of mass, but they also have a tiny magnetic field and therefore some very tiny charge. They are now believed to make up about half of the invisible "dark matter" of the cosmos.

In Part II . . .

The second half of this discussion will start with a theory of tiny electrostatic-electromagnetic waves called **photons**, how they are produced and how they fit into our daily living, including a possible new look at radio transmissions. ■

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

These records represent the pinnacle of achievement by the true champions of contesting. We congratulate them on their success. Number groups after calls are: year of operation, total score, contacts, zones and countries. All-Band and Multi-Operator records include a band-by-band breakdown of the world leader in each category. *(See the CQ website, <www.cq-amateur-radio.com>, for the expanded version of the records.)*

Phone Single Operator/Single Band WORLD RECORD HOLDERS

1.8	IG9/IV3TAN('96)	441,252	1,203	24	102
3.5	IG9T('95) (Opr. IV3TAN)	816,959	1,938	33	110
7.0	IG9GSF('97) (Opr. IT9GSF)	1,249,236	2517	35	137
14	PYØFM('94) (Opr. PY5CC)	3,202,242	5,109	38	175
21	ZD8Z('94) (Opr. N6TJ)	3,481,925	5,535	36	179
28	HC8A('01) (Opr. N6KT)	3,916,600	6,957	39	161

Single Operator/All Band

AF	EA8BH('99) (Opr. N5TJ)	25,646,796	10,253	176	692
AS	JY9NX('01) (Opr. JM1CAX)	10, 785,336	6,290	143	475
EU	GIØKOW('99)	10,457,664	6,375	155	589
NA	8P5A('01) (Opr. W2SC)	14,531,272	8,690	147	511
O	KH7R('00) (Opr. CT1BOH)	11,894,730	7,473	170	392
SA	HC8A('99) (Opr. N6KT)	18,607,050	8,638	175	595
QRP	P40W('00) (Opr. W2GD)	5,097,780	3,599	127	381
Low Pwr. Asst.	P40P('00) (Opr. W5AJ)	8,747,520	5,944	133	377
	P4ØW('94) (Opr. W2GD)	11,224,877	6,323	131	470

WORLD RECORD

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

Multi-Operator/Single Xmtr.

AF	D44TC('01)	22,978,944	9,638	178	694
AS	P3A('00)	17,409,816	8,282	167	635
EU	IQ4A('90)	17,255,700	7,253	183	717
NA	VP2EC('92)	16,287,152	7,434	183	685
O	KH2S('91)	11,095,392	7,086	145	387
SA	PJ1B('93)	22,596,570	9,386	164	646

WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	148	14	57
D44TC	3.5	194	21	80
(2001)	7.0	290	29	97
22,978,944	14.0	2,380	38	145
	21.0	2,413	37	151
	28.0	4,213	39	164
	Total	9,638	178	694

Multi-Operator/Multi-Xmtr.

AF	CN8WW('00)	78,170,508	25,711	199	854
AS	P3A('98)	29,108,800	13,073	182	738
EU	LX7A('89)	26,578,978	14,947	175	751
NA	VP2KC('79)	37,770,012	17,767	175	677
O	KHØAM('90)	35,730,600	16,309	179	565
SA	PJ4B('99)	59,127,810	20,618	188	834

WORLD RECORD

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

CW Single Operator/Single Band WORLD RECORD HOLDERS

1.8	C4A('99) (Opr. 9A3A)	261,489	969	21	80
3.5	EA8EA('96) (Opr. OH2KI)	1,175,550	2,672	36	114
7.0	YV5A('95) (Opr. OHØXX)	1,364,465	3,095	35	122
14	P4ØV('91) (Opr. N7NG)	1,883,700	3,521	38	142
21	ZD8Z('97) (Opr. N6TJ)	2,357,967	4,589	39	140
28	ZX5J('99) (Opr. N6TJ)	2,131,942	3,962	39	152

Single Operator/All Band

AF	EA8BH('00) (Opr. N5TJ)	18,010,765	7,555	183	634
AS	A61AJ('01) (Opr. S53R)	10,720,332	5,957	161	523
EU	LY6M('99) (Opr. LY1DS)	7,140,784	4,634	163	558
NA	8P9Z('01) (Opr. K4BAI)	10,006,568	6,814	136	436
O	9M6NA('99) (Opr. JE1JKL)	7,402,265	4,211	169	442
SA	HC8N('99) (Opr. N5KO)	14,626,579	7,001	185	546
QRP	P4ØW('99) (Opr. W2GD)	5,024,800	3,277	137	413
Low Pwr. Asst.	P4ØW('01) (Opr. W2GD)	10,198,792	5,723	151	475
	P4ØW('94) (Opr.W2GD)	10,288,950	5,541	155	460

WORLD RECORD

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

Multi-Operator/Single Xmtr.

AF	TS7N('00)	13,140,050	6,348	156	614
AS	P3A('99)	19,243,476	8,288	191	691
EU	RU1A('00)	12,753,600	5,670	203	757
NA	8P9Z('99)	18,711,252	8,245	192	669
O	AH2R('01)	9,283,872	4961	170	522
SA	HC8N('95)	14,302,820	7,252	162	503

WORLD RECORD

Station	Band	QSOs	Zones	Countries
	1.8	264	13	61
P3A	3.5	1,121	27	98
(1999)	7.0	1,535	35	121
19,243,476	14.0	1,825	39	136
	21.0	1,782	39	136
	28.0	1,761	38	139
	Total	8,288	191	691

Multi-Operator/Multi-Xmtr.

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

WORLD RECORD

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

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

Tabulated below are the record-high scores achieved by U.S. contesters in the CQ World-Wide DX Contest. Number groups following calls and bands are: year of operation, total score, contacts, zones, and countries. *(See the CQ website, <www.cq-amateur-radio.com>, for the expanded version of the records.)*

PHONE

Single Operator/Single Band

1.8	K1ZM('95)	55,420	215	15	70
3.5	K1ZM/2('96)	292,100	952	27	100
7.0	KC7EM('95)	409,446	1,083	34	95
14	K1OX('85) (Opr. KC1F)	1,131,328	2,176	36	140
21	KQ2M/1('99)	1,327,139	2,624	39	148
28	W4ZV('01)	1,464,255	2,654	40	155

Single Operator/All Band

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

QRP

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

Low Power

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

Assisted

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

Multi-Operator/Single Xmtr.

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

Multi-Operator/Multi-Xmtr.

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

CW

Single Operator/Single Band

1.8	K1ZM('95)	142,358	470	23	83
3.5	W1MK('00)	417,240	1,273	26	96
7.0	K1ZM('90)	839,520	1,783	34	125
14	K2WK('98)	1,007,781	1,955	39	144
21	K2SS/1('00)	974,440	2,035	36	134
28	W4ZV('00)	965,874	1,984	37	137

Single Operator/All Band

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

QRP

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

Low Power

K1RO('00)	3,409,245	2,245	131	422

Assisted

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

Multi-Operator/Single Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	49	13	46
K1AR	3.5	569	27	101
(1998)	7.0	1,384	35	136
12,063,114	14.0	991	38	151
	21.0	999	36	135
	28.0	1083	32	132
	Total	5,074	181	701

Multi-Operator/Multi-Xmtr.

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

Club Record: Yankee Clipper Contest Club ('99) 702,296,971
Team Contesting: Phone – Neiger's Tigers Team #1 ('99) 66,546,582
CW – The Team ('98) 55,385,494

Do you own a Hy-Gain Discoverer antenna that has "died"? WRØU and WBØMCO reveal the action they took to bring their Discoverers back to life!

It's Alive!

BY SCOTT AUGSBURGER,* WRØU, AND DAVID WAGNER,† WBØMCO

If you own a Hy-Gain Discoverer series antenna that has experienced mechanical failures, perhaps your worries are over. We had repeated mechanical failures and were about ready to throw in the towel and get rid of our antennas. Fortunately, we found a way to save them, and so can you!

I have a Discoverer 7.3.3 three-element 40 meter Yagi that performed perfectly when it was first installed. However, when the wind speed exceeded approximately 10 miles per hour, the antenna failed. The nature of the failure could not be determined from the ground even with the use of a pair of binoculars. Climbing the tower and closely examining the antenna revealed that a break had occurred in the aluminum linear loading segment which spanned the insulator in the center of one of the elements (see photo A). Two identical failures over a period of two years were corrected by renting a crane at $125 an hour, removing the antenna, making repairs, and then reinstalling the antenna on the tower. That is a big, expensive operation. The third such failure had me scratching my head in frustration. Should I repair it again or just scrap the darn thing?

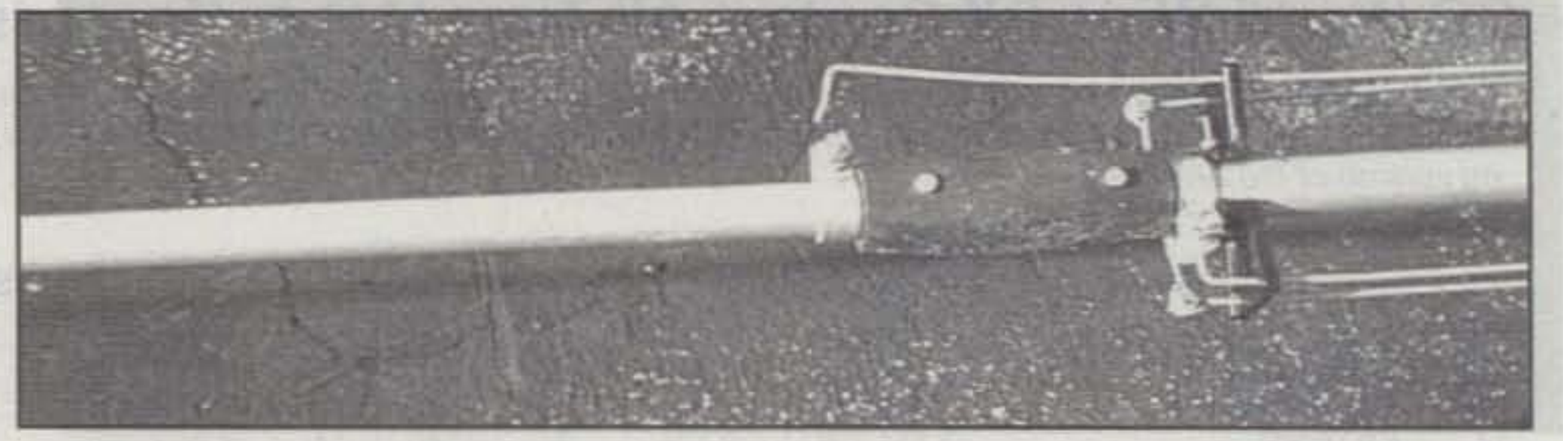


Photo A– Broken aluminum loading segment spanning the center insulator.

WBØMCO Leads the Way

It was then that I learned WBØMCO had a Discoverer model 7.1 (40 meter one-element dipole) which had experienced similar failures. Three years ago he decided to replace the aluminum linear loading segments on his Discoverer. He removed his antenna from the tower and replaced the loading segments with #10 TW copper wire. At the point of the long span over the center insulator (the failure point) he used flexible RG58 copper braid to form a flexible link. The modification did not affect the performance of his antenna except that he had to trim the antenna tips to restore the VSWR. After three years his antenna is still ticking, just like the proverbial watches in the Timex® advertisements. With his success, it seemed apparent that a solution was at hand.

The Need for a Jig

Now it was time to apply his technique to my antenna! My beam is a monster to handle compared to Dave's dipole, so I had to figure out a way to modify my antenna without spending a small fortune on cranes. The only way this might happen was if I could rotate my Yagi into a stable vertical position on the tower and fasten it in place. If so, I knew I could then remove the three elements and lower them to the ground for modification while the boom remained in place on the tower.

In order to do that, I designed the jig shown in photo B. It is about 18 inches long and weighs about 5 pounds. On each end of the jig, two 2 inch muffler clamps are bolted to a 2" × 4" × 1/4" steel plate. The center "twist" tube is a 6 inch length of 1 inch gas pipe with a 3/4 inch nut welded into each end. A 3/4 by 4 inch bolt, with head removed, is screwed into each end of the "twist" tube. A 3/4 inch nut is added to each bolt to serve as a locking device when in use. A 1 1/2 inch length of 1 inch gas pipe is welded into the center of each steel plate, and a 1/4

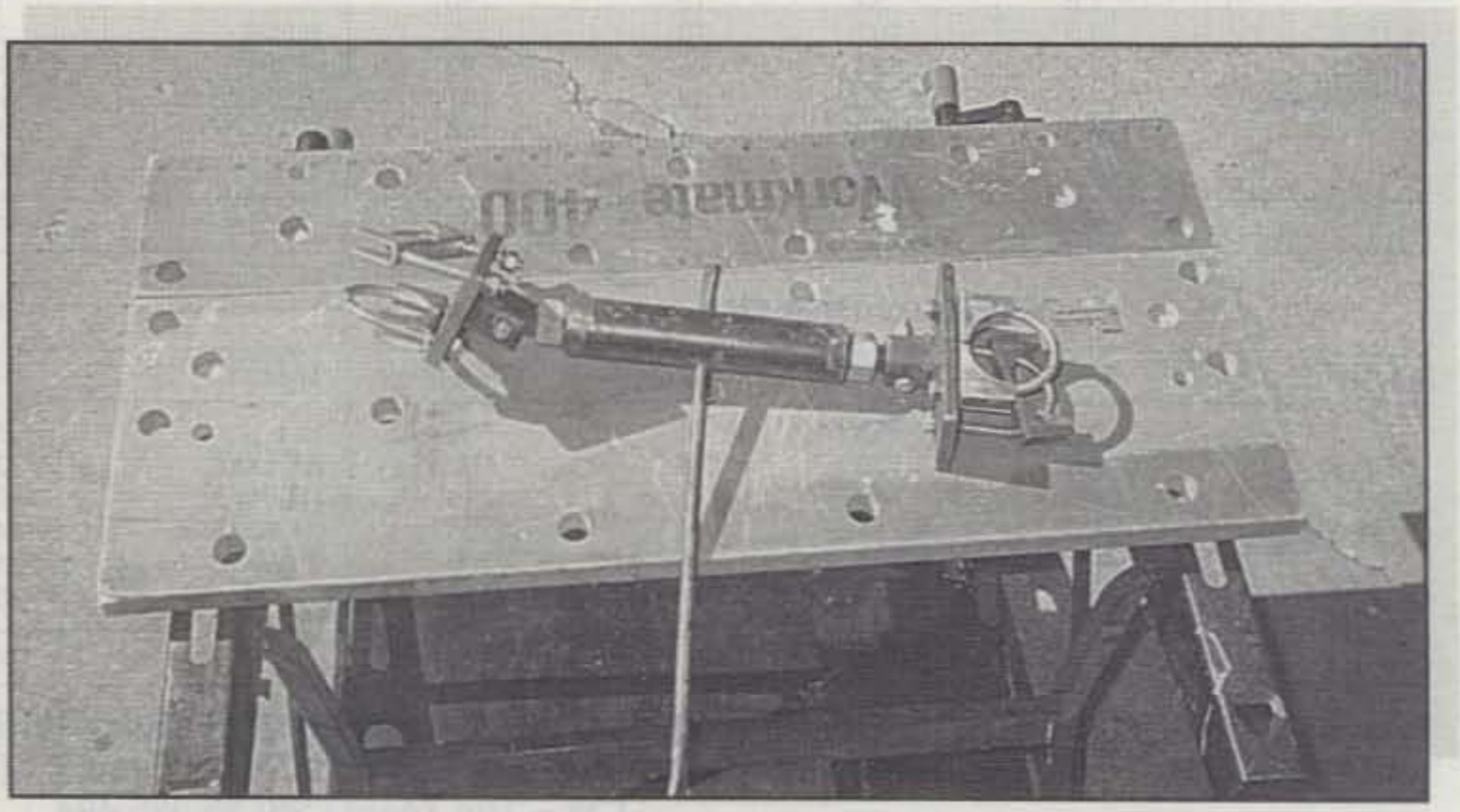


Photo B– Jig used to control and rotate antenna on tower.

*1005 Westwood Dr. Westwood, Mt. Pleasant, IA 52641
e-mail: <augsburg@interl.net>
†2300 Baumberger St., Burlington, IA 52601
e-mail: <arwb0mco@interl.net>

MFJ *Pocket size* Morse Code Reader™

Hold near your receiver -- it instantly displays CW in English!

Automatic Speed Tracking . . . Instant Replay . . . 32 Character LCD . . . High-Performance Modem . . . Computer Interface . . . Battery Saver . . .

MFJ-461
$79.95

Is your CW rusty?

Relax and place this tiny pocket size MFJ Morse Code Reader near your receiver's speaker . . .

Then watch CW turn into solid text messages as they scroll across an easy-to-read LCD display.

No cables to hook-up, no computer, no interface, nothing else needed!

Use it as a backup in case you mis-copy a few characters - - it makes working high speed CW a breeze - - even if you're rusty.

Practice by copying along with the MFJ-461. It'll help you learn the code and increase your speed as you instantly see if you're right or wrong.

Eavesdrop on interesting Morse code QSOs from hams all over the world. It's a universal language that's understood the world over.

Automatic Speed Tracking

MFJ *AutoTrak*™ automatically locks on, tracks and displays CW speed up to 99 Words-Per-Minute.

Simply place your MFJ-461 close to your receiver speaker until the lock LED flashes in time with the CW.

Four Display Modes

1. Bottom line scrolls and fills with text, then that entire line is displayed on top line until bottom line refills -- makes reading text extra easy! Automatically displays speed in WPM.

2. Same as **1**, without speed display -- gives you maximum text display.

3. Top line scrolls, bottom line displays speed in Words-Per-Minute.

4. Both top and bottom lines scroll.

Two-line LCD display has 32 large 1/4 inch high-contrast characters.

MFJ Instant Replay

The last 140 characters can be instantly replayed. This lets you re-read or check your copy if you're copying along side the MFJ-461.

High Performance Modem

Consistently get solid copy from MFJ's high performance *PLL* (*phase-lock loop*) modem. Digs out weak signals. Even tracks slightly drifting signals.

Of course, nothing can clean up and copy a sloppy fist, especially weak signals with lots of QRM/QRN.

Computer Interface

The MFJ-461's serial port lets you display CW text full screen on a bright computer monitor -- just use your computer serial port and terminal program.

More Features

When it's too noisy for its microphone pickup, you can connect the MFJ-461 to your receiver with a cable.

Battery saving feature puts MFJ-461 to sleep during periods of inactivity. It wakes up and decodes when it hears CW.

Uses 9 Volt battery (not included).

True Pocket Size

Fits in your shirt pocket with room to spare - smaller than a pack of cigarettes. Tiny 2¼x3¼x1 in. 5½ ounces.

No Instruction Manual needed!

Super easy-to-use! Just turn it on -- it starts copying instantly!

Accessories

MFJ-26B, $4.95. Soft leather protective pouch. Clear plastic overlay for display, push button opening, strong, pocket/belt clip secures MFJ-461.

MFJ-5161, $14.95. MFJ-461 to computer serial port cable (DB-9).

MFJ-5162, $5.95. Receiver cable connects MFJ-461 to your radio's external speaker 3.5 mm jack.

MFJ *Pocket* Morse Tutor

MFJ-418
$79.95

Learn Morse code anywhere with this tiny *MFJ Pocket-sized Morse Code Tutor*™! Practice copying letters, numbers, prosigns, punctuations or any combination or words or QSOs. Follows ARRL/VEC format. Start at zero code speed and end up as a high speed *CW Pro!* LCD, built-in speaker.

MFJ Code Oscillator

MFJ-557
$29.95

MFJ-557 Deluxe Code Practice Oscillator has a Morse key and oscillator unit mounted together on a heavy steel base -- stays put on your table! Portable. 9-Volt battery or 110 VAC with MFJ-1312, $14.95. Earphone jack, tone and volume controls, speaker. Adjustable key. Sturdy. 8½x2¼x3¾ in.

MFJ *Pocket* CW Keyer

MFJ-403P
$69.95

Built-in Iambic Paddle. Thumbwheel speed control. Adjustable weight. Adjustable sidetone with speaker. Iambic modes A or B. Fully automatic or semi-auto "bug" mode. Reversable paddle. Tune mode. RF-proof. Battery Saver. Tiny 2¼x3¼x1 in.

MFJ *miniature* Travel Iambic Paddle

MFJ-561, $19.95. 1¾Wx1¾Dx¾H in. *Formed* phosphorous bronze spring paddle, stainless steel base. 4 ft. cord, 3.5 mm plug.

Free MFJ Catalog
and Nearest Dealer . . . 800-647-1800

http://www.mfjenterprises.com

• 1 Year *No Matter What*™ warranty • 30 day money back guarantee (less s/h) on orders direct from MFJ

MFJ ENTERPRISES, INC.
300 Industrial Pk Rd, Starkville, MS 39759 **PH:** (662) 323-5869
Tech Help: (662) 323-0549
FAX:(662)323-6551 8-4:30 CST, Mon.-Fri. ***Add shipping.***

MFJ . . . the world leader in ham radio accessories!

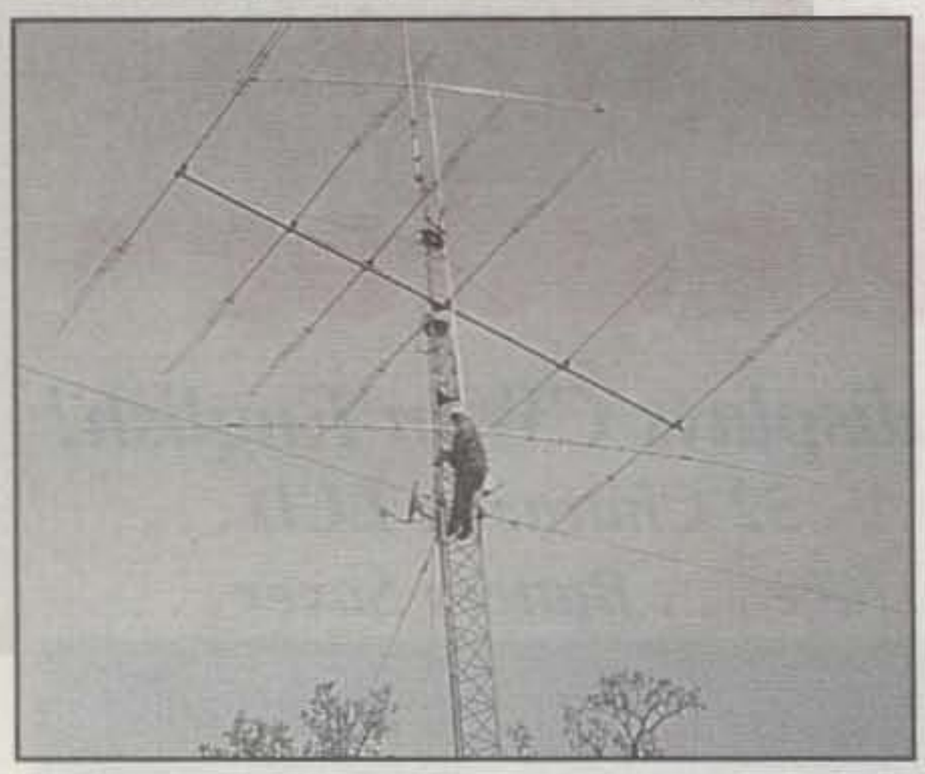


Photo C– WRØU removing antenna elements.

inch hole is drilled in each gas pipe about 3/8 inch from the open end of the pipe. The end plates are slipped over the bolts, which are screwed into the "twist" tube, and the 1/4 inch hole in the gas pipe is continued through the bolt. A 1/4 by 20 by 1 1/2 inch graded bolt fastens the end plates to the "twist" tube. A hole drilled in the center of the "twist" tube is used for a rod to provide increased torque. Both the graded bolt and the twist rod are shown in photo B.

Removing the Elements

After climbing the tower, mount the jig as closely as possible to the boom balancing point. Using the muffler clamps, fasten the other end of the jig to the tower. Plan your location, as you will need free space to rotate your antenna as well as working space on the tower to remove the elements. Detach the antenna and rotate it into the vertical position; tighten the lock nuts to hold it in place. Use a tie rope just below the jig to fasten the antenna to the tower. Use another as a tie near the end of the boom. These ropes will help prevent any movement of the antenna. Now the elements can be removed and sent down on a hand line (see photo C). Don't forget to mark the elements so that they can be reinstalled in their original locations after modification. Also keep in mind the fact that some of the bolts will break in the removal process and will require replacement later.

The Modification Procedure

The aluminum linear loading segments turned out to be 0.110 inches in diameter so that #8 solid copper wire (diameter 0.112) should make a suitable replacement without changing any of the electrical characteristics of the antenna. Since the failures probably were caused by wind-induced vibration, I decided to also add 1/4 inch Poly rope inside each tubular element to dampen vibrations. With that in mind, the following material was needed to complete the next two phases of the project: 275 feet of #8 solid-copper wire, 6 feet of RG8 with 98% braided copper shield, 200 feet of 1/4 inch Poly rope, six solderless terminals to fit over a 1/4 inch bolt and accept #8 wire, one can of 3M electrical coating, several rolls of Scotch™ 88 tape, clear ATV silicone compound, 1/4 by 20 by 1 inch stainless steel bolts with nuts and lock washers (to replace those twisted off during removal of the elements), OO steel wool, 60-40 solder, and a 260 watt solder gun.

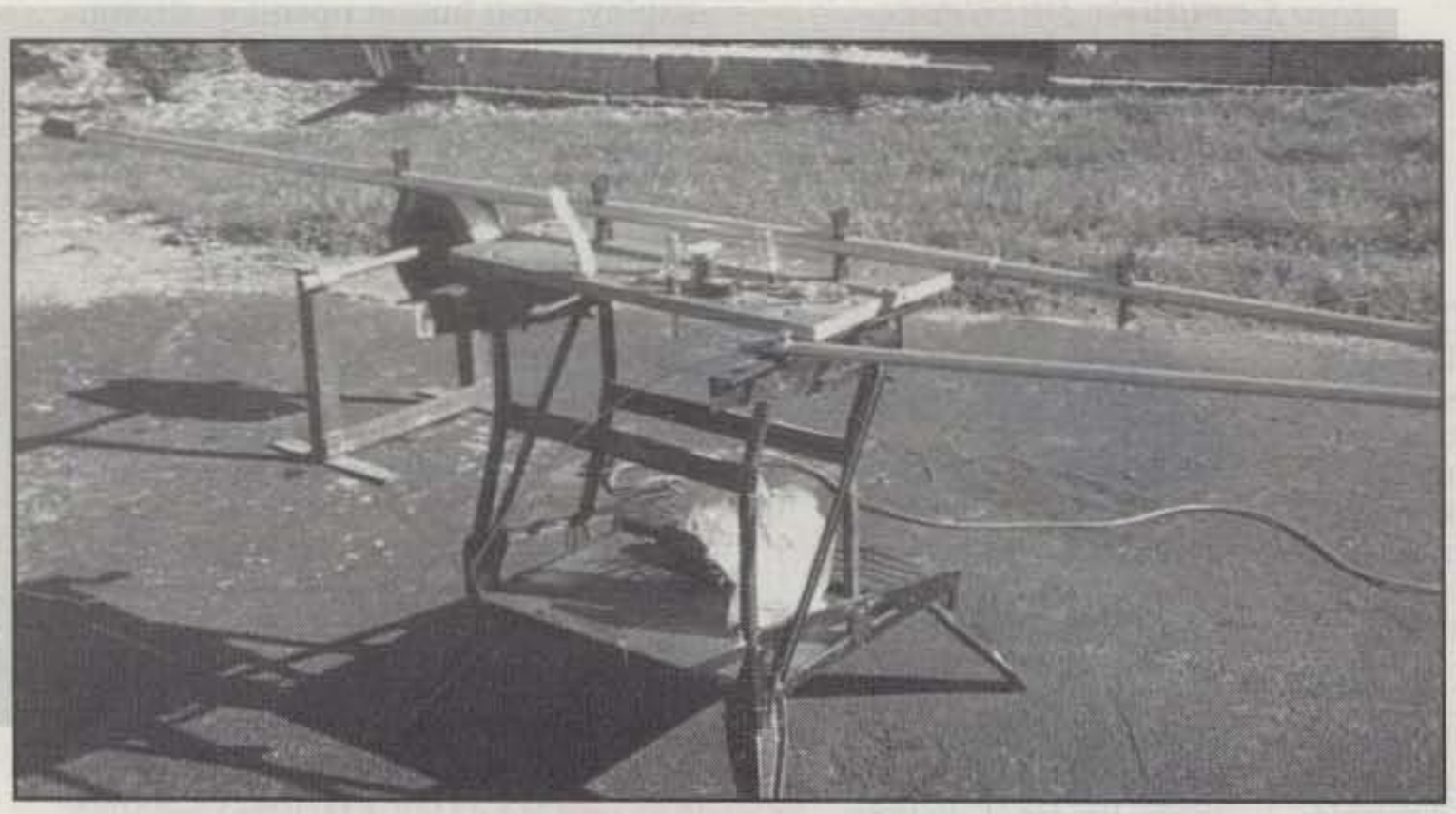


Photo D– Wire protruding from tip used to pull Poly rope through element.

A large workspace with work bench is required for the re-stringing operation.

Remove the aluminum linear loading segments; make a sketch or keep a clear mental image of the layout. Separate the two halves of each element at the center insulator. Insert a 20 foot long piece of #8 solid-copper wire into the small tube of the element (remove end caps first if they are still in position) until about 8 inches of the wire protrudes out of the tube (see photo D). Tape the 1/4 inch Poly rope to the pull wire "end-for-end"; you need the smallest diameter to permit the rope to be pulled through the center of the element. Make sure you control the rope because it can tangle in a hurry!! Pull the rope through the small tube leaving about 2 inches exposed. Apply a generous amount of RTV seal on the exposed rope and pull the rope back until about 1 inch is left exposed. Reinstall the end cap or tape the element tip with the Scotch™ 88 tape. Apply enough RTV to completely seal the end. (*Note:* This procedure of installing Poly rope to dampen vibration is a trick from the old days. I did not insert any rope in the boom, but it might be a good idea to do so.) Follow this same procedure on the large end of the element. An insulator may have to be removed to eliminate blockage. However, such removal is not normally required if care is taken when pulling the rope through the elements.

At the boom-to-element-clamp side of the element tie two or three knots in the end of the Poly rope and gently pull it back into the tube (see photo E). Cut the rope off even with the outside edge of the insulator and rejoin both halves of the element. A 16-penny nail will help to align the mounting holes. Restring the linear loading segment using the #8 wire; leave about 4 inches or so at the end of the last insulator block adjoining the center insulator. Solder about 8 inches of RG8 coax braid to a solderless terminal and fasten the terminal securely to the 1/4 inch bolt. Clean the exposed end of #8 solid-copper wire and insert it into the end of the braid. Make a tight mechanical connection and solder (see photo F). Do not apply too much solder or it will act like a desoldering wick and remove the flexibility from the braid. Generously apply electrical coating to seal this pigtail unit. Examine carefully and re-coat if necessary, as any points where water can enter may cause problems later.

Reinstalling the Antenna

Repeat this process with all of the elements and then reinstall the modified parts on the boom. Level all elements

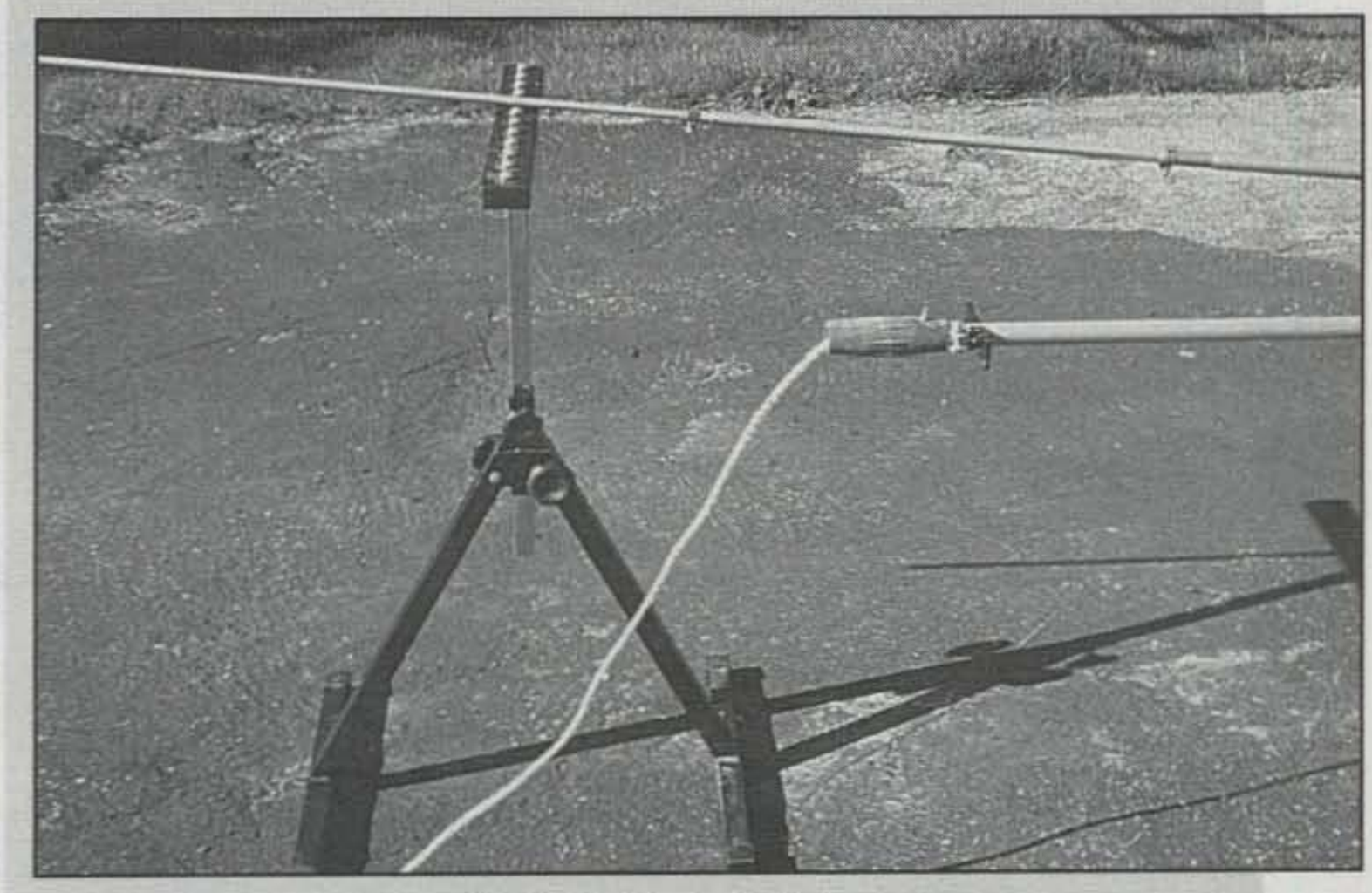


Photo E– Knots in Poly rope.

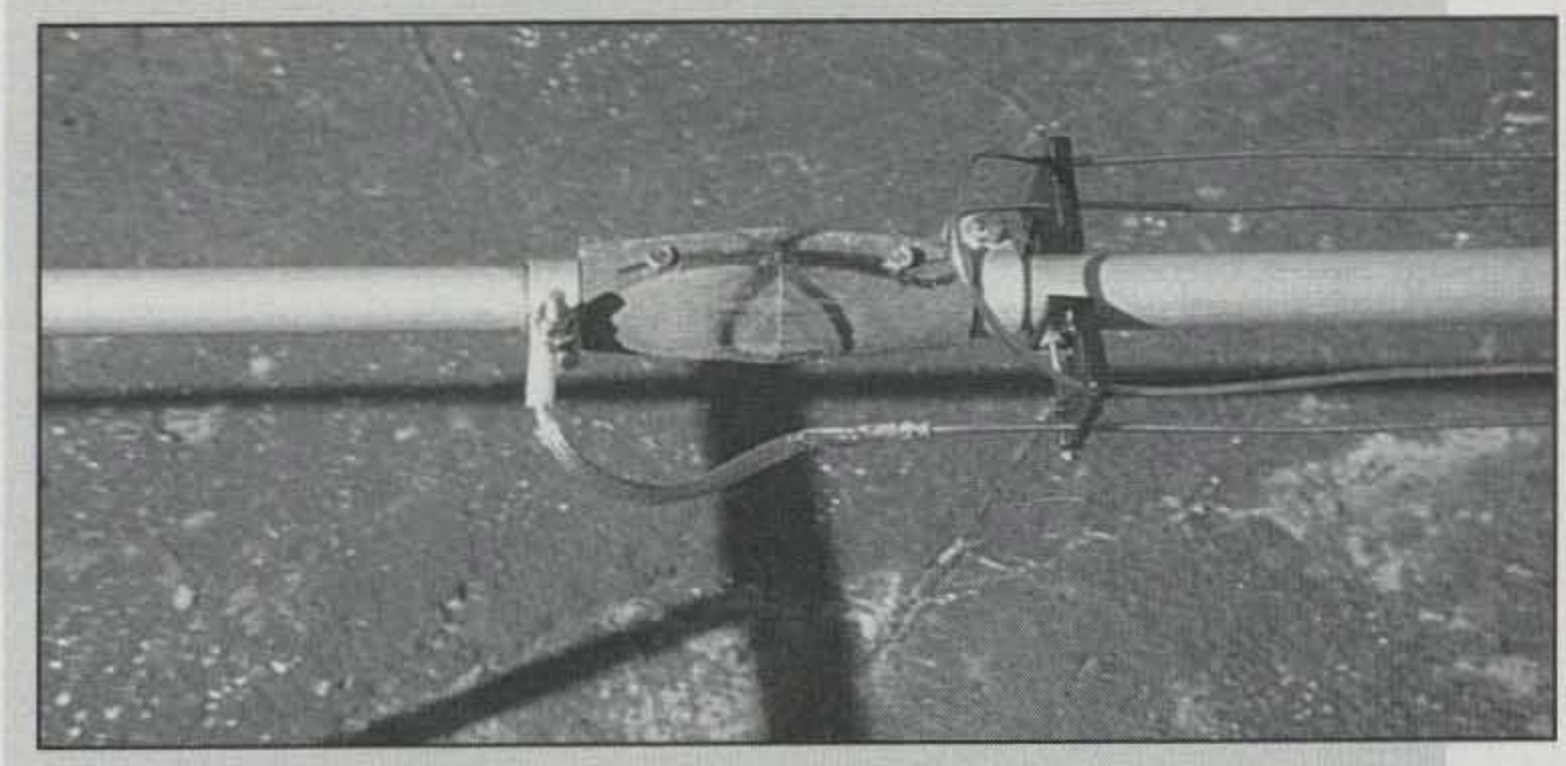


Photo F– Re-strung linear loading segment showing flexible connection.

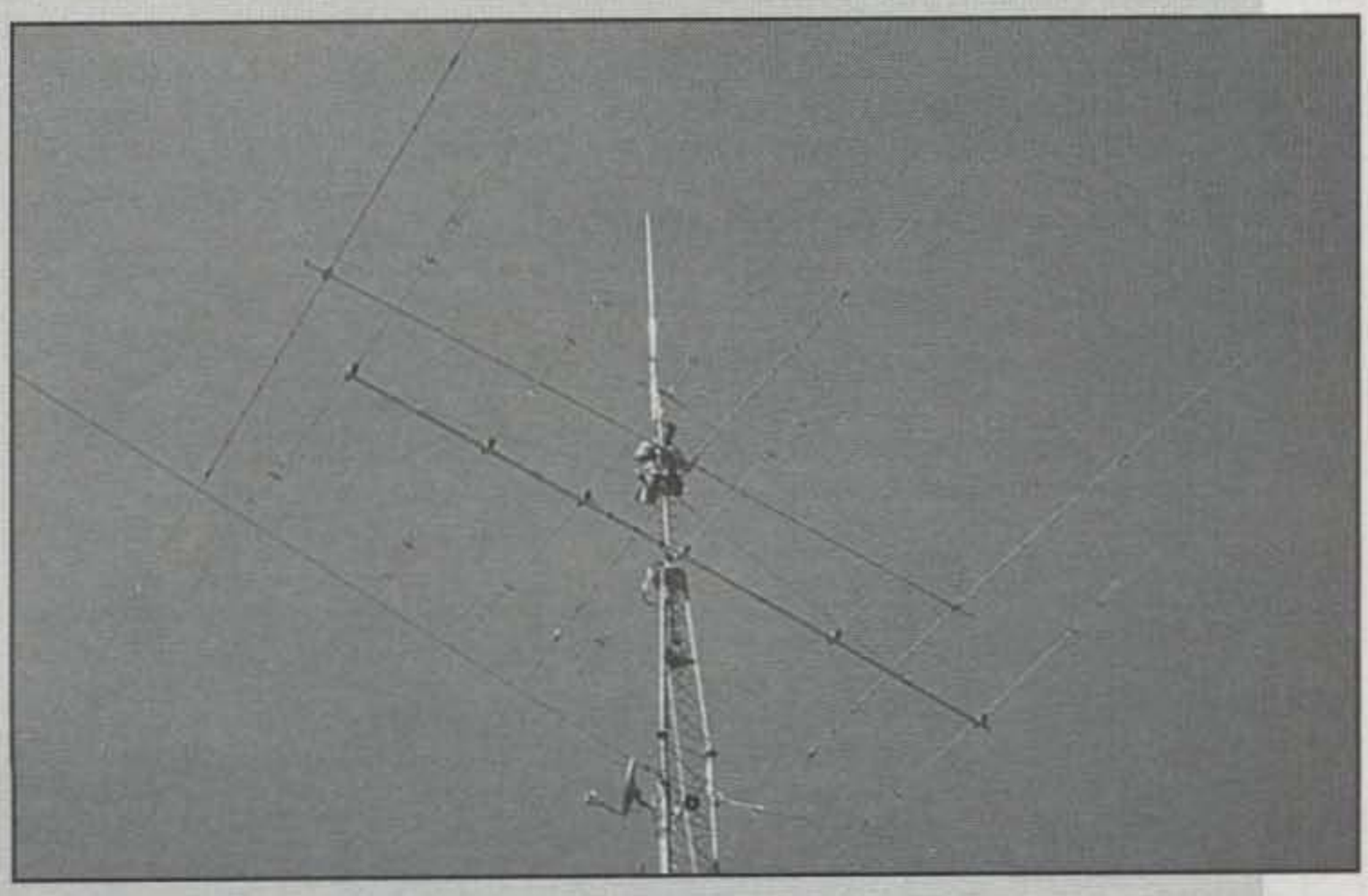


Photo G– Installation of repaired antenna.

and ensure that they are in perfect alignment. Drill one 1/4 inch hole all the way through the boom and element-clamp and install a graded 3 inch bolt, lock washer, and nut. A little Lok-Tite® may help hold the nut in place. This added bolt will help keep the elements from oscillating from side to side and wearing holes in the boom in the way that Hy-Gain's single bolt-locking system does. The completed job is shown in photo G.

Tests were run after the installation was completed. I was pleased to find out that the bandwidth had improved with the VSWR changing from a range of 2.1 through 1.0 to a range of 1.5 through 1.0. This may be a good check to make before everything is permanently mounted.

Summary

The entire job took about 16 hours spread out over a three week period. It was interesting to note that the antenna was in the position shown in photo C during a 50 mile per hour wind storm and it sustained no damage. The most satisfying result of this project besides restoring a "dead" antenna to "life" was that the entire project only cost about $200 including lunches and breaks. Hope you have as much success as we had! ■

What You've Told Us...

The results of our August survey on contest activity were interesting (as always). Among those who responded, 86% participate at least sometimes in on-air contests (20% rarely, 35% occasionally, 31% regularly), but only 1% consider themselves "big guns." Among the rest, 13% consider themselves serious contesters but "little pistols," while 27% say they're more than casual but less than serious contesters. Another 18% categorize themselves as casual contesters, while an additional 27% say they're non-competitors, operating in contests to work toward personal goals or to give out points. Again, 14% say they don't operate contests.

The number of hours you typically operate in a 48-hour contest is inversely proportional to the number of respondents at each level. Only 3% say they operate all 48 hours; another 3% report operating 37–48 hours, while 17% operate 25–36 hours, 18% operate 13–24 hours, another 18% operate 5–12 hours, and 26% operate four hours or less. Overall, though, nearly one quarter of you operate at least 24 hours in a typical 48-hour contest and over 40% operate more than 12 hours.

The vast majority of you (78%) operate single op/single transmitter stations from home, with only 2% each operating single/single mobile, assisted, multi/single, or multi/multi. It is therefore no surprise with that in mind that most of you (55%) operated with low power (6–100 watts) and with either a single Yagi on a single tower (38%), one or more wire antennas (34%), or a multiband vertical (21%). Many of you indicated some combination of the above, but only 13% have the benefit of multiple Yagis and only 6% attempt contesting with either "stealth" or mobile antennas.

These responses confirm our long-held belief at *CQ* that the "little guys" are the lifeblood of our contests. If it wasn't for you, those very few "big guns" would have very few other stations to work! This month's free subscription winner is Ken Floyd, W5AMA, of Amarillo, Texas.

Reader Survey October 2002

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

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

Since this month's issue is a QRP Special, we'd like to hear your views on low-power operating and see how much they've changed since we last asked these questions a year and a half ago.

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

1. ... whether you have ever operated QRP (5 watts or less) on the HF ham bands. (Please choose only one response.)
- Yes....33
- No....34
- Do not operate HF....35

2. ... whether you currently operate QRP (5 watts or less) on the HF ham bands. (Please choose only one response.)
- Yes....36
- No....37
- Do not operate HF....38

3. ... your opinion of QRP operating
- My favorite way to operate....39
- Fun to do once in a while....40
- I'll do it if it's the only way to get on the air....41
- Not for me; life's too short for QRP....42

Please answer the following questions only if you answered "yes" to Question 1.

Please indicate...

4. ... your favorite QRP mode
- CW....43
- SSB....44
- Digital....45

5. ... whether your QRP equipment is
- homebrew....46
- a QRP-only kit....47
- a QRP-only commercial rig....48
- a standard commercial rig with the power turned down....49

6. ... where you do most of your QRP operating
- at home....50
- at a portable fixed location....51
- while mobile (in a vehicle)....52
- while walking (HF Packing)....53

7. ... whether the antenna(s) you use primarily for QRP is/are
- a Yagi (or similar) on a tower....54
- a permanent wire antenna....55
- a temporary wire antenna....56
- a mobile antenna....57
- a portable antenna....58

8. ... whether you are a member of a QRP specialty club
- Yes....59
- No....60

Thank you for your responses. Our survey staff will be taking the next couple of months off for a trip to Tahiti (sorry, no radios). We'll be back in January (with tans and coconuts).

Meet Our New Family of Mobile/Base Transceivers

Fantastic Features • Rugged • Good Looking • Superior Alinco Value!

Each member of our new "family" includes:

- 100 memory channels
- Large alphanumeric display
- CTCSS and DCS encode+decode, DTMF encode and European Tone Bursts
- Large, comfortable backlit mic
- Ten autodial memories
- Accepts optional EJ-41U internal 1200/9600 TNC
- Rear panel DSUB9 serial connector for packet operation
- Front panel input for GPS/APRS® operations
- Ignition key on/off feature
- Theft alarm feature
- Multiple scan modes including CTCSS and DCS
- Available with classic black(T) or pewter(TG) colored chassis
- Narrow FM operation feature
- 1200/9600 bps capability with internal or external TNC
- Wire clone feature

DR-135T/TP/TG/TPG 2 Meter FM Transceiver

Additional features include:

- 144 ~ 148 MHz TX/RX
- AM Airband RX (118 ~ 136 MHz)
- Extended Receive 136 ~ 174 MHz (FM)
- MARS capability
- 50/10/5 watt power output settings
- Available with or without internal 1200/9600 TNC
  TP and TPG include factory-installed TNC

By Popular Demand!

DR-235T/TG 222 MHz FM Transceiver

Additional features include:

- Amazing low price for 222 MHz
- 222 ~ 225 MHz TX/RX
- Extended receive 216 ~ 280 MHz (FM)
- 219 ~ 220 MHz TX/RX capability (see FCC rules)
- MARS capability
- 25/10/5 watt power output settings
- Accepts optional EJ-41U 1200/9600 internal TNC

DR-435T/TG 440 MHz FM Transceiver

NEW!

Additional features include:

- 430 ~ 450 MHz TX/RX
- Extended receive 350 ~ 511 MHz (FM)
- All memories capable of odd splits
- 35/10/5 watt power output settings
- Accepts optional EJ-41U 1200/9600 internal TNC

www.ALINCO.com

Distributed in North America by ATOC Amateur Distributing LLC • 23 S. High St., Covington, OH 45318 • (937) 473-2840

Chances are your rigs run on 12 volts DC. However, your house runs on 110 volts AC ... until you lose power. Then nothing works—unless you have a combination AC supply/battery/charger that doubles as an emergency power supply. Here's how to build one.

An Automatic Power Supply/Battery Charger For Your Ham Station

BY P. J. FERRELL,* K7PF

Most new-generation amateur radios operate on 12 volts DC. This makes it convenient to operate them in your car as well as in your shack. For shack use, of course, you'll need a power supply to change the 110 volt AC electricity in your house wires into the 12 VDC that your rig needs. I decided to supply 12 volts to all my radios using a combination of AC supply and battery pack. The battery provides emergency operability (a real plus) but requires attention (a real minus). What I really needed was a 12 volt power system capable of supplying a minimum of 20 amps using AC power, with a battery to provide backup in the event of AC line failure. The battery should require no operator attention whatsoever. Whenever the load current exceeds the trickle charge and the battery voltage drops, the AC supply will come on. It will stay on until the load current drops below a preset value.

The final design splits neatly into three parts: First is the AC supply, second the battery trickle charger, and finally the automatic changeover circuitry. I had an old 30 amp, 12 volt supply which provided the transformer, the diode rectifiers, the transistor heat sinks, and a nice big, black case. A 10 volt Zener diode, a 0–1 mA meter, and a 5K resistor made a very nice expanded-scale voltmeter for the power system. . . . We old guys like analog meters anyway. Circuit design is pretty straightforward using proven (some might say obsolete) technology.

Battery acquisition is in the time-honored amateur style (in descending order): your junk box, other people's junk boxes, swapmeets, and when all else fails, buy one. When Steve, K7LZJ, moved away, I lucked out and was the recipient of his treasure trove of 30 AH (amp-hour) high-discharge, nickel-cadmium batteries (NiCads) made by NIFE in Sweden.

Photo A– Front view of the automatic power supply and charger. Of course, it should be covered when in use.

Ten of those puppies will put you in business big time. This supply will work nicely with either NiCads or lead-acid batteries; the higher the battery capacity the better.

Part 1: AC Supply

After more than 30 years of repairing repeater power supplies under less-than-ideal conditions, I was driven to the conclusion simple is best. Somewhere along the line I stumbled across a series-pass circuit using a three-legged regulator and a PNP power transistor. It doesn't get a whole lot simpler than that. Want more current? Add another series-pass transistor, ensuring load sharing with emitter resistors. Only the regulator knows about the supply voltage. The pass transistor(s)

*e-mail: <philf@olypen.com>

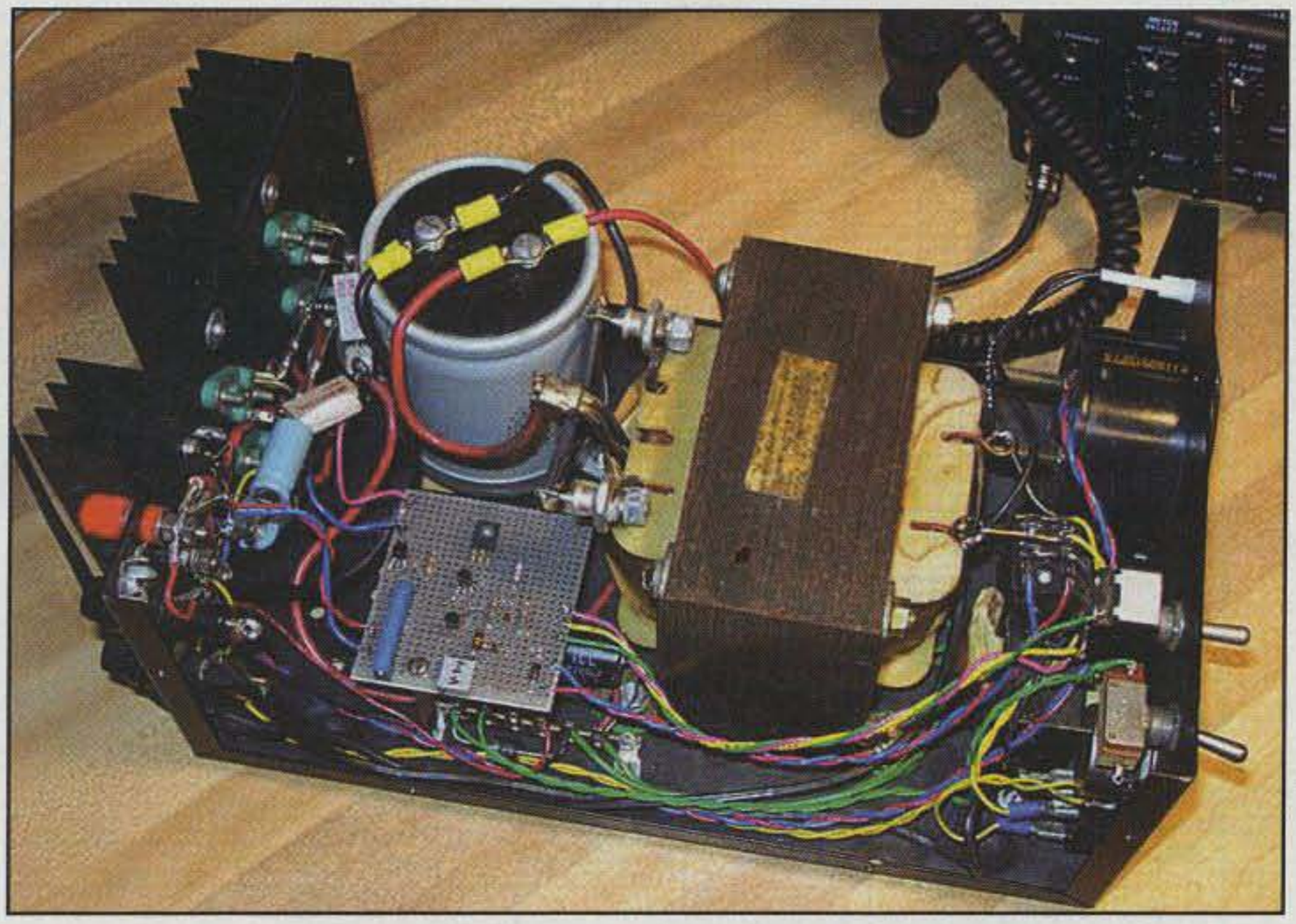


Photo B– Interior view of parts layout. As you can see, most of the wiring is "old-fashioned" point-to-point, with just a few small components mounted on a piece of perfboard.

greatly extend the current delivery capacity of the regulator. Normally one would add a crowbar circuit, but when floated across a big battery, a simple fuse in the transformer primary elegantly solves the pass- transistor failure problem. The 7812 regulator delivers the first few milliamperes all by itself. As the load current increases, the big PNP pass-transistors come on line and share the load with the 7812. A small pot in the 7812's ground lead lets you trim the output voltage from 12 to 14 volts. No complicated circuit cards with ICs and many transistors, just a few components. If you worry about regulation, the output drops 0.1 volt when the load current changes from 200 mA to 20 amps (100:1 increase).

Just about any PNP 15-20A power transistors will work for the series-pass regulators. I have used PNP power-Darlington transistors, which work especially well. The 7812 regulator output and the pass-transistor collectors go directly to the battery bus connector. An isolation diode is *not* required for this component arrangement.

Part 2: Battery Charger

This part of the circuit looks a bit like a single-wave voltage doubler, except that the "output capacitor" is the battery. It is called a *charge transfer* charger, and works as follows:

The capacitor is charged to peak AC voltage by the negative peak. A half-cycle later the capacitor discharges into the battery. This repeats 60 times per second. Battery charging current is given by the simple formula I = C*F*dV, where I is in current in amperes, C is capacitance in Farads, F is the line frequency of 60 Hz, and dV is the voltage difference between a fully charged and a fully discharged capacitor.

If the charger transformer has a 6.3 volt RMS secondary winding, then the peak voltage is about 9 volts, and Vpp is 18 volts. The value for dV used above is Vpp – Vbat. If Vbat (battery voltage) is 13 volts, then dV will be 5 volts. Thus, a 2000 µF capacitor will give a theoretical charging current of 600 mA (I get 500 mA).

A couple of design details need attention: First, capacitors are commonly rated in volts, not amperes. Capacitors all have an internal series resistance. For larger trickle-charging currents, consider paralleling capacitors. Several capacitors in parallel add their capacitances and reduce the series resistance. Electrolytic capacitors can get hot and explode, so beware. Second, if the peak AC voltage exceeds the battery voltage, the capacitor can become reverse charged. That's not a good thing for electrolytic or tantalum caps. I use a 6.3 volt, 1 amp filament transformer (about 10 volts peak) for this service, but those are mostly a junk-box item these days. It does pay to know old timers, particularly those with healthy parts collections. I used 6 amp Schottky diodes, mainly for the reduced voltage drops they provide.

The fused output of this charger goes directly to the battery bus connector as well. The output Schottky diode acts as an isolation diode for this component arrangement.

Part 3: Automatic Changeover

The AC supply should come on when the battery load current exceeds the trickle charge and the battery voltage drops a bit. Battery voltage is measured by an important part of the circuit known as a *voltage trip.* When battery voltage falls below a preset value (I set mine to 12.7 volts), the selector relay is energized, starting the AC supply and turning off the trickle charger. This brings into play the "current hold" part of the circuit. Without it, the voltage trip would immediately cease to hold the relay, since the voltage quickly increases.

Supply load current can roughly be determined by measuring the voltage drop across the 30 ohm, 1 watt resistor. The current-hold portion keeps the relay energized until such time as the load current falls below a preset value (I set mine to 500 mA.). I used ten-turn (10T) pots for adjusting both the voltage trip and current-hold values.

My transistor selection was driven by stock on hand. Any PNP/NPN small-signal switching transistors with current gains around 100 should work okay. Suggested types are given in the schematic (fig. 1). The NPN relay driver transistor should also be able to dissipate about half the power needed to hold in the relay. Any 1 watt NPN switching transistor should work well for a relay driver. I used an SPDT center-off switch to manually select trickle charge or AC supply. When set to center off, supply selection is automatic.

Integration

Supply transformer primary selection uses a lowly SPDT relay. It is actually a RadioShack DPDT 12 volt relay with heavy contacts, which are connected parallel. I've used solid-state switches and blown lots of fuses because of them. A Triac shuts off at zero current, which leaves transformer flux at maximum. If you attempt a turn-on at a time when the flux tries to increase further, the core promptly saturates, and a big transformer will blow *any* size fuse when that happens. Most people have noticed that a big transformer will "groan" once in a while when turned on. Switch and relay contacts "bounce" and arc, which relieves the problem. I learned long ago not to use Triacs or mercury-wetted relays to switch big

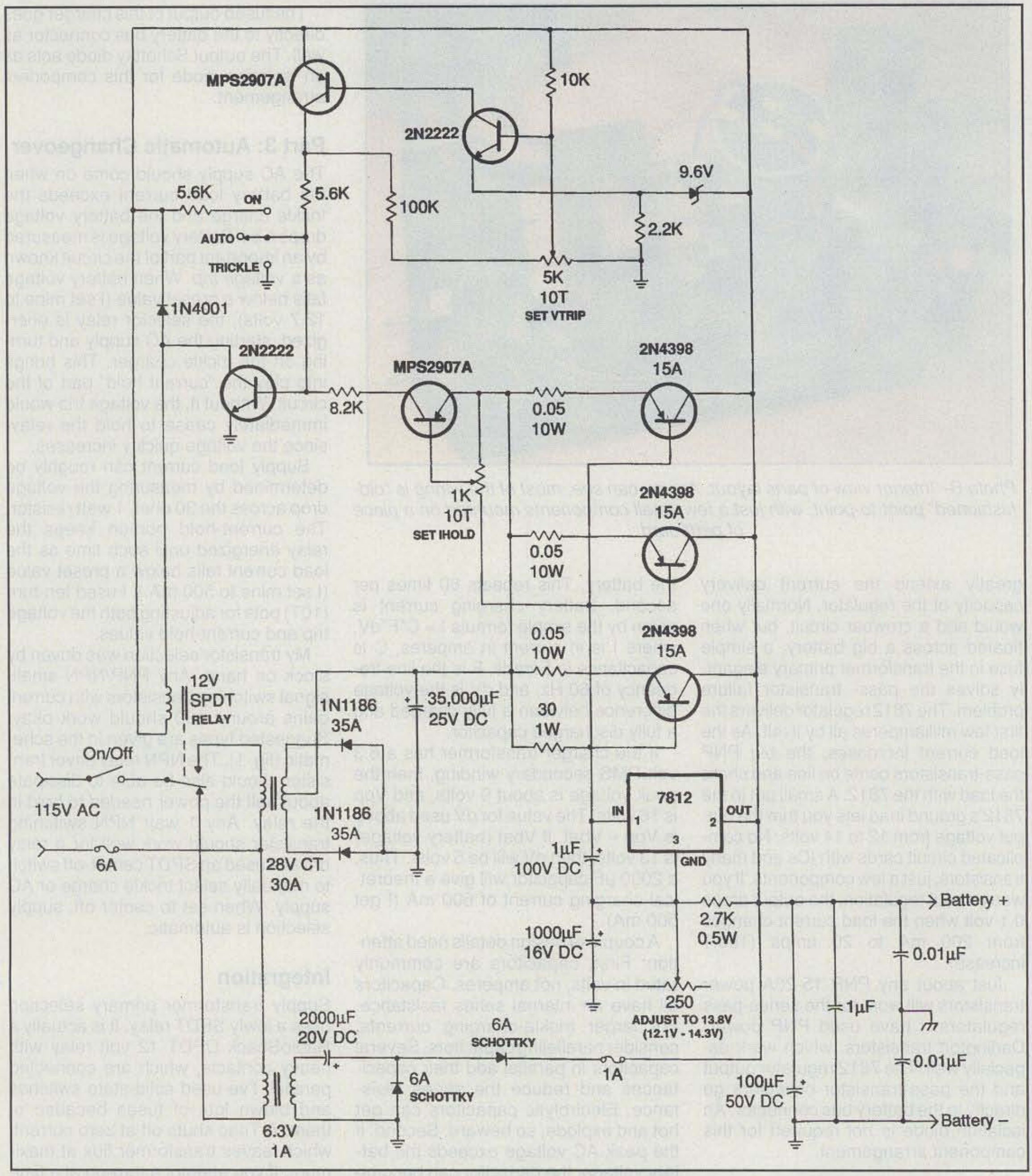


Fig. 1– Schematic of the automatic power supply. Many of the specific parts are the author's suggestions, but similar parts in your junk box may often be substituted. (See text for specifics.)

transformers, unless they are *very* conservatively wound.

Construction

The AC supply is wired point-to-point. The battery charger is wired on a small terminal strip. The automatic changeover is wired on a 2 inch square perfboard. I used Vector T44/M miniwrap terminals for all components and wiring terminals. Connections between the pins are made on the bottom with wirewrap. Various friends are partial to perfboard stitch-wiring or making their own etched circuit boards, so pick your own favorite wiring method.

Photo A shows the front panel. I also added a neon pilot light across the AC supply transformer's primary to indicate when the power supply is on. These are

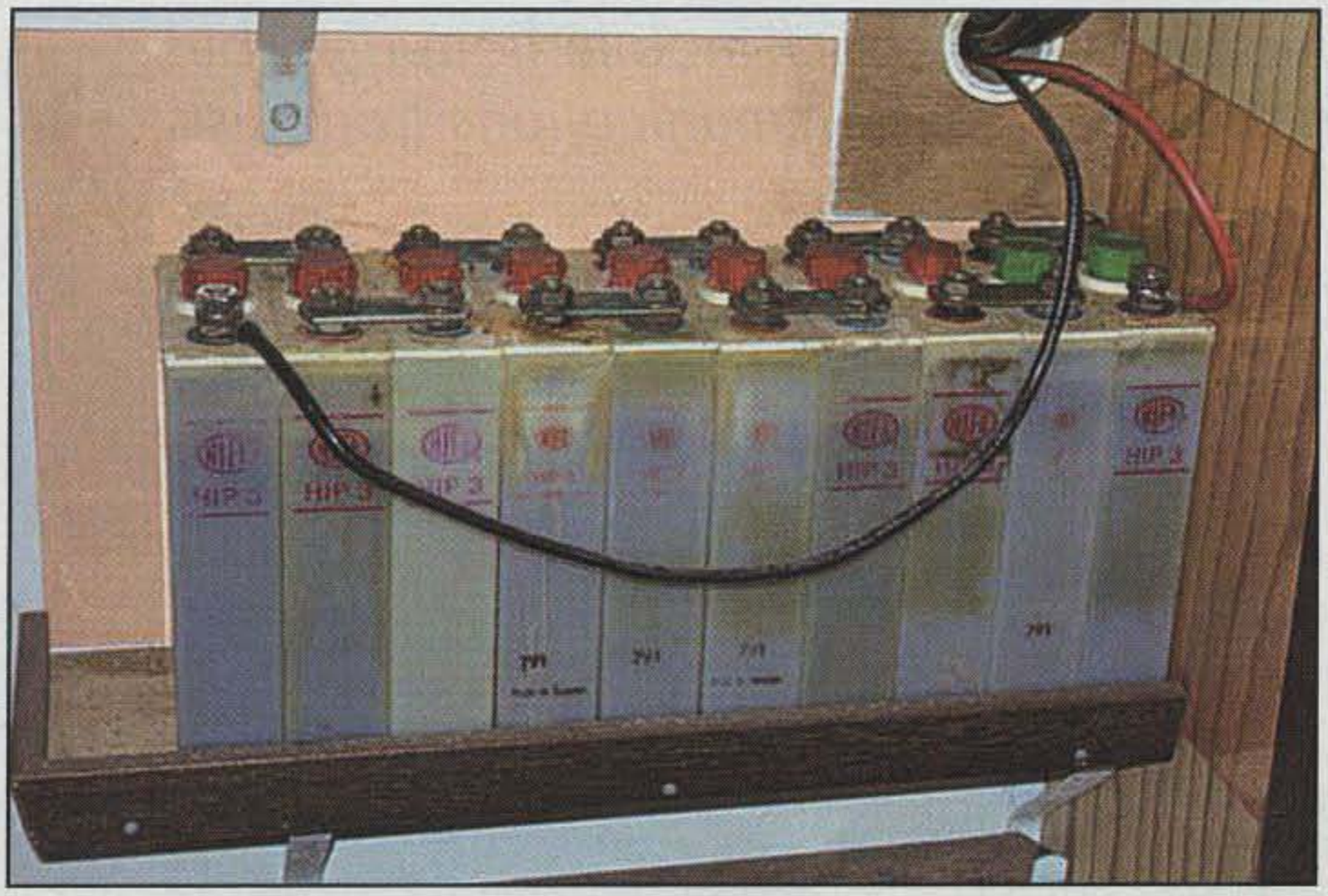


Photo C– The batteries do not need to be physically co-located with the supply/charger. The author keeps his batteries out of the way on a shelf in his garage.

not required items, and so are not shown in fig. 1.

Photo B shows parts layout and wiring. As a licensed gadgeteer, I included the expanded-scale voltmeter mentioned above so I could watch and marvel. The completed supply connects to the battery bus just the same as the radios do. My NiCad cell pack is on a shelf outside in the garage (see photo C), and connects to the 12 volt bus with short No. 4 red and black wires. This is another advantage of the design: The batteries don't have to sit in the shack with the power supply, but can be safely in another part of the house. I made my own 12VDC distribution bus from a breaker-box grounding bar. You know, one with lots of holes and a set-screw for each hole. The radios (and the automatic power supply) connect to the bus with banana jacks. You can save a nickel by just tinning the wires, but it's a whole lot prettier with those black and red banana jacks.

Performance

A high-current supply using a 7812 regulator and three 20 amp PNP series-pass transistors has powered the Seattle Repeater continuously since 1976, with no component failures. It also seems to be immune to site lightning strikes.

When first turned on, my HF transceiver will operate in receive for about 15 minutes (with slowly decreasing voltage) before the supply turns on. Once on, the supply stays on until the rig is turned off. One 2 meter radio is always on, and it pulls 80 mA on standby. The half-amp trickle charge splits between the radio and the battery, much like the old "battery burping" pulse chargers did.

"Rolling your own" power supply is a fairy easy, straightforward project. When you add in the battery/charger and the automatic switchover, you also have an emergency power supply that's always charged and ready for the unexpected.

These aren't your typical mobile or backpack-mobile ham rigs, but they certainly were designed to provide communications from just about anywhere.

Military Manpack Radios

BY BEN NOCK,* G4BXD

The rebirth of amateur radio after World War II was fueled in large part by the sudden availability at low cost of thousands of surplus military radios that could easily be converted to ham use. While today's commercial ham rigs offer many bells and whistles you won't find on a radio designed for military use, the enterprising ham can still find radio gear on the surplus market ... and modifications often aren't needed, as they tend to cover the entire HF spectrum! With renewed interest in upgrading military communications today, more surplus gear may soon appear on the market and find its way onto the ham bands, especially for mobile and portable use. G4BXD offers us an introduction to some of what's out there today.

—W2VU

Many amateurs are interested in military equipment. I don't know what the fascination is with such sets, even though I do have a modest collection myself. Maybe it's the thought that some of the sets actually may have been to war and been used for something just a little more exciting than discussing the weather.

As with all facets of the hobby, there are divisions even within this strain. Some like collecting a particular type of set (Air Force, Navy, or Army); some like collecting foreign sets, although many of the Eastern Block sets are not to my taste; and some like either the old sets or the new. Many of the newer military sets—say, from the 1980s onward—are still in use, and although not classified as such, they are still hard to come by. Apparently, the majority of those sets released from the MOD (Ministry of Defense) find their way to African and Far Eastern homes.

Despite the above, there are a few rather modern sets around, so I'll describe some of the European sets for your enlightenment. It must be said that after the 1960s, most military sets went toward the "dial-up a frequency" method—i.e., they have several knobs that you adjust to the required frequency. This was ideal for military use, but it makes tuning the ham bands a very difficult task indeed.

**62 Cobden St., Kidderminster, Worcs., DY11 6RP United Kingdom*
e-mail: <g4bxd@qsl.net>

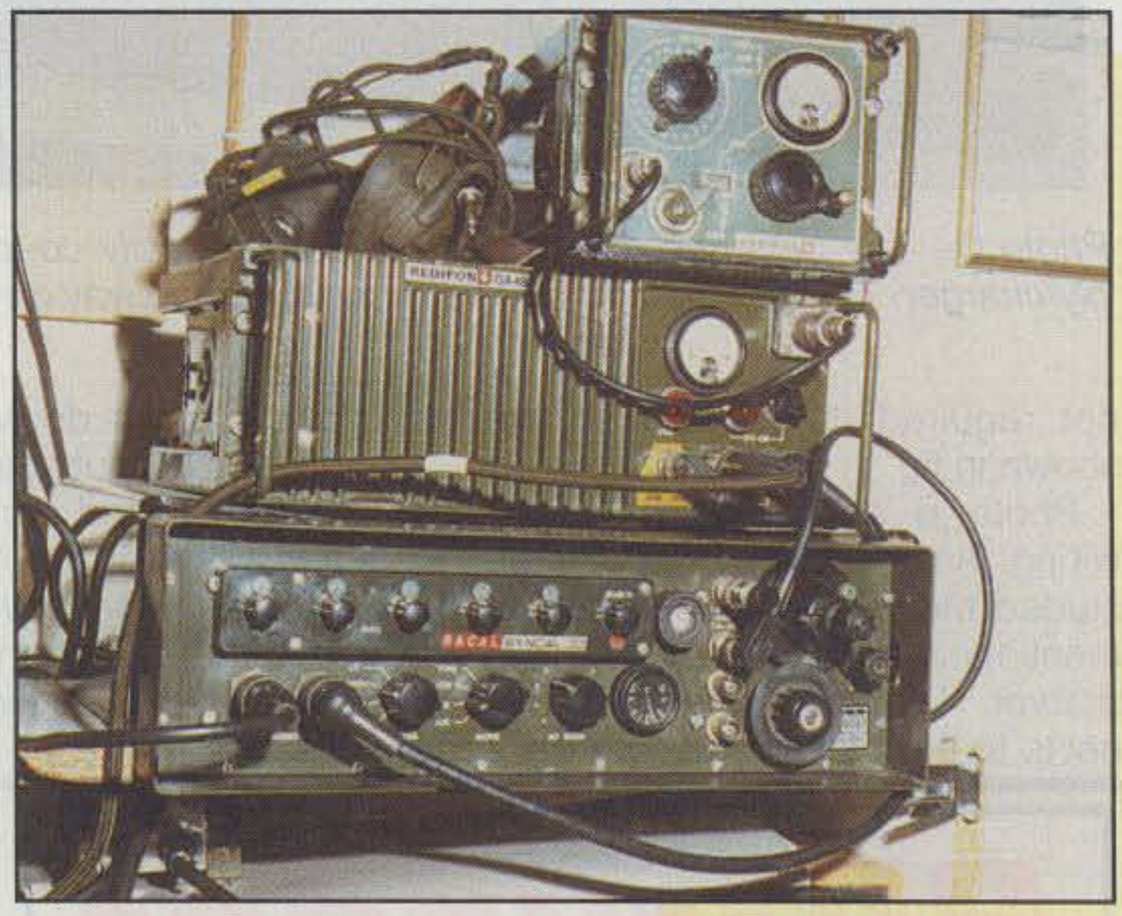


Photo A– The Racal Syncal 30 in use with the GA480 amplifier and ACU9 antenna-tuning unit.

Photo B– The PRC320 HF manpack transceiver with handset and key. Battery attachment is on the right. The antenna would plug into the left-hand edge.

The Racal Syncal 30 Transceiver

Racal is a well-known name in the manufacture of military equipment. The Syncal 30 designation covers several sets, including the more recent frequency-hopping types. For example, the one described here is the TRA.931X version, while the XH is the hopping variety—not much use on the ham bands. Think what your log-book entry would look like!

The TRA.931X provides coverage of 1.6 to 29.999 MHz in 28,400 channels. Now that's what you call a CB rig! The channels are spaced 1 kHz apart, and a "search" (or clarifier) knob

Photo C– The French TRC300 manpack transceiver with battery on the left and automatic ATU on the right.

Photo D– The Redifon GR-345 with the GA-480 amplifier and ACU9 ATU in use in the author's shack.

allows the operator to fill in the gap smoothly. Modes provided include USB and LSB, AM and CW modes, and the set runs a nominal 20 watts on high power and some 5 watts on the low-power setting. Two headphone/microphone sockets on the front panel allow operator and commander inputs with an intercom facility between operators provided.

In the backpack role, a 24 volt nickel-cadmium battery pack attaches to the bottom of the set, although an external supply can be used both as the main power source and as a charging source for the batteries. A complete manpack set —with haversack, battery, whip, and headset—weighs in at 11 kg (24 lbs).

The internal construction of the transceiver unit is on two main printed-circuit boards with two smaller PC boards being used for switching and ATU functions. Total screening against unwanted external pick-up is widely used. A meter on the front panel shows the state of the battery in the receive mode and RF output in the transmit mode. Two small LEDs inside the meter case give indications as to the direction in which the internal ATU tuning coil needs to be adjusted for maximum output.

The Syncal 30 can be used as a backpack set on its own, or mounted in a vehicle and used with a 100 watt amplifier. Whip antennas are used when portable and again when mobile, although dipoles and wire antennas can also be matched.

The PRC-320 Backpack

The PRC-320 is very similar to the Syncal 30, synthesized from 1.5 to 29.999 MHz CW, SSB (USB), and AM. The 320 offers the choice of wide and narrow bandwidth (on receive) CW and USB voice, while the 320/1 version offers just wideband CW but USB and LSB speech.

The 320 will run around 15 to 25 watts, with 5 watts in low-power mode, depending upon the state of the battery (a 24 volt type). The set operates into a whip while portable, but also can be matched into a wire antenna or dipole for fixed use. Tuning of the set is by six selector knobs, allowing a minimum tuning of 100 Hz. However, there is no provision for a clarifier, so if the set is adjusted for best receive signal, the transmitter frequency also moves.

Included at the top of the set is an ATU, which allows the various types of antennas to be used. Affixed to the side of the set is a large data plate which gives the operator guidance as to the ATU settings for various antenna configurations.

With its strong die-cast case and large battery, the whole set is very heavy. A small rucksack-type frame is used to enable the operator to carry the set on his back, but I for one would not want to have to go into battle with it and a rifle on my back.

The TRC-300

First made around the late 1970s, this set was manufactured by Thomson CSF of France and was supplied to many users in countries including South Africa and Argentina. Basically, the specifications are as follows: frequency 2 to 30 MHz, spacing of 100 Hz or 1 kHz according to version; operation on phone/SSB (A3j–A3h) and CW (A2j); power (PEP) 6 or 20 watts, selectable; sensitivity 0.6 microvolts for S+N/N >12 dB; power supply 15 volt nickel-cadmium battery; temperature (operation) –15 to +55 degrees C; weight 8.5 kg (approximately 19 lbs).

The TRC300 does have some interesting points. For starters, it has an automatic ATU. Change frequency on the set, and motors whirl and the ATU is retuned. This is convenient but does draw on the battery supply. This set came with a hand-cranked charger, which would be ideal in the field for pumping up the battery.

One thing that worried me about this set, though, is the fact that when you switch the unit on or move frequency more than 10 kHz, the auto ATU kicks in. Unlike the Syncal 30 or PRC320 ATU, which is manual and can be tuned for best received signal first, the TRC300 actually transmits a carrier and somehow must look at the match as it rotates the ATU coil. This would, in effect, give away its position to the enemy. There are many systems today that could lock on to the tuning signal and give distance and bearing, ideal information for passing to a mortar team.

One useful point, though, is that the tuning knobs do not have a stop fitted. In other words, if one has to dial up a new frequency and, say, the knob is set at the 9 division and the new setting is 1, with the PRC320 you have to rotate the knob all the way back, while with the TRC300 two clicks through zero to one get you to the required position. This is a small detail, but it's very useful in ham applications.

The Redifon GR-345D Station

Although not quite a backpack set, the GR-345D transceiver (driver unit) is listed as a manpack. Along with its matching amplifier (the GA-480), ATU, and power supply—making the radio station GR-479—the GR-345D can be found at UK

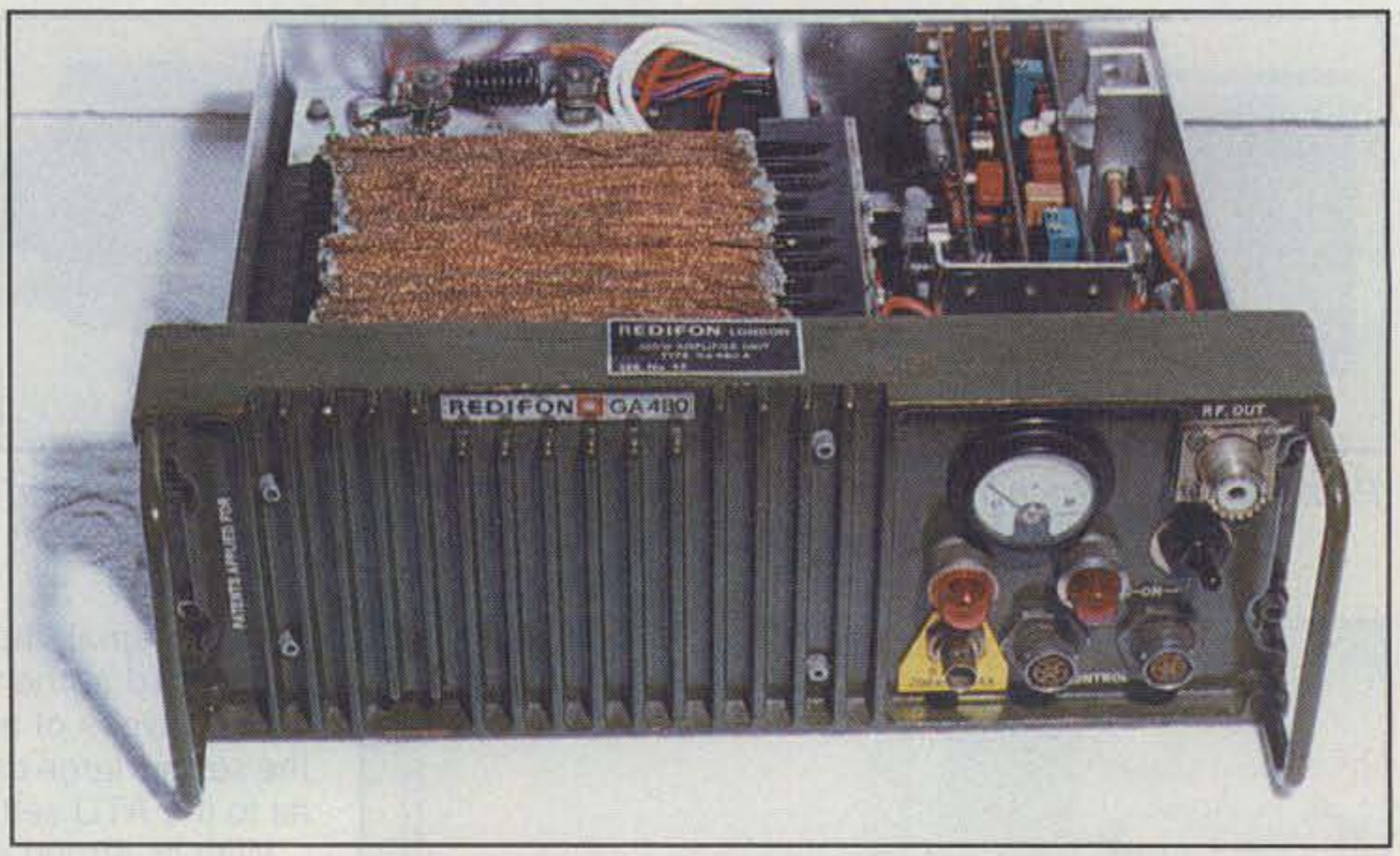


Photo E– The inside of the GA-480 amplifier showing the large heatsink (left) and driver and control boards.

rallies and the like. This portable/fixed/mobile system is capable of 100 watts RF output and covers 2 to 12 MHz, giving SSB (USB), CW, and AM modes.

The driver unit is again typical of the later-day military sets. Four knobs allow the frequency to be "dialed" up, with a clarifier control to tune the slight gap. The four knobs adjust the MHz, the 100 kHz, and the 10 and 1 kHz ranges. The clarifier range is quoted as ±1 kHz normal shift.

The power output of the 345 driver unit is a mere 100 mw. While a 24 volt battery pack is used, the entire set, except for the main TX/RX relay, runs off an internally regulated 12 volt line. A small meter on the front panel gives an indication of battery state on receive and an RF output indication on transmit.

A 24/28 volt supply is normally used with power consumption on RX at 4 watts and on TX at about 16 watts, so less than 1 amp will run this set. The transceiver is 32 cm deep by 31 cm wide by 10 cm high (12.8 by 12.4 by 4 in.) and weighs in at 10 kg (22 lbs.).

The GA-480A Amplifier

This solid-state amplifier delivers 100 watts of RF output for an input of between 100 milliwatts and 12 watts. An internal alteration has to be made on the control board, setting the input power at either not greater than 200 milliwatts or not greater than 16 watts.

The input impedance is selectable at either 50 or 75 ohms, while the output impedance is fixed at 75 ohms nominal. The supply needed is 24 volts, some 12 amps needed at full power output.

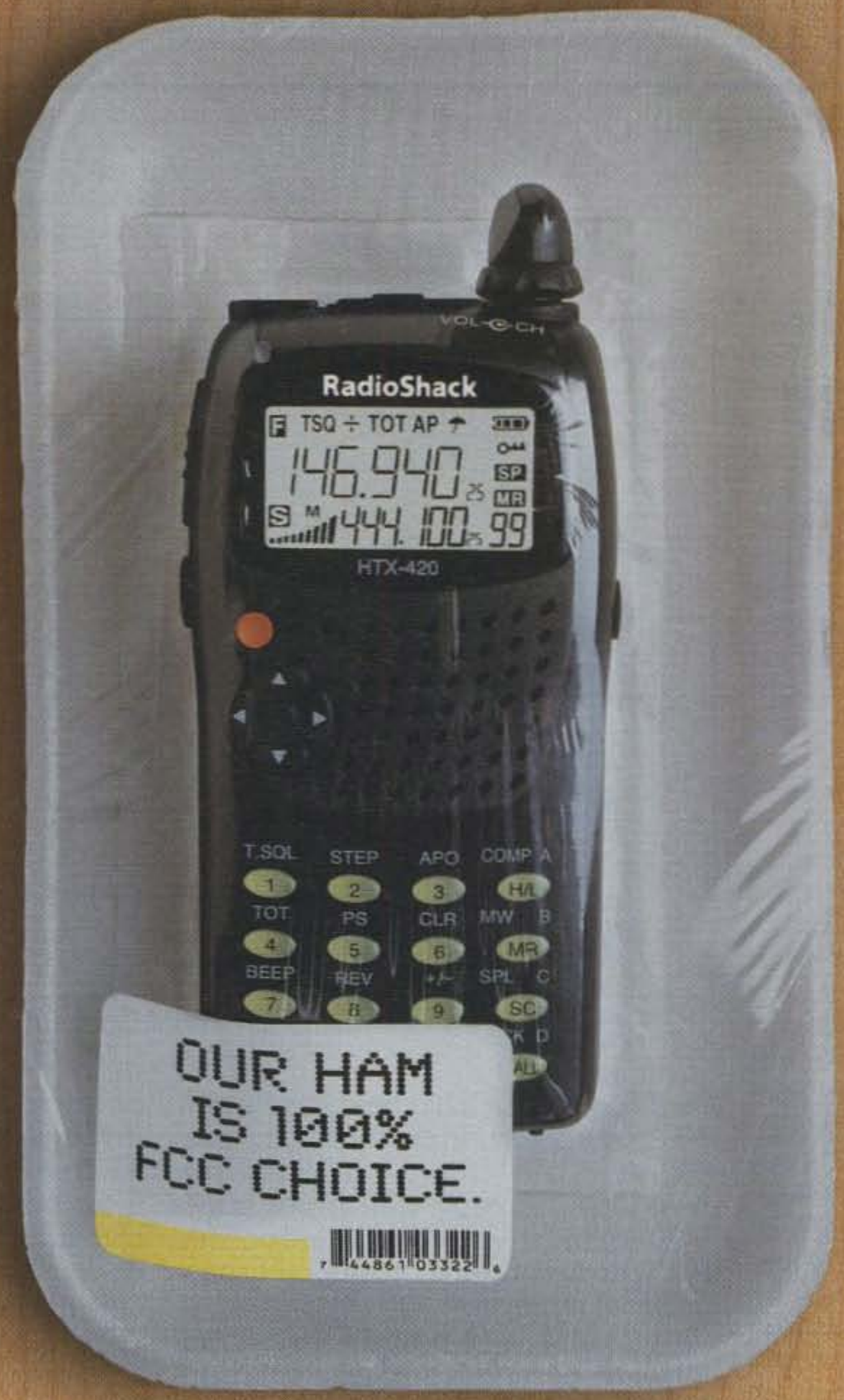
In the off mode and during standby, the antenna is passed directly through the unit to the driver. The front panel also has an ammeter, which measures the current being taken by the PA stages.

No provision for RF switching is included, the amplifier being controlled from the GR-345 PTT by means of a connecting lead. This connecting lead also carries the keying line, and the audio and mic lines, which means that the headset/key, etc., can be plugged into either the transceiver or the amplifier. Three parallel sockets are supplied on the driver set, with another two sockets on the amplifier. The flexibility of this amplifier means it can be used with other sets—the Syncal 30, for instance (as in photo A).

The matching ATU, the ACU9, is designed to match a dipole, whip, or end-fed wire antenna through the range 2 to 14 MHz. The roller-coaster-type coil means a good match can be obtained with a wide range of antennas. An RF detector and front-panel meter give a tuning indication. Connection is via a BNC socket on the front, going to the set, and three screw terminals on the rear.

Finally . . .

There are many other similar sets. As I said at the beginning of this article, most modern sets, or at least those from the 1970s until about the early '90s, used the same dial-up frequency methods. Modern military manpacks have LCD screens and computer-controlled interfaces, making frequency hopping, as well as encryption of messages, easy. No doubt, in a short while some of these will be available on the surplus market, and we will get the chance, as amateurs radio operators, to play with them. ■



But what really cooks is the tasty selection of Ham radio accessories at our many convenient locations. So shop RadioShack for all your Ham radio needs.

25W/10W 2M Mobile Transceiver
HTX-252

Easy to mount and use. 10-channel memory, 1 call channel, 38 CTCSS enc/decode plus 16-key DTMF and up/down mic tuning. Lighted LCD display with signal-level meter. Scan freq. range or memory. Rotary tuning. RX 136–174MHz 100kHz to 8MHz repeater offset. 5.5-ft fused DC power cord, mobile mounting bracket and manual.
#19-1127, $159.99

New Dual-Band Handheld
HTX-420

Feature-rich, 2M/70cm transceiver with up to 5W on 2M, SAME weather alert plus digital compass. 100-ch. memory, 50 CTCSS enc/decode, 16-key DTMF with 6, 16-digit autopatch memory, lighted display and keypad, battery volt meter, condition indicator. 7.2V 1200mAh Li-ion pack and charger, and empty "AA" battery tray.
#19-1108, $269.99.

RadioShack®
You've got questions. We've got answers.®

Visit us at www.RadioShack.com or call 1-800-THE-SHACK®
FCC Amateur Radio Technician Class or higher license required to operate the above products.

Math's Notes

What's New And How To Use It

BY IRWIN MATH, WA2NDM

White LEDs

I am sure that by this time most experimenters are familiar with the white LEDs present in the marketplace. These unique devices have found wide application as back-lighting sources for the newer color displays that are becoming more and more prevalent, or even as the low-current "heart" of simple pocket flashlights. In fact, we have just begun to see some of these devices make an appearance on the surplus market, so it's time to "dig out the iron" and experiment!

In reality, the standard white LED is a blue LED with a special phosphor coating on the inside of the housing. The short-wavelength blue light produced by the LED chip activates the phosphor and causes it to produce white light. Unlike conventional LEDs, however, the forward voltage drop of a white LED (as well as a blue one, for that matter) will be in the range of 3.5 to 4 volts. This means that one or two simple 1.5 volt carbon-zinc or alkaline cells will not produce enough voltage to light a flashlight, if you plan to try to make one. You will need at least three or four cells.

Fig. 1 is the basic circuit and mathematics you need to figure out how to drive a white LED. This example uses three 1.5 volt cells in series to get to 4.5 volts; if you use an LED with a 3.5 volt forward drop, achieving 20 milliamperes flowing through the LED will require a 50 ohm resistor rated at 1/4 watt. This combination should result in a bright white light. Since the circuit draws only 20 ma (keep in mind that you could run it on less), battery life should be much longer than with a conventional flashlight lamp, which could easily draw 100 ma or more.

If you want to use a lower battery voltage, you will have to revert to a voltage-multiplier scheme. Several manufacturers have chips for this purpose, and we chose the LM3354 from National Semiconductor as an example. The circuit shown in fig. 2 (using this chip) will allow operation from voltages as low as 2.5 volts. The chip operates near 1 MHz, by the way, so small charge pump capacitors can be used and efficiency is quite high. You might wish to look at the data sheet for variations in component values to optimize the circuit for your particular application.

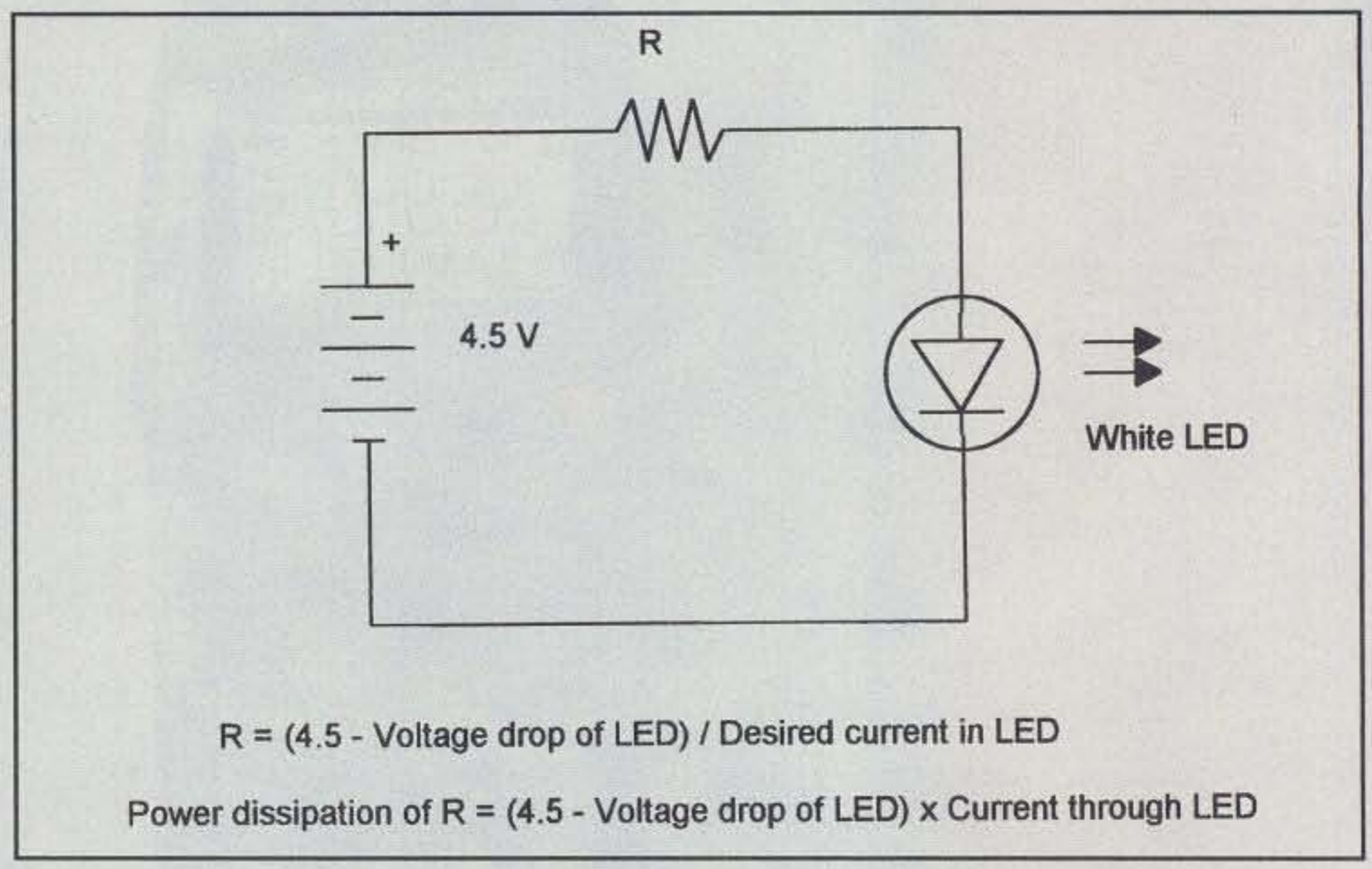


Fig. 1– Basic circuit and mathematics for driving a white LED.

The LM3354 also has a shut-down input, as do similar devices from competing manufacturers, and this input can be used to dim the white LED if desired. Since the output of the chip can be turned off and on by means of a control voltage applied to this pin, strobing it will adjust the brightness. If you apply a 50% duty-cycle square wave to the shut-down pin, for example, the brightness of the LED will drop by about half. Other duty cycles will adjust the apparent brightness accordingly.

To generate such a signal, get out the trusty old 555 and "play around." For those less creative, fig. 3 is a reasonable starting point. More information on

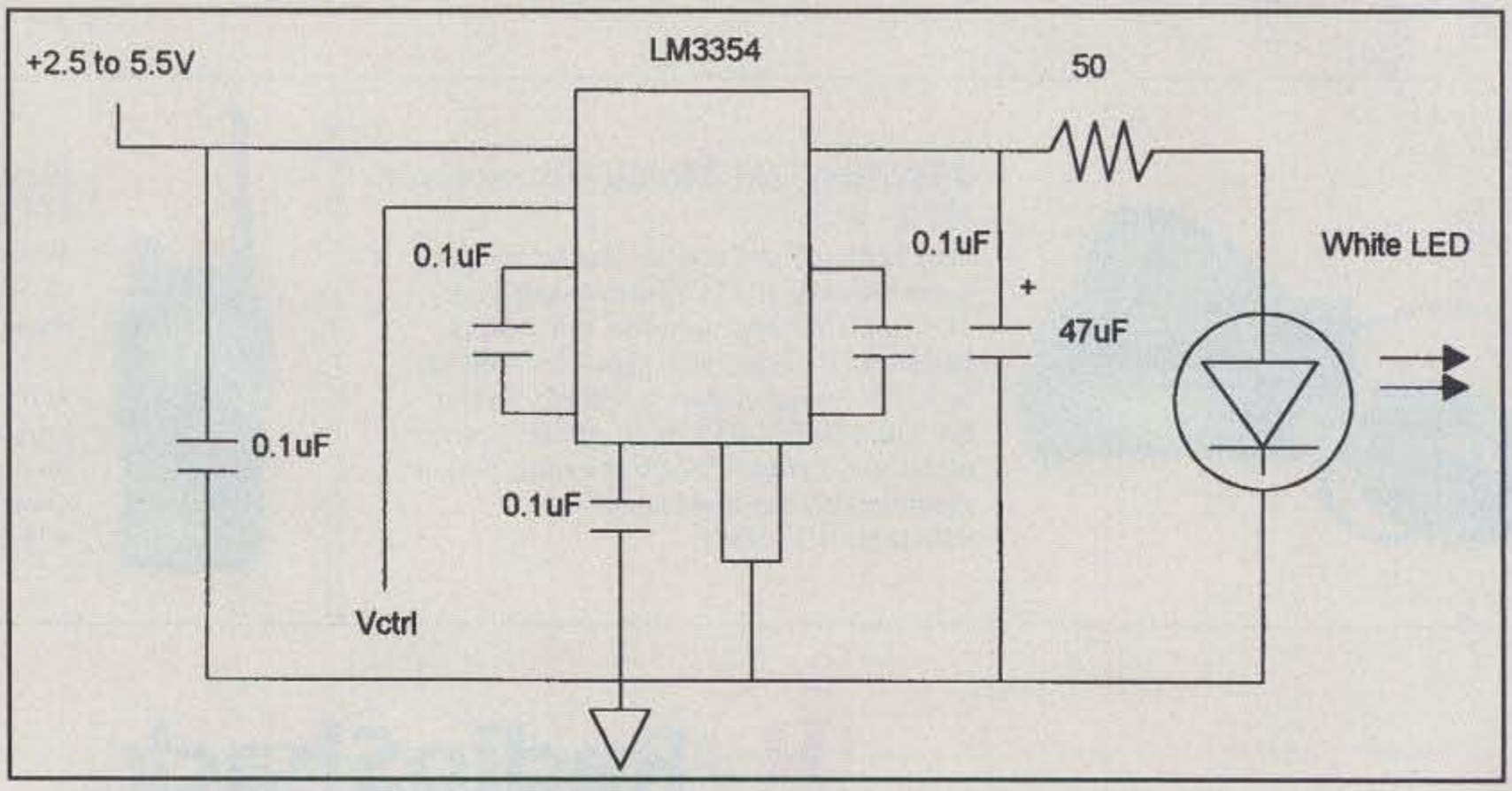


Fig. 2– DC/DC converter for driving white LEDs from low voltage.

c/o CQ magazine

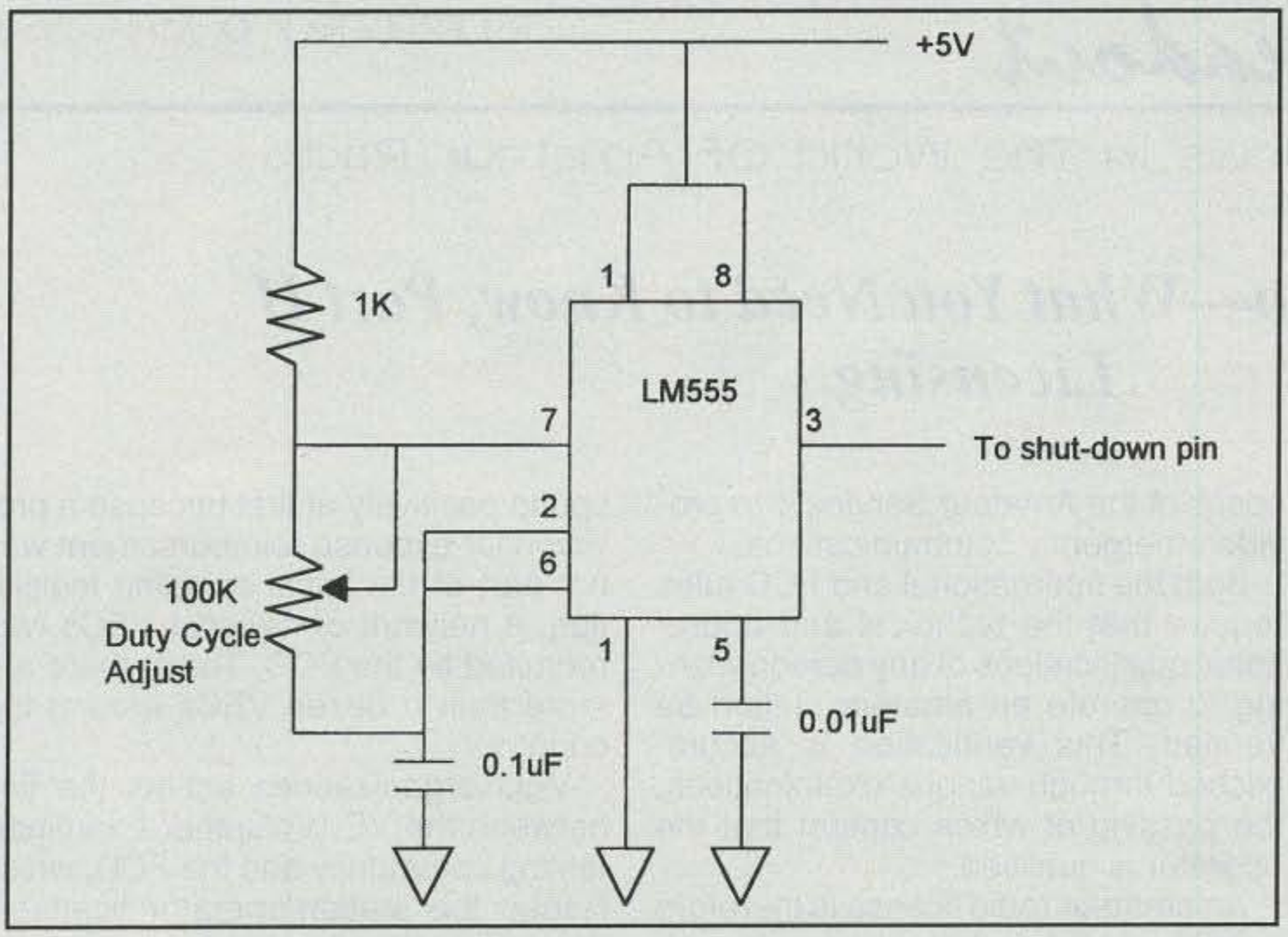


Fig. 3– A variable-duty-cycle circuit for use with fig. 2.

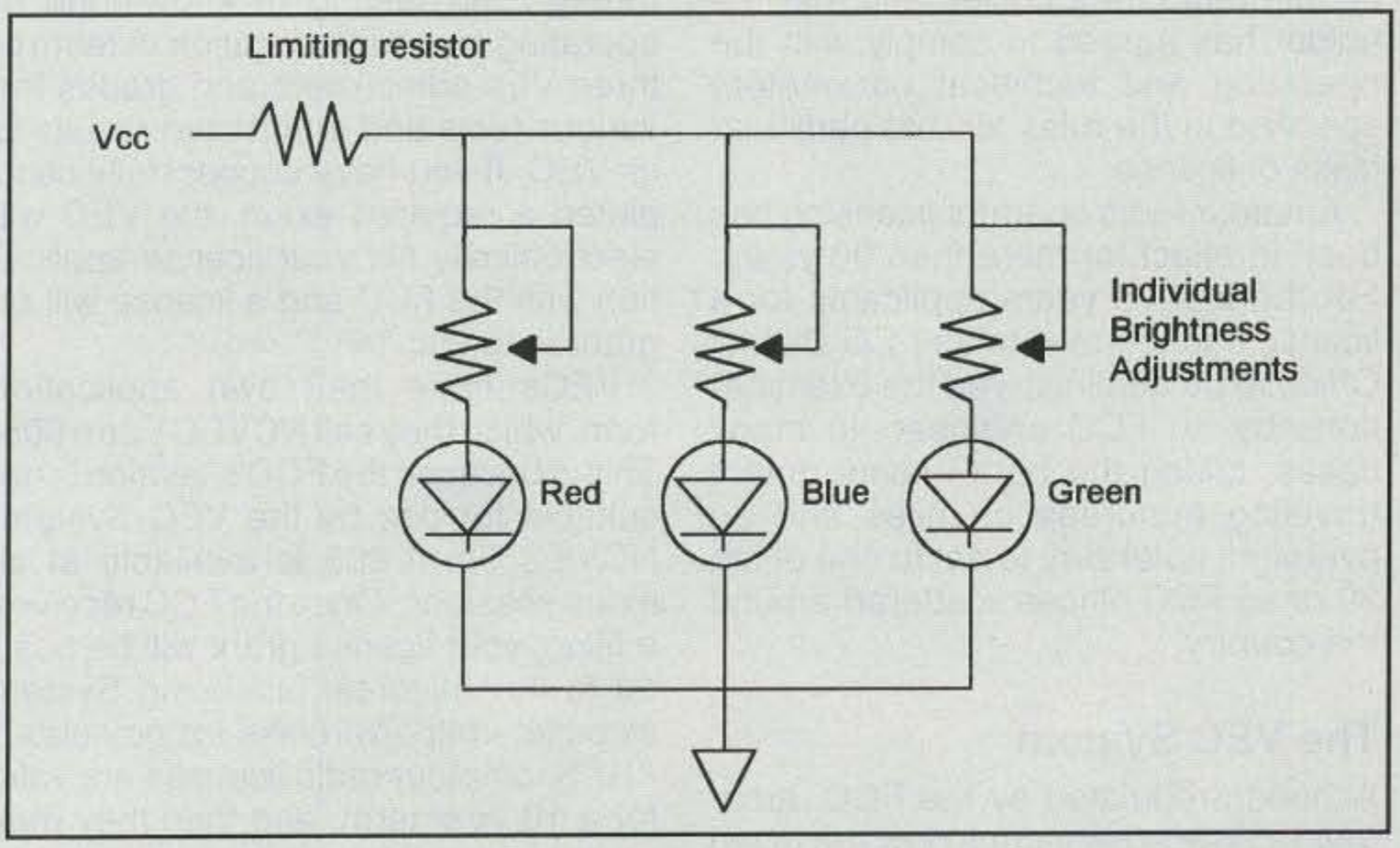


Fig. 4– Producing a unique-color LED.

the LM3354 can be obtained from National's website: <www.national.com>.

Another use for a white LED could be to produce any color you wish simply by coating the device with a transparent lacquer of the type used for model making. Since white contains all colors, the result would be an LED with an output of approximately the color of the lacquer used. Another way of making a unique colored LED is to borrow the technique used in color TV. Simply group a red, green, and blue LED together and adjust the brightness of each until you get the color you want. Fig. 4 is a starting circuit for such a device.

Since one can now obtain white, red, blue and green LEDs, isn't it about time that we amateurs came up with a way to build an inexpensive color display? Industry has already done so, and large-screen displays using tens of thousands of such LEDs are commonplace in places such as Las Vegas and Times Square (the theater district) in New York City. Even some highway traffic signs using these versatile devices have surfaced. It would be interesting to see a "home-brew" version of such a display. You would have to arrange red, green, and blue LEDs together in the same configuration as the phosphor dots in a color CRT. Then you would have to determine how to scan the array of LEDs to produce a usable picture. The results would indeed be unique! Let us know your thoughts.

73 Irwin, WA2NDM

Washington Readout

Regulatory News In The World Of Amateur Radio

BY FREDERICK O. MAIA, W5YI

Amateur Radio—What You Need to Know, Part II
Licensing

This is the second of several columns dealing with the regulatory side of ham radio. Last month we presented an overview of the Amateur Radio Service and the history of radio regulation. This month we cover licensing issues. Future columns will discuss topics such as operator responsibilities, qualifying for a license, amateur callsign systems, permitted and prohibited communications, third-party and international communications, safety and RF exposure rules, technical and equipment standards, and emergency communications.

Amateur radio is quite different from Citizens Band radio. CBers do not have to pass any examinations nor meet any specific qualifications before being allowed to operate. Their transmitter power level is limited to 4 watts, communications distance is short, and only FCC-approved radios may be used. By contrast, amateur radio operators can radiate up to 1500 watts with worldwide range and build and repair their transmitting equipment.

Amateur radio is primarily a hobby, but it has a serious side. It is called the *Amateur Radio Service* because it provides a pool of skilled radio operators who spring into action to provide emergency communications when regular communications channels are overloaded or disrupted.

Article 1.56 of the ITU regulations contains the international definition of the Amateur Radio Service. It defines the service as: "A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest." The FCC's version goes a step further. It adds that one of the purposes of the Amateur Service is to provide emergency communications.

Both the international and FCC rules require that the technical and operational qualifications of any person wishing to operate an amateur station be verified. This verification is accomplished through various examinations, the passing of which confirm that the operator is qualified.

An amateur radio license is therefore tangible evidence that a person is qualified to operate a radio transmitter on certain radio frequencies and that the holder has agreed to comply with the operating and technical parameters specified in the rules for that particular class of license.

Amateur radio operator licensing has been in effect for more than 90 years. For the first 70 years applicants for a license had to travel to an FCC District Office to be administered the examinations by an FCC engineer. In many cases, taking the ham exams meant traveling hundreds of miles and an overnight hotel stay to get to one of the 30 or so FCC offices scattered around the country.

The VEC System

Although regulated by the FCC, amateur radio license exams now are given by volunteer groups of ham operators operating under supervisory organizations called Volunteer Examiner Coordinators (VECs).

In the early 1980s, mainly due to budgetary constraints, a general trend towards privatization developed at the FCC. In 1982 President Reagan signed legislation authorizing amateur radio operator license examinations to be prepared and administered by volunteer ham radio organizations. The new testing procedure came to be known as the Volunteer Examiner Coordinator System, or VEC System for short.

Initially it was thought that the American Radio Relay League, the U.S. membership organization of ham operators, would become the single national coordinator of ham radio exams. However, when the ARRL did not respond positively at first because a provision for expense reimbursement was not part of the initial enabling legislation, a network of regional VECs was recruited by the FCC. Today there are more than a dozen VECs around the country.

VEC organizations act as the link between the VE (Volunteer Examiner) testing community and the FCC, which issues the station/operator licenses. The VEs determine the license operator class for which a person is qualified through the testing of knowledge of operating an amateur station. A team of three VEs administers and grades the various tests and reports the results to its VEC. If you have successfully completed a required exam, the VEC will electronically file your license application with the FCC and a license will be granted to you.

VECs have their own application form, which they call NCVEC Form 605. This is because the FCC's version is not suitable for use by the VEC System. NCVEC Form 605 is available at all exam sessions. Once the FCC receives a filing, your license grant will be posted to its Universal Licensing System website: <http://wireless.fcc.gov/uls>.

U.S. amateur radio licenses are valid for a 10-year term, and then they may be renewed. Anyone except a representative of a foreign government may hold one.

"Primary" Licenses and Callsigns

A single "primary" license authorizes the amateur radio station and signifies that the operator is qualified for certain radio privileges. Radio amateurs used to be able to hold more than one station license at a time, and it was fashionable in the 1960s and '70s to have an additional station callsign at a summer home or other location. Today, amateurs may hold only one callsign at a given time, and that callsign may be used at any location under FCC jurisdiction.

The evolution of the assignment of amateur radio station callsigns is interesting. As of 1978, all initial station call-

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (telephone 817-461-6443)
e-mail: <w5yi@cq-amateur-radio.com>

signs are assigned "systematically" in strict alphabetical suffix sequence within a specified prefix. Four prefix groups —simply called A, B, C, and D—were established for the various license classes. This came to be known as the Group Call Sign System. The shorter, more desirable callsigns were allocated to Group A, while the longer ones went to Group D. There are three callsign systems: Sequential, Vanity, and Special Event, which we will cover in more depth in an upcoming column.

Licenses Other Than "Primary"

In addition to the "primary" station/operator licenses issued to individuals, there are various licenses and operating privileges that are available to organizations and foreign nationals.

A *club* license is granted to a person designated by an amateur radio club to be its license trustee. The club must have at least four members.

A *military recreation* station license is issued to a person who has been designated as the custodian of an amateur radio station at a military installation. This person need not be a licensed radio amateur.

A *RACES* station license is issued to the custodian of an amateur station used in conjunction with a local-government civil-defense communications organization. New RACES licenses are no longer being issued or renewed, but existing licenses may be modified.

In addition to the primary license for an individual, there are also two licenses issued to non-U.S. citizens by foreign countries that are recognized by the U.S. The *CEPT* radio amateur license is issued by a country belonging to the European Conference of Postal and Telecommunications Administrations. An *IARP* (International Amateur Radio Permit) is issued by a Caribbean or Central or South American country that is a member of the Inter-American Convention.

Amateur radio operators licensed in Canada may operate their ham radio equipment in the U.S. without additional licensing. Radio amateurs who are licensed in and citizens of countries with which the U.S. has a multi-lateral or bilateral reciprocal arrangement may also operate here. They must carry their foreign license and proof of citizenship.

Amateur Radio Examinations

Operation of an individual amateur station requires an amateur operator license "grant" from the FCC. We say

"grant," because you are licensed as a ham operator as soon as your callsign enters the FCC's computer system and is posted to its website. You do not have to wait for the actual paper license document to arrive before beginning your operation on the ham bands.

Before receiving a license grant, you must pass one or more examinations to determine your operator class. A major reason for an exam is to ensure that potential licensees are fully aware of the interference potential and RF and electrical safety hazards of radio equipment.

In 1983 banks of multiple-choice license questions were developed by the FCC. Five different question pools from which the questions would be drawn were produced for the five license classes in existence at the time: Novice, Technician, General, Advanced, and Amateur Extra Class. In general, the higher the class of license, the more frequencies and operating privileges are available to the licensee. Earning each higher class license requires passing a more difficult examination, and each license must be obtained in order. It is possible, however, to take several exams at one session and go directly to a higher class license.

Through a restructuring of the U.S. Amateur Service in 1999, the number of available license classes (and question pools) was reduced to three: Technician, General, and Extra Class. The FCC issued these new regulations to streamline the licensing system.

The amateur radio license examination system consists of one 5 words-per-minute (wpm) telegraphy (Morse code) examination element (called Element 1) and three written examination elements, Elements 2, 3, and 4. The Technician license requires passing only Element 2. General Class requires passing Elements 1, 2, and 3. Extra Class requires passing Elements 1, 2, 3, and 4. The written examination establishes your level of operating and technical knowledge in properly performing the duties of an Amateur Service licensee at the Technician, General, or Extra Class level.

The VEs will accommodate examinees with physical disabilities who require a special examination procedure. They may, however, require you to provide a physician's certification indicating the nature of your disability before determining which, if any, special procedure must be used.

The Question Pools

In 1986 the FCC turned over maintenance of the written exam question pools to the Volunteer Examiner Coordinators. In turn, the VECs elected an internal Question Pool Committee (QPC) to update each question pool. Each pool is revised on a four-year cycle, incorporating the latest rules, new technology, and interests of the Amateur Service community. By FCC rule, each pool must contain at least ten times the number of questions required for a single examination. Your author is one of the four members of the QPC.

The exact question set that you will be administered is prepared by the VE team. This is done by selecting a specified number of questions from each question-pool topic. There are ten topics (subelements) covered in each of the Element 2, 3, and 4 question pools. The question set is frequently selected by a computer program that randomly selects the appropriate number of question from each subelement.

It is important that you prepare for your examination by studying material based upon the question pools currently in use. This material is available in the form of audio and video tapes, manuals and books, and computer and live classroom courses.

Technician License

The Technician class license is the entry-level license and does not require a Morse code test. The single requirement is passing a relatively easy 35-question multiple-choice test (Element 2) on radio theory, regulations, and operating practices. The passing score is 26 questions answered correctly. The license allows access to all amateur radio bands above 30 MHz. The favorite band of the Technician Class operator is 2 meters, which allows local communication with other hams in an area using small hand-held radios. Two meters also provides occasional long-distance "openings." LOng-distance communications are also available to Technicians on 6 meters and via satellite on other bands. Passing the Element 1 code exam also gives Technicians limited priveleges below 30 MHz on the worldwide HF bands.

General License

The General Class license grants some operating privileges on all amateur radio bands and all operating modes. An important feature is that this license opens the door to worldwide communications on the long-range HF bands. Like the Technician license, the General class license also requires passing a 35-question (Element 3) exam (passing score is 26) and the 5 wpm Morse code test (Element 1).

Upon accreditation by a Volunteer Examiner Coordinator, a General Class license holder may help administer certain examinations (Elements 1 and 2 only) or even establish his or her own testing team for the Technician license.

Amateur Extra License

The top-of-the-line Amateur Extra Class license conveys all available U.S. amateur radio frequency privileges on all ham bands using all operating modes. It requires passing a more difficult, technically oriented 50-question examination (Element 4 passing score is 37.). Extra Class licensees must also have previously passed Elements 1 (5 wpm code), 2, and 3.

The Telegraphy Exam

By international treaty, Morse proficiency is required when an amateur operator transmits on frequencies below 30 MHz. The telegraphy examination establishes the degree of skill by your reception of a short Morse code message typical of those transmitted by amateur stations. Sending tests are not administered, since the FCC has found that if you can receive Morse code, you can also send it.

The telegraphy exam contains a transmitted message of about five minutes duration. It must contain the 26 letters of the alphabet, numerals 0–9, period, comma, question mark, slant mark, and operating prosigns AR, BT, and SK. You must answer seven out of ten questions correctly (not multiple choice) about the transmitted text or copy 25 characters in a row without error to pass.

The 1999 restructuring order reduced the maximum Morse code exam speed required to operate on the high-frequency (under 30 MHz) bands to 5 wpm. Prior to April 15, 2000, the requirement was 13 wpm for General and Advanced Class and 20 for Extra.

Finding an Exam Session

There are thousands of VE teams throughout the U.S. and its possessions. Some even administer the FCC ham exams in foreign countries. You must contact a VE team in your community to make arrangements to be administered the exam elements you desire. Contact a VEC if you need assistance in finding a VE team in your area. The two largest VECs, which account for 85 percent of all ham testing, are ARRL-VEC and W5YI-VEC. They have their examination points listed on the World Wide Web at: <www.arrl.org/exam.htm> and <www.w5yi.org> and, respectively.

Volunteer examiners are permitted to charge a fee to recover their out-of-pocket costs incurred in preparing, processing, administering, or coordinating an examination. The current fee is $10, although some VEC organizations charge less. Applicants may take as many examination elements as they can successfully pass for the one fee. Another fee is charged to retake a failed examination.

Address Changes, Renewals, and Other Filing Tasks

Once you are licensed, it is important that you keep your FCC licensing record up to date. Each license grant must show the licensee's correct name and mailing address, which must be a U.S. address. The FCC rules provide for revocation of an amateur license when

mail is returned as undeliverable because of a failure to provide a correct mailing address.

There are three ways to change your address or renew your license in the FCC's Amateur Service database. You can use the FCC's online Universal Licensing System, you can file an FCC Form 605 document (but not the VEC's version—NCVEC-Form 605), or you can have a VEC do it for you. You may obtain an FCC Form 605 by calling 800-418-FORM (3676) and downloading the form. As an alternative, you call the FCC's fax-on-demand system at 202-418-0177 from the handset of a fax machine.

You must have an FRN (FCC Registration Number) and your ULS password in order to handle the filing yourself. Check the FCC database to find out if you already have an FRN by going to <http://wireless.fcc.gov/uls>. Click on "Licenses" and enter your callsign. Filing instructions are located on the web at: <http:wireless.fcc.gov/services/amateur>. You will need to register with the FCC's Commission Registration System (CORES) to receive an FCC Registration Number (FRN), if you do not already have one.

There is no charge if you handle the filing yourself; it is $6.00 if handled by a VEC. To have the W5YI-VEC handle your filing, go to <www.w5yi.org> and click on the "Renew, Change Address or Duplicate license" link. Some people find this to be the easiest way to handle the filing. You may receive a license expiration notification from a VEC, but you are not required to use its services.

If your license expires, you may apply for renewal of the license for another ten-year-term during the two-year filing "grace period" that follows. The renewal information must be received by the FCC on or before the end of the grace period. However, once your license expires, you may not operate your amateur radio station until the license is renewed. Renewals received after the grace period has ended cannot be granted. You must then take a new exam for a new license.

New, renewal, and license-modification applications for club, military recreation, or RACES stations require filing a paper NCVEC Form 605 document through an FCC-appointed Club Station Call Sign Administrator. The CSCSA will electronically file the application with the FCC.

Novice, Tech Plus, and Advanced Classes

Radio amateurs who held Novice and Advanced Class licenses on April 15, 2000 when the new Amateur Service restructuring took place are permitted to renew or modify (change information) their licenses indefinitely, but no new Novice or Advanced Class licenses are being issued by the FCC. The new U.S. Amateur Service license structure allows ham operators to move from the beginner to expert level more quickly.

A sixth license class, "Tech Plus" (which simply indicates that a Technician Class operator passed a Morse code test), was abolished. All Tech Plus licenses are now renewed as Technician, and the class is now known as a "Technician with code credit."

Checking Application Status

There are two ways to check the status of your pending new, renewal, or modification application. You can call the FCC at 800-CALL FCC (800-225-5322) or you can access the FCC's Universal Licensing System at <http://wireless.fcc.gov/uls> and click on "Applications."

In our next installment we will be covering responsibilities of the station licensee and operating privileges.

73, Fred, W5YI

AMERITRON *True Legal Limit™* Tuner

Easily handles 1500 Watts continuous carrier even on 160 Meters . . . High-current edge-wound silver plated Roller Inductor . . . Two 500 pf high capacitance tuning capacitors with 6:1 vernier reduction drives . . . 3 core choke balun . . . Six position antenna switch . . . True peak reading Cross-Needle SWR/Wattmeter . . .

Call your dealer for your best price!

AMERITRON ATR-30

$599

Suggested Retail

- *Handles 1500 Watts carrier*
- ***Super High Current edge-wound silver plated Roller Inductor***
- ***500 pf tuning capacitors with 6:1 vernier reduction drives***
- ***3 core choke balun***
- ***6 position antenna switch***
- ***True peak reading meter***

AMERITRON's ATR-30 *True Legal Limit™* roller inductor antenna tuner is ham radio's toughest! It'll handle 1500 Watts *continuous carrier output* on *all* modes and *all* HF bands into most antennas -- even on 160 Meters where most antenna tuners fail.

It's perfect for Ameritron's most powerful amplifiers where the ATR-30 just loafs.

All band coverage lets you operate 1.8-30 MHz including all MARS and WARC bands.

Super High Current Roller Inductor

You'll see Ameritron's new *super high current* air core roller inductor. It's *edge wound* from a thick solid copper strip and silver plated. This produces a large surface area and a massive conductor. It can carry huge circulating RF currents and withstand tremendous heat that'll melt or burn ordinary roller inductors.

A gear driven turns counter and crank knob gives you precise inductance control.

Two 500 pf Tuning Capacitors

Two 500 pf -- *the highest of any antenna tuner* -- variable transmitting capacitors give you no-arc wide range impedance matching for true high power performance.

6:1 vernier reduction drives makes capacitor tuning smooth and easy.

Super Balun, 6 position Antenna Switch

Super heavy duty three core choke balun lets you match virtually any balanced feedline antenna without core saturation.

A 6 position antenna switch lets you select your desired operating antenna.

Read *true* Peak Power

Ameritron's active electronic *true* peak reading meter accurately reads forward and reflected power and SWR *simultaneously* on a lighted Cross-Needle meter.

Roomy Cabinet maintains High-Q

Roomy extra-strong .080 inch thick aluminum cabinet gives highest efficiency and lowest loss. 13¼Wx5⅝Hx17½D inches.

AMERITRON ATR-15 Antenna Tuner

ATR-20, $459. Handles a full 1.2 kW SSB and 600 Watts CW. It's designed to safely handle the full SSB power of Ameritron's AL-811/811H/80B, ALS-500M/600 and other 1.2 kW SSB amplifiers. Compact all metal cabinet.

Ameritron has the best selection of *TrueLegalLimit™* HF Amplifiers

AMERITRON's legal limit amplifiers use Peter Dahl super heavy duty Hypersil power transformer capable of 2500 Watts!

Ameritron's *most powerful* Amp

with Eimac® 8877 ceramic tube

AL-1500

$2995

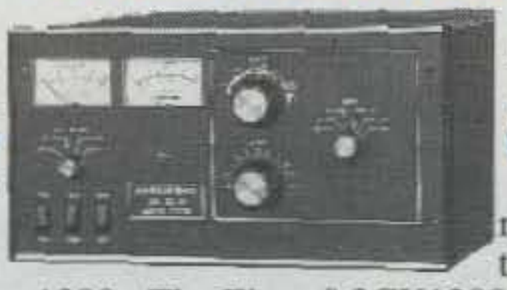
Suggested Retail

TrueLegalLimit™

Ameritron's *most powerful* amplifier uses the herculean Eimac® 8877 ceramic tube. It's so powerful that 65 Watts drive gives you the full output power -- and it's just loafing because the power supply is capable of 2500 Watts PEP. All HF bands, all modes. 77 pounds, 18½Dx17Wx10H in.

Ameritron's *toughest* Amp

with Eimac® 3CX1200A7 tube



AL-1200

$2545

Suggested Retail

TrueLegalLimit™

Get ham radio's *toughest* tube with AL-1200. The Eimac® 3CX1200A7 has a 50 Watt control grid dissipation and the lowest history of field replacement of any modern transmitting tube that we use. 90 Watts in gives you full power out. All HF bands, all modes. 76 pounds, 18½Dx17Wx10H in.

Ameritron's *classic* Amp

with 2 graphite plate Amperex® 3-500ZG tubes

AL-82

$2495

Suggested Retail

TrueLegalLimit™

Most linears using 3-500s can't give you 1500 Watts because their lightweight power supplies *can't* use these tubes to their full potential. AL-82 is ham radio's *only* super 3-500 amp! 100 Watts in gives you full power out. All HF bands, all modes. Hefty 76 pounds, 18½Dx17Wx10H inches.

1.5 *plus* kW SSB HF Amp

with 2 Eimac® 3CX800A7 tubes

AL-800H, $2595 suggested retail. Two Eimac® 3CX800A7 tubes produces 1500 *plus* Watts SSB PEP with 55 Watts drive. 52 lbs., 8½Hx16½Dx14¼W in. **AL-800, $1775** suggested retail, single 3CX800A7, 1250 Watts out with 70 Watts drive.

NearLegalLimit™ Amp

with four Svetlana® 572B tubes

AL-572, $1395 suggested retail. New class of *Near Legal Limit™* amplifier gives you 1300 Watts SSB PEP power output (70 Watts drive) for 65% of price of full legal limit amps! Instant 3-second warm-up. 40 lbs. 8½Hx15½Dx14½W inches.

1 kW Desktop HF Amp

with Amperex® 3-500ZG tube

AL-80B, $1299 suggested retail. Gives you full kilowatt SSB PEP output (85 Watts in) from a whisper quiet compact desk- top linear. 8½x14x15½ in. Plugs into 120 VAC outlet. Graphite plate *Classic®* 3-500Z tube. Nearly 70% efficiency. Weighs 48 lbs.

Precision SWR/Wattmeter

AWM-30, $149 suggested retail. Active circuit gives *true* peak/average readings on lighted Cross-Needle meter. 3000/300 Watt ranges. Remote sensor.

Call your dealer for your best price!

Free Catalog: 800-713-3550

AMERITRON®

. . . the world's high power leader!

116 Willow Road, Starkville, MS 39759

TECH (662) 323-8211 • **FAX** (662) 323-6551

8 a.m. - 4:30 p.m. CST Monday - Friday

For power amplifier components call (662) 323-8211

http://www.ameritron.com

QRP

BY DAVE INGRAM, K4TWJ

The Art of Low-Power Hamming

More FT-817 and QRP-Related Treats

Thanks to miniature "do it all" transceivers such as the Yaesu/Vertex FT-817, many of today's amateurs are acquiring a favorable introduction or new-era re-introduction to the world of low-power hamming. Indeed, almost every day we are hearing folks running FT-817s on popular QRP frequencies such as 14.060, 21.060, and 7.040 MHz; on various SSB frequencies; and on HF Pack "hot spots"—i.e., 18.157.5 and 14.342.5 MHz. This little rig is proving low-power "works out" in a big way, and it is also being supported by a continuously expanding mini-industry of clever accessories. Many of these items were highlighted in our December 2001 and February and April 2002 "QRP" columns. The list continues to grow, however, so we are delighted to bring you more views of new FT-817 and QRP-related goodies this month.

4941 Scenic View Drive, Birmingham, AL 35210

If you missed the previously mentioned columns or want more information on all kinds of FT-817 complementing treats, incidentally, check out my new book *"Ultralight HF'n": Portable Fun and Survival Ready* (photo A). It is loaded with ideas and details for "Walk-and-Talk HFing"; an autographed copy is $16 plus $2.50 book rate or $3.95 Priority Mail direct to you from me (Dave Ingram, K4TWJ, 4941 Scenic View Drive, Birmingham, AL 35210). Now let's look at some just-announced goodies and treats!

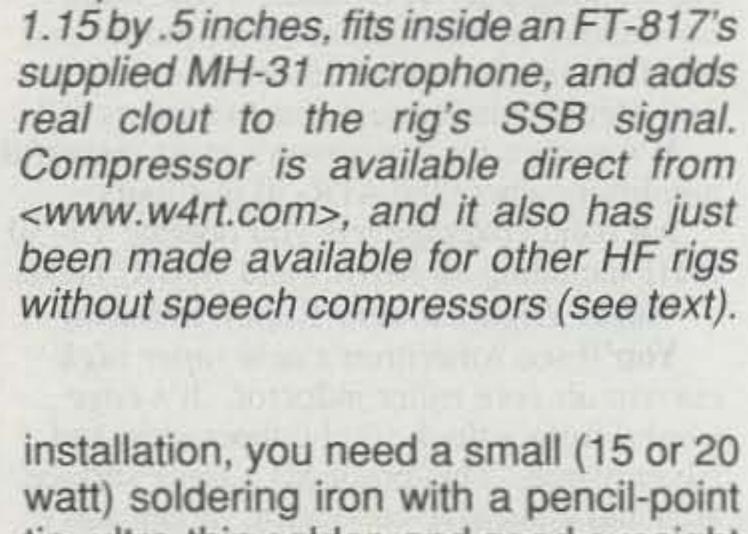


Photo B– This One Big Punch speech compressor on PC board measures 1.15 by .5 inches, fits inside an FT-817's supplied MH-31 microphone, and adds real clout to the rig's SSB signal. Compressor is available direct from <www.w4rt.com>, and it also has just been made available for other HF rigs without speech compressors (see text).

FT-817 Speech Compressor

First in the spotlight is a custom item with real appeal for operating SSB with an FT-817: the W4RT Electronics One Big Punch speech compressor shown in photos B and C. This add-on PC-board item mounts inside a (supplied with rig) MH31 hand mic or inside the FT-817's case and produces up to 5 dB improvement in audio punch and "talk power." You can install it yourself (It takes roughly an hour for the "slow but sure" amateur, I would say.) or for a small extra fee, W4RT Electronics will install it for you. To perform the mod/ installation, you need a small (15 or 20 watt) soldering iron with a pencil-point tip, ultra-thin solder, and good eyesight or a magnifier. The installation involves desoldering two connections, cutting one PC board trace, soldering five

Photo A– Do you want maximum enjoyment from your Yaesu FT-817? Check out my new book, Ultralight HF'n. *It is loaded with information on rig accessories and helpful tips for walk-and-talk HFing, and an autographed copy is available directly from me, Dave Ingram, K4TWJ.*

Photo C– Inside view of the FT-817's supplied MH-31 mic after installation of the One Big Punch speech compressor. When completed, the switch on the mic's back activates or bypasses the compressor. (Photo courtesy Barry Johnson, W4WB, and W4RT Electronics)

wires, and sticking the small PC board to the microphone case's inside edge. High-resolution and vividly detailed photos are included with the PC board/mod and make installation a no-miss, step-by-step process. I favor the in-mic rather than the in-rig arrangement, mainly because the mic's rear "position 1 and 2" switch then serves as an in-circuit/bypass or on/off switch for the compressor. The results are akin to having two microphones in one case.

If you want to make the compressor-equipped FT-817 mic a real romper, add a Heil HC-4 "DX element" to it during installation. The combination delivers a one-two punch that will make you forget the FT-817 is running QRP. You will reach out like crazy! I have heard the compressor in use with Yaesu's stock MH-31 element and with the Heil HC-4 element, incidentally, and the difference is remarkable. Heil mics and elements just sound great!

As a finishing touch to the W4RT speech compressor, consider fine-tuning the FT-817's transmit-carrier insertion point so microphone audio will be tailored to fit your voice. You do this by tuning in your SSB signal on an auxiliary receiver without an antenna connected to it and with its attenuator on so your FT-817's transmitted signal is around S9. Use earphones to monitor your audio, and watch the auxiliary receiver's S-meter while adjusting menu setting 56 for LSB carrier point or menu setting 57 for USB carrier point. Typically, you will find a carrier insertion point of +100 to +130 Hz for LSB gives the best audio response and signal punch. Also remember to reset the mic gain (menu 46 for SSB, menu 27 for FM, and menu 05 for AM), and enjoy hopped-up fun with your FT-817.

Where do you get W4RT Electronics speech compressors—plus high-current NiMH battery packs, Collins filter mods, and other items highlighted in past columns? Just check the firm's website at <www.w4rt.com> or write to Barry Johnson, W4WB, at 1527 Chandler Road S.E., Huntsville, AL 35801.

Flash! After completing this column, we learned that W4RT Electronics just made an adaptation to the "One Big Punch" circuit/board, and the compressor is now also available in a version for older, more "basic" transceivers such as the Kenwood TS-50, etc.—rigs lacking speech compressors. Wow!

Novel Keys

Half the fun of operating CW while portable is using some of the unique

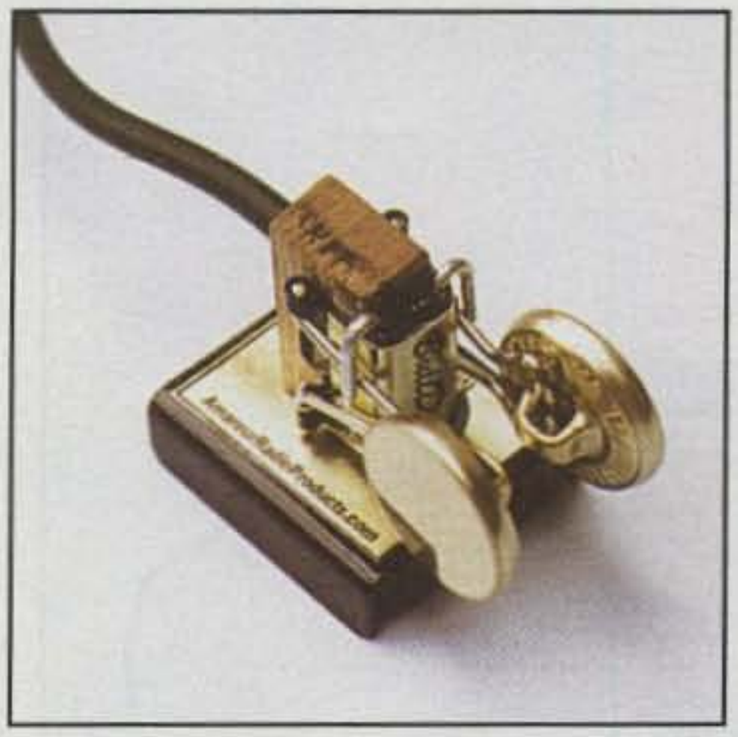


Photo D– Like grab-and-go CW? This ultra-small Bull Dog iambic paddle is only an inch square, has a magnetic base that adheres to an FT-817's steel case, and handles very well. It is available from Louis Petkus, K9LU.

new keys and paddles being introduced almost every month. Yes, and go-anywhere transceivers such as the FT-817 beg to be teamed up with miniature or novelty-type keys. (Deluxe keys are also terrific, but they are larger and more suited to home-station use.) A quick investigation here revealed three recently announced gems with special appeal (photos D, E, and F).

The first item is a tiny, new version of the popular Bull Dog iambic paddle made by Louis Petkus, K9LU (photo D). The paddle measures 1 inch square, it is made from a highly modified bulldog paper clip fitted with brass buttons for fingerpieces, and has a super-strong magnet in its base. A steel washer approximately 1.5 inch in diameter with a strip of reusable adhesive is also supplied with the paddle so you can adhere it to your desk, belt, watch, or shack wall, as desired. If you do not remember the original, larger K9LU Bull Dog paddle, it is approximately 2 inches square and has a triangular wood base with three rubber suction cups for solid footing. Both paddles are supplied with pre-installed cables and three conductor mini-plugs, and both paddles have adjustable tension and gaps.

I have been using a mini BullDog paddle while pedestrian mobile around the neighborhood and find it handles quite well for such a small key. It's nice! You

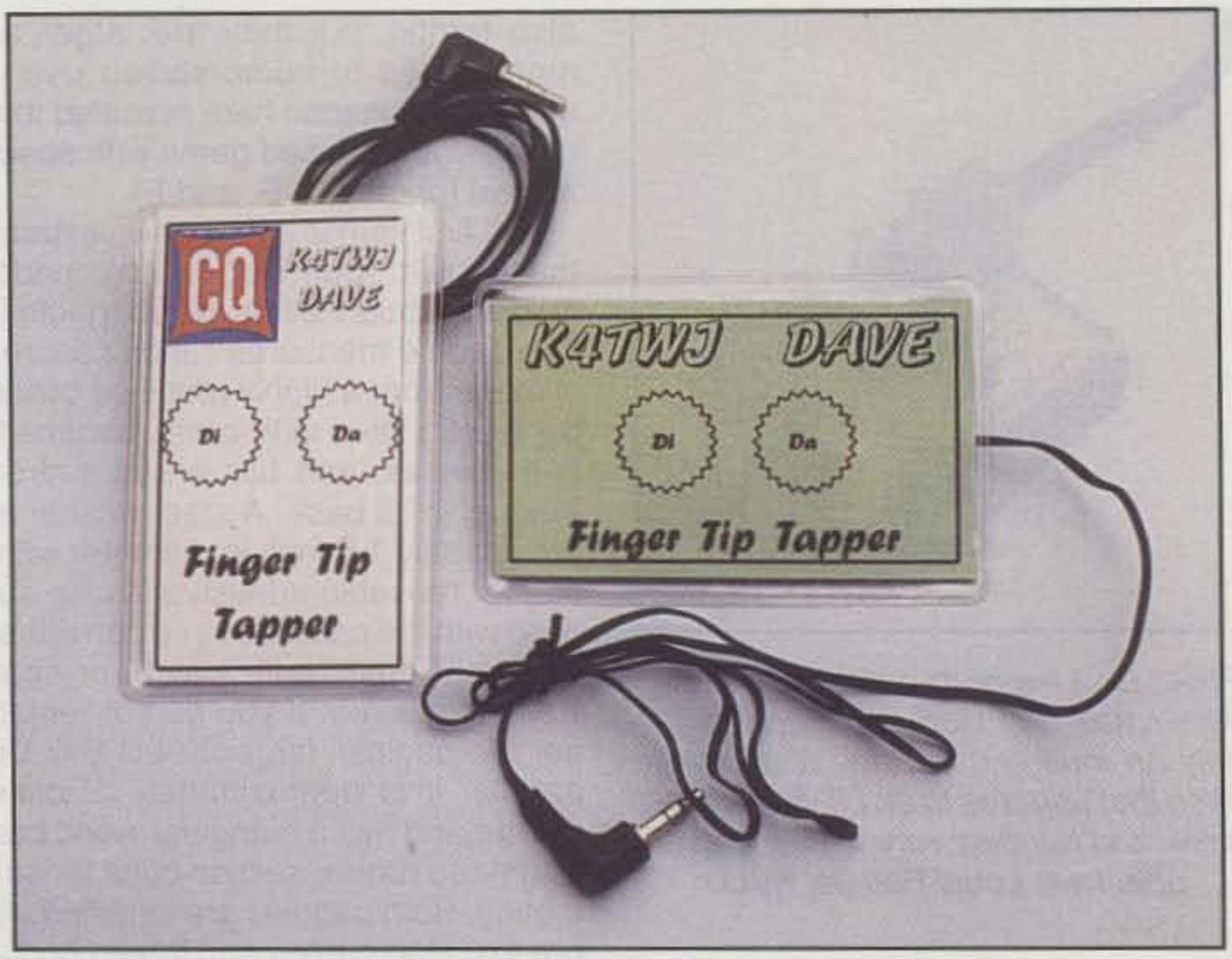


Photo E– Want to add a novel touch to your traveling HF activities? Try a flat, cricket-type Finger Tip Tapper from Jim Panzitta, N2CAU. It is easy to carry, has a magnetic backing, and can be used as an iambic paddle or a pump key.

can get one (or two—a mini and a regular) by contacting Louis Petkus, K9LU, at General Business Software, 2 South 872 Wagner Road, Batavia, IL 60510; by telephoning (toll-free) 877-227-9139; or on the web at <www.AmateurRadioProducts.com>.

Would you like to try something really different in a portable paddle with your FT-817—something that slips in a shirt pocket, lies flat on a rig case or table, and handles like a cricket key? Try a Finger Tip Tapper from Jim Panzitta, N2CUA (photo E). This thing is thin like a charge card and has twin surface-mount tactile contacts, a magnetic base, and an attached three-conductor cable with mini plug.

You operate the Finger Tip Tapper by tapping your fingers on its dot/dash pads in a up/down rather than side-to-side motion. This "cricket" concept takes a few minutes to master, but it can be rather entertaining and enjoyable when approached with an open mind. In other words, avoid trying to use the Tapper above 20 words per minute (finger-pad coordination gets tricky), and do not limit yourself to right-hand operation. As an example, I find the Tapper works well when turned backwards, so I press the left/dash pad with my left forefinger and the right/dot pad with my left thumb. Given half a chance, portable CW can be more fun than a romp on the beach during spring break—well, almost.

Finger Tip Tappers are available in various colors, in vertical or horizontal printed formats, and are personalized with your name and call letters. They are made and sold by Jim Panzitta, N2CAU, 602 Greenway Avenue, Trenton, NJ 08618; telephone 609-771-8182 or <www.fingertiptapper.com>. Try one just for the fun of it!

A fair number of hams tell me they prefer using a single- (rather than dual) lever CW paddle for portable operations because they do not require precise handling and finger coordination. In other words, a single lever can move in only one direction (and produce only dots or dashes) at a time, whereas dual levers can move simultaneously (and produce alternating dashes and dots).

Good news, friends: Bob Hammond, KI7VY, now has an easy-to-use single-lever version Paddlette ready for sale (photo F). The paddle sports a brass mechanism with adjustable dot/dash gaps, a magnetic base, and a mating mounting plate with adhesive backing for holding the paddle to a non-metallic surface. Miniature single-lever paddles are not easy to find, so Bob's new brainchild fills a definite void and serves a good purpose. It is available directly from Bob Hammond, KI7VY, of Pad-

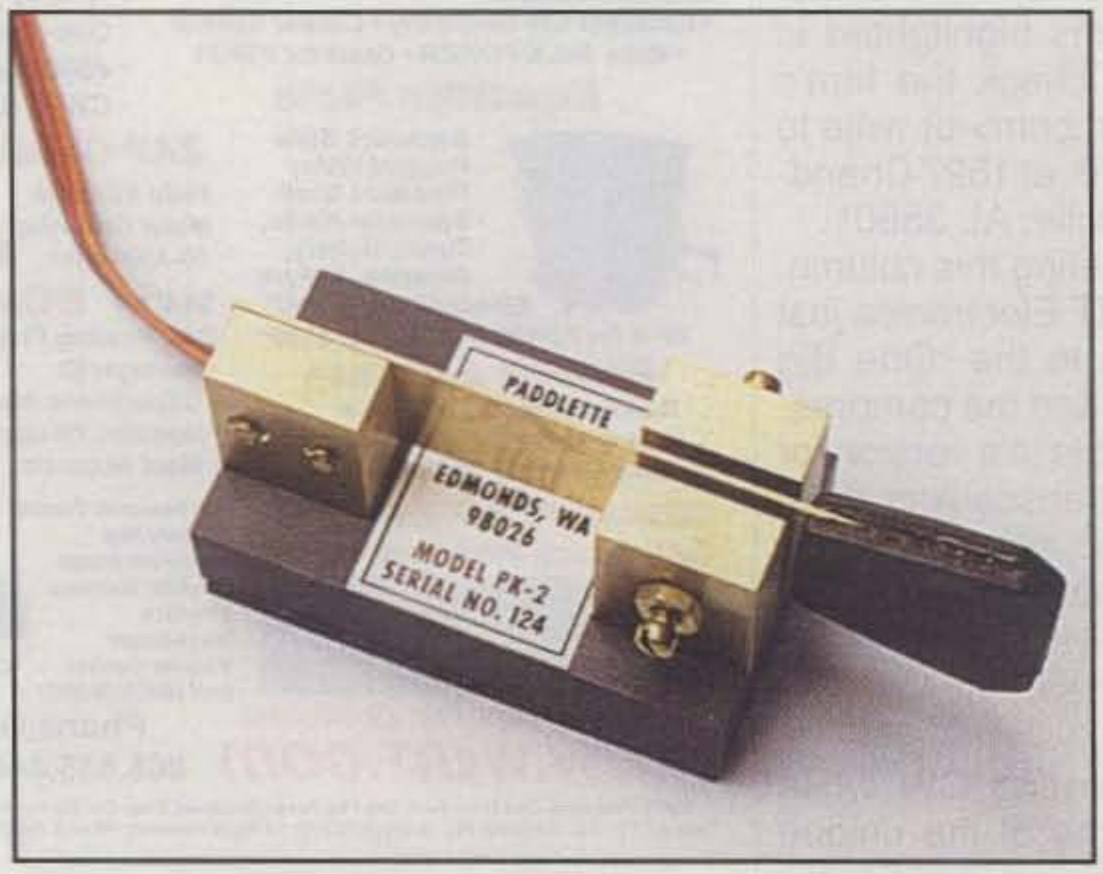


Photo F– You say dual levers and uncoordinated fingers stifle your outdoor CW fun? The new, single-lever Paddlette from Bob Hammond, KI7VY, should solve the problem. It has adjustable gaps, a magnetic base, and the arm moves in only one direction at a time to minimize keying errors.

Photo G– The new MinuteMan antenna from John Bee, N1GNV, and Quicksilver Radio Products is a slip-together portable vertical antenna for 20, 17, 15, 12, and 10 meter operation. Here you see it laid out and ready for field assembly, which takes only a couple of minutes.

dlette, P.O. Box 6036, Edmonds, WA 98026; telephone 425-743-1429, or e-mail: <bham379627@aol.com>.

New MinuteMan 20 Antenna

Getting full enjoyment from an FT-817 obviously involves using it for stand-alone portable operations, and the main prerequisite is a handy snap-together travel-tenna. Enter the MinuteMan 20 shown in photos G and H.

This lightweight, multiband radiator is designed around 11 sections of 15 inch long PVC tubes you slip together to produce an approximately 11 foot tall vertical antenna with 2.5 foot square support base. The antenna works 10, 12, and 15 meters as a full quarter-wave vertical (You adjust the length of its top whip to change bands.), and a near-center loading coil is used for 17 and 20 meter operation. The antenna is supplied with two multi-conductor counterpoise cables precut for various bands, and its PL-259 socket, wire radiator, and near-middle coil sections are pre-assembled for easy setup.

Typically, the MinuteMan 20 can go from car trunk or knapsack to contact in around 4 or 5 minutes. Thanks to a tall radiating section, the antenna performs quite well—comparable to a big Bug-catcher mobile antenna, I would say.

The antenna's producer, John Bee, N1GNV, says the MinuteMan 20's main attraction is quick-setup portable operations from a fixed site, and it works well in that application. Being hopelessly engrossed in HF Pack action, however, I started out using it for "pedestrian mobile" work with a hip-strapped FT-817, carrying the whip upright and dragging the two counterpoise cables. I worked stations in both the U.S. and Europe while using the MinuteMan 20. What a gas!

The antenna makes a dandy traveling companion. Just tie its plastic sections into bundles, toss or store them in the trunk of the car, and go. At a vacation cottage or campsite, slip the sections together, set SWR, and operate!

The MinuteMan antenna (and more details) is available from John Bee, N1GNV, Quicksilver Radio Products,

Photo H– The new MinuteMan 20 antenna assembled and ready for operation on its self-supporting base. Counterpoise wires and coax cables connect to the antenna two feet up from the base.

30 Tremont Street, Meriden, CT 06450; phone 203-440-4468, e-mail: <sales@qsradio.com>, <www.qsradio.com>.

Conclusion

That's it for available space this time, gang, but stay tuned for more hot news in QRP during the months and good times straight ahead. Meanwhile, stay active and enjoy some exciting on-the-air QSOs every day.

73, Dave, K4TWJ

E-mail Notice

I appreciate hearing from each and every reader, even though there is not enough time for individual replies to everyone. Please be aware, however, that I have been having problems accessing and responding to my e-mails. Although "antiquated"(?) my postal mail still works great. Please use my street address given on the first page of this column, be brief, include an SASE if a reply is desired, and be patient for a reply. Thanks for your understanding. —*K4TWJ*

Public Service

Public Service and Emergency Communications

BY BOB JOSUWEIT, WA3PZO

The End of an Era: Franklin Institute Station Silent After 50 Years

This month's column covers a different sort of amateur radio public service—educating the public about amateur radio and using an amateur station in a museum setting to educate visitors about the science of radio communication. Unfortunately, this is also an "obituary" for one of the longest operating museum-based stations in the United States. —WA3PZO

World War II was over. Radio and television broadcasting were still in their infancy. In the late 1940s the location of political conventions was determined by where television was available. At the time, Philadelphia was the obvious choice because of the number of stations on the air and those stations' ability to network with other cities on the east coast.

People were excited about communications. Whether it was a late-breaking news bulletin or the reporting of a major league baseball game, people were fascinated by the idea of hearing a voice from afar. In Philadelphia, the Franklin Institute Science Museum was a central point for introducing what was new in communications. Ham radio, and the idea of being able to talk to someone over the radio, was an exciting communications medium.

Early Memory

"I can tell you that the Franklin Institute was always active in ham radio during the '40s and right after the war," said retired NBC broadcaster Roy Neal, K6DUE. Neal began his broadcasting career in Philadelphia. "We did many early-day TV shows from that location, including demonstrations of what we hams are all about! I remember one in particular...during which we had mobile units at locations all over the city. As they checked in, lights lit up on a city map...to illustrate how we could provide communication any time, anywhere!"

The mobile operation was on 10 meters AM. At the time, interest in mobile operation was growing, but so was the interest in television. In many cases it was difficult to operate from a fixed location without the risk of television interference and an FCC citation. Many of the early television sets struggled to pick up a snowy Milton Berle on Philco's WPTZ. Unfortunately, the TV sets were equally responsive to hams' mostly unshielded home-brew transmitters.

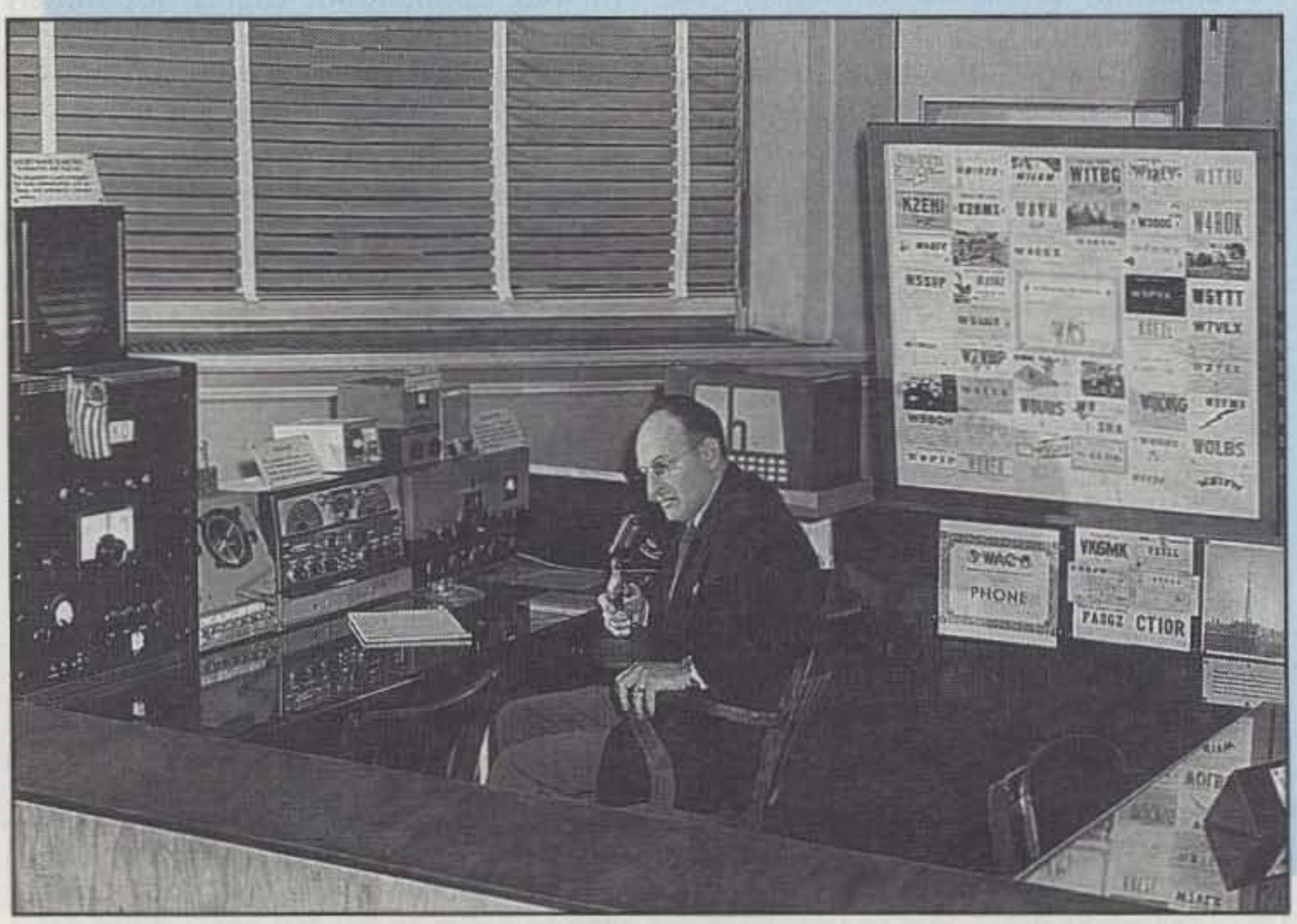
Amateur Radio Moves In

Amateur radio had a friend at the Franklin Institute. Executive Vice President Dr. Wynn Laurence LePage approached his neighbor, Fred Shaw, W3ADV, about becoming a ham radio operator. LePage got his license (W3QCV) and became active with Shaw and members of the Haverford Township Emergency Radio Net in suburban Philadelphia.

In 1951 LePage proposed that the Haverford Township group sponsor a station at the Franklin Institute. Within a year amateur radio became a featured exhibit at the institute, using the call W3TKQ. Initially the station only had 2 and 10 meter home-brew equipment. The first contact was made on April 5, 1952. Net members scheduled their operating hours to keep the station on the air on weekends and holidays. Even this schedule became difficult for the net members to sustain.

Paid Operators

The institute secured the services of Mason Frankenfield, W3PBR, the station's first "paid" operator. His duties included being a demonstrator in the electrical hall, where lightning storms were created for visitors to see, and in his spare time operating W3TKQ. This



Nelson Shurr, W3DYP, helped staff the Franklin Institute's station, W3TKQ, from 1951–1962. (All photos courtesy the Phil-Mont Mobile Radio Club)

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

ASTRON CORPORATION
9 Autry Irvine, CA 92618
(949) 458-7277 • (949) 458-0826
www.astroncorp.com

E151765 E151765

...POWER ON WITH ASTRON

SWITCHING POWER SUPPLIES...

MODEL SS-10TK

MODEL SS-12IF

SPECIAL FEATURES:

- HIGH EFFICIENCY SWITCHING TECHNOLOGY SPECIFICALLY FILTERED FOR USE WITH COMMUNICATIONS EQUIPMENT, FOR ALL FREQUENCIES INCLUDING HF
- HEAVY DUTY DESIGN
- LOW PROFILE, LIGHT WEIGHT PACKAGE
- EMI FILTER
- MEETS FCC CLASS B

PROTECTION FEATURES:

- CURRENT LIMITING
- OVERVOLTAGE PROTECTION
- FUSE PROTECTION.
- OVER TEMPERATURE SHUTDOWN

SPECIFICATIONS:

INPUT VOLTAGE: 115 VAC 50/60HZ
OR 220 VAC 50/60HZ
SWITCH SELECTABLE

OUTPUT VOLTAGE: 13.8VDC

AVAILABLE WITH THE FOLLOWING APPROVALS: UL, CUL, CE, TUV.

MODEL SS-18

DESKTOP SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-10	7	10	1⅞ x 6 x 9	3.2
SS-12	10	12	1⅞ x 6 x 9	3.4
SS-18	15	18	1⅞ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅝	4.2
SS-30	25	30	3¾ x 7 x 9⅝	5.0

MODEL SS-25M

DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-25M*	20	25	2⅞ x 7 x 9⅝	4.2
SS-30M*	25	30	3¾ x 7 x 9⅝	5.0

MODEL SRM-30

RACKMOUNT SWITCHING POWER SUPPLIES

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

WITH SEPARATE VOLT & AMP METERS

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

MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

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

WITH SEPARATE VOLT & AMP METERS

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

MODEL SS-12SM/GTX

MODEL SS-10EFJ-98

CUSTOM POWER SUPPLIES FOR RADIOS BELOW

EF JOHNSON AVENGER GX-MC41
EF JOHNSON AVENGER GX-MC42
EF JOHNSON GT-ML81
EF JOHNSON GT-ML83
EF JOHNSON 9800 SERIES
GE MARC SERIES
GE MONOGRAM SERIES & MAXON SM-4000 SERIES
ICOM IC-F11020 & IC-F2020
KENWOOD TK760, 762, 840, 860, 940, 941
KENWOOD TK760H, 762H
MOTOROLA LOW POWER SM50, SM120, & GTX
MOTOROLA HIGH POWER SM50, SM120, & GTX
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
UNIDEN SMH1525, SMU4525
VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

CIRCLE 134 ON READER SERVICE CARD

NEW SWITCHING MODELS

SS-10GX, SS-12GX
SS-18GX
SS-12EFJ
SS-18EFJ
SS-10-EFJ-98, SS-12-EFJ-98, SS-18-EFJ-98
SS-12MC
SS-10MG, SS-12MG
SS-101F, SS-121F
SS-10TK
SS-12TK OR SS-18TK
SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V

*ICS – Intermittent Communication Service

In 1962 W3TKQ moved to a newly remodeled location. Collins donated a complete S-Line to the station.

worked very well until about 1960, when it was discovered that Mason was beyond the institute's mandatory retirement age. Additional operators were found, and the policy of "part-time" station operators was continued until September 20, 1990.

Early Expansion

By 1954 the station at the Franklin Institute had begun to feature commercially made equipment. A transmitter, receiver, and triband beam were donated by Hallicrafters, Johnson Viking, and Mosely, respectively.

In 1960 Dr. LePage, now the president of the institute, wanted to see a larger club take over the station operation. The Phil-Mont Mobile Radio Club stepped forward. The institute donated space and enough money for a glass enclosure for the station, and in May of 1962 a new station emerged, thanks to the efforts of Jim Spencer, W3QQH (now W3BBB). Steve Hoch, WU3I, the current station trustee, says the institute also donated air conditioning, and the Bell Telephone Company donated telephone instruments, amplifiers, and loud speakers so that visitors could not only see, but also hear the station in actual operation. Spencer even designed a back-lit map so visitors could see the area of the world where each contact was being made.

The '60s

In 1962 Collins Radio Company donated a complete S-line station. With approximately $5000 in equipment having been donated to the station, the call "W-3-Thomas-King-Queen" radiated to over 2500 hams in over 90 countries.

Besides the fascination of radio that was offered to millions of museum visitors, the institute's station maintained an active presence in emergency and civil-defense operations in the Philadelphia area.

It was always a friendly voice that greeted ham visitors to the City of Brotherly Love. The station and its members also participated in the institute's science program by teaching Novice license classes.

More Upgrades

In 1982 Phil-Mont's John Tinaglia, W3AWH, campaigned to replace the aging Collins equipment with a complete new station. With the assistance of Hamtronics of Trevose, Pennsylvania, a brand-new station was obtained from the R.L. Drake Company and installed in May. The equipment consisted of a TR7/DR7 transceiver, L7-2KW amplifier, MN-75 matching network, RV-7 VFO, Theta 7000E communications terminal, and TR-930 video monitor. In the fall of 1984 a new Telrex beam antenna was installed.

At the end of July 1986 the station was moved to a "temporary" location on the fourth floor of the building, where it remained until its final day.

Rolland Madara, W3PWG, served as trustee of W3TKQ from 1975–1991. In the mid '80s W3TKQ featured Drake equipment.

Uncertain Times

In 1990 the Franklin Institute began to modernize its exhibits. A focal point of the renovation was the newly completed Omniverse theater. If W3TKQ was to keep up with these new exhibits, the station was going to have to feature the latest state-of-the-art equipment.

In September 1990 the club was told that due to the institute's critical financial situation, the current "operator-demonstrators" would be laid off, and the station would be asked to vacate the premises. Jake Kovalchek, AK2I, and Kay Craigie, WT3P (ex-KC3LM), who was then the ARRL Atlantic Division

Perry Blum, W3PTB, with the late Mrs. Gioia Marconi Braga at the rededication of W3TKQ in 1991.

A picture of Benjamin Franklin graced the walls of W3TKQ/W3AA.

Vice Director, made a presentation to the institute's management. They proposed a program of instruction and demonstration of as many facets of amateur radio as possible to show the vast wealth of information and electronic technology ham radio has to offer both the general public and in particular children, the leaders and scientists of tomorrow.

Kovalcheck said, "We will strive to maintain our station in a 'state-of-the-art' condition. . . . To remain status quo is to regress. We must never allow that to happen."

The proposed plan was enthusiastically approved, and the station continued to be staffed seven days a week by volunteers.

The station was upgraded again with the help of many manufacturers. Attending the rededication ceremony in October 1991 was the late Mrs. Gioia Marconi Braga, daughter of Guglielmo Marconi, "The Father of Radio."

Making a Difference

ARRL Executive Vice President Dave Sumner, K1ZZ, said, "as a result of your efforts, many thousands of museum visitors will leave with a better understanding of amateur radio. In some cases, particularly young people, their lives will be permanently enriched by the discovery of new opportunities."

The impact of W3TKQ/W3AA (Phil-Mont changed the callsign of the station to W3AA following the death of one of its members.) is told one visitor or one contact at a time, from teaching a child his or her name in Morse code, to helping a student decide on a career in electronics, to explaining to the public just what we hams are about. Phil-Mont club members also conducted 200 monthly amateur radio license exam sessions at the institute. If you wanted to take an exam in Philadelphia, you usually went to the institute.

A highlight of the museum station's history is W3AA's SSTV contact with astronaut Kenneth Cameron, KB5AWP, aboard the space shuttle Discovery (STS-56) in April 1993. The pass was an early morning event, so everything had to be tested and checked out well in advance. Steve, WU3I, and Al Tribble, W3STW, checked the antennas on the roof. They set up the shuttle orbiting tracking program to simulate the orbital pass. As they watched the antennas scan the sky, they discovered one problem. The contact was going to be cut short unless they could get a signal through a center-city skyscraper. All they could do was hope that they would have enough time before the shuttle "disappeared" behind the building.

Several school students and a host of club members, parents, and television personnel assembled at about 7 AM to witness the contact. Joshua Feierman, N3NLR, started calling "KB5AWP Discovery" as the shuttle began to pass over Philadelphia. He received a reply: "We hear you loud and clear." Joshua gave Ken a 5-7 report. A student asked Cameron, "What would happen should the navigational computer fail?" Cameron replied that they would be in big trouble.

Feierman then sent an SSTV picture of the participating students to the Discovery. Cameron replied, "What a fine group of young people." Tribble said the highlight of the event was "perhaps to see and talk to some of America's future astronauts." Hoch remembers how excited one television reporter was. He was so impressed that he invited some of the operators to appear on his television show.

Moving on . . .

While the amateur radio voice of the Franklin Institute will be silent as of this October, W3AA will continue to be active in Philadelphia. Currently, plans are in process to set up the station at a Philadelphia high school. It is hoped that W3AA will continue to introduce amateur radio communications and all the hobby has to offer to some of the scientists and leaders of tomorrow.

73, Bob, WA3PZO

Magic In The Sky

BY JEFF REINHARDT, AA6JR

New Views of Amateur Radio

Here and There

The airwaves are alive with magic. Hopefully that magic will increase even more as we make the transition to the autumn and winter, the seasons that favor long-haul HF activity. It's been a busy several months since our last visit on these pages of *CQ*, so let's take on a number of subjects.

New Bands?

It's exciting to see CQ, the ARRL, and others supporting the push for new HF spectrum. Soon we could enjoy operating on "60 meters," 5.25–5.4 MHz and way down on 136 kHz. We all should be excited at the prospect of any additional frequencies, but it's a rare treat to consider additional HF possibilities and learn about the characteristics of the bands. There are sure to be many challenges ahead, including suggested band planning and, of course, finding or building gear that will operate on those frequencies. Anyone have a 60 meter antenna handy?

Word has it this is the QTH of B1RD.

Detail of B1RD's Yagi. In spite of a good antenna, there are reports of chirp on his signals.

Homeland Security

When you read this, it will have been over a year since the attacks on our nation. Much has been said and done about the notion of homeland security, including the formation of a government department to manage our safety. It may be a bit early to be critical, but I'm concerned that few of the discussions I have heard about homeland security include any *active* involvement by the general public.

In the aftermath of the September 2001 attacks, I wrote a piece posing the following rhetorical question: Would more monitoring of the airwaves by radio hobbyists have made a difference? I received several thoughtful and supportive responses to that piece, which has also made the rounds in some law enforcement agencies.

Here's an interesting problem: Law enforcement is becoming frustrated because they can no longer reliably monitor *other law enforcement agencies!* While that may sound comical at first, the introduction of trunked and digital systems by certain jurisdictions has raised all hell with state and federal agencies charged with coordinating the activities and deployment of interagency and mutual-aid responses. This flies in the face of legislation emplaced years ago—the Standardized Emergency Management System (SEMS), which was supposed to mandate a unified approach to handling larger emergencies. Progress had been made, until the most basic component of SEMS—communications—started to unravel when trunked and digital systems began to be sold to local agencies by manufacturers eager to ring up multi-million dollar sales and sell service contracts to agencies not capable of thinking beyond their borders.

Public-safety agencies are being herded into narrower bandwidths, converted to digital, putting the *lives of firefighters and police officers at risk*, as several agencies across the country have reported severe difficulties with the new equipment. What's also interesting is that the spectrum they moved off lies unused. There are huge chunks of VHF Low (30 ~ 50 MHz), VHF High (150 ~ 174 MHz), and now UHF (460 ~ 520 MHz) that are all but abandoned. Meanwhile, big communications firms are ringing up seven-figure (or larger) sales, while police and firefighters in several large cities are frustrated because they cannot talk to one another as well as they could *before* their city or county spent big taxpayer dollars on the new systems. Anyone see anything wrong with this picture?

Toss in the derailment of the intent behind SEMS, and we have a big set of problems brewing because institutional buyers are falling under the spell of engineers and salespeople who promise benefits such as "clear digital communications" and encryption, neither of which is a necessary component of *basic* public-safety radio operations. The bad guys don't have to worry so much about the police listening; the police often can't hear one another!

The New York Times identified several problems related to communications during the World Trade Center response, and the findings indicate that poor communications cost several people their lives (see "Fatal Confusion," a

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

five-part series published by the *Times*.) Imagine a homeland-security element comprised of hundreds of thousands of homes equipped with scanners that monitor, well, just about everything. Volunteers from age 20 to 120 could do it and perform a valued service. Anyone hatching a plot against the country would be hard pressed to sustain communications through that kind of network!

It may be time to get public-safety communications back to basics.

Hamfests

It's a long way from Dayton to Santa Maria, California, but I bought radios at hamfests held at both locations this year. Hamfests don't get much bigger than the Dayton Hamvention®, or much smaller than the event in Santa Maria, but both were fun and put on by a dedicated group of volunteers. It's unfortunate that Dayton has seen its fleamarket shrinking in size the past few years. The escalating cost for space has driven away many sellers, and I'm sure the Dayton Amateur Radio Association folks are well aware of the problem. They probably have good reasons for the cost increase, but a diminished Dayton is not good news to anyone.

Meanwhile, the Santa Maria barbecue and hamfest, held at one of the most scenic locations for such an event, came back into existence this year after a brief hiatus. While attendance was not quite up to expectations, this Father's Day tradition made a welcome return and hopefully will be bigger and better in 2003. I have to give them a plug; I won a bird house in the prize drawing. In the proper spirit of things, I crafted a Yagi for the bird house, but am distressed at reports of chirps on the occupants' signals.

Creative Mobile Antennas

The newer cars are presenting more of a challenge when it comes to installing radios and mounting antennas. We have a new car in the family fleet, and it has a very high "degree of difficulty" in terms of radio compatibility. The roof, front fenders, and doors are not ferrous metal; only the hood and rear fenders are. Recently, a county hunter rented a convertible of the same model, and on a county hunter website made several unpleasant comments about trying to integrate HF operations with that car, including an observed propensity for the car's engine to die when he keyed up!

I have a friend who overcame the challenge of putting a 2 meter antenna on the family van. The vehicle came with a rear wind deflector. As the defector was 19 inches long, it was just right for insulating and loading as a 2 meter antenna. While it didn't have great range, it did work as a "stealth " antenna . . . and look, Mom, no new holes!

I'm wondering if anyone with a "plastic car" has tried using window burglar-alarm tape to make a stealth antenna on the inside of the body panel? It would seem there are many possibilities, including the pattern for a J-pole, dipole, or even a beam, although a beam in mobile use would probably be a somewhat silly endeavor. If you have done so, let me know. Even better, send photos and we'll publish your project and comments here.

Before attempting such a project, be sure that you're dealing with non-conductive composite body materials. A few years back, I purchased a Mercury Grand Marquis and was surprised to find a magnetic-mount antenna would not adhere to the trunk or the hood. Turns out those body panels are aluminum, not a composite, as I had originally suspected.

N1MZA

I'll close with a tribute to Steve Mansfield, N1MZA, an ARRL employee (Legislative and Public Affairs Manager) who became a Silent Key July 29 after a courageous fight with brain cancer. You and I owe Steve a lot, in that he worked hard for over a decade to advance the cause of amateur radio in the halls of government. Steve had a great attitude, was well respected, and it was always apparent that his efforts were truly a labor of love.

The last time I saw Steve was in the summer of 2001, and despite the challenges he faced he was chipper and eager to continue his activities, which he did for quite some time. Without people like Steve, there might well be no Magic.

Next time you key up a transmitter, do it in honor of N1MZA, who gave far more than most in helping to make the airwaves a place where you and I can put some "Magic In The Sky."

73, Jeff, AA6JR

Beginner's Corner

BY PETER O'DELL, WB2D

For the Newcomer to Ham Radio

Rules and the "Radio Police"

Shortly after I had bought my first 2 meter FM rig (at the end of the Dark Ages), I was driving along some of the back roads in Ann Arbor, Michigan. My car was a stick shift, and in those days I smoked a pipe. Adding a microphone to the mix meant juggling more objects than two hands could be expected to handle. At some point, a moron ran a stop sign and almost hit my car. I swerved, hit the brakes, and recited from memory all seven of George Carlin's words that "you can't say on TV." Only at the end of my speech did I realize I had not dropped the microphone. No, I had gripped it very tightly, and so, that day all those listening in heard a very heart-felt rendition of Carlin's soliloquy.

Things were different then. Comedians were busted for doing risqué routines in night clubs—routines that would be too mild for the Springer show these days. The FCC was serious about keeping the ham bands as pristine as *Leave It to Beaver*. Ann Arbor just happens to be about 30 miles west of Detroit, where one of the FCC Field Offices is located. Back then one of the Radio Inspectors from that office was a zealous ham intent on enforcing the rules. I often heard people discussing citations they had been issued for some 2 meter rules infraction.

Was I worried? Yes. Had I committed an infraction? Yes. Would I intentionally do it again? Of course not! However, a rule had been broken, and there was a price to pay. The price I paid was the ribbing from other club members. No citation came in the mail, but in a good-natured way the club members did not let me forget that I had goofed. In the end, that sort of "discipline" probably was much more effective than an official citation.

Several years later I was on the upper end of the 15 meter phone band attempting to keep a sked with a friend on the west coast. We had an agreement to drop down through the bands until we found one which would support communications that day. I called him several times with no luck. On the off chance that he could hear me even though I could not hear him, I said, "I'm going to try 20 meters now."

I reached out and punched the 20 meter button on my then state-of-the-art HF rig. Immediately I was on 20 and started calling my friend. When I let up on the mic, a male voice came out of the speaker and simply said, "You are out of the band."

I looked at the dial. Yep. I had been on 21.375 MHz or so, and now I was on 14.375, somewhat out of the band. Moreover, I had just spent 30 seconds or more giving my callsign phonetically over and over again. If "The Man" was listening, he heard me. If he heard me, he knew my call. I didn't freak out or anything quite that severe, but I wondered if I would get a slap on the wrist from the FCC this time.

Nothing came in the mail, and so that memory drifted back down with the others of by-gone times. Every once in a while, though, I think about the fellow who said, "You are out of the band." Who was he? I think I now know. Oh, not his name or callsign, but I'll bet he was a ham, a ham who just happened to be listening in on my efforts to contact my friend. When I said I was going to 20 meters, he went along for the ride. Then he did something very kind—and very illegal. He told me that I was screwing up. In order to do that, he had to break the rules, too.

Personally, I think he did the right thing, but there are a lot of different ways you can look at this. If you believe that "rules are rules," then you might think that we both deserved a citation. At the other end of the spectrum, I would say that I simply made a stupid mistake, a kind soul gently pointed out that I had made the mistake, and I quickly rectified it. No citations. Which view is right?

Condo Cops

Ever live in a condo? I did for a year, and it was an interesting experience. I'd heard the term "condo police," but I did not know exactly what it meant. Now I do. In my case, it was two sisters who each owned a unit. They didn't fit the mean,

*123 NW 13th Street, Suite 304-2, Boca Raton, FL 33432
e-mail: <wb2d@cq-amateur-radio.com>

In the photo on the left the VFO is tuned to 21.375 MHz, perfectly legal. Drop down two bands to 20 meters by tapping the down band switch twice, and you now have the illegal (out of band) frequency of 14.375 (right). Had WB2D been below 21.350, this would not have been a problem.

lonely old-hag stereotype, so I have no idea why they acted the way they did. Both were in their mid-to-late thirties, physically attractive, "involved," well educated, employed, and obsessed with running my life (and that of the other 20 or so people living there). Let me add, this had nothing to do with radios or antennas. I was in the midst of a divorce and had sold most of my equipment. I don't recall even so much as turning on an HT while I lived there.

No, these ladies were intent on micromanaging everyone's life. There were rules for everything, and they demanded every rule be followed to the letter. After my anger subsided a bit, it became a game to me. What could I get away with? What could I do to annoy them that did not break one of their rules? Better yet, could I find some way to twist one of their rules around so that I would be doing something really annoying while following their rules to the letter? Thus, I became a 45-year-old juvenile delinquent. What a waste of my time and energy.

Band Police

Ham radio has its share of condo police. Who knows what makes them tick, either. The simple fact is they are there. Sooner or later you are going to run into one of them.

When I first started checking into VHF traffic nets, I didn't pay as close attention to procedures as I might have. One evening I took a message from another ham, "Duke," and did not use formal net procedure for confirming receipt of the message. Duke then asked the net control station to talk to me on a simplex frequency. We moved there, and he spent the next 15 minutes ranting and raving about what an incompetent jerk I was. By the time he finished with me, I was thinking that the honorable thing might be to mail my license back to Gettysburg before I jumped off a bridge.

Fortunately, a friend had listened in on the episode and called me: "You don't know about Duke, do you?" He went on to tell me that Duke was a loudmouthed jackass on the radio who was always correcting people. Everyone laughed at him behind his back, because he came across on the air as some sort of authority on the rules and regs. In reality, his advice was wrong just as often as it was right. That helped some, but the memory of what he said and how he said it bothered me for a long time, and I probably spent less time handling traffic because of it.

Later on I bumped into "Duke" at a hamfest. He bore about as much resemblance to John Wayne as I do to King Arthur. On the radio, however, he had seemed so. . . . Somehow, it just became absurd and didn't matter anymore. It was something to laugh at. Laughing is a good thing.

A Lesson?

I haven't always laughed at the condo police, though. When I first got into ham radio, I became super active on the air and locally in clubs. Pretty soon, I was given the job of editing the club newsletter. I was listening to the repeater one day when a new ham committed some *faux pas*. It was pretty minor, but noticeable. Unfortunately for all involved, Freddie was listening, too. Freddie royally chewed out the new guy and that really annoyed me. How dare he. This wasn't the spirit of ham radio. Someone should teach this buffoon a lesson.

As luck would have it, I was putting together the newsletter and I needed something that would fill a column. I sat down and directed my anger into a satirical fable about Sheriff Fred. It was biting, sarcastic, and funny, but it was also cruel and mean spirited. This will certainly be in my "Top Ten List of Dumbest Things I Did" when I die. Oh, I forgot to

Reader Feedback

From Russ Fish, K7INA: First, let me say thanks for the article in the August issue of *CQ* [about being prepared in an emergency]. Well done and long overdue.

Second, you, like almost everyone else on the planet, don't know about, overlook, or just plain forget, a class 5 hurricane that occurred just weeks after Andrew. Hurricane Iniki devastated the Hawaiian island of Kauai on September 11, 1992. That's right, another 9-11 event. I know, because I lived on the island and was the first amateur on the air with news of our survival. I have an NOAA satellite picture taken exactly when Iniki was "dead center" over Kauai; the spiral arms extended 100 miles out and actually caused evacuation of Waikiki Beach on Oahu. Think the tourists liked that action? I don't know why "our" hurricane is not mentioned; winds were clocked at the Waimea Canyon NASA tracking site at 200 mph, sustained for several hours. It all started at 10 AM local time and lasted until 6 PM local. My home was without power for six months, and I was one of the first to get back "on line."

Both my neighbors' homes were reduced to the concrete foundation slabs. All the resorts at Poipu, Lihue, and Kapaa were destroyed. The Princeville Resort on the north shore was completely blown over the cliff and into the sea. Virtually every structure, tree, utility pole/tower, etc., on the island was damaged if not destroyed outright. Catastrophic enough?? So why is Iniki ignored? I don't know. And I guess you don't either. I just wish our close encounter with death *(Yes, I thought I was going to die.)* would get equal ink with these other events.

I'm not taking anything away from Andrew victims; don't get me wrong. I just want people to know we had a real "blast" on Kauai a few weeks later. In fact, there were a lot of people on the island from Florida, who had been through Andrew, trying to "get away," and they found themselves having another "blast" half a world away. Spielberg had been filming some last snippets for *Jurassic Park* and he was stranded. But with all his $$$$, he chartered a cargo jet from California to come and "rescue him." He and his crew were essentially the first people off the island after Iniki and that annoyed a lot of tourists. Guess they still went to see the movie tho'.

After a few days of helping to clear the local streets of trees, power poles, house remains, etc., I took my R-5 vertical and ICOM 730 into Lihue to KQNG, "KONG," the local radio station. They had managed to get up a temporary antenna and were on the air with limited power using their generator. I was able to erect my vertical on their roof, tap into their generator, and by Ground Zero +3 days I was on the air handling health and welfare traffic on 20 meters SSB for people who were able to get there. All phone lines were history. I was also helping the local ham club get 2 meter inter-island communications up-and-running, as well as intra-island 2/80/40 meters. Hams were going everywhere to try to get a handle on the post-Iniki needs.

Lots more to tell, but I won't bore you. My main point here is we had a real problem on Kauai that day, and there is hardly any mention of Iniki when the topic of hurricanes comes up. It was, after all, one of the worst (I think *the* worst) in U.S. history. Maybe because Hawaii is way out in the ocean, it doesn't count. Try to convince me and my Kauai Island *ohana* it doesn't count! *Ohana* is Hawaiian for family—a small island in the middle of the ocean, believe me, everyone is *ohana!*

One last thing: You have heard of the famous resort Coco Palms on Kauai? The one where Elvis filmed the lagoon canoe ride in Blue Hawaii? Well, it never reopened after Iniki. Just another Iniki memory. Last week I spoke to a fellow ham on the island and he confirmed the resort is still boarded up. A ghost resort in paradise.

mention that Freddie was a martial arts expert, and he did look like John Wayne. He sounded a little like a very angry John Wayne when he called me on the phone to tell me he would see me at the next club meeting—and he knew all of George Carlin's words, too.

Feddie and I had never been close friends. Had I taught him a lesson? No. Had I improved ham radio? No. All I did was make a bigger fool of myself than Freddie had of himself. His offense had been a few words drifting across the ether and disappearing as soon as spoken. With a stroke of genius, I had chosen to put mine down in black and white, about as permanent as you can do. I embarrassed him in public, and I turned him into an enemy. Fortunately, a mutual friend was able to smooth it over somewhat. I see Freddie at Dayton occasionally, and there is still tension between us. We speak, but I know he still remembers. I do. I'm sorry for what I did.

What About Now?

A few years back the FCC did very little direct policing of the amateur bands. The chance of your receiving a citation for any transgression was pretty remote. Some of the urban areas produced behavior and language inappropriate rap musician reunion. However, that doesn't mean no one was listening.

The pendulum has swung back again, and the FCC is now going after the more egregious offenders. Hams talk about "Riley" the same way the residents of Tombstone, Arizona talked about "Wyatt" a hundred years ago. Beyond that, though, there is a mechanism in place to "encourage" gracious behavior on the bands.

Part of the Communications Amendments Act of 1982 provided for the FCC to make use of volunteers to monitor the airwaves for rules violations. The Amateur Auxiliary, administered by the ARRL, grew out of its Official Observer (OO) program.

The general objectives of the Amateur Auxiliary are to foster a wider knowledge of the rules and regulations, extend the concepts of self-regulation and self-administration, enhance the opportunity of individual amateurs to contribute to the public welfare, and enable the FCC to effectively and efficiently utilize its resources. Essentially, the Auxiliary is there for observation and advice, not direct enforcement. In short, the ideal Auxiliary member is the wise and kindly soul who wants to help you find a solution to a problem you may not even know you have. Condo cops need not apply! On the other hand, that does not mean they will turn and look away from someone who intentionally and repeatedly violates the rules. Data is constantly being collected and analyzed.

OO's still exist, too. The primary purpose of that program is to note technical discrepancies and call attention to them. Probably the most frequent VHF/UHF violation is overdeviating an FM signal. If an OO notices that you have a problem (such as overdeviation), he will send you an Official Observer Advisory Notice. This is a written equivalent of a voice quietly telling you, "You are out of band." You do not have to respond in writing to the Notice, but do keep in mind that the OO is doing you a favor. You could get angry and yell, but is that what you really want? If you receive such a notice, have your rig checked out. There is somebody in every club who will help with problems such as that.

What if you notice someone else violating the rules? Use some common sense. After checking out the regs and thinking about it for a while, if you still think you need to let the transgressor know, do it quietly, off the air in a friendly way. Nobody likes a condo cop. There's a lot of truth in the old cliché, you catch more flies with honey rather than vinegar.

I think most hams want to do the right thing. Just give them a chance.

Step up to the performance leader.

...Step up to Force 12

The XR-5©

20-17-15-12-10 mtrs, one feed line
10 full size elements, full coverage
no traps, no log cells
18' boom, 100 mph
54 pounds, 8.5 sqft

HF and VHF Antennas and Towers

High Performance Yagis and Verticals

The Gold Standard of Tribanders

C-31XR

20-15-10 mtrs for those who want the best.
31' Boom, 100 mph, 5KW

Sigma-80©

36' true vertical
dipole, no radials

Sigma-40©

24' true vertical
dipole, no radials

C-19XR

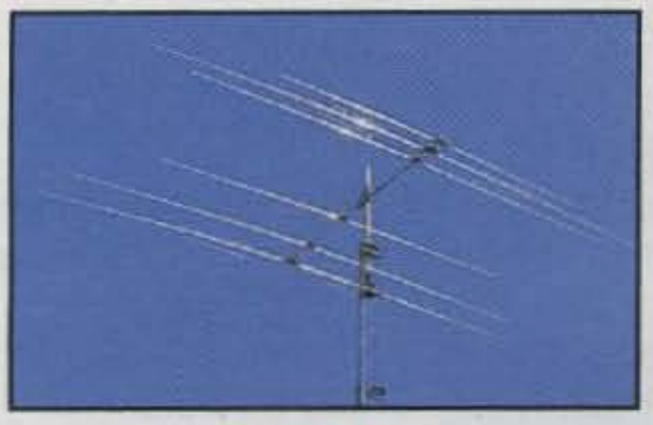
Dollar for dollar the best buy in a
20-15-10 mtr tribander.
19' Boom, 100 mph, 5KW

Sigma-5©

20-17-15-12-10 mtrs, no radials
no tools, 9' tall + base, 7 lbs, 2' pieces
1200w PEP, pre-tuned, >91% efficient
(optional X-base)

Sigma-SV5©

CC&R Friendly© falling
within the OTARD Rule
20-17-15-12-10 mtrs
no radials, 11'11" tall
including 4' base.
12 lbs, 4' sections.
Can receive local TV
broadcast and has
cosmetic TV elements
for concerned neighbors
1200w PEP, pre-tuned
>91% efficient
(optional X-base)



C-3SS

World's Most Popular
Non-trapped
20-10 mtr Yagi, 12' boom
100 mph, 30 pounds, 5KW

Force 12 ⇒ Anything Else is Just an Antenna!

Complete line HF and VHF Antennas, Amateur and Commercial, Aluminum Manual and Hydraulic Towers
Available direct, through Texas Towers, Antennas Plus, Ham Radio Outlet and Dealers Worldwide

For FREE brochure - down-loadable, viewed on line, product info, tech tips: Debugging an Antenna, Antenna Specs, DXpeditions, Customer's Antennas, Antenna Tests and Tuning and more: www.force12inc.com
E-mail to: force12e@lightlink.com Join the Force 12 Reflector – see the web site for details

Force 12, Inc. PO Box 1349 Paso Robles, CA 93447
Order Line 1.800.248.1985 Tech Line 1.805.227.1680 FAX 1.805.227.1684

World Of Ideas

BY DAVE INGRAM, K4TWJ

A Look At The World Around Us

HF Pack'n in the U.S.A.—Part I

The trend started with a redheaded YL in California. It is called HF Pack, and it is covering the U.S. and rapidly expanding into other areas of the world. What is HF Pack, why is it so irresistibly exciting, and how do you join the action? These questions will require a couple of columns to answer, so let's start with a quick and simple description and expand from there.

HF Pack initially might be visualized as walk-and-talk HF'n. However, it also includes all types of stand-alone operations with battery-powered gear and snap-together antennas. It is the ideal answer to emergency preparedness and the perfect alternative for antenna-restricted neighborhoods or mobiling on busy roads. How seriously and how far you take HF Pack action is a matter of personal preference. The only prerequisite is enthusiasm for hamming in unique ways and/or from unusual or noteworthy locations. HF Packers have been heard operating pedestrian, bicycle, and snowmobile mobile, and hamming from mountaintops, from kayaks, on snowshoes, on the Golden Gate Bridge, from a golf cart, and more. There is no limit to the possibilities—and the fun!

While almost all types of stand-alone operations can be considered HF Pack'n (and the more unusual the better!), the most popular form is "pedestrian mobile" (see photos A, B, and C). That is the fun side, so to speak. Totally independent global communications from anywhere is HF Pack's special benefit and attraction, and it is has most merit during these times of uncertainty and continued terrorist threats.

Looking closely at photo A, we see a leading HF Packer, Budd Drummond, W3FF, operating from a rather unusual location with his high-power setup (a TS-50 running 50 watts) and professionally produced Buddipole antenna, which Budd manufactures. Budd is an ex-radio-DJ with a terrific voice and an incredible enthusiasm for HF Pack. You can hear him most Sunday afternoons spearheading Pack action on 18.157.5 or 14.342.5 MHz.

4941 Scenic View Drive, Birmingham, AL 35210

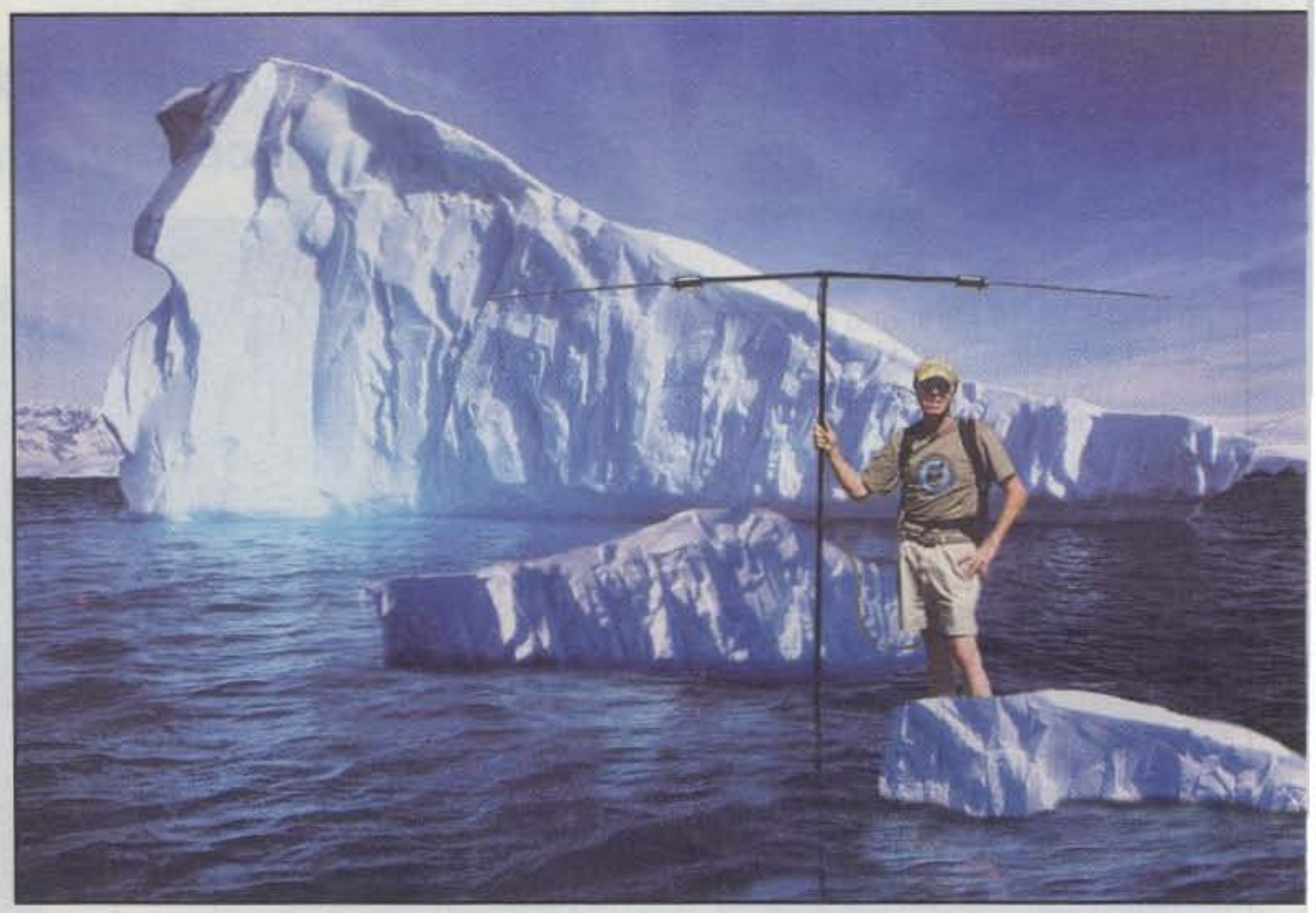


Photo A– Budd Drummond, W3FF, a live wire in HF Pack action, says it all in a single photograph: "This pedestrian mobile stuff is so cool!"

Another big-time supporter of HF Pack, Bob Follett, AB7ST, is shown operating HF Pack from atop a scenic western mountaintop in photo B. Bob is a professional photographer of outdoor attractions, so he knows many favored spots for DXing. You don't think there are any exciting places in your area for HF Pack or pedestrian-mobile action? Think again. Photo C shows "World of Ideas" columnist Dave Ingram, K4TWJ, Packing in the park. If I can do it, anyone can do it!

Listen In; Join in!

You may have unexpectedly tuned across HF Pack activities on the air (a

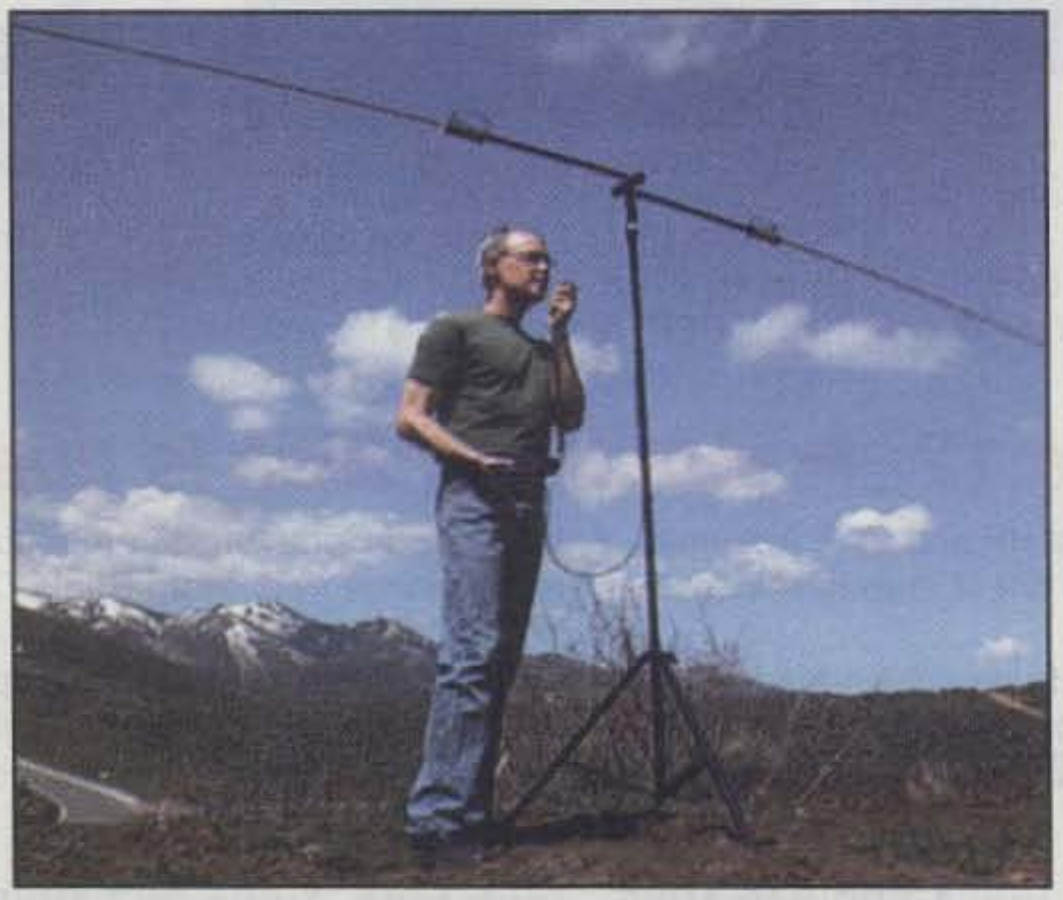


Photo B– No power-line noise, no TVI, and a straight shot to DX! Another top HF Pack operator, Bob, AB7ST, enjoys hamming from the hills with an FT-817 and tripod-supported Buddipole antenna. Note snow-capped mountains in the background! For those worried about RF exposure, remember the 817 is a QRP rig and the photo is posed for height reference, not operating example.

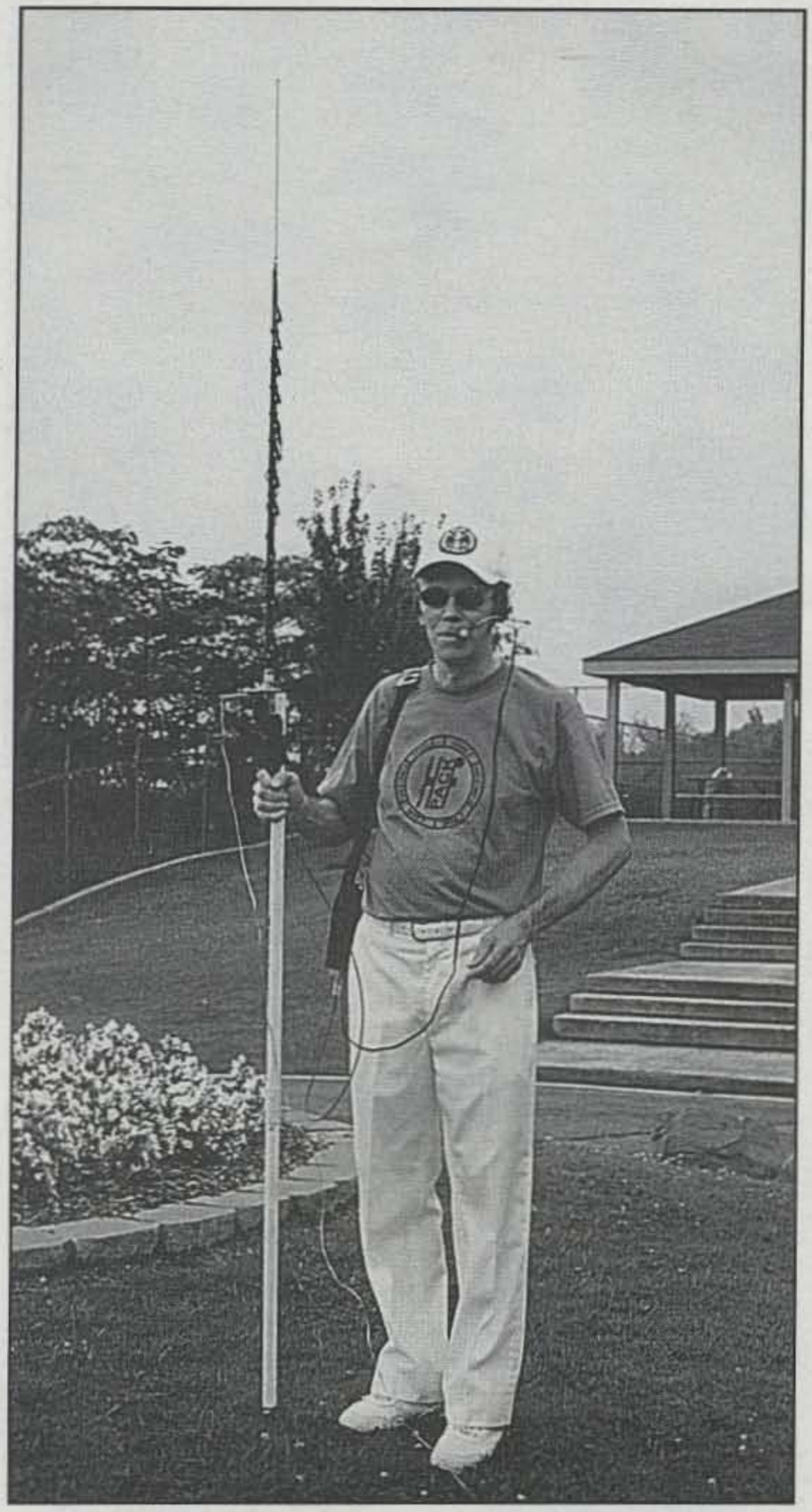


Photo C– Here's your columnist, K4TWJ, Packing in the park. Gear consists of a shoulder-strap-equipped FT-817, boom mic headset for hands-free operation, and Outbacker Joey antenna with trailing counterpoise. HF Pack T-shirt adds 10 dB to both transmit and receive signal levels!

←

Photo D– What do you need for operating HF Pack? As shown here, the main requirements are a mini transceiver such as the FT-817, a carrying case or bag, an easy-to-carry antenna, mic, key, and short coax cable. An HF Pack T-shirt is optional, but has a noticeable advantage (see above).

Band	Frequency & Mode	Popular Time of Group Activity
80 m	3.687.5 MHz CW 3.997.5 MHz SSB	Eclectic activity—mainly on weekends
40 m	7.087.5 MHz CW 7.242.5 MHz SSB	Eclectic activity—mainly on weekends
30 m	10.137.5 MHz CW	Eclectic activity—mainly on weekends (soon to increase)
20 m	14.342.5 MHz SSB	1700 and 2300 UTC Daily & especially weekends
17 m	**18.157.5 MHz SSB**	**1630 and 2230 UTC** **Daily & especially weekends**
10 m	28.327.5 MHz SSB	Eclectic—mainly on weekends

Table I– Outline of popular frequencies and times for group-type HF Pack activities. Main spot of 18.157.5 MHz is the most active frequency, especially on weekends.

pleasant surprise), or you may be asking what the hot frequencies for HF Pack are, so a quick tuning guide is shown in Table I. Presently, the most popular frequency of operation is 18.157.5 MHz, with 14.342.5 MHz following behind it and other bands/frequencies supporting HF Pack in a somewhat more eclectic manner.

Although Packers may be noted on 18.157.5 and 14.342.5 MHz almost any time the band is open, most group activity tends to favor afternoons—especially on weekends. The 1630 UTC gathering on 18.157.5 MHz and the 1700 UTC meets on 14.342.5 MHz are always good spots to store in your rig's memory and check regularly. In doing so, you will find 17 meter action often continues at a steady pace right up until the band closes. A moderator, "Pack Leader," or group host may not always be present or on frequency during a "hot" time, so just turn up your receiver's gain and listen carefully. Most Packers use low power and compact, portable antennas, so signal levels are usually low. Yes, HF Pack and QRP are closely related, mainly because the weight of a large battery pack and the close proximity of an antenna encourage use of low power. Unlike most QRP activity (which is usually on CW), however, HF Pack leans more toward SSB operations.

Many visitors or newcomers to HF Pack frequencies tell us it is the first time they heard or worked a bicycle-mobile or a pedestrian-mobile/walk-and-talk HFer and say it is quite exciting. Others say they cannot resist calling in with their own battery-powered rig and mini HF antenna, and that is fine. Give it a go. It will be the most fun you have experienced in a month of Sundays. As you become more interested in Pack activity, you might also check the group's website at

Bonnie Crystal, KQ6XA
The Founder of HF Pack

Bonnie Crystal is a most interesting YL. She is a broadcast engineer, an RF engineer,and a technical writer. She co-founded Telegen Corporation, a high-tech video broadcast and display R&D company and the first woman-founded company to go public on NASDAQ ("TEGN"). Bonnie is also a noted expert in cave science, and it was her cave explorations in various world areas that inspired the use of backpack radios for communications from remote locations—the first form of HF Pack.

As Bonnie explains, "I founded HF Pack in November 2000 for HF operators to exchange ideas and notes. I hoped to find at least 25 others interested in sharing knowledge and enjoying portable on-the-air QSOs. The first day HF Pack e-group started, over 60 operators joined. By mid 2001 the group had reached 500 members and a steering committee was formed. Today there are over 2500 members. Bob Follett, AB7ST, and Budd Drummond, W3FF, are steering committee moderators. HF Pack's website (www.hfpack.com) gives members access to hundreds of information files plus an endless number of special bulletins and e-mails. The real excitement, however, is getting on the air and making unscheduled pedestrian-to-pedestrian and bicycle-to-bicycle QSOs, and it happens every weekend on the main HF Pack frequency of 18.157.5 MHz. HF Pack brings together a large number of active operators with a common focus. Everyone is welcome—especially QRPers (18.157.5 MHz has become a prime gathering spot for SSB QRPers), so join in."

I am sure you will agree that amateur radio is indeed fortunate to have Bonnie Crystal, KQ6XA, among its ranks. *—de K4TWJ*

HF Pack founder Bonnie Crystal, KQ6XA, with her cool collection of backpack/HF Pack SSB transceivers. Units are (left to right) FT-817 with homebrewed docking booster; Tokyo Hi-Power HT-750 handheld for 40, 15, and 6 meters; Yaesu FT-70G; Vertex VX-1200 with laptop on top; and Kachina MP-25 with Mizuho MX-7S handheld on top. (Photo by Jessica Stevens, KF6WMY)

Photo E– Budd, W3FF, pulls a Buddipole out of its tubular carrying case and prepares for on-the-spot action. Everything for instant plug-and-play operation is supplied with the antenna, even a pre-installed PL-259 and a PL-259-to-BNC adapter. (Photo by Chris Drummond)

<www.hfpack.com> or join the continuously expanding chat group at <hfpack@yahoo.com>. Whether on the air or on the web, you will find HF Packers enthusiastic, encouraging, and upbeat all the way.

Gearing Up

As you probably have surmised and as shown in photo D, the basic requirements for HF Pack'n are a portable transceiver and battery pack, a carrying pack or pouch, a breakdown antenna, and a key and microphone. An official HF Pack T-shirt is optional, but we understand folks wearing them "reach out" better than more conventionally attired ops. It must be the magic of the logo. Check the website mentioned above for more details and availability of the shirts, and remember, image is everything. Ya gotta look like a Packer!

The Yaesu/Vertex FT-817 is a natural for HF Pack, as it is small, reasonably priced, and has its own built-in battery tray or pack. Several other transceivers such as the Elecraft K2 and SGC-2020 also fill the bill in high style. If you are healthy and ready for gusto adventure, heavier transceivers such as the TS-50, IC-706, FT-100, and new FT-897 are also appealing. Trying to run 100 watts with one and an automobile battery strapped to your back is not too cool, but using a 7 or 8 amp gel cell and reducing rig power to 10 or 15 watts works fine. Just remember to keep checking your rig's temperature if it is enclosed in a bag.

Three good sources of "bags" are PowerPort with its rig pouches (www.powerportstore.com), Communication Outfitters with carry-all backpacks (www.communication-outfitters.com), and Mountain-Ops with padded wraparounds (www.mountain-ops.com). PowerPort also carries a neat selection of external-to-rig battery packs (and chargers) for the FT-817 and other 100 watt mobile transceivers. We will take a closer look at mating randomly purchased batteries and rigs

Photo F– The snap-together, multiband W3FF Buddipole antenna laid out and ready for quick field assembly. All sections store neatly in a roll-up bag, which slips into the 24 inch container at the top of the photo.

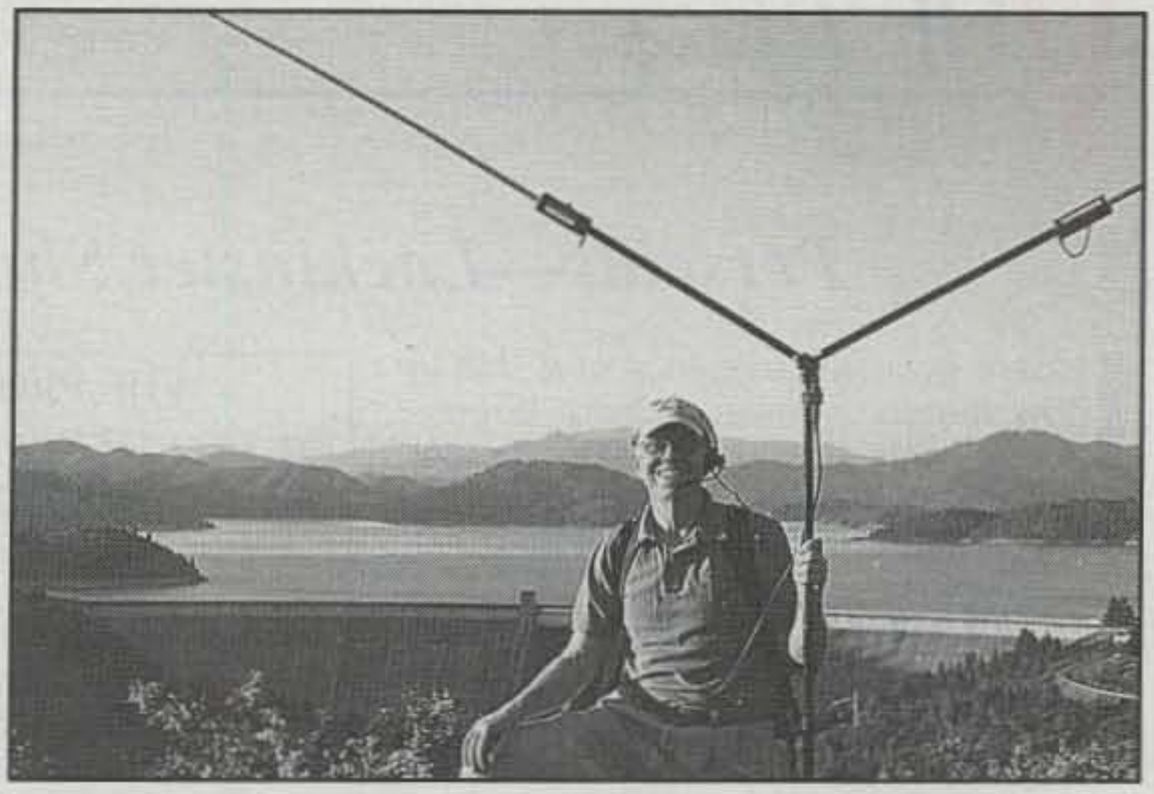


Photo G– The fun starts here! Budd, W3FF, with his Buddipole arranged in a Vee configuration and set for 17 meter operation. Antenna measures 16 feet tip-to-tip when assembled, weighs 2.2 pounds, and covers 40 through 6 meters. (Photo by Chris Drummond)

in next month's column. Some views of handy keys, mics, and interconnecting cables for Pack'n with an FT-817 are also included in my "QRP" column in this issue of *CQ*.

Surely the main reason operators realize less-than-optimum results when HF Pack'n is an unnecessarily compromising antenna system. A short vertical is often required, and that is fine. Just always remember to include a quarter-wavelength counterpoise or ground-synthesizing wire connected to the coax cable's shield at your antenna's base. You can let the counterpoise trail behind you while walking, but watch for snags. Through numerous checks and tests, I have found this counterpoise is more than necessary; it is *mandatory* for personal portable work with an acceptable SWR. When mobile in a car or on a bicycle, the vehicle's metal body acts as a ground or counterpoise. Unless you eat tin cans and wear aluminum clothes, you need a counterpoise—or a horizontal antenna—and that brings us to our next topic.

Meet the Buddipole!

Budd Drummond, W3FF, has pursued HF Pack and unique-style mobile operations for several years, so his recent development of the portable Buddipole antenna was a natural expansion of his radio interest. You saw the first generation of this snap-together multiband dipole in our "World of Ideas" column on mobiling a couple of years ago (W3FF golf-cart mobile). Budd continued to refine and perfect the antenna. Hams noticed his impressive pedestrian mobile signal, and began to ask him to make one for them. OM Budd and his son, Chris, thus started a mini-business making antennas, and they are first class all the way (photos E, F, and G).

The antenna proper is comprised of four main sections, two of which include tapped loading coils and large-diameter pull-up (pull-out?) end whips. Black-powder-coated whip and coil-supporting shafts for each side screw directly into the center tee or attach with swivel lugs and nuts to produce movable arms or elements. Using this arrangement, the Buddipole can be configured as a horizontal or vertical dipole, an "L," a sloper, or a Vee like Budd is using in photo G. The design is as cool as ice, and the antenna works so well you have to stuff it in its carrying case and put a large rock on it to stop the thing from chasing DX!

Technically speaking, the Buddipole covers 7 to 54 MHz continuously with coil/band taps preset for "plug and play" operation (but easily movable for special frequency use). Custom mini-banana plugs and sockets on the taps ensure positive connections. An in-line balun fitted with two more mini plugs and 17 feet of coax cable (plus pre-installed connectors) round out the package. The Buddipole measures 22 inches collapsed and 16 feet extended.

If you are looking for a handy "no fumbles" way to go portable on a moment's notice and command a big signal to boot, this antenna is the answer! Want more details (or an antenna)? Contact Budd Drummond, W3FF, at 2390 Templeton Drive, Redding, CA 96002; telephone 530-226-8446 or on the web at <www.buddipole.com>. Check out the Buddipole's optional mast and tripod mount as well. They are strong, light, and awesome!

Conclusion

That winds down the views for this time, gang, but we only scratched the surface of HF Pack fun. More details are coming in Part II next month, and a sheer wealth of additional information far too extensive for inclusion here is also featured in my new book, *Ultra Light HF'n*. You can get an autographed copy by sending $16 U.S. plus $2.50 book-rate postage or $3.95 Priority Mail to me, Dave Ingram, K4TWJ, 4941 Scenic View Drive, Birmingham, AL 35210 (postage higher for DX orders). Now get Packing, have fun, and may the force of good signals be with you! 73, Dave, K4TWJ

E-mail Notice

I appreciate hearing from each and every reader, even though there is not enough time for individual replies to everyone. Please be aware, however, that I have been having problems accessing my e-mail and sending replies. Although "antiquated"(?) my postal mail still works great. Please use my street address given on the first page of this column, be brief, include an SASE if a reply is desired, and be patient for a reply. Thanks for your understanding. . . .
—K4TWJ

VHF Plus

BY JOE LYNCH, N6CL

All About The World Above HF

Perseids—Lackluster Shower but Surprising Results

If there ever was evidence of a shift in how meteor shower activity is conducted, this year's *Perseids* shower was it. In the run-up to the shower Joe Taylor, K1JT, reported that over 200 people downloaded his latest version of WSJT (Version 2.2.2). In addition, Udo Langenohl, DK5YA, reported that more than 1400 accessed his mirror of Joe's website to download the WSJT software via his site. Shelby Ennis, W8WN, reported that it seemed everybody and his brother was on. Also, Shelby recorded the second highest ever number of hits on his Hot News Page.

Shelby also reported that the location that hosts the Ping Jockey and associated web pages suffered a power loss. The unfortunate result was that the Ping Jockey and associated pages were down for the entire weekend, forcing everybody to use the old DX World Web page, which couldn't begin to handle the load. The Ping Jockey web page <http://www.pingjockey.net/cgi-bin/pingtalk> did return by Monday morning, August 12, but it also was almost swamped. Webmaster Chris said something like 75 different stations had been there within a 30-minute period late that afternoon! Shelby also noted that he had seen about 20 new calls there that weekend, and received e-mails from several others reporting receiving his CQ for their first-ever meteor-scatter (MS) signal.

Shelby went on to say that without a full-time web connection, it would have been impossible to keep up with the activity. Reports sometimes were gone even from the Look Back page in less than an hour.

Shelby's record keeping showed that as of press time he had received around 40 reports, mostly from Europe. From those reports he made the following observations:

FSK441 was the mode of choice for nearly all contacts. There was some SSB activity reported from both Europe and North America, but it was very small compared with previous years. Europeans were reporting only limited high-speed CW (HSCW) activity, with FSK441 being used by nearly everyone.

Because of the amount of activity, the use of the calling frequencies—by listening and moving to another frequency for a contact—was found to be necessary in both Europe and North America. While for the most part this was done quite successfully, some stations new to meteor scatter did not seem to understand the procedures; fortunately, though, there were few of them.

It was also noted on both sides of the Atlantic that some stations answered a CQ, but called for only a few minutes before leaving the frequency. It needs to be pointed out that pings may be separated by a number of minutes, especially if it is not during the peak of a major shower or if the geometry is not optimum.

The long, rather flat peak in meteor activity associated with the *Perseids*, which covers several days, may have been somewhat smaller than usual. The larger peak on August 12 seems to have been about average, possibly slightly below average.

On the bands, Shelby stated that according to his reports many operators did very well. The largest number of contacts reported was about 50 (in Europe). Even so, while the Europeans did well, the totals appear to be slightly lower than in previous years.

While the North American reports he received were too few to draw any conclusions, there were a number of new grids worked and several 222 MHz contacts were reported. While there were no 432 MHz contacts reported, there were some "near misses" on that band.

On the long-haul activity, on 144 MHz K9KNW and W7XU completed a 1486 mile contact, which is the longest distance reported and is believed to be a new record for the FSK441 mode. There was one other "near miss" of interest: K2TXB and WØAH came very close to a MS contact at 1617 miles, but were unable to exchange final reports. (They saved the pings they received as proof.)

The individual band reports, taken from Shelby's records, indicate the following activity:

50 MHz: There seemed to be a lot of FSK441 activity on this band in North America, but less SSB.

144 MHz: As usual, most activity was on this band. Worldwide, nearly all activity was FSK441. In Europe several stations reported 40–50 contacts (often all random); many picked up a number of new grids. The 144.370 MHz calling frequency became "crowded." In general, totals seemed fewer this year than during previous *Perseids*, and many Europeans felt that the shower was "poor." In North America there was much FSK441 activity, with many contacts being made, though not a large number by any one station; there were a good number of CQs heard on 144.140 MHz.

222 MHz: Somewhere from 12–15 contacts were reported, usually by stations in the 150 watt range.

432 MHz: Only two attempts were reported, both "near misses." There were several requesting 432 skeds, so there probably was more activity than was reported.

As indicated by Shelby's reports and reports of others, SSB, CW, and to some extent HSCW seem to have become modes of the past for working meteor scatter, even for peaks such as the *Perseids*. Even so, these modes—SSB in particular—are not dead. As was indicated during last year's *Leonids* shower, SSB is the mode of preference during a meteor storm. With a storm again forecast for this year's *Leonids*, SSB will play a dominant role in making meteor-scatter contacts. There will be more on this in next month's column.

VHF Plus Calendar

Oct. 2	432 MHz Fall Sprint
Oct. 6	New Moon and Moon perigee Good EME conditions.
Oct. 9	*Draconids* meteor shower predicted peak
Oct. 12	Lowest Moon declination.
Oct. 13	First quarter Moon. Very poor EME conditions
Oct. 19	50 MHz Fall Sprint
Oct. 20	Moon apogee. Moderate EME conditions
Oct. 21	Full Moon
Oct. 26-27	ARRL International EME Competition first weekend
Oct. 27	Highest Moon declination. Very poor EME conditions
Oct. 29	Last quarter Moon

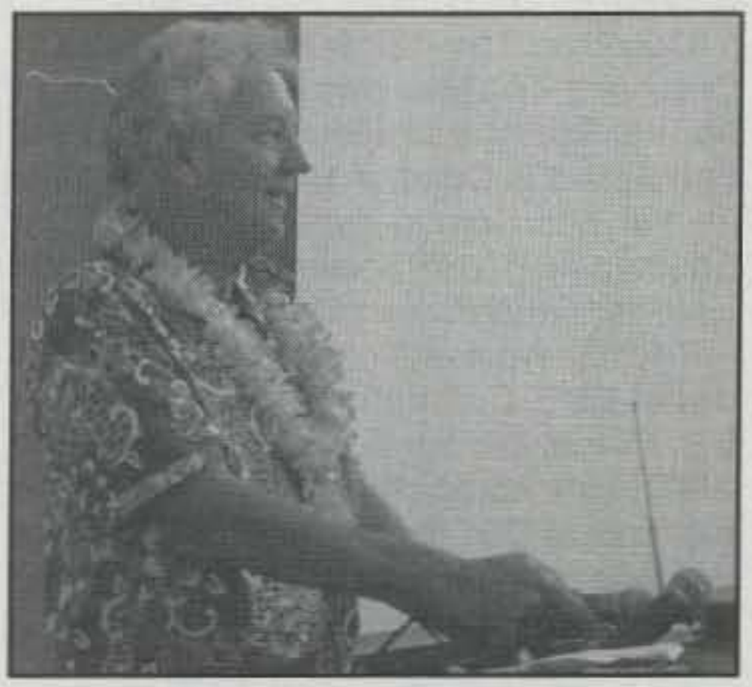
— EME conditions courtesy W5LUU

CSVHFS Conference A Huge Success

A record 206 participants registered for this year's Central States VHF Society Conference, which was held in Milwaukee, Wisconsin in July. They were treated to excellent presentations. For whatever reason, your editor led off the presentations with my paper on the history of the *Leonids* meteor shower (A version of this paper will appear in the fall issue of *CQ VHF* magazine.). Following me was Tom Whitted, WA8WZG, who gave a very informative talk on the various types of hardline available today.

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

Pat Coker, N6RMJ, addressed a number of attendees on how to operate weak-signal VHF at the ARRL Southwestern Division Convention.



Gordon West, WB6NOA, presented a history of records set via the Hawaii tropo at the ARRL Southwestern Division Convention in Escondido, California, this past August.

Paul Lieb, KH6HME, holder of many of the Hawaiian side of the VHF and above Hawaiian tropo records, was the special guest at WB6NOA's talk at the ARRL Southwestern Division Convention.

Other participants included Al Ward, W5LUA, and Barry Malowanchuk, VE4MA, who did a dog-and-pony presentation of their 24 GHz EME accomplishments. Curt Roseman, K9AKS, gave a presentation of seven decades of VHF contesting, indicating the changes that have taken place over these many years.

Andrew Flowers, KØSM, spoke on the new WSJT software on Friday, and then on Saturday morning he gave a live demonstration by contacting Shelby, W8WN, with a station set up in the hotel parking lot. Steve Sawyers, NAØIA, spoke on the art of the Rover. Dr. Paul Shuch, N6TX, gave a talk on the installation of the Very Small Array, which is used by SETI as one of the principal listening posts.

The banquet speaker was ARRL President Jim Haynie, W5JBP, who reported on the League's efforts to represent the interests of the weak-signal operators, in particular in securing amateur radio's primary status on 2400–2402 MHz. Also part of the banquet were the presentations of the prestigious Chambers and Wilson awards. This year's recipient of the Chambers Award, which is given for technical excellence in VHF weak-signal activity, was Mike Staal, K6MYC. The recipient of the Wilson Award, given for outstanding and continuing support of the CSVHF Society or of VHF/UHF activity in general, was Bruce Richardson, W9FZ.

All in all, each of the presenters challenged the participants to think "outside of the box" as they talked about their particular expertise. The overall consensus was that we came away from this conference educated and challenged, educated about something new and challenged on how we can incorporate this new knowledge in our own station. Copies of this year's *Proceedings* are still available from the League. The cost is $20, plus shipping. You may order them online at the League's website: <http://www.arrl.org>.

Next year's conference will be held in Tulsa, Oklahoma, July 25–27. Hosted by incoming president Charlie Calhoun, K5TTT, this conference represents a return to the area where the society's con-

Oops...

In our "Hot Stuff at Hamvention" article in the August *CQ* we incorrectly identified the Array Solutions 4-Square control box as being designed for high-end VHF operators "stacking" four Yagis in an H-Frame array. Array Solutions President Jay Terleski, WXØB, explains that this 4-Square box "is really for the other end of the spectrum where vertical antennas are used in a square array for DXing. The 4-Square controller we introduced at the Hamvention is for this purpose."

These square arrays of four verticals are "turned" by changing the phasing between them and varying the power applied to each antenna. Terleski noted that his company also introduced 2-element and 3-element (triangle) controllers at Dayton, along with a full-size, free-standing 80 meter vertical. More information is available online at <http://www. arraysolutions.com>.

ferences first started, northeast Oklahoma. In his invitation speech Charlie announced that he will attempt to have parallel beginner and advanced sessions running during at least part of the program.

Weak-Signal Presence at ARRL SW Division Convention

Thanks to the efforts of the leadership of the Western States Weak Signal Society and Gordon West, WB6NOA, two separate forums promoting weak-signal activity were part of the program at the ARRL Southwestern Division Conference, which was held in Escondido, California this past August. Pat Coker, N6RMJ, gave an introductory presentation on working weak-signal VHF. Gordon West, WB6NOA, talked about the history of the records established via the Hawaii tropo duct. Assisting Gordo in his presentation was Paul Lieb, KH6HME, the record holder of so many of these contacts. In addition, your editor presented a condensed version of the *Leonids* meteor-storm talk from the Central States VHF Society conference in July.

Sunspot Peak Three-peat?

The appearance of giant sunspot number 69 during the better part of August has given rise to speculation that the Sun's solar activity is again on the rise. While it is doubtful that the Sun will again show the intense activity that it did last fall, it is possible that enough of an increase in solar activity will be sufficient to sustain some 6 meter *F2* propagation this fall and winter. Only time will tell. One website to watch as an indicator of solar activity is <http://www.spaceweather.com>, which regularly reports on the Sun's current activity, as well as a number of other solar activities that relate to our aspect of our hobby. Also check NW7US's "Propagation" column here in *CQ* for updates.

Current Conferences

The **Western States Weak Signal Society** will hold its conference the weekend of October 11–13. For more information e-mail <ko6sy@soara.org>.

This year the **Microwave Update Conference** will be held in conjunction with the **Eastern VHF/UHF Conference**. Sponsored by the Northeast Weak Signal Group, the conference will be held October 24–27 at the Radisson Hotel, Enfield, Connecticut. For the latest information and reservations visit the official website: <http://www.microwaveupdate.org/>.

The **20th Space Symposium and AMSAT-NA Annual Meeting** will be held November 7–11 at the Lockheed Martin Recreation Area in Fort Worth, Texas, which is located in the North Texas Metroplex. The AmeriSuites Fort Worth/Cityview has been designated the official hotel. Make your reservations as soon as possible by calling the hotel directly at 817-361-9797 (don't use the web page form), and ask for the AMSAT group rate ($75/day plus taxes). For more information visit the AMSAT-NA website at <http://www.edtexas.com/amsat/>.

Current Contests

July 2002 through June 2003: The annual Central States VHF Society States Above 50 MHz Contest began on July 1 this year and will end on 30 June of next year. The object of the contest is to work U.S. states and Canadian provinces on each of the VHF+ ham bands. Winners of the contest are acknowledged at the society's annual conference held the fourth weekend of July. First through third place receive a plaque, while all other winners receive certificates. More information and entry blanks can be found on the society's web page: <http://www.csvhfs.org>.

October: The **432 MHz Fall Sprint** is October 2. The **Microwave (902 MHz and above) Sprint** is October 12. The **50 MHz Fall Sprint** is October 19. Complete rules for the Fall Sprints can be found at the Southeastern VHF Society's (the sponsor) website: <http://www.svhfs.org>.

The first weekend of the **ARRL International EME Competition** is October 26–27. Complete rules for this and other ARRL-sponsored contests can be found in the issue of *QST* the month prior to the contest or the month prior to the first weekend of contests extending over two months.

Meteor Showers

October: The *Draconids* is predicted to peak somewhere between 0315–0630 UTC on October 9. The International Meteor Organization is suggesting the remote possibility of a storm, with the peak favoring Asia east to western North America.

And Finally . . .

My attending both the Central States VHF Society Conference in July and the ARRL Southwestern Division Conference in August allowed me to see longtime friends and meet new ones. In particular, the ARRL conference, the first one I had attended in 24 years, allowed me to experience what is happening in weak-signal activity on the West Coast.

Perhaps the most important aspect of my travels occurred when I was at the Southwestern Division Conference promoting the new *CQ VHF* magazine and other CQ products. Thanks to the generosity of Gordon West, WB6NOA, I was able to share booth space with him. It was during this time that something special happened. It went like this:

A ham looking over Gordo's licensing study guides asked whether or not Gordo's products were really good material for his son to use to study for his

Larry Hazelwood, W5NZS, Central States VHF Society secretary, presents Mike Staal, K6MYC, with the society's Chambers Award plaque, as society President Ken Boston, W9GA (left), and ARRL President Jim Haynie, W5JBP, look on.

ARRL President Jim Haynie, W5JBP, was the featured speaker at the Central States VHF Society banquet in Milwaukee, Wisconsin, this past July.

Technician exam. Before I could get a word out of my mouth, another attendee standing in front of the booth pointed to his 11-year-old daughter, beamed, and said, "She's living proof that they are!" That clinched the sale.

As the proud father was filling out a subscription blank for *CQ VHF* magazine, I engaged his daughter in conversation, congratulating her on passing the exam and welcoming her into the hobby. Then a thought occurred to me to ask her to write something for the magazine from her perspective as a youth. This caught her father's attention, whereby he added that he thought she could do so.

Commenting further, I told her that when I was a couple of years older than she, I published a letter to the editor in *QST*. I added that later when I was in high school, I became the editor of the South Bay Amateur Radio Society's monthly newsletter. I encouraged her to seriously consider writing a short article from her perspective as a youth, and told her if she did, we would do everything we could to publish it. With her father standing by and adding his words of encouragement, we ended our conversation by my giving them my e-mail address so she could send in the article.

I am looking forward to receiving something from this girl. I believe she has lots of potential and just needs some encouragement to explore it. With her father by her side, I expect to see good things from her.

My challenge for us is this: What have you done lately to encourage young people to join our hobby or further their experiences in it? When I was speaking to this girl, I remembered the encouraging words I received as a youth from my older mentors who boosted me along in my journey as a writer and a ham radio operator. I remembered when I beamed as I showed my high school English teacher that letter to the editor in *QST*. Her retort was well deserved: "That's nice, Joe. It shows me that you have the potential to improve your grades. Now let's get to work on them."

To its credit, the membership of the Central States VHF Society is intentionally electing some younger members to its board of directors. Other organizations should follow the society's example.

Each summer Gordon West has a special ham radio class for youth for which the only cost is for the materials. I cannot tell you the number of young hams who came up to Gordo at the conference in August and thanked him for helping them become licensed.

Again, I ask, "What have you done to bring a young person into our hobby?" One of the most important activities in ham radio is promoting the continuation of the hobby. Those of us who are presently the movers and shakers in ham radio are graying, and too many of us are becoming Silent Keys. Without each one of us doing our part to encourage young people to become involved, there may not be a hobby in 20 or so years.

Please let me hear from you with information about your activities in encouraging our youth. I will be happy to write about them in a future column.

Until next month . . .

73, Joe, N6CL

Looking Ahead in CQ

Here's a look at some of the articles we're working on for upcoming issues of *CQ:*

- Results – 2002 CQ World-Wide 160 Meter Contest
- Rules – 2003 CQ World-Wide 160 Meter Contest
- "Electricity is Everywhere, Part 2," by W6BNB
- "Things Not Found in the Handbook," by K4ZA

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

Amateur Satellites

BY PHILIP CHIEN, KC4YER

Ham Radio in Space

AO-7 Comes Back to Life; AMSAT-DL Plans to Go to Mars

One of the most amazing events in the history of the space program and amateur radio happened on June 21st. As Pat Gowen, G3IOR, reported, "I have just come across something most remarkable this evening. Checking out interlopers in our 145.800–146.000 MHz space band with a new vertical now atop my 60 foot tower and working like magic, at 1728 UTC I came across a beacon at S.7 sending slow 8–10 wpm CW on 145.973.8 MHz. It slowly Dopplered down to 145.970 MHz before going out at 1739 UTC."

Pat went on to describe Morse code telemetry that matched the description of the long-dead AO-7 satellite. AO-7 was launched in 1974, in an era of teletype machines, vacuum-tube amplifiers, and transparent overlays with grease pencils for satellite tracking. It worked for 6 1/2 years before its onboard batteries shorted. Could the almost three decades old satellite have come back to life?

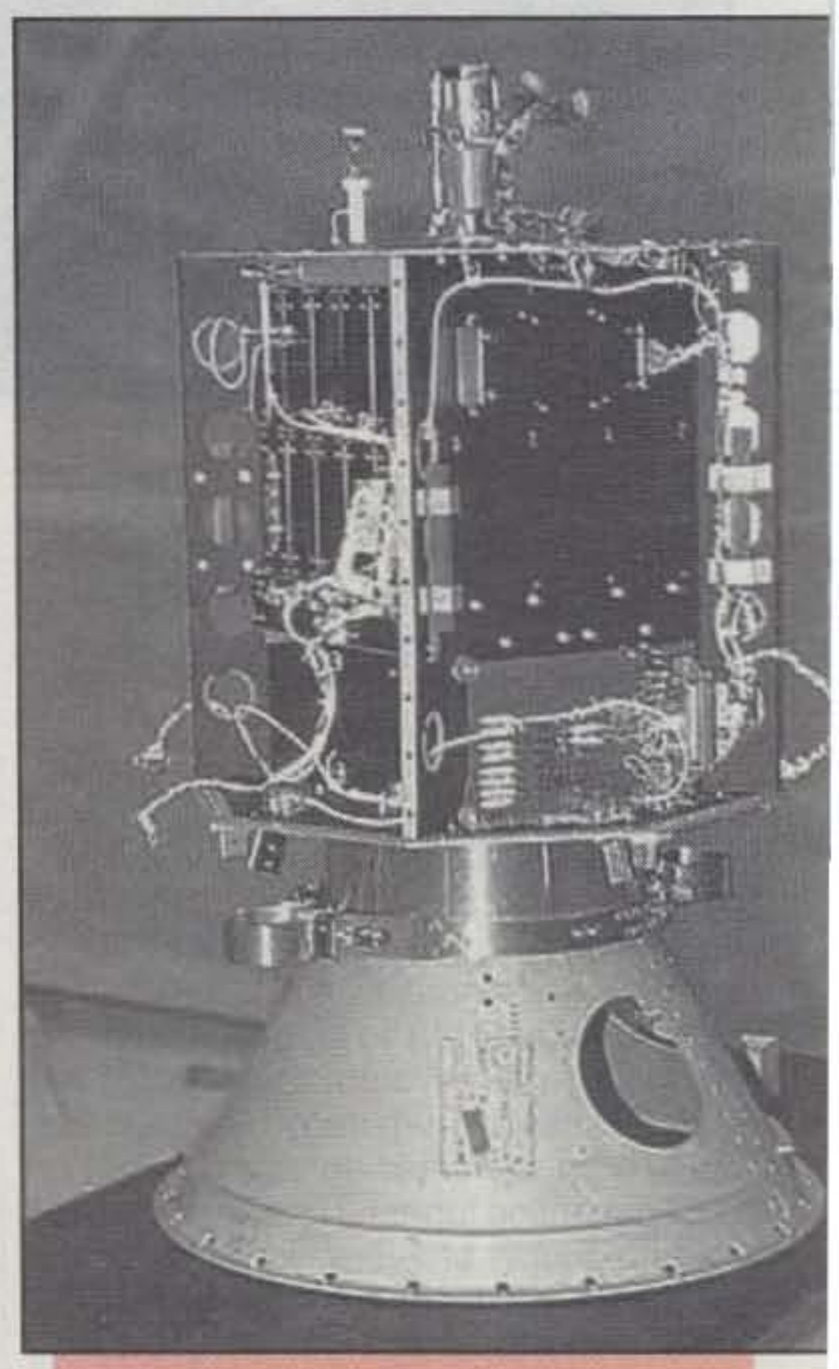
Strangely enough, the answer is yes. The folks who built the satellite have theorized that through the constant day/night cycles, 12.5 times each day some chemical change happened in the batteries which removed the short that killed the satellite in 1981. Thus, AO-7 is now a daylight-only satellite, transmitting whenever it's in sunlight. It comes up randomly in one of several modes, however, so it can be transmitting on 10 meters, 2 meters, or 70 cm. One mystery that will never be answered is when it came back to life. It's quite possible the battery "unshorted" several years ago, but nobody noticed because nobody was listening to those frequencies at the proper times!

Amazingly, the almost 30-year-old electronics still work. Some of the people involved with OSCAR-7's construction cautiously note that since the electronics and solar cells have lasted this long in the harsh space environment, there is reason to believe that the satellite will continue to operate for quite a while.

One intriguing question was posed: Would the command channel still work? AO-7 was built before microprocessors became common. It used a set of flip-flop latches to set the "path" for commands to turn on and off the transponders. If it still would respond to commands, it would be possible to tell the satellite which transmitter to use and put it on a more predictable schedule. Mike Seguin, N1JEZ, succeeded using a combination of a 30-year-old radio (needed because of features not available in currently manufactured radios) and a current home computer to recreate the signals in the proper formats.

OSCAR-7 has made over 122,600 orbits around the Earth in its 28 years in space. However, AO-7 isn't the oldest Earth satellite still in operation. That record belongs to an ancient experimental communications satellite, ATS-3 (Applications and Technology Satellite), launched in 1965. Because ATS-3 ran out of fuel, it has drifted in to an orbit where it can view the South Pole for several hours each day, making it an invaluable link for scientists in Antarctica.

Since AO-7 has come back to life, the obvious question is what about the other early OSCARs. Several have reentered and their transmitters are now dust particles in the Earth's upper atmosphere, but OSCARs 3, 5, 6, and 8 are still in orbit.



The OSCAR-7 satellite, launched in 1974 and off the air since 1981, suddenly returned to life in June. No one is sure how or why, but lots of hams are having lots of fun with the "dinosaur" satellite. (AMSAT photo)

AMSAT-DL Plans to Go to Mars

On July 25th AMSAT-DL (Germany) announced two key projects: a follow-on Phase 3 satellite and P5-A, a satellite to Mars.

While Phase 3E would have open ham radio transponders like the previous Phase 3 series, the primary purpose of the Phase 5-A satellite would be to act as a relay for future Mars atmospheric and surface spacecraft. Only the most sophisticated ground stations would be able to communicate with Phase 5-A.

It's important to note that AMSAT-DL takes a much broader view of what amateur satellites are in comparison to some other AMSAT organizations. For AMSAT-DL, the *amateur* in amateur satellite does not automatically mean amateur radio. In addition, much of AMSAT-DL's funding comes from the German government, so ham radio operators would not be expected to contribute towards P5-A.

The announcement said, however, "The latest satellite of this series, P3D (now operational as AMSAT-OSCAR 40), was launched in 2000 and demonstrated sufficient bus and propulsion capabilities for a flight to Mars." Well, yeah, AO-40 almost did go to Mars—by accident. The fact that AO-40's propulsion system failed to operate properly, *twice,* is well documented. Had the second burn gone on for a few more seconds, AO-40 would have reached escape velocity, putting it into orbit around the Sun! While it may not have been

779 Merritt Island Causeway #808, Merritt Island, FL 32952
e-mail: <kc4yer@cq-amateur-radio.com>

books calendars videos

video special!

~~$19.95~~ NOW ONLY
$12.95ea.

Buy all 7 for your Club for only $69.95

Ham Radio Horizons: The Video .....*Order No. VHOR*
Getting Started in VHF .....*Order No. VVHF*
Getting Started in Ham Radio.....*Order No. VHR*
Getting Started in DXing .....*Order No. VDX*
Getting Started in Packet Radio.....*Order No. VPAC*
Getting Started in Amateur Satellites..*Order No. VSAT*
Getting Started in Contesting.....*Order No. VCON*

Ham Radio Magazine on CD

Brought to you by CQ & ARRL

Hot Item!

Here's what you've been waiting for! Enjoy quick and easy access to every issue of this popular magazine, broken down by years!

Three sets, each containing 4 CDs -

1968-1976 Order No. HRCD1 **$59.95**
1977-1983 Order No. HRCD2 **$59.95**
1984-1990 Order No. HRCD3 **$59.95**
Buy All 3 Sets and Save $29.90!

Order No. HRCD Set ***$149.95***

2003/04 calendars

$10.95ea.

Fifteen month calendars
January 2003 through March 2004
(Specify Amateur Radio or Classic Keys)

Classic Keys Calendar features 15 magnificent photos of some of the memory-jogging keys that so many of us treasure or used years ago!

Amateur Radio Calendar brings you 15 spectacular images of some of the biggest, most photogenic shacks, antennas, scenics and personalities.

The Mobile DXer

by Dave Mangels, AC6WO

An in-depth look at Mobile DXing- includes its language; versatility; selecting and installing mobile HF radios; mobile HF antennas and tuners; tuning HF antennas; utilizing tools, tactics, and techniques; and more!

Order No. DXER ***$12.95***

Keys, Keys, Keys

by Dave Ingram, K4TWJ

You'll enjoy nostalgia with this visual celebration of amateur radio's favorite accessory. This book is full of pictures and historical insight.

Order No. KEYS ***$9.95***

33 Simple Weekend Projects

by Dave Ingram, K4TWJ

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

Order No. 33PROJ ~~$15.95~~
NOW ONLY ***$9.95***

The NEW Shortwave Propagation Handbook

by W3ASK, N4XX & K6GKU

A comprehensive source of HF propagation principles, sunspots, ionospheric predictions, with photography, charts and tables galore!

Order No. SWP ***$19.95***

W6SAI HF Antenna Handbook

by Bill Orr, W6SAI

Inexpensive, practical antenna projects that work! Guides you through the building of wire, loop, Yagi and vertical antennas.

Order No. HFANT ***$19.95***

Building and Using Baluns and Ununs

by Jerry Sevick, W2FMI

This volume is the source for the latest information and designs on transmission line transformer theory. Applications for dipoles, yagis, log periodics, beverages, antenna tuners, and countless other examples.

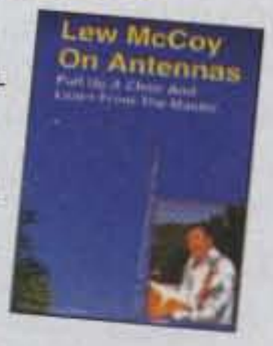
Order No. BALUN ***$19.95***

McCoy on Antennas

by Lew McCoy, W1ICP

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

Order No.MCCOY ***$15.95***



The Vertical Antenna Handbook

by Paul Lee, N6PL

Learn basic theory and practice of the vertical antenna. Discover easy-to-build construction projects

Order No. VAH

~~$9.95~~
NOW ONLY ***$6.95***

Visit Our Web Site
www.cq-amateur-radio.com

Name _____ Callsign _____

Street Address _____

City _____ State _____ Zip _____

Qty	Item #	Description	Price	Total Price
U.S. and possessions - add $4 shipping/handling; $2 shipping/handling for single calendar. Foreign - shipping/handling charges are calculated by order weight & destination.			Shipping/Handling	
			Total	

Method of payment ☐ Check ☐ Money Order ☐ Visa ☐ MasterCard ☐ Discover ☐ American Express

Credit Card No. _____ **Expiration date** _____

CQ Communications Inc., 25 Newbridge Rd., Hicksville, NY 11801/516-681-2922; Fax 516-681-2926
Order Toll-Free 800-853-9797

Susan Helms, KC7NHZ, who was very active on ham radio from the International Space Station, has left NASA and returned to her primary job as an Air Force Colonel. (NASA photo)

headed towards Mars or another planet, once it hit escape velocity there would be no way to put it into operation.

It's more dumb luck than anything else that AO-40 is still in one piece after the near catastrophic onboard explosion which damaged many components. Even if you don't count AO-40's partial disaster, the track record for Phase 3 propulsion is hardly something to crow about. AO-10's engine also had problems in its command sequence, caused in part by accidental recontact with the launch vehicle. However, even if the launch-vehicle incident had not occurred, it still would have resulted in the wrong orbit. AO-13 is the only one of the three cases where a Phase 3 satellite's propulsion system has worked properly.

NASA Testifies Before Congress; Value of Ham Radio Cited

On June 19th NASA officials testified before the U.S. Senate Science, Technology, and Space Subcommittee Hearing on NASA Education Programs. Astronaut Jim Voss, a member of the Expedition 2 space station crew, discussed the use of ham radio as a tool for education. Even though Voss does not have an amateur radio license, he used the space station's ham rig to talk to several schools during his five months in orbit. He said:

It offers the the opportunity for students to experience the excitement of talking directly to an astronaut in space and having questions answered via this ham radio system. During the year and a half we've had humans onboard the international space station we've had 65 contacts with classroom students in 26 states and 10 different countries. During that time hundreds of students have asked questions of astronauts in orbit, and over 15,000 other students, their classmates, have listened to those answers. It is a way which really gets students excited about space and science and other things.

If you'll bear with me, I'd like to read something that came from a gentleman who was involved with one of these events. It's from a Mr. Alan White in Alabama, and he wrote me a note after my flight:

"Did the contact with the ISS have educational benefits? Yes. Would we spend the time and preparation to do it again? Yes. There's no way I can adequately describe the excitement this created in our school and community. I think this was the most exciting educational event of the year for these students. Nearly 100 students submitted questions; all three of the science teachers at the Admiral Moore middle school, the principal, and school administrator supported the efforts in every way possible. Interest in the space studies unit was heightened. The US space program and the International Space Station became real to the students and our community because our kids talked directly to an astronaut in space. The space program was no longer something they just read about. This event was the talk of the town for weeks. So not only did they get the kids involved, but the entire community. This is a typical reaction I have heard from the educational activities in space we've participated in."

Ham Radio on the International Space Station

The current occupants aboard the International Space Station are the Expedition 5 crew—commander Valeri Korzun, RZ3FK, and flight engineers Peggy Whitson, KC5ZTD, and Sergei Treschev, RZ3FU. Korzun was very active on ham radio when he was aboard the Mir space station, so it came as no surprise to many when he started to make random contacts from ISS. His English was fair when he was Mir's commander, and now it is quite good. On July 4th he spent several passes wishing American ham radio operators a good holiday. It's one thing for someone from space to wish you a happy 4th of July, but a Russian? How the world has changed! Whitson has been on the air for preplanned educational contacts.

The Expedition 5 crew is scheduled to return to Earth in mid-November. The Expedition 6 crew was supposed to be commander Kenneth Bowersox, KD5JBP, flight engineer Don Thomas, KC5FVF, and Russian flight engineer Nikolai Budarin, RV3DB. However, in July NASA announced that Thomas had to be removed from the crew due to medical reasons. With a four to six month stay in space medical requirements are far more stringent than for short-duration one- or two-week shuttle missions. An astronaut getting sick in space on a long flight would cause major problems for the space station's operations and assembly. Thomas is expected to be assigned to a shuttle mission where his condition is not expected to be an issue. He was very active with SAREX on all of his previous spaceflights—STS-65, STS-70, STS-83, and STS-93. In Thomas's place will be his backup, rookie astronaut Don Pettit, KD5MDT.

In Other News . . .

ISS astronaut news: Air Force Colonel Susan Helms, KC7NHZ, decided to leave NASA and return to the Air Force, transferring to Peterson AFB in Colorado. Several lucky hams got to talk to Susan on her second spaceflight, STS-64 in 1994. On that flight she didn't have a ham radio license, so she used command Dick Richards, KB5SIW, as her control operator. She enjoyed the contacts so much she decided to get her own license.

Unlike most astronauts, Susan chose to take her tests in her home state of Oregon (which explains her 7 call). She was very active on her next spaceflight, the STS-78 mission in 1996, as well as during her five-month stay aboard the International Space Station in 2001 as a member of the Expedition 2 crew.

Until next time . . . 73, Phil, KC4YER

What's New

BY KARL T. THURBER, JR., W8FX

A New Column for A New Century

Fabulous Fall Goodies

This month we again shine the spotlight on a variety of new radio gear and accessories, antennas, software, and books we think will be of interest to you. Let's dig right in!

Antennas and Accessories

OptiBeams from Array Solutions. Jay Terleski, WXØB, president of Array Solutions, offers a wide variety of phased arrays, RF switches, antennas, towers, and more. Now Jay has announced that Array Solutions is the exclusive distributor in North America for OptiBeam Antennas of Pforzheim, Germany.

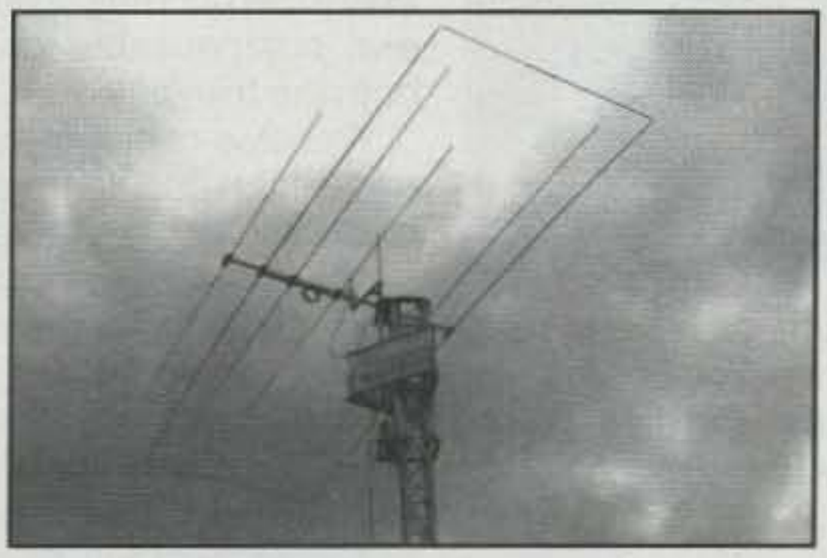


Photo A– Array Solutions has teamed up with OptiBeam Antennas of Pforzheim, Germany, to introduce the OB6-3M, reportedly the world's first small tribander with full-size performance also on the 20 meter band. The antenna is said to have exceptionally high gain, SWR, and front-to-back ratio. (Photo courtesy Array Solutions)

Jay has teamed up with OptiBeam to introduce the OB6-3M, reportedly the world's first small tribander with real full-size performance also on the 20 meter band. With a boom length of only 10 feet and a turning radius of just 14 feet, 1 inch, the antenna is said to have exceptionally high gain, SWR, and front-to-back (F/B) ratio. The OptiBeam antenna takes advantage of the Moxon rectangle design, which is prominently visible in photo A.

Jay says the OptiBeam represents the first commercial application of the Moxon rectangle design, intended to provide the city-lot dweller or the DXpeditioner with a no-compromise small antenna. The F/B ratio on 20 meters is enhanced due to the Moxon coupling to reportedly yield performance equivalent to or exceeding that of a full-size, two-element beam, even with the shortened elements.

For more information and pricing, contact Array Solutions, 350 Gloria Road, Sunnyvale, TX 75182 (telephone 972-203-2008; e-mail: <wx0b@arraysolutions.com>; web: <http://www.arraysolutions.com>).

Accessories for the Shack

The RF-Power Protector from SSB Electronic. Does your ham shack make use of a downconverter, a device that receives signal energy on one frequency and converts it to a lower frequency? If so, you probably realize the considerable risk to your downconverter if you key the wrong radio: inadvertent transmission of RF power can destroy the circuitry and semiconductors of the converter. The RF-Power Protector is a clever device that contains the right circuitry to sense RF from the transceiver and automatically protect your downconverter.

The new device, priced at about $60, is installed between your downconverter and your transceiver. It absorbs up to 30 watts FM and up to 50 watts SSB, while allowing only a small, harmless amount of RF power to reach the IF output port of the downconverter. The insertion loss in receive mode is close to nothing—typically 0.1 dB.

As an added bonus, even high-power transceivers can't destroy your converter, if you place the Protector directly in the coax cable after the transceiver. In transmit mode the

Photo B– The new Rolling Tool Organizer Pro from Bucket Boss is great for light-duty tool transport. Convenient side handles make it easy to lift over obstacles, too. (Photo courtesy Jensen Tools)

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

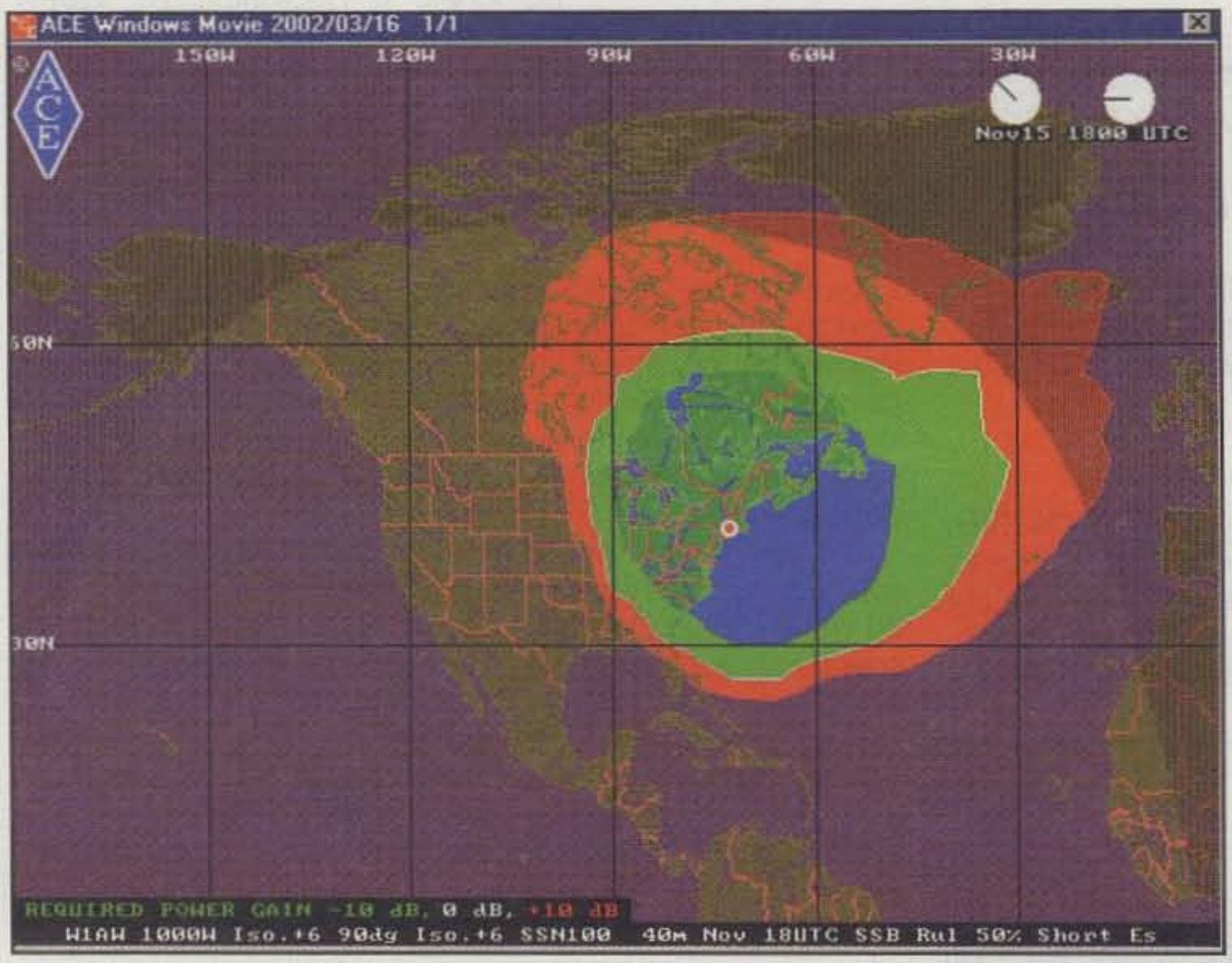


Fig. 1– The ACE-HF professional propagation software has an intuitive interface that makes HF propagation predictions easy to produce. Here required power gain is graphed. The red area shows coverage if power is increased by 10 dB; the green area shows a –10 dB change. (Graphic courtesy ACE-HF)

ACE-HF (see fig. 1) uses the latest VOACAP program as a computational engine. ACE stands for Animated Communications Effectiveness, the key feature that shows signal-to-noise ratio (SNR), reliability, and required power gain coverage limits. World and zoomed-down maps with moving terminators can be created for each time-of-day, frequency, and sunspot number. The resulting maps may be animated as a function of either parameter.

ACE-HF produces point-to-point circuit predictions "on the fly" in seconds. Predictions for all HF amateur bands, including the proposed 60 meter band, are made simultaneously. Summary graphics show when each band is open, and they are automatically updated every five minutes. You can specify several customizable antenna types for both the transmit and receive locations.

You also can show a traditional MUF (maximum usable frequency) chart and a "best frequency" chart; these update as each new circuit is specified. In addition, SNR and reliability summary charts help to quickly define a circuit's quality at different times and frequencies. A station timer and extensive help tutorials also are included.

The software is available in two versions. With ACE-HF ($99) a new receive location can be specified simply by moving the dot on the map, and new predictions are then made automatically in seconds. ACE-HF Pro ($129) adds a database of more than 35,000 receive locations, plus a DXCC list, with filtering and speed select functions. The programs are available via the internet.

Protector offers the transceiver a very high SWR, which forces the VSWR protection feature of the transceiver to immediately switch down the power. There is also a handy DC bypass.

For more information, contact SSB Electronic, 124 Cherrywood Drive, Mountaintop, PA 18707 (phone 570-868-5643; fax 570-868-6917; web: <http://www.ssbusa.com>).

Bucket Boss Rolling Tool Organizer Pro. The new Rolling Tool Organizer Pro from Bucket Boss (photo B), offered by Jensen Tools, is great for those needing light-duty tool transport. It's a foldable rolling crate with 3 inch rubber wheels and a collapsible tote handle that extends to 39 inches. A convenient side handles make it easy to lift over obstacles. The Organizer Pro features a large (17"W × 15"D × 16"H) interior compartment and a rugged, removable liner with 58 (count 'em!) outside pockets to organize tools. There is also a custom pocket for cordless drills, bits, and tape measure, plus a wide inside pocket.

For details or a catalog, contact Jensen Tools, Inc., 7815 S. 46th St., Phoenix, AZ 85044-5399 (1-800-426-1194; e-mail: <jensen@stanleyworks.com>; web: <http://www.jensentools.com>).

Software and Computers

ACE-HF Professional Propagation Software for HF Radio Operators. The "HF is dead" issue has been discussed a great deal lately, and Dick Buckner, who publishes the ACE-HF propagation prediction software package for the amateur community, is trying to do something about it. It's his hope that this innovative new program will contribute to reviving the HF bands and promoting the higher-level licenses and experimental work on HF.

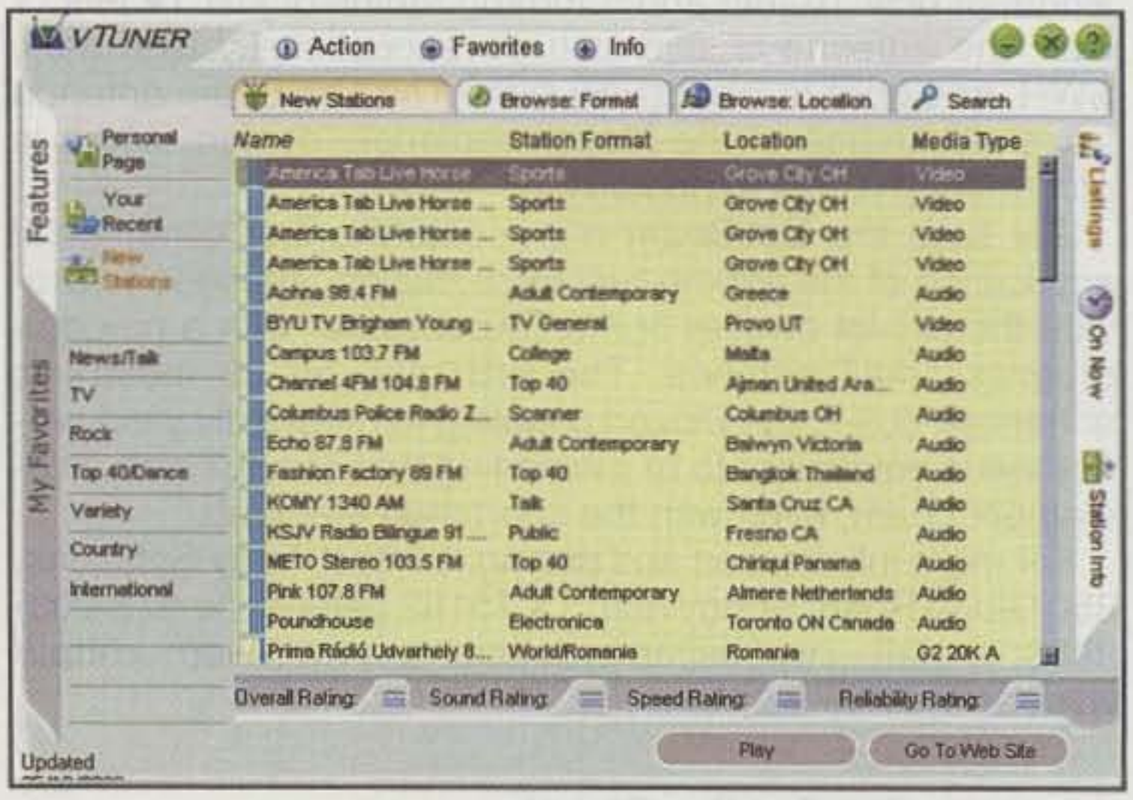


Fig. 2– The newly updated vTuner Plus 4.0™ lets you dial up over 4000 internet-based radio stations on your PC. The program also lets you tune in to those stations using the Microsoft Windows Media Player™ format, plus those using the RealPlayer™ or RealOne™ formats. You will have to have the players installed on your PC, but you can download what you need for free. (Graphic W8FX screen capture)

For more information, contact ACE-HF, 2218 N. Tuckahoe St., Arlington, VA 22205 (phone 703-241-2661; e-mail: <orders@acehf.com>; web: <http://www.acehf.com>). The ACE-HF website features an extensive, well-illustrated "take the tour" section.

vTuner Plus 4.0™. We radio amateurs normally communicate with each other over the air, but we often just listen to AM, FM, shortwave, and other one-way radio broadcasts. Recently, several thousands of radio broadcasters—AM, FM, shortwave, and others—have climbed aboard the internet to distribute their signals. In fact, there is some question about whether that good, old-fashioned shortwave radio broadcasting we all love so well may become a thing of the past within a few years.

Many of these internet-based stations broadcast in the popular RealPlayer™, now known as RealOne™, format. This means that if you have RealPlayer or RealOne software (free downloads from <http://www.real.com>), you can click on a station's website and then hear their digital-based broadcasts. The main problem is finding these far-flung internet-based stations, keeping current, and organizing them in a convenient way.

In May 2000 and April 2001 we profiled vTuner Free and vTuner Plus. As we noted, the programs come with a massive station database to make internet listening and DXing easy. While vTuner Free is no longer available, the new vTuner Plus 4.0 update (fig. 2) sports several admirable features, including the ability to schedule stations, shows, and events for playback; in-depth station descriptions; program station schedules; enhanced searching; a customizable "personal start page"; and automatic station updating.

The software lets you browse for stations by format; easily search for and bookmark stations; sort stations by different criteria; find sports games, concerts, and other events; and considerably more. The really big news in the latest release is that the program also lets you tune in to those stations which use the Microsoft Windows Media Player™ format. You will need the player installed on your PC, but you can obtain it free at <http://www.microsoft.com/windows/windowsmedia/download/default.asp>. As a result, the updated program "has it all," to let you listen to well over 4000 internet-based radio stations. The new vTuner Plus 4.0 is $29.95. A 15-day free trial is available, and previous vTuner Plus users can upgrade for $9.95.

The new vTuner Plus 4.0 is offered by vTuner.com, 215 Park Ave. South, Suite 2008, New York, NY 10003 (212-477-8722; e-mail: <info@vTuner.com>; web: <http://www.vtuner.com>).

Topo USA® 4.0 from DeLorme. Over the past several years we have profiled many high-quality mapping and navigation software packages from DeLorme. Recently, the firm introduced Topo USA 4.0, the latest version of its high-performance mapping software, an update from Topo USA 3.0, which we described in November 2001. With its detailed topographic maps of the entire United States, combined with extensive road data, Topo USA 4.0 is ideal for off-road and highway navigation as well as for hiking, biking, camping, and outdoor exploring. The software offers users automatic trail or road routing, plus the ability to add and name their own routable trails and roads. Mountaintoppers and hiking hams, especially, will be interested in the revised program.

Topo USA 4.0 takes digital topographical mapping to new levels with

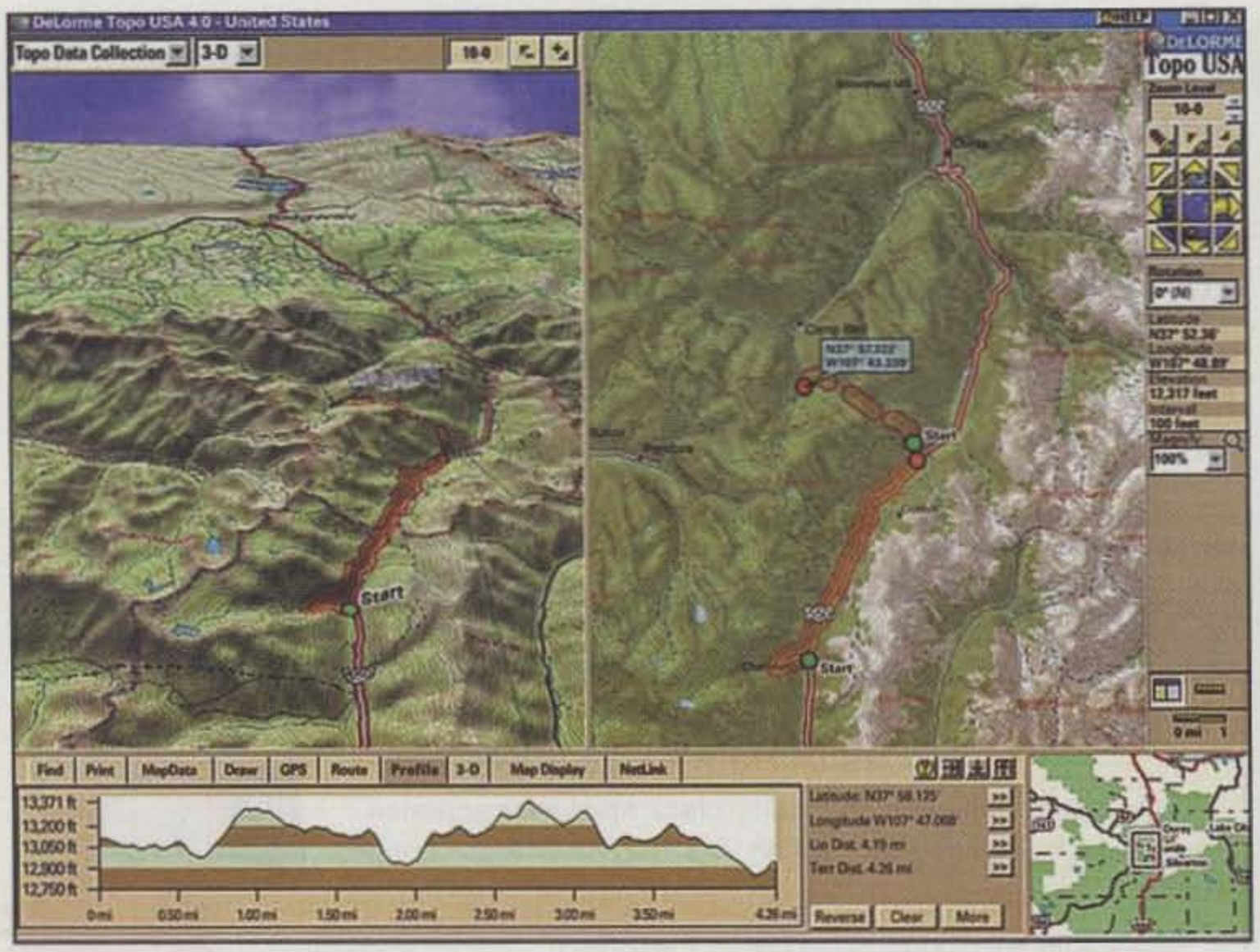


Fig. 3– Topo USA® 4.0 features more than 6 million miles of roads and 300,000 miles of trails in 2-D and 3-D map views, plus a versatile split-screen display which allows the user to view side-by-side 2-D maps or 2-D or 3-D maps at the same or different magnification levels. (Graphic courtesy DeLorme)

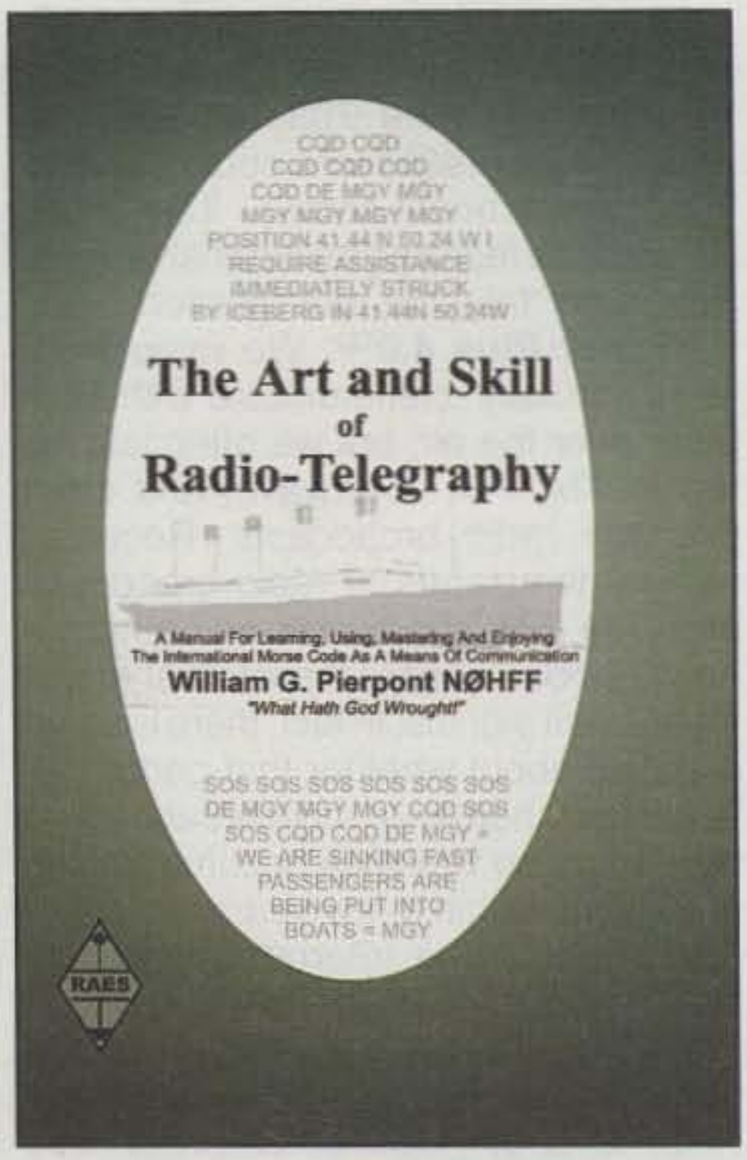


Fig. 4– In keeping with the Morse Code theme, the cover of The Art and Skill of Radio-Telegraphy *features a picture of the* Titanic *with the first and last message sent by the* Titanic*'s station, MGY, in the background. The story of the Titanic as recorded by Lloyd's of London is told in the book. See the text of this column for details. (Cover art courtesy Radio Amateur Educational Society, via Dave Clarke, VE6LX)*

more than 6 million miles of roads and 300,000 miles of trails in 2-D and 3-D map views. The software provides instant access to detailed topographic maps of the entire country on six CDs or one DVD for under $100.

The product's most advanced feature is its versatile, split-screen display (fig. 3). This important addition opens up a whole new kind of mapping. With just one click you now can simultaneously see and work with maps in split-screen mode, viewing side-by-side 2-D maps, or 2-D or 3-D maps at the same or different magnification levels.

You can use the split screen to view additional map datasets available from DeLorme; the program even includes a free download of USGS 7.5 minute quad map data. Also available is GPS tracking on 2-D and 3-D maps with the DeLorme Earthmate® GPS receiver connected to a laptop computer.

Both the CD and DVD versions have a suggested retail price of $99.95, with regional editions retailing for $49.95. For more info, contact DeLorme, Two DeLorme Drive, P.O. Box 298, Yarmouth, ME 04096 (1-800-452-5931; e-mail: <info@delorme.com>; web: <http://www.delorme.com>).

From the Bookshelf

***The Art and Skill of Radio-Telegraphy,* by NØHFF.** William G. Pierpont, NØHFF, is the author of one of the most comprehensive manuals "for learning, using, mastering, and enjoying the International Morse Code as a means of communication." The 234-page English Revised Edition 3.1 (fig. 4) is about more than just the mechanics of learning Morse Code. The author also covers a wide range of important historical material that is both carefully researched and engagingly retold, helping put Morse Code study into its proper perspective. In addition, Bill provides the necessary introductory material to show the right way to learn Morse.

As Gary Bold, ZL1AN, recounts in the book's foreword, NØHFF "ponders the code's history, its great characters [and] its technology, reviews in depth the many teaching methods that have appeared over the years, and quotes expert practitioners." The book isn't a dry textbook; rather, "the reader feels engaged in more of an extended 'fireside chat,' where Bill ruminates discursively over many topics."

Besides the 34 chapters themselves, there also are a preface, an introduction, a question for the reader (Is the radio-telegraph code obsolete?), an overview of learning Morse Code, a source list, a discussion of keys and high-speed code readers, an "about the author" note, an appendix and index, addenda, and more.

The Art and Skill of Radio-Telegraphy is distributed by the Radio Amateur Educational Society (RAES), a Canadian organization. The book is US$16 for continental U.S. airmail delivery, with checks made payable to Dave Clarke. The price is US$19.50 for international delivery, and CDN$26.00 for Canadian delivery. For more information and shipping to other parts of the world, contact Dave Clarke, VE6LX, VP Corporate Relations, Radio Amateur Educational Society, 8607 – 34A Ave., Edmonton, Alberta Canada T6K 0B9 (e-mail: <raes@sas.ab.ca>; web: <http://www.raes.ab.ca/book.html>). The book is also available in a large-print version at additional cost.

Wrap-Up

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

Overheard: Always keep in mind that the attitude you have at the start of a task will likely predict how well you actually do at the end of the task.

73, Karl, W8FX

DX

BY CARL SMITH, N4AA

News Of Communication Around The World

"QRP DXing . . . Revisited," by Uncle DX

Ahhh . . . October at last. After a long, hot, dry summer, hopefully we can look forward to cooler temperatures and improved propagation. There are lots of operating activities on the schedule starting this month and continuing for the next several months. This should satisfy our DXing appetites for a while.

7O – Yemen

Now here is a subject that always generates debate. We have been anxiously awaiting the outcome of the German operation as 7O1YGF back in 2000. On August 15, 2002 the ARRL posted a news story to their website entitled "DXCC Credit Remains Elusive for Yemen DXpedition." Quoting from that story:

ARRL Membership Services Manager Wayne Mills, N7NG, said: "I'd love to count it, but in DXCC situations, we have to know that it was authorized by the government. We don't want any operations to reflect badly on Amateur Radio."

The DXCC Desk also wants assurances that the Yemeni government would have no reason to disapproved of the ARRL's granting DXCC credit for the operation.

"So far," Mills said, "the DXCC Desk has 'absolutely nothing—directly or indirectly—from the Yemeni government in Sana'a to indicate that the 7O1YGF operation had its blessing. It has to be some kind of evidence traceable to the government."

A lot of those pushing for DXCC approval of 7O1YGF point to the continuing operation from the once rare North Korea of Ed Giorgadze, P5/4L4FN. That operation was okayed for DXCC credit as of last November —for SSB and RTTY QSOs only at this point.

"When we approved P5, they assumed that there was no license and no evidence that there was permission," Mills said, referring to the 7O1YGF team. "So, they assumed—as did many others—that their operation should count."

On the other hand, Mills said the DXCC Desk has "all sorts of evidence" that P5/4L4FN has been operating with the North Korean government's approval.

[In conclusion] Mills said the German team continues to work with the Yemeni government and with ARRL to determine if the operation can, one day, be accredited. "We'll try to come up with something," Mills said—indicating that he wants to be as flexible as possible. But he made it clear that the burden of proof in meeting DXCC criteria rests with the 7O1YGF team.

There you have it, as of August 15, 2002. I just excerpted what I felt were the pertinent portions of the story. If you want to read it in its entirety, it is posted on the ARRL website at <www.arrl.org/news/stories/2002/8/15/2/?nc=1>.

Several Havana area hams gather at the Federacion de Radioaficionados de Cuba every Saturday morning. Top row, left to right: Pedro Rodrigues, CO2RP (President of FRC); Fabio Castillo, CO2CW; Arnie Coro, CO2KK; Jorge Martinez, CO2JZ. Center: Ruperto O'Farrill, CO2OR. Front row, left to right: Jose Amador, CO2JA; Lazaro Alvarez, CO2WL; and Oscar Morales, Jr., CO2OJ. (Photo courtesy Frank Smith, AHØW)

There is one other item associated with Yemen, and that is the operation by Pekka, OH2YY. QSL cards are being received by those who worked Pekka, but the DXCC Desk has not yet received any documentation from OH2YY. Thus, the operation has not been approved for DXCC credit.

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

The WPX Program

SSB

2839.....IZ8DBJ
2840.....KA5EYH
2841.....EA6SB
2842.....KK9T
2843.....LX3BY
2844.....IT9FCC
2845.....IK2UWA

CW

3093.....YBØECT

Mixed

1901.....OK2BBD
1902.....KK9T

AWARD OF EXCELLENCE: K4LQ

CW: 800 HB9DOT. 850 E4/G3WQU. 1800 W9IL.

SSB: 350 IZØBNR. 500 IZ8DBJ. 600 K4LQ, IT9FCC. 700 NØYYO. 800 IK2UWA. 1100 AG4W. 1900 W9JDX, W9IL.

MIXED: 600 OK2BBD. 900 W9BOK. 1000 K4LQ. 2700 W9IL.

10 meters: HB9DOT, K4LQ
15 meters: HB9DOT
20 meters: HB9DOT
40 meters: K4LQ
80 meters: K4LQ
160 meters: DF6SW

Asia: JH8WGT, HB9DOT, W9BOK
Africa: DF6SW
No. America: WBØWAO, DF6SW
So. America: K4LQ
Europe: HB9DOT, WBØWAO
Oceania: K4LQ, JH8WGT

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, ABØP, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1PO, K9LNJ, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MC, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, KZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, I7PXV, S57J, EA8BM, DL1EY, KØDEQ, KUØA, DJ1YH, OE6CLD, VR2UW, 9A9R, UAØFZ, DJ3JSW, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, W4GP, K4LQ.

160 Meter Endorsement: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF N4NX, SMØDJZ, DK3AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR1QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N8JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, WBØDD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA5CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, KØDEQ, DJ1YH, OE6CLE, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, UAØFZ, CT4NH, W1CU, EA7TV, LY3BA, RW9SG, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, W4GP.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to "CQ WPX Awards," P.O. Box 593, Clovis, NM 88101 USA. ***NOTE:*** *WPX will not accept prefixes/calls which have been confirmed by computer-generated electronic means.*

The K1B operating team on Baker Island. Front, left to right: Sasha, LY3NUM; Igor, RA3AUU; team leader Hrane, YT1AD; Vladimir, ZS6MG; Srecko, YU1DX; and Jordan. Back row, left to right: Roman, RZ3AA; Dave, KW4DA; Doug, N6TQS; Mario, S56A; Mome, Z32ZM; Mickey, YU1AU; and Andy, YU8/9X0A. (Photo courtesy Dave Anderson, KW4DA)

Most Wanted Surveys

The DX Magazine Most Wanted Survey mentioned last month is available on the website <www.dxpub.com>. The deadline for submitting data is October 15, so if you want to have any input to this highly popular survey do so right away. For those without internet access, the survey is also available in the September/October issue of *The DX Magazine*. You can select CW/SSB or RTTY separately for this survey, and the results for all three modes will be published in *The DX Magazine* in early 2003.

A RTTY Most Needed DXCC Entities Survey is being conducted by Don Hill, AA5AU. Complete instructions and the link can be found at <www.aa5au/rttysurvey.html>.

For both of these surveys, the more input received, the better the results.

Vlad, JW0HR, stands outside his radio shack on a warm day. Vlad has provided over 30,000 QSOs from Svalbard. Look for him on his favorite band/mode, 15 meters SSB. (Photo courtesy John Tull, KD0JL)

QRP Month

This issue of *CQ* being a "QRP Special," I thought it appropriate to include an article by my good friend "Uncle DX." He comes with some rather good credentials, having worked 302 countries in only 25 months with his Elecraft K2. He also has 7-band DXCC to his credit and over 200 countries on five bands; this includes 253 on SSB, 276 on CW, 35 on 160 meters, and 75 on 80 meters. Now I'll admit that Uncle DX has better than average antennas and has spent a lot of time doing this, but it is proof that it can be done with QRP.

QRP DXing . . . Revisited

By Uncle DX

After a few years of "QRPing" and learning the challenges, Uncle DX has concluded the following:

The most consistent challenge for QRP DXing is breaking the EU pile-ups to Asia and Africa on the upper bands (20 meters up) during the morning hours in the eastern USA! This is far more difficult and challenging than being successful in the Americas with the legal limit in the evenings on 80/160.

There are several reasons. The location and propagation are no surprise. However, the European stations are seemingly large in number with many good, aggressive operators who work to make their signals LOUD. So when the phrase is used "life is too short for QRP," I think subconsciously of the morning eastern time zones, and the EU dominance is alive and well.

If your aim is to get in and out of a pile-up in a reasonable amount of time . . . say, 15/20 minutes . . . don't even bring a QRP rig to the planet. Forget it, as the frustration level will override any pleasure derived from operating and chasing DX. This must be a considering factor and mindset going into the decision process from the beginning, relative to moving into the world of DXing with QRP.

I've found as a great surprise that SSB will, and has, worked very well for me using QRP. CW is a bit easier and my choice, but SSB is okay and was a pleasure from the beginning. Perhaps I didn't want to admit it! Some of this is because there is more DX on

The WAZ Program

10 Meter SSB

538 .....DS5ACV

20 Meter SSB

1098.....WB6AXV 1099 .....K5DV

12 Meter CW

33 .....KØDEQ

15 Meter CW

305.....WA2YMX

20 Meter CW

530 .....JA6XXF 531.....KØKG

6 Meters

54 .....W4TJ (26 zones)

160 Meters

179 ....K1ZM (all 40 zones)

All Band WAZ SSB

4794 .....DL8ARJ 4797.....IT9IQQ
4795 .....W6RJC 4798 .....W4GCK
4796 .....KG2KJ

Mixed

8168 .....F6BCP 8173.....W5HY
8169.....SP3FYX 8174.....KØRY
8170.....G3KWK 8175 .....N5ID
8171 .....W1RZ 8176 .....YL2DZ
8172.....K7IB

All CW

323 .....KG2KJ 325 .....6K2BTX
324 .....SM7VIK 326.....W4MA

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>.

5 Band WAZ

As of August 15, 2002, 604 stations have attained the 200 zone level and 1285 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:
K4CIA

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)
KL7Y, 199 (34)
NN7X, 199 (34)
IK1AOD, 199 (1)
DF3CB, 199 (1)
F6CPO, 199 (1)
KC7V, 199 (34)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W6SR, 199 (37)
W3NO, 199 (26)
K4UTE, 199 (18)
HB9DDZ, 199 (31)
RU3FM, 199 (1)
HB9BGV, 199 (31)
N3UN, 199 (18)
OH2VZ, 199 (31)
K5MC, 199 (22)
W1JZ, 199 (24)
K2UU, 199 (26)
W1WAI, 199 (24)
W1FZ, 199 (26)
UT4UZ, 199 (6)
SM7BIP, 199 (31)
PY5EG, 199 (23)
SP5DVP, 199 (31 on 40)
KY7M, 199 (34)
W8AEF, 199 (40)
W9NGA, 199 (26)
W6BCQ, 199 (37)
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)
LA7FD, 198 (3, 4)
K5PC, 198 (18, 23)
K4CN, 198 (23, 26)
KF2O, 198 (24, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
N4XR, 198 (22, 27)
OE2BZL, 198 (1, 27)
N4PQX, 198 (24, 26)

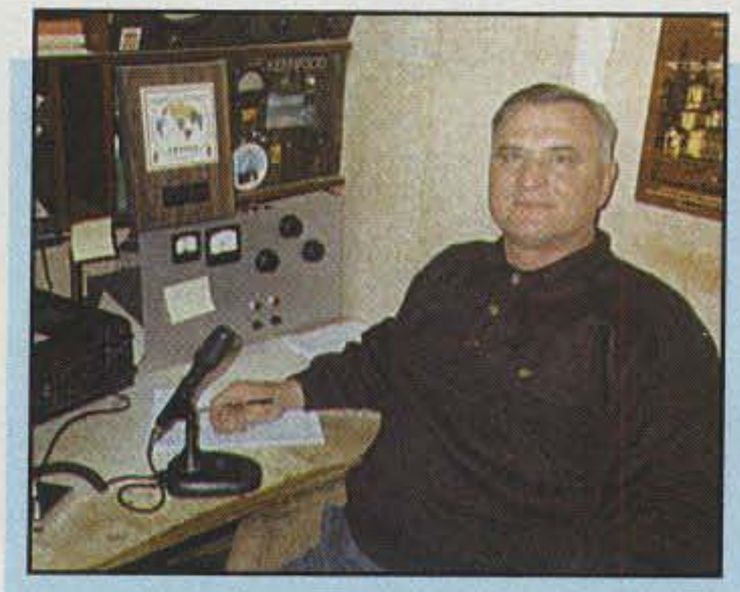
The following have qualified for the basic 5 Band WAZ Award:

N4PQX (198 zones)
RU9TU (193 zones)
NEØP (160 zones)

Endorsements: NA2X (191 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 via e-mail: <k5rt@cq-amateur-radio.com>.



Yuri, 4J3M (ex-UD6DJ), at his station. Note the 5-Band DXCC plaque. The tube on top of the radio looks something like a 4-1000. (Photo courtesy John, KDØJL)

Alex, 4J3DJ, is the son of Yuri, 4J3M, and they share the same operating position. (Photo courtesy John, KDØJL)

CQ DX Awards Program

SSB

2379.....WN9NBT
2380.....KJ8F
2381.....AC4K

SSB Endorsements

320.....K2TQC/335
320.....W6EUF/335
320.....KZ2P/335
320.....VE3MR/335
320.....NØFW/335
320.....K5OVC/335
320.....W7OM/335
320.....VK4LC/335
320.....W6BCQ/335
320.....VE3MRS/334
320.....W4UW/334
320.....K9BWQ/333
320.....W4WX/331
320.....N5ORT/331
320.....AB4IQ/330
320.....AE5DX/330
320.....WA4ZZ/322
310.....WN9NBT/317
275.....WA1ECF/295
200.....AC4K/210
150.....EA3FYD/164
150.....KJ8F/150
28 MHz.....WN9NBT

CW Endorsements

320.....K2TQC/334
320.....W7OM/334
320.....NØFW/331
320.....N4AH/331
320.....W4UW/327
320.....IKØADY/320
310.....K1FK/319
275.....DJ1YH/281

The basic award fee for subscribers to *CQ* is $6. For nonsubscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. 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 335 active countries. Please make all checks payable to the award manager.

SSB than CW. The latter is of no surprise, but getting out on SSB well was, and continues to be, satisfying.

Finesse can be used better on CW in my judgment, but if timing is worked judiciously with a bit more aggressive operating, SSB is a QRP pleasure and can be very successful.

I also believe the mindset of QROing for most of us is that power will prevail, be it in our heads or the sheer "brute force" of the power. We are a society . . . worldwide . . . where being first means a lot. QRP is seldom first or even in the first few "waves." This may just be the subconscious switch that keeps others away from QRP for DX work.

Hearing is just as important, or more so, than getting out. In the past, most QRP radios/transceivers have suffered this shortcoming. Today's QRP transceivers have made great progress and, in my judgment, surpassed some of the 100 watt transceivers.

This is not just a feeling, believe me. I've seen and witnessed it first hand. So receiving makes successful QRP possible and feeds on itself, making it fun albeit a challenge.

For those thinking about QRP, don't start with the age-old bands. Start with 17 or 30 meters, for instance. Go make the antenna for one or two bands better by concentrating on them more. Make a decision to try it for a "season" and not necessarily a life commitment. Even build one of the kits on the market, or a real challenge would be to use some of the excellent "do it yourself" articles in *QST, CQ,* or the handbooks. A club project is a wonderful way to start with little expense and is long on fellowship.

But if you are not ready to say to yourself that you no longer need to be in the first 5 or 10 percent to work the DX in the pile-up, don't even think about QRP for DXing. You will be surprised to actually be in this high percentile a few times, and what a pleasure, but it's not the rule. Somewhat like fishing, one never knows what will be on the hook, or when, hi.

In summary, the secret is MINDSET and a desire to do something strange and new.

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

5062 .....9A2AA	3784.....N6JV	3465.....N5JR	3005 .....HAØIT	2545 .....W9IL	2121 ...PY2DBU	1914 .....I2EAY	1501.....W2EZ	1226 ...EA2BNU
4424 .....W2FXA	3707.....VE3XN	3167 .....S53EO	2952 .....KØDEO	2456.....9A4W	2117 ...OZ1ACB	1788.....AA1KS	1472..OK1DWC	1130 ..PY1NEW
4146 .....W1CU	3668 .....N4MM	3139 ..WB2YQH	2944.....IT9QDS	2454.....K2XF	2063 ..WB3DNA	1751 .....VE6BF	1461.....WT3W	742.....K5IC
4034.....F2YT	3602 .....I2PJA	3121 ...PAØSNG	2912 .....W2WC	2436 .....W7OM	2018.....HA9PP	1724 .....W7CB	1448 .....NG9L	728 .....VE3NQK
3971 .....EA2IA	3548 .....N9AF	3118 .....I2MQP	2898.....IK2ILH	2334 .....W6OUL	1983 .....W9OP	1697 .....Z35M	1429 .....N1KC	604 .....VE9FX
3928.....N4NO	3519.....YU1AB	3094 .....KF2O	2694 ..YU7GMN	2331 ....W8UMR	1976 .....DJ1YH	1573 .....VE8FX	1369 ...KU5USA	
3827 .....9A2NA	3489...SM3EVR	3086 .....K9BG	2655...WA1JMP	2288 .....K5UR	1958....CT1EEB	1564 .....KØKG	1325 .....KX1A	

SSB

4386 .....IØZV	3068 .....N4NO	2607.....KF2O	2325 .....CX6BZ	1950 .....K5UR	1721 .....DK5WQ	1520 .....DF7HX	1190 .....K4CN	990 .....HA9PP
4018 .....VE1YX	3049.....F2VX	2596.....4X6DX	2301.....HAØIT	1937.....I8LEL	1706 .....NQ3A	1485.....W2FKF	1162....EA5DCL	959 .....VE7SMP
3995.....ZL3NS	3030.....9A2NA	2594 .....I8KCI	2186 .....IN3QCI	1916.....N6FX	1704 .....IT9SVJ	1384....LU3HBO	1125.....I2EAY	842 .....N9DI
3581 .....I2PJA	2925.....I2MQP	2570 ....LU8ESU	2180...OIE2EGL	1864.....K2XF	1687.....K3IXD	1377.....VE9FX	1089 .....N1KC	822 .....K1BYE
3525 .....F6DZU	2885.....I4CSP	2509.....EA5AT	2061.....W2WC	1862.....EA7TV	1658 .....W6OUL	1368.....NG9L	1078 .....EA3KB	812 .....KU6J
3260 .....CT4NH	2885 .....N5JR	2444 .....KF7RU	2002 .....LU5DV	1852.....W7OM	1606 .....K8MDU	1287 .....KI7AO	1062 .....AG4W	786.....KX1A
3234 .....N4MM	2824....CT1AHU	2386.....EA1JG	1969....CT1EEB	1821.....W98L	1562 .....W2ME	1238 .....LU4DA	1059 ....JN3SAC	783 .....VE6BMX
3126 .....OZ5EV	2741 ...PAØSNG	2337.....W2WC	1954....CT6EEN	1730.....I3ZSX	1540 ...SV3AQR	1193.....WT3W	1048....EA3EQT	702 .....KU4BP
3079.....EA2IA								

CW

4145...WA2HZR	2681 .....9A2NA	2259.....KA7T	2009.....OZ5UR	1854 .....K5UR	1671 .....DJ1YH	1460.....I2MQP	1118 ...EA2BNU	935 .....VE6BMX
3785.....N6JV	2558 .....N4MM	2219 .....KF2O	1955.....G4SSH	1798.....W7OM	1654 .....VE6BF	1359 .....4X6DK	1118 ...HB9DOT	877.....KX1A
2384.....N4NO	2578.....N5JR	2189....EA6AZA	1938 .....LU2YA	1789.....W6OUL	1603.....I2EAY	1284 .....AC5K	1097.....K6UXO	871 .....WT3W
3217.....K9QVB	2399 .....HAØIT	2058.....N6FX	1919.....K2XF	1780.....IK3GER	1585...EA7AAW	1282 .....DF6SW	1096 .....YU1TR	809 .....KU6J
3035.....EA2IA	2375 .....W2WC	2032.....I7PXV	1905....JN3SAC	1728 .....W9IL	1483 .....EA6AA	1218 .....WO3Z	942 ....WA2VQV	729 .....N1KC
2822 .....LZ1XL								

Next is to know from the first that it's a challenge. Then work and work and work some more on the antenna system and operating skills.

To work Andy, G3ZVJ, from XU7AAV; Dick, N6FF, from PWØT; or Bob, K4UEE, from VP8THU is such a pleasure. Working all the WRTC stations in Slovenia in 2000 and Finland in 2002 is as good as it gets. It will replace ten times the DX Qs with QRO. To know the best of the best can pull you out of the huge piles is a wonderful pleasure. There is a HUGE canyon between the best and good DX ops . . . It's pointed out time and time again with QRP.

I say jokingly that QRP is a cult, and one must have the patience of Job. Well, the "cult" part is perhaps the wrong notion, but the Job factor is for real, hi.

I close by saying, QRP is relative from a power point of view and is what the operator wishes to make it. QRP is, for many, 100 watts. For the purest it's 5 watts or less, which is okay, too. For Uncle DX it's 10 watts. Make it whatever you like, and IT WILL NOT BE WRONG. It's a personal thing, as Ham Radio is, which is one strength of the hobby.

Yes, Uncle DX likes QRP but has the black box when needed. So QRP is just another bullet in the arsenal of toys to continue my challenge in a beloved avocation. . . . Oh, I meant hobby!

Happy DXing . . . Uncle DX

That's my buddy, Uncle DX. Interesting reading, don't you think?

Until next time, I hope you had a good summer and are looking forward to the upcoming operating season.

73, Carl, N4AA

QSL Information

IA5P via IØVWV
IBØA via IZØBTV
IU2HQ via I2MQP
J28AG via F6KQK
J28EX via F8BON
J28UN via F8UNF
J41YM via OK1YM
J45KLN via SMØCMH
J45PC via OM3PC
J48ALO via SV2DGH
J48S via ON4AAC
J49RW via OM5RW
J79MM via NA2U
JT4/G3NOM via GM4FDM
JWØHU via SP3WVL
JW3YJA via LA3YJA
JW4LN via LA4LN
JW5E via JW5NM
JWØHU via SP3WVL
JXØLMJ via LA7DFA
JX2IJ via LA2IJ
JX7DFA via RW6HS
JX7DFA via LA7DFA
JY9NX via JH7FQK
K1D via W1DAD
K4S via K5JIM
K5F via KW5DX
KHØN via JA6CNL
KH2VI via JR1VAY
KH6ND via K2PF
KP2D via KU9C
L73F via LU5FF
LU2EC via EA7FTR
LU5EUL via EA7FTR
LXØHQ via LX1KQ
LX8LGS via LX2AJ
LY2AAM via DL3BQA
M7W via G3CSR
MQØADG via NØJT
N8JA via VY1JA
NA8KD via KG8DP
NH6D/KH4 via N6FF
NP4A via W3HNK
OA2AEL via EA7FTR
OC4WW via OHØXX
OD5/OK1MU via OK1TN
OD5QT via YO3FRI
OHØA via OHØRJ
OHØZV via K7ZV
OJØSM via SM5HJZ
OJØVR via OH1VR
OK9GLX via OK2AOP
OL2HQ via OK1FLM
OL5T via OK1FLM
ON9CPI via N4JR
OR6AA via ON6AA
OR6NR via ON4RU
OS7KG via ON7KG
OT2H via ON4IT
OX/VE7RKK via XE1KK
P29VR via W7LFA
P3A via W3HNK
P40AV via K4AVQ
P40C via AJ9C
P40Q via KØDQ
P40SF via W4YHD
P40TC via N6WIN
P40Y via AE6Y
PJ2/WØCG via N9AG
PJ2/W8TK via N9AG
PJ2MI via W2CQ
PJ2T via N9AG
PJ2Y via G3SWH
PJ4G via WA2NHA
PJ4M via K2QM
PU3A via PY3DX
PX2W via PY2YU
PY5A via VE3HO
PZ5PI via PA3EXX
R16S via UA1RJ
R1MVI via OH2BR
R3CA/Ø via RW3GW
RA3RCL via HSØ/7L1MFS
RIØB via RW3GW
RIØL via RUØLL
RIØL via IK2DUW
RJ9J via RA9JR
RK1A/P via RZ1AK
RK1B/1 via RZ1AK
RK4WWQ via AA4NU
RP1COP via RZ1AK
RSØB via RW3GW
RUØB via RW3GW
RW9QA via W3HNK
RZ1CXF/P via RZ1AK
SØ7U via JA1UT
S2/G3NOM via GM4FDM
S21ZF via GM4FDM
S9SS via N4JR
S9YL via N4JR
SI9AM via SM3CVM
SNØWI via SP2LLW
SN150HZ via SP9PGB
SO4TEC via DL3BQA
STØ/5T5CF via K5LBU
SU60WW via SU1SK
SU9BN via EA7FTR
SU9US via K4DX

(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," P.O. Box 3071, Paris, TN 38242; phone 731-641-4354; e-mail: <golist@golist.net>.)

Contesting

BY JOHN DORR, K1AR

News/Views Of On-The-Air Competition

WRTC 2002—They Did It Again!

October's Contest Tip of the Month

When purchasing anything related to your contest station, it's a good idea to do it well in advance of the contest season. Not only will this allow you to "ring things out," sparing you additional expense with the express mail services, you'll also ensure you made the right purchase(s) from an ergonomic/usability point of view. For example, there's nothing worse than buying a new set of headphones to replace the old broken ones right before the contest, to then learn that you can't wear them for more than ten minutes without getting a headache. Competing in contesting includes a significant planning component. Those who are consistent winners are also consistent planners. Give it some thought, as your contest totals will be impacted—positively and negatively—by the timing and implementation of your purchases.

Calendar of Events

Sept. 21-22	Scandinavia Activity CW Contest
Sept. 21-22	Washington State Salmon Run
Sept. 22-23	Fall Classic (& Homebrew) Radio Exchange
Sept. 28-29	**CQ/RJ WW RTTY DX Contest**
Sept. 28-29	Scandinavia Activity SSB Contest
Sept. 28-29	Texas QSO Party
Sept. 28-29	Louisiana QSO Party
Oct. 5-6	Oceania SSB DX Contest
Oct. 5-6	California QSO Party
Oct. 5-6	QCWA QSO Party
Oct. 6	ON SSB Contest
Oct. 6	RSGB 21/28 MHz SSB Contest
Oct. 12-13	Oceania CW DX Contest
Oct. 12-13	Pennsylvania QSO Party
Oct. 13	N. American RTTY Sprint Contest
Oct. 19-20	JARTS RTTY Contest
Oct. 19-20	Worked All Germany Contest
Oct. 26-27	**CQ WW DX SSB Contest**
Nov. 2-3	Ukrainian DX Contest
Nov. 2-4	ARRL CW Sweepstakes
Nov. 16-18	ARRL SSB Sweepstakes
Nov. 23-24	**CQ WW DX CW Contest**

There are some great cities in the world, among them Seattle, San Francisco, Ljubljana (Slovenia), and Helsinki. What do these cities all have in common? They have hosted contesting's World Radiosport Team Championships.

This past July contesting history was made as the fourth WRTC event took place in Finland. WRTC formed its roots under the vision and leadership of Danny Eskenazi, K7SS. His idea in 1990 was to create a contesting Olympics, where, as much as possible, stations and antennas along with their locations would be on equal footing. The concept was to promote an event that focused on the skills of contesters from around the world in a common location. In classically understated form, the first WRTC was an enormous success. Not only did the "contest" itself create a new benchmark in contesting, the fact that the timing was still in the Cold War era made for camaraderie between eastern and western hams that is still talked about to this day.

While the events of WRTC 1990 were still in full motion, discussions were underway about the next one. Where should it be located? Who would be willing to undertake the massive organizational responsibilities? Where would we find the funding? Well, history tells us that the Northern California Contest Club (and others) stepped up in a big way with WRTC '96 in San Francisco, followed by the incredible efforts of the Slovenia Contest Club and its sponsorship of WRTC '00. With each successive WRTC, the bar continued to rise as contest leaders became more experienced in the creation and execution of these world-class operating events.

Needless to say, as the hams of Finland raised their hands to lead WRTC '02, there were some mighty big shoes to fill from the efforts of the past. Filling those shoes admirably is exactly what the Finns did this past summer. What follows is a first-hand account of those events. I, along with my teammate, Doug, K1DG, have been fortunate to attend and compete in all four WRTC events. Although we did reasonably well in two of them (and not so well in the others!), each WRTC event had its own personality and memories that will last a lifetime.

2 Mitchell Pond Road, Windham, NH 03087
e-mail: <K1AR@contesting.com>

The Invasion of Finland July 9, 2002

Finland, with its population of approximately 5 million people, is Europe's seventh largest country. However, would they be ready for the onslaught of contesters arriving in the early part of July 2002? Our question was answered within minutes of arriving in Helsinki.

The Finns are a very independent and proud people, and they have one of the most "high-tech capable" infrastructures in all of Europe. With that in their arsenal, the arrival of 52 contest teams and scores of other dignitaries and invited guests posed a huge challenge, but few problems. Arriving in Helsinki on July 9th, we were greeted with perfectly coordinated logistics and transportation, and yes, a WRTC-issued Nokia cell phone, which would prove to be a key contributor to the superb coordination we experienced over the course of our visit.

Our welcome in Helsinki began at the airport, but continued as we were transported to the Hotel Radisson in Espoo. As we walked into the lobby, a "who's who" group of contesters greeted us as a week's worth of camaraderie and new friendships began. Frankly, there's really no adequate way to describe the excitement and "sensory overload" that comes from seeing many of your friends from around the world whom you haven't seen in years, as well as meeting others face to face for the very first time.

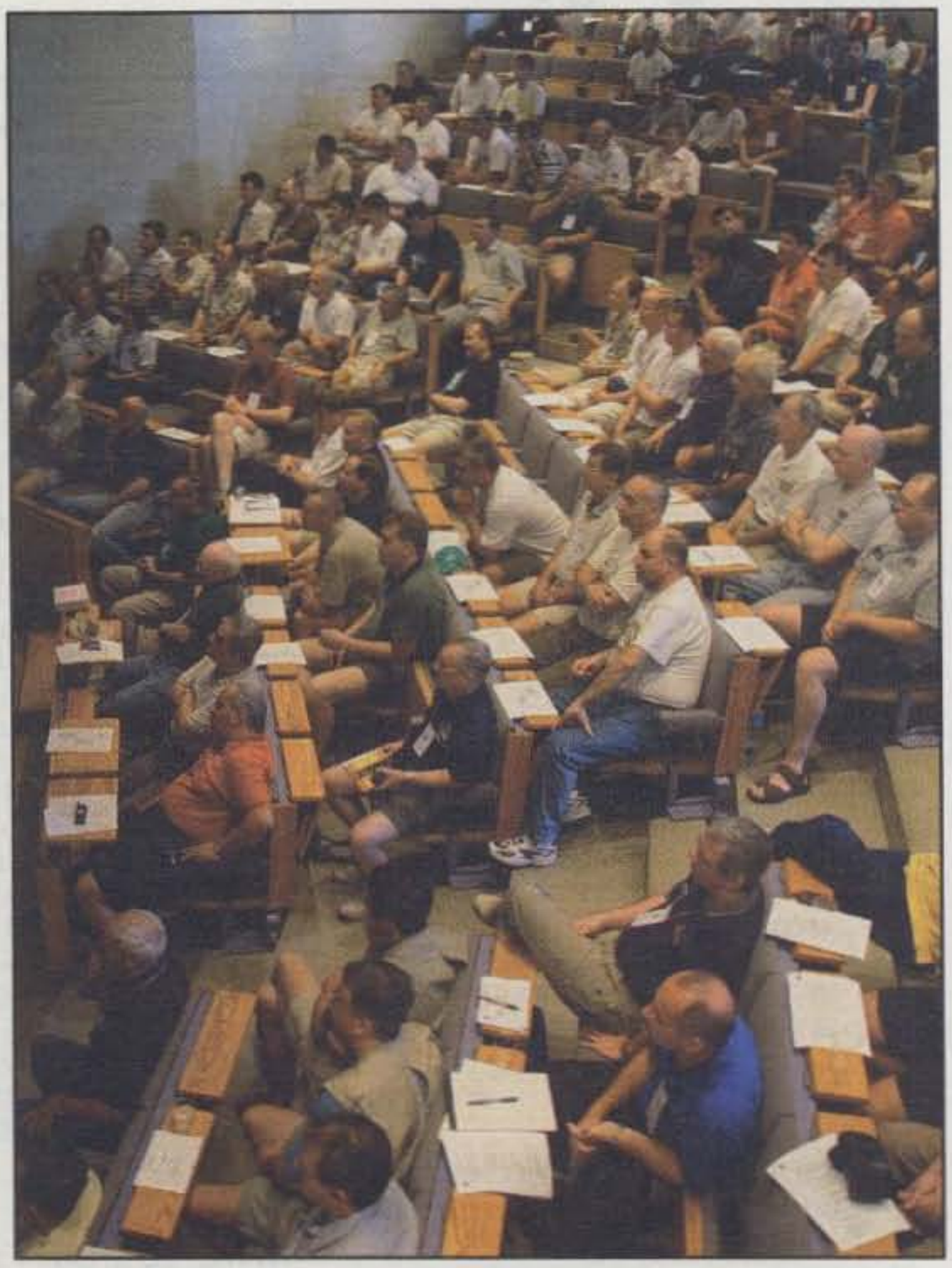
As you might expect, we unpacked our travel gear and headed to the beer tent for what proved to be a week of great food and drink. As it turned out, the events of the day eventually ended in the hotel room of Willy, UA9BA, as we engaged in serious scientific investigation into the distilling methods of fine Russian vodka. With the clock approaching 3 AM, I knew that this was going to be a very long week.

Our Adventure in Himos July 10–12

On of the highlights of our WRTC 2002 adventure was our stay at Himos, a skiing resort a few hours north of Helsinki. After the obligatory competitor Q&A meeting at the hotel in Espoo, we all boarded buses and headed north, to discover a large resort facility complete with cabins and, of course, the Finnish sauna. Our pre-contest experience at Himos turned out to be a mini hamfest, with a fully functional ham station (and tower), flea market, and scores of Finnish hams (as well as many others from around the world). Himos had all the excitement of other pre-WRTC events, as we had more competitor meetings, pile-up tapes, presentations, great food and music, and the requisite amount of local beer and conversation. While the unusually warm nighttime temperatures and midnight sun made for tough sleeping in some cases, the never-ending QSOs carried the day (and night!).

#	Call	Team	Mults/QSOs	Score
1	OJ3A	N5TJ/K1TO	438/2782	1,629,798
2	OJ8E	RA3AUU/RV1AW	426/2627	1,619,226
3	OJ2V	DL2CC/DL6FBL	473/2468	1,608,673
4	OJ3R	N6MJ/N2NL	436/2705	1,560,008
5	OJ8K	KQ2M/W7WA	394/2816	1,479,470
6	OJ5A	VE3EJ/VE7ZO	437/2635	1,473,127
7	OJ1M	K5ZD/K1KI	457/2519	1,469,255
8	OJ6E	UT4UZ/UT3UA	416/2637	1,468,064
9	OJ5W	LY1DS/LY2TA	416/2638	1,459,744
10	OJ5M	DK3GI/DL1IAO	440/2534	1,456,840
11	OJ6W	OE2VEL/OE9MON	416/2560	1,436,448
12	OJ6C	RW1AC/RW3QC	395/2776	1,414,100
13	OJ5U	N6RT/N2NT	432/2435	1,412,640
14	OJ8W	9A9A/9A5E	373/2778	1,405,837
15	OJ7M	SP3RBR/SP8NR	403/2650	1,402,440
16	OJ2F	N6TJ/N6AA	397/2428	1,391,088
17	OJ3T	RZ9UA/UA9MA	395/2708	1,390,795
18	OJ2H	N5RZ/K2UA	410/2559	1,388,670
19	OJ8A	K1AR/K1DG	432/2382	1,382,400
20	OJ2J	HA1AG/HA3OV	408/2602	1,368,432
21	OJ3N	N2IC/K6LL	405/2513	1,355,940
22	OJ4M	K3LR/N9RV	366/2642	1,347,612
23	OJ3D	W4AN/K4BAI	389/2530	1,347,107
24	OJ2Y	UA2FZ/RW4WR	421/2389	1,331,623
25	OJ4N	ON6TT/ON4WW	416/2260	1,301,248
26	OJ2Q	YU7BW/YU1ZZ	381/2743	1,300,734
27	OJ6X	OH1MDR/OH1MM	438/2267	1,293,414
28	OJ7C	ES5MC/ES2RR	393/2505	1,288,254
29	OJ2Z	G4PIQ/G4BWP	419/2342	1,277,950
30	OJ6N	OK2FD/OK2ZU	379/2446	1,274,577
31	OJ1S	SP7GIQ/SP2FAX	371/2498	1,234,317
32	OJ5T	SM5IMO/SM3SGP	386/2381	1,214,742
33	OJ7X	S50A/S59AA	379/2542	1,210,147
34	OJ4S	JM1CAX/JE1JKL	392/2289	1,205,008
35	OJ7N	YL2KL/YL3DW	382/2392	1,196,424
36	OJ3X	5B4ADA/5B4WN	386/2310	1,186,950
37	OJ7S	N5KO/N1YC	389/2177	1,142,882
38	OJ1X	K1ZM/N6ZZ	370/2354	1,139,230
39	OJ5E	OH6EI/OH2XX	402/2059	1,131,630
40	OJ1F	NT1N/AG9A	397/2101	1,105,645
41	OJ5Z	F6FGZ/F5NLY	375/2016	1,086,750
42	OJ8N	YT1AD/YU7NU	359/2335	1,069,820
43	OJ7W	UA9BA/RN9AO	368/2168	1,052,480
44	OJ6K	VE7SV/VE7AHA	351/2257	1,045,980
45	OJ4A	DJ6QT/DL2OBF	347/2166	1,005,259
46	OJ1C	LU7DW/LU1FAM	322/2335	986,930
47	OJ7A	PP5JR/PY1KN	333/2263	978,021
48	OJ1N	EA3AIR/EA3KU	340/2140	954,380
49	OJ8L	S56M/S57AL	345/1920	883,545
50	OJ1W	ZS6EZ/ZS4TX	369/1723	880,065
51	OJ6Y	IK2QEI/I4UFH	339/1921	878,349
52	OJ4W	UN9LW/UN7LAN	297/1893	699,732

Table I– WRTC 2002 final results,



Opening competitors' meeting in Espoo, where the tension was just beginning to build before the WRTC 2002 big event. (All photos by Gene Walsh, N2AA, unless otherwise noted.)

An important and even somewhat dramatic event at all of the pre-contest meetings is the process of selecting one's station, referee, and callsign. WRTC 2002 was no exception, with everyone keeping their local maps right at hand as the station locations were revealed via random drawing by each team leader. The questions ranged from "Are we near one of the Finnish lakes?" to "I hope I get that island location." In the end, the Finns did a marvelous job of making the stations as equal as possible so that we truly could focus on operating as the only meaningful variable. Equally anticipated were the referee assignments. We had the good fortune to have Tord, SM3EVR, assigned to our team. I've known Tord for years as a fellow FOC member, but I have to say that WRTC 2002 was really the place that brought us together. We could have not asked for a better referee. As it turned out, Tord listened to every single QSO we made, keeping his own handwritten log of our contest QSOs. I'm still impressed by his ability to do that and with his dedication to the spirit of WRTC.

The Contest Site – July 12

Now that all of the competitors had selected their host operator, referee, and callsign, there was tremendous anticipation as all of us were transported to our stations to set up for the big event. For example, was our shack going to be in a hotel penthouse or a tent in the woods? Was there running water or would we just have to run? Much to my delight, we were in a beautiful, newly constructed shack at the home of Jari, OH1BOI. We couldn't have asked for a better setup. Also, with the exception of a noisy (and cheap) 12V power supply, our equipment worked flawlessly right out of the shipping containers.

Our QTH (and that of many others) was several hours west of Helsinki, so the easiest path to a night's rest was for our group of competitors to sleep at a very nice motel near the stations—all pre-arranged by the organizers, of course. Resisting the temptation to stay up all night and operate, we turned off the equipment and headed to the motel for some sleep. The WRTC 2002 competition was less than 24 hours away from becoming a reality.

Then There Was a Contest July 13–14

Unlike previous WRTC events where final scores were weighted by mode and number of multipliers, the rules of WRTC 2002 centered on the actual scoring used in the IARU contest. The usual challenges existed for the non-Europeans (understanding local propagation and beam headings), but otherwise the task was sim-

There were 52 identical antenna installations like this for each WRTC 2002 team.

ply to operate the contest and make the highest score.

After a quick trip to the local supermarket for weekend sustenance, we fired up the computers, rigs, and accessories and prepared for war. There was only one last task to do at T-minus 15 minutes—open the envelope containing our contest callsign. As it turned out, we received OJ8A. Not a bad call, but I have to say that the number 8 can be a challenge in a phone pile-up. On balance, though, everyone had a decent call and no one can claim that they lost the contest because of their callsign.

Naturally, operating from northern Europe presented its usual concerns about propagation. Being so close to the Arctic Circle means that any solar disturbance can create havoc on the bands. Fortunately, conditions turned out to be very good—for the most part. We were able to have many good runs into the U.S., especially on 20 meters. Short-skip into Europe was common, with the net result being that most stations averaged at least 100 QSOs per hour for the entire contest (see Table I).

Just as in any contesting event, there is pure operating skill and there is a strategy component. Given that in WRTC 2000 our effort suffered from a low multiplier

The WRTC 2002 winners' circle (left to right): RV1AW & RA3AUU (OH1AV host), N5TJ & K1TO (OH2HXP host), DL2CC & DL6FBL (OH1XX host). (Photo by N6TV)

total, I was focused on not letting that happen again. In retrospect, that turned out to be a bit of a mistake, as many of the higher scoring stations operated in a "run and gun" mode, assuming that the multipliers would just call in over time. As it turned out, that would be a great operating strategy for WRTC 2002.

A new component to WRTC and contesting overall was the addition of real-time reporting of contest scores. For the first time in a major contest, participants (non-WRTC competitors) could view the status of each WRTC team via hourly updates on the web. Each referee used his assigned Nokia phone and sent a pre-formated SMS message that was read and uploaded to a website location for worldwide reporting. I'm told it added a new level of participation for the operators outside of the actual WRTC 2002 experience. We need to learn from what the Finns did and discover how we can use the concept in contests to come.

The WRTC 2002 contest was not unlike most other contests. It had its periods of high rates, which for us little 100 watt stations surprised us at times. We did our share of passing multipliers from one band to the next. In the case of our OJ8A team, we switched operators on the hour for the entire contest.

As the contest wound down, Doug and I (perhaps more myself) were convinced that we had done pretty well. Our rates were decent, and we knew we had solved the multiplier shortages of the past. Also, to their credit, Jari and Tord did not even provide a hint as to how we were doing based on what they learned from the real-time-scoring website.

Well, it turned out we didn't do that well, at least in comparison to our expectations. At the end we finished in 19th place, a reasonable performance, but about 18 places too low! However, that was what was meant to be for us at WRTC 2002, and we were just glad to be there and be one of the competing teams. Words simply cannot express how great that feeling was.

Time for War Stories

At the end of the contest we packed up our stuff and headed back via bus to Espoo. Bear in mind that none of us had slept for over 30 hours, so the energy level on the bus wasn't quite what you would expect under normal circumstances. However, back at the hotel and with a quick catnap under our belts, the stories started to flow as we provided never-ending perspectives on the contest and what we did right and wrong. At that point no one knew for sure who had won the contest. Although the competitors' jobs were done, the log checkers' task was just beginning.

The Last Day – July 15

There were a number of pre-arranged tours set up for the attendees on this last day of WRTC, ranging from a tour of Helsinki to a bus ride into the north to see and learn about Finnish nature from OH5NQ. The last day of WRTC is always a little tense as anticipation builds around learning the final results. Also, after a week of QSOing, we all were starting to have mixed feelings about not wanting WRTC to end and our desire to go home.

After all the tours of the day concluded,

Contesting's youth movement in action at WRTC 2002. Left to right: WC4E, N2NL, and N6MJ.

The Slovenians seemed a bit more relaxed this time around!

we took one more boat ride into Helsinki for the closing ceremonies and awards dinner. The Finns delivered this event with class, and after a wonderful dinner together with fine drink and song, the final results were announced. For the third WRTC in a row, the U.S. team of Jeff Steinman, N5TJ, and Dan Street, K1TO, took the gold medal. After thinking of comparing Jeff and Dan to Tiger Woods, there was one consistent opinion: In contesting, they are the best of the best. The fact that they are also

Jouko Hayrynen, OH1RX, Head of the Organizing Committee
Martti Laine, OH2BH, Co-Chairman, WRTC 2002 Radio Competition
Pasi Luoma-aho, OH2IW, Co-Chairman, WRTC 2002 Radio Competition
Jukka Kulha, OH2MA, President of Contest Club Finland
Veijo Kontas, OH6KN, Scoring Communication
Merja von Weissenberg, Financial Controller
Risto Lund, OH3UU, Logging & Scoring Management
Ari Korhonen, OH1EH, Competitor Correspondence, International Publicity
Timo Klimoff, OH1NOA, Competitor Correspondence, Webmaster

Table II– WRTC 2002 officers and committee members.

great people makes their result even more deserved. Congratulations!

Some Final Thoughts

The following morning (or one last all-nighter, in some cases) came quickly to all of us at WRTC 2002 as we grabbed our bags and headed to the airport (although some stayed on for more vacationing). Our experience was filled with memories that will last a lifetime.

Frankly, no words can adequately express how much WRTC 2002 meant to us, and the thanks we owe to everyone who made WRTC 2002 happen. The ultimate testament was in people's eyes. From a competitor's point of view, there were tears of joy as we said our final good-byes. The Finns knew they had pulled it off and had every right to be proud of what they had done. Finally, everyone there knew they had just been a part of one of the most unique experiences that had ever taken place anywhere in our hobby. In the simplest but most sincere way I know, I simply say, "thank you."

Final Comments

Well, editorially speaking it's been a busy month indeed, and next time will be no exception as I report on the final results of the 2002 CQ Contest Survey. To be honest, I've lost count of how many responses I've received to date. I can say that the numbers have been record-breaking, and for that I say a heartfelt thank you. I look forward to summarizing your input, with each survey ultimately offering us something we didn't know before.

As always, best of luck in this year's contest season. Our friend the sun still has some gas left in it, which will certainly provide for fun and entertainment in this fall's contests!

73, John, K1AR

New CQ WW Category – Multi-2

Multi-Operator/Two Transmitter: A maximum of two transmitted signals at any time on different bands. Both transmitters may work any and all stations. A station may only be worked once per band regardless of which transmitter is used. Each of the two transmitters used must keep a separate chronological log for the entire contest period, or if electronic logging is used, the electronic log submittal (Cabrillo) must indicate which transmitter made each QSO. Each transmitter may make a maximum of 8 band changes in any clock hour (00 through 59 minutes).

For the first time in a number of years, a new category has been created for the CQ WW DX Contest—Multi-Operator/Two-Transmitter. As a matter of policy and some old-fashioned common sense, there have not been many categories added to the CQ WW. The reality is that a new category adds a huge administrative burden to an already overworked committee. However, for a number of years there has been a strong desire by the contest community to have the CQ WW bridge the gap between the big guns of the Multi-Multi category and some of the inherent limitations of the Multi-Single class. Put another way, as a Multi-Single operation, it's very common to want to "run" stations on the second transmitter, with the rules being the limit. Up to this point, the only alternative was to upgrade to the complexity of a full Multi-Multi station, which is beyond the means and desire of most contest station owners.

With the advent of the Multi-2 rule, a relatively modest Multi-Single station can enter the ranks of a two-transmitter operation, often with little, if any change. The bottom line is that there is more to do for the second operator than ever before. While Multi-Single still has its appeal, this new category of operation will as well, as evidenced by its success in the ARRL's DX contests.

A Bit About the Rule

To state the rule in different words, M-2 entrants may now run stations on both transmitters (unlike the CQ WW Multi-Single rule, which limits the second station to multiplier chasing). In addition, unlike the old 10-minute rule, you are free to move around the bands as you see fit, provided you change bands 8 times or less per hour per transmitter.

The M-2 category can be a lot of fun. If you still have questions, you can send them to <K1AR@contesting.com> or <questions@cqww.com> for a speedy reply.

Awards

BY TED MELINOSKY, K1BV

News Of Certificate And Award Collecting

This month we present some DX awards you will be sure to find interesting and challenging. First, though, we have with some background on Cliff Smith, K6JN, USA-CA #1041, April 20, 2002. In Cliff's own words . . .

I am now 67 years of age and have been interested in radio since I was a grade-school kid. I remember rushing home from school to listen to the Lone Ranger on local radio. Later, as a teen, I recall listening to the 500,000 watt big-signal border radio station from Del Rio, Texas while at home in middle Georgia.

I entered the Navy when I was 17 and went to radio school. I was a radio operator on a destroyer and a submarine for four years. While I was in college and law school, I was in the Navy Reserve and met many of the local hams in Macon, Georgia, my hometown area.

I was first licensed in 1958 as K4SIJ. My first transmitter was a Heathkit DX-40 transmitter and a not very good military surplus receiver. Later, when I earned a few more dollars, I moved up to a Heathkit DX-100 and a Hallicrafters SX-99. That was a good rig for its day.

In 1961 I graduated from law school and entered the FBI as a Special Agent. I was stationed in Albuquerque and Los Angeles. I stayed in the San Bernardino, California area while practicing law and raising a family. Like a lot of hams, due to the pressures of work and family, I let my license expire (in about 1980). In 1990 I got the Extra license and have remained active in ham radio since then.

Prior to my retirement in 1997, I listened to the County Hunter's Net. I liked the fact that the net gave everyone an opportunity to work a mobile in a quick fashion. I did not like the slow pace of the other nets.

Finally, in December 1997, I decided to become a county hunter. I finished all 3077 on April 7, 2002, when Lloyd, VE4AGT, gave me Campbell County, South Dakota. Along the way I got to meet and make friends with a lot of good folks. County hunting is truly a shared effort. No one could ever work all the counties without the assistance of many hard-working, hard-running county hunters.

There are too many folks to thank. However, I do want to thank Jim, KZ2P, a frequent county hunter net control, who helps the mobiles and county hunters on a regular basis. I also want to mention Ken, KC4UG, and Percy, KA1JPR, and thank them for their advice and encouragement along the way. Finally, I would like to thank my wife, Nelda, W6XJN, who helped and prodded me to finish.

I worked worked most of the counties from our home in Wrightwood, California. I also worked a good many counties from out home in Tavares, Florida. In addition, there were a lot of counties worked when Nelda and I were putting on counties across the U.S. Putting on a highly sought after county is about as good as it gets in ham radio for me. Giving someone his or her last county for a state or the last one for the "whole ball of wax" (last in the entire U.S.) is even better.

As Pete, K4QFK, says, county hunting is addictive. It is truly a kick to turn on the radio in the morning and have Alan, VK4AAR, from Australia as net control. I plan to continue county hunting, working the counties for the awards sponsored by MARAC.

—73, Cliff, K6JN

65 Glebe Road, Spofford, NH 03462-4411
e-mail: <k1bv@cq-amateur-radio.com>

USA-CA Special Honor Roll

John R. Bowman, W4OHP
USA-CA All Counties #1047
July 8, 2002

USA-CA Honor Roll

500
W4OHP 3202
LA9SN 3203
RX3AP 3204

1000
W4OHP 1602

1500
W4OHP 1340

2000
W4OHP 1239

2500
W4OHP 1159

3000
W4OHP 1070

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is $6.00. For nonsubscribers it is $12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 65 Glebe Road, Spofford, NH 03462-4411 USA. DX stations must include extra postage for airmail reply.

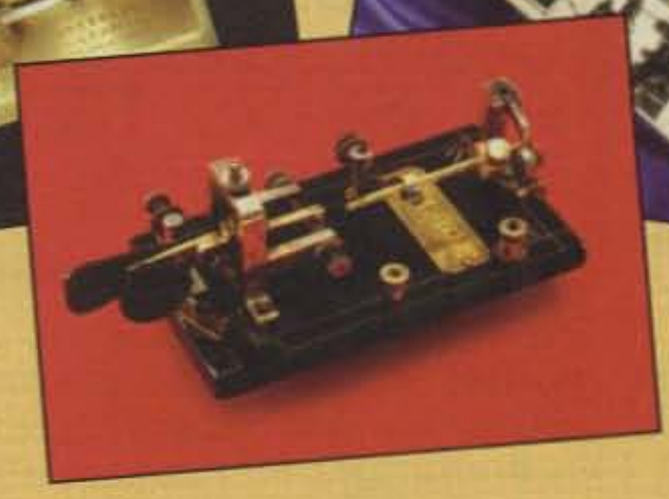
Cliff Smith, K6JN, USA-CA #1041, April 20, 2002.

DX Awards

The Antarctic Bases/Stations Award Series. This month we feature the challenging, handsome awards from the Italian Diamond DX Club. They are based on making contacts with stations of various countries in bases located on the continent of Antarctica. The group has done a great deal of research on the subject and offers several publications and lists on their website, <http://www.ddxc.org>, including an Antarctic Bases Directory supporting the Worked Antarctic Bases and Worked Antarctic Stations awards. It makes fascinating reading, as 26 countries have established scientific and exploratory bases on the Antarctic continent. Most, if not all, have encouraged ham radio activity as a morale builder which allows personnel to stay in contact with their fam-

CQ 2003 calendars

10th Anniversary



Yes, this year marks ten years of outstanding calendar photography with the release of the 2003/2004 CQ Amateur Radio Calendars. Buy a few for yourself, and solve some holiday shopping dilemmas by ordering a few for giving to your special ham friends.

Better than ever and still 15 months of value.

Marking the 10th anniversary of the famous CQ calendars, we're pleased to introduce the new 2003/2004 CQ Classic Keys Calendar. Classic equipment photographer Joe Veras, N4QB, takes a different track this year by featuring 15 magnificent photographs of 15 extraordinary telegraph keys, both new and old. Fifteen magnificent photos of beautiful telegraph keys presented as an art form. You absolutely will not want to miss out on this one.

Order your 2003/2004 CQ Keys Calendar today. We anticipate a ship date on or about October 1, 2002.

The 2003/2004 CQ Amateur Radio Calendar brings you fifteen spectacular digital images of some of the most interesting and photogenic Amateur Radio shacks, antennas, scenics, and personalities. These are the people you work, the shacks you admire, the antenna systems you dream about having, all digitally captured by the talented Larry Mulvehill, WB2ZPI, CQ's own roving photographer.

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

Order both versions of the highly acclaimed CQ Amateur Radio Calendars today. Keep your collection complete!

Save shipping by ordering more! On orders of more than one calendar, you pay just one shipping charge. Order a few for your shack. Order one for the office. Order several for your Ham friends as Holiday gifts, or just to share the fun.

Available directly from CQ and from your local dealer!

Calendars are $10.95 each plus only $2 shipping and handling no matter how many you order!

For Fastest Service call 1-800-853-9797 or FAX 516-681-2926
www.cq-amateur-radio.com

CQ Communications, Inc.

25 Newbridge Road, Hicksville, NY 11801

The Worked Antarctic Bases Award (WABA) is issued for contacting Antarctic bases (and bases from 60° to 90° south latitude) after 1 January 1961, the year the Antarctic treaty was signed.

The Worked Antarctic Bases Top Honor Roll is awarded free to those who can prove contact with 50 different Antarctic bases representing at least 15 countries, plus all endorsements must have been received.

ilies during the long winters at the bottom of the world. The group also publishes an internet newsletter which lists the calls and operations of current and planned operations from the Antarctic. Information on subscribing to the newsletter is found on the website.

General Requirements: Cards are required, except from members of the sponsoring club. You must supply the fee for return of your cards. Fee for each award is 25,000L, or $US15. Endorsement fee is 3,000L, or $US2. Apply to: Diamond DX Club Award Manager, Gennaro Casaburi, I8YRK, Via XXXI Maggio N.11, I-80027 Frattamaggiore (NA), Italy (e-mail: <gennaro.casaburi@tin.it>).

Worked Antarctic Bases Award (WABA). Contact Antarctic bases (and bases located from 60° to 90° south latitude) after 1 January 1961, the year the Antarctic treaty was signed. SWL okay. All bands and modes.

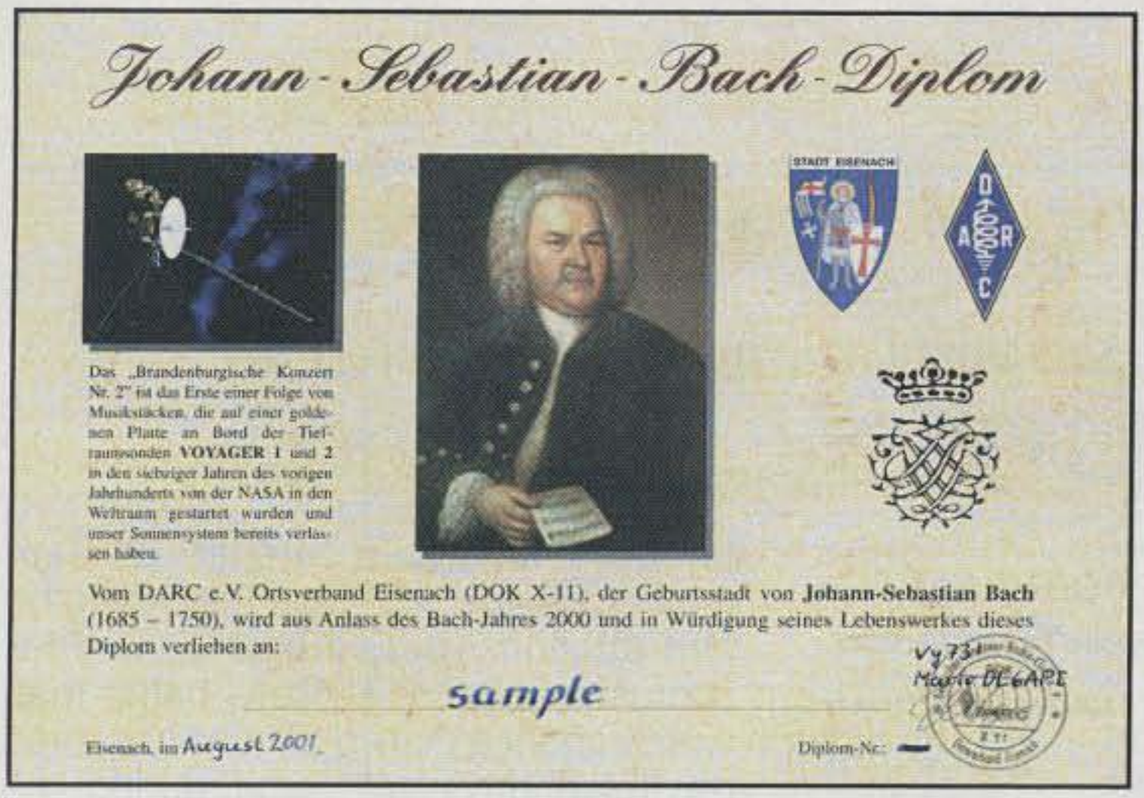
1. Basic/Simple Award: Ten different calls in the Antarctic representing at least five countries with bases there.

2. Honor Roll: 25 contacts from 15 different countries with such bases. (Endorsements are adhesive color flags representing countries having a base in the Antarctic. They are available if you submit at least 50% of the active bases or at least three of the active Antarctic bases belonging to that country—i.e., the bases with a reference number in the WABA directory.)

3. Top Honor Roll: Awarded free to all those who can prove contact with 50 different Antarctic bases representing at least 15 countries, plus all endorsements must have been received.

Contact stations in Antarctica, including any Antarctic base located from 60° to 90° south latitude, on or after 1 January 1961 to qualify for the Worked Antarctic Stations Award (WASA).

Worked Antarctic Stations Award (WASA). Contact stations in Antarctica, including any Antarctic base located



The Johann Sebastian Bach Award is issued for contacting areas of Germany that were important in the life of this famous composer.

Make a total of five confirmed QSOs with 5Z4 stations to earn the Big Five Award from Kenya.

from 60° to 90° south latitude, on or after 1 January 1961. All bands and modes. The basic award is available for 10 contacts and confirmations. Adhesive color flag endorsements from 20 to 80, then 85, 90, 95, and 100. Honor Roll is issued at the 100 level.

Contacts with special Italian stations IR1ANT, IYØA, IY8UN, and INØG may be used as "jokers" to substitute for any Antarctic stations.

Johann Sebastian Bach Award. Mario, DL6API, supplied us with the rules for this high-quality, multicolor award given for contacting areas of Germany important in the life of the famous composer Johann Sebastian Bach (1685–1750).

A reminder: In Germany, radio clubs associated with DARC are identified with a letter and number combination called the DOK. German stations are very good about including this DOK number on their QSL cards. Most German awards are based on the DOK, and successful German award hunters keep track of DOK identifiers to make it easy to qualify for awards. Note in the list shown below that a large city, such as Leipzig, has several clubs and all have different DOK numbers.

Contact stations on or after 1 January 2000 who operate from DOKs where Bach lived and worked. These are Eisenach X-11; Ohrdruf X-17; Luneburg E-05; Weimar X-03; Arnstadt X-10; Muhlhausen X-02; Kothen (–); Leipzig S-30, S-31, S-37. SWL okay. One-hundred points are needed. Regular stations in any of these DOKs = 5 points each, and club stations = 10 points each. Contacts with special event stations connected with Bach = 20 points each. Any contacts made on CW are worth twice the above values.

Send GCR list and fee of DM10, $US8, or 5 Euros to: Mario Baertig, DL6API, Hohenlohestrasse 31, D-99817 Eisenach, Germany.

The Big Five Award. From Kenya comes the Big Five Award. The certificate features artwork of five well-known animals we associate with that continent. 5Z4 is a somewhat rare prefix, but there's always a good chance of working one in the various DX contests.

Make a total of five confirmed QSOs with 5Z4 stations. Award fee is US$10. Send fee and application to Application to be made to: The Awards Manager, Amateur Radio Society of Kenya, P.O. Box 45681, Nairobi – 00100, Kenya.

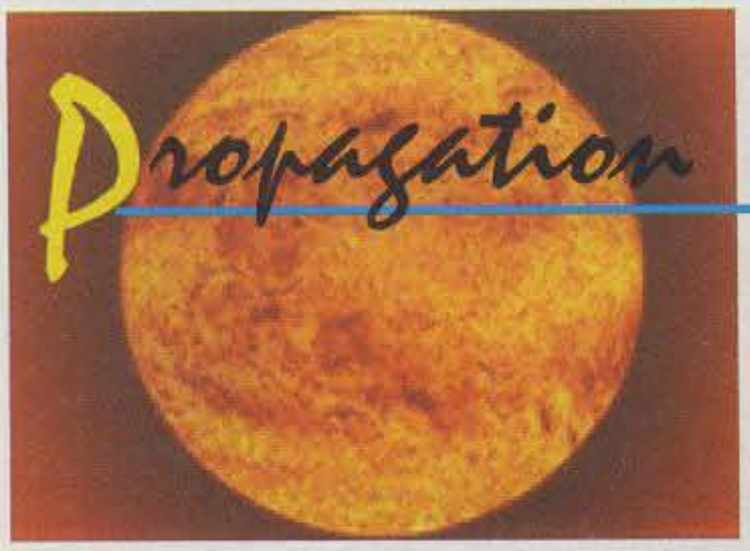
URL of the Month

Recently, lighthouse awards have become quite popular. They provide a DXpedition possibility for the average ham who might live anywhere along a seacoast. Here's a great link showing a fairly complete list of current awards: <http://www.lighthouse-award.de/>.

Big changes are coming for me. I'll be leaving my full-time job doing business insurance automation for National Grange Mutual and entering the world of retirement, which should allow me to spend more time on my hobbies, including awards hunting and DXing. The old QTH is up for sale, and my wife and I will be relocating to eastern Connecticut, where we will be closer to our two children and many old friends. The new address will follow next month.

Remember, publicity is the key for a successful club awards program, and *CQ* magazine will do its best to help you if you send me the rules and a sample of your award.

73, Ted, K1BV



BY TOMAS HOOD, NW7US

The Science Of Predicting Radio Conditions

Above Normal Conditions Predicted for 2002 CQ WW DX SSB Contest

Solar Cycle 23 has been declining slowly since the smoothed sunspot peak of 120.8 recorded for April 2000, yet solar activity is remaining high enough to support the possibility of near record-breaking scores again this year. The sun has surprised us with occasional major flares lately, but it looks as if conditions will be great during the contest weekend.

The 2002 CQ WW DX Contest will be held on the following dates:

SSB: 0000 UTC Sat., October 26 to 2400 UTC Sun., October 27

CW: 0000 UTC Sat., November 23 to 2400 UTC Sun., November 24

Table I shows observed sunspot levels during previous WW DX Contest periods since 1991 and the level predicted for the 2002 contest. Contest conditions could be somewhat like those of 1992, or even 1998, yet looking at the 27-day cycle trend we can expect Above Normal conditions on the HF bands for both days during the October event.

The DX Propagation Charts, and other information in this month's column, are designed to help you to make the most of propagation conditions during the contest. Even if you are not a dedicated contester, you should give it a try. With the great conditions expected, you will have a lot of fun making contacts with stations worldwide. If you are trying for DXCC or other wall paper, this is a very good opportunity, and many die-hard participants will appreciate putting you in their logs.

Above Normal Conditions Expected for SSB Weekend

The best tool available to predict HF propagation conditions in advance is the 27-day recurrence tendencies of geomagnetic, solar, and ionospheric conditions. It is not an absolute method, but it does give a very good indication of what can be expected. This column is being written in early August, approximately three 27-day solar rotation cycles away from the start of the CQ WW SSB weekend. Based on a study of the patterns expected during the next three rotational periods of the sun, it looks as if conditions for the contest on both October 26 and 27 will likely be Above Normal for middle- and low-latitude openings.

Predictions for one 27-day rotational period are far more accurate than for three 27-day rotational periods. Be sure to check conditions carefully on September 29 and 30, since this would be one rotational period before the SSB contest weekend. There is better than a 90% chance that conditions observed on those days will recur during the October contest weekend.

See the Last-Minute Forecast for additional information concerning expected day-to-day conditions for the entire month of October. An updated day-to-day forecast for the SSB contest weekend will appear as a bulletin at the beginning of next month's column. The November issue of *CQ* should reach most subscribers before the SSB contest begins.

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for October 2002

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 1-2, 20-21, 26-29	A	A	B	C
High Normal: 3-10, 13-16, 18-19, 25, 30-31	A	B	C	C-D
Low Normal: 11-12, 17, 24	B	C-B	C-D	D-E
Below Normal: 22	C	C-D	D-E	E
Disturbed: 23 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 Oct. 1st and 2nd, good (B) on the 3rd through the 10th, poor-to-fair (D-C on the 11th and 12th, etc.

Progress of Solar Cycle 23

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports an observed monthly mean sunspot number of 100 for July 2002, up from 89 for June. The 12-month running smoothed sunspot number centered on January 2002 is 114, one point down from December. The sunspot minimum for July 2002 was 52, on July 12. The sunspot maximum of 192 occurred on July 28.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada reports a 10.7 cm observed monthly mean solar flux of 175 for July, up from June's 149. The 12-month smoothed 10.7cm flux centered on January 2002 is 195, up a point from December 2001.

The observed monthly mean planetary *A*-index (*Ap*) for July 2002 is 13, up a bit from an *Ap* of 11 for June. The 12-month smoothed *Ap*-index centered on January 2002 is 12.

	1991	'92	'93	'94	'95	'96	'97	'98	'99	2000	'01	'02
SSB Oct.	142	76	45	27	12	9	32	71	108	115	114	81*
CW Nov.	138	74	41	26	11	10	35	73	111	113	116	76*

*Table I– Smoothed sunspot numbers recorded during CQ World-Wide DX Contests since 1991. *Predicted values expected during the 2002 contest.*

P.O. Box 213, Brinnon, WA 98320-0213
e-mail: <cq-prop-man@hfradio.org>

A smoothed sunspot level of 81 and a 10.7 cm solar flux of about 135 are predicted for October 2002. Geomagnetic storming will be much the same as we have had during September.

Band-by-Band Conditions

The following is a band-by-band summary of DX propagation conditions expected from mid-October through mid-December and centered on the two CQ WW contest weekends. Next month's column will update this summary.

160 meters: Expect a few DX openings on this band during the hours of darkness and into the sunrise period. Considerably decreased static levels and longer hours of darkness in the northern latitudes should provide a number DX openings. These openings will often be weak due to the relatively high signal absorption, higher levels of static, and the lower power levels used on this band. Give it a try, however, as some fairly good openings should be possible. Look for openings toward Europe and towards the south from the eastern half of the U.S., and toward the south, the Far East, Australasia, and the South Pacific from the western half of the country. Other DX openings might also be possible. The best propagation aid for this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path. A good internet website featuring a grey-line map display is at <http://www.fourmilab.to/earthview/>. Follow the link "map of the Earth" which shows the day and night regions.

80 meters: This should be a good band for DX openings to many areas of the world during the hours of darkness and into the sunrise period. The band should peak towards Europe and in a generally easterly direction around midnight. For openings in a generally western direction, expect a peak just after sunrise. The band should remain open toward the south throughout most of the night. Propagation in this band is quite similar to that expected on 40 meters, except signals will be somewhat weaker on the average, noise levels will be a bit higher, and the period for band openings in a particular direction will be a bit shorter.

40 meters: This should be the hottest DX band during the hours of darkness, as the seasonal static levels are lower than they were during the summer. The band should be open first for DX toward Europe and the east during the late afternoon. Signals should increase in intensity as darkness approaches. During the hours of darkness expect good DX openings to most areas of the world. Signals should peak from an easterly direction at about midnight, and from a westerly direction just after sunrise. Excellent openings toward the south should be possible throughout most of the nighttime period. With conditions Above Normal or High Normal, it will be a choice between 40 and 20 meters for the best nighttime band.

20 meters: DX openings should be possible on this band both day and night. Conditions should peak from about an hour or two after sunrise and again during the late afternoon and early evening hours. Expect to work into most areas of the world between sunrise and sunset. Good to excellent openings should be possible to many areas of the world well into the hours of darkness as well. When conditions are Above Normal, expect 20 meters to remain open for worldwide DX during most of the night. Look for long-path openings for about an hour or so after sunrise and again for an hour or so before local sunset. Signal levels are expected to be exceptionally strong during the October contest period. If you plan on operating on a single band during the SSB WW DX Contest, this band should be your choice. This will be the band that produces the longest period for DX openings, the strongest signals, and openings to more places of the world than any other single band during the contest periods. Of course, with the majority of contestants using 20 meters, you can expect a challenge of your skill in working a crowded band!

15 meters: During the daylight hours this band should be jumping with action. Good to excellent conditions are expected from shortly after sunrise through the early evening hours. The band could remain open into the evening toward southern and tropical areas. Peak openings should occur toward a specific geographical area about an hour or so after the peak has occurred to the same area on 10 meters. Openings are expected to all areas of the world, and exceptionally

Time EST	Optimum Band (meters)	Areas To Which Band Is To Be Open
00–02	40	Most of Europe, Eastern Mediterranean, and Middle East. Most of Central and South America. A few African areas and possibly Antarctica.
02–04	20	Some South Pacific, New Zealand, and Australasia. A few Far East and Asian areas. Some South America and Antarctica.
04–06	40	South Pacific, New Zealand, Australasia. Many South American areas. A few Far Eastern and Asian areas. Possibly Antarctica.
06–08	20	Most of Europe, South Pacific, New Zealand, and Australasia. Most of Central and South America. A few African areas. Some Far East and Asian areas.
08–10	15	All of Europe, Eastern Mediterranean, and Middle East. Some of Africa. Most of Central and South America. South Pacific, New Zealand, and Australasia. A few Asian areas.
10–12	10	Most of Europe and Africa. Most of Central and South America. A few Asian areas, New Zealand, South Pacific, and Australasia.
12–14	15	Some of Europe and most of Africa. Most of Central and South America. A few areas of the South Pacific, New Zealand, and Australasia.
14–16	15	Most of Africa, and Central and South America. Some of South Pacific, New Zealand, and Australasia. A few Asian areas.
16–18	20	Most of Europe, Eastern Mediterranean, and Middle East. All of Africa, and Central and South America. A few Australasian areas.
18–20	15	Lots of South Pacific, New Zealand, and Australasia. Some of Far East and Asia. Most of Central and South America. Possibly Antarctica.
20–22	20	Most of Africa, Far East, South Pacific, New Zealand. Australasia, Central and South America. A few European areas and Middle East. Some Antarctica.
22–00	20	Lots of Far East, South Pacific, New Zealand, Australasia, Central and South America. A few African and Asian areas. Antarctica.

**Similar work plans can be devised for single-band operation or for openings to specific DX areas.*

Table II– Sample multi-band work plan for eastern U.S. QTH. (Courtesy of George Jacobs, W3ASK)

strong signals should be possible most of the time. Fifteen meters might possibly be the best daytime band for the contest weekends.

10 meters: For those in low- and middle-latitude locations, this band will yield a high number of daytime contacts during the contest weekends. Good, solid openings should be possible to just about every corner of the world during daylight hours. Openings toward Europe and in a generally easterly direction should peak an hour or two before noon, while those toward South America and Africa are expected to peak during the early afternoon hours. Optimum conditions toward the Far East, Australia, southern Asia, and the South Pacific are forecast for the late afternoon and early evening hours, especially from stations in lower latitudes. Expect exceptionally strong signals on most openings if conditions do reach Above Normal levels. Those in the Caribbean and other tropical regions will find 10 meters a fantastic band this year.

Overall, expect great conditions on the entire HF spectrum. It is unlikely that there will be any major solar or geomagnetic storms during the October contest weekend. Of course, anything can happen. If a radio storm should develop, concentrate on working transpolar paths on 10, 15, and 20 meters during the daylight hours. The storm's influence generally will extend outward from the polar regions the more severe the storms become. Expect considerably fewer openings, weaker signals, higher noise levels, flutter fading, and increase deep fading. Check the 40, 80, and 160 meter bands for possible openings to some areas of the world during the hours of darkness, although these bands will become erratic as well.

Contest Work Charts

The DX Propagation Charts in this issue show the times when each amateur band from 160 through 10 meters is expected to open from each time zone area in the continental U.S. to the major DX areas in the world. The information contained in these charts, while useful during the contest period in its present format, can easily be reorganized into more operational work plans or schedules. Experience gained during previous contests has shown that specifically tailored schedules derived from the charts can be extremely useful in piling up contacts and points with a minimum of wasted time.

Table II is an example courtesy of George Jacobs, W3ASK (who wrote this column for 50 years until December 2001, without missing a single issue!) of one of several types of plans that can be devised. It is a multi-band operational work plan which shows the times and bands when propagation conditions are expected to be optimal to various areas of the world for each two-hour period throughout the day. An eastern QTH has been chosen for this example, but similar plans can be devised for central and western locations.

WARC Band Conditions

While the WARC bands are not included in the CQ WW DX Contest, expect 12 meters to exhibit conditions much like those on 10 meters, but with the band opening a bit more frequently than 10. Seventeen meters should behave the same as 15 meters. Openings on 30 meters should resemble 40 meter openings, but expect the band to open less frequently than 40 meters during the hours of darkness.

Useful Websites (URLs)

One great resource you can utilize during a contest is the internet. Real-time solar, geomagnetic, ionospheric, and HF propagation prediction information is right at your fingertips, allowing you to better plan your on-the-air operation.

On The Cover

Help Scouts in your area connect with other Scouts around the world during the annual Jamboree on the Air (JOTA) and you'll connect young people in your community with amateur radio! This year's JOTA, held on the third weekend of October each year, will be on October 19th and 20th, starting at 0001 *local time* on Saturday and ending at 2359 *local time* on Sunday. There is some spillover into Friday night and Monday morning to account for differences in local times. The 2002 event will be the 45th annual JOTA, sponsored worldwide by the World Scout Bureau and the World Organization of the Scout Movement. In the United States, Cub Scouts, Brownies, Boy Scouts, Girl Scouts, and members of Venture crews may take part.

Hams can participate by inviting groups of Scouts to visit their stations and get on the air, or by setting up stations at Scouting events or in other locations. JOTA is not a contest, so you should take as much time as is needed to comfortably complete each contact. Recommended SSB frequencies for JOTA activity include 3.940, 7.290, 14.290, 18.140, 21.360, 24.960, and 28.390 MHz. For additional details, including information on "postcard-size participation certificates" (QSLs!), see any of the following websites:

World Scout Bureau: <http://www.scout.org/jota/>; Boy Scouts of America: <http://www.bsa.scouting.org/international/jota.html>; ARRL: <http://www.arrl.org/ead/jota.html>.

In our cover photo, Steve White, W4SNW, of Sarasota, Florida, is operating with Scout Nick Thomas. Steve is currently Advisor of Venture Crew 73, a ham-radio focused group of teens (both boys and girls) between ages 14 and 20. He and his crew members will be active during JOTA from K4BOY, the permanent ham station they've set up at BSA Camp Flying Eagle in Manatee County, Florida. (Cover photo by Larry Mulvehill, WB2ZPI)

If you want to be alerted any time the *Kp*-index rises above 4, or the solar flux changes, and so on, then you will want to subscribe to my propagation eAlert service (a free resource). If you have a pager, a cell phone with e-mail features, or an open e-mail client on your contest computer, these eAlerts will let you know when conditions are changing. Direct your web-browser software to view the eAlert subscription page at <http://hfradio.org/ealert/>. When you fill out the form, enter the e-mail address you will use to receive these eAlerts.

If you are at a location where you do not have easy internet access, but you have a WAP/WML device (nifty technology), you can gather the latest propagation information, warnings, alerts, and a look at conditions by pointing your WAP device to <http://wap.hfradio.org/>. This is a special URL for wireless access to this free resource.

If you have live internet connectivity at your contest location, use the following websites, which provide real-time data, forecasts, links to in-depth historical data, and graphical content.

N6RT Propagation Report: <http://dx.qsl.net/propagation/>. This page contains a dynamic collection of propagation information gathered from many different sources. It provides a quick view of real-time solar, geomagnetic, auroral, and ionospheric data. Updated many times an hour, it features storm warnings, a real-time MUF map, and a grey-line map.

The NW7US Propagation Center: <http://prop.hfradio.org/>. This site provides a rich collection of live propagation information. In addition, you will find a lot of links to educational resources covering the science of propagation, links to the many space and earth science resources found around the world, forecasts, and archived analysis and data.

D-Region Absorption Prediction: <http://sec.noaa.gov/rt_plots/dregion.html>. This is a great resource for those times when you want to know if the lower bands are experiencing degradation due to solar activity. It is updated once every minute. Long-range communications using high-frequency radio waves depend on reflection of the signals in the ionosphere. Along the path to the *F2* peak, the radio-wave signal suffers attenuation due to absorption by the intervening ionosphere. This site shows current and forecast conditions of the ionospheric *D*-layer, which has direct influence on the ability of your contest signal to reach its destination.

160 Meter Radio Propagation Prediction Table: <http://solar.spacew.com/www/160pred.html>. Don't miss this page. It is based upon selected high-latitude magnetic observatory data that is used to estimate the influence of the auroral oval on 160 meter path propagation. For details refer to the article "160 Meters: An Enigma Shrouded in Mystery," by Cary Oler and Ted Cohen, N4XX, in the March and April 1998 issues of *CQ*.

The Solar Terrestrial Activity Report from the DX-Listeners' Club in Norway: <http://www.dxlc.com/solar/>. The Solar Terrestrial Activity Report is generally updated once a day. The report contains a graphical view of the last three months of solar-flux values, sunspot count, and planetary *A*-index. In addition, there is information on recent solar events, as well as a forecast for the next few days. Charts of all sunspot cycles from Cycle 1 are available, as are comparisons of the most recent cycle with previous cycles.

IPS Radio and Space Services from Australia: The Australian Space Weather Agency's <http://www.ips.gov.au/>. Following the "Space Weather," "Geophysical," "Solar," or "HF Systems" links brings you to a wealth of live data resources.

You can dial each URL directly, or you can find many more links at my page <http://prop.hfradio.org/>. If you do not have access to the World Wide Web (try a local library or school), solar flux, geomagnetic indices, and ionospheric reports can be obtained by calling 303-497-3235, where a recorded announcement is updated every three hours. Both the Space Environmental Center and the U.S. Air Force Space Weather Program staff encourage radio amateurs to either call the recorded line, or to use WWV (Fort Collins, Colorado) at 18 minutes past each hour. WWV transmits the solar and geomagnetic information, storm updates, and other items of concern to radio users. The frequencies are 2.5, 5, 10, 15, and 20 MHz. Sister station WWVH is located in Kauai, Hawaii and carries the same information at the same times, on the same frequencies.

October VHF Report

Conditions on 6 meters during October should start to become exciting, with possible *F2* openings in a north-south direction (U.S. into the Caribbean or Central America, and western Europe into parts of Africa). There will be moderate levels of trans-equatorial propagation (TE) in which stations in the

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. An ** indicates best time to check for 6 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 *standard* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 8 hours in PST Zone, 7 hours in MST Zone, 6 hours in CST Zone, and 5 hours in EST Zone. For example, 13 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 04 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.

October 15 - December 15, 2002
Time Zone: EST (24-Hour Time)
EASTERN USA To:

Reception Area	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Central Europe & North Africa	08-09 (1) 09-11 (2) 11-13 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-11 (4) 11-12 (3) 12-13 (2) 13-15 (1)	04-05 (1) 05-06 (2) 06-07 (3) 07-09 (4) 09-10 (3) 10-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-18 (2) 18-21 (1)	16-17 (1) 17-18 (2) 18-20 (3) 20-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 19-21 (1)* 21-23 (2)* 23-01 (3)* 01-02 (2)* 02-03 (1)*
Northern Europe & European CIS	08-11 (1)	07-08 (1) 08-10 (3) 10-11 (2) 11-12 (1)	04-06 (1) 06-07 (2) 07-09 (3) 09-11 (2) 11-13 (3) 13-14 (2) 14-16 (1)	17-19 (1) 19-02 (2) 02-04 (1) 20-03 (1)*
Eastern Mediterranean & Middle East	08-09 (1) 09-10 (2) 10-12 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-12 (2) 12-13 (1)	06-10 (1) 10-13 (2) 13-14 (3) 14-16 (4) 16-17 (3) 17-20 (2) 20-23 (1) 23-01 (2) 01-02 (1)	18-20 (1) 20-22 (2) 22-00 (3) 00-01 (2) 01-02 (1) 20-00 (1)*
Western & Central Africa	08-10 (1) 10-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	07-10 (1) 10-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	04-05 (1) 05-07 (2) 07-13 (1) 13-15 (2) 15-16 (3) 16-17 (4) 17-20 (3) 20-22 (2) 22-01 (1)	18-22 (1) 22-01 (2) 01-03 (1) 00-03 (1)*

Eastern Africa	09-11 (1) 11-13 (2) 13-15 (1)	07-11 (1) 11-13 (2) 13-16 (3) 16-17 (2) 17-18 (1)	07-14 (1) 14-16 (2) 16-20 (3) 20-00 (2) 00-01 (1)	19-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Southern Africa	08-09 (1) 09-10 (2) 10-12 (3) 12-13 (2) 13-14 (1)	07-10 (1) 10-12 (2) 12-15 (3) 15-16 (2) 16-18 (1)	07-13 (1) 13-15 (2) 15-17 (3) 17-19 (2) 19-22 (1) 22-01 (2) 01-02 (1)	18-19 (1) 19-22 (2) 22-23 (1) 19-21 (1)*
Central & South Asia	08-10 (1) 17-19 (1)	07-10 (1) 17-20 (1)	06-07 (1) 07-09 (2) 09-12 (1) 19-22 (1)	18-21 (1) 06-08 (1)
Southeast Asia	09-12 (1) 17-20 (1)	08-12 (1) 18-20 (1)	06-07 (1) 07-09 (2) 09-13 (1) 18-22 (1)	18-20 (1) 05-07 (1)
Far East	08-10 (1) 17-20 (1)	08-10 (1) 16-17 (1) 17-19 (2) 19-20 (1)	02-04 (1) 06-07 (1) 07-09 (2) 09-12 (1) 16-19 (1) 19-22 (2) 22-00 (1)	04-08 (1) 05-07 (1)*
South Pacific & New Zealand	09-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-10 (2) 10-14 (1) 14-15 (2) 15-17 (3) 17-19 (2) 19-20 (1)	04-06 (1) 06-07 (2) 07-09 (4) 09-11 (2) 11-17 (1) 17-18 (2) 18-21 (3) 21-02 (2) 02-04 (3)	00-03 (1) 03-05 (3) 05-07 (2) 07-09 (1) 03-04 (1)* 04-06 (2)* 06-07 (1)*
Australasia	09-12 (1) 14-16 (1) 16-17 (2) 17-18 (1)	08-10 (1) 10-13 (2) 13-15 (1) 15-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	05-06 (1) 06-07 (2) 07-09 (3) 09-10 (2) 10-15 (1) 15-17 (2) 17-19 (1) 19-20 (2) 20-22 (3) 22-00 (2) 00-03 (1)	03-05 (1) 05-07 (2) 07-08 (1) 05-07 (1)*
Caribbean, Central America & Northern Countries of South America	07-09 (1) 09-11 (2) 11-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (1) 07-09 (2) 09-14 (3) 14-16 (4) 16-18 (3) 18-19 (2) 19-20 (1)	07-09 (4) 09-11 (3) 11-14 (2) 14-16 (3) 16-19 (4) 19-22 (3) 22-02 (2) 02-06 (1) 06-07 (2)	18-19 (1) 19-21 (3) 21-03 (4) 03-05 (2) 05-06 (1) 19-21 (1)* 21-03 (2)* 03-05 (2)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	08-09 (1) 09-13 (2) 13-15 (3) 15-16 (4) 16-17 (2) 17-18 (1)	07-08 (1) 08-10 (3) 10-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 18-20 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-20 (4) 20-22 (3) 22-02 (2) 02-06 (1) 06-09 (2) 09-11 (1)	20-23 (1) 23-04 (2) 04-06 (1) 23-04 (1)*
McMurdo Sound, Antarctica	14-17 (1)	06-09 (1) 15-17 (1) 17-19 (2) 19-20 (1)	16-18 (1) 18-20 (2) 20-22 (3) 22-02 (2) 02-06 (1) 06-08 (2) 08-09 (1)	00-06 (1)

Time Zones: CST & MST (24-Hour Time) CENTRAL USA To:

Reception Area	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Southern Europe & North Africa	08-09 (1) 09-11 (2) 11-12 (1)	06-07 (1) 07-10 (2) 10-11 (3) 11-12 (2) 12-14 (1)	05-06 (1) 06-08 (3) 08-12 (2) 12-15 (3) 15-19 (2) 19-21 (1) 00-02 (1)	17-18 (1) 18-20 (2) 20-22 (3) 22-00 (2) 00-02 (1) 19-20 (1)* 20-22 (2)* 22-00 (1)*
Northern & Central Europe & European CIS	08-10 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-10 (2) 10-13 (1)	06-07 (1) 07-09 (2) 09-11 (3) 11-13 (2) 13-16 (1) 01-03 (1)	18-20 (1) 20-23 (2) 23-01 (1) 20-23 (1)*
Eastern Mediterranean & Middle East	08-10 (1)	07-09 (1) 09-11 (2) 11-12 (1)	06-08 (1) 08-11 (2) 11-13 (3) 13-15 (2) 15-17 (1) 17-19 (2) 19-22 (1) 01-03 (1)	17-19 (1) 19-22 (2) 22-23 (1) 20-22 (1)*
Western & Central Africa	08-09 (1) 09-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	06-10 (1) 10-12 (2) 12-14 (3) 14-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-20 (3) 20-22 (2) 22-02 (1)	17-19 (1) 19-21 (2) 21-22 (1) 19-21 (1)*
Eastern Africa	09-10 (1) 10-12 (2) 12-14 (1)	08-10 (1) 10-13 (2) 13-15 (3) 15-16 (2) 16-18 (1)	06-14 (1) 14-17 (2) 17-20 (3) 20-21 (2) 21-22 (1)	20-00 (1) 21-23 (1)*
Southern Africa	08-09 (1) 09-10 (2) 10-12 (3) 12-13 (2) 13-14 (1)	07-10 (1) 10-12 (2) 12-15 (3) 15-16 (2) 16-17 (1)	07-13 (1) 13-15 (2) 15-17 (3) 17-20 (2) 20-22 (1) 22-00 (2) 00-02 (1)	18-19 (1) 19-21 (2) 21-22 (1) 19-21 (1)*
Central & South Asia	07-10 (1) 19-21 (1)	07-10 (1) 17-18 (1) 18-21 (2) 21-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-18 (1) 18-21 (2) 21-23 (1)	06-08 (1) 18-20 (1)
Southeast Asia	09-12 (1) 16-18 (1)	09-12 (1) 14-16 (1) 16-18 (2) 18-20 (1)	06-08 (1) 08-11 (2) 11-14 (1) 18-19 (1) 19-21 (2) 21-22 (1)	04-07 (1)
Far East	15-16 (1) 16-18 (2) 18-19 (1)	08-10 (1) 15-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-12 (1) 16-18 (1) 18-20 (2) 20-22 (1)	02-03 (1) 03-06 (2) 06-09 (1) 02-04 (1)*
South Pacific & New Zealand	11-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	08-09 (1) 09-11 (2) 11-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-17 (1) 17-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-00 (2) 00-02 (1)	23-01 (1) 01-06 (3) 06-07 (2) 07-08 (1) 00-02 (1)* 02-06 (2)* 06-07 (1)*
Australasia	09-12 (1) 14-15 (1) 15-17 (2) 17-18 (1)	08-09 (1) 09-11 (2) 11-15 (1) 15-16 (2) 16-18 (3) 18-19 (2) 19-20 (1)	17-19 (1) 19-21 (2) 21-23 (3) 23-02 (2) 02-04 (3) 04-05 (2) 05-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-14 (1)	02-04 (1) 04-07 (2) 07-08 (1) 03-04 (1)* 04-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	07-09 (1) 09-11 (2) 11-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (1) 07-08 (2) 08-14 (3) 14-16 (4) 16-18 (3) 18-19 (2) 19-20 (1)	06-07 (2) 07-09 (4) 09-11 (3) 11-13 (2) 13-15 (3) 15-19 (4) 19-22 (3) 22-01 (2) 01-06 (1)	18-19 (1) 19-21 (2) 21-02 (3) 02-04 (1) 04-05 (2) 05-06 (1) 19-21 (1)* 21-02 (2)* 02-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	08-09 (1) 09-12 (2) 12-14 (3) 14-16 (4) 16-17 (2) 17-18 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	02-06 (1) 06-08 (2) 08-14 (1) 14-16 (2) 16-17 (3) 17-20 (4) 20-22 (3) 22-02 (2)	19-21 (1) 21-01 (2) 01-03 (1) 03-04 (2) 04-05 (1) 21-04 (1)*
McMurdo Sound	14-17 (1)	07-10 (1) 15-17 (1) 17-19 (2) 19-20 (1)	16-18 (1) 18-20 (2) 20-00 (3) 00-02 (2) 02-06 (1) 06-08 (2) 08-10 (1)	23-05 (1)

Time Zone: PST
(24-Hour Time)
WESTERN USA To:

Reception Area	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Southern Europe & North Africa	07-08 (1) 08-10 (2) 10-11 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-12 (2) 12-13 (1)	05-06 (1) 06-08 (2) 08-10 (1) 10-12 (2) 12-14 (3) 14-16 (2) 16-20 (1) 00-02 (1)	18-20 (1) 20-22 (2) 22-00 (1) 19-23 (1)*
Central & Northern Europe & European CIS	07-09 (1)	07-08 (1) 08-09 (2) 09-11 (1)	06-07 (1) 07-11 (2) 11-16 (1) 23-02 (1)	21-00 (1)
Eastern Mediter-ranean & Middle East	07-10 (1)	07-08 (1) 08-10 (2) 10-11 (1)	06-07 (1) 07-10 (2) 10-14 (1) 14-16 (2) 16-18 (1) 21-23 (1)	18-22 (1) 06-08 (1)
Western & Central Africa	08-09 (1) 09-12 (2) 12-14 (1)	06-10 (1) 10-12 (2) 12-15 (3) 15-17 (2) 17-18 (1)	06-10 (1) 10-14 (2) 14-16 (3) 16-18 (4) 18-19 (3) 19-21 (2) 21-23 (1)	18-23 (1)
Eastern Africa	10-13 (1)	08-12 (1) 12-15 (2) 15-17 (1)	08-13 (1) 13-15 (2) 15-17 (3) 17-19 (2) 19-21 (1)	18-21 (1) 06-08 (1)
Southern Africa	08-09 (1) 09-11 (2) 11-12 (1)	06-10 (1) 10-11 (2) 11-12 (3) 12-14 (4) 14-15 (2) 15-16 (1)	06-12 (1) 12-15 (2) 15-18 (3) 18-20 (2) 20-21 (1) 00-02 (1)	18-19 (1) 19-20 (2) 20-21 (1) 06-08 (1) 18-19 (1)*
Central & South Asia	07-09 (1) 17-19 (1)	16-17 (1) 17-19 (2) 19-20 (1) 07-09 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-21 (1)	04-09 (1) 17-19 (1)
Southeast Asia	14-15 (1) 15-17 (2) 17-18 (1)	09-11 (1) 13-15 (1) 15-18 (2) 18-19 (1)	06-07 (1) 07-10 (2) 10-12 (1) 17-19 (1) 19-20 (2) 20-22 (1)	02-03 (1) 03-05 (2) 05-08 (1) 03-05 (1)*
Far East	14-15 (1) 15-17 (2) 17-18 (1)	12-14 (1) 14-15 (3) 15-16 (4) 16-17 (3) 17-18 (2) 18-20 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-12 (2) 12-16 (1) 16-18 (2) 18-20 (3) 20-21 (2) 21-23 (1)	23-02 (1) 02-05 (2) 05-08 (1) 01-03 (1)*
South Pacific & New Zealand	08-10 (1) 10-12 (2) 12-13 (3) 13-16 (2) 16-17 (2) 17-18 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-16 (2) 16-18 (4) 18-19 (2) 19-20 (1)	05-07 (1) 07-09 (4) 09-11 (2) 11-16 (1) 16-17 (2) 17-18 (3) 18-20 (4) 01-05 (3) 20-22 (3) 22-00 (2) 00-03 (1) 03-05 (2)	21-22 (1) 22-05 (3) 05-07 (2) 07-08 (1) 22-00 (1)* 00-05 (2)* 05-06 (1)*
Austral-Asia	08-10 (1) 12-13 (1) 13-14 (2) 14-15 (3) 15-16 (4) 16-17 (2) 17-18 (1)	08-09 (1) 09-10 (2) 10-12 (3) 12-14 (2) 14-16 (3) 16-18 (4) 18-19 (2) 19-21 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-02 (2) 02-04 (3) 04-06 (2) 06-07 (3) 07-09 (4) 09-10 (3) 10-12 (2) 12-14 (1)	02-03 (1) 03-04 (2) 04-06 (3) 06-08 (1) 03-04 (1)* 04-06 (2)* 06-07 (1)*
Caribbean, Central, America & Northern Countries	07-08 (1) 08-09 (2) 09-10 (4) 10-12 (3) 12-14 (4)	06-07 (1) 07-08 (2) 08-10 (3) 10-13 (2) 13-14 (3)	07-09 (4) 09-13 (2) 13-15 (3) 15-18 (4) 18-20 (3)	18-19 (1) 19-01 (3) 01-04 (2) 04-05 (1) 19-22 (1)*
of South America	14-15 (2) 15-16 (1)	14-16 (4) 16-17 (2) 17-18 (1)	20-00 (2) 00-05 (1) 05-06 (2) 06-07 (3)	22-01 (2)* 01-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	07-08 (1) 08-11 (2) 11-13 (3) 13-15 (4) 15-16 (2) 16-17 (1)	06-07 (1) 07-09 (2) 09-13 (1) 13-14 (2) 14-15 (3) 15-16 (4) 16-17 (2) 17-18 (1)	07-09 (1) 12-14 (1) 14-16 (2) 16-17 (3) 17-19 (4) 19-23 (3) 23-02 (2) 02-04 (1) 04-07 (2)	20-22 (1) 22-00 (2) 00-02 (1) 22-00 (1)*
McMurdo Sound, Antarctica	12-16 (1)	07-14 (1) 14-18 (2) 18-20 (1)	16-18 (1) 18-20 (2) 20-00 (3) 00-02 (2) 02-06 (1) 06-08 (2) 08-10 (1)	00-05 (1)

**Indicates best times to listen for 80 meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2) or higher.*
For 12 meter openings interpolate between 10 and 15 meter openings.
For 17 meter openings interpolate between 15 and 20 meter openings.
For 30 meter openings interpolate between 40 and 20 meter openings.

Propagation charts prepared by George Jacobs, W3ASK.

southern states and parts of the Caribbean will be able to work into the northern areas of South America during the late afternoon. During peak years of a solar cycle October is one of the best months for TE activity, especially later in the month.

Sporadic-*E* activity is sparse during October in the northern temperate zone (where much of the U.S. is located). If a sporadic-*E* open should occur and link with a TE or *F2* opening toward the south, expect a possible opening into Argentina, or perhaps even into Australia and the South Pacific.

While the contest weekend looks like a quiet period, there will be those days of high solar activity and possible radio storms. It is possible to have a few aurora events during October. Remember that CW is the best way to go with aurora, particularly on 2 meters and 432 MHz, as the voice modes become extremely distorted and unrecognizable due to the effects of the aurora. The best times to check for VHF aurora openings are when conditions are expected to be Below Normal or Disturbed, as shown in the Last-Minute Forecast at the beginning of this column.

There is some possibility of extended tropospheric conditions during October because of the changing weather patterns. Two meters is the best band to watch for this.

A possible meteor shower, the *Draconids,* is expected on October 6 to 10, peaking on October 8 or 9. The *Draconids* is primarily a periodic shower that produced spectacular, brief meteor storms twice in the last century—in 1933 and 1946. In 1999 a wholly unexpected minor outburst was witnessed in the Far East. This could imply a peak might be seen as late as October 9, 0315 to 0630 UTC. Radio observers had picked up the minor 1999 event. The possible shower maximum times favor Asia east to western North America at about 1350 UTC, and Europe and North Africa east to most of Asia by 2130 UTC, and North America east to the Near East during the October 9 times stated above.

Draconids meteors are exceptionally slow moving, a characteristic which helps separate genuine shower meteors. This shower could produce meteor-reflection-type ionospheric openings on the VHF and UHF bands. During other showers I've worked stations off of the ionized tails (left by the meteors) with just a vertical mobile antenna and 100 watts. It was one of the most exciting experiences I've ever had. Check out <http://www.imo.net/calendar/ cal 02.html> for a complete calendar of meteor showers in 2002.

CW Contest Forecast

This month's DX Propagation Charts are valid for both the SSB and CW sections of the 2002 CQ WW Contest. Be sure to keep them handy for next month's CW weekend. Short-Skip Propagation charts for use during October appeared last month.

Summary

The *NEW Shortwave Propagation Handbook* makes an excellent companion during the CQ WW DX Contest. It contains a considerable amount of information concerning propagation, radio storms, do-it-yourself forecasting, and more. Copies can be obtained from *CQ* by calling 1-800-853-9797 ($19.95 plus $4.00 s/h).

Experience from the past contest years has shown that DX contests are excellent periods in which to test the accuracy of prediction and forecast methods used in this column. Comments concerning the 2002 contest and the accuracy of these forecasts and predictions would be greatly appreciated and should be sent to NW7US at P.O. Box 213, Brinnon, Washington 98320-0213, or via e-mail to <cq-propman@hfradio.org>.

Starting next month I will begin reviewing propagation software. I have been trying out a number of the available offerings, and will delve into these with at least one review per month.

I hope to hear your station on the air, especially during the contest weekends. Good luck in the 2002 CQ WW DX SSB Contest! 73, Tomas, NW7US

time you read this. According to the *ARRL Letter,* the tape-measure-type antennas will support VHF and UHF operations for ARISS, Amateur Radio on the International Space Station. They were scheduled to be installed during a space-walk in mid-August.

FCC Tells Utility: Fix it and Foot the Bill

Reliant Energy of Houston, Texas has been told by the FCC that the responsibility for resolving power-line interference to amateurs lies with the utility, which must also bear the cost of making the repairs. Reliant apparently proposed making the ham suffering the interference pay the cost of relocating the offending transformer, and the FCC said no, in no uncertain terms. It also criticized the utility's methods of trying to track down the source of the interference as well as its attorney's claim that amateur radio is a licensed "use" of the spectrum but not a "service."

Reliant's response was unacceptable, according to the FCC, which added that "Reliant must do all things necessary, and bear any and all necessary costs, to comply with its obligations as an operator of unlicensed devices (under) Part 15 regulations." The company was given 30 days to report back on the steps taken to eliminate the interference.

ARRL's "Face" in Congress is Silent Key

Steve Mansfield, N1MZA, the ARRL's Legislative and Public Affairs Manager, became a Silent Key on July 29 after a two-year battle with cancer. He was 55 and had worked for the League for 11 years. Mansfield initially joined the ARRL staff as Public Relations Manager, but his portfolio quickly grew to include representing the League and its members on Capitol Hill. He typically would spend three days a week in Washington and two in Newington. A memorial service was held on August 3 in Connecticut.

Callbook Calls it Quits

The *Radio Amateur Callbook,* an institution in amateur radio since 1920, is calling it quits. Publisher Bob Hughes said the easy availability of FCC database information on the internet made it unprofitable to continue publishing the annual directory. The *Callbook* was published in book form until 1997, when it switched over to CD-ROM. The Winter 2003 edition of the *Callbook* CD, due out in November, will be the last.

Videoconferenced Exam Experiment Okayed

With the FCC's blessing, the National Conference of Volunteer Examiner Coordinators (NCVEC) has approved a one-year experiment by the Anchorage VEC in administering amateur license exams remotely, via videoconferencing. According to the *ARRL Letter,* the three-ham team of Volunteer Examiners would be able to be "present and observing" the examinees via a videoconference link. The Anchorage VEC cited the expense of traveling to remote locations to administer exams in its request. The FCC's Bill Cross, W3TN, said the rules don't specify how exams should be administered and that determining standards for conduct of exams is up to the VECs.

Also at the NCVEC annual meeting in late July, the council voted 9-2 *not* to bring back multiple-choice Morse code exams, and agreed unanimously to develop a website where question pools, news, and other exam-related information would be posted.

FCC May Relicense Herb Schoenbohm

The FCC's Enforcement Bureau says Herb Schoenbohm, formerly KV4FZ, has rehabilitated himself, and recommended that the Wireless Telecommunications Bureau grant his pending application for a new license. The FCC had refused to renew Schoenbohm's license in 1998 based on a 1992 federal fraud conviction, according to the *ARRL Letter.* Schoenbohm appealed the ruling to the US Supreme Court, which declined to hear the case.

Now the Enforcement Bureau says it's willing to give him another chance, noting that the offense for which he was convicted occurred in 1987 and that he has not had any further legal problems. The recommendation comes in a brief filed with the Administrative Law Judge hearing the case. The judge has not yet issued an opinion, and the FCC itself has the final say in the matter.

Hum and Whine Draw FCC Notice

Here's one you don't see too often these days: A ham in California has been cited by the FCC for not taking steps to rectify alternator whine in his mobile station and power-supply hum at his home station. The letter from FCC amateur enforcement chief Riley Hollingsworth says the ham has been notified of the problems several times and has not done anything about them.

"(A)s an Advanced Class licensee, you should have sufficient knowledge to correct this relatively simple problem and should also be familiar with the Amateur rules as set forth in Part 97," writes Hollingsworth, adding, "Please contact a local Amateur Radio club, however, if you are uncertain how to proceed." Failure to respond or to take corrective action, Hollingsworth noted, would result in enforcement action against him.

the vest) and be strong enough to hold a handie-talkie or extra battery packs.

The back would have "THE [ARRL]" (logo patch) on the neck between the shoulders. The main part of the back panel would have in large block letters:

AMATEUR
-HAM-
RADIO OPERATOR

The reason both "Amateur" and "Ham" would be on the vest is for the public. We are officially "Amateur Radio Operators" by FCC rules, but most people and operators refer to us as "hams."

The vests should be over-size, since they would be worn outside regular clothing. The color *must be uniform*. That is one of our biggest problems. Each amateur radio society or repeater group has its own color. When several groups work the same event, we have color chaos. No wonder the event spectators are confused. The people sponsoring the event or function do not know who is working with them. At one local function we use red baseball hats with "Ham Radio" on them, but everybody watching the event seems to wear a baseball cap or golf visor.

Some groups have vests, shirts, or jackets of a uniform color for *that* group, but not uniform with other ham groups. This same vest could be used for ARES, etc. The color is important; we want to stand out, let people know we are there. We can put our local society or repeater group logos over the pen pocket on the left side and if an ARES or other emergency groups, that logo on the right side. Our local emergency civil preparedness group has a patch/ID to permit crossing police lines or to enter restricted areas. The single-color vest would also help when hams go to non-local emergencies. Everyone would know: who we are, we are there, what we do, and how we can assist them. Also, it would be very helpful to be able to say, "Look for the person in a yellow vest."

Why yellow vests? We do not want orange, which could be confused with Department of Transportation workers or hunters. Red is seen everywhere, from fire departments on. Green is a St. Patrick's day color, and blue, black, khaki, and olive drab are military colors. Yellow is a bright color and is the psychological color to foster talking. Place a group of people together who do not know one another in a yellow room, and they will start to talk. *Our theme is communications.*

Next is where perhaps the ARRL or CQ Communications leadership comes in. The ARRL, let's say, can get a consensus, be the leader, and locate a source to make them. The League can negotiate a special price, and they could provide a discount on the vest and the ARRL logo free. If a ham is not a member of the League, he or she can remove the logo, leave it on to promote the ARRL, or join.

My local VHF/UHF repeater group, The Jacksonville Range Association, has endorsed this idea. They also asked me to talk up the idea with other area groups for a unified vest color. This will give us visible recognition and promote the Amateur Radio Service to the general public.

Ron Cyre, KE4QWP
Jacksonville, FL

In Praise of Practical Reviews

Editor, *CQ:*

For years I have viewed technical specifications and lab reports with multiple grains of salt. If nothing else, different test equipment and bench setups can make comparisons meaningless.

Second, on-air results don't necessarily track with what specs and lab measurements might suggest. Consider the original ICOM 756PRO: The woods were full of self-proclaimed experts—who had never even seen the radio—trashing it based on their interpretation of specs, schematics, and their knowledge of traditional receiver theory. All the while, PRO owners, myself included, were finding it a truly outstanding piece with a few—but very few—warts. In A/B comparisons my PRO could hear a few stations that my FT-1000D (an acknowledged standard for comparison) couldn't, and the reverse was never true.

That's a long preamble to thanking you and Rick Littlefield, K1BQT, for a refreshing, interesting, and useful review of the PRO II in your July issue. It was so nice to hear what it's really like to *use* the radio unclouded by technical gibberish. I now know more about the PRO II—in terms of what's important to me—than I knew after reading several lengthy technical reviews.

Ed Juge, W5EJ
Ruidoso, New Mexico

SSTV Via I-Link

Editor, *CQ:*

I'm from Monterrey, N.L. Mexico, and I just want to say that we can send SSTV via "iLink" software *(see "I-LINK, A Marriage between Radio and the Internet," by Jim Millner, WB2REM, March* CQ, *p. 30—ed.)*. Sounds strange, but it's true. I use MMSSTV software and an Audio Edit program like Cool Edit, Gold Wave, Voxrecorder, etc., to record the sounds that produce the MMSSTV software when it's transmitting the information (like our QSL card). Then I save the audio in ".Wav" archive and Play it in "Winamp software."

Winamp seems to be the only software that works with iLink, because other SSTV programs can't share the sound card with iLink. This happens because the sound card is busy when we are using the iLink software and we can't use MMSTV or ChromaPix to send QSL cards or other information.

If I am connected to another ham in iLink and I want to send him my QSL card on SSTV, I open Winamp and play the archive that I recorded to MMSSTV. It is very easy and it works.

Jimmy Herrera, XE2MZS
Monterrey, N.L. Mexico

Ham Shop

Advertising Rates: Non-commercial ads are 20 cents per word including abbreviations and addresses. Commercial and organization ads are $1.00 per word. Boldface words are $1.50 each (specify which words). Minimum charge $2.00. No ad will be printed unless accompanied by full remittance. All ads must be typewritten double-spaced.
Closing Date: The 10th day in the third month preceding date of publication (example: Jan. 10th for the March issue). Because the advertisers and equipment contained in Ham Shop have not been investigated, the Publisher of *CQ* cannot vouch for the merchandise listed therein. The publisher reserves the right to reject any advertisement. Direct all correspondence and ad copy to: CQ Ham Shop, 25 Newbridge Road, Hicksville, NY 11801 (fax: 516-681-2926; e-mail: <hamshop @cq-amateur-radio.com>.

CB-TO-10M CONVERSIONS: Frequency modifications, FM, books, plans, kits, high-performance CB accessories. Catalog $3. CBCI, Box 30655CQ, Tucson, AZ 85751. <www.cbcintl.com>

FOREIGN AIRMAIL POSTAGE for successful QSLing! Plus **EUROPEAN NESTING AIRMAIL ENVELOPES, EYEBALL CARDS, QSL ALBUMS.** Bill Plum, 12 Glenn Road, Flemington, NJ 08822-3322 (e-mail: <plumdx@msn.com>).

QSLs FOR DX STATIONS: Our new "International Division" was established to handle QSL needs of DX hams. We understand the problems of packaging, shipping, and dealing with the customs problems. You can trust us to deliver a quality QSL, usually much cheaper than you can find locally. Write, call, or FAX for free samples and ordering information. "The QSL Man—W4MPY," 682 Mount Pleasant Road, Monetta, SC 29105 USA. Phone or FAX 803-685-7117.

"QRZ DX"—since 1979: Available as an **Adobe PDF file** each Wednesday or by regular mail. Your best source for weekly DX information. Send #10 SASE for sample/rates. **"The DX Magazine"—since 1989:** Bimonthly – Full of DXpedition reports, QSL Information, Awards, DX news, technical articles, and more. Send $3.00 for sample/rates. DX Publishing, Inc., P.O. Box DX, Leicester, NC 28748-0249. Phone/Fax: 828-683-0709; e-mail: <DX@dxpub.com>; WEB PAGE: <http://www.dxpub.com>.

CERTIFICATE for proven contacts with all ten American districts. SASE to W6DDB, 45527 Third Street East, Lancaster, CA 93535-1802.

TRYLON SELF-SUPPORTING TOWERS: Delivered **ANYWHERE** in the US for **ONLY** $261.00. This is the **BEST** tower value around – 96 feet for only $2451.00 **DELIVERED TO YOUR QTH!** Go to <www.championradio.com> or call 888-833-3104 for more information.

MAUI, HAWAII: vacation with a ham. Since 1990. <www.seaqmaui.com>, telephone 808-572-7914, or <terry@flex.com>.

ALUMINUM CHASSIS-CABINET KITS, UHF and VHF Antenna Parts. K3IWK, 5120 Harmony Grove Rd, Dover, PA 17315-3016; <www.flash.net/~k3iwk>.

HALLICRAFTERS Service Manuals. Amateur and SWL Write for prices. Specify Model Numbers desired. Ardco Electronics, P.O. Box 95, Dept. C, Berwyn, IL 60402.

KNOW FIRST! Ham radio fanatics—you need THE W5YI REPORT, a twice-monthly award-winning Hot Insider Newsletter Acclaimed best! Confidential facts, ideas, insights, nationwide news, technology, predictions, alerts. Quoted coast-to-coast! We print what you don't get elsewhere! $19.50 annually to new subscribers! Money-back guarantee! FREE sample for SASE (two stamps). W5YI, P.O. Box 565101, Dallas, Texas 75356.

REAL HAMS DO CODE: Move up to CW with **CW Mental Block Buster III.** Succeed with hypnosis and NLP. Includes two (2) Tapes and Manual. Only $27.95 plus $5.00 s/h US. FL add $2.02 tax. Success Easy, 123 NW 13th Street, Ste 304-2, Boca Raton, FL 33432, 800-425-2552, <www.success-is-easy.com>.

Sound Card to Transceiver Interface for PSK31, SSTV, MFSK, MMTTY, and more! *No other manufacturer offers you this VALUE and Quality in a sound-card to transceiver interface! All Cables, Connectors, Components, Case, Custom-designed Printed Circuit board, PSK31 software, pictorial diagrams, large schematic, software disk, and setup instructions ARE INCLUDED with every* ***RASCAL®™ (Radio And Sound Card Adapter Link®™)*** *interface, Wired and Tested, or Kit.* There are no jumpers to joggle, no wall-wart or external power supplies required. This makes the ***RASCAL®™*** ideal for portable and field-day operation. The wired and tested ***RASCAL®™*** is ready to "Plug-N-Play" with more than 75 Sound Card software packages to choose from. Freeware, Shareware, and Commercial software (see software links at bottom of page at: <www.PacketRadio.com/psk.htm>) that enables you to enjoy the best of your PC sound card and our hobby. The ***RASCAL®™*** Sound Card Line in and Line out are isolated from the transceiver by special, audio-coupling transformers designed for this application. The LINE IN and LINE OUT (or Mic IN & Spkr OUT) cables are high-quality, shielded cables with high-permeability ferrite chokes molded into the cable. This ferrite choke provides an increased degree of immunity from potential RF feedback. ***RASCAL®™*** activates automatic PTT using an optical coupler, via the PC serial comport. ***RASCAL®™*** **Kit** is $24.95. ***RASCAL®™*** wired & tested is $44.95. ***RASCAL®™*** wired & tested with added FSK option is $54.95. *(Prices do not include s&h.)* SECURE, On-Line ordering, go to: <www.PacketRadio.com/PSK.htm>; or fax 434-525-7818; or U.S. mail: BUX CommCo, 115 Luenburg Drive, Evington, VA 24550. ALL ORDERS are shipped same day, except Sundays and holidays.

****

AMATEUR TV — 1250 & 2400 MHZ TX-RX MODULES: Compact, ATV 8 channel programmable, FM, PLL, Stereo and NTSC/PAL compatible. Great receiver sensitivity with 1 mile range w/rubber duck! 12 v/130 mA. Gain antennas extend range to over 30 miles. Fully assembled, tested, and complete with 1/4 wave antennas. **(1)** ATV-2400 (transmitter and receiver), **$159**; **(2)** ATV-1200, **$159**; **(3)** 3.0 GHz Wireless Freq Counter, **$129**; **(4)** 14 dbi Linear Patch 13" × 13" × 1" patch w/30 degree beam angle, **$179**; **(5)** SMA Low Loss Male-Male cables, **$10** & up. Contact our regional Dealers listed on website, or **ORDER DIRECT** ON-LINE at **www.4atv.com**, fax 847-619-0852; EzATv. Also, Seeking other Dealers and Distributors; e-mail us at **sales@4atv.com**

Antenna **MADE** for **AO-40.** <http://www.n3iyr.com/>

IMRA-International Mission Radio Assn. helps missioners—equipment loaned; weekday net, 14.280 MHz, 1:00–3:00 PM Eastern. Sr. Noreen Perelli, KE2LT, 2755 Woodhull Ave., Bronx, NY 10469.

TEST EQUIPMENT MANUALS: Manuals Plus. Visit Us on the Web: <www.manualsplus.com>.

PHASED ARRAY NETWORKS by COMTEK SYSTEMS deliver gain and front to back. Call 704-542-4808; fax 704-542-9652. COMTEK SYSTEMS, P.O. Box 470565, Charlotte, NC 28247.

FREE HAM CLASSIFIEDS <http://hamgallery.com>

FREE Ham Gospel Tracts, SASE. KW3A, 265 West Ave., Springfield, PA 19064.

Advertiser's Index

now including websites

Advanced Specialties, Inc.	103	www.advancedspecialties.net
Alinco	43	www.alinco.com
Aluma Towers	112	www.alumatower.com
Ameritron	59	www.ameritron.com
Antenna World	62	www.antennaworld.com
Antique Electronic Supply	113	www.tubesandmore.com
Antique Radio Classified	98	www.antiqueradio.com
Associated Radio	39	www.associatedradio.com
Astron Corp	65	www.astroncorp.com
Atomic Time, Inc.	12	www.atomictime.com
Batteries America/E.H.Yost	115	www.batteriesamerica.com
B & D Enterprises	113	www.bdenterprises.com
Bencher, Inc.	15	www.bencher.com
Bilal Co./Isotron Ants	112	www.rayfield.net/isotron
Buckmaster	102	
Burghardt Amateur Center	81	www.burghardt-amateur.com
C.A.T.S	112	www.rotordoc.com
Collins Book	102	www.artcollinsradiowiz.com
Command Productions	53	www.LicenseTraining.com
Command Technologies	114	www.command1.com
Communication Concepts Inc	33	www.communication-concepts.com
CQ Calendars	101	www.cq-amateur-radio.com
CQ Merchandise	85	www.cq-amateur-radio.com
Cubex Quad Antennas	114	www.cubex.com
Davis Instruments	16	www.davisnet.com
DX4WIN(Rapidan Data Systems)	56	www.dx4win.com
EQF Software	98	www.eqf-software.com
EZ Hang, Inc.	93	www.ezhang.com
Finger Lakes Radio	56	www.fingerlakesradio.com
Fingertip Tapper	114	www.fingertiptapper.com
Force 12 Antennas	73	www.force12inc.com
Glen Martin Engineering, Inc	57,97	www.glenmartin.com
Ham Radio Outlet	10	www.hamradio.com
Ham Radio CD's	89	www.cq-amateur-radio.com
Ham Station	97	www.hamstation.com
Heil Sound	47	www.heilsound.com
Hy-Gain	1,17	www.hy-gain.com
ICOM America, Inc	Cov.IV,25,27,29	www.icomamerica.com
International Radio	83	www.qth.com/INRAD
K2AW's "Silicon Alley"	112	
K-Y Filter Co.	58	www.ky-filters.com/am.htm
Kanga US	108	www.bright.net/~kanga/kanga/
Kangaroo Tabor Software	81	www.taborsoft.com
Kenwood, USA	Cov. II,3	www.kenwood.net
KK7TV Communications	114	www.kk7tv.com

HF VERTICAL COMPARISON REPORT: K7LXC and NØAX test Cushcraft, Butternut, MFJ, Force 12, Hustler, Gap, and Diamond verticals. 64-page report includes protocol, data sets, and summaries. $17 plus $4 s/h. <www.championradio.com>, 888-833-3104.

RF TRANSISTORS & TUBES: 2SC2879, 2SC2290, MRF454, 2SC1969, 2SB754, 2SA473, SAV7, 3-500ZG, 4CX250B, 3CX3000A7, 4CX1000A, 4CX1500B, 572B, 811A, and more. Catalogue available. WESTGATE LABS, 800-213-4563.

KK7TV COMMUNICATIONS: *See our display ad.*

PACKET RADIO AND MORE! Join TAPR, connect with the largest amateur radio digital group in the U.S. Creators of the TNC-2 standard, working on Spread Spectrum technology. Benefits: newsletter, software, discounts on kits and publications. For membership prices contact TAPR, 8987-309 E. Tanque Verde Road, #337, Tucson, AZ 85749-9399 (phone 940-383-0000; fax 940-566-2544; internet <tapr@tapr.org>; web: <http://www.tapr.org>).

QUAD 5-band, 2-element, 3-inch boom $340.00; 724-530-7396; LightningBoltAntennas.com

Join the LAMBDA AMATEUR RADIO CLUB (LARC), since 1975, the only open and visible public-service-oriented ham club for gay and lesbian hams. Monthly newsletter, HF skeds, internet listserv and IRC, ham-fest meetings, chapters, DXpeditions. Write LARC, P.O. Box 56069, Philadelphia, PA 19130-6069 or e-mail <lambda-arc@geocities.com>; <http://www.geocities.com/WestHollywood/1686>.

FLYING HORSE CDROM $37.50 SHIPPED. Secure order on our website at <www.prolog2k.com> or call toll-free 1-800-373-6564. Even better pricing when you order any ProLog2K product. Datamatrix.

VINTAGE RADIOS: Restoration on boat anchor equipment, silkscreening and repair equipment, see our ad in this issue. Vintage Radios of N.E. Texas, phone 903-785-2077.

DWM COMMUNICATIONS: Neat Stuff! SASE brings catalog! P.O. Box 87-CQ, Hanover, MI 49241.

TNC-to-TRANSCEIVER Interface Cables from BUX CommCo: Radio-to-TNC interface cables. Prices start at $14.95 each. *(Prices do not include s&h.)* For a complete list of in-stock Radio-to-TNC interface cables and order numbers, go to: **<www.PacketRadio.com/radio2TNC.htm>.** SECURE, On-Line ordering; or fax 434-525- 7818; or U.S mail: BUX CommCo, 115 Luenbueg Drive, Evington, VA 24550. ALL ORDERS are shipped same day, except Sundays and holidays.

AWARDS: <www.ko6lu.com>

QRP Now! Today's hottest book on QRP rigs, kits, accessories, contests, DXing tips, and more! Or, **KEYS II** views & info on world's most exotic keys. Either book $16 + $3 Priority Mail. Dave Ingram, K4TWJ, 4941 Scenic View Drive, Birmingham, AL 35210.

KA2RIT Computer Parts Accessories: web <www.globalcomputer2000.com>, phone 973-372-8300, fax 973-372-8818.

W4UFO QTH: Lake Norman (35K acres, 520 miles shoreline) waterfront 35 miles north of Charlotte, NC. 2400 sq.ft., 8 rooms: 3 bedrooms, 2 baths, office/shack, hot tub/wet bar, 60 x 12 deck, 2-car+ finished garage. Beautiful sunsets, heavily wooded, deep-water dock/boat-slip. Custom-built rustic contemporary. Many extras: burglar/fire alarm, automatic lawn sprinkler, storage shed, massive rock fireplaces. Good DX location, CDXA PacketCluster, 100 ft. 25G, antennas: ALL bands 160m–70cm. No antenna restrictions. Adjoining waterfront lot available for additional towers, verticals. Pictures, broker info: Nobby Mills, e-mail: <w4ufo@aol.com>, phone 704-528-5013.

3030 DIFFERENT AWARDS from 123 DXCC countries online at <http://www.dxawards.com/>. One year full access $6.00. Ted Melinosky, K1BV, 65 Glebe Road, Spofford, NH 03462-4411.

COUNTY HUNTERS: Worked All Texas Award. Beautiful certificate. Temple Amateur Radio Club, P.O. Box 616, Temple, TX 76503 <www.tarc.org>.

FOR SALE: CQ/Ham Radio/QST/73 magazines and binders. SASE brings data sheet. W6DDB, 45527 Third Street East, Lancaster, CA 93535-1802.

TRIBANDER COMPARISON REPORT: Find out the real story on tribander performance. K7LXC and NØAX test more than a dozen antennas, including Force 12, Hy-Gain, Mosley, Bencher, and Cushcraft. 84-page report includes protocol, data sets, and summaries. $17 plus $4 s/h. <www.championradio.com> or 888-833-3104.

US TOWER 89 ft. Model HDX589-MDPL. Big, full-size, 40 meter Yagi beam antenna, $7,000. Call 209-836-4963, Tracy, California.

P49V's ARUBA COTTAGE FOR RENT with 2 bedrooms, rig, and antennas. For info write Carl Cook, 2191 Empire Ave., Brentwood, CA 94513.

WANTED: KIM's, SYM's, AIM's, and related 6502 HW (including literature); ROBOT's, UNIMAT's, and Watchmakers/Jewelers Lathes. John Rawley, 1923 Susquehanna Rd., Abington, PA 19001; 215-884-9220; e-mail: <johnr750@aol.com>.

TOWER HARDWARE, SAFETY EQUIPMENT, weatherproofing, T-shirts, and **MORE**. Champion Radio Products, telephone 888-833-3104, or <www.championradio.com>.

WANTED: VACUUM TUBES – Commercial, industrial, amateur. Radio Daze, LLC 7 Assembly Drive, Mendon, New York 14506 (phone 585-624-9755; fax 800-456-6494; e-mail: <info@radiodaze.com>).

AWARDS: <www.ko6lu.com>.

CASH FOR COLLINS, HALLICRAFTERS SX-88, & DRAKE TR-6. Buy any Collins equipment. Leo, KJ6HI, phone/fax 310-670-6969, e-mail: <radioleo@earthlink.net>.

Antenna **MADE** for **AO-40** <http://www.n3iyr.com/>

www.hamwave.com Amateur Radio forums, DX Clusters, auctions, software, search engine, and more. ALL FREE.

HEATH, DRAKE, KENWOOD, YAESU, more. List $1.00, SASE. Joseph Bedlovies, P.O. Box 139, Stratford, CT 06615.

SMART BATTERY CHARGERS Kits & Assemblies, Surplus Parts, and more. <www.a-aengineering.com>

2 & 3 Element HF Beams from $129.95; Rotatable Dipoles from $44.95; 6063 tubing. Skycraft Communications, <www.SkycraftUSA.com>; 678-425-4015, 4–8 PM M–F, 9–5 Saturday.

WANTED: HAM EQUIPMENT AND RELATED ITEMS. Donate your excess gear—new, old, in any condition—to the Radio Club of Junior High School 22, the Nation's only full time non-profit organization working to get Ham Radio into schools around the country as a teaching tool using our EDUCOM—Education Thru Communication—program. Send your radio to school. Your donated material will be picked up ANYWHERE or shipping arranged, and this means a tax deduction to the full extent of the law for you as we are an IRS 501(c)(3) charity in our 18th year of service. It is always easier to donate and usually more financially rewarding, BUT MOST IMPORTANT your gift will mean a whole new world of educational opportunity for children nationwide. Radios you can write off; kids you can't. Make 2001 the year to help a child and yourself. Write, phone, or FAX the WB2JKJ "22 Crew" today: The RC of JHS 22, P.O. Box 1052, New York, NY 10002. Twenty-four hours call 516-674-4072; fax 516-674-9600; or e-mail <crew@wb2jkj. org>. Join us on the WB2JKJ Classroom Net, 7.238 MHz, 1200–1330 UTC daily and 21.395 MHz from 1400 to 2000 UTC.

Advertiser's Index

now including websites

LDG Electronics	71	www.ldgelectronics.com
Lewallen, Roy, W7EL	81	http://eznec.com
M2 Antennas	56	www.m2inc.com
MFJ Enterprises	31,37	www.mfjenterprises.com
Morse Express	62	www.MorseX.com
N3IYR Antennas	113	www.n3iyr.com
National RF, Inc.	50	www.NationalRF.com
Nemal Electronics	89	www.nemal.com
Palomar Engineers	102	www.palomar-engineers.com
Personal Database Applications	108	www.hosenose.com
Peter Dahl Co.	97	www.pwdahl.com
PowerPort	50,112,113	www.powerportstore.com
QSLs by W4MPY	98	www.w4mpy.com
Quick Silver Antenna Products	108	www.mmantenna.com
Radcomm Radio	71	www.rad-comm.com
Radio Amateur Callbook	110	www.callbook.com
Radio Club of JHS 22	30	www.wb2jkj.org
Radio Daze	114	www.radiodaze.com
Radio Depot	50	www.hammall.com
Radio Shack	51	www.RadioShack.com
Radio Works	55	www.radioworks.com
RF Connection	114	www.therfc.com
RF Parts	13	www.rfparts.com
Ross Dist.	93	www.rossdist.com
Rotor EZ-Idiom Press	108	www.idiompress.com
SGC, Inc.	7	www.sgcworld.com
Spectrum International	58	
Ten-Tec	5	www.tentec.com
T.G.M. Communications	98	www3.sympatico.ca/tgmc/index.html
Traffie Technology	35	www.hexbeam.com
Universal Radio, Inc.	53	www.universal-radio.com
Vibroplex	33	www.vibroplex.com
W & W Manufacturing Co.	19	www.ww-manufacturing.com
W4RT Electronics	61	www.W4RT.com
W5YI Marketing	16,55	www.w5yi.org
W9INN Antennas	112	
West Mountain Radio	47	www.westmountainradio.com
Wireman, The	113	www.thewireman.com
XX Towers, Inc.	102	www.K1EA.com
Yaesu Electronics	Covlll,20-21,116	www.vxstd.com

It's easy to advertise in CQ.
Let me know what I can do to help.
Arnie Sposato, N2IQO.
(516) 681-2922 or FAX (516) 681-2926
e-mail:arnie@cq-amateur-radio.com

Leading the Way in FM Mobile Design... From the Engineers at Yaesu!

You'll never think about mobile radios the same way. Instead of a dual-bander, enjoy the versatility and performance of the FT-8900R Quad Bander!

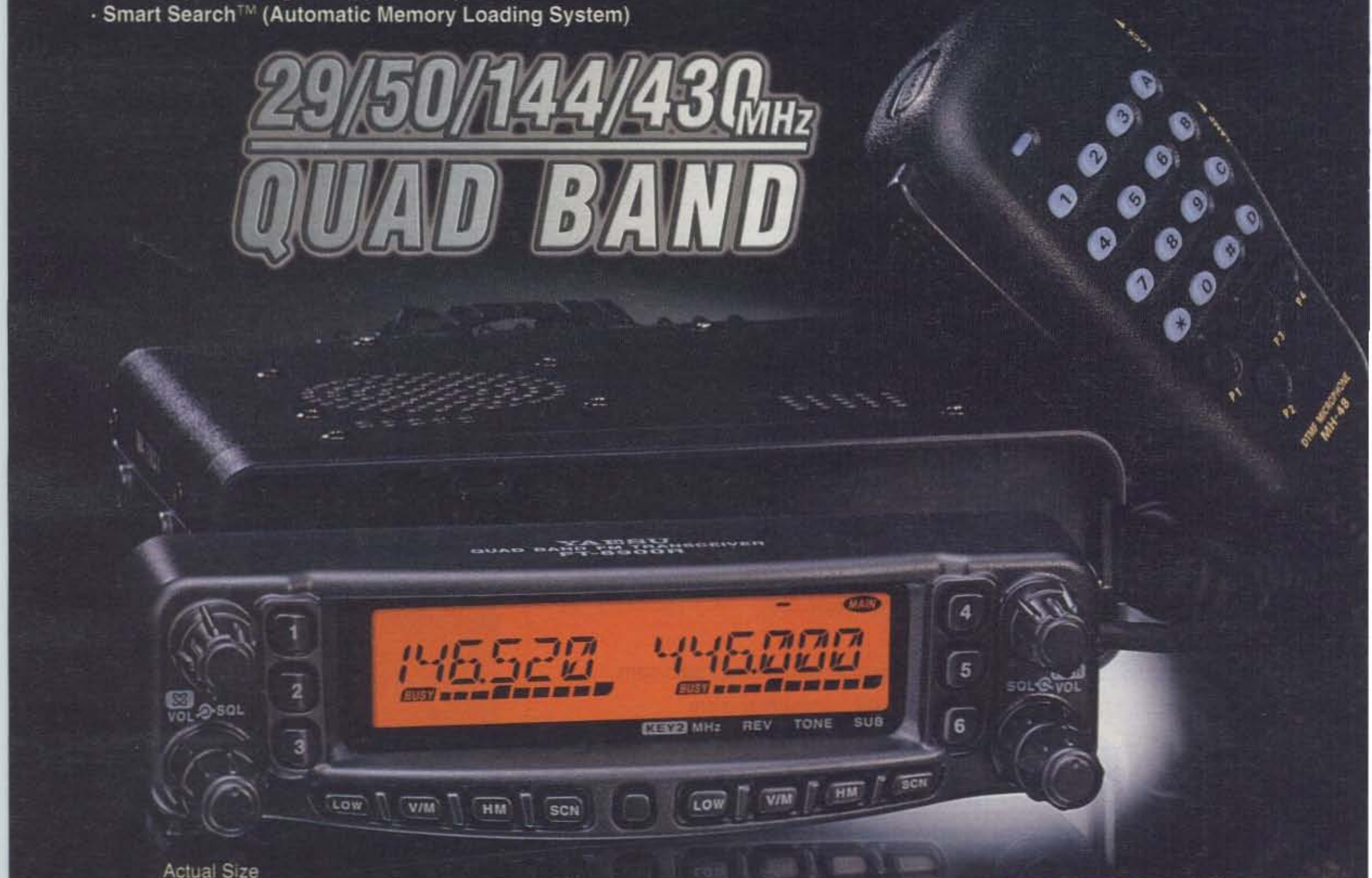
Crafting the "perfect" dual-band FM transceiver is a difficult task, requiring engineering expertise in the latest areas of high-tech design. Adding other bands is an even greater challenge, calling for a delicate touch so as not to upset the original performance of the dual-bander. The FT-8900R is the crowning achievement in our proud FM mobile design history, bringing together the best features of Yaesu electrical, ergonomic, and mechanical design know-how in a compact, versatile Quad Bander with leading-edge features like VHF/UHF full duplex, cross-band repeat, independent operation on two bands, and six "Hyper Memory" keys that store complete transceiver configuration settings. Quite simply, the FT-8900R has no peer among mobile transceivers.

Features

- 29/50/144/430 MHz FM Quad Bander
- V+U/V+V/U+U Dual Band Reception
- V+U Full Duplex Operation
- Cross-Band Repeater Operation
- Independent Dial for Each Band
- Heavy-Duty Construction
- Remote-Head Mounting Capability (requires optional YSK-8900)
- High-Power 50 W (430 MHz: 35 W) and Heavy-Duty PA Design
- User-Programmable Microphone Keys
- Huge Illuminated Display
- 50-Tone CTCSS/104-Code DCS Tone Systems
- ARTS™ (Auto-Range Transponder System)
- Smart Search™ (Automatic Memory Loading System)
- Hyper Memory (stores and recalls six complete sets of transceiver configuration data)
- Huge 800-Channel Memory Capacity
- Versatile Scanning Selections
- RF Squelch
- Internet Key for Instant Access to WIRES™ (Wide-coverage Internet Repeater Enhancement System)
- 1200/9600 bps Packet Operation

FT-8900R

29/50/144/430 MHz Quad Band FM Mobile



Actual Size

*Simulated LCD.

For the latest Yaesu news, visit us on the Internet: http://www.vxstdusa.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.

YAESU
Choice of the World's Top DX'ers

Vertex Standard
US Headquarters
10900 Walker Street
Cypress, CA 90630 (714)827-7600

HF/VHF/UHF Portable Operation Just Got a Lot More Powerful! Meet the YAESU FT-897!

Turn your next weekend getaway into an HF DX-pedition, and leave the power supply at home.

Portable/Base Station

FT-897

All-Mode 1.8-430 MHz Transceiver

Shown with optional FC-30 Automatic Antenna tuner and FP-30 AC Power Supply

- HF/50 MHz 100 W, 144 MHz 50 W, 430 MHz 20 W (External 13.8V DC) 20 W (430 MHz 10W) Self-contained w/optional FNB-78 Battery Pack
- SSB/CW/AM/FM/Digital Modes
- Optional FP-30 Internal Power Supply and FC-30 Antenna Tuner
- Built in DSP

For the latest Yaesu news, visit us on the Internet:
http://www.vxstdusa.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.

YAESU
Choice of the World's top DX'ers™

Vertex Standard
US Headquarters
10900 Walker Street
Cypress, CA 90630 (714)827-7600

New IC-T90A

Get back to basics with the new IC-T90A. This pocket sized tri-bander is loaded with high performance features, yet is small enough to take anywhere. Designed for one-handed operation, all radio functions are easily accessed via the color selectable backlit keypad. Lithium - ion power lets you enjoy a full 5W of power on all bands, for up to 6 hours of operating time! Wide band receive from 495kHz to 999.999MHz*, DTCS/CTCSS with encode/decode for multiple signaling, 500 alphanumeric memories with Dynamic Memory Scan, and much more. Coming soon to your authorized ICOM dealer.

5 Watts on all bands!

Big Performance. Actual Size.

Wide Band Receive 495kHz - 999.999MHz*

AM/FM/WFM. Preprogrammed TV memories. Listen to shortwave, AM & FM broadcast radio stations, police, fire, military, aircraft, and various amateur bands.

Morse Code Synthesizer New feature in ICOM HTs!

Announces the operating frequency in morse code. With adjustable code speed.

Weather Alert Keep track of the weather

Checks for National Weather Service activity during normal operation. When a weather emergency occurs, the T90 automatically switches to the weather channel.

Large Backlit Display

Shows the operating frequency, set mode contents, battery indicator, relative signal strength, etc...

External Jacks

Connect an optional speaker-mic or headset for more privacy

Connect to your PC for programming & cloning

Tuning Dial

Can be customized for channel selection or volume control

6M/2M/70CM

Up/Down Switch

Can be customized for volume control or channel selection

Rugged Construction

Die-cast aluminum case and chassis coupled with JIS-4 weather resistant construction make the T90 great for active outdoor operation

Backlit Keypad

Enter frequencies or memory number and use special function keys to toggle between different modes, memory banks, and more.

IC-T90A. Mini multiband marvel.

6M/2M/70CM • 5W Output Power w/Li-ion Battery • Wide Band Receiver - 495kHz - 999.999MHz* • CTCSS/DTCS Encode/Decode w/Tone Scan • 500 Alphanumeric Memory Channels • Dynamic Memory Scan (DMS) • Weather Alert • Backlit Keypad & Display • JIS-4 Weather Resistant Construction • Split Band Operation • Die-cast Aluminum Case & Chassis • PC Programmable w/Optional Equipment

Selectable Colors for Backlit Keys

Lithium Ion Power

Enjoy a full 5watts of power on all bands and up to 6 hours of operating time!

Small, Take-Anywhere Size

Dimensions: 2.5"W x 3.4" H x 1.15"
Weight: 8.5 oz.

ICOM ADVANTAGE

*Cellular frequencies blocked; unblocked versions available to FCC approved users.

Why not? You deserve it!

www.icomamerica.com

ICOM®