Amateur Radio

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COMMUNICATIONS & TECHNOLOGY

JANUARY 2002

CQ

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

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CQ Amateur Radio

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DEPARTMENTS

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TH-D7A(G) / TM-D700A

Throughout the years, Kenwood has engineered many significant feature and hardware advancements that earned us the nickname "Pacesetter in Amateur Radio". Kenwood continues to show this leadership in advanced design and technology with the TH-D7A(G) handheld and the TM-D700A mobile dual-banders. Not only do our radios perform all the functions of any other radio, but you can also explore the exciting digital world of APRS™, which has become the fastest growing and most dynamic part of the hobby. Most Disaster Communication organizations use APRS™. Identifying someone's location with APRS™ can save a life.

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Ham Radio News

From The CQ Newsroom

FCC Reroutes Gettysburg Mail—Halts Vanity Processing

In an effort to protect the health and safety of staff members at its Gettysburg office, the FCC is no longer accepting any deliveries there. The change has temporarily halted processing of vanity call-sign applications and possibly license renewals. All mail, courier, and hand-delivery items are being rerouted to: Rear Entrance, 35 York St., Gettysburg, PA 17325. Postal mail addressed to 1270 Fairfield Rd. will be accepted but delivered to the new location.

ARRL-VEC Manager Bart Jahnke, W9JJ, says the changes have effectively shut down processing of vanity callsign applications and may affect license renewals as well. According to an ARRL bulletin, Jahnke says vanity applications received through October 14th had been processed, but everything received after that was put on hold while new mail-handling procedures were put into place. At the same time, Jahnke said, electronic applications were put on hold as well, since FCC procedures give equal weight to applications received by mail and via e-mail.

Jahnke also said some license renewals could be caught in the backlog, but points out that amateurs who file their renewal applications before the license's expiration date may continue operating while the renewal is processed. At press time in late November, there was no indication of when license processing would resume.

Russia Bucks Tide on Code

The Russian Federation thinks it's a good idea to retain a code requirement for amateur licenses, and says it plans to do so even if the International Telecommunications Union (ITU) does away with it as an international requirement. According to ARRL Executive Vice President Dave Sumner, K1ZZ, who attended an informal ITU meeting in Geneva in late October, the Russians presented an alternative there to eliminating the current rule requiring code tests for licenses with HF privileges. Sumner said Russia wants to keep the current rule unchanged, but add a provision allowing administrations to waive it if desired. This would make it clear that the decision rested with each individual country.

In addition, "Newsline" reports that a Russian position paper delivered to the ITU says that country feels a code requirement remains important and that Russian amateurs overwhelmingly support keeping it.

Last month we reported that the International Amateur Radio Union called for an end to the international code requirement. For more details on the IARU decision, see this month's "Washington Readout" on page 52.

VHF DX Explosion

VHF was the place to be in November for unparalleled DX opportunities. Even though the sunspot cycle is beginning a slow decline and HF bands have been "just okay" for DXing, 6 meters was open nearly every day from early November into December with both transcontinental and intercontinental DX. Cross-country QSOs in the U.S. were sandwiched in between morning openings from the eastern U.S. to Europe and afternoon openings from the western U.S. to Asia and Oceania, with a few paths to Central and South America thrown in as well.

If that wasn't enough, the *Leonids* meteor shower in mid-November met or exceeded predictions of a meteor storm. In addition to the great visual display, the VHF bands were crowded with stations working meteor scatter on voice as well as code. For details, see this month's "VHF Plus" column on page 88.

DX: Ducie Island Okay for Award Credit

The ARRL has approved Ducie Island in the South Pacific (VP6???) as a new DXCC "entity," after the Pitcairn Island Amateur Radio Association was accepted for membership in the International Amateur Radio Union. According to the *ARRL Letter*, the ARRL will give DXCC credit for contacts with Ducie made on November 16, 2001 or later. The island will also be accepted for the CQ DX Award, according to CQ DX Award Manager Billy Williams, N4UF.

In other DX news, it was expected that 4L4FN's operation from North Korea would receive written approval from the government there, making it acceptable for DXCC credit. A written license will also result in North Korea being added to the CQ DX Award list, and once that happens, Williams says, CQ credit will also be given for the demonstration station that was active in North Korea several years ago.

Digital Radios for Hams

The first commercial ham rigs offering digital voice have arrived on the market. Alinco has introduced a dual-band VHF/UHF handheld that offers digital voice as well as analog FM. You need to have two similarly-equipped units to use the digital voice feature. See "What's New" on page 58 for details.

NY Hams Respond Once Again

Still recovering from a month-long activation in response to terrorist attacks on the World Trade Center, hams in and around New York City were called out once again on November 12, when an airliner crashed soon after takeoff from John F. Kennedy International Airport. Amateurs provided communications support for the Salvation Army and the Red Cross.

The Red Cross is coming under fire from some amateurs for refusing to release the names of hams who volunteered to help after the World Trade Center attack. "We did not let them or New York City down, but they sure let us down," writes ARRL Hudson Division Director Frank Fallon, N2FF, in his e-mail newsletter, the "Hudson Division Beacon." "Our local ARES folks, with the aid of AB2M, Joe Tomasone, provided (the Red Cross) with a great FREE software package used over the internet to process volunteers. The understanding was that (the Red Cross) woul later provide us with a list of operators. When asked for the list, they reneged, claiming 'privacy concerns.'" Fallon said discussions to make the list available are continuing.

NYC School Kids Talk to Space Station

"What did it look like in New York on September 11th?" asked a student from New York City's PS 234 in a recent ham radio contact with the International Space Station. According to a report on "Newsline," Commander Frank Culbertson responded that the station came over New York just a few hours after the attacks. "I could see a large column of smoke coming out of the World Trade Center and floating off to the south and kind of a fog of smoke all over the southern part of the city," he explained. Their school is just two blocks from the World Trade Center and classes have been held in temporary quarters ever since September 11th.

The space station soon should have a new set of amateur antennas, according to the AMSAT News Service. The antennas, due to be launched on an upcoming flight and installed around the perimeter of the Service Module, would permit future operation on HF through microwave frequencies.

Pilot Schools Sought for ARRL Education Project

The ARRL is looking for a few good schools—additional pilot schools to take part in the ARRL Amateur Radio Educa-

tion Project, popularly known as "The Big Project." According to the *ARRL Letter,* two schools—in Texas and Georgia—are already participating, but more are needed, including some that are already using amateur radio in their curricula. Interested schools should download the pilot school application from <http://www.arrl.org/FandES/tbp/pilot-school-ap.html>.

Monetary donations to fund the project are also sought. For more information, contact ARRL Development Officer Mary Hobart at 860-594-0397 or via e-mail to <mhobart@arrl.org>.

OSCAR-40's First Anniversary

Last month we marked the 40th anniversary of the launch of OSCAR-1, and November marked the first anniversary of the launch of OSCAR-40! The satellite, known before launch as Phase 3D, is the biggest and most expensive project ever undertaken by amateur satellite enthusiasts. It has suffered a series of crises and failures in its first year, but is operational, with excellent signal reports, on one combination of transponders. Users send their signals up on either 435 or 1269 MHz, and they are retransmitted on 2401 MHz.

AO-40 ground controllers have concluded that the primary 2.4 GHz transmitter aboard the spacecraft is permanently dead. They tried cycling power on and off to it over 1300 times in 45 minutes while monitoring its current draw. There was none seen. According to the AMSAT News Service, similar tests are planned for the non-functioning 10 GHz transmitter. Controllers have also concluded that the satellite's 2 meter transmitter, which never has worked, likely never will.

As of November 2001, according to information gathered by the AMSAT News Service, there were 27 satellites carrying amateur radio orbiting the Earth, of which 16 are at least partially operational. The oldest is AMSAT-OSCAR-10, launched in 1983 and still in use. The newest is PCSat, launched last September and now available for limited use. For information on PCsat, see <http://web.usna.navy.mil/~bruninga/pcsat.html>.

FCC: Solve Your Own Disputes

Several amateurs involved in an ongoing dispute between three 75 meter nets and "an informal group of amateur licensees" have received a letter from FCC amateur enforcement chief Riley Hollingsworth, K4ZDH, essentially telling them to work out their problems on their own. The nets claim that the "informal group" is intentionally interfering with them, while the "informal group" says the nets claim to own the frequencies on which they operate. Hollingsworth wrote that this "appears to be largely a 'who's on first' dispute," and says "(i)t is regrettable that the parties cannot solve it, and it is unreasonable to ask that the Commission use scarce enforcement resources to do so." He says both groups need to exercise a little more flexibility and courtesy, and warns them not to violate FCC rules as they try to work things out.

Meanwhile, a Puerto Rican amateur accused of repeatedly interfering with a net in Mexico has been warned to "immediately cease" or face license revocation proceedings.

Florida Hams Test Meteor Effects

Hams in Florida were planning to work with the state's Division of Emergency Management to test communications capabilities during the Leonids meteor shower. According to the *ARRL Letter,* some experts believe large meteor showers have the potential to disrupt terrestrial and satellite-based communications systems. The tests were scheduled during the peak of the 2001 *Leonids* shower.

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

Zero Bias

BY RICH MOSESON, W2VU

An Editorial

Looking Forward (and Backward)

The month of January is named for the Roman god Janus, the patron of beginnings and endings, who is shown as having two faces, one looking forward, one looking backward. The image is particularly appropriate for this year—2002—an anagram year, which looks the same no matter which way you look at it*. It's also appropriate for this issue, as we attempt to look backward and forward at the same time. One constant, looking in both directions, is debate over CW. As we continue our focus on radio history in honor of the centennial of transatlantic radio communication, W6BNB brings us first-person recollections of the days between World Wars I and II, when "upstart" CW battled with "King Spark" for supremacy on the airwaves. CW won. Looking forward, we are now a little more than a year away from WRC-2003, the next World Radiocommunication Conference, which is slated to decide the future of Morse code as an international amateur radio licensing requirement.

It is widely assumed that this longstanding requirement will either be deleted or, as Russia is now proposing, left to the discretion of each country's licensing authority. Regardless of the semantics, it is clear that the tide of world amateur opinion has shifted, and that the majority of amateurs no longer believes that demonstrating code proficiency is a valid prerequisite for holding an amateur license with HF privileges. Even the International Amateur Radio Union (IARU) has adopted this position as its policy (see this month's "Washington Readout" for details). This means it is likely that within the 2005–2010 timeframe, Morse code proficiency will no longer be one of the skills required to hold an amateur radio license of any class, in the United States and in most other countries

What will this mean for the future of amateur radio and the future of CW? Opponents of code tests claim it will save the hobby, spurring an upsurge in licensees once it is no longer required to know what many feel is an "archaic" means of communication in order to operate on HF. Opponents of change feel it will hasten the death of amateur radio in general, and CW in particular. They argue that, if code proficiency is no longer required for HF access, then the flood of no-code voice operators will squeeze out CW fans from the frequencies that currently are reserved for CW and other narrow-bandwidth digital modes. Neither group realizes that they agree on one basic point—dropping the CW test will attract thousands of new operators to the HF bands. It is only the effect of that change on which they disagree.

Does this mean that CW as a popular operating mode is about to go away? That depends on who you ask. There are many ardent CW enthusiasts who seem to believe that, if code proficiency is no longer required for licensing, then no one will learn it anymore. We disagree. We feel that people will continue to learn and use CW as long as it can add to their enjoyment of amateur radio. Many people simply enjoy using CW and will continue to do so (see the "What You've Told Us" survey results on page 43); some DX is accessible only via CW; people with limited stations will work more stations, farther away, using CW than SSB. Even VHFers who want to work DX via meteor scatter, aurora or moonbounce will benefit from learning CW.

Our survey shows a very high level of support for CW among our readers, and we believe it will continue to be a strong and popular operating mode, whether or not it continues to be a licensing requirement. We do have to wonder why so many of the code exams' most vocal proponents seem to have so little faith in CW's ability to endure if its knowledge becomes an option instead of a requirement. Could it be that, deep down inside, those who oppose dropping the code test requirement are less interested in "growing" more CW ops than in keeping their CW-only band segments as uncrowded as possible? Just a thought ...

QSY to 40...

The other major action related to amateur radio that's anticipated at WRC-03 has to do with the possible realignment of the 40-meter band to reduce interference between amateurs and broadcasters in different International Telecommunications Union (ITU) regions. The big difference between the code question and this one is that no one knows how—or whether—the 40-meter question will be resolved. The goals here include separating amateurs in North and South America (ITU Region 2) from broadcasters in Europe, Asia, Africa and Oceania (Regions 1 and 3) on 7100–7300 kHz, and expanding the worldwide amateur allocation beyond its current limits of 7000–7100 kHz (only in Region 2 do amateurs have privileges above 7100 kHz).

Until very recently, the main thrust of planning has focused on moving the 40-meter amateur band down 100 kHz, to 6900–7200 kHz; and moving broadcasters in Regions 1 and 3 from their current 7100–7350 up to 7200–7450. The frequencies both above and below the 40-meter amateur / 41-meter shortwave broadcast band are currently allocated to the fixed and mobile services. In the US, these are government frequencies, often used for military communications. Over the past decade, much military communication has been moving off of HF and onto satellites. But the events of September 11 apparently caused a re-evaluation of that policy. At an ITU working group meeting in Geneva at the end of October, it was made clear that military usage of HF was going to increase, and that 6900–7000 kHz was no longer on the table. So now the focus has shifted, according to one participant in that meeting, to leaving the amateur band where it is and finding ways to move the broadcasters above 7300. There is resistance, of course, from the current fixed and mobile users above 7300, and much remains to be worked out.

We'd like to offer a possible compromise arrangement in case the negotiations come to an impasse, one that offers something for everyone, but everything for no one. Our proposal is this: Create a worldwide amateur allocation at 7000–7200 kHz, while maintaining the Region 2 amateur allocation between 7200 and 7300. Move the broadcasters up to 7200–7450, taking away only 100 kHz from the fixed/mobile services above 7350. Yes, there would still be sharing and interference between amateurs and broadcasters at 7200–7300, but the amount of shared spectrum would be cut in half. The fixed and mobile services would still lose spectrum, but their band usage is still shrinking, even if not as quickly as before. Hams in Region 2 would see no change,

**Most anagram years are 110 years apart, but because of the change of millennium, we get to have two in 11 years, 1991 and 2002, making us the first people in a thousand years to have two anagram years in one lifetime. The last time this happened was in 999 and 1001.*

except that 7100–7200 would be cleared of broadcast interference. Hams outside Region 2 would have double their current allocation on 40 meters, reducing the current need for SSB operators to operate "split," transmitting and receiving on different frequencies (typically, a DX station will transmit below 7100 kHz, in the CW portion of the US band, and listen in the US phone band above 7150). Obviously, we'd prefer a 300-kHz worldwide amateur allocation here, but if that's not going to happen, we suggest the above solution as a better alternative to leaving everything as it is or reducing the amateur allocation in Region 2.

Until an agreement is reached, we'll still need to make the best of a bad situation, and do our best to work around the QRM and each other. The best way to do that, of course, is to be considerate operators. First and foremost, listen before you transmit. Be sure you're following your country's rules for the band; familiarize yourself with—and *try* to understand—your national band plan and the IARU band plan for your part of the world (the IARU band plans for all three regions are at <http://www.iaru-r2.org/hf_e.htm>). Remember, anyone can listen to our bands. You can be sure that those who'd like to *have* our bands listen often. What kind of impression do we make on communications professionals and government officials? In light of world events, it's important that our governments consider amateur radio and amateur radio operators to be communication assets, not liabilities.

Be Prepared

As we head into a new year, still facing the uncertainty of more possible terrorist attacks, in the United States and around the world, it is more important than ever that we as amateurs be as prepared as possible to respond if needed to provide emergency communications. Dust off that VHF/UHF FM rig; make sure it works. Practice programming it. Use it. Give that repeater some exercise. If your rig isn't reliable, consider getting a new one. Know which repeaters you can access, which ones offer emergency training nets. Join them. Learn how nets operate and how to pass information quickly, concisely and correctly. Volunteer for public service events. These provide vital practice for "the real thing." While I would never discourage anyone from volunteering to help in an emergency, it was pretty tough to get your on-the-job training in lower Manhattan on September 13th or 14th.

We never know where or when our help will be needed next. We do know this: it *will* be needed. Over the next several months, we'll be helping you get and stay prepared. Our "point people" on this effort will be Contributing Editors Bob Josuweit, WA3PZO, and Dave Ingram, K4TWJ.

The Digital Future

One final "looking forward" note: CW was the original means of digital communication. Today's digital technology has replaced dits and dahs with zeros and ones, and has made it possible to reproduce voice digitally (just play your favorite CD through your computer's sound card). Now, digital voice technology has arrived in amateur radio. The new Alinco DJ-596 dual-band handheld offers an optional board that uses an open digital voice standard and allows any users with similarly-equipped radios to select digital voice as well as analog FM. See this month's "What's New" column for details. The other manufacturers certainly won't be far behind.

As we begin a new year, looking backward and forward at the same time, may we always remember what we see behind us but also look ahead to better days on the horizon. Happy 2002 ... or, reading the year backwards, Happy 2002.

73, Rich, W2VU

Announcements

FAR Scholarships – The Foundation for Amateur Radio, Inc. plans to administer 62 scholarships for the academic year 2002–2003 to assist radio amateurs. Licensed radio amateurs may compete for these awards if they plan to pursue a full-time course of studies beyond high school and are enrolled in or have been accepted for enrollment at an accredited university, college, or technical school. The awards range from $500 to $2500 with preference given in some cases to residents of specified geographical areas or the pursuit of certain study programs. Clubs—especially those in Delaware, Florida, Maryland, Ohio, Pennsylvania, Texas, Virginia, and Wisconsin—are encouraged to announce these opportunities.Additional information and an application form may be requested by letter or QSL card, postmarked prior to April 30, 2002 from: FAR Scholarships, P.O. Box 831, Riverdale, MD 20738.

Call for Speakers – The Southwestern Division of the ARRL has announced a call for speakers for the 2002 Convention, which will be held August 16–18, 2002 in Escondido, California. The main theme for the convention is "mentoring." If you are interested in speaking, or would like to recommend a speaker, e-mail: <KF6NXQ@home.com>, or write to P.O. Box 211861, Chula Vista, CA 91921-1861.

Ham Radio University – The third annual Ham Radio University will be held on Sunday, January 20 beginning at 9 AM, at the Babylon Town Hall Annex, Babylon, Long Island, New York. For this day of education about amateur radio there will be 20 one-hour presentations with special forums geared to the non-ham as well as the seasoned ham radio operator, including satellite communications, low-power operating, finding and fixing RFI problems, purchasing station equipment, and more. The focus will be "hands-on" with many demonstrations. There will be tables set up with information about different groups, ham radio classes, exam schedule sessions, and other activities, plus there will be a Special Event station set up and operational on HF. Donation is $2.00 per person. For more information, contact Phil Lewis, N2MUN, 631-226-0698, <N2MUN@optonline.net>, or George Tranos, N2GA, 631-286-7562, <N2GA@arrl.org>.

K1D Special Event – K1MOM and W1DAD will present K1D for Kid's Day & Ham Radio Awareness, Atkinson (NH) ARC, from 0500Z December 22, 2001 to 0500Z January 6, 2002. Kid's Day is January 5 from 1800–2400Z. For QSL send SASE to Peter Schipelliti, W1DAD, 7 Dearborn Ridge Rd., Atkinson, NH 03811. A free (via e-mail) K1MOM Amateur Radio Coloring Book for children including operating aids for Kid's Day, log sheet, WAS map to color, and phonetic alphabet is available from <k1mom@arrl.net> (or <k1dad@arrl.net>).

The following hamfests are scheduled for January:

Jan. 5, **West Allis RAC Midwinter Swapfest,** Waukesha County Expo Center, Waukesha, Wisconsin. Advance registration deadline December 30; send business-size SASE to WARAC Swapfest, P.O. Box 1072, Milwaukee, WI 53201. For more info contact Phil Gural, W9NAW, 414-425-3649. (Exams at AMF Waukesha Lanes, across from Expo Center)

Jan. 11–12, **Southwest Florida Hamfest & Computer Show,** Shady Oaks Community Center, Ft. Myers, Florida. Contact G. E. Sammons, WA4DQE, 941-936-1431, e-mail: <wa4dqe@juno.com>; or Earl Spencer, 941-332-1503, e-mail: <k4fqu@juno.com>. (Talk-in 146.880)

Jan. 19, **Flushing, MI Ham Radio & Computer Swap,** St. Robert Catholic School, Flushing, Michigan. Contact Clay, KF8UI, 810-233-7889, e-mail: <clay@iavbbs.com>. (Talk-in 147.100+ [100 Hz PL])

Jan. 19, **Hammond, LA Hamfest,** University Center, Hammond, Louisiana. Contact Southeast Louisiana ARC, P.O. Box 1324, Hammond, LA 70404. Table reservations Bill Borstel, KB5SKW, 225-695-6414; e-mail: <wborstel@hotmail.com>; <www.selarc.org>. (Exams)

Jan. 19, **Gallatin, TN Hamfest,** Galatin Civic Center, Gallatin, Tennessee. Contact 615-451-0213, e-mail: <hamfest@scara.net>; <www.scara.net>. (Talk-in 147.240+ [114.8 PL], 444.350+ [107.2 PL])

Jan. 26, **Lockport, NY ARA Hamfest,** Eagles Hall, Lockport, New York. Contact Duane Robinson, W2DLR, 716-791-4096, e-mail: <w2dlrham@aol.com>, <http://lara.hamgate.net>.

Jan. 27, **Wheaton Community Radio Amateurs Midwinter Hamfest,** Hawthorne Race Track, Stickney, Illinois. Contact WCRA at 630-545-9950, e-mail: <info@wheatonhamfest.org>, <http://www.wheatonhamfest.org>. (Talk-in on 145.390; 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; e-mail: <hamfests@cq-amateur-radio.com>. Deadline is the first of the month that is two months prior to the event date (i.e., May 1st for a July event).

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"It it's green, he'll buy it," the author's wife likes to tell all his friends. What started out as "just a few" has expanded into hundreds. Now WB8VGE tells all in his . . .

Confessions of A Heathkit Collector

BY MIKE BRYCE,* WB8VGE

Some of the best times I've had as a ham were spent at my workbench assembling a Heathkit. I can still remember opening the box, all those paper sacks lined up holding scores and scores of parts. Sitting right on top was the yellow assembly manual. I would stop and study a page or two, looking over the forthcoming steps with pleasure. Let's not forget about the illustration booklet either, those larger-than-life drawings detailing things to come.

Time would seem to stand still while I carefully spread out the parts. I never did the "check to see if you have all the parts" routine. I figured if a part was missing, I would find out when I needed it. I can recall coming home from the steel mill and plugging in the soldering iron. While the iron heated up, resistors were being stuffed into the PC board. Wait a second! Don't forget; keep those resistor color codes all going in the same direction!

Assembling a Heathkit was a work of art in progress. Forget about time and space; it did not exist when those bags were opened. One second I would look up at the clock and it was five in the afternoon. The next time I looked, it was going on midnight. For the next few days, my wife would become a "Heathkit widow" until the project was completed. They're right about time flying when you're having fun. "Yes, honey, I'll be to bed soon. Just one more page to go."

One never, never rushed through just to see how fast the project could be completed. No, you savored the assembly, carefully checking off each step as you finished it. When a PC board was completed, you held it in your hands, a work of art. The process continued until you came to those last several pages of alignment.

Here's just a fraction of my Heathkit gear waiting to be checked out. The other side of the basement is full.

It was those last pages that caused my hands to sweat. Would T1 really peak like it should? How about L3? Oh, no—look! There are three more coils that need adjusting! As they always did, T1 peaked and L3 did likewise. Those other coils popped up exactly as the manual said they would.

Then came the moment of truth. The antenna was connected, the power switch flipped on, and for a few seconds it seemed your heart just stopped. Then

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How many Novices got their first QSL card by way of this rig, the HW-16?

came the signals. Ahhhh! The feeling one got at the first moment a Heathkit came alive. But like everything else in life, we are born, grow old, and die. So did Heathkit. Gone are those days of yellow manuals, the assembly steps, and those first signals. Gone, but the memories still linger.

A Quick History of The Heath Company

Ed Heath started the company selling airplanes. Ed was killed while flying one of the planes in a test flight. Howard Anthony then purchased Heath in 1935. It seems Howard bought boxcar loads of World War II surplus after the war ended. What to do with all of this stuff? How about kitting up the parts into something useful?

The first Heathkit was a 5 inch oscilloscope that appeared in 1947. In 1954, history repeated itself. This time Howard was killed in a plane crash. In 1958 Howard's wife sold the company to Daystrom. Somewhere along the line Heath was purchased by Schlumberger. Schlumberger was not interested in Heath, but rather was looking for some help in high-end instrumentation manufacturing. It wanted Weston, which was owned by Daystrom, which just happened to own Heath. Thus, Schlumberger bought Daystrom to get Weston and ended up with Heath in the bargain. This all took place in 1964. Schlumberger held on to the company from 1964 to 1978.

Schlumberger was also looking for a place to get semiconductors, and it saw Fairchild as a source. You see, Heathkit was buying so many transistors that it became Fairchild's largest customer. It was hard for Schlumberger not to notice. Schlumberger wanted Fairchild, but to avoid the Federal Trade Commission's wrath, it sold Heathkit to Zenith in 1978. What Zenith wanted was Heath's computer line. Computers were just starting to come into the mainstream. There was money to be made and lots of it. However, Zenith really had no plans to recycle any of the cash back into Heathkit. In short order budget cuts and layoffs were in the mix. Zenith pulled the plug on Heathkit in 1986.

What Really Happened To Heathkit?

Most Heathkit collectors, and those people who ponder such things, put the blame on Zenith, but several factors really caused the demise of the company as we knew it. First, of course, was competition from Japan. Also, the technology was changing. Gone were the days of 6AU6s and 12AT7s. Things changed seemingly overnight, and Heathkit was unable to keep up with those changes. You see, not only did the engineers have to come up with a proven design, the whole shebang had to be designed so you could assemble it. After you got it together, you also had to be able to adjust and align the radio with nothing more than a VTVM. That took way too long. By the time Heathkit had what had started out as cutting-edge technology worked into kit form, it was already outdated by the stuff coming in from overseas.

As the technology grew, so did the complexity of the products. For example, the Heathkit SB-104 has over 275 transistors and ICs. That's a lot of parts, and a lot of parts means a greater chance of things going wrong.

Americans' buying habits and their choices of goods have changed, too. Back in the 1960s, if you wanted an AM broadcast radio you went to the local radio and TV shop. There you could pick out one from a choice of, say, two or three models the store carried. Today you go to a chain store such as Best Buy and have your choice of several dozen models.

One has to remember that Heathkit produced more than just amateur radio gear. It was the largest producer of electronic kits in the world. Its product line ran the gamut from color TVs to dirt bikes, and just about anything else in between. I wonder how many R/C modelers got their first taste of radio-controlled flight using Heathkit R/C kits?

Finally, too, people changed. Again, in the '60s you had (or made) the time to carefully assemble a radio. Today's soccer mom does not have the time to cook dinner, let alone try to build a TV set. Who has time today to devote 100-plus hours to assembling an amateur radio transceiver? No, we want it now, and we want it with all the bells and whistles. Dial the 800 number, plop down your credit card, and UPS's next-day service will have it on your doorstep tomorrow afternoon.

All of these things piled up until Heathkit could no longer stand the strain. By the way, although it no longer sells electronic kits, the Heath Company is still alive. It went into educational videos and workbooks for the electronic industry (*Heath's connection to RF is still alive, too. Guess whose*

Anyone for AM on 2 meters? This HW-17 is a rare find.

Sitting on an end table, this GR-78 receiver is tuned to W1AW for code practice.

brand name is on my wireless doorbell?—ed.).

Collecting Heathkits

Perhaps it's shallow try to relive the past. Perhaps there's something about that green Heathkit paint. Then again, it might be that I couldn't afford a Collins radio collection!

No matter what the reason, for the last several years I've been slowly and carefully rebuilding my Heathkit inventory. Rebuilding? Yes, like a dummy, I sold off most of the Heathkit gear I had built. Talk about kicking oneself in the butt.

I'll admit it; I'd just as soon get a Heathkit that is broken than one that's working perfectly. While I can't relive building one, fixing it is almost as much fun. There's a second reason for getting a broken Heathkit, too—price. They're much cheaper if they're broken!

A good place to start looking is in your own backyard. Ask the locals if they have a Heathkit lurking in the dust. Sometimes your local ham radio club may have a Heathkit stored away. It's worth asking! Often you can get the gear just by asking.

Believe it or not, hams really do spend money. Some of us are members of the "rig of the month" club. One of the big four will introduce a new transceiver, and you just have to have it. What happens to the old rig? Sometimes it's traded in on the new one. Sometimes it's sold at a hamfest. Then there's the guy who wraps it up and stores it in the attic. This is the guy you want to seek out. There's a good possibility that he built a HW-101 way back when, then got a new Kenwood TS-520 and boxed up the HW-101. It's been sitting in storage all these years *(most likely with the 520 next to it by now—ed.)*. You can see why it pays to ask around.

Don't forget to attend your local hamfests. Hamfests and swapfests are your number two sources for old Heathkit equipment. Don't overlook the neighborhood garage sales either. I've seen ham radio gear show up at some of these, and the goofy thing is usually no one knows where the stuff came from. Of course there's the internet, too.

How Much is Too Much?

As far as I know, there is no official price guide for Heathkit equipment. Bottom line? You pay what the market will bear. If you're willing to pay $200 for an HW-16, there's someone out there eager to sell you one at that price. If you are at a hamfest and you see twelve HW-16s, then the price that day will be much lower than if there is only one. It's supply and demand.

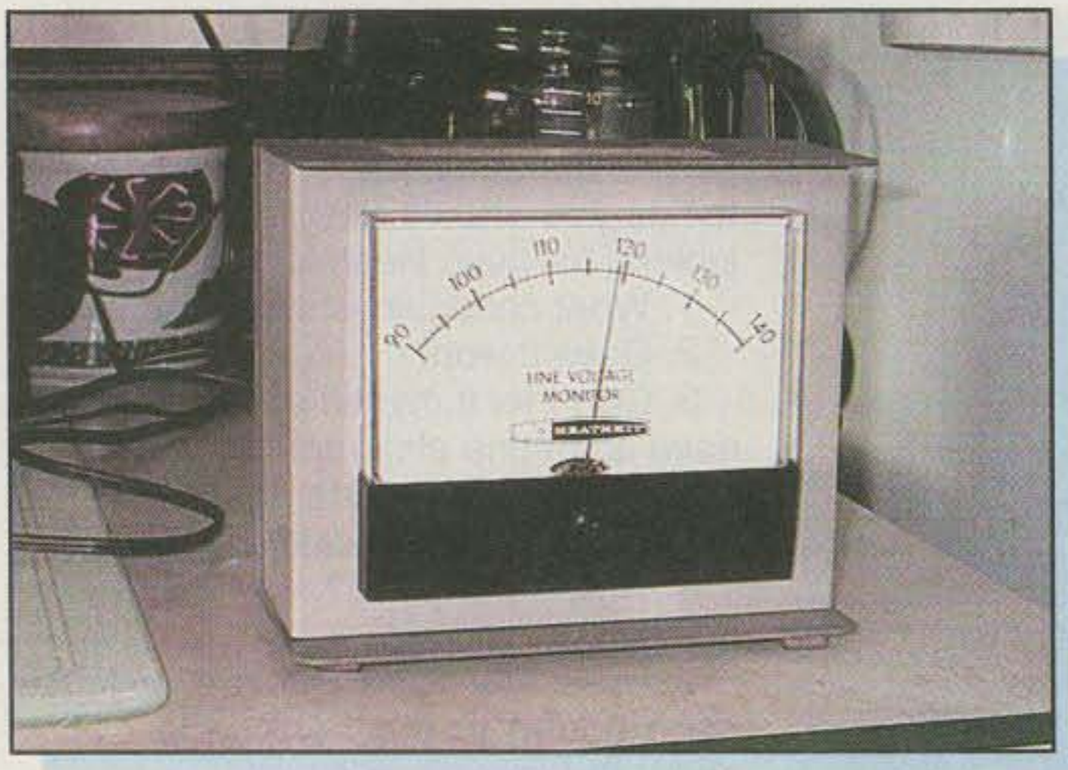
How much is a particular Heathkit rig worth? I really can't tell you. I know what I am willing to pay, how badly I want it, and if I can afford it. I've paid from over $450 for a mint HW-101 to as little as $25 for the same radio. Here are a few things you should keep in mind when looking for used Heathkit gear:

1. What condition is it in?
2. Does it work?
3. Can I fix it myself or will I have to have someone else repair it?
4. Will this be a parts rig?
5. Is the manual included?
6. How's the paint? Has it been repainted?
7. Have any holes or extra switches been added to the front panel? How about the rear panel?
8. How rare is it?
9. Are there any accessories included, such as the power supply or cables?
10. Are all the knobs original?
11. How badly do I want this piece?

Buying Heathkits on the Internet

Now I am not sure and have no way of knowing, but I do believe eBay is having an effect on used ham gear. The last time I looked on eBay for Heathkit gear they had almost 500 pieces listed. I am talking just ham stuff, not the audio or TVs, computers, or whatnots, just ham gear.

I've seen HW-9s go for over $400 a pop. There have been Heathkit "basket cases" that went for hundreds of dollars. An HW-16 in good shape should be around $25 to $75, a little more if the manual is included and, of course, depending on the condition of the rig. On eBay I've seen an HW-16 sell for over $250. HW-16s are not rare. Apparently, finding someone to pay $250 for one is not that rare either! Then there was that unbuilt SB-220 that sold for $2400! But that's another story. Let's not forget the unbuilt cantenna; it went for almost $200! What's wrong with these people?



Sitting all by itself, the IM-103 line-voltage monitor does its thing.

Value, like beauty, is in the eye of the beholder. I would not give you a dime for a shoebox full of genuine love letters handwritten by Elvis. On the other hand, the guy with the letters most likely would not drop a penny for a garage full of unbuilt Heathkit SB-102s.

Many times on eBay I have seen Heathkits listed as "mint" or "collector" quality, only to see the photo and notice an extra switch or hole drilled in the front. Be careful! I only bid on gear that has a clear photo of the item I am trying to purchase, not a photo scanned out of the catalog.

It also pays to know a little bit about the gear you're bidding on. Heathkit did not use four-pin microphone connectors in vintage rigs such as the HW-101 and the SB-101. It used a two-pin microphone connection. If you see an HW-101 with a four-pin mic connector, it's not mint in my book. The same goes for the antenna connector. Heathkit used those nasty RCA connectors for the antenna connections. It used them in its 2 meter rigs as well. If you see an HW-202 with a BNC connector, it's not mint either.

On the other side of the fence, I can live with a four-pin mic connector. I really don't need to have an absolutely mint-condition rig. The same goes for the HW-101 with an SO-239 connector installed. Sure, it's not factory, but I can live with it. However, I can't go for the extra hole drilled in the front panel to add an LED power indicator. That's not the way Heathkit wanted it to look, so I pass on stuff so modified. The only exception would be a parts-only rig.

Watch out for "dead ham" gear. It's been sitting on the shelf for a very long time. That's how I got my HW-16. It usually goes something like this: Dad dies, but mom can't throw out the stuff, so years later mom kicks off and the kids are left with all this radio stuff dad had. Off to eBay it goes. Worse yet, someone else gets the whole shebang and sells it on eBay as an estate sale. The gear is "collector quality" and the prices go through the roof. In almost all cases, the stuff is broken up into separate items. You need to bid on the manual, the power supply, and the rig. It's almost a sure bet you'll need to fix or at least work on the equipment. It's been sitting idle for decades!

On the brighter side, the online auctions do have their place. I've been able to pick up Heathkit equipment on eBay that I would never have found by myself. One example is the HW-17 two meter transceiver. I picked up this one on eBay. According to the book *Heathkit. A Guide to the Amateur Radio Products,* by Chuck Penson (Electric Radio Press), the HW-17 is rare in any condition. This one is mint! And it works! The best part of all was the selling price. After adding on shipping, the HW-17 cost me $43. That's a bargain in anyone's book. In another example I purchased a Heathkit VF7401 two meter rig. This rig is very, very rare. It was the last of the kit 2 meter transceivers. I did pay over $100 for it, but in all the years I've been going to hamfests I've only seen one. Without eBay I never would have found this radio.

There's another place to find Heathkit gear on the internet—the newsgroups! There's a fine group dedicated to keeping the green flame burning. So, you see, we're out there. It is just a matter of finding us!

What to Collect

I like the old two-tone green radios myself. That includes the entire SB and HW lines. Generally they're easy to work on and easy to obtain. If you really want to collect on the cheap, look at the many different types of test gear Heathkit made. They made a zillion different models of the VTVM. Oh, my! Did they love to make oscilloscopes! You could spend a lifetime just collecting scopes. A lot of times this stuff goes very cheaply, even on eBay.

If you want to start collecting HF transceivers, then look around for a good HW-101. They're easy to come by, not overly expensive, and simple to troubleshoot. Notice I said *troubleshoot*. Repairing the HW-101 is an acquired talent. They're hard to work on—not impossible, just a challenge sometimes (see my guide to restoring HW-101s in the November 2001 issue of *CQ*).

Here's a GC-1 "Mohican" that I have tuned to 40 meter AM. It's great to listen in on the AM guys on the weekends. That's a GR-88 monitoring the local police department.

You can pick up an HW-101 in working condition for about $100. Plan on spending about $75 more for the HP-23 power supply. You'll need one, as the HW-101 does not have an internal power source. The HW-101 produces 100 watts of RF output from 80 through 10 meters. You get CW and SSB. These are great rigs for someone trying the HF bands without much money.

Another really good radio to pick up is the SB-102. Known as the "Collins clone," many of these radios are still in daily use. Plan on dropping up to $300 for a working radio. Again, you'll need that external power supply. The HW-100 and SB-101 are a bit cheaper, just as nice to operate, and somewhat easier to find.

The SB-104A is a radio to which I've always been drawn. I really like the clean, straight lines of the design. However, the SB-104A does not have a very good reputation. In fact, if you see one at a hamfest, there's even money that the radio has a problem. By the way, there is an SB-104. This was the first version of the rig. There were so many things wrong with the basic design that Heathkit came out with the SB-104A. It also sold an upgrade kit to convert the 104 to a 104A. You can' t tell by looking at the radio. Okay, that's not really true. The original SB-104 had a push-button switch labeled "100 Hz" just below the RF gain control. If the nameplate says "SB-104A" and you see the "100 Hz" button, you have an upgraded radio. Another way to check is to open the top and look for two blue-and-white stickers, one for the original and the other for the upgrade.

Basically, there are three major bugs in the SB-104A: deaf receiver, digital readout problems, and low RF output. All three of these are fixable, so don't pass up an SB-104A just because it might be a basketcase.

Don't get me wrong! When the SB-104A is working, it is a very good rig. Watch for modifications! In one particular SB-104A that made it across my workbench, it seemed as if every ham east of the Mississippi had had their fingers inside it.

How much for an SB-104A? Depending on condition, anywhere from $125 to $300. The SB-104A requires a 12 volt at 20 amp power supply.

Two Meters and Above

If you want to get on 2 meters cheaply, the HW-202 can be picked up for about $20. It's crystal controlled on transmit and receive, so you'll need to check what crystals are inside. Of course, if Mr. Murphy is around, the crystals won't be the ones you need. You can order crystals from JAN Crystals (P.O. Box 60017, Ft. Myers, FL 33906; telephone 813-936-2397; toll-free 800-526-9825) or Bomar Crystal Co. (201 Blackford Avenue, Middlesex, NJ 08846; telephone 732-356-7787; toll-free 800-526-3935; fax 800-777-2197; e-mail: <sales@bomarcrystal.com>; on the web: <http://www.bomarcrystal.com>). If you don't want to mess with crystals, the HW-2036A runs about $50 to $100. It's fully synthesized and will cover the entire 2 meter band. Then, of course, there's the VF-7401. This one's really rare, so expect to pay a lot of money for one.

There you have it. I confess. I can't seem to go to a hamfest without bring back something by Heathkit. As for those smiles I've been missing from assembling a Heathkit? Oh, they're back. I'll answer a guy who is calling "CQ." During the QSO, he'll say, "My God, that rig sounds great! Is it one of the new super pros I've been hearing about?" "Well, no. As a matter of fact, it's a 40-year-old Heathkit. An HW-22A to be exact." Ah . . . priceless. ■

You've heard of Edison and Marconi and DeForest and Tesla, but unless you live in Canada, you're probably not familiar with Ted Rogers. You should be, and you will be after you read about the accomplishments of this early innovator and ham operator.

Batteryless

Ted Rogers and the Invention of The AC Vacuum Tube

BY GIL McELROY, * VE3PKD

In its July 8, 1922 issue, *Radio World* magazine ran a half-page photograph of a Mr. P. D. Powell of the U.S. Bureau of Standards posing beside his "radio receiving-set," as it was described in the caption. The headline read "New Amplifier Eliminates Battery," and Powell rated a half-page because he apparently had done the impossible: He had plugged his "radio receiving-set" into an AC outlet and actually made it work.

Powell's radio was a big deal at a time when radio vacuum tubes depended on separate batteries to heat filaments (the "A" battery"), supply plate voltage ("B"), and provide grid bias ("C"). However, his cumbersome receiver simply involved the use of separate battery "eliminators" to convert household AC to DC before reaching the tubes, and didn't constitute an entirely new approach to the problem.

It wasn't until two years later that a practical AC-powered vacuum tube was developed, the work of a young Canadian ham radio enthusiast named Edward Samuel ("Ted") Rogers. His device helped revolutionize an industry and made radio available in virtually every home.

Ted Rogers was born on June 21, 1900 in Toronto, Ontario, the son of an oil executive. His introduction to wireless came at the age of 11 in a school science class. He was immediately hooked, and with the help of his brother he built his first receiver, an electrolytic detector based on the invention of another Canadian, wireless pioneer Reginald Fessenden.

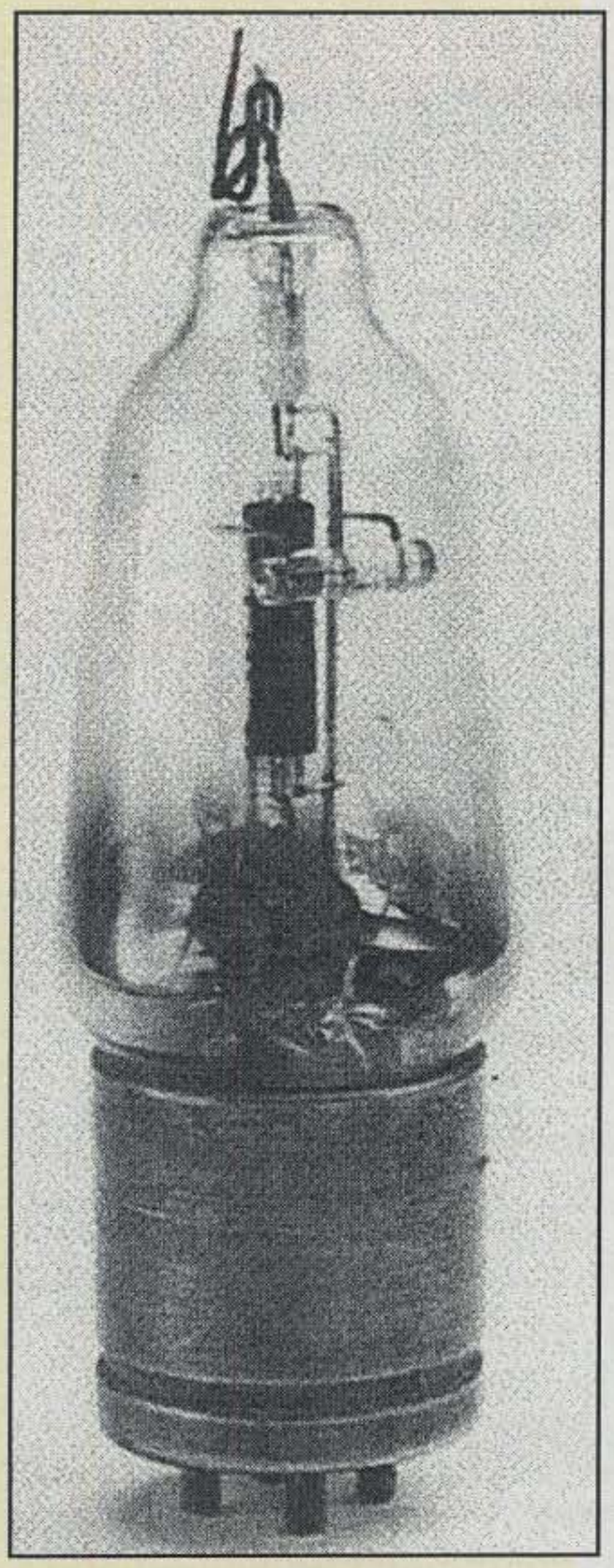
In April 1912, while vacationing with his parents in northern Ontario, Rogers listened in on wireless reports about the sinking of the *Titanic* transmitted by a young wireless operator in New York City named David Sarnoff (who later rose to be President of RCA). In 1916 Rogers earned his commercial radiotelegrapher's license and then spent his summers working for the Canadian Marconi Wireless Telegraph Company as an operator aboard passenger ships plying the Great Lakes. When the ban on amateur radio activities was lifted in Canada in 1919 following the end of WW I, Rogers received one of the earliest licenses issued. His callsign was 3BP.

The cover of the January 1922 issue of *QST* carried that callsign, along with 25 others. The previous month Paul Godley of the ARRL had sat shivering

Ted Rogers at the controls of 3BP, his ham radio station in Newmarket, Ontario, which was part of the first successful Transatlantic Tests. (Photo courtesy the family of Ted Rogers, Jr.)

**P.O. Box 7, Colborne, Ontario, K0K 1S0 Canada*
e-mail: <gmcelroy@eagle.ca>

← *Edward Samuel ("Ted") Rogers, inventor of the first workable AC-powered vacuum tube. (Photo courtesy the family of Ted Rogers, Jr.).*



The Rogers Experimental Tube 15-S, the first successful AC-powered vacuum tube developed by Ted Rogers in August 1924. (Photo courtesy the family of Ted Rogers, Jr.).

on a cold beach in Scotland listening to the first North American amateur signals successfully spanning the Atlantic. Ted Rogers' half-kilowatt spark signal, one of only a handful amidst more numerous CW transmissions, was the sole Canadian heard. The next year he acquired further fame in Canada for another first—transatlantic communications with British and French amateurs, at one point even relaying a message from England to Don Mix, 1TS, radio operator aboard the schooner *Bowdoin*, serving the MacMillan Expedition high in the Canadian Arctic. Two-way contact between Leon Deloy, 8AB, of France and American hams the same year made the record books. Rogers' feat made it into Toronto newspapers.

Although an avid ham, Rogers had a very keen interest in the business of radio, and the development of an AC-powered vacuum tube, perhaps the "Holy Grail" of 1920s radio, seemed like a timely and profitable enterprise. With their frequent need for recharging and the ever-present risk of spilling acid on the living-room carpet, battery-powered radios, the industry norm at the time, were messy and inconvenient. In a letter from 1924, Rogers wrote: "Now what we are going to make is a tube that will operate directly on ... house lighting current in place of the usual dry cells or storage battery, and I believe it is going to be a winner as there is nothing like it at all on the market so far."[1]

Rogers was up against a lot of things, one of the biggest being the very nature of household AC. Unlike today, homes of the 1920s were not equipped with wall outlets into which appliances could be plugged. Electrical wiring was intended strictly for lighting, and if you wanted to use an electrical appliance, it had to be plugged into the wall-mounted lighting fixture.

Rogers also faced the inertia of corporations that had bet heavily on battery technology and were reluctant to see their investments go down the drain before turning a profit. At the same time, though, the development of an AC-powered vacuum tube had not escaped the attention of more forward-looking members of the radio industry. As far back as 1913, Western Electric, for instance, had been working on an indirectly-heated cathode for use in telephone repeater tubes. In Pittsburgh, a former engineer for Westinghouse had come up with a radio tube that worked—more or less—on AC power. His name was Frederick S. McCullough, and in April of 1924 Ted Rogers paid him a visit. His invention was less than ideal. According to Gerald Tyne in *Saga of the Vacuum Tube*, it "was prone to produce excessive hum,"[2] the most common problem to beset early AC tube attempts. However, it impressed Rogers enough for him to purchase the Canadian rights to the patent for $10,000, and he returned home to Toronto to perfect it. (McCullough himself began commercially manufacturing his own version of the tube in 1925.)

On August 1, 1924 Rogers succeeded in his efforts, producing the very first Rogers Experimental Tube 15S. He'd managed to successfully insulate the heater filament, electromagnetically shielding it from the cathode-grid-plate circuitry and thus eliminating AC hum. It was an enormous step forward, but the hard part was yet to come—producing a working radio that operated entirely on AC.

With his father and brother, Rogers had incorporated as Rogers Radio Limited in 1924. Corporate structure and backing in place, he went to work devising a means of mass-producing his new tube and a radio receiver that could use them. On April 8, 1925 Rogers unveiled the Model 120, a receiver employing five of his AC tubes and the Rogers B-Eliminator Power Unit, a device he had patented and begun to commercially manufacture the year before. The whole package sold for $260, a sizable amount of money in those days. Of interest, and a real sign

After developing a working AC vacuum tube, Ted Rogers poured his energies into building radios that could use them. This advertisement appeared in a Canadian magazine in the late 1920s.

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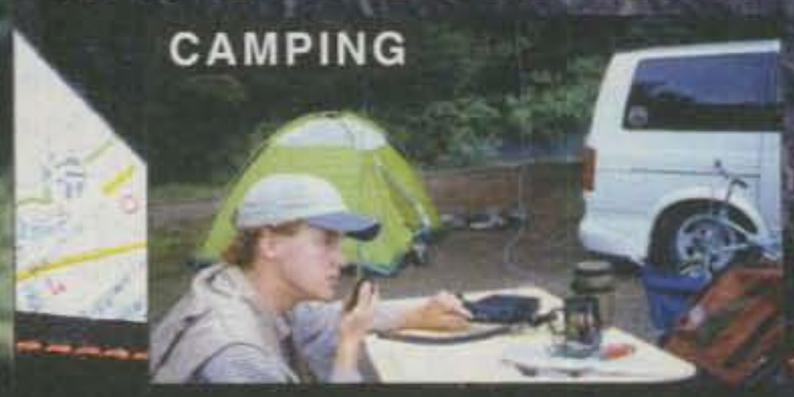

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- **MULTIMODE DESIGN:** Ready for action on SSB, CW, AM, FM, FM-Wide (Rx), 1200/9600 bps Packet, and Digital, including dedicated USB and LSB PSK-31 configurations.
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- **WIDE CHOICE OF POWER SOURCES:** The FT-817 is equipped with an alkaline "AA" cell battery case, and a 13.8 volt DC cable is also supplied. Available as an option is the FNB-72 Ni-Cd Battery Pack (9.6 V, 1000 mAh), which can be recharged using a 13.8 Volt power supply while the radio is being operated.
- **TWO ANTENNA PORTS:** A "BNC" connector is provided on the front panel, and a type "M" connector on the rear panel, with Menu selection of which connector will be assigned for operation on HF, 50 MHz, 144 MHz, and 430 MHz.
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FT-7100M

FEATURES

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- VHF/UHF, VHF/VHF, and UHF/UHF Dual Receive operation*
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- 104 DCS Encode/Decode Codes
- CTCSS and DCS Search
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of the times, was the receiver's screw-in plug, designed to fit into lighting fixtures just like a lightbulb!

By August of 1925 Rogers had improved the design of his AC tubes, and the Rogers Type 32 vacuum tube began production from a factory in Toronto. His new corporation, Standard Radio Manufacturing Company, also began producing a variety of console and tabletop radios, all employing Rogers' AC tubes. In 1928 he merged his company with the American radio manufacturer Grigsby-Grunow to form the Rogers-Majestic Corporation, becoming the largest radio manufacturer in Canada. The merger had a lot to do with another new AC vacuum tube, the UY-227, released by RCA in 1927. In his book *70 Years of Radio Tubes and Valves*, John Stokes called the UY-227 "a landmark tube as, apart from being the first standardized indirectly-heated tube, it ushered in the era of the mass-produced receiver..."[3] Suddenly there was competition, and the Rogers-Majestic merger was designed to meet it head on.

The company flourished, manufacturing tubes and receivers in plants throughout Toronto. Rogers even branched out into broadcasting, starting his own AM radio station, CFRB (Canada's First Rogers Batteryless) in 1926, and in 1930 received a license—one of the first four issued in Canada—to broadcast experimental television.

Throughout the decade Rogers' business enterprises prospered and grew. However, on May 6, 1939 he died suddenly of a hemorrhaging ulcer that his family believed was a result of overwork. Ted Rogers was just 38 years old.

The Canadian government issued this commemorative postage stamp honoring Ted Rogers.

Control of his corporate interests passed along to Philips Electronics two years later. His radio station, CFRB, is still going strong today, and Rogers' son, Ted Rogers, Jr., now heads up Rogers Communications Inc., a large telecommunications firm in Canada that encompasses everything from cellular communications to publishing (and includes ownership of the Toronto Blue Jays baseball team).

The AC vacuum tube, though superseded in 1948 by the invention of the transistor, is now commonplace. The early battles for technological supremacy in radio waged by RCA, Westinghouse, and other corporations are long since over, the battlegrounds having moved elsewhere into other technologies. In the histories of the period, Ted Rogers and his Experimental Tube 15S typically rate only a small paragraph, usually an aside to the doings of the major American players in early radio. In the end, though, a young Canadian ham had scooped them all, producing a radio tube that could be used with household electrical current and a batteryless radio before the "big boys" managed to achieve the same feat.

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1. Ian A. Anthony, *Radio Wizard: Edward Samuel Rogers and the Revolution of Communications* (Toronto, Ontario: Gage Educational Publishing, 2000), p. 36.

2. Gerald F. J. Tyne, *Saga of the Vacuum Tube* (Indianapolis: Howard W. Sams & Co., 1977), p. 349.

3. John W. Stokes, *70 Years of Radio Tubes and Valves* (Vestal, NY: The Vestal Press, Ltd., 1982), p. 45 ■

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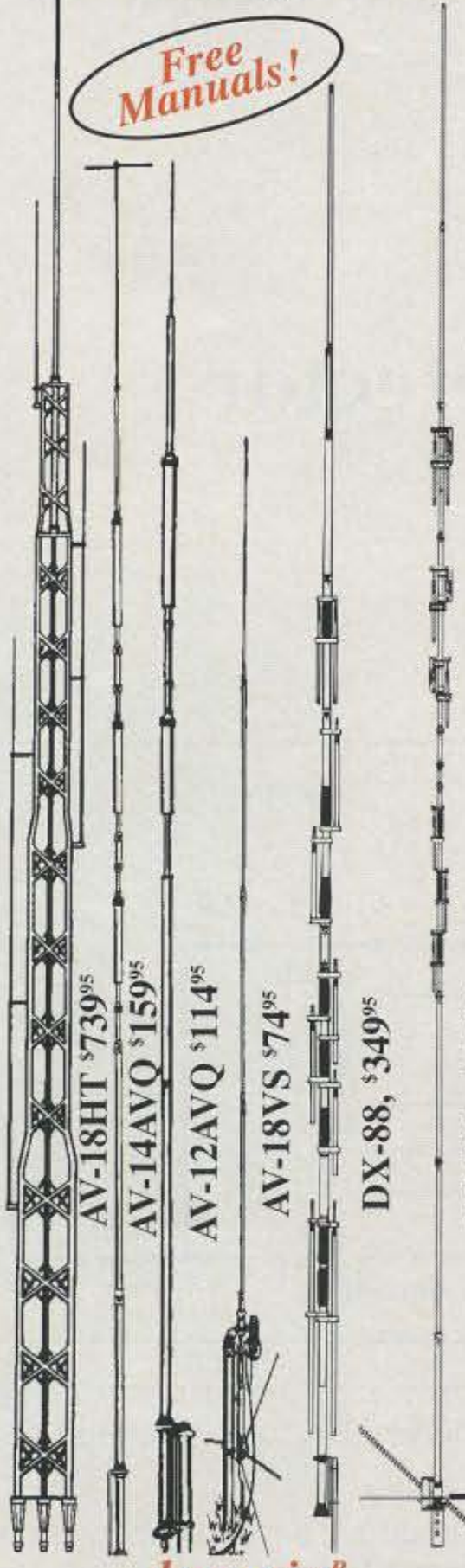

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AV-14AVQ	**$159.95**	**10,15,20,40**	**1500 W PEP**	**18 feet**	**9 pounds**	**80 MPH**	**1.5-1.625"**
AV-12AVQ	$114.95	10/15/20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	**$74.95**	**10 - 80 M**	**1500 W PEP**	**18 feet**	**4 pounds**	**80 MPH**	**1.5-1.625"**
DX-88	$349.95	10 - 40 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	**$429.95**	**10 - 80 M**	**1500 W PEP**	**29 feet**	**25 pounds**	**60 mph no guy**	**1.5-1.625"**

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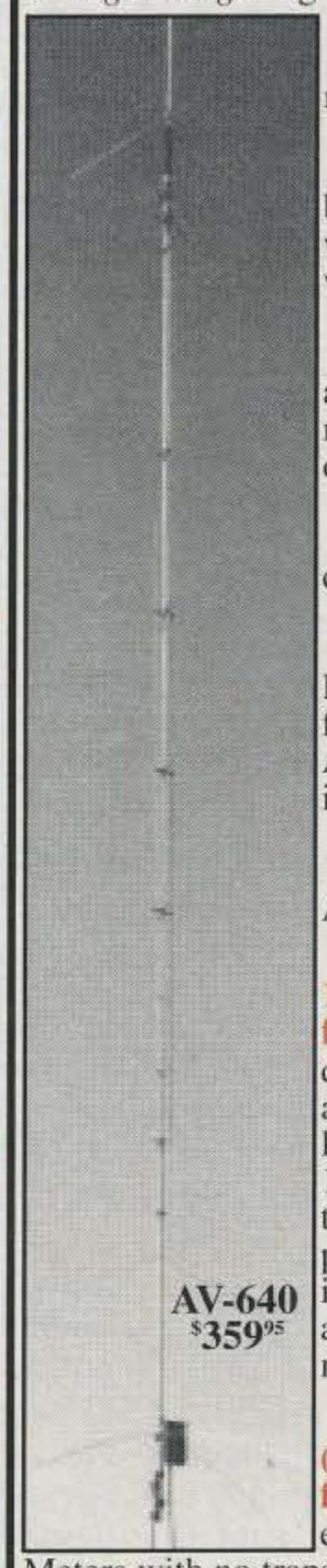

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Ham radio in the early part of the 20th century was very different than it is today. It was a time when if you wanted to get on the air, all you had to do was first build a receiver, then get a code and theory license, then build a transmitter, and finally put up your new resonant antenna. For the average ham, there was no going out somewhere to buy those things. W6BNB takes us back to ham radio "between the big wars."

An OT Remembers

Starting Out with a Crystal Detector

BY BOB SHRADER,* W6BNB

There are still quite a few Old Timers around who remember back into the 1920s when amateur radio was still pretty much in its infancy and everyone put together their own stations out of parts they purchased, sometimes at Woolworth's 5 & 10 cent stores, or scrounged from anywhere they could find them or from everyday items converted into radio parts. This OT was not on the scene early enough to build some of the real old-time radio detectors or even to put together and operate an amateur spark transmitter, although he did use spark transmitters for several years at sea. In the early 1920s, when his radio activities started, a crystal detector was the only receiver being used by most people. It wasn't until the mid-1920s that vacuum-tube (VT) receivers and transmitters began to predominate.

In 1922 he became the proud owner of a Beaver Company "Baby Grand" crystal-detector receiver for amplitude-modulated (AM) broadcast signals. It consisted for the most part of a multi-tapped 2 inch by 3 inch jumble-wound coil with tap-leads going to two 12-contact switches and a crystal. (For those of you who don't quite remember these radios, a jumble-wound coil was wound into a deeply cut out, rounded oblong form. It was tapped at the desired points and then removed from the forma and tied with string to hold its oblong form. In cross-section, it is about 1/2 inch in diameter and round. It does not necessarily have to be wound in separate layers, just wound to fill up the empty form.) A diagram of its circuit is shown in fig. 1.

The coil in parallel with the antenna-to-ground capacitance formed an inductor-capacitor (LC) parallel resonant circuit. Its resonant frequency could be changed to tune to different station frequencies by changing the inductance, or number of turns used on the coil. One 12-contact switch was connected to 12 single-turn taps on the coil, and the other was tapped onto every 12th turn. In this way the whole coil could be varied by 156 turns in single-turn steps.

The crystal detector receiver consisted of the LC circuit—a solid-state galena, silicon, carborundum, or iron pyrites crystal with a thin-wire "cat-whisker" touching it. This metal/crystal junction rectified the radio frequency (RF) AC to pulsating DC that then flowed through the earphones. The capacitor across the earphones completed the RF AC circuit from antenna through the crystal diode to ground. When the LC circuit was made resonant to the frequency of the station it was desired to hear, maximum strength modulated DC pulses were fed through the earphones. The variation of pulse amplitudes caused by the modulation on the RF carrier wave vibrated the earphone diaphragms, producing the air vibrations that developed the sound waves. The selectivity, or bandwidth of reception, was controlled only by the length of the single wire antenna. The longer the antenna, the stronger the signals but the broader the bandwidth and the more likely QRM would be produced between two or more local stations. The suggested antenna wire length was 100 feet. The "ground" connection was to a cold-water pipe to make a good connection to the earth.

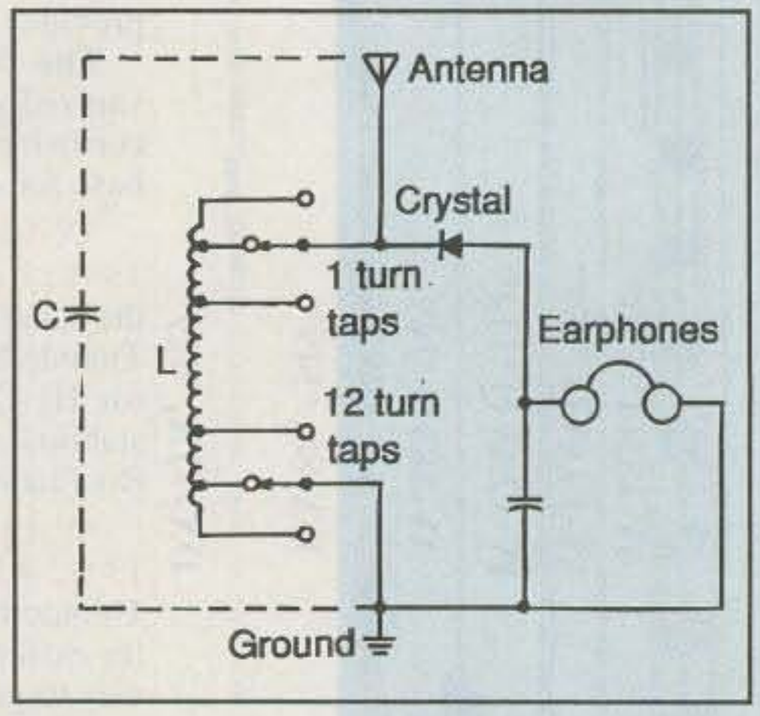

Fig. 1–Schematic diagram of the "Baby Grand" crystal detector receiver.

It wasn't long before this budding ham started home brewing crystal receivers. Many different circuits were tried, all far more sophisticated than the little Baby Grand, which was probably one of the simplest receivers ever made. A really good crystal receiver was finally developed (fig. 2) out of parts no longer to be found. It had a variometer, L_1 (two coils connected in series, one rotating inside the other to provide a wide variation of inductance) as its antenna circuit inductor. In series with the variometer was the primary of a variocoupler, essentially the same kind of device except that each coil was brought out with its own two terminals.

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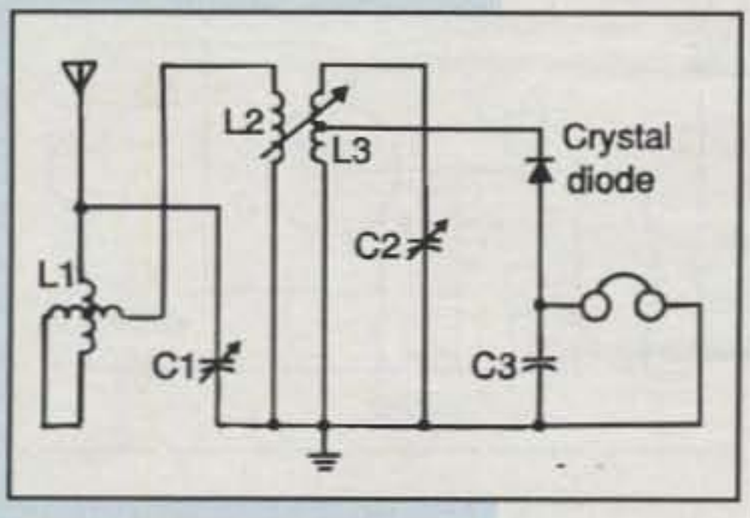

Fig. 2– A more advanced home-brew crystal detector receiver.

The arrow through the two coils in the diagram indicates the coupling between these two coils is variable. L_1 and L_2 were in series. In parallel with them, the variable capacitor C_1 formed the tuned LC antenna circuit. Some of the RF developed in this circuit was coupled to the L_3C_2 resonant circuit via the vario-coupler. The coupling from the first to the second tuned circuit could be varied from a very loose to a very tight value. The inductor of L_3C_2 was tapped down to provide a higher Q (Quality) or less heavily loaded circuit, resulting in a narrower bandwidth resonant circuit. The RF AC from this circuit was rectified and fed to the earphones through the crystal diode. (Years later a solid-state germanium diode was used to remove the requirement of searching around with the cat-whisker to find a sensitive spot on a crystal.) By keeping the antenna circuit coupling to L_3C_2 at a low value, this circuit could separate two stations on nearby frequencies quite well, provided both tuned circuits were resonant to the desired station's frequency. C_3 is known as a "by-pass" capacitor, meaning it passes RF well, but it also acted as a filter to smooth off the RF pulses somewhat, concentrating the received energy more in the lower, more normal audio range.

Triode Detectors

The next improvement was to use a triode (3-element) vacuum tube (VT) as a detector. By the late 1920s there were several types of triode detectors in use. One of the most common was the grid-leak detector, shown in fig. 3. The antenna picked up RF signals and fed them across an air-core transformer to the resonant circuit L_1C_1, which was tuned to select the station to be heard. (If the antenna circuit was also made tunable it resulted in better adjacent signal rejection.)

Resistor R was usually 1 to 5 megohms. When RF AC was fed through

the 100 pFd C_2 to the grid of the triode, the positive half cycles attracted negative electrons from the hot cathode. The captured electrons would drain back to the cathode through R. Since electrons always move through a resistor from its negative to its positive ends, the negative voltage at the grid end of R produced a negative bias voltage on the grid, limiting the electrons flowing to the plate and reducing the plate current (I_p). Capacitor C_2 acted both as a coupling capacitor for RF to the grid and as a filter capacitor across R to hold its bias voltage more constant. As AM RF signals varied in strength, the bias voltage on the grid (across R) would vary, resulting in a varying I_p through the earphones, vibrating the diaphragms according to the AM signal amplitude variations. The plate supply voltage (V_p or E_p) was usually about 22.5 V, provided by a "B-battery."

The little inverted-V below the cathode (K) represents the heater resistor that heated the cathode when either AC or DC current was made to flow through it, making the cathode hot enough to boil off electrons from its surface. The spacing of the grid wires and the amount of grid bias voltage determined the amount of electron current, I_p, that could flow to the plate. When the RF AC signal voltage varied, the negative bias voltage varied and the I_p varied.

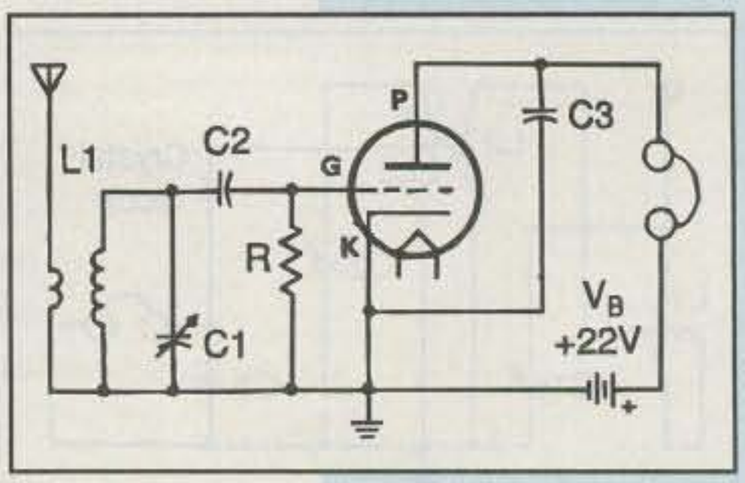

Fig. 3– Simple triode grid-leak detector AM receiver.

Regenerative Detectors

The simple triode grid-leak detector left a lot to be desired in sensitivity and selectivity. Thus, the next advancement was to feed back, or regenerate, amplified RF energy from the plate circuit to the grid tuned circuit. This could bring the gain of the whole stage up to the point where it could sustain RF oscillations in the grid LC circuit, making the stage an Armstrong oscillator (fig. 4).

The few-turn feed-back coil, L_3, was used to inductively couple in phase some RF energy back to the grid LC circuit from the plate circuit. A small but many-turn RF choke coil (RFC) connected the earphones to the plate circuit. It presented a very high impedance (high Z) to RF AC, but a low Z to AF variation, thus preventing RF from getting to the earphones but allowing the lower frequency AF current variations to pass through unimpeded. The feedback control, C_4, if tuned to a small capacitance value, allowed only a small amount of amplified RF energy to be coupled back into the grid LC circuit. As C_4 was increased in capacitance, it improved the RF AC path from plate through L_3 and C_4 to the cathode. The more RF energy fed back to the grid circuit, the more it made up for any normal losses that are present in all LC circuits. This raised the Q of the grid LC circuit, lowering its losses, resulting in louder earphone signals and also narrowing the LC circuit bandwidth.

If enough energy was fed back to cancel all of the losses in the LC circuit, the circuit would break into oscillation, generating RF AC at its resonant frequency. At a feedback value just below the oscillation point, there was a greatly increased signal strength for weak AM signals, as well as a greatly reduced LC circuit bandwidth. This made the detector an excellent one for listening to DX broadcast stations, a common pastime in early days. It worked well on weak AM or spark amateur station signals, or even weak spark signals from ships at sea.

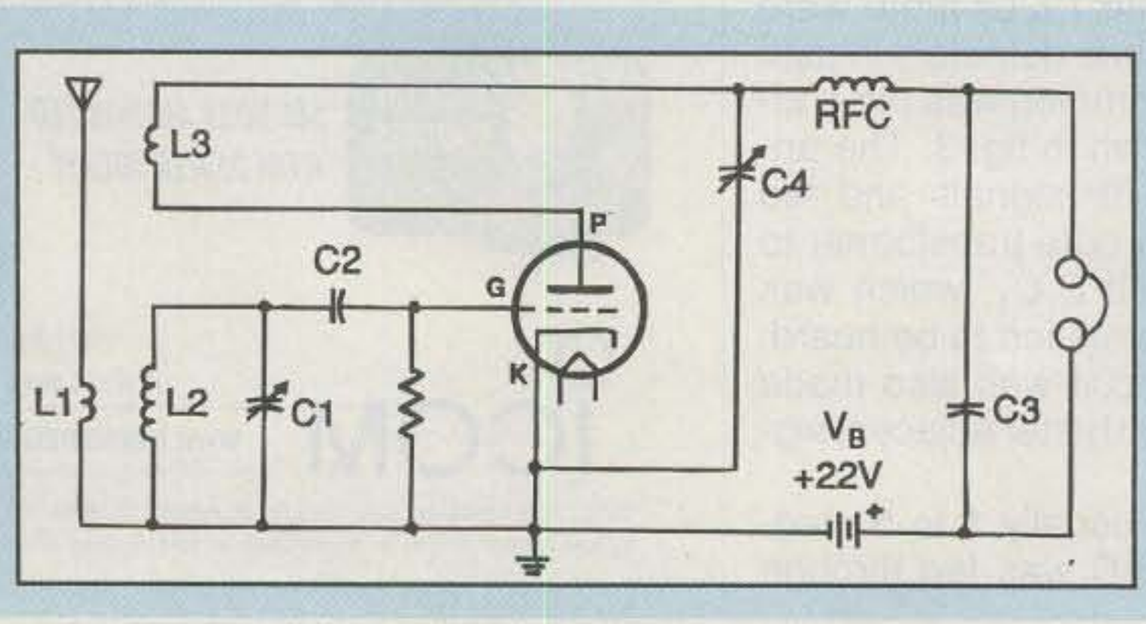

Fig. 4– Simple regenerative detector receiver.

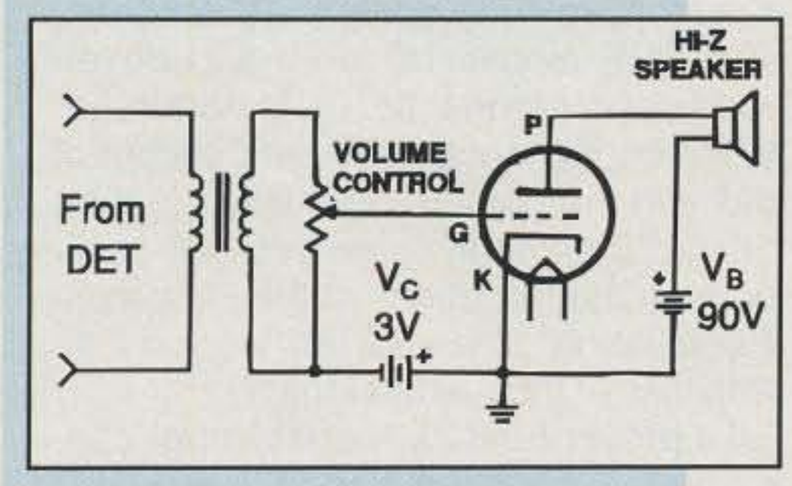

Fig. 5– Simple triode AF amplifier circuit.

When regenerative detectors were put into oscillation, their antennas radiated some of the RF energy the detector was generating. Such a radiated signal often interfered with the receivers of nearby neighbors. Radio operators standing watch at sea on the calling and distress frequency of 500 kHz (known as a wavelength of 600 meters then) often heard a weak whistle from some other ship's regenerative receiver get stronger and finally die out as the other ship, sometimes below the horizon, was being met or passed. During WW II German submarines homed in on some of those weak signals from ships using regenerative receivers in oscillation and monitoring 500 kHz. The result was the sinking of many of those vessels. Adding a one-way "RF amplifier," explained below, between the antenna and the oscillating detector prevented RF energy from the detector from being fed back to the antenna circuit.

Regenerative detectors in oscillation can be used to "heterodyne" incoming unmodulated or Continuous-amplitude Wave (CW) RF signals to produce a "beat" tone. Heterodyning means mixing or beating two frequencies together in one circuit to produce additional sum and difference frequencies. If in oscillation, a regenerative detector receiving a 7050 kHz CW signal can be tuned to 7051 kHz (or 7049 kHz) to produce a difference beat frequency of 1 kHz in the detector tuned circuit. The receiver thus detects and amplifies such a CW signal as 1000 Hz audio tones. It also develops a sum beat frequency of 14,101 kHz, but this frequency cannot be heard in the earphones. In other applications, however, such sum beat frequencies can be utilized. The abbreviation "CW" has come down over the decades to mean any dot and dash code signals.

Audio-Frequency Amplifiers

The disadvantage of vacuum-tube receivers having only normal detector cir-

cuits was the low-amplitude output of the received signals. Their high impedance (Z) plate circuits might have operated high-Z earphones fairly well, but they produced little signal output from a high-Z loudspeaker. An audio frequency (AF) amplifier stage or two was required to properly operate a loudspeaker.

A simple, single-stage VT AF amplifier circuit is shown in fig. 5. The primary of an iron-core AF transformer was connected in place of the detector's earphones. Across its secondary winding a "potentiometer" (a form of variable resistor) was connected. In the diagram, as its variable (arrowhead) contact was moved up the resistor, more of the secondary's AF AC was fed to the grid, varying the output I_p more, increasing the volume of the AF stage output. Had there been no negative bias voltage (which is provided by the 3 V "C-battery," or V_c, shown), the I_p developed by a 90 V "B-battery" would have been excessively high and distorted signals would have resulted. To reduce I_p to a desired value, V_c provided a negative bias voltage on the grid. The more negative the bias voltage the lower the plate current. With V_c added to the input signal voltage, signals could properly control the I_p to reduce distortion. A relatively small AF voltage variation between grid and cathode produced a relatively large I_p variation through the high-Z loudspeakers that were used in the early days and reasonably loud audio output resulted.

Later an audio transformer that had a high Z primary to match the high Z of the VT plate circuit was used, but it had a step-down ratio secondary to feed a low-Z 8 ohm loudspeaker, which was more efficient. Compared to what a loudspeaker produces from a crystal detector circuit, the output from a single-stage amplifier could be 10 dB or more louder (3 dB represents twice the power output.). If the input coupling transformer to the amplifier had a voltage step-up ratio of 1:2, the output of the stage could be increased by 6 dB more. Thus, a second AF amplifier stage could easily increase weak signals by 10 dB or more. Because a grid-leak detector had a greater output than a crystal set, it might operate a loudspeaker fairly well with only one AF amplifier. With the cost of vacuum tubes at around $4 to $7 in those days, equivalent to maybe $60 to $100 today, the fewer tubes used the better! People tended to group together close to their loudspeakers.

Radio-Frequency Amplifiers

Adding an amplifier stage *before* the detector provided several advantages. Such "RF amplifiers" were first developed using triodes (fig. 6). Unfortunately, the capacitance between the control grid and the plate (C_{gp}) inside the tube caused the circuit to go into self-oscillation at the frequency of the LC circuit. If oscillating, it would not work as an amplifier of incoming signals.

To prevent this, a "neutralizing" capacitor, C_n, could be added to feed just the right amount of out-of-phase RF AC from the output circuit back to the input circuit to stop the self-oscillation of the RF amplifier LC grid stage. The plate circuit air-core RF transformer primary coil was center-tapped to develop both a positive and negative voltage at the same time. With the center tap held at ground potential by C_3, at any one instant the top of the primary coil might be at RF positive, making the bottom 180 degrees out of phase, or RF negative. If such a "neutralizing" capacitance had the same value as the grid-to-plate capacitance, the amplifier would not oscillate. Later, tetrode and pentode (4- and 5-element) tubes had other grids between the control grid and the plate. If these grids were put at RF ground potential, they stopped the C_{gp} RF feedback present in triodes and no neutralization was needed.

Signals that were too weak to be picked up by a detector alone, with an RF amplifier, might be made strong enough to operate the detector and the AF amplifier(s). Adding an RF amplifier also meant that there were now two tuned LC circuits to narrow the bandwidth of the receiver, resulting in greater selectivity (ability to select between adjacent signals). As mentioned above, an RF amplifier also prevented any RF output from an oscillating detector from reaching the antenna and radiating unwanted signals to the neighbors. Receivers with one or more RF amplifiers were known as tuned-radio-frequency, or "TRF," receivers.

Spark Transmitters

The first transmitters used in radio were spark types. A diagram of a simple spark transmitter is shown in fig. 7. When the key was closed, power-line 110 V, 60 Hz AC would be fed to a transformer primary and was stepped up to several thousand volts high enough to cause a spark to jump the spark gap in the secondary circuit on each half-cycle of the AC. The surge of spark current through the primary of the air-core RF transformer induced a strong surge of RF current in the antenna. The antenna, being a high Q LC circuit itself, would oscillate

on its own resonant frequency for several decreasing amplitude cycles, called "wave-trains." If the power-line AC was 60 Hz, the resulting 120 wave-trains of RF per second was very harsh and unpleasant to listen to. If the power-line AC frequency was increased to perhaps 400 Hz, the gap would break down and spark across 800 times a second and excite the antenna into 800 wave-train oscillations a second, a much more pleasing tone.

Spark signals could be detected by crystal and simple triode detectors the same way amplitude-modulated voice and music signals were detected. Regenerative detectors in weak oscillation detected weak spark signals far better than any other detectors of that day. Since the frequency of the RF transmission was controlled by the resonant frequency of the antenna-to-ground circuit, the number of turns of the antenna coil controlled the transmitting frequency. To lower the frequency, the tap on the antenna coil in the diagram could be moved up the coil to provide more inductance in the antenna circuit. A major difficulty with spark signals was the broad bandwidth of their emissions. AM voice and music had bandwidths of about 10 kHz. Spark signals had local bandwidths of several hundred or more kilohertz. The closer the spark transmitter was to a receiver, the broader the apparent bandwidth. In the mid 1920s, with more radio signals appearing all the time, spark transmitters had to go. Amateur spark emissions became illegal in 1927, although spark transmitters were used aboard U.S. ships through the 1930s and on some foreign ships well into the 1950s.

Vacuum-Tube Transmitters

By the late 1920s vacuum tubes were being made that could put out hundreds and then thousands of watts of RF power. There were many popular oscillator circuits, such as the Hartley, Colpitts, Tuned-Plate-Tuned-Grid, Armstrong, TNT, and so on. All of these circuits had feedback developed in some way to make their LC circuits stay in self-oscillation to generate RF AC. The RF AC when coupled to an antenna radiated radio waves.

While in high school, the author's first transmitter used a type 210 triode vacuum tube, with a 7.5-V-filament as its cathode. It used a Hartley oscillator circuit with 200 volts E_p, coupled to a 40 meter Zepp antenna, shown in fig. 8. A hand key between cathode and plate-voltage negative was used to send CW. (If a finger happened to touch across the key contacts when the key was open, the operator received quite a thrill as the finger completed the electric circuit! This could be corrected by using a keying relay.) By substituting larger

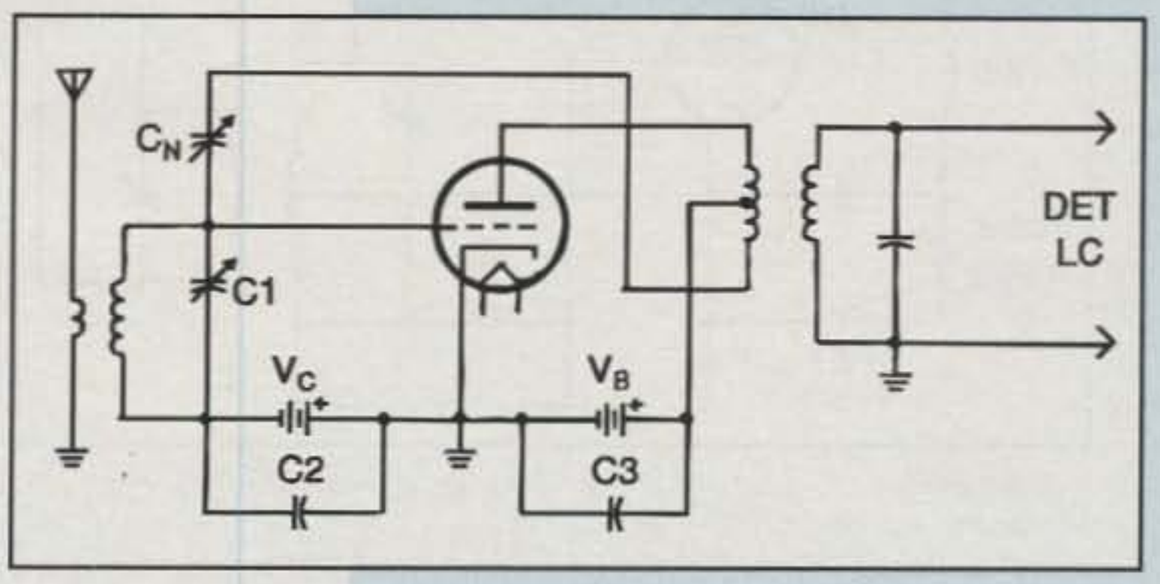

Fig. 6– Neutralized RF amplifier circuit.

coils the same transmitter could be used on the 80 or 160 meter CW bands. With smaller coils it could be used on the 20 and 10 meter bands. The higher the frequency of the oscillations, however, the more drift of frequency and the more that hand capacitance affected the LC oscillator's frequency. (Distributed capacitance increased if a hand approached an LC coil or capacitor.)

In the 1920s and earlier, the 40 meter band was from 7 to 8 MHz. If amateurs were using fixed frequency oscillator transmitters, after calling CQ it was necessary to tune across the whole 1 MHz to listen for answers! By 1930 the band was narrowed to 7–7.3 MHz, but with fixed tuned transmitters this still required 300 kHz of tuning. Today with tunable transmitters we may only tune a small fraction of a kilohertz from our calling frequency when looking for answers. Preferably the answering station should be zero-beat with the calling station to maximize band utilization—only one frequency for a QSO.

MOPA Transmitters

In the late 1920s transmitters improved, becoming master-oscillator-power-amplifiers (MOPA) types. They had an oscillator that was coupled, either capacitively or inductively, to an RF power amplifier (PA) stage. If the PA had 1000 VDC as the plate circuit voltage and was tuned to a resonant I_p dip of 150 milliamperes, the DC power input would be 1000×0.150, or 150 W. Since amplifiers averaged about

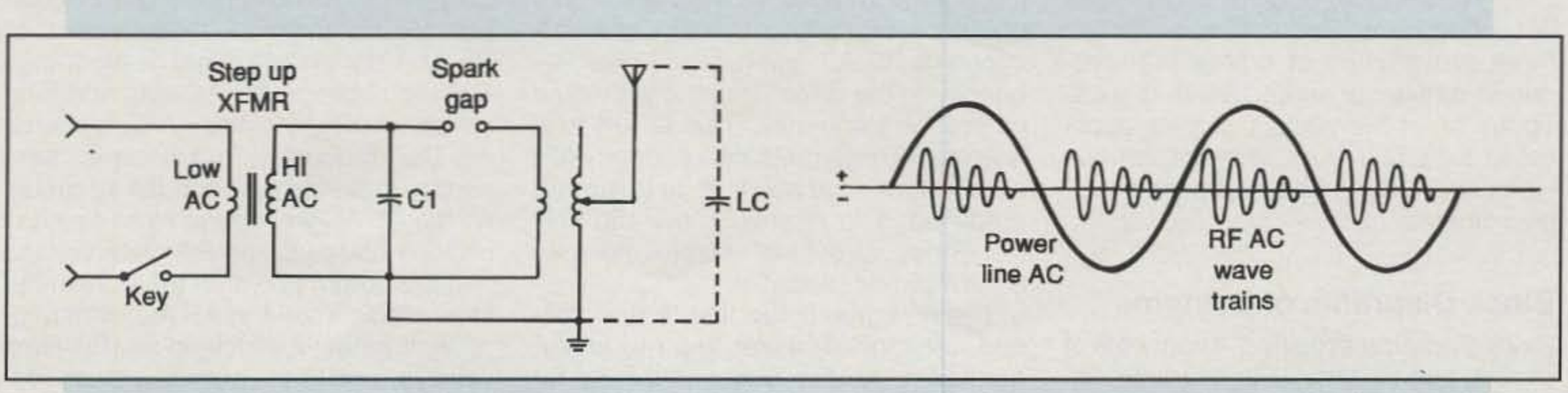

Fig. 7– Basic spark transmitter.

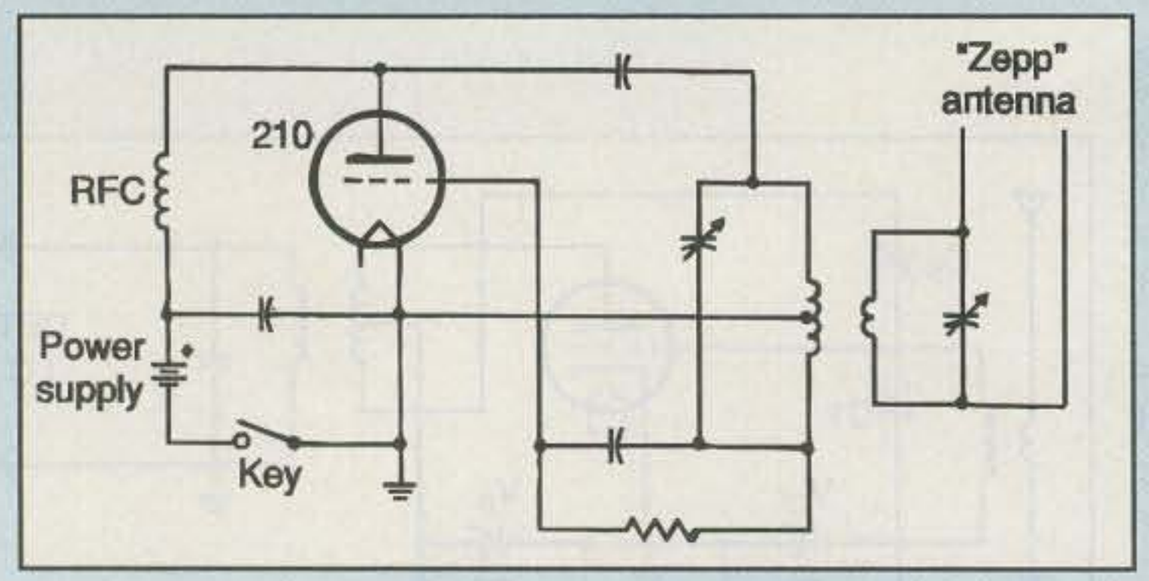

Fig. 8– Author's first Hartley oscillator CW transmitter.

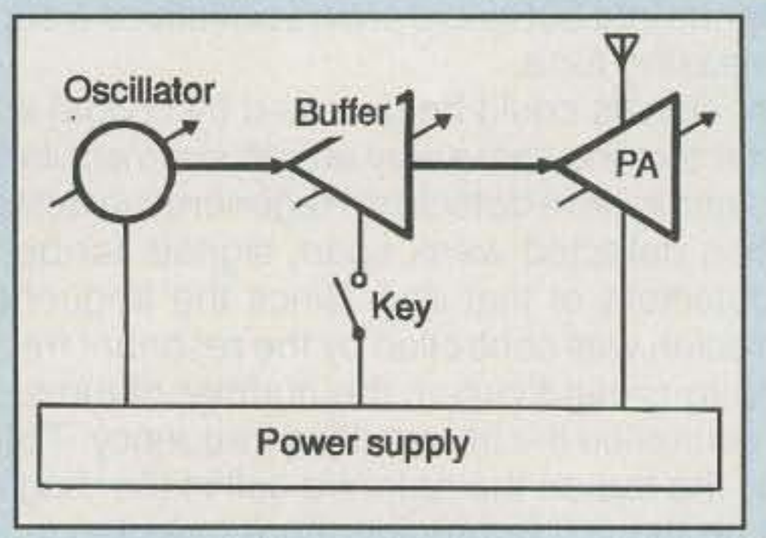

Fig. 9– Block diagram of an MOPA transmitter with an added buffer RF amplifier.

50% efficiency, the RF power output to the antenna would be about 75 W. By increasing the coupling to the antenna, more PA circuit I_p might be drawn and more power might be fed to the antenna. However, there is a maximum amount of coupling that should be used. At some point, increasing coupling any further does not increase power output, but it does increase unwanted harmonic radiation and heats the plate excessively.

Because the usual triode-tube RF amplifier circuits would break into oscillation on their own, they required neutralization. Even if neutralized, tuning a PA through resonance usually shifted the oscillator frequency somewhat. To better isolate the oscillator and to increase the drive to the PA, a low-power RF amplifier, called a "buffer" amplifier, was added ahead of the PA.

Originally, transmitters and receivers had their parts mounted on wooden "breadboards." In the '30s all radio equipment began to be built in metal boxes to shield their circuits from unwanted internal and external effects.

It should be understood that only the simplest popular circuits have been described here. For all circuits shown there are dozens of others that produced similar or even better results. Today all of the circuits can be duplicated by using transistors of various types and with much lower power-supply voltages.

Block Diagrams of Systems

Block diagrams simplify the concepts of circuits and systems. For example, fig. 9 is a block diagram of an MOPA, but with a buffer stage added. A circle can be used to designate an oscillator, a triangle as an amplifier stage, and labeled squares or oblongs for other things such as a power supply (PS). If an arrow is shown through any symbol it means the stage is tunable. The PS is shown with three different voltage outputs, maybe 50 V for the oscillator, 150 V for the buffer, and 1000 V for the PA. In this transmitter the buffer stage is being keyed, although any one of the three stages could be. It is assumed that heater or filament voltages for the cathodes of all tubes would also be supplied by the power supply, but they may not be shown in block diagrams.

A regenerative detector may also be termed a *heterodyne detector* since heterodyne means to beat two AC signals together. In the 1930s regenerative TRF receivers were giving way to superheterodyne receivers. The term *superheterodyne* infers two or more heterodyne or mixer stages. A block diagram of a very simple 7 MHz superheterodyne is shown in fig. 10.

Signals from the antenna are tuned to maximum amplitude in the grid circuit of an RF amplifier. They are then fed to a first detector or mixer stage tuned to the signal frequency. A tunable local oscillator (LO) adds or beats or heterodynes its RF AC against the signal frequency in the mixer stage to provide a difference frequency. This is fed to a fixed-tuned intermediate frequency (IF) amplifier, often at 450 kHz, to be further amplified. The relatively low 450 kHz frequency provides stable narrow-bandwidth amplification.

The IF signal is fed first to the "second detector" or mixer, then to an AF amplifier and to a loudspeaker. So far this explains an AM detecting superheterodyne receiver. To receive CW or SSB signals the beat-frequency-oscillator, or "BFO," (possibly termed "pitch" or "clarifier" today) must be switched on to feed its frequency to the second detector to heterodyne against incoming IF signals. This produces an audible beat frequency for CW signals, or supplies the missing carrier frequency of SSB signals to make them readable. For simplification, power supplies are not shown.

From about 1910 up to the 1930s, amateurs might have used single-button microphones, first attached to a turn or two of wire coupled into the antenna circuit of a CW-type transmitter to produce "loop modulation." Loop modulation produced both amplitude and frequency modulation of the RF output of an oscillator. Many a ham's nose was burned by RF when it was brought too close to those metal RF-hot carbon button microphones! Loop modulation only produced a low percentage of modulation, resulting in weak detected signals.

Later, amateur radiotelephone transmitters used a fairly high-powered AF amplifier to amplify the weak microphone signals. Fig. 11 shows in block diagram form how the most popular type of plate amplitude modulation of an RF amplifier system might be produced. The high-voltage AF AC was added to the plate voltage of the PA by connecting the "modulator" transformer secondary in series with the PA I_p circuit. As the AF AC went positive on one half cycle, it added to the PA plate voltage and the output power of the transmitter increased. When the AF AC went negative, it partially canceled the PA plate voltage and the output power decreased. A high percentage of modulation, up to 100%, could be produced, which resulted in loud received signals.

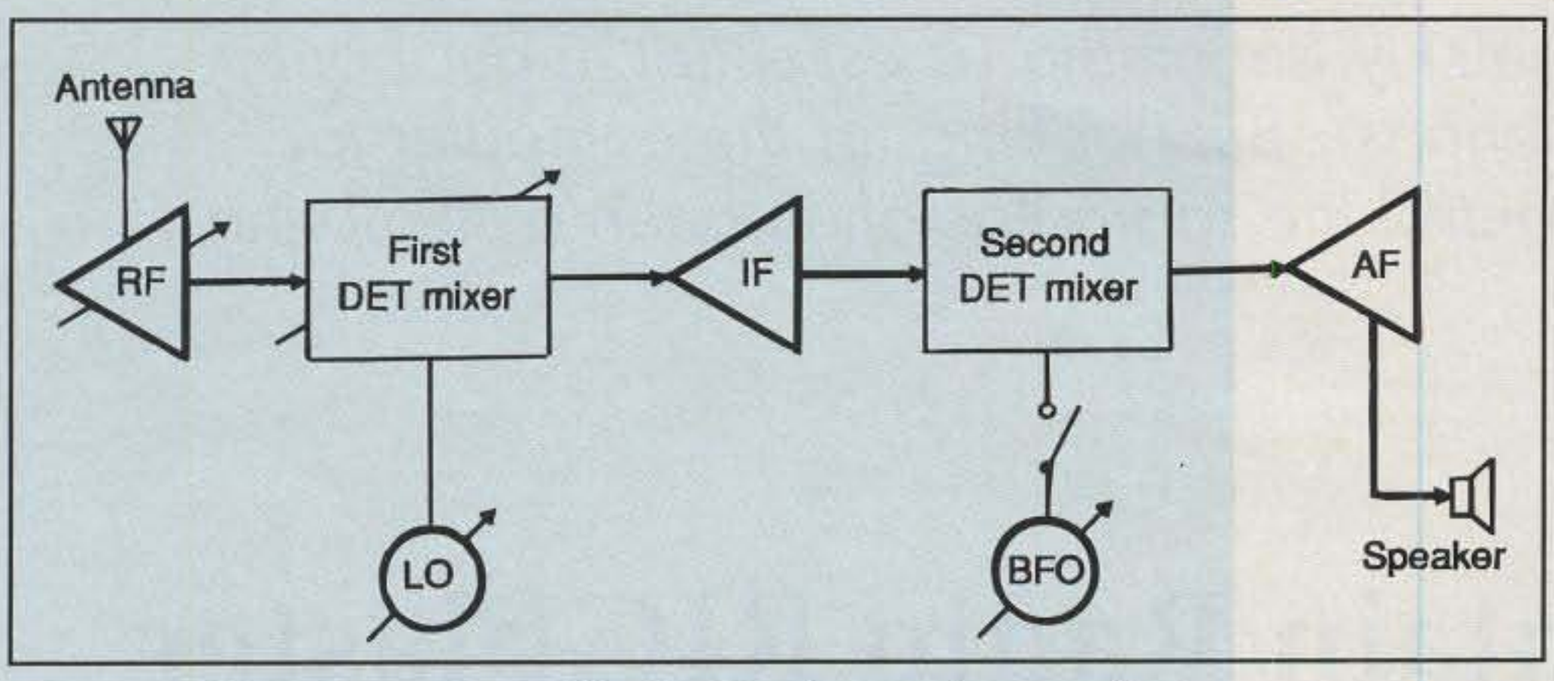

Fig. 10– Block diagram of a simple superheterodyne receiver.

Amateurs also tried out many other types of AM, such as grid, screen grid, suppressor grid, and series modulation, as well as anything else they could think of. They began experimenting with small transmitters and receivers in automobiles, using whips and other antennas, but had to home brew everything because there were few, if any, of the required parts available in the early years up to about 1925.

After the war amateurs began getting a lot of surplus war equipment. Some could be used as purchased. In most cases they were rebuilt to operate in the amateur bands. In the mid-1950s amateurs began using second-hand teletypes for radio teletype (RTTY) communications, often building their own oscillator frequency-shifting circuit with its two-frequency filters for the terminal unit circuits. However, single-sideband (SSB) communication (first known as single-sideband-suppressed-carrier, or SSSC) suddenly became popular because of its narrow bandwidth and better response to fading signals. Some amateurs experimented with FM transmitters and receivers, but since FM required broader bandwidths than AM, they were limited to the 28 MHz and higher frequency bands.

All of a sudden state-of-the-art transmitting and receiving equipment became too complex for the average ham to build, starting the buy-it-already-built era in which we are living today. It is too bad that so few amateurs have the chance to experiment and build equipment from scratch today. The closest thing for most is to buy kits and learn how to use a soldering iron, bolt a chassis together, and tune up. Most kits today involve ICs that may have hundreds or thousands of transistors and diodes in them, many having pre-wired boards, and many even having some or most of the parts already soldered in. However, it is still possible to home-brew simple CW transmitters and regenerative receivers as described above if the parts can be rounded up.

One of the greatest thrills of this OT's life was the first CW contact made using a completely home-brewed transmitter and receiver. Of course, there is still a lot of home brewing of antennas, and that will always be a most important phase of sending and receiving amateur radio signals. ■

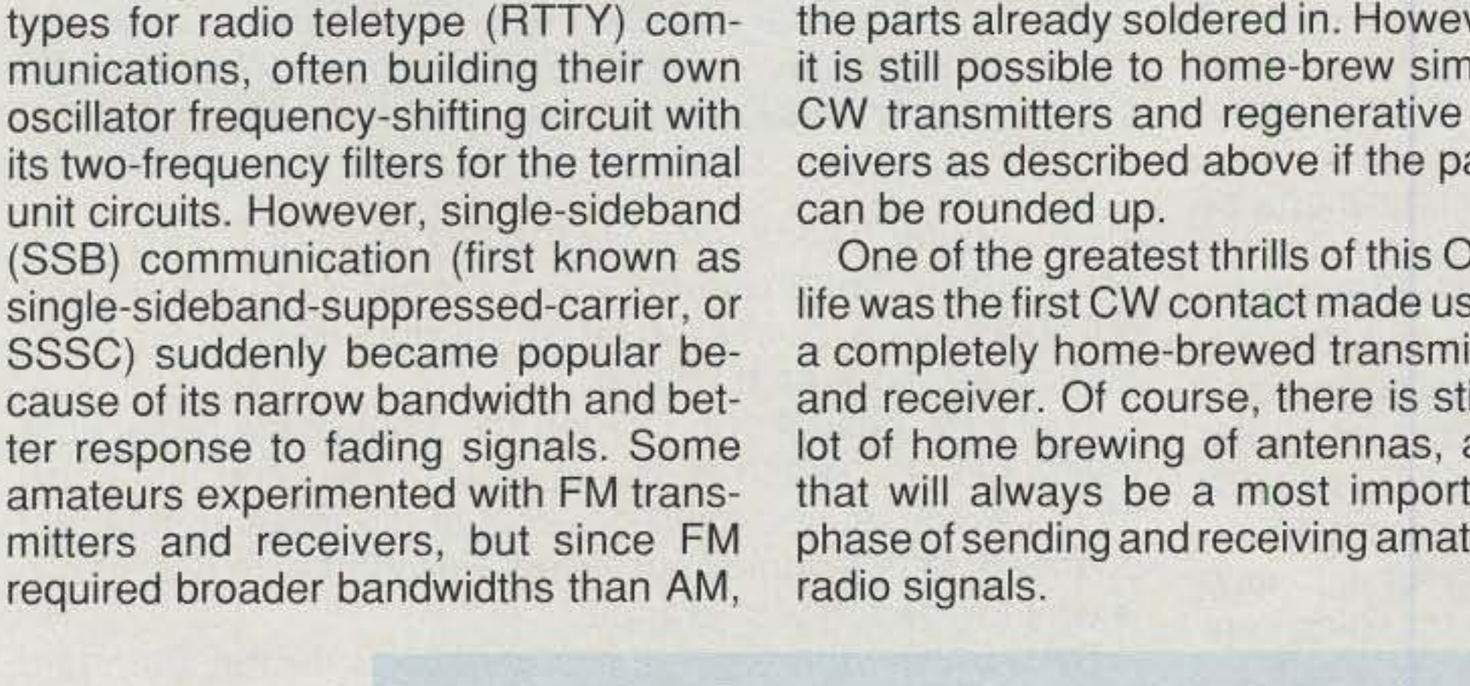

Fig. 11– Block diagram of a plate-modulated AM PA.

Personal computers are quickly becoming as essential in our ham shacks as radios and antennas. But hooking up the computer to communicate with and control the radio has often been a stumbling block. Not anymore...

CQ Reviews:

West Mountain Radio RIGblaster and RIGblaster Plus

BY RICH MOSESON,* W2VU

"Oh, cool! It's just like instant messaging!" exclaimed my daughter as she sat at the computer keyboard, having a PSK31 QSO (mostly about horses) with a ham in Florida and his granddaughter. One of the drawing points for getting more kids into ham radio today is HF digital communications—instant messaging, if you will—with people all over the world (and without tying up the phone line for hours at a time). Computer sound cards have put amateur digital communications within the range of just about any ham with a radio and a computer. But connecting the radio to the computer can be a challenge, especially for those hams whose skills lie more in the analog world than the digital. Well, the folks at West Mountain Radio heard your cries of frustration and have solved the problem for you.

West Mountain's "RIGblaster" and now, "RIGblaster Plus," have taken the world of amateur digital communications by storm. It's a rare station whose "brag list" of equipment doesn't include one of these interface boxes. Why? Because the RIGblaster is reasonably priced, simple to install and use, and most importantly, it works. But what exactly does it do?

The RIGblaster brings together in one small box all the cabling and switching that the average ham needs to switch back and forth between using a microphone and using a keyboard to communicate. It also provides routing for incoming audio cables that need to feed both a speaker for voice contacts and the computer for digital QSOs. Better yet, it detects whether you're switching on the transmitter from your microphone or your computer and automatically opens that channel for communication with the radio. No switching is required in most cases.

The "Plus" model, introduced at the 2001 Dayton Hamvention®, adds a front panel headphone jack and a separate PTT in/out jack on the back. This jack may be used in one of two ways. First, you may connect a foot switch to key your transmitter on and off. Second, you may connect a cable from this jack to an external device, such as a linear amplifier or sequencer that needs to be keyed on whenever the transmitter is keyed on. The Plus model also has a "key out" jack on the rear panel. This is for software that switches your transmitter on and off directly from the computer's serial jack via the key input or FSK port on your radio (other programs using the mic input actually put out audio tones, giving you MCW, modulated CW, or AFSK, audio frequency shift keying).

The RIGblaster (bottom) and RIGblaster Plus (top) from West Mountain Radio. See text for differences in features between the two models.

That new headphone jack on the front panel replaces a "left/right/both" switch on the original (now called Standard) model which let you send different audio tones to different channels for full duplex operation. Few hams do this, which is why the switch was dropped.

By the way, there are three variations on the Standard model. One comes with an RJ-style modular mic plug on both input and output, another comes with an 8-pin round connector, and another comes with a 4-pin round connector. Pick the one that matches the mic jack on your rig. The RIGblaster Plus comes with the modular plug as standard output and your choice of cables to match your rig's mic connector. The only mic *input* jack on the Plus is an 8-pin, which is the most common (if your mic has a different jack, you'll need to go with the Standard instead of the Plus).

There's also a "NoMic" version, without a mic connector, for people who plan to operate digital modes exclusively and don't need to connect a microphone.

The Plus communicates with your computer via a DB-9 serial port rather than the DB-25 serial port found on the Standard model. This was changed in order to make room for the additional jacks on the back panel. The correct cable comes with each model, so there's no problem. However, be careful that

*Editor, CQ
e-mail: <w2vu@cq-amateur-radio.com>*

MFJ *Apartment* Antenna

Covers 40 thru 2 Meters . . . Mounts outdoor to windows, balconies, railings . . . works great indoors mounted to desks, tables, bookshelves

MFJ-1622
$99.95
New!

New MFJ-1622 Apartment Antenna lets you operate 40 thru 10 Meters on HF and 6 and 2 Meters on VHF with a single antenna!

Its universal mount/clamp lets you easily attach it to window frames, balconies and railings. It also works great indoors mounted to a bookshelf, desk, or table. It's not a 5 element yagi, but you'll work your share of exciting DX!

Highly efficient air wound "bug catcher" loading coil and telescoping 5½ foot radiator lets you really get out! Radiator collapses to 2½ feet for easy storage and carrying.

It includes coax RF choke balun, coax feed line, counterpoise wire and safety rope. Handles 200 Watts PEP.

Operating frequency is adjusted by moving the "wander lead" on coil and adjusting counterpoise for best SWR.

MFJ Ground-Coupled Portable Antenna Base

Provides effective RF ground and stable mount for vertical antennas . . . Antennas radiate well with low SWR

MFJ-1904
$99.95
New!

MFJ *Ground-Coupled Portable Antenna Base*™ provides an *effective* RF ground 160 through 2 Meters and a stable mount for vertical antennas.

Capacitive coupling to ground is a *time-proven* principle. It needs no tuning and antenna radiates well and gives good SWR on all bands. Performance is similar to mobile stations when using a mobile antenna but is far better with longer antennas.

The base can support a lightweight multiband vertical antenna -- like the all band Hy-Gain 18AVS and the bandswitching MFJ-1795 -- and provide a semi or permanent installation.

You can easily set up and take down vertical antennas for stealth operation and hide the base by covering it with dirt.

The MFJ-1904 is a 2x2 foot *stainless steel* square with reinforcing bends that greatly strengthens it. Folded and tapered six-inch *stainless steel* legs firmly anchor the MFJ-1904 into the ground.

Built-in antenna mount with SO-239 coax connector and two U-bolts lets you mount most standard and homebrew vertical antennas.

Standard 3/8-inch x 24 mobile mount is built-in for MFJ Mobile Whips, bug catchers, *Hustlers* and screwdriver antennas.

Two handles make carrying and removing the base fast and easy. You can also attach radials for improved performance.

33 Feet Telescoping fiberglass Mast . . .

Collapses to 3.8 feet, weighs 3.3 lbs.

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Rear view of the RIGblaster (bottom) and RIGblaster Plus (top) show additional jacks added on the Plus version. See text for details.

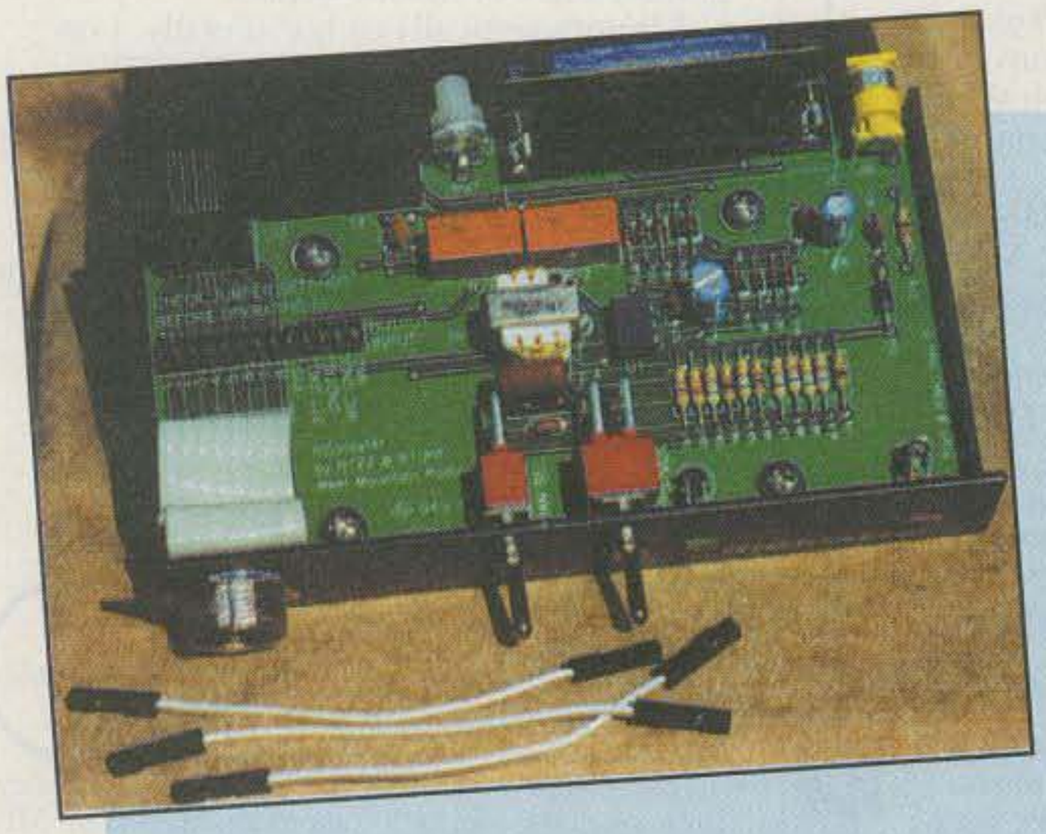
you hook up to the same "Com" port on your computer that you have configured to communicate with the RIGblaster.

The computer in my shack has two serial ports, one of which is used by the mouse. Somehow, I managed to swap the cables. I was having problems with the mouse freezing up whenever there was a signal from the radio coming into the computer, and I couldn't get the computer to switch my transmitter on and off. When I put the RIGblaster in "Auto" mode, it locked the rig on transmit. The audio came through fine, so I never suspected a cable problem (which is really dumb in hindsight, since the audio travels on its own cables to the sound card). I had to switch the transmitter on and off by hand, and it was driving me crazy (along with the folks at West Mountain, who couldn't figure out what was going wrong). Finally, out of desperation, I swapped the mouse cable and the RIGblaster cable. Lo and behold, both the RIGblaster and my mouse worked perfectly! Lesson: Make sure you hook up your cable to the correct computer port.

When VOX Isn't Really VOX

The one front panel switch common to both the Standard and Plus versions of the RIGblaster is marked "Auto" and "VOX." This doesn't mean what it seems to at first glance and it's important to understand what each setting does. For most uses, you'll be leaving the switch in the "Auto" position. The unit will sense whether keying commands are coming from the mic or the computer and will shut off the inactive channel. Pressing the PTT (Push-To-Talk) switch on your mic will *always* key your transmitter and turn on your microphone. West Mountain calls this its PTT Override feature. Your rig's VOX (Voice-Operated Switching) circuit for voice contacts should also work just fine with the RIGblaster in the "Auto" position, but *not* in the VOX position.

Switching the RIGblaster into "VOX" will actually *disable* your ability to use VOX on your microphone. This position is used when, for whatever reason, your computer's normal switching commands are not being understood by your radio. In this case, switching on the VOX on your radio and flipping the RIGblaster switch to VOX will allow the audio coming from the *computer* to switch on your transmitter via the VOX circuit. But to protect against accidental voice keyups, *the mic is disconnected* from the circuit when the RIGblaster is in the VOX position. Again, though, the PTT override feature takes precedence, so you may make voice contacts by manually keying your mic, even when the RIGblaster is in the VOX setting.



Interior view of the RIGblaster, with three of the jumpers you'll need to install on the left side. Arrangement of the jumpers varies with the type of radio you're using.

Starting With Receive

The manual strongly urges you to install your digital communications software and make sure that received signals are being properly received and decoded before you set up the RIGblaster itself. The unit comes with a CD containing software for various digital modes, including Baudot RTTY (radioteletype), PSK31, Hellschreiber, VHF packet, SSTV and a host of others. West Mountain has just released Version 5 of its CD, with updated programs, including the hot new meteor scatter mode, WSJT (If you already have a RIGblaster with a previous version of the CD, you may go to the West Mountain website, click on Links, and go to get the latest versions and new offerings). Most of the programs on the CD are either freeware or shareware, so once you find a program you like, you *may* have to pay the authors a registration fee. If you find you're really enjoying yourself, you'll want to do this anyway, because many of these programs are constantly updated and the latest versions are available only to registered users. The West Mountain CD also includes a variety of other handy software, including two digital voice programs for contesting (and a CW contest program), electronic logbook programs, a repeater controller/voice message program, and much more. Plus, it's set up to let you install the programs of your choice with a single mouse click—no unzipping, etc. The CD may be as valuable as the RIGblaster itself!

But back to the RIGblaster. Pick some software based on the type of digital communications that interests you and the type of operating system on your computer. Install it. Connect a cable from your rig's audio out jack to your sound card's line in jack (if you must use speaker-level audio rather than line-level, you may need to plug into the sound card's mic jack). This line does *not* go through the RIGblaster. Turn on your radio and tune around for some digital signals (on 20 meters, the neighborhood within 30 kHz either side of 14.100 MHz is generally good hunting ground), and see if words start to appear on your computer screen. A good starting point for PSK31 is 14.07015 (if your VFO is that precise). Then lock your tuning dial and just use your mouse to select signals on your computer screen. On a typical evening or weekend day, there should be plenty to choose from. And of course, there's much more out there than PSK31. If you're a VHFer, you've got to check out WSJT and a whole new dimension of working meteor scatter (see N6CL's "VHF Plus" column in the October, 2001

issue of *CQ* for an introduction to WSJT).

A couple of notes here: First of all, even if gibberish appears on your screen in a sequence matching a signal, then the connections and software are probably working OK. If you've never tried to tune in digital signals, it can be quite a challenge, first of all identifying what type of signal you're hearing (you'll soon learn to differentiate between Baudot RTTY, PSK31, Packet, etc.) and then tuning it in precisely. If your rig is capable of fine tuning in the 10 Hz range, it will help. Much of today's software also helps, either with tuning guides that show you on-screen when the signal is properly tuned in, or with so-called waterfall displays that let you click your mouse on a visual depiction of the signal and fine-tune the radio for you. Click on the center of the signal. Expect a lot of trial and error, though, as you get started. And if possible, start out operating with a friend who's already familiar with HF digital and who can tell you which signals match the mode your software decodes.

(A couple of tips: On a "waterfall" display, a PSK31 signal will be a single vertical line with fuzzy edges, while a Baudot RTTY signal will consist of two parallel lines. A single line with sharp edges is usually a dead carrier. Also, while it used to be common practice for digital modes to use LSB on all HF bands, it now seems that USB has become the standard, at least on those bands where USB is the voice standard.)

Another cool thing to try: slow-scan TV. There's software on the CD. Even if you don't have anything to send, you can still tune to 14.233 MHz (the main HF SSTV frequency) and monitor what people are sending to each other. Watching images from all over the world slowly appear on your computer screen is unlike anything else you've tried in ham radio. Guaranteed.

Setup and Installation

Once you're receiving OK, getting your RIGblaster up and running is relatively easy and straightforward. You will need to install some computer-type jumpers on a strip inside the unit. For this reason, the RIGblaster ships without the cover being screwed on! You must remove the cover and put in the jumpers in order for it to work. Basically, the jumpers make sure the PTT, Audio, and Ground lines from your microphone continue to match up with the correct pins on your rig's mic jack, and bring in the computer audio and switching lines to the same pins. The process is explained well in the manual and there are diagrams for hooking up many popular radios. You should check the wiring against your rig's manual to be sure all the pin number assignments match those in the RIGblaster manual. If your rig isn't listed, several more are on West Mountain's website support page (<http://www.westmountainradio.com/support.htm>), which also includes additional helpful information.

Once you've got the jumpers set, close up the cover, plug in your mic, the RIGblaster-to-mic jack cable, the audio output of your computer sound card and, if desired, your computer speakers. (You should already have run a cable from your rig's audio out jack to the sound card line input. Again, this does not run through the RIGblaster.) Then plug in the "wall wart" power supply and you should be on your way. An interesting note here: There is no power on/off switch on the RIGblaster. According to the manufacturer, the unit uses so little power in standby mode that it would take 60 years at average electric rates for your added electricity costs to equal the cost of an additional switch!

The only adjustment on the RIGblaster is audio level output control. It's pre-

set at the maximum setting, so you may need to turn it down. The typical setting is 1/4 of maximum. Before touching the output level control, though, you should optimize the mic gain and speech processor settings on your rig for normal SSB operation. The RIGblaster manual explains how to set up the audio level control on the interface, along with the levels on your computer, for the best audio and about 50% RF power out (since many HF digital modes are "key-down," it's generally advisable to reduce your power output to avoid damaging your final amplifier).

If you do have problems, both the manual and the website have excellent troubleshooting guides. Please consult these resources before contacting the manufacturer for help. And if you do end up calling, please keep in mind that in the vast majority of cases, the problem is in the way you've hooked up something or set up some parameter, not in the RIGblaster unit itself. There simply isn't that much stuff in there to not work.

Using the RIGblaster

Using the RIGblaster is basically the same whether you're using the original (Standard) model or the Plus version. Once everything is hooked up and you've confirmed that the software is working properly, it's time to make some contacts. If you're brand new to this stuff, again it's best to make a sked with another ham who's already experienced (and if you're trying meteor scatter with WSJT or the high-speed CW software, a sked is almost a necessity). If you don't know someone who's already active in these modes, then start by tuning around looking for a station calling CQ or finishing up a QSO. Then call that station. I suggest this instead of calling CQ yourself because it will give you a better chance to make sure all your settings are correct. If you call CQ and get no answer, it could just be that no one is listening. If you call a station you know is there and get no answer (and he doesn't call someone else who may have beaten you to the punch), that would suggest you need to re-examine your settings. Plus, since it seems that every other ham you contact on any HF digital mode is *also* using a RIGblaster, you may be able to get immediate help with any questions you still have, plus a detailed signal report.

Note that I didn't tell you what to *do* with the RIGblaster in order to use it. That's because, if everything is hooked up properly, you won't have to *do* anything. All switching should be taken care of automatically. It will be more important to learn how to tell the software to switch your transmitter on and off (each program has its own way, but most are pretty simple to learn).

My recommendation? Well, I've only dabbled in HF digital before this, and I've never gone beyond receiving on SSTV and meteor scatter, so perhaps it's best to listen to more experienced operators. And I've been amazed to find that, no matter whom I talk to, no matter where in the world they are, there's an excellent chance that they're using a RIGblaster between their radios and their computers. That alone should speak volumes.

List price for the RIGblaster Plus is $139.95, including power supply, all cables—no less than four—and software CD. RIGblaster Standard is $109.95 complete (as above), and the NoMic version is $59.95 (as above, minus the power supply as none is needed). You may order from your favorite dealer or directly from West Mountain Radio, 18 Sheehan Avenue, Norwalk, CT 06854 (telephone: 203-853-8080; fax: 203-299-0232; e-mail: <sales@westmountainradio.com>; and on the web: <http://www.westmountainradio.com>.

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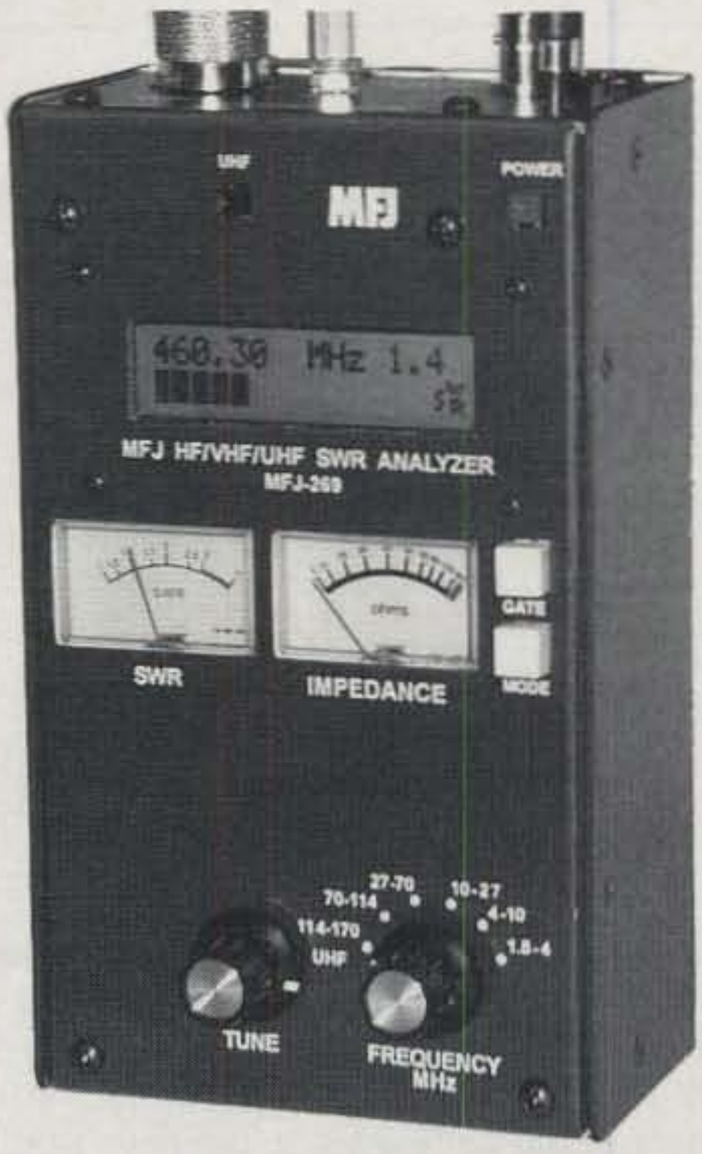

You can test and tune stubs and coax lines. You can manually determine velocity factor and impedances of transmission lines.

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Select a band and mode. Set frequency. Your measurements are instantly displayed! Smooth reduction drive tuning makes setting frequency easy.

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Has clear protective window for frequency display and cutouts for knobs and connectors -- use your MFJ *SWR Analyzer*™ without ever taking it out of your case. *Authentic MFJ leather logo distinguishes the real thing from imitators!*

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Okay, so that new vertical of yours gets out like a dummy load! Well, before digging up the backyard to bury hundreds of radials, you might want to consider the latest thinking on earthing (grounding) systems. It could just save you an aching back and lots of $s.

What on Earth?

BY PHIL HARMAN,* VK6APH

In Australia and a few other English-speaking countries, "ground" is referred to as "earth" and "grounding" as "earthing." While we'd normally Americanize such terms to prove our macho superiority (and help those of you who can't figure out that "whilst" and "while" mean the same thing), a title of "What on Ground?" just wouldn't cut it, so we left the text in its original Australian ... whilsts and all. — ed.

Most of us were brought up to believe that we need to have an extensive earth system in order to radiate an effective signal from a vertical antenna. Virtually all the antenna design books warn against operating low-band verticals with anything short of hundreds of buried radials accounting for miles of copper wire. However, what if there was another way to get a quarter-wave vertical to perform at peak efficiency with just a few, very short radials? From professional results and amateur experimentation, it is starting to look as if a half mile of copper buried in your back garden may *not* be the only way to go *(Note that this discussion is about quarter-wave verticals, not the half-wave "no-radial" verticals offered commercially—ed.).*

A Bit of History

The concept of using the earth as part of an antenna system can be traced back to the early days of radio when Marconi was using very-long-wave communications (wavelengths of thousands of meters). These early experiments formed the basis of our heritage, and it was natural that we carry on the practice for wavelengths of 200 meters and down.

**45 Ventnor St., Scarborough, WA 6019 Australia*

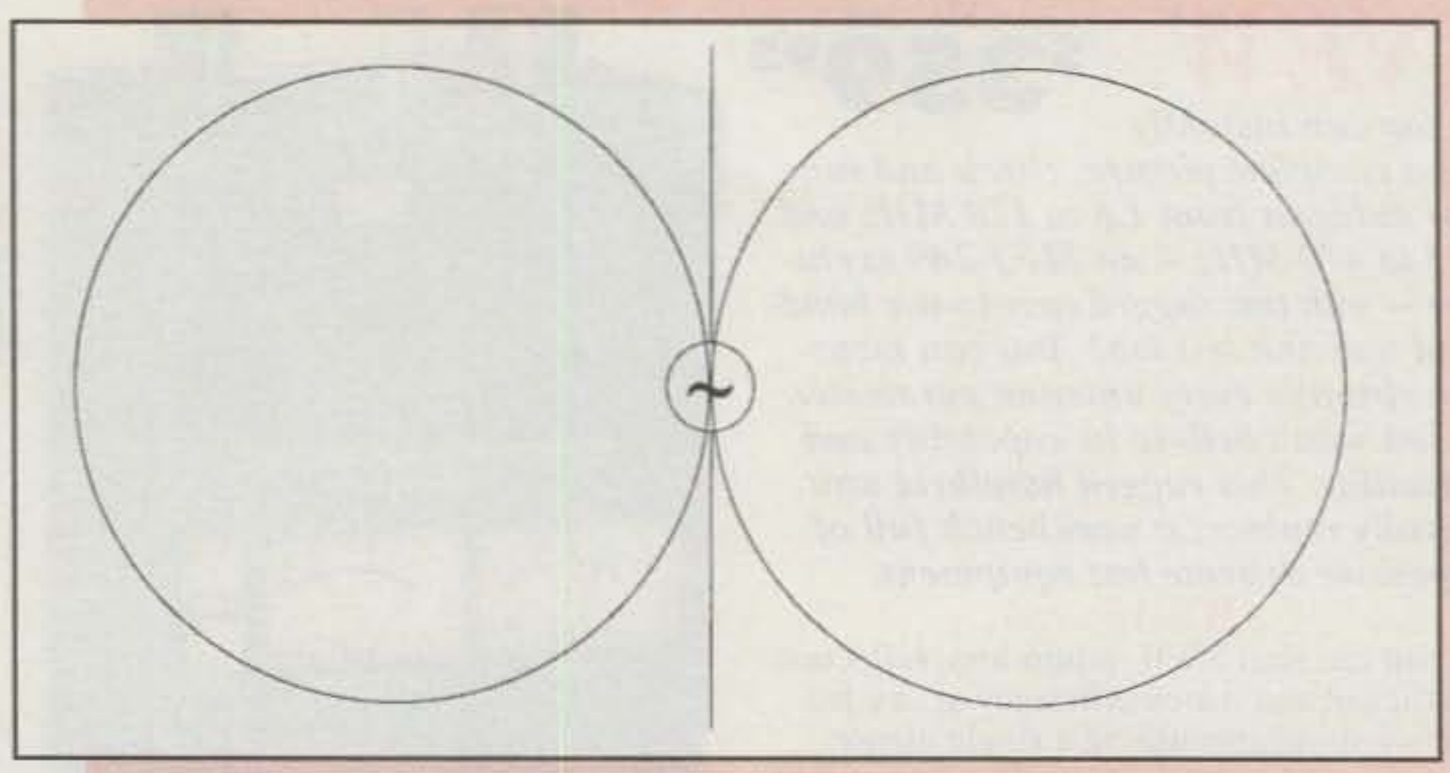

Fig. 1– Radiation pattern of a half-wave dipole in free space.

What's not generally recognised is that the shorter the wavelength, the less efficient and less appropriate it becomes to use the earth as part of the antenna system. To some extent, we have been led astray in carrying on long-wave practices into the short-wave region.

If radio had developed from the dipole-like antenna structures of Hertz, who in the pre-Marconi era experimented with spark equipment on very short wavelengths, it is possible that the concept of using the earth as part of a tuned antenna (e.g., vertical at ground level) never would have caught on.

A number of amateurs in the 1920s appear to have recognised the value of antenna systems not directly connect-

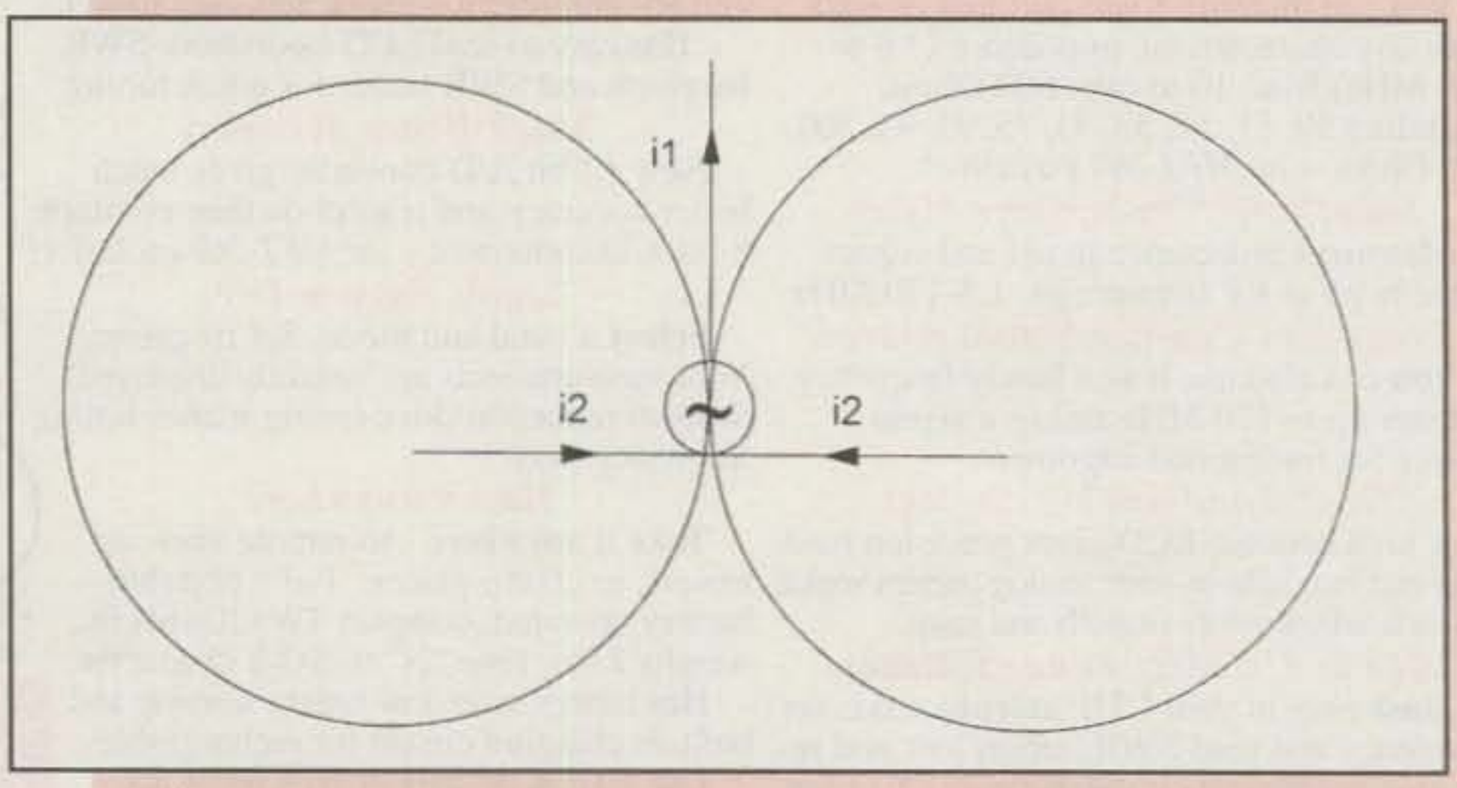

Fig. 2– Radiation pattern of a ground plane in free space.

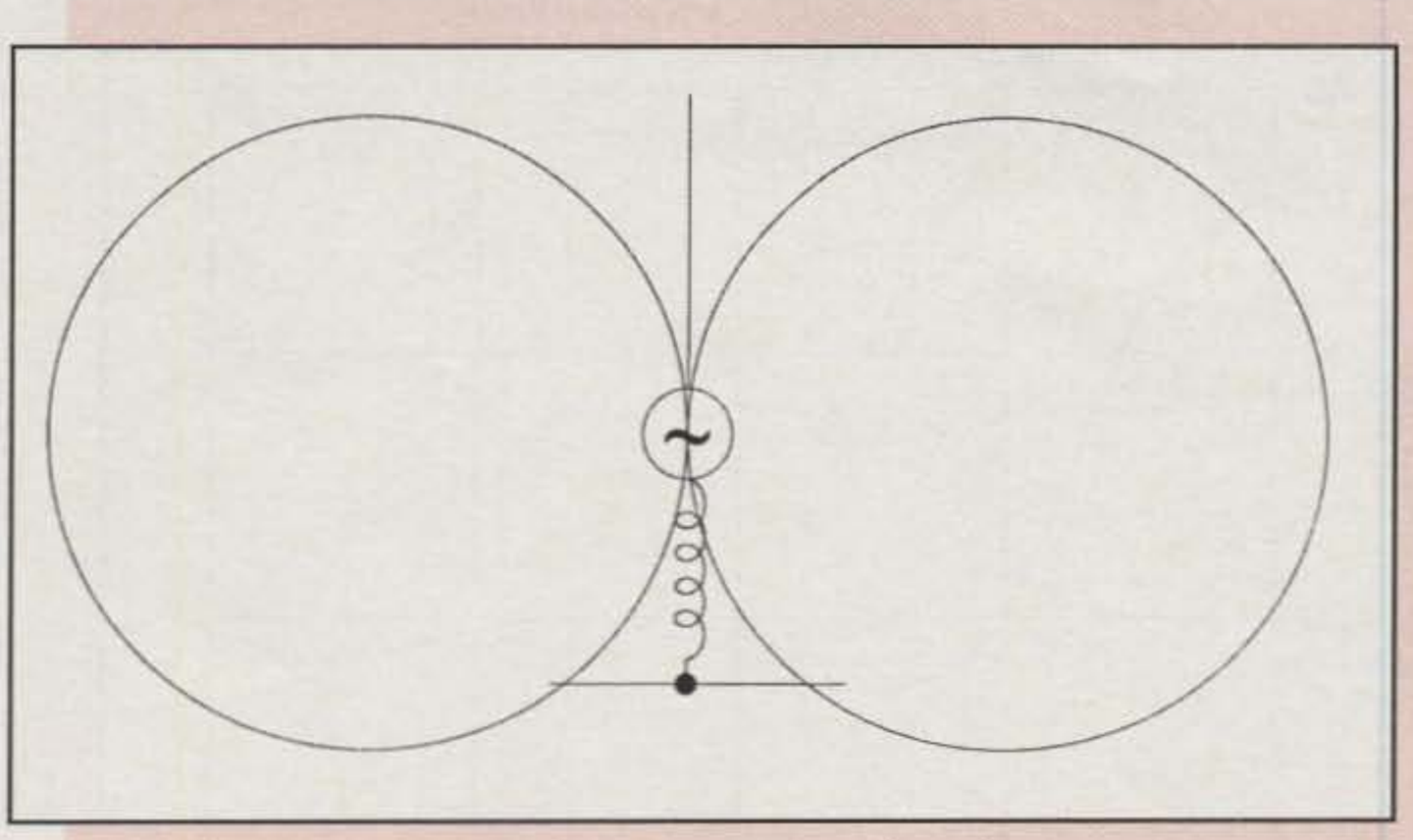

Fig. 3– Loaded radial ground plane in free space.

ed to the earth, and it is in this era that the "counterpoise" approach appeared. It would seem that over the years amateurs in general have been using very long-wave techniques for short-wave radio and paying the price in terms of inefficiency and unpredictability. In fact, Jack Partridge, 2KF, who was the first British amateur to make contact with the USA on 200 meters, used an inverted-L antenna and a wire counterpoise some 7 ft. above the ground. The single-wire counterpoise remained popular in the 1930s until, largely due to the classic study of medium-wave antennas by Dr. George Brown (the inventor of the ground plane, amongst other antennas), using large numbers of buried radials became the done thing.

Even George was not immune to outside influences, though, since it is often reported that his prototype ground plane actually consisted of two quarter-wave radials. It was on the insistence of the marketing department that the first commercial ground-plane antennas used four radials—to make them "look more symmetrical."

Why on Earth?

Why do we need an earth system for a vertical antenna anyway? Let's make our starting point for this explanation a vertical half-wave dipole in free space, or at least far enough away from the ground that the latter has no effect (see fig. 1). The radiation resistance at the

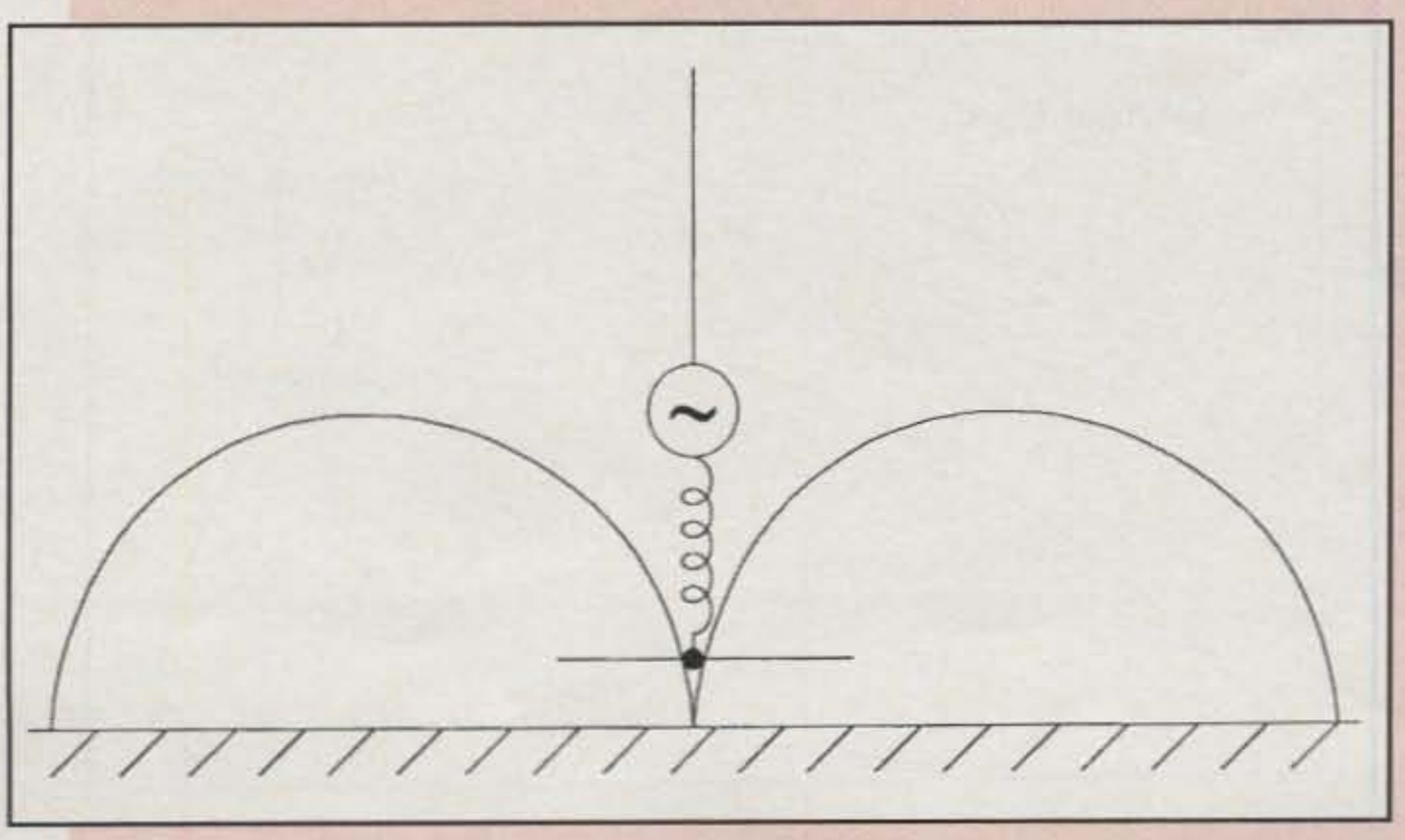

Fig. 4– Loaded radial ground plane over perfect earth.

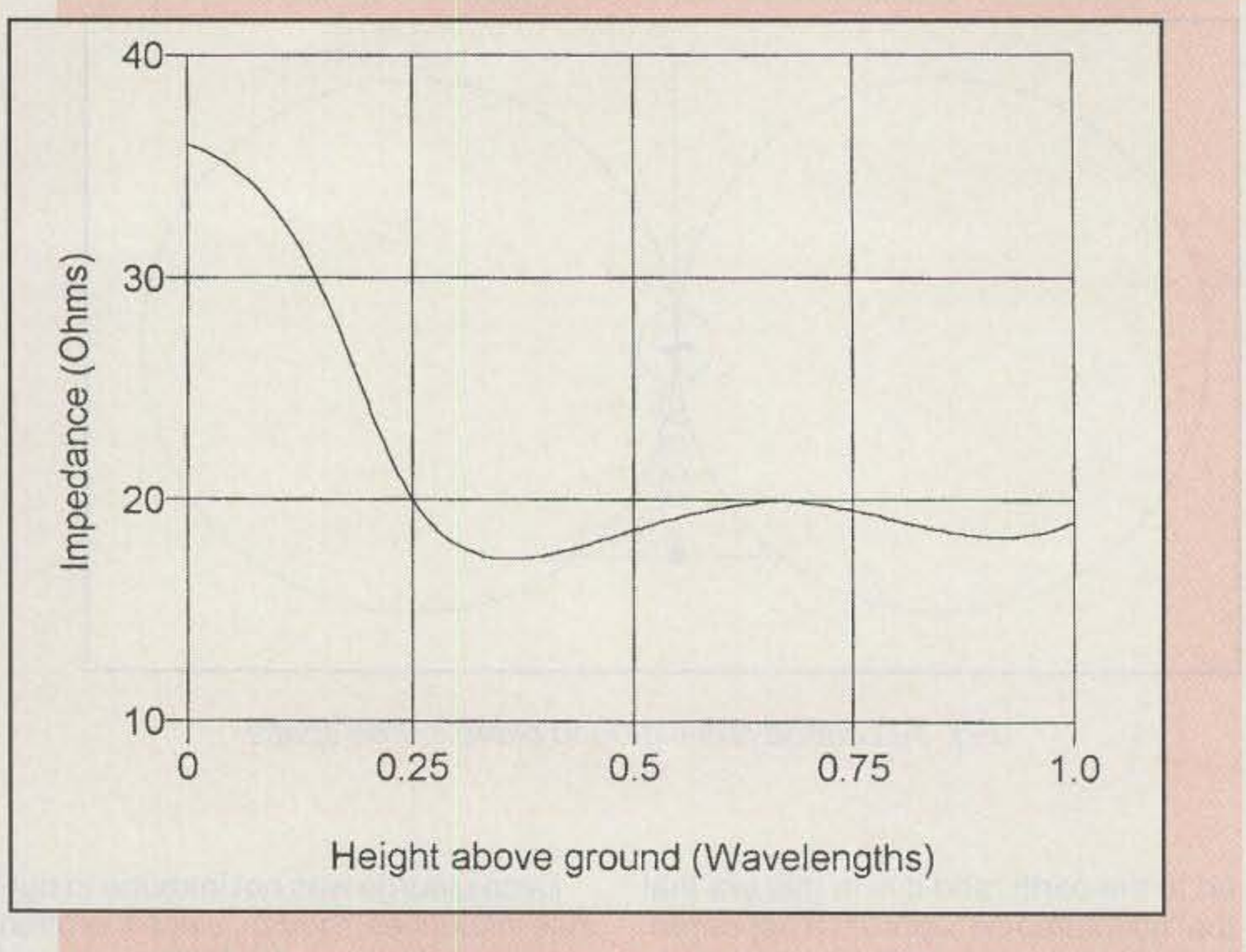

Fig. 5– Base impedance of a quarter-wave vertical with height.

centre of the dipole will be 78 ohms, and it will have the standard radiation pattern found in all the textbooks.

Now let's modify our vertical dipole by removing the bottom quarter-wave conductor and replacing it with two quarter-wave radials (fig. 2). Note that the radials are *exactly* a quarter wavelength long at the frequency we are working on and *identical* in length.

In this case a current, I1, flows in the vertical element, and two *equal* currents, each of I2, flow in the radials such that I1 = 2 × I2. Since the currents flowing in the radials are equal, and flowing in opposite directions, the radiation from the radials cancels out and all the radiation comes from the vertical element. Note that the radiation pattern has not changed, and at a distance you could not tell if the signal was coming from a vertical dipole or a ground plane.

Now since the radiating element is only half the length of a half-wave dipole, its radiation resistance must be a quarter of the dipole's, which brings it to 20 ohms and is *independent of anything done to the radials since these are*

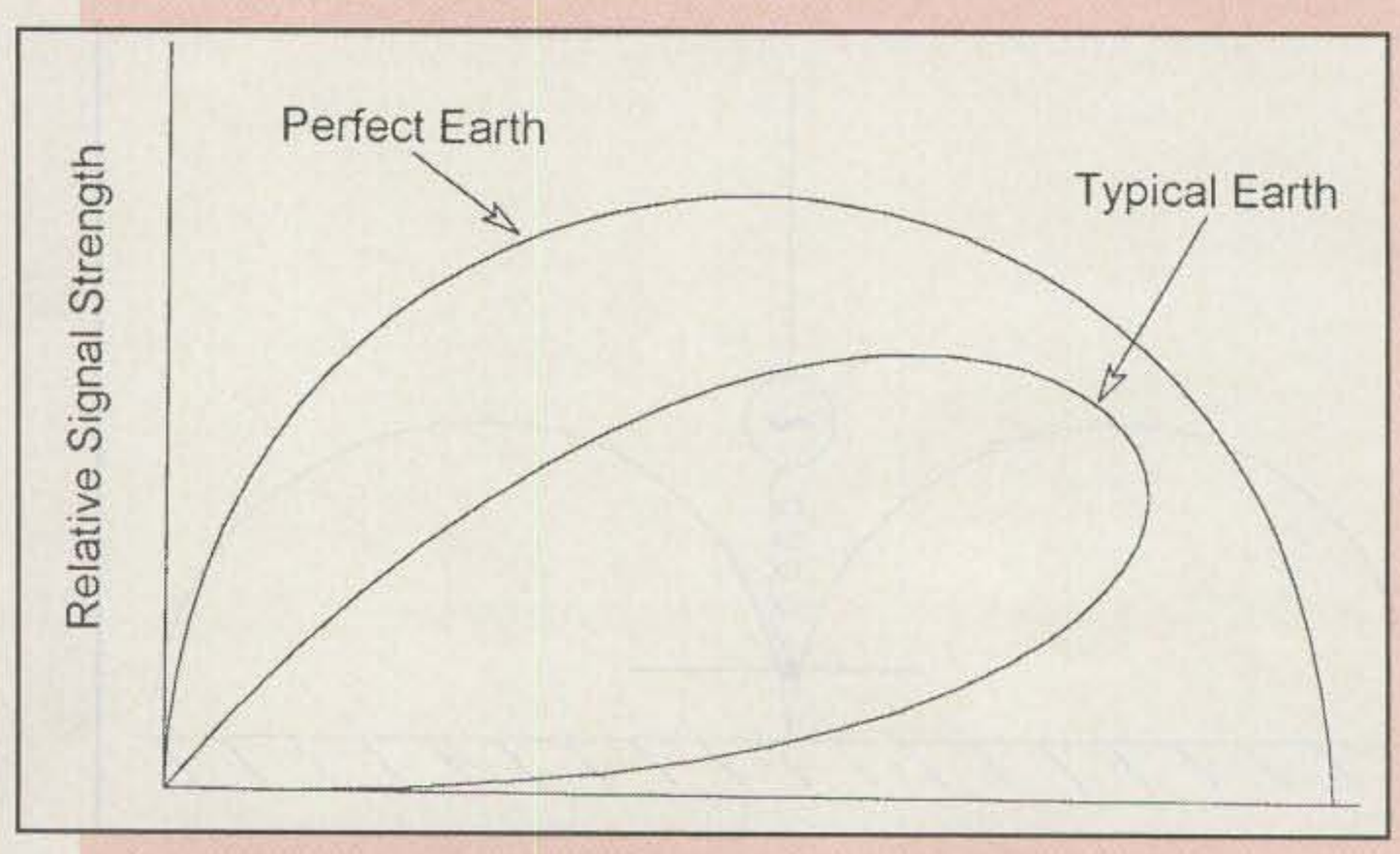

Fig. 6– Effect of ground on radiation resistance.

non-radiating! Note that the radiation resistance is *not* 35 ohms as incorrectly reported in many antenna handbooks. We will see where this figure comes from later. Also note that the radials do *not* in anyway act as a reflecting plane, since their fields cancel out in all directions; nor do they contribute to the angle of radiation.

In practice we have a major problem using quarter-wave radials, since length tolerances are always finite, making it impossible to maintain current equality whilst tuning through resonance. So if quarter-wave radials are a "no-no," what's a practical alternative?

We have already seen that if we can equalise the currents flowing in the radials then they do not radiate. It's logical, therefore that since they don't radiate, they can be shortened to any desired extent without affecting the radiation resistance. If we shorten the radials, then we need to bring them back to resonance by connecting a loading inductance at the centre of the radials (fig. 3). As long as the losses in the loading coil remain small compared with 20 ohms, then the efficiency of the system will remain high.

We now bring the dipole down to earth (fig. 4). Shortly before reaching ground level, the antenna changes from a dipole to a monopole. Its radiation resistance rises to 35 ohms (over a perfect earth) because of the mutual impedance between the antenna and its collinear image in the ground. The vertical radiation pattern broadens to one half that of a dipole and losses are incurred because of currents flowing in the (imperfect) ground.

The variation of radiation resistance with height can be calculated by considering the antenna and its image as a collinear pair separated by the distance between the "centres of gravity" of the current distributions. This gives the graph shown in fig. 5, which has been verified mathematically by VK2BBF.[1]

As long as equal and opposite currents flow in the radials, then there is no radiation from them. No radiation means that there can be no current induced in the ground *due to the radials, and hence no loss.* It's for this reason that a single radial is ineffective: With a single radial there can be no equal and opposite current flow; hence the radial radiates and induces current in the ground, resulting in loss.

Effect of the Earth

You might conclude from the foregoing that I am suggesting that the earth has no effect on the radiation performance of the antenna. As we shall see, this is certainly not the case. The point I am making is that hundreds of radials *do* work but are *not necessary* to provide the missing half of the dipole and do *nothing* to improve the efficiency of the antenna.

If you already have an extensive radial system then simply make sure they are each less than a quarter wavelength long and use a current probe to check for current equality.

In practice, the nature of the earth below the monopole has a very significant effect on its radiation pattern. The major influence on performance comes from the soil conductivity and dielectric constant, *out to tens of wavelengths* from the antenna's location.

The effect of the earth conductivity is shown in fig. 6 where the radiation patterns over a perfect earth and typical earth are plotted. As can be seen, over a typical earth, radiation at low angles is reduced and the "gain" of the antenna is lower.

In practical terms there is little the user can do to improve the situation,

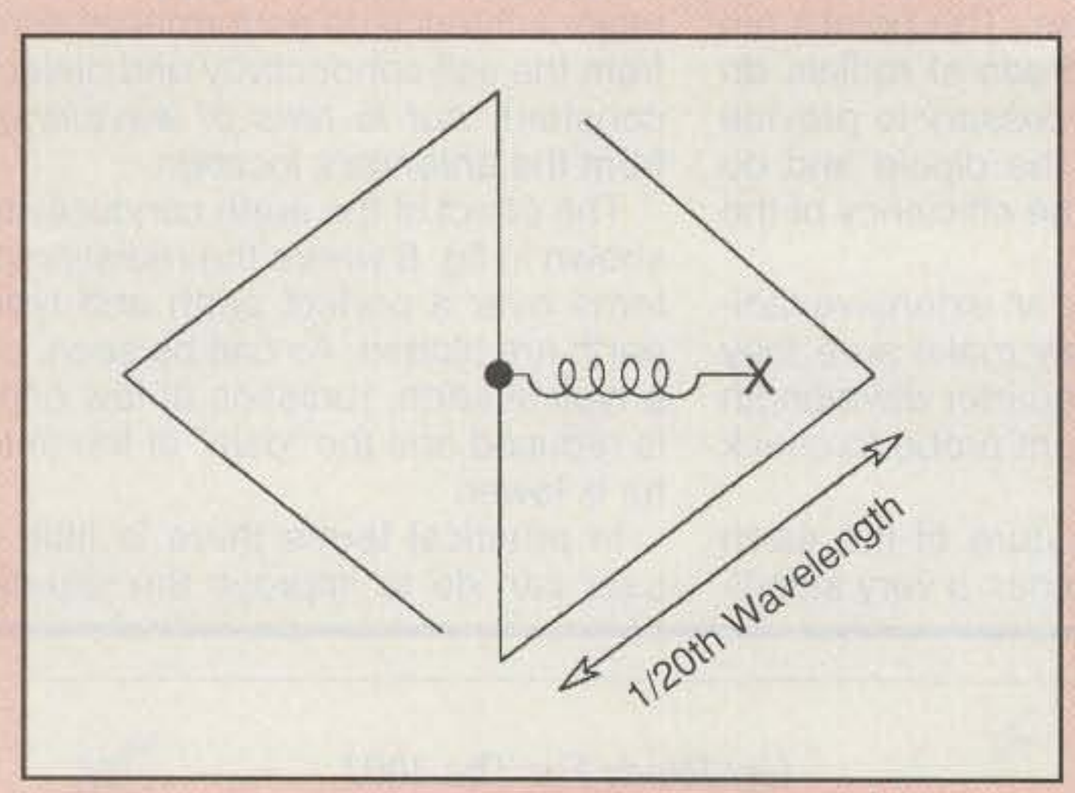

Fig. 7– Compact radial system.

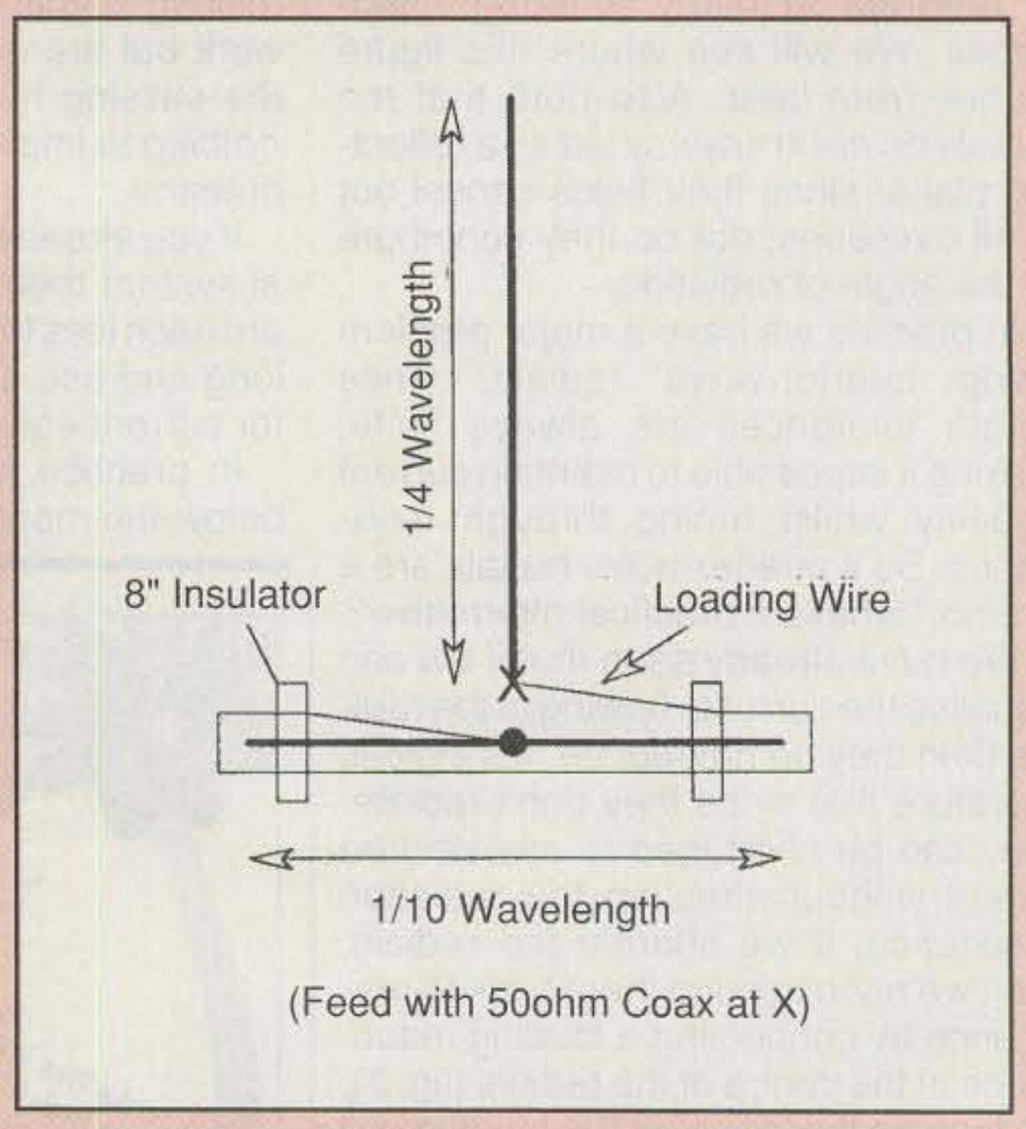

Fig. 8– Linear-loaded radial system.

since unless a radial system that extends tens of wavelengths away from the base of the antenna can be constructed, little improvement is possible. As noted by others, portable operation against the seashore, or on a boat, can provide spectacular performance.

In most cases the vertical antenna system is best improved by constructing a two or more element vertical array, at a cost a fraction of the equivalent horizontal beam. Even over a perfect earth system our vertical will only have 6 dB of gain over the theoretical free-space vertical. If we phase together two verticals, we immediately can achieve 5.3 dB of gain *regardless of the earth conductivity* and generally at less cost and backache!

Practical Systems

It has been proven experimentally that as long as the inductance of the loading coil is scaled accordingly, and its loss resistance is small compared with 20 ohms, then the radials can be as short as desired. For practical purposes, a lower limit of 1/12 wavelength is recommended, since below this, bandwidth is significantly reduced and there is no practical advantage of exceeding 1/8 wavelength.

Reference 2 describes the successful construction of a 14 MHz vertical using two 60 inch radials and a common loading inductance of 3 µH.

In its simplest form, the radial system can consist of nothing more than a horizontal wire or tubing, between 1/12 and 1/8 wavelength long, well insulated, mounted clear of any surrounding obstructions, and tuned to resonance by a single loading coil. For design purposes, a good starting point is a coil 3 inches in diameter, spaced the wire diameter, and as long as necessary to give resonance—a 1 inch long coil will give 3 µH of inductance.

If space is at a premium, then the radial system can be folded as per fig. 7 to form a very compact structure. A radial height of 3 ft. has been found to be quite adequate for use with 160 and 80 meter verticals.

Where the loading coil may become large and heavy, an alternative "linear loading" may be used, as in fig. 8. Here the necessary inductance is obtained from a length of wire mounted on insulators as indicated.

It is essential that the complete antenna system be tuned to resonance—using a grid dip oscillator (GDO), antenna analyzer, or SWR meter—by adjusting the loading coil or length of the linear loading element.

Summary

I hope that by now you will at least be tempted to experiment with a loaded radial system before digging up the back lawn and burying miles of copper wire. In summary, radials:

1. act as one pole of a dipole so as to provide a return path for the current flowing in the other pole
2. reduce the current flowing on a coaxial feeder to prevent it from radiating
3. allow a "dipole" to be brought down to earth without having to dig a hole for the bottom element
4. do not act as a reflecting screen
5. do not have any effect on the radiation angle
6. may be shortened to approximately 1/12 wavelength and brought back to resonance with a center-connected loading coil
7. (when resonant) have no effect on the radiation resistance of the antenna.

All in all, quite a non-controversial article! In a future article I'll describe a low-band vertical antenna that's only 1/10 wavelength high and radiates very efficiently with a single wire "ground plane." Now go out there and experiment!

Notes

1. "The Feed Impedance Of An Elevated Vertical Antenna," Guy Fletcher, VK2BBF, *Amateur Radio* magazine, Wireless Institute of Australia, August 1984.

2. *HF Antennas For All Locations*, Les Moxon, G6XN, Radio Society of Great Britain. ■

Reader Survey
January 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 Reader Service 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*.

This month we'd like to hear from you about your own level of emergency preparedness.

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

1. How you'd rate your overall level of preparedness to provide communications in an emergency or disaster.
- Very well-prepared 1
- Well-prepared 2
- Not too well-prepared 3
- Poorly prepared 4
- Unprepared 5

2. How much experience/training you have in operating in an emergency, public service event, or traffic net.
- Considerable 6
- Some 7
- A little 8
- None 9

3. What radio equipment you have available to take with you to the scene of an emergency or disaster (circle all that apply).
- VHF/UHF handheld/portable 10
- VHF/UHF mobile w/power supply 11
- HF handheld/portable 12
- HF mobile w/power supply 13
- HF base/fixed w/power supply 14
- VHF/UHF antenna 15
- HF antenna 16
- Antenna feedline 17
- Power cables/strips 18
- Spare HT batteries/charger 19
- Headphones 20
- Backup radio (if primary fails) 21

4. What personal equipment you have available to take with you to the scene of an emergency or disaster (circle all that apply).
- Change of clothes 22
- Paper/clipboard/pen or pencil 23
- Protective clothing 24
- Rain gear 25

5. How quickly you could pack up required radio and personal gear and be ready to respond if needed.
- Within an hour 26
- Within 3-4 hours 27
- Within 12 hours 28
- Within a day 29
- Unable to respond with gear 30
- Don't know 31
- No interest 32

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

What You've Told Us...

Our September survey asked about your CW operating habits. The results were staggering—about double the usual response—and they say a lot about the future of code in ham radio.

First of all, over 80% of you rate your own CW abilities as intermediate (30%), advanced (32%), or expert (20%). Another 11% rated yourselves as beginners, while 6% said you don't know CW. Nearly two-thirds of you operate code at least half of your on-air time, with 14% operating CW exclusively, 32% operating code most of the time, and 17% about half the time. In addition, 13% operate CW once in a while, 11% said rarely and 14% never.

Next we asked about the activities in which you operate CW either some of the time or most of the time. HF DXing came out on top (23% some of the time, 34% most of the time), followed by rag-chewing (23% some, 32% most), contesting (20%/21%), none (17%/15%), VHF DXing (11%/3%), other (8%/5%), and traffic-handling (6%/4%). The VHF DXing response is one of the most interesting, suggesting that many VHFers—who aren't required to know code—realize that it's to their benefit to know the code and to use it when the need arises.

We next asked your primary reason for operating CW. The big winner was "enjoyment of the mode," with 55%, followed by its ability to get through in marginal conditions (22%), its simplicity and efficiency (15%), don't operate CW (15%), better behavior on CW (11%), and other (8%).

Finally, we asked if you feel you would have learned code even if it was not required. Just over half (54%) said yes, while 26% said no, 13% said they don't know, and 4% said they have not learned the code.

As always, thank you to all who responded to our survey. This month's winner of a free one-year subscription to *CQ* is Jim Oberg, N9JO, of Tinley Park, IL.

Announcing:

The 2002 CQ World-Wide WPX Contest

SSB: March 30–31, 2002 CW: May 25–26, 2002

Starts: 0000 GMT Saturday Ends: 2359 GMT Sunday

I. Contest Period: Only 36 hours of the 48 hour contest period permitted for Single Operator stations. Off periods must be a minimum of 60 minutes in length and clearly marked in the log. Listening time counts as operating time. Multi-Operator stations may operate the full 48 hours.

II. Objective: Object of the contest is for amateurs around the world to contact as many amateurs in other parts of the world as possible during the contest period.

III. Bands: The 1.8, 3.5, 7, 14, 21, and 28 MHz bands may be used. No WARC bands allowed. **Observance of established band plans is recommended.**

IV. Types of Competition (for all categories): All entrants must operate within the limits of their chosen category when performing any activity that could impact their submitted score. Transmitters and receivers must be located within a 500 meter diameter circle or within the property limits of the station licensee, whichever is greater. All antennas must be physically connected by wires to the transmitters and receivers used by the entrant. Only the entrant's callsign can be used to aid the entrant's score. A different callsign must be used for each entry.

Note: Category and Category-overlay names for the CABRILLO header are shown in ( ) after each category definition.

1. Single Operator (Single Band and All Band)

(a) Single operator stations are those at which one person performs all of the operating, logging, and spotting functions. Only one transmitted signal is allowed at any time. **Maximum power allowed is 1500 watts total output power.** (SINGLE-OP)

(b) Low Power: Same as 1(a) except that output power shall not exceed **100 watts**. Stations in this category will compete with other low power stations only.

(c) QRP/p: Same as 1(a) except that output power shall not exceed **5 watts**. Stations in this category will compete with other QRP/p stations only.

(d) Assisted/with Packet: Same as 1(a) except the passive use (no self-spotting) of DX spotting nets or other forms of DX alerting is permitted. Stations in this category will compete with other Assisted stations only. (SINGLE-OP ASSISTED)

(e) Tribander/Single Element (TS): Tribander (any type) with a single feedline from the transmitter to the antenna and single element (TS) category. During the contest, an entrant shall use **only one (1) tribander** for 10, 15, 20 meters and single-element antennas on 40, 80, and 160. (TB-WIRES)

(f) Band Restricted (BR): An eligible entrant must hold a license restricting operation to less than the six (6) contest bands (160, 80, 40, 20, 15, 10) on both modes. Examples of such licenses are: Novice, Technician, 4 class license, etc. Since frequency privileges differ from country to country, competition is within one's own country. (BAND-LIMITED)

(g) Rookie (R): An entrant in this category shall have been licensed as a radio amateur three (3) years or less. (ROOKIE)

2. Multi-Operator (All band operation only)

(a) Single-Transmitter: Only one transmitter and one band permitted during the same time period (defined as 10 minutes). **Exception: One—and only one—other band may be used during any 10-minute period if—and only if—the station worked is a new multiplier. Use a separate serial number for the multiplier station. Logs found in violation of the 10-minute rule will be automatically reclassified as multi-multi. Maximum power allowed is 1500 watts total output power. Your log MUST show the correct serial number sent for each contact.** (MULTI-ONE)

(b) Multi-Transmitter: No limit to transmitters, but only one signal and running station allowed per band. *Note:* All transmitters and receivers must be located within a 500 meter diameter area or within property limits of the station licensee, whichever is greater. All operation must take place from the same operating site. **Maximum power allowed is 1500 watts total output power.** (MULTI-MULTI)

3. Use of Packet: Passive use of packet or internet DX spotting nets is permitted only for Single Operator Assisted/with Packet, Multi-Operator Single Transmitter, and Multi-Operator Multi-Transmitter stations. **No self spotting by a station or one of its operators is permitted. Stations engaging in self-spotting will be disqualified**.

V. Exchange: RS(T) report plus a progressive contact three-digit serial number starting with 001 for the first contact. (Continue to four digits if past 999 and five if past 9999.) **Multi-operator, multi-transmitter stations use separate serial numbers for each band. Your log MUST show the correct serial number sent for each contact.**

VI. Points: (a) Contacts between stations on different continents are worth three (3) points on 28, 21, and 14 MHz and six (6) points on 7, 3.5, and 1.8 MHz.

(b) Contacts between stations on the same continent, but different countries, are worth one (1) point on 28, 21, and 14 MHz and two (2) points on 7, 3.5, and 1.8 MHz. **Exception: For North American stations only—contacts between stations within the North American boundaries (both stations must be located in North America) are worth two (2) points on 28, 21, and 14 MHz and four (4) points on 7, 3.5, and 1.8 MHz.**

(c) Contacts between stations in the same country are worth 1 point regardless of band.

VII. Multiplier: The multiplier is the number of "valid" prefixes worked. A PREFIX is counted only once regardless of the number of times the same prefix is worked.

(a) A PREFIX is the letter/numeral combination which forms the first part of the amateur call. Examples: N8, W8, WD8, HG1, HG19, KC2, OE2, OE25, etc. Any difference in the numbering, lettering, or order of same shall constitute a separate prefix. A station operating from a DXCC country different from that indicated by its callsign is required to sign portable. The portable prefix must be an authorized prefix of the country/call area of operation. In cases of portable operation, the portable designator will then become the prefix. Example: N8BJQ operating from Wake Island would sign N8BJQ/KH9 or N8BJQ/NH9. KH6XXX operating from Ohio must use an authorized prefix for the U.S. 8th district (W8, K8, etc.). Portable designators without numbers will be assigned a zero (Ø) after the second letter of the portable designator to form the prefix. Example: PA/N8BJQ would become PAØ. All calls without numbers will be assigned a zero (Ø) after the first two letters to form the prefix. Example: XEFTJW would count as XEØ. Maritime mobile, mobile, /A, /E, /J, /P, or interim license class identifiers do not count as prefixes. You may not make up your own prefix.

(b) Special event, commemorative, and other unique prefix stations are encouraged to participate. Prefixes must be assigned by the licensing authority of the country of operation.

VII. Scoring:

1. Single Operator: **(a)** All Band score = total QSO points from all bands multiplied by the number of different prefixes worked (prefixes are counted only once). **(b)** Single band score = total QSO points on the band multiplied by the number of different prefixes worked.

2. Multi-Operator: Scoring is the same as Single Operator, All Band.

3. A station may be worked once on each band for QSO point credit. Prefix credit can be taken only once.

IX. QRP/p Section: Single Operator only. **Output power must not exceed 5 watts**. You must denote QRP/p on the summary sheet and state the actual maximum output power used for all claimed contacts. Results will be listed in a separate QRP/p section and certificates will be awarded to each top-scoring QRP/p station in the order indicated in Section XI.

X. Low Power Section: Single Operator only. **Output power must not exceed 100 watts**. You must indicate low power on the summary sheet and state the actual maximum output power used for all claimed contacts. Results will be listed in a separate low power

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MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-10	7	10	1⅛ x 6 x 9	3.2
SS-12	10	12	1⅛ x 6 x 9	3.4
SS-18	15	18	1⅛ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅝	4.2
SS-30	25	30	3¼ 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	3¼ 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 9⅜	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 9⅜	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 9⅜	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 9⅜	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

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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

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

*ICS – Intermittent Communication Service

section and certificates will be awarded to each top-scoring low power station in the order indicated in Section XI.

XI Awards: Certificates will be awarded to the highest scoring station in each category listed under Section IV—

1. In every participating country.

2. In each call area of the United States, Canada, Australia, and Asiatic Russia.

All scores will be published. To be eligible for an award, a single operator station must show a minimum of 12 hours of operation and multi-operator stations must show a minimum of 24 hours of operation.

A single band log will be eligible for a single band award only. If a log contains more than one band, it will be judged as an all band entry unless specified otherwise.

In countries or sections where entries justify, second- and third-place awards will be made.

XII. Trophies, Plaques, and Donors:

SSB

Single Operator, All Band

WORLD – Stanley Cohen, WD8QDQ
USA – Atilano de Oms, PY5EG
EUROPE – Jim Hoffman, N5FA
SOUTH AMERICA – Ron Moorefield, W8ILC
OCEANIA – Phillip Fraizer, K6ZM Memorial
AFRICA – Peter Sprengel, PY5CC
JAPAN – The DX Family Foundation
WORLD Low Power – Steve Bolia, N8BJQ
USA Low Power – Oklahoma DX Association
CANADA Low Power – Amateur Radio League of Alberta
WORLD QRP/p – Dayton Amateur Radio Assn.
USA QRP/p – Doug Zwiebel, KR2Q

Single Operator, Single Band

WORLD – John N. Reichert, N4RV
WORLD 28 MHz – Alan Dorhoffer, K2EEK Memorial
WORLD 7 MHz – William D. Johnson, KVØQ
WORLD 3.7 Low Power – Nilay & Berkin Aydogmus, TA3YJ & TA3J
OCEANIA – D. Craig Boyer, AH9B
USA 21 MHz – Bernie Welch, W8IMZ Memorial
USA 3.7 MHz – Lance Johnson Digital Graphics
USA 14 MHz Low Power – Boomer Contest Club

Multi-Operator, Single Transmitter

USA – D. Craig Boyer, AH9B
ASIA – W2MIG Memorial (NT4TT Sponsor)

Multi-Operator, Multi-Transmitter

NORTH AMERICA – Burt Curwen, KL7IRT Memorial

Contest Expedition

WORLD – Kansas City DX Club

CW

Single Operator, All Band

WORLD – Steve Bolia, N8BJQ
USA – Dennis Motschenbacher, K7BV
EUROPE – Ivo Pezer, 5B4ADA/9A3A
OCEANIA – Tom Morton, K6CT
CANADA – Radio Amateurs of Canada (RAC)
JAPAN – The DX Family Foundation
WORLD LOW POWER – Steve Bolia, N8BJQ
USA LOW POWER – Ron Stark, KU7Y
CANADA LOW POWER – Amateur Radio League of Alberta
ZONE 3 High Power – Jim Pratt, N6IG

Single Operator, Single Band

WORLD – Pedro Piza, Sr., KP4ES Memorial (NP4A Sponsor)
WORLD 7 MHz – William D. Johnson, KVØQ
WORLD 3.5 MHz – Lance Johnson Digital Graphics
OCEANIA – D. Craig Boyer, AH9B
USA – Kansas City DX Club
USA 28 MHz – Bernie Welch, W8IMZ Memorial
USA 21 MHz – Wayne Carroll, W4MPY

Multi-Operator, Single Transmitter

WORLD – Ron Blake, N4KE
USA – Austin Regal, N4WW

Contest Expedition

WORLD – Steve Bolia, N8BJQ

Combined SSB/CW
Single Operator, All Band

WORLD – Al Slater, G3FXB Memorial
USA – D. Craig Boyer, AH9B

Club (SSB & CW)

WORLD – CQ Magazine

A station winning a World trophy will not be considered for a sub-area award. That trophy will be awarded to the runner-up for that area if the returns justify the award.

XIII. Club Competition: A trophy will be awarded each year to the club that has the highest aggregate scores from logs submitted by members. The club must be a local group and not a national organization. Participation is limited to members operating within a local geographical area (exception: DXpeditions specially organized for operation in the contest and manned by members). Indicate your club affiliation on the summary sheet or in the CABRILLO file. To be eligible for an award, a minimum of three logs must be received from a club.

XIV. Log Instructions:

(a) All times must be in GMT. All breaks must be clearly marked (not required for CABRILLO logs). Single operator and multi-single logs must be submitted in chronological order. Multi-multi logs must be submitted chronologically by band.

(b) All sent and received exchanges are to be logged.

(c) Prefix multipliers should be entered only the FIRST TIME they are worked.

(d) Logs must be checked for duplicate contacts, correct QSO points, and prefix multipliers. Duplicate contacts must be clearly marked. Computerized logs must be checked for typing accuracy. Original logs may be requested if further cross-checking is required.

(e) An alpha/numeric check list of claimed PREFIX multipliers must be submitted with your log.

(f) Each entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, and the entrant's name and mailing address in BLOCK LETTERS. Also submit a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.

(g) Official log and summary sheets are available from *CQ*. Fax your request to *CQ* (516-681-2926). You may make your own forms as long as all required information is present.

(h) Electronic submission of logs is encouraged for all participants, and is required for all top-scoring entrants and all who use a computer to log or prepare the logs. The CABRILLO format is preferred. Please ensure that you fill out all of the header information, including your club affiliation. If you submit a CABRILLO log, no additional summary sheet is required. For instructions on filling out the CABRILLO header, see the WPX Contest website. Failure to fill out the header correctly could result in your entry being placed in the wrong category. If you cannot submit a CABRILLO log, you may submit the ASCII output from most of the popular logging programs such as TR, CT, NA, Writelog, and SuperDuper. You may also submit the *.BIN,*.DAT, *.QDF files from CT, TR, or NA. If the log is not in CABRILLO format, a separate summary sheet is required. Please name your files with your call and the file type. Example: N8BJQ submits a CABRILLO file. It should be named N8BJQ.CBR. If N8BJQ chose to submit a non-CABRILLO file such as TR's .dat file, he should name the log file N8BJQ.DAT and the summary file should be N8BJQ.SUM. See the WPX website for more information on e-mail log formats. Logs sent on disk should be on 3.5" disks.

(i) E-mail is the preferred method of log submission. **SSB logs** should be sent to **WPXSSB@KKN.NET** and **CW logs** should be sent to **WPXCW@KKN.NET.** Non-CABRILLO internet or disk submissions require a summary sheet as well as the log file. All logs received via e-mail will be confirmed via e-mail. A listing of logs received can be found on the CQ WPX website at **http://home.woh.rr.com/wpx/** and will be updated frequently.

XV. Disqualification: Violation of amateur radio regulations in the country of the contestant, or the rules of the contest, unsportsmanlike conduct, taking credit for excessive duplicate contacts, unverifiable QSOs or multipliers will be deemed sufficient cause for disqualification. An entrant whose log is deemed by the WPX Contest Committee to contain a large number of discrepancies may be disqualified as a participant operator or station for a period of one year. If within a five-year period the operator is disqualified a second time, he will be ineligible for any *CQ* contest awards for three years.

The use of non-amateur means such as telephones, fax, telegrams, packet, e-mail, etc., to solicit contacts or multipliers during the contest is unsportsmanlike and the entry is subject to disqualification. Self-spotting is grounds for disqualification.

Declaration: Submission of an entry in the CQ WPX Contest implies that you have read and understood the rules of the contest and agree to be bound by them, as well as all rules of your country which pertain to amateur radio. Actions and decisions of the WPX Contest Committee are official and final.

XIII. Deadline:

All entries must be postmarked **NO LATER than May 1, 2002** for the **SSB** section and **July 1, 2002** for the **CW** section. E-mail logs are also subject to these deadlines. **Indicate SSB or CW on your envelope**. One extension of up to 30 days, for legitimate reasons, may be granted if requested from the contest director. Logs postmarked after the deadline, or extension deadline, if granted, may be listed in the results, but will be ineligible for any awards.

Check the WPX website for instructions on mailing WPX logs. Questions pertaining to the WPX Contest can be mailed to WPX Contest Director, Steve Bolia, N8BJQ, 7354 Thackery Road, Springfield, OH 45502 USA, or via e-mail to N8BJQ@ERINET.COM.

Please remember to send in early for WPX contest log and summary sheets.

The WPX Home Page:
http://home.woh.rr.com/wpx/

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Ameritron gives you four 811A tubes, 800 Watts and far better quality -- for less money than the competitor's 3 tube 600 watt unit . . . Why settle for less power, less quality and pay more money?

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Suggested Retail

AL-811
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Ameritron mounts the 811A tubes vertically -- not horizontally -- to prevent hot tube elements from sagging and shorting out. Others, using *potentially damaging horizontal mounting*, require special 811A tubes to retard sagging and shorting.

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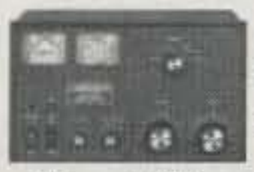
New class of *Near Legal Limit*™ amplifier gives you 1300 Watt PEP SSB power output for *65%* of price of a full legal limit amp! Four rugged and powerful 572B tubes. Instant 3-second warm-up, plugs into 120 VAC. Compact 8½Hx 15½Dx14½W in. 160-15 Meters. 1000 Watt CW output. Tuned input, instantaneous RF Bias, dynamic ALC, parasitic killer, inrush protection, two lighted cross-needle meters, multi-voltage transformer.

HF Linears with Eimac 3CX800A7



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AL-800
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Single tube, 1250 Watts

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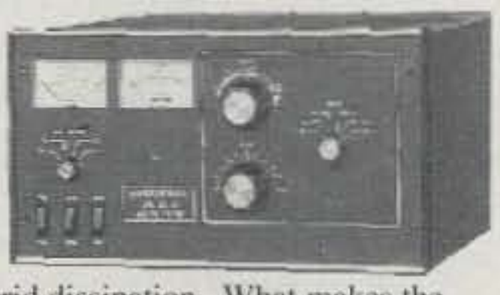
Ameritron's 3CX1200A7 linear Amp

AL-1200
$2495
Suggested Retail



Get ham radio's toughest tube with the Ameritron AL-1200 -- the EimacR 3cx1200A7. It has a 50 Watt control grid dissipation. What makes the Ameritron AL-1200 stand out from other legal limit amplifiers? The answer: A super heavy duty power supply that loafs at full legal power -- it can deliver the power of more than 2500 Watts PEP two tone output for a half hour.

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ALS-500M 500 Watt Mobile Amp

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Stops power-up inrush current and absorbs momentary high voltage spikes to your amplifier. ICP-120 for 110 to 120V, ICP-240 for 220-240 V.

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Handles a full 1.2 kW SSB and 600 Watts CW. It's designed to safely handle the full legal SSB power of the AL-811/811H/80B/ALS-500M/ALS-600 and others.

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No matter where or how you're traveling, if you can carve some time out of your vacation for operating, one of today's tiny QRP rigs and a simple antenna can make it possible.

Going on a Family Vacation? Don't Forget the Rig!

BY PETER S. DeLUCA,* AA2VG

If you think today's new hams avoid code at all costs, think again. I am one of many relatively new amateurs who happily prefer using code. Those who ignore or avoid CW are missing an exciting ham challenge, especially at QRP power levels. I am not sure why, but since my introduction to our hobby in 1993 I found that I prefer code, and over the years my interest has not waned. For me, nothing beats the fun of CW and QRP operating and contesting! Equipment designs may have evolved into smaller and smaller packages, but the excitement of my chosen method of operating has never diminished.

I guess I am not unique in my constant search for new equipment or approaches, anything to give me an added edge and improve my ability to catch one of those elusive DX stations. I have tried different transceivers, antennas, keys, and even various frequencies, so it should be no surprise that when I had an opportunity to get an SGC SG2020, I jumped at it.

The SG2020 is a compact HF transceiver with power output adjustable from 1 to 20 watts. It covers all bands from 160 to 10 meters, CW and SSB. Full break-in operation and a built-in iambic keyer make it a wonderful portable CW rig. Some trial runs convinced me that I had a great piece of gear. The supreme test, however, would be how it handled as a portable "out of the backpack" rig on a traveling vacation. To be sure of portable operating capability on 10 meters, I modified a magnet- mount CB whip by reducing the radiating element to 34.5 inches. The equipment and my portable whip antenna were tested and proven ready and raring to go.

*55A Fleets Cove Road, Huntington, NY 11743

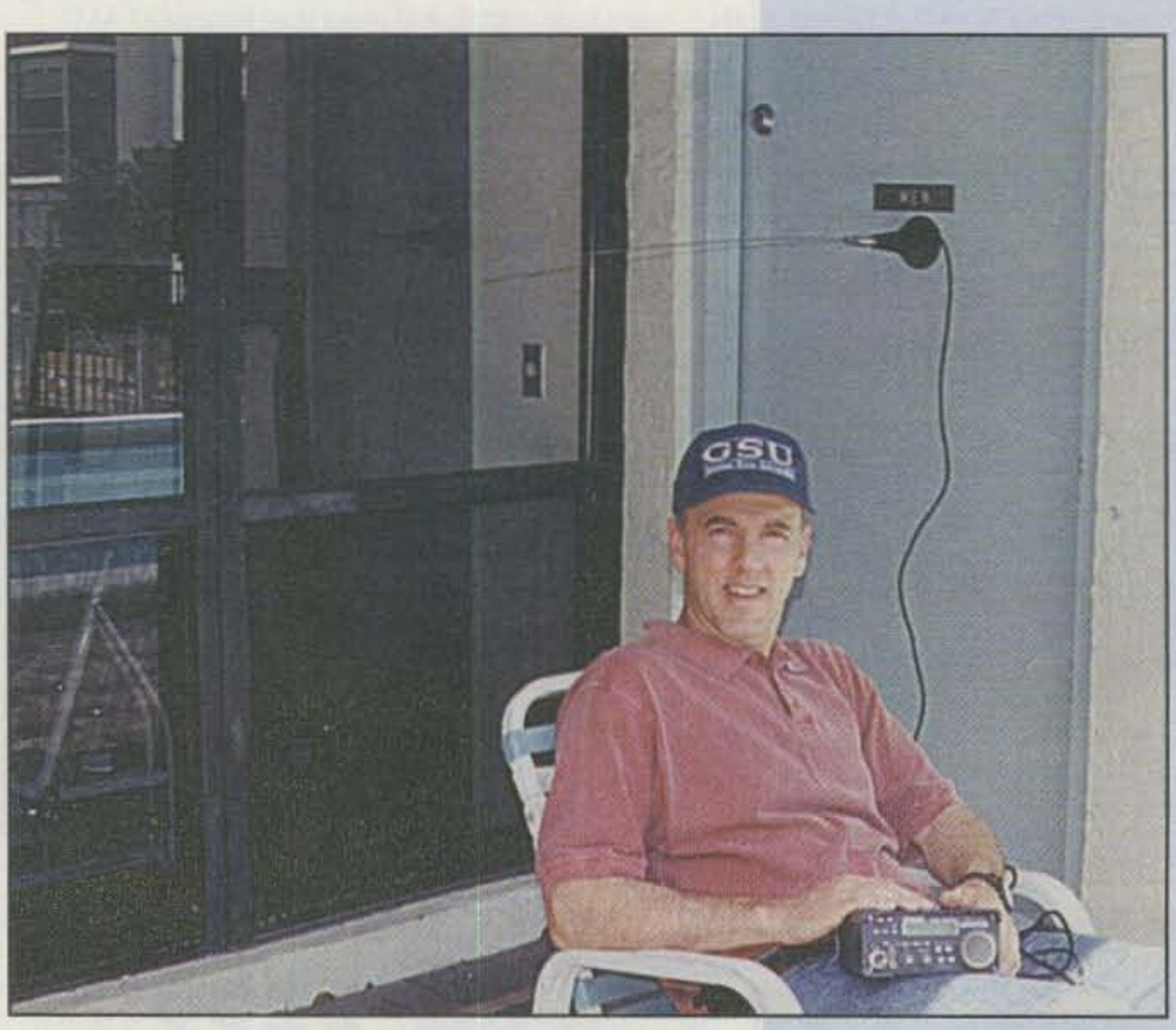

Photo 1– The author at his poolside operating position with the magnetic-mount antenna mounted on the metal men's room door.

Our family trips are dictated by our children's school vacations. I was in luck last year because the ARRL CW International DX Contest was taking place during the first weekend of our planned vacation to my mom's condo in Florida.

CW contesting is a sport within the hobby of amateur radio. I know it's a sport because it involves stamina, strategy, coordination, and skill. I have tried to convince my XYL that it is my new sport. In college my sport was pole-vaulting; now it's contesting and DXing. I still don't have a good answer for her observation that my triceps and biceps don't look like they did during those pole-vaulting years. I guess pounding a CW key is not the same as bending a fiberglass pole!

I have learned that CW contests are for everybody, not just for the "professionals" who strive for the top prize and can stay awake for 48 hours. As a beginner, contacts are easy to make. Other operators are trying hard to get your callsign in the log and come back to you. Low power is no problem, because the many large antennas out there will easily pick up your anemic signal. You can jump into the contest at any time and stay as long as you like. For me the best

Photo 2– AA2VG with his equipment set up to operate with a wire vertical antenna.

part of a contest is calling "CQ contest" and having several stations respond at one time. I probably use contesting as a way to practice for that imaginary DXpedition I hope to take before I am toooo old.

Enough digression. Let me get back to my vacation. The day before our departure, I started gathering the ham equipment I wanted to take. While filling my backpack with the transmitter, antenna, antenna tuner, key, and battery pack, my thoughts drifted to the reception I might receive when I tried to board the airplane with all of that equipment mounted on my back. I could almost hear myself saying, "Of course I will open my backpack. No, sir, it's not bomb-making material, it's only my portable shortwave amateur radio gear!"

I decided against using the above statement, however, after reading the sign at the entrance to the terminal: "Carrying explosive material is strictly prohibited!" With that warning imbedded in my brain, I loaded my backpack on the conveyor belt going through the x-ray machine.

I was not surprised when the belt stopped with my backpack directly under the scanner. Uh oh, I thought, what now? The security guard gave her viewer an extended careful look, and after what seemed like a long, long time she turned to me and said, "Will you please open this backpack?"

Out came all of my goodies. She inspected my rig and gave me a chance to explain what I was carrying on board. Apparently my explanation satisfied her, because she released the equipment and allowed me to join my family on the way to the plane (maybe I made a convert to ham radio in the process).

We arrived late Saturday night, and since the contest had started on Friday and would end on Sunday, less than 20 hours remained to compete. Sunday morning my son asked if he could take a swim in the pool, so off we went, him decked out in swimming attire and me loaded down with my ham equipment. My objective was to oversee my son's safety and yet still find time to operate in the contest.

With my son playing in the pool, I set up my station. I needed a metal ground plane in order to make my modified whip antenna effective. The tables were fiberglass, the garbage can plastic, but wait … the men's bathroom door was metal! Could I use it somehow? The magnetic mount attached nicely to the door just below the sign "Men" (see photo 1). The rig loaded properly and I was in business. With one eye on my son and the other on my rig, I proceeded to play catch-up in the contest.

First came Yugoslavia, YZ1U, then France, TM5C. Using that same metal door as a ground plane, I collected four more countries: VP2E, PJ2T, LU1DZ, and P49V. I was accumulating some contest points. It was great. My son was having fun and so was I! The luckiest part of my setup was that nobody needed to use the bathroom. Imagine the questions if someone had wanted to open that door. I was able to put in a few more hours using my fabulous "men's room special" before the contest ended. I planned to try operating from the condo whenever I could for the duration of our stay.

A New Antenna Takes Shape

First thing Monday morning the family was informed by the social director (my XYL) that we all were going to an outdoor beachside shopping area. While the ladies shopped, I had time to daydream about a new portable antenna; after all, I would not always have access to a metal bathroom door. A magnetic-mount antenna works well as a portable antenna, but it certainly has its limits out in the field.

The restrictions imposed by the con-

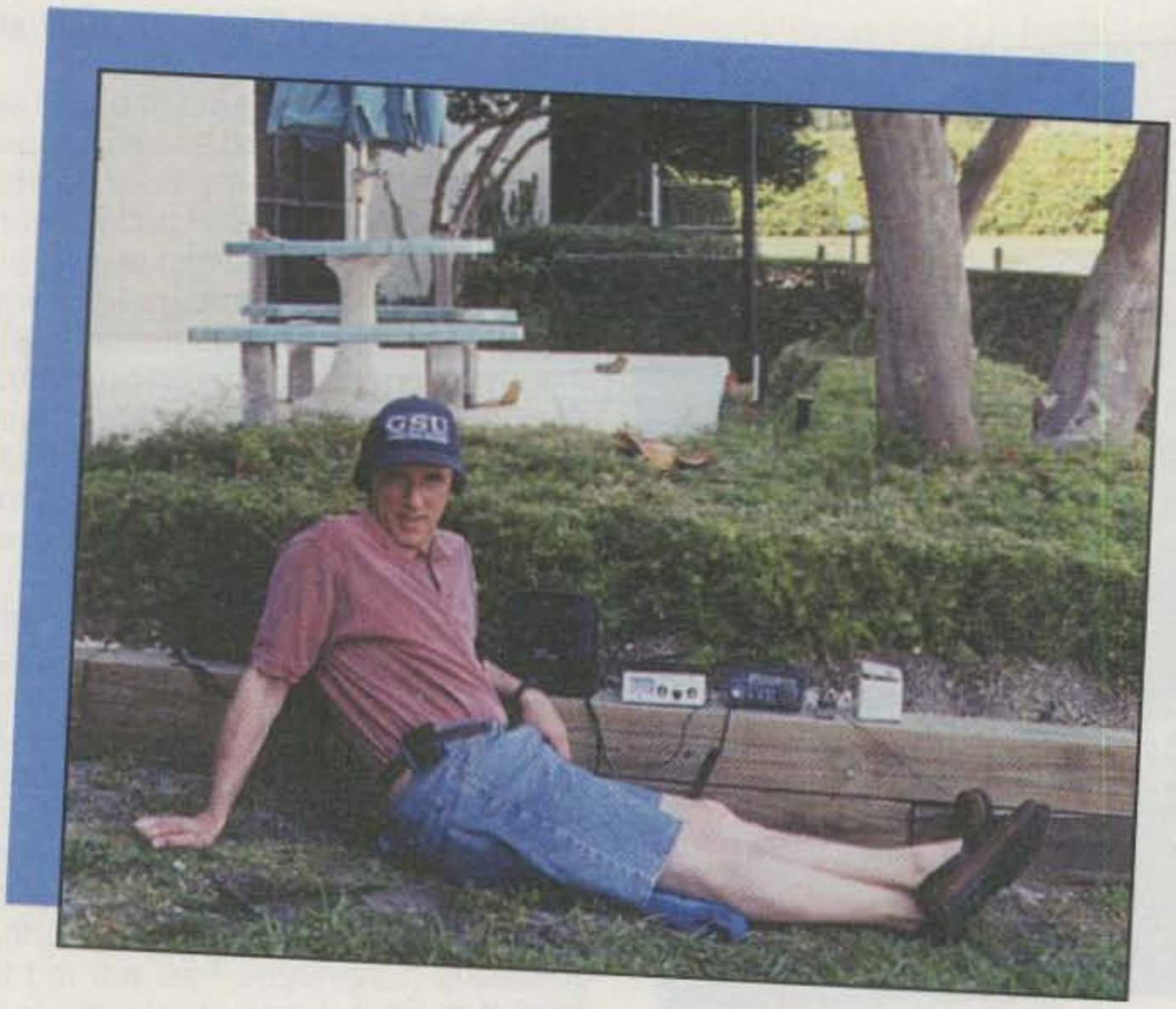

Photo 3– Can you see the "stealth" antenna in this shot? There were no problems at the condo with this setup.

do limited my ability to easily replace the mag mount with a more conventional type of antenna. Even hanging a simple dipole in a Florida condominium community is about as inconspicuous as a 50 ft. tower would be on my front lawn at home!

Suddenly I had a great idea, an inspiration brought on by necessity. Why not make a wire vertical antenna for 15 meters using thin, barely visible wires? All I had to do was remember that half-wave dipole formula I had learned nine years earlier for my Novice exam. Let's see, 2-4-6-8 who do we. . . . That was it—468 divided by the frequency! That night I cut four 11.12 ft. lengths of 22-gauge vinyl-covered wire. I hung one vertically from a tree branch and spread out the other three sections on the ground as a "ground plane." I then connected the vertical wire to my MFJ-971 portable tuner at the random-wire antenna port. The three wires spread out on the ground were hooked up to the tuner at the earth grounding post. With a tweaking of the tuning dials I was able to settle at a perfect 1:1 SWR. This stealth quarter-wave vertical antenna performed wonderfully (see photo 2). Using 5 watts I was able to easily work Roland, DL1LQR, who came back to my CQ and gave me a 569 report. I also had a nice QSO with Willy, ON4LBV, who sent me a 339 report. Bob, KA3NIL, came through with a 599 from Princess Anne, Maryland. Not only did my antenna perform extremely well, it was barely visible, as shown in photo 3.

Portable HF has always interested me. The ability to contact fellow amateurs around the world using equipment and a power source that can easily be carried in a backpack remains a thrill. Relying on atmospheric radio waves to carry intelligence is much more exciting to me than modern satellite communications. Of course, working from a DX location using portable low power would be the *ultimate!* With this in mind I am planning a family summer trip to Alaska. Maybe I will be able to attract a massive pile-up (see "Adventure in Alaska").

Like any aspiring pole-vaulter, DXer, or trumpet player (My son plays the trumpet and is tired of hearing me say, "Practice makes perfect."), I have not only practiced operating, I have also had to learn to arrange all of my equipment safely in a backpack. The full set-up includes the SG2020 rig, MFJ-971 tuner, TE NE KE CW paddle with a leg strap, Portable Power Station 12 volt battery and charger, 15 meter wire antenna, and mag-mount 10 meter whip.

Practicing in the wooded area behind my house has made me realize that finding a place to sit is not always easy. Wet leaves can make one's bottom very uncomfortable! Paul, N2PVS, loaned me a portable, lightweight Boy Scout camping seat. It's the perfect addition to my go-anywhere HF system. ■

Adventure in Alaska

Editor's note: In the several months it took from the time Paul wrote this article to the time it appeared in print, his Alaska vacation came and went. We received this update right after his return.

We are back from Alaska, tired but full of great memories. The scenery was magnificent. Getting up close to a glacier was probably the biggest thrill.

I am suffering from lack of sleep, jetlag, and too many suitcases to unpack, but let me give you a very brief overview of my radio activities.

While in Vancouver before the cruise I met several friendly amateurs on a local 2 meter repeater. I tried 15, 17, and 20 meters from my hotel there, but the bands seemed dead. Perhaps it was my poor excuse for an antenna—a long wire out the sixth floor window!

In Juneau I met Glen, KLØQZ, and George, NL7RD, on the local repeater. Glen was extremely helpful and informative about Juneau and Alaska in general. I felt privileged to be able to talk to a local amateur. He informed me that the best HF band to work was 20 meters in the morning hours and 40 meters at night. He even listened for me as I hastily put together a 40 meter wire antenna and tried to work from the ship. I quickly learned that although a cruise ship can make a great ground, a *big* hunk of metal such as a ship also can block a lot of signals, especially if your cabin balcony is facing the wrong way!

Before I transmitted from the ship I obtained the captain's permission. This was quite an adventure in itself. Captain Bill Wright is the only American captain on the Royal Caribbean cruise ships and possibly the only American captain on any present cruise ship. At the emergency drill that took place within hours of getting on board, I handed a letter to one of the officers and asked if he could get it to the captain. Indeed, he delivered my letter requesting permission to work from the ship. That evening Captain Wright called my cabin and left the message that he had granted me permission to operate low power from the ship.

Okay, so how was the pile-up? Sorry to say there was no pile-up. Actually, I had to work very hard to finally get *one* QSO with Kano, JA8LDC/1, on CW from Skagway, Alaska. I was set up in a park using the 20 meter wire antenna I had made in Vancouver. It was the same setup I had used in Florida on 15 meters. I finally did it. I worked AA2VG/KL7!

I also had three contacts from the ship on the way back to Vancouver. My cabin balcony faced northeast, and I was able to get CT1EEB, UAØAZ, and K3DV—my first contacts as AA2VG/MM!

Must QRT for now, however. The suitcases are staring at me.

73, Peter, AA2VG

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100 mph standard rating and 120 mph optional
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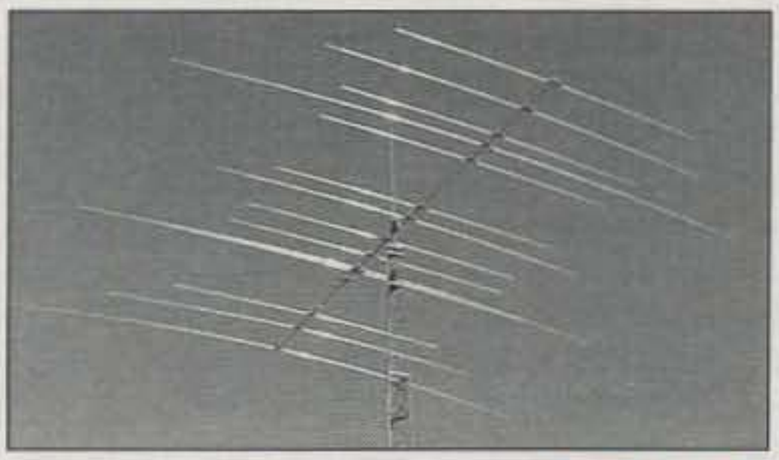

C-31XR for 20-15-10

The 20-15-10 Leader
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Single coax feedline, OR separate feedlines
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Washington Readout

BY FREDERICK O. MAIA, W5YI

Regulatory News In The World Of Amateur Radio

IARU Calls for End to Morse Testing

The International Amateur Radio Union (IARU) has called for an end to Morse code testing as an international requirement for amateur licenses with privileges below 30 MHz. Saying that "the position of Morse as a qualifying criterion for an HF amateur license is no longer relevant to the healthy future of amateur radio," the IARU's Administrative Council said the Union's policy "is to support the removal of Morse code testing as an ITU requirement for an amateur license to operate on frequencies below 30 MHz," and called on member societies, as an interim measure, to seek Morse code testing speeds not exceeding five words per minute. The resolution also noted that it superseded any previous IARU decisions on the code exam question, but took pains to recognize that Morse code continues to be an effective and efficient mode of communication used by many thousands of radio amateurs. (See full text of resolution in sidebar #1.)

ARRL Executive Vice President Dave Sumner, K1ZZ, told *CQ* the decision "basically enshrined what had already been discussed in the three regional conferences" and used "basically the same language" adopted in 2000 by the IARU Region 3 conference. Still, it was the first time that the worldwide organization of national amateur radio societies had taken a unified position on the question of continued Morse testing. The International Telecommunications Union (ITU) is scheduled to decide the future of code tests as an international requirement at next year's World Radiocommunication Conference (WRC-03). As a prelude to that conference, last summer the ITU adopted a new recommendation outlining the basic qualifications to hold an amateur radio license. This recommendation, M.1544, is expected to be incorporated by reference into the revised international rules (more on this later).

Sidebar #1:

IARU Administrative Council resolution regarding code examinations:

Considering

the approval without opposition of ITU-R Recommendation M. 1544, which sets out the minimum qualifications of radio amateurs,

Recognizing

that the Morse code continues to be an effective and efficient mode of communication used by many thousands of radio amateurs, but

Further recognizing

that the position of Morse as a qualifying criterion for an HF amateur license is no longer relevant to the healthy future of amateur radio,

Resolves that

member societies are urged to seek, as an interim measure, Morse code testing speeds not exceeding five words per minute;

Setting aside any previous relevant decisions

IARU policy is to support the removal of Morse code testing as an ITU requirement for an amateur license to operate on frequencies below 30 MHz.

IARU Region 2 Triennial Conference

The IARU Administrative Council session followed the 14th Session of the IARU Region 2 General Assembly of Delegates, held October 1–5, 2001 in Guatemala City, Guatemala. IARU regional conferences are held once every three years in each of the Union's three Regions. Region 2 follows the same geographical boundaries as ITU Region 2, and includes North, Central, and South America. At the conferences the region's officers, directors, and member societies meet to elect new officers and to discuss and vote on matters affecting amateur radio internationally.

The Club de Radioaficionados de Guatemala (CRAG) was the host society for the 2001 conference. About half the possible national societies were represented. Thirteen sent delegates and another eight were represented by proxy votes. Family members not participating in the working sessions were treated to alternate activities such as visits to the city, churches, museums, and shopping centers. The conference was held at the Marriott hotel in downtown Guatemala City, and an amateur radio station was installed there for use by the delegates. It used the callsign TGØIARU. The Club de Radioaficionados de Guatemala also issued a temporary permit to the delegates which allowed them to operate under their own callsigns with a TG9 prefix.

The conference was organized into working committees covering Administrative Matters, Technical and Operational Matters, VHF/UHF/Satellites/Digimodes, and Finances and Credentials. Each accredited delegate and observer was invited to take part in a working group of his/her choice. The proposals were submitted to the Plenary Assembly. Those approved by majority vote became the Guatemala Conference Decisions and Recommendations.

Incoming Region 2 officers elected at the conference were Pedro Seidemann, YV5BPG (Venezuela), who replaced Thomas B. J. Atkins, VE3CDM (Canada) as President; Vice President Dario Jurado, HP1DJ (Panama); and Treasurer Noel Donawa, 9Y4NED (Trinidad and Tobago). ARRL International VP Rod Stafford, W6ROD, was elected Secretary.

Conference Matters

Many of the discussions at "Guatemala 2001" were centered on WRC-2003 issues and the future of amateur radio in the Americas. The conference agenda included the proposed realignment of the 40 meter band and possible changes to the ITU regulations governing amateur radio, including revision of Article S25, the basic international rules for amateur radio, and Article S19 regarding greater flexibility in assigning amateur callsigns.

Article S25 has been carefully studied over several years by the IARU's Future of the Amateur Service Committee (FASC), chaired by Michael Owen, VK3KI, of Australia. This committee developed a strategy that was adopted by the IARU Administrative Council. The approach is based on a belief that the interests of the amateur services would best be served by eliminating the current S25.5, which reads: "Any person seeking a license shall prove that he is able to send correctly by hand and to receive correctly by ear texts in Morse code signals. The admin-

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

Sidebar #2: New Recommendation ITU-R M.1544

Minimum Qualifications of Radio Amateurs
(adopted by the ITU, August, 2001)

The ITU Radiocommunication Assembly,

considering

a) that No. S1.56 of the Radio Regulations (RR) defines the amateur 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;

b) that No. S1.57 (RR) defines the amateur-satellite service as: A radiocommunication service using space stations on earth satellites for the same purpose as those of the amateur service;

c) that certain minimum operator operational and technical qualifications are necessary for proper operation of an amateur or amateur-satellite station,

recommends

1. that administrations take such measures as they judge necessary to verify the operational and technical qualifications of any person wishing to operate an amateur station;

2. that any person seeking a license to operate an amateur station should demonstrate theoretical knowledge of:

- Radio Regulations
  - international
  - domestic
- Methods of radiocommunication
  - radiotelephony
  - radiotelegraphy
  - data and image
- Radio system theory
  - transmitters
  - receivers
  - antennas and propagation
  - measurements
- Radio emission safety
- Electromagnetic compatibility
- Avoidance and resolution of radio frequency interference

istrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz."

Further, the FASC recommended the incorporation by reference in Article S25 of a new ITU-R Recommendation on amateur operator qualifications, which has since been adopted by the ITU. Recommendation M.1544 (see sidebar #2) is now in effect, but it does not supersede the current language of S25.5.

The IARU's belief is that incorporation by reference of a recommendation will ensure the most flexible definition possible of at least a minimum level of operator qualification. One of the major benefits to the amateur services of incorporating minimum qualifications by reference is the opportunity for the IARU, as a Sector Member, to participate in the work of ITU-R Study Group 8 (SG 8), which has jurisdiction over amateur matters. The IARU is limited to observer status at WRCs but has full membership and participation rights in ITU Working Parties and Study Groups. It was felt by the Conference that the IARU can satisfactorily influence the output product of a Study Group Working Party rather than risk future changes to Article 25 at future World Radiocommunication Conferences.

It was also thought that the Region 2 Conference in Guatemala would require the ARRL to vote on the controversial S25 International Morse Code testing issue. Instead the conference sidestepped the issue by endorsing the ability of each sovereign nation to decide its own requirements on Morse examinations in the Amateur Service. The Conference went along with a proposed revision of Article S25 of the

ITU Region 1	ITU Region 2	ITU Region 3
7000-7100 Amateur Amateur-Satellite (worldwide)		
7100–7300 Broadcasting	7100–7300 Amateur	7100–7300 Broadcasting

Table I– Current ITU frequency allocations between 7000 and 7300 kHz.

International Radio Regulations that was first suggested by the FASC in 1997 and proposed by the IARU Administrative Council. The text of the proposed new S25 is in sidebar #3.

Article S19: Formation of Callsigns

The WRC-03 agenda item dealing with callsign structure had its origin at WRC-2000 in a proposal from Finland, endorsed by the Conference of European Postal and Telecommunications Administrations (CEPT), seeking additional flexibility in the formation of amateur callsigns.

The International Radio Regulations limit amateur and experimental callsign suffixes to "a group of not more than three letters." This restriction places a limit on the number of possible callsign combinations and their formulation.

The Region 2 Conference agreed on a revision that would increase amateur callsign suffixes from three to four letters. Such a change would expand considerably the number of possible callsign combinations and provide administrations with increased flexibility without creating conflict with the callsign formats specified for stations in other services.

Harmonization of The 40 Meter Band

Consideration of realignment of the 7 MHz band allocations is also on the agenda of the 2003 World Radiocommunication Conference (WRC-03) and represents an opportunity to improve the condition of the amateur services in the 40 meter band.

The 7 MHz band is very heavily used by radio amateurs around the world and is a key band for domestic and international communications in times of natural disaster. However, parts of this amateur band are frequently unusable in Region 2 since it is allocated to HF broadcasting in ITU Regions 1 and 3.

WRC-2003 agenda item 1.23 will "...consider realignment of the allocations to the amateur, amateur-satellite, and broadcasting services around 7 MHz on a worldwide basis, taking into account Recommendation 718 (WARC-92)." This recommendation states that it is desirable to have exclusive worldwide allocations to the amateur and broadcasting services in the 40 meter band and recommends that a future WRC consider this re-alignment, with due regard to the requirements of other services.

At WARC-92, the United States proposed a worldwide amateur allocation in the band 6900–7200 kHz, but this proposal was not adopted. The current ITU frequency allocations between 7000 and 7300 kHz are shown in Table I.

The IARU Region 2 Conference endorsed a 40 meter amateur allocation of at least 300 kHz, amateur exclusive on a worldwide basis, while attempting to achieve harmonization between the amateur and broadcasting services on this band. The requirement is even greater today than in the past, due to the increasing number of amateur stations and the expanding diversity of emission modes.

The current focus of negotiations on 40 meters is on moving broadcasters up the band while keeping the amateur allocation where it is. It appears that military use of HF is likely to increase in the current world situation, after several years of shifting toward satellites. Apparently, the 6900–7000 kHz band segment is no longer even up for discussion. *(See this month's "Zero Bias" for more on 40 meters.—ed.)*

Participation in Field Day

The role of the Amateur Radio Service in supplying communications in the event of disasters has always been recognized in Region 2 and is now gaining increasing recognition worldwide. The ARRL's annual Field Day gives radio amateurs an opportunity to exercise their skills in setting up portable stations under conditions similar to what might be experienced following a disaster. The use of alternate power sources and temporary antennas is emphasized.

It was agreed that the Field Day rules will be modified to support full participation by amateurs in all Region 2 countries. The new rules will be announced this spring. The next ARRL Field Day is the weekend of June 22–23, 2002.

Additional Allocations To the Amateur Service

The conference also endorsed proposals to allocate new amateur bands at 135.7–137.8 kHz and 160–190 kHz, and suggested that the Region 2 Executive Committee study the possibility of an amateur allocation near 5 MHz, similar to the domestic allocation requested by ARRL in the United States.

These new allocations would provide radio amateurs with the opportunity to participate in and contribute to an exciting new aspect of radio communications (VLF) and which would further the self-training in the radio art that is a principal obligation of the Amateur Service. Many other countries already have amateur allocations in the low frequency range, including 73 kHz, 135.7–137.8 kHz, and 160–190 kHz.

The IARU Region 2 Conference also approved a three-year budget and voted to hold its 15th General Assembly in 2004 in Trinidad & Tobago.

Sidebar #3: Proposed Text for Revised Article S25 of ITU Radio Regulations

Article S25 Amateur Services

Section I – Amateur Service

S25.1 1. Administrations shall verify the technical and operational qualifications of any person wishing to operate an amateur station. A person seeking a license to operate an amateur station shall be required to demonstrate a knowledge of the topics specified in ITU-R Recommendation M.1544.

S25.2 2.(1) Transmissions between amateur stations of different countries shall be limited to communications incidental to the purposes of the amateur service or of a personal character.

(2) Except with the authority of the relevant administration granted to meet a particular operational need, transmissions between amateur stations shall not be encoded for the purpose of obscuring their meaning.

S25.3 3. Administrations are urged to take the steps necessary to allow amateur stations to prepare for and meet communication needs in the event of a natural disaster.

S25.4 4. An administration may, without issuing a license, permit a person who has been granted a license to operate an amateur station by another administration, to operate an amateur station while that person is temporarily in its territory, subject to such conditions or restrictions it may impose.

Section II – Amateur-Satellite Service

S25.5 5. The provisions of Section I of this Article shall apply equally, as appropriate, to the amateur-satellite service.

S25.6 6. Administrations authorizing space stations in the amateur-satellite service shall ensure that sufficient earth command stations are established before launch to ensure that any harmful interference caused by emissions from a station in the amateur-satellite service can be immediately eliminated.

Announcing:

2002 Nominations Open for The *CQ* Amateur Radio Hall of Fame

Amateur radio operators have been responsible for many advances in communications technology and entire industries have been built on the foundation of amateur radio experimentation and activity. In an effort to recognize outstanding amateurs and their achievements, and help the public appreciate the far-reaching and long-standing value of amateur radio in our society, we established the *CQ* Amateur Radio Hall of Fame. Nominations for the 2002 "class" are now open. Members of the inaugural 2001 "class" were announced last May and appeared in the July issue of *CQ*.

The *CQ* Amateur Radio Hall of Fame honors those whose technical or other accomplishments have helped propel amateur radio forward, or whose achievements in other areas of life have helped improve ham radio's reputation simply through association. Nominees for the *CQ* Amateur Radio Hall of Fame will be judged on the basis of qualifying in one of two broad areas: those individuals—whether licensed amateurs or not—who have made significant contributions to the amateur radio hobby, and those radio amateurs who have made significant contributions to society in general. Nominees must have made *significant* contributions of nationwide or worldwide impact.

The Envelope, Please...

Between now and March 31, 2002 we will be accepting nominations for the 2002 "class" of the Amateur Radio Hall of Fame. Nominations received after that date will be considered for future selection. You may either use the form on the following page or on our website, or simply write us a letter stating your candidate's name, where to contact him/her if still living, for which category you are nominating him/her, and a brief one or two paragraph description of this person's accomplishments.

CQ DX and Contest Halls of Fame

Nominations are also open for the *CQ* DX Hall of Fame and the *CQ* Contest Hall of Fame, which recognize those amateurs who have made major contributions to DXing and contesting, respectively. The activities and accomplishments that qualify one for membership in these elite groups involve considerable personal sacrifice and can usually be described by the phrase "above and beyond the call of duty."

Nominations for the Contest and DX Halls of Fame are made by contesting or DX clubs or national organizations, and must be submitted by March 1 of each year to be considered. A maximum of two (2) people may be inducted into each hall of fame each year. Nominations for the CQ Contest and DX Halls of Fame should be directed to Bob Cox, K3EST, 1816 Poplar Lane, Davis, CA 95616 USA; or via e-mail to <k3est@cqww.com>.

Please include your name and contact information as well. E-mail to <hall-of-fame@cq-amateur-radio.com> or mail to *CQ* Amateur Radio Hall of Fame, 25 Newbridge Rd., Hicksville, NY 11801. If you feel someone has earned this recognition, please submit a nomination. Please *don't* assume that someone else will nominate the person you may have in mind.

We'll be making up our own candidate list at the same time and will announce this year's selections at the Dayton Hamvention in May 2002. Please help us recognize these "ham radio heroes" whose contributions have helped shape our hobby, our nation, or our world.

(Official nomination form is on the next page.)

CQ Amateur Radio Hall of Fame Nomination Form

The purpose of the CQ Amateur Radio Hall of Fame is to recognize individuals who have made significant contributions to the amateur radio hobby, and/or radio amateurs who have made significant contributions to society at large.

Name of Person Nominated:_____

Callsign (if licensed amateur/if multiple callsigns, list most recent): _____

If your nominee is still living and you know how to contact him/her, please supply the following contact information:

Mailing address: _____

City: _____ State/Prov. _____ Zip/Postal Code:_____

Country: _____

Phone: _____ Fax: _____

E-mail address:_____ @ _____

Please write a brief (one to two paragraph) description of this person's accomplishments/achievements and why you feel he/she should be elected to the CQ Amateur Radio Hall of Fame (if you need more room please attach a separate piece of paper):

Nominator Information

(This is only for the purpose of contacting you in case of questions, and will not be published.):

Your name: _____ Callsign: _____

Mailing address: _____

City: _____ State/Prov. _____ Zip/Postal Code:_____

Country: _____Phone: _____Fax: _____

E-mail address:_____ @ _____

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CQ and now... the 2002 CQ calendars

better than ever, all digitally photographed, and still 15 months of value.

The new 2002/2003 CQ Radio Classics Calendar features fifteen magnificent photos of some of the memory-jogging, heart-tugging gear that so many of us treasure or aspired to years ago. (Publisher's Note: They're making antiques a lot newer than they used to!) This year's Radio Classics Calendar features some of the great equipment of the '50s and '60s, with a smattering of the 1940s and 1930s.

Here's what's featured this year:

Collins 75S-3 Receiver, 1961; Lakeshore Bandhopper VFO, 1957; Gonset Commander II Mobile HF Transmitter, 1955; Gonset 913A 6 meter amplifier, 1964; Technical Materiel Corporation (TMC) GPR-92 Receiver, 1964; Hammarlund HQ-170 Receiver, 1958; McElroy Model 100 Straight Key, 1941; Sonar XE-10 Modulator, 1947; National NC-300 Receiver, 1955; Hallicrafters S-85 Receiver, 1954; Heathkit SB-500 VHF Transverter, 1969; Sideband Engineers SB-34 Transceiver, 1965; Swan 400 Transceiver, 1964; Drake TR-3 Transceiver, 1963; Utah UAT-1 Transmitter, 1937.

How many do you recognize? How many did you own? How many did you wish you owned?

The 2002/2003 CQ Amateur Radio Calendar brings you fifteen spectacular digital images of some of the biggest, most 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 cover photographer. Larry's travels this year took him to Colorado, Montana, Wyoming, Texas, Florida and New York, capturing some of the greatest Amateur Radio photos of the year especially for this annual favorite calendar. From winter scenes of the frosty northeast to pedestrian mobile in the Rockies, you'll love this traveling Amateur Radio photo show.

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!

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What's New

BY KARL T. THURBER, JR., W8FX

A New Column for A New Century

Digital Voice Comes to Ham Radio

A very hearty and happy New Year to all our readers! That having been said, let's dig right in and focus on some noteworthy hamshack radio gear and accessories, software, net news, books, and other resource information we think will be of considerable interest to you in this new year.

Radio Gear

Alinco DJ-596 Dual-Band HT. According to Craig Cota of Atoc Amateur Distributing (which now distributes Alinco products to dealers in the USA and Canada), Alinco has introduced the DJ-596 VHF/UHF HT (photo A). It's a compact HT that can transmit up to 5 watts output on the 2 meter and 70 cm bands, working in analog wide or narrow FM modes. Best of all, with the optional EJ-43U digital board you can conduct digital voice communications. The DJ-596 has 100 memory channels, full coverage of the 2 meter and 70 cm amateur bands, extended receive capabilities, CTCSS and CSS encode/ decode, three scan modes, the ability to work and save in memory any number of "odd split" offsets, and much more.

The optional digital board allows similarly equipped DJ-596 HTs to communicate via digital voice. Using the open ITU-TV.32 protocol, the board lets the operator easily select between analog FM communications and digital voice operations. Signals transmitted are not encrypted, and they can be monitored by any similarly equipped unit or any station able to receive and decode the ITU-TV.32 protocol.

The DJ-596 has a manufacturer's suggested retail price (MSRP) of $301.95. For more information, contact Alinco USA through its North American distributor, Atoc Amateur Distributing, LLC, 23 S. High St., Covington, OH 45318 (937-473-2840; web: <http://www.alinco.com>). Also note that customer service now is obtained through the Ohio-based distributor.

Photo A– Alinco has introduced the DJ-596 VHF/UHF HT, a compact unit that can transmit up to 5 watts output on the 2 meter and 70 cm bands. It works in analog wide or narrow FM modes, and with the optional EJ-43U digital board you can conduct digital voice communications. (Photo courtesy Alinco)

Accessories for the Shack

ECP® Electrically Conductive Particleboard for the Hamshack. The shocks we all have received when getting out of our cars, touching our radio gear, or shaking someone's hand are from static electricity. It's also a feared "silent killer" that's enough to damage or destroy sensitive electronic equipment, including amateur radio gear and PCs. According to Mark Reiland of Eagle Manufacturing, LLC, an innovative wood technology is available to protect electronics from destructive ESD, or electrostatic discharge.

ECP® Electrically Conductive Particleboard is a high-tech wood product that's catching up to advancements in the computer and electronics world. It's a specially engineered wood material, offered from 1/4 inch to 3 inches thick, that can provide long-term, standalone protection of sensitive electronics. This wood-based ESD technology can easily be manufactured into office furniture, operating consoles, workcenters, workbenches, tables, and shelving, which ordinarily offer no protection to electronics.

ECP is available through Eagle Manufacturing, LLC. Call the company and simply state the thickness you need and the dimensions you would like, and the Eagle staff will work up a quote for you. ECP is about double the cost of standard particleboard, but having something in place to protect from ESD and possibly even RFI may well be worth the cost. (Eagle is now testing a version of their ECP product that will offer RF shielding, to attenuate RFI.)

Everyone (including amateur radio operators) likes a nice-looking, furniture-like desk or console. Eagle also can help line you up with static dissipative laminates through another company so you can have attractive work surfaces that will offer ESD protection.

For more information on ECP and laminates, or to obtain a price quote, contact Eagle Manufacturing, LLC, 16601 N.E. 236th Ct., Brush Prairie, WA 98606 (phone 920-406-1608; e-mail: <eaglemfg@eaglemfg.com>; on the web: <http://www.eaglemfg.com>).

BurkTek Cordpro Cord Reel. BurkTek Incorporated has announced a novel, new, patented cord reel called Cordpro™. The new cord reel (photo B) is unique in that it lets you wind or unwind either end of an extension cord, RV power cord, drinking-water hose, coaxial cable, or practically any "flexible linear commodity," as it's called, at the same time or independently.

To use the Cordpro unit you simply connect one end of the cord, hose, or wire to the needed appliance or outlet, placing the Cordpro on the ground and pulling the opposite end to the needed location, or you can hold the Cordpro in one hand and either end can be selectively unwound, as needed, with the other hand. You easily can rewind each end back into the unit by holding it by its ergonometric grip in one hand and wrapping the loose end on with the other hand. The loose cord ends wind past each other with ease because of an internal divider that keeps them permanently separated, thus eliminating frustrating tangles.

This flexible, yet durable, plastic reel is made of weather-resistant, high-density polyethylene (HDPE), a plastic mate-

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

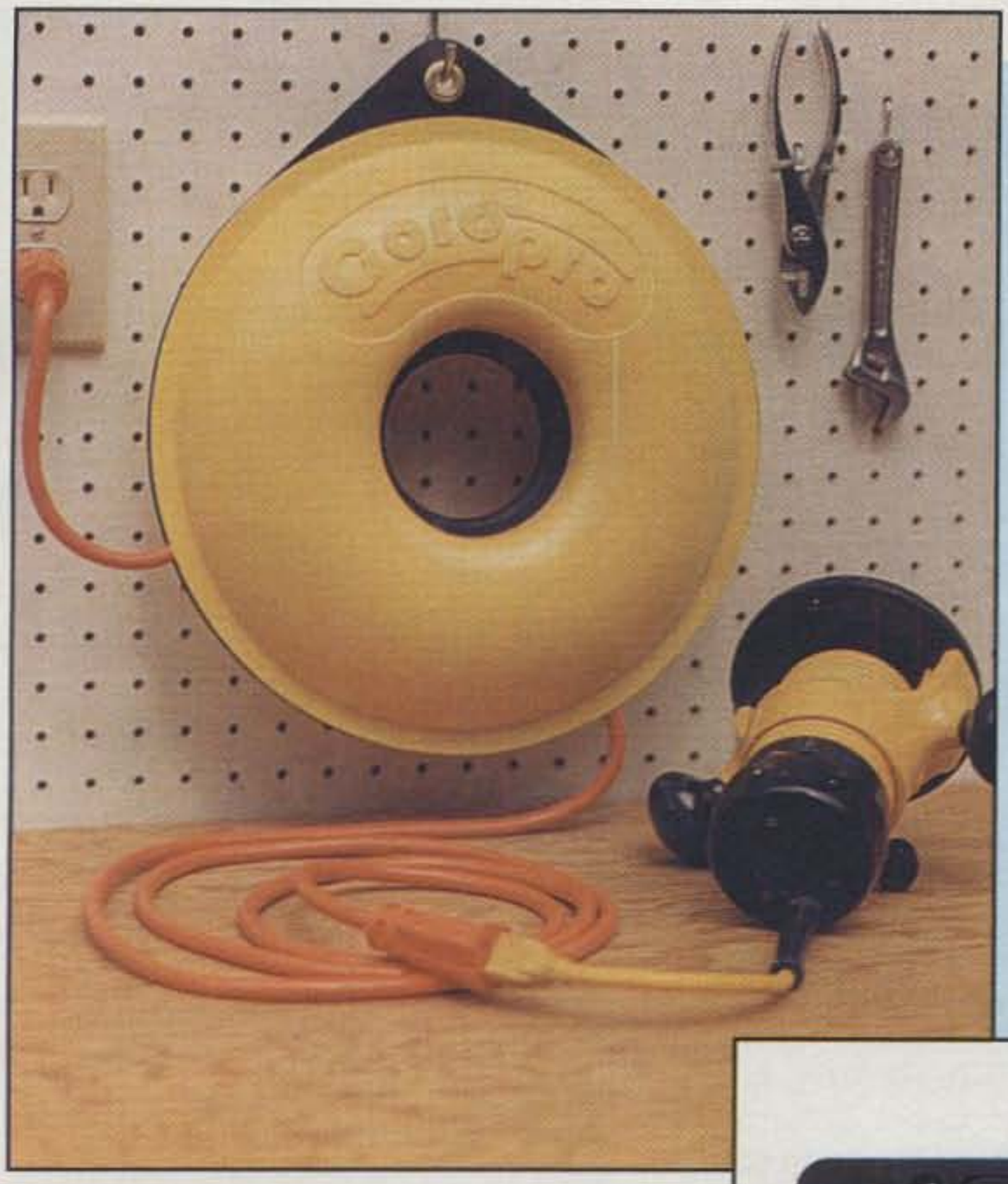


Photo B– Burktek Incorporated has announced a new cord reel, Cordpro™. It's unique in that it lets you wind or unwind either end of an extension cord, RV power cord, drinking-water hose, coaxial cable, or practically any "flexible linear commodity" at the same time or independently. (Photo courtesy BurkTek)

←

Photo C– Jensen Tools offers Sargent's Uni-Seal, a universal tool for RG-6 and RG-59 male Type F environmental compression connectors. The tool incorporates high mechanical advantage to reduce compression force during connector installation, while its ergonometric design minimizes user fatigue. A toggle action is used to assure complete connector sealing. (Photo courtesy Jensen Tools)

↓

rial commonly used for pickup-truck bed liners. It has no moving parts to bind or wear out. The flagship CP-100 unit ($20.90 plus $5.95 s/h) has a capacity of up to 100 ft. of 16/3 extension cord. Longer lengths of lightweight cords and coaxial cables can be accommodated, or shorter lengths of heavier cords, coax, and hoses can be used. A larger unit, the Cordpro® XL (CP-XL), operates in the same manner but has approximately twice the capacity of the CP-100; it's $34.95, including shipping.

For details contact BurkTek Incorporated, P.O. Box 10736, Kansas City, MO 64188 (phone 1-800-700-6784; e-mail: <burktek@cordpro.com>; web: <http://www.cordpro.com>).

Sargent® Uni-Seal Drop Tool from Jensen Tools. Jensen Tools offers Sargent's Uni-Seal, a universal tool for RG-6 and RG-59 male Type F environmental compression connectors. The tool (photo C) incorporates high mechanical advantage to reduce compression force during connector installation, while its design minimizes user fatigue. A toggle action is used to assure complete connector sealing, eliminating faulty compressions such as tight nuts, bent connectors, or popped O-rings.

For more details and pricing, 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

World Watch Pocket PC Version. In the July 1999 column we profiled the World Watch® Global Timepiece and Screen Saver for Windows®, a desktop PC application for radio amateurs and SWLs. To recall, World Watch, from Express Technologies Corporation, displays "real time" for locations throughout the world. You can completely customize the displays for your own location, time, and display needs through the use of various maps, user defined cities, and map settings. An illuminated pattern in the center of the map delineates those areas of the world currently experiencing daylight. This pattern highlights the progress of the seasons and displays sunrises and sunsets as they happen. Individual clocks digitally display and continually update local time for any location you select.

Recently, Express Technologies announced the long-awaited Pocket PC version of World Watch. Compatible with all pocket PCs, the software allows you to access the time for an unlimited number of cities around the world. World Watch Pocket PC has over 500 cities preconfigured, and you always have the option to add a custom location. You can connect World Watch Pocket PC with cables or docking stations which let you connect the software to your desktop or notebook PC. This capability lets you synchronize and update files on your Pocket PC with those on your desktop or notebook computer.

World Watch Pocket PC is priced at $39.95. Contact Express Technologies Corporation, 3753 Howard Hughes Parkway, Suite 200, Las Vegas, NV 89109 (phone 1-800-654-9548; e-mail: <info@exptech.com>; on the web: <http://www.exptech.com>).

***Encyclopedia Britannica* Expanded DVD Edition.** Over the years the public has moved away from expensive, heavy sets of encyclopedias to CD-ROM-based versions. Even more recently many encyclopedias have established public websites where one can download information free. How-

ever, there's still a market for high-quality CD-ROM- or, increasingly, DVD-based encyclopedias that include more detailed information and images than are available on free, public-access encyclopedia websites.

Encyclopedia Britannica has had a great reputation as "the world's reference standard" for some 230 years, and so has put its imprint on the latest version, *Encyclopedia Britannica* 2002 Expanded DVD Edition (separate versions are available for Windows and the Macintosh, each priced at $69.95). The DVD is billed as an all-in-one resource featuring a comprehensive, highly visual encyclopedia plus a dictionary, world atlas, and over seven hours of video and audio, all on one digital disc. Britannica's renowned intelligent search capabilities, and a new and improved results display, are designed to retrieve exactly what you need fast.

Also available are the *Encyclopedia Britannica* 2002 Deluxe Edition CD-ROM for Windows ($59.95; and the 2002 Standard Edition CD-ROM (Win/ Mac, $39.95). The *Encyclopedia Britannica* software is published by Britannica.com, 310 S. Michigan Avenue, Chicago, IL 60604. Distribution is through Pearson Education/Macmillan Software, 201 East 103rd Street, Indianapolis, IN 46290-1097 (phone 1-800-858-7674; e-mail: <info@mcp.com>; on the web: <http://www.mcp.com> or <www.macmillansoftware.com>).

New on the Net

Javaradio.com Website. Would you like to be able to remotely control, tune, and listen to someone else's shortwave radio over the net while sitting in front of your own PC? There are several web-controlled SW radio websites that let you do just that.

If this capability intrigues you, check out the main Scandinavia-based Javaradio.com website (fig. 1). At this site you can tune the site's receivers yourself. While Javaradios don't brew coffee, they do sport sophisticated features and streaming audio so you can hear the signals you dial up. The site offers discussion forums and frequent news updates. Also, using links at the website you easily can log in to several other Javaradio sites around the world which let you control the receiver that's physically located at the site. Additional Javaradio sites are located in Illinois, California, Australia, Japan, and several other locations worldwide.

Javaradio itself is client/server software for controlling the ICOM PCR 100/1000 shortwave and VHF/UHF receivers over the web using the TCP/IP protocol. You can download the necessary software from the Javaradio.com website. However, bear in mind that if you want to put up your own Javaradio website, you must have one of these ICOM receivers and a Linux server. Javaradio doesn't work with Windows®- or Mac-based servers.

Fig. 1– Would you like to be able to remotely control, tune, and listen to someone else's SW radio over the net while sitting in front of your own PC? If so, check out the main Javaradio.com website at <http://www.javaradio.com>. At this Scandinavian website you can tune the site's receivers yourself. Javaradios sport sophisticated features and streaming audio so you can hear the signals you dial up. (W8FX screen capture from Javaradio.com website)

For more information, check out the Javaradio website at <http://www.javaradio.com>, or contact the site's webmaster, Kelly Lindman, at <webmaster@javaradio.com>.

From the Bookshelf

Practical Antenna Handbook, Fourth Edition. Back in the November 1997 column we mentioned an earlier edition of Joe Carr, K4IPV's authoritative *Practical Antenna Handbook*. Joe is a Silent Key now, having passed away on November 25, 2000.

At the time, we really didn't fully appreciate Joe's huge and prolific editorial and technical legacy. Our radio columnist colleague had an outstanding and well-deserved reputation as a "hands on" antenna designer and technical book author. At one point a few years ago, I read that Joe was the author of over 85 books and 650 electronics- and communications-related articles.

The fourth edition of Joe's *Practical Antenna Handbook* (photo D) is pub-

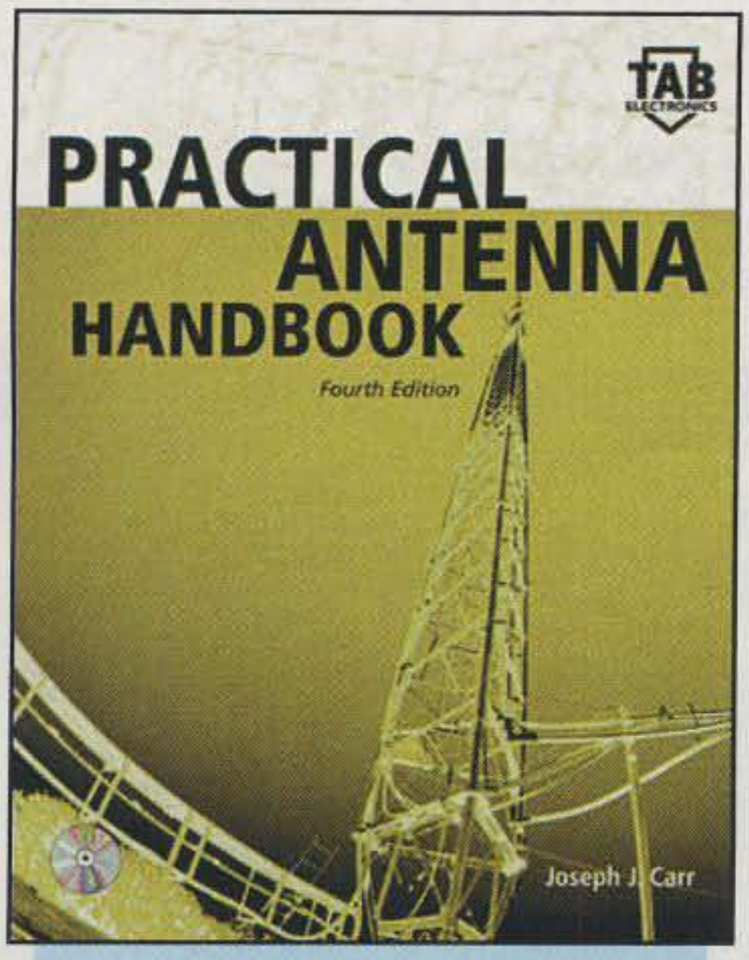


Photo D– The fourth edition of the late Joe Carr, K4IPV's Practical Antenna Handbook *is a monument to his editorial and technical legacy. An alternative to trial-and-error antenna guesstimates, the book is famous for its clearly stated, lavishly-illustrated explanations.*

lished by McGraw-Hill Professional Book Group and is billed by them as "the savvy alternative to trial-and-error, seat-of-your-pants guesstimates." The book is famous for its clearly stated, lavishly illustrated antenna explanations which dispel dangerous myths and hearsay to keep you out of trouble and on the right track. Joe's book is packed from cover to cover with fully-detailed instructions for designing, constructing, installing, and troubleshooting antennas. A nice plus is that a CD-ROM loaded with antenna-modeling software and other useful programs is included as part of the book package.

You can buy the book at bookstores (brick and mortar) or online at <amazon.com>, <barnesandnoble.com>, and other sites. To purchase it directly from the publisher, contact McGraw-Hill, P.O. Box 182605, Columbus, OH 43272-5032 (1-800-262-4729). To order online from McGraw-Hill, go to <http://www.mhorder.com/ant107.html>.

Short Bursts

Array Solutions to Handle Pro.Sis.Tel Rotators. Pro.Sis.Tel Rotators and Array Solutions have announced that Array Solutions is the new U.S. distributor for the Pro.Sis.Tel line of amateur, commercial, and military rotators. Pro.Sis.Tel's owner, Annamarie Fiume, stated that since introducing the line of rotors in the U.S., they have had good success, but now are looking to expand the markets, which Array Solutions is in a position to do.

The strong, worm-gear-driven line of Pro.Sis.Tel rotators takes its place among high- performance antenna systems for commercial, military, and amateur arrays offered by Array Solutions. These systems include WXØB antenna stacking and phasing devices, high-power antenna switches, baluns, impedance transformers, RF filters, custom antenna arrays and switching systems, and several other products.

For more information, contact Array Solutions, 350 Gloria Rd., Sunnyvale, TX 75182 (972-203-2008; e-mail: <wx0b@arraysolutions.com>; web: <http://www.arraysolutions.com>).

Wrap-Up

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

Overheard: Remember that in ham radio as in other activities and hobbies, being nice is always the best policy.

73, Karl, W8FX

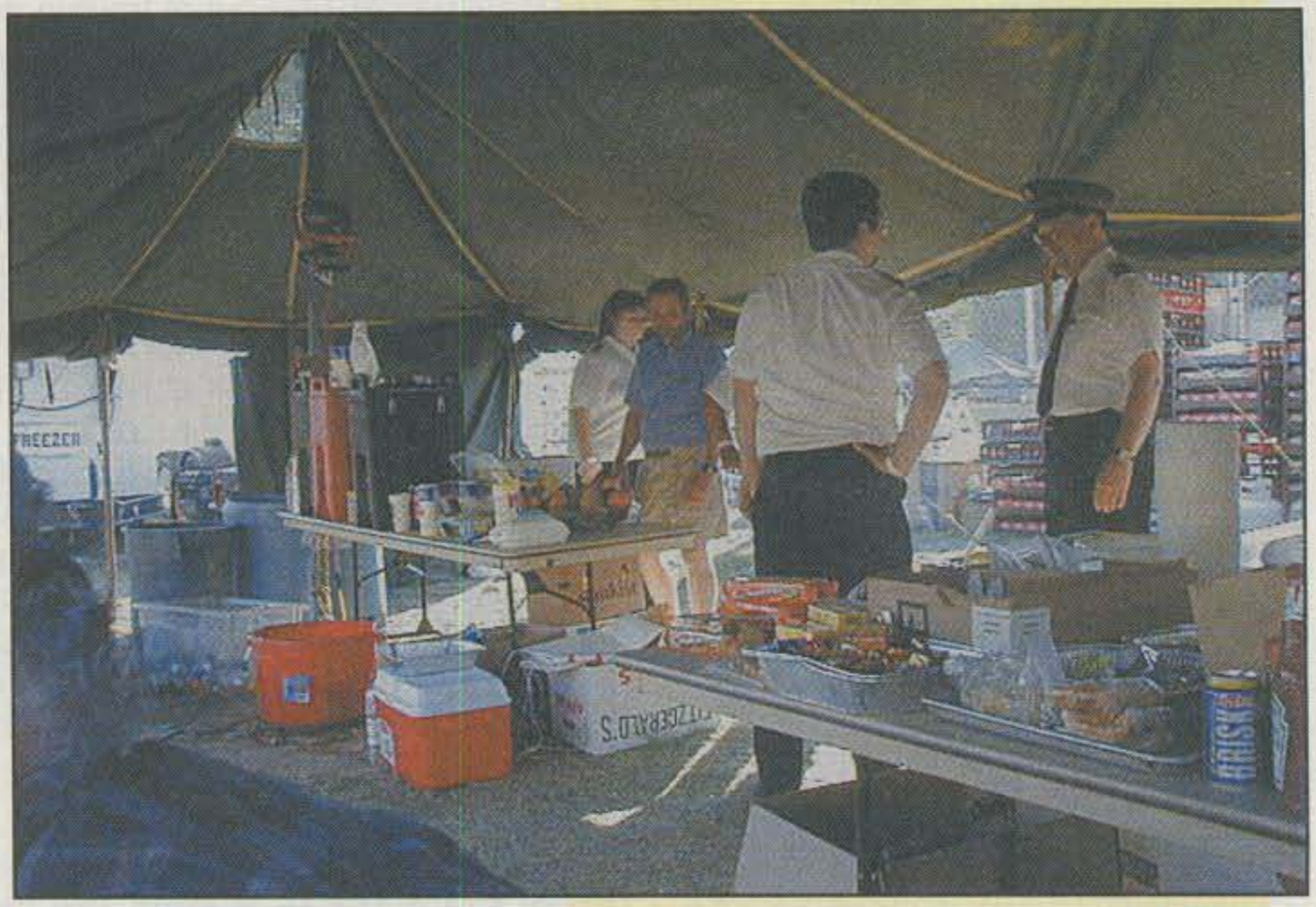
Public Service

Public Service and Emergency Communications

BY BOB JOSUWEIT, WA3PZO

September 11th Continued: Hams Respond in D.C. and PA

For the past two months we have been reporting on the events of September 11th. In the November issue we presented an overview of amateur radio response to the hijacking of four commercial airliners that crashed into the World Trade Center, the Pentagon, and a field in western Pennsylvania. Last month we focused on the activity in New York City. This month we look at the amateur radio response in Washington, D.C. and Somerset County, Pennsylvania.



A Salvation Army tent set up to feed all the workers in the restricted area. They even had dog treats available for the K9s.

At the Pentagon

A symbol of American might and the hub of the United States Department of Defense had been damaged by a commercial airliner flying into the building. ARRL Northern Virginia Section Emergency Coordinator Tom Gregory, N4NW, said ARES operators provided logistical support between the Salvation Army's relief and recovery effort on site and the agency's Arlington headquarters. The Salvation Army has been providing food and refreshments to the crews engaged in the Pentagon investigation and recovery operations.

Paul Konigsburg, K3MZ, of Great Falls, Virginia participated in the amateur radio support on September 14th. He provides a good insight into what it was like to be at the disaster site for a day and tells of the help that he and other hams provided. Paul picks up the story.

Setting the Stage

As I rode in the Salvation Army van, I first saw the gouge in the Pentagon. It looked similar to what I had seen on TV. As we drove around the parking lot, I saw three dogs resting on the grass. I was taken to a spot in the south parking lot and was told to get my badge. Many people were waiting in line to get badges. They were staring at the hole in the side of the Pentagon some 200 feet away. It smelled like a fire that had been recently put out. There were several generators running next to us in line, so the burn smell mixed with exhaust. Heavy machinery was moving in and out. There were nearly 1000 local, state, and federal police, including the FBI, the National Transportation Safety Board, the Secret Service, and the Bureau of Alcohol, Tobacco, and Firearms.

There had to be 600 rescue people at the site. There were fire fighters from Montgomery County, Maryland, as well as Arlington and Fairfax Counties, Virginia. There were people who had "Urban Search and Rescue" on their shirts and hats. Some people's attire just said "Rescue." There were GIs in white suits and yellow boots going into and coming out of the building.

While I was waiting in line, the three dogs I had seen resting were walking with their handlers into the crevice of the Pentagon. Meanwhile there were others working at the site. There were construction people who could run the heavy machinery to remove the debris, men to drive trucks to haul the debris, and others who could install temporary wood bracing to stabilize the building. Meanwhile, Secretary of Defense Donald Rumsfeld walked past us clasping his hands together and smiling for support. Fifteen minutes later I saw a strange sight. Military people were bivouacked on the grass and in the parking lot at the Pentagon. Many of them were putting on the white suits and going into the building. I later learned the white suits kept the men away from airplane fuel contamination and the decaying bodies.

A Large Support Operation

There were at least 2000 people working at this crash site, and they all needed to be fed. The Salvation Army had set up four feeding centers, two outside the restricted area and two inside. The amateurs relayed information to and from the various canteens. Many messages were of the form, "Need 50 meals at site 1," or "Need gasoline at site 2." My job was to shadow one of the Salvation Army Captains who went among all the sites. Messages were passed on a directed net.

Noise!

From a radio perspective, the area was very noisy. I saw the military had set up wireless communications, and from the size of their antenna, it looked like they were using a frequency between our 2 meter and 70 centimeter bands. On the amateur frequencies there were a lot of beeps, squawks, chirps, and other forms of radio interference. There was also a lot of audible noise from the generators. You needed an in-the-ear type earphone, and many messages still had to be repeated.

Food

I went back to the south parking lot and noticed that both McDonalds and Burger King had set up mobile kitchens. You could walk up and get burgers and fries. Also in the parking lot were hundreds of cases labeled "Frito-Lay." There were squads of soldiers and Marines distributing these chips. There were also piles of socks, sweatshirts, underwear, and flashlights. Both Costco and Wal-Mart had trailers there, too. I saw a pallet in the parking lot filled with snacks for dogs. Food was kept in refrigerated trailers. There was one trailer that had hundreds of bags of ice. Everywhere there

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were coolers filled with water, Gatorade, and sodas. When I asked the person I was shadowing, Capt. Burton, he said that this was all donated. People were friendly and helpful.

Standards To Be Met

There was a health inspector who looked at all the food. He was very concerned about the food being prepared on site. He saw some chili and wanted to make sure the temperature was above 180°F. He cleaned off his thermometer and stuck it in the chili. The temperature rose past 180° and I couldn't read it anymore because the steam fogged the dial. He wanted to make sure the chicken was cooked through. He took a piece and ripped it up. The meat fell off the bone. It was thoroughly cooked. While he was doing his job and while he was telling them to not reuse utensils and other basic food health care, I was thinking to myself, "Here we have people who have fed folks from Hurricane Andrew and lots of disasters since then. They have kept people fed and given them good food for years. They have worked in hotter temperatures and in colder temperatures. They know how to keep hot things hot and cold things cold!"

Volunteer Organizations Working Together

I could sense a little tension between the Salvation Army and the Red Cross, so I asked a Salvation Army person and she said that they had been there first. The Salvation Army had set up two feeding stations and many tents by the time the Red Cross set up its first tent. She said that the Red Cross is associated with the military, so it was getting all the glory. The organizations still worked together. When the Red Cross people came and asked for ice, the Salvation Army person merely asked how many bags, and then proceeded to give them, cheerfully, the bags of ice.

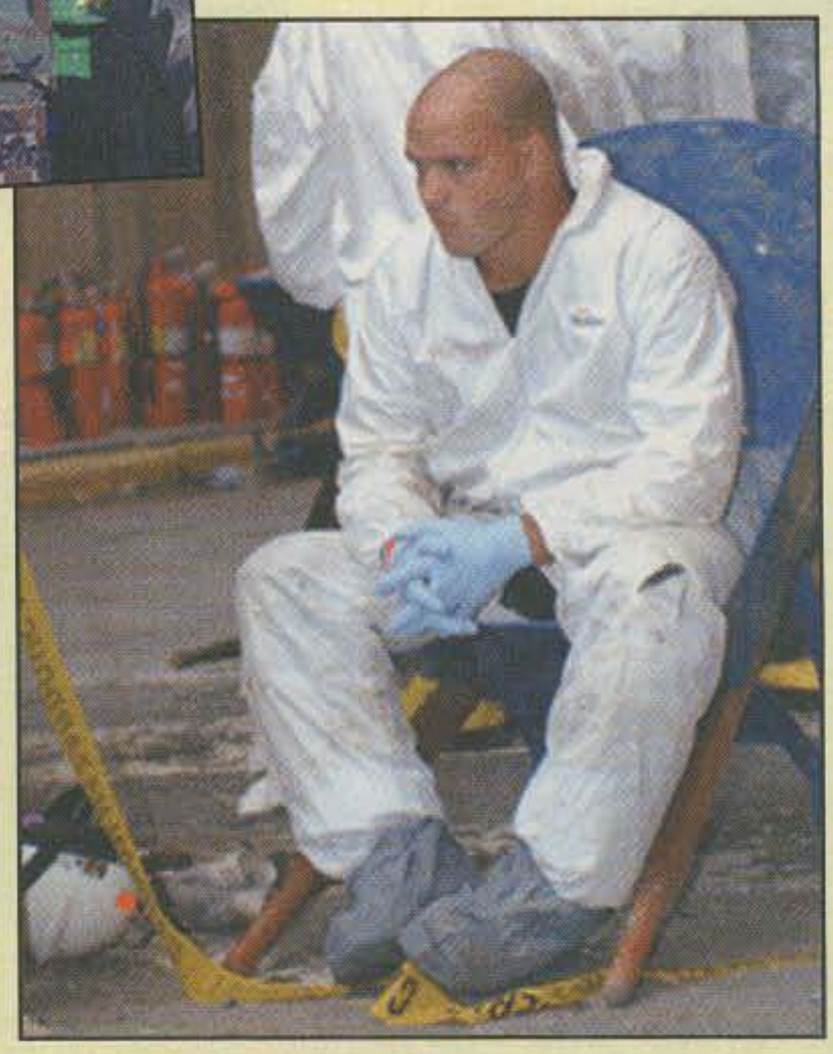
Capt. Burton, a few other Salvation Army folks, and I loaded up a truck with drinks and snacks. We then delivered it to station 1. I helped unload the truck. While Capt. Burton was talking to some of his people, I got to talk to one of the folks in the white suits. I asked him, "What was it like in there?" He thought for a few moments. Then he said, "Imagine a junk yard that has been blown up."

Radio Traffic

Messages kept coming:

"Net - station 2."
"Station 2—net."
"Station 2 needs snacks."
"Roger station 2, did you copy station 4?"
Silence.
"Station 4 this is net."
"Station 4."
"Did you copy that station 2 needs snacks?"
"Did now, how many?"
"Station 4 please go direct with station 2."
"Station 2—Station 4."
"Station 2, we need about 200."
"Roger station 2. Station 4 out."
"Station 2 out."
"Net out."

Secretary of Defense Rumsfeld thanks one of the many soldiers working at the Pentagon. (Department of Defense photo by R. D. Ward)



K3MZ later learned the white suits were to protect rescuers from contamination from the airplane fuel and decaying bodies. (DoD photo by Staff Sgt. Larry A. Simmons, U.S. Air Force)

Station 4 was near the main supplies and had most of the Salvation Army officers. At Station 4 an FBI agent asked for some ice and water. Capt. Burton got a round cooler, the ice and water, and delivered it to the side of the restricted area. There were dozens of FBI agents. There was also a temporary chain-link fence with black plastic on the chain. I asked Capt. Burton what was behind there. He said that is where they were placing the corpses. I was glad it was covered.

Later in the evening some firefighters came by and asked for some hot food. We put trays together and then went into the restricted area. When you are in a cart or in a vehicle, dogs sniff you for bombs. This time the MPs said they would do the sniffing. The firefighter said to the MP that he would give him some food, but he needed it all for his men. I asked this firefighter what it was like inside. He said that it was starting to smell rotten. I asked if there was any chance of finding people alive. He shook his head no. He thanked us for the food and then took it to his unit.

I would say that the mood of most of the workers was grim mixed with a little exhaustion. I didn't see much hope on their faces. They were doing their jobs and were going to let the emotions have their time later.

The warm day was now turning into a cool evening. The calls on the radio changed to requests for sweatshirts, socks, and underwear. I guess most of the people, men and women, just changed their underwear and went back to work. A call came on the radio that Station 1 needed dog treats.

This was a day when I got to witness first hand some of the worst of mankind. The destruction of that part of the Pentagon was horrific. I thought to myself that as bad as this is, New York must be twenty times worse. I also got to see that some of D.C.'s products—politics and bureaucracy—survived. I also got to see some of the best of humanity—people volunteering their time and special skills; people doing all they could to rescue their fellow man; people giving food and clothing; corporations giving their products to help the cause. I realized that these specialized rescue people need ordinary folks to feed them, clothe them, and give them fresh batteries. I was glad to be a part of this. I was honored that I could help.

And yes, the dogs got their treats.

Logistics

Since the noise level was so high, operators were rotated in and out of the immediate vicinity of the attack as frequently as possible. "There's the emotion of it, and there's the tremendous amount of noise, and it's very grating on you because you can hardly hear the radio to communicate," the ARRL's Gregory explained. In addition, the cellular telephone network was swamped, and because the Pentagon remained open,

The western Pennsylvania crash site was in the middle of a field. There were no survivors. (Picture courtesy Salvation Army Disaster Services)

there was a lot of other RF in the vicinity, which further complicated matters.

"I found that it took me a few minutes to realize the gravity of what was going on and the importance of what we hams are doing in our own small way to help out," Gregory told the ARRL. "The devastation of that building is awesome. It puts things in perspective and it certainly made me proud to be an amateur radio operator and serve the people of the United States by offering this support."

Western Pennsylvania

While most of the news media focused on New York and Washington, D.C., another aircraft crashed into a field in Somerset County, Pennsylvania. This disaster was much different from the other two in that there were no survivors. The FBI declared the crash site a crime scene and secured the entire area. The plane did not come down in a populated area.

The Western Pennsylvania Division of the Salvation Army Disaster Services went to full activation on September 11 at about 10:30 AM. By 11:00 AM three canteen units were headed to the site. In addition, the Salvation Army Amateur Radio Team (SATERN) was dispatched from Pittsburgh. On the way to the scene an emergency net was established on several 2 meter repeaters, said Eric Hegerle, N3VOC. Three repeaters were remotely linked together, forming a direct radio connection from the Army's Pittsburgh headquarters to the plane crash site some 80 miles away.

Dave Kleber, KB3FXI, was one of the first SATERN operators from Pittsburgh to arrive at the crash site. After assessing the situation with the Salvation Army, he made contact with the net control. "The repeater link was fantastic and worked flawlessly," said Kleber. "I'm not sure how I would have handled the job without that local repeater. I was equipped with a homebrew 3-element beam and my 50 watt Kenwood TM-261, but I would have had a heck of a time, at best, hitting the 146.61 machine direct from the site and I would have been tied down to my vehicle the entire day. The repeater link allowed me to do the vast majority of my radio work with my Yaesu FT-50 handheld."

Kleber handled traffic from the site until 11 PM. He said most of the traffic involved messages to some of the Salvation Army leaders at the site from the Pittsburgh Headquarters and also messages in and out of a staging area that was closer to the crash site than the one at which he was.

Amateur radio operators from the Somerset County area also became active, assisting the SATERN team without hesitation in shadowing non-licensed personnel and communicating for the canteen units.

Local hams also provided communications between the Pennsylvania Emergency Management Agency's Western headquarters, which was operating on 75 meters, and the Somerset County EOC on 2 meters. County Emergency Management Director Richard Lohr, N3VFG, placed hams on "standby" late Tuesday evening until early Wednesday morning. The hams were again placed on standby status Wednesday and were asked to remain alert. Jim Crowley, NJ3T, RACES Radio Officer for Somerset County, said, "Preliminary communications between the EMA EOC and the crash site EOC was established by our RACES/ARES volunteers quickly and professionally. Volunteers were poised to help continue these communications."

An Overview

Since the November issue we have tried to relay to readers some of the work, emotion, and dedication of the hundreds of public-service-minded hams involved in the September 11disaster. We couldn't have done it without so many of you sharing your experiences with us. This month I would like especially to thank K3MZ, N3VOC, and KB3FXI for sharing their stories with us.

The events of September 11 show us that amateur radio plays an important role in emergency communications whether it's in the middle of a field or in New York City. The first communications between Westchester County, New York and New York City were via amateur radio operators in the County Emergency Operations Center. According to a report on the Westchester Emergency Communications Association reflector, a senior county official pointed out that things were so bad in New York City that all normal means of communications had broken down and for a while only R.A.C.E.S could get messages through.

Our lives have changed since September 11. If you are in a city or near an airport, you routinely see a military uniform. High-level alert warnings have become routine. The threat of anthrax contamination has become routine in some places as post offices and mail-rooms are closed, tested, and in some cases decontaminated.

The role of amateur radio emergency communications has changed. In the past, much of our emergency communications was weather related. In many cases we had some warning. Now more than ever we have to be ready—for anything—at a moment's notice.

Do you have a story that you would like to share with us? Drop us a note. Until next time . . .

73, Bob, WA3PZO

Magic In The Sky

BY JEFF REINHARDT, AA6JR

New Views of Amateur Radio

Would Listening Have Made A Difference?

Stay with me through this one, because I'm going to ask some questions to which I do not know the answers. As I write this, it is just a few days past the infamous attack on our country. Millions in this nation and around the world share the shock and sadness.

The difficult question I raise for radio hobbyists is this: Would more monitoring on our part have made a difference?

Were there any radio hobbyists listening to the aircraft frequencies that fateful day? If so, what would they have heard? Maybe nothing. Maybe some of the desperate mic clicks reported to have come from one of the hijacked aircraft? Was the doomed pilot sending Morse code? Maybe some of the reported communications on "company" frequencies about aircraft that had been hijacked? Might any of this have led to earlier warnings given to the FBI and others? I don't know. We never will.

What about cell-phone traffic? Most are aware of communications industry sponsored legislation making it illegal to monitor cell-phone calls. As a result, the Communications Act of 1934 was amended and the airwaves no longer belonged totally to the people. Scanners sold in the U.S. must now have the cell-phone segments of the spectrum blocked. The matter came into the media spotlight because a prominent politician was reported to have said some things on a cell phone that were monitored by third parties who later disclosed the conversation to the press. The fact that this was illegal under existing law was not enough. The uproar led to the enactment of more rigid scanner regulations, making the airwaves safe for congressmen once again.

The nexus of those events may have led to unintended consequences. It is reported that the terrorists who victimized our country made extensive use of wireless telephone communications. If those conversations had been conducted "in the clear" and monitoring cell-phone conversations was legal, could radio hobbyists, the FBI, or others have helped avert one or more of the tragedies of September 11th?

There has been increasing concern about privacy for some time. We are told by some that we (the people) have none. Our financial records and other personal data are freely shared by just about everyone with whom we do business. The internet is a cesspool of snooping, cookies, hacking, and more, much of it targeted at extracting as much information about you as possible.

Concerns about privacy led to the cell-phone monitoring ban. We've also seen the proliferation of digital phones geared toward ensuring secure communications. The question is, how much privacy is too much . . . and how much is too little?

I liked the original Communications Act of 1934. It said the airwaves belong to the people. From that point on, most RF rules were developed on that premise. It also mandated that broadcasters act "in the public interest," reflecting that they operated on frequencies that were not their own. This policy was dramatically changed in the '90s when cell-phone privacy became a concern and the government realized it could reap billions by selling off vast segments of the RF spectrum that *formerly* belonged to *all* the people. The need for some secure communications was addressed by the old Secrecy of Communications Act, which essentially said you could monitor any communication but you could not disclose a non-broadcast communication to a third party. (This item used to be on the old FCC commercial licensing tests.) I would be surprised to learn if anyone was ever prosecuted for having violated that regulation.

The media came to make something of a mockery of the Secrecy Act, monitoring police, fire, and other public-service frequencies as a means of gathering news, which to a point was okay, provided they verified the information they obtained through other parties before reporting it. Unfortunately, many did not. Then the wireless industry lobbied for security, the congressman got caught doing something, and everything changed.

Under the old rules you had a reasonable expectation that your radio communications were *not* secure, that anyone *could* be listening to anything—public-safety frequencies, aircraft frequencies, and yes, wireless phones. I took that to mean I would not say anything on a wireless phone or two-way radio that was intended to remain private. Not a difficult concept to grasp. Much like talking to a friend on a crowded bus. Whether or not you like it, you have an audience. In that venue, you do not disclose your bank balance or share your deepest secrets. By making it illegal to monitor wireless phone calls, did we provide terrorists with a low-cost, secure communications system?

Here's another issue: The push for privacy is taking away another "check and balance" in our system of government. Police and fire agencies across the country are converting to trunked and/or digital systems, many based on the APCO 25 format but very easily encrypted so as to be unintelligible to the average listener. It's unintelligible anyway, because as of this writing, no one has introduced a scanner that can copy digital transmissions. It is reported that Los Angeles media outlets are buying expensive commercial transceivers and begging to get them programmed by whatever means they can to restore their ability to monitor public-safety transmissions. Is there something wrong with this scenario?

I believe that in this country *individuals* do have a right to privacy, but nowhere in the Constitution can I cite a passage that states the *government* has an absolute right to privacy in all its communications. The Bill of Rights puts limits on government, not the people. I'll concede that certain agencies, such as the Secret Service and the military, have a need for security. However, I'm sorry, but not everything the police and firemen and other public servants have to say is secret, nor should it be. There are many legitimate reasons to know what public-safety agencies are reporting. Rioting in a defined area? The location of the tornado? Godzilla marching up Main Street? You can think of more.

Some of the radio communications surrounding the Rodney King beating

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incident in Los Angeles showed that when radio communications can be conducted away from public scrutiny some very awful things can be said. Had those LAPD communications been in the clear, perhaps the public would have been better informed that there are indeed some bigots in places where they do not belong. Public safety is the public's business. We pay for it. We should be able to listen to most of it. When secrecy is needed, let a judge make that determination, as is done for wiretaps. When you can't monitor the activities of your public servants, just whom are they serving and how well are they doing it?

Worst of all, the trend toward secure government communications has had some (more) unintended consequences. There have been severe communications problems reported in New York, Los Angeles, and Washington, D.C. as police and fire agencies in those cities have converted to digital and found the system does not work as well as the older analog systems. The manufacturer says there is no problem. The police and firefighters whose lives are on the line say there is. Which side do *you* believe? So for a few bells and whistles such as addressable radios, millions are spent on a system that is inferior in many ways, except for the ability to encrypt routine communications.

Here's another way encryption cuts both ways: It has been reported that reputed terrorist factions have been purchasing "secure" communications devices. We must now come to grips with the notion that the good guys have it, the bad guys have it, and we have no means of tracking either. Worse, it's a genie that will never go back into the bottle.

No one knows if the monitoring public might have had a role in averting this tragedy, or might in the future. Let me put it another way, however: The ability to monitor our radio spectrum *could* have made a difference, and that's enough for me. I also see a troubling trend when the government gets more and more privacy while we the people get less. The incidents surrounding September 11, 2001 have given us much to think about.

Finally, here's a salute to those communications volunteers who have given their time and the use of their skills and equipment in the recovery effort. When the cell-phone system failed due to damage and over-demand, once again ham radio came through. These volunteers are people who put true magic in the sky for the benefit of others. On behalf of a grateful nation, thank you.

73, Jeff, AA6JR

Beginner's Corner

BY PETER O'DELL, WB2D

For the Newcomer to Ham Radio

A Separate Peace

At this writing, the World Trade Center attack was almost two months ago. As a nation, we are angry. Ham radio played a behind-the-scenes role in the recovery effort. As a new ham, have you considered what you can do to help? Has it occurred to you that you can do something to help stop this from happening again? It may not be what you think.

After the attack, ham radio emergency groups were there lending what support they could. Other hams were a part of the search effort. I tracked down an old friend from Long Island who is on the Port Authority Police Force, Bill Savarese, N2HII. I found out that he was okay and was volunteering in the recover efforts. What he was doing at the time seemed to me to be a lot more important than chit-chatting with me, so I have not called him—yet. I'll do that one day soon. We need to catch up, and I want him to know that we support what he was doing.

About ten years ago Bill and I lived near one another and shared a lot of common interests besides ham radio. Both of us held offices in the Suffolk County Radio Club. Then I moved, and we lost track of each other. However, there is a bond between hams that time and distance can't break.

It's a funny thing, though. Radio waves do not recognize political borders. In fact, they have a habit of ignoring them as if they were imaginary. There is a ham radio legend from a war six decades ago that is worth revisiting in these troubled times.

The jungle was hot and heavy and close. Almost no beach; the tide was in. Just jungle and water. Jones's wet clothes clung to him, but he was alive. That thought had run through his mind over and over as he watched his wounded fighter sink into the shark-infested sea a hundred yards off shore of this unnamed, uncharted island. Would he be rescued? Didn't matter, he was alive. If only he had been able to pull the transmitter out before the plane started sinking! He could make an antenna out of a wet vine or monkey entrails or something, but first he needed a radio. Even a ham could only do so much.

What resources did he have? His sidearm, a Colt 45 automatic, and a knife and a three-year-old copy of *QST*. The pages were wet now, but they would dry out.

Jones was sure he was alone on this swamp floating somewhere in the South Pacific off Midway. If the Navy couldn't find him, chances were good that the Japanese wouldn't find him either. Nonetheless, he couldn't risk a fire. In this heat, he would dry out soon enough.

The single, metallic "click" brought him to his senses. As he raised his hands and slowly turned around, the magazine fell out of his shirt into the sand. Regular Japanese Army. Short. Mustache. Riffle aimed at his chest. For a moment their eyes locked, and Jones knew his life was over. This man would not take a prisoner. His mind raced through bizarre scenarios that should have been terrifying but weren't. He was amazed at how calm he felt staring death in the eye.

His captor dropped his eyes to the ground. Jones knew when he looked back up he would pull the trigger. He wondered what he would feel. Pain? Burning? Or maybe blackness. Nothing. Do the lights just go out?

"Are you a ham?" The English was perfect with only a trace of accent.

"What?"

"Are you a ham!"

"Yes. I'm K6 . . ."

They exchanged callsigns and recalled working one another. Nao had studied at Berkeley before the war.

"What are we going to do? The soldiers in my unit will kill you if they find you . . . Oh. I'm sorry," he mumbled looking embarrassed as he dropped the barrel of the rifle down and uncocked the firing pin.

Jones was stunned, but he understood. He couldn't kill a fellow ham, either. Hell, he had Nao's QSL on his wall at home. It would be like shooting his own brother. Nothing made sense any longer. Somewhere deep inside he knew the war was over for him, even if by some miracle he was rescued.

"I haven't read that issue of *QST*. Could I borrow it, please?"

"Of course. You can have it. I've read it cover to cover about 50 times in the last year alone."

Thus the story goes that Nao kept Jones hidden away from the other Japanese solders until the war ended. He ate half his food and smuggled the other half to the American ham. Jones caught fish, and Nao taught him to love sushi.

Did it really happen? Probably not, but it could have. This legend has been floating around ham radio circles for over 50 years. Like a lot of other mod-

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e-mail: <wb2d@cq-amateur-radio.com>

ern myths, it's always told as something that happened to a friend of a friend.

Ham radio has the mystical ability to bring together the far corners of the Earth. The most unusual ham conversation that I ever heard came as the Soviet Union was collapsing and the Berlin Wall was coming down. I was tuning across the bottom of the 20 meter phone band when I came across a QSO that sounded interesting. A W1 in Maine was chatting with a ham in one of the Baltic countries. I think it was Estonia. A year earlier the Estonian would certainly have lost his license and maybe his life for engaging in such a conversation.

They were talking about how the Berlin Wall had come down. The W1 related how some entrepreneurs in his town had gone to Berlin and salvaged very large chunks of what had been the wall. They had returned to Maine and were selling small pieces of it as souvenirs. The Estonian laughed and said that he himself would love to be able to buy a piece of the wall.

"Give me your address. I'll buy a small piece and send it to you. It's pretty inexpensive, maybe $10 or so. No big deal," said the W1. For those of us who had grown up in the Cold War, survived the bomb-shelter craze, and laughed at the utter madness of *Dr. Strangelove,* it was a moment to savor.

All along there has been a camaraderie among hams that transcends the political bickering and maneuvering that our leaders go through. For me, it was a small incident over a decade before the Berlin Wall came down, but then it is those little things that let us know we all are human.

I was working the CQ WPX Phone Contest as a single op and had been sitting at the radio with the headphones on since Friday night at 7. It was Sunday afternoon now as I sat calling CQ, working Europeans. The roar had been virtually non-stop, and my brain was mush.

There was a weak Swiss station (probably a QRPer) who answered, but I kept missing the second letter of his suffix. Finally, there was a booming signal and a deep voice that said, "Echo, it's echo, roger?" I rogered the Echo and signed with the Swiss station. Oddly enough, the next station I worked was a UA3 with a booming signal and deep voice . . . and a chuckle. Those were the days when our countries had thousands of nukes aimed at one another. We were all about 15 minutes from being toast if someone made a mistake.

So what can you do as a new ham? One of the best things that I can think of is to start working DX. But you say you are not competitive and you dislike

Feedback:

From **Nate Williams, W9GXR, Middleton, WI:** I really enjoyed your article on ground in the June 2001 issue of *CQ* magazine. I am one of those guys who has the ham shack in a room on the second floor, and my tower and Yagi are right above me. While the tower is adequately grounded, I have never had a good ground internally for the equipment and am always looking for new thoughts. A friend of mine once told me that radio transmitters work alright in airplanes without ground and that gave me pause to think. Anyway, I was thinking of trying your second method, the counterpoise, employing quarter wavelengths, but wonder if that might run into a rat's nest of wires in an attempt to operate my kilowatt on all bands from 160 through 10. My question is, what gauge wire would you recommend? Yes, I will have to use insulated wire since the wire will run every which way in the attic. It sure would be nice to be able to use my computer at the same time I am on the air. Maybe this would help; who knows. Any thoughts would be greatly appreciated. Thanks.

WB2D's response: I've never noticed any difference in wire size for this application. Some engineer may respond and tell me why I'm wrong, but I would go with any convenient insulated wire strong enough not to snap. None of the ladies in my life have been decorating freaks, so I have gotten away with running the wire around the baseboards. Secure the wire to the baseboard as you would do with a phone line. Depending on band and room size and such, the wire might never leave the room. (Why go into the attic with this?) Since you seem to live in a private dwelling, I would just run the wires for the lower bands (80 and 160, at least) out the window and down the side of the house. You can then bury them a few inches below ground surface in a "trench" you make with the edge of a shovel.

From **Bill Turner, W7TI, Landers, CA:** I enjoyed your article on using loaf pans for projects, something I hadn't thought of. You mentioned that an aluminum can sometimes be hard to work with when it's thin, which I heartily agree with.

There is a drill bit called a "Unibit" which is designed just for drilling holes in thin material and it does a beautiful job. It is in the form of a stepped cone and comes in at least two sizes. Because of the steps, it can drill a number of different size holes. It is far superior to a standard twist drill for thin stock. Your local hardware store guys will know about it. It is expensive—around $20—but one of them will replace several regular bits.

Perhaps you already knew of this, but I think the beginning readers should be made aware of it. To me, it is absolutely indispensable.

From **Chad E. Phillips, KGØMW, Sioux Falls, SD:** Just wanted to let you know that I just finished reading the Sept. column. I too use the RadioShack foot switch. What is interesting is to think not only about how many times you have used the switch, but if you are like me, think about the times when you get a little excited and slam your foot down on the switch! Amazing the switches last! Anyway, this is in response to your asking for newcomer stories. I don't have the time tonight to write the whole story.

I have been a licensed ham for 15 years now. A year ago we moved into a new house. I decided to take the opportunity to "start over" in ham radio. Everything was in boxes, antennas were down, and cables thrown away. I gave it a lot of thought and tried to decide which direction I wanted to go with my hobby. Let me tell you, in the process it has been a lot of fun! New countries, new bands, and new friends. I hope to put the story together for you (if you would like) along with pictures and send it to you during the next couple of weeks.

WB2D's response: Okay, Chad, sounds like a good story. Send it in.

chasing awards. No problem, because there are a lot of DX hams who would much rather just rag chew. If you look around, you can find them. We have a powerful tool for connecting with other human beings. One human being who feels a deep connection with another rarely decides to hate that other one.

Just find one other ham out there somewhere and declare peace between the two of you—not with those exact words, but just by being friendly. It's too late to humanize the political psychotics hiding behind religion. Our military will take care of them. However, the more friends we make around the world, the harder it is for these psychotics to operate. If we make enough friends, they won't have any place to hide.

Ham radio cuts across all sorts of borders. Some of them are political and geographical, but others are social of one sort or another. Even if you have no interest at all in ever getting on the DX bands, you will find that your radio cuts across many boundaries. When you hear a voice coming out of the speaker, you probably don't stop and wonder about what color the owner's skin is, or what his or her religion is. Maybe the person is a quadriplegic or blind. Does it make any difference? No. Everyone is equal on the radio.

It is more than equality, though. We are at once anonymous and close. Hams are brothers and sisters. We are a family of disembodied voices.

73, Pete, WB2D

Call for Photos and Stories

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

Our Readers Say

Awesome!

Editor, *CQ:*

I just wanted to take the time to say that the article on the Heathkit HW-101 restoration by Mike Bryce in the November issue is great! Really enjoyed it!

Thank you very much!

Bryan Byers, KA9KHD
via e-mail

Editor, *CQ:*

I am writing this e-mail to say that the article Mike Bryce, WB8VGE, wrote on restoring a Heathkit HW-101 was awesome!! It was one of the best articles I have read in any ham publication thus far. Is there any way of getting a similar article written for an SB-101 or SB-102? I have a soft spot for Boatanchors.

Frank Majewski, KB1HHA
via e-mail

Frank – it seems you're in good company. Mike's Heathkit restoration pieces have been among our most popular articles recently. Be sure to read his "Confessions of a Heathkit Collector" in this issue.

80 Meters and the Moon

Editor, *CQ:*

It is difficult to find a valid physical reason for a DX max during full moon ("80 Meter DX —The Moon Effect," November *CQ*) since the spectra of light from the moon only has peaks in the visual range. The *F*-region is ionized by Extreme UV and X-rays...

Bob Hunsucker, Ph.D., AB7VP
via e-mail

Mobile Antenna Shootout

Editor, *CQ:*

Having spent much time on mobile installations I can appreciate Gordon West's efforts ("Mobile Antenna Shootout," October *CQ*). His good advice is often forgotten—limit the height to clear overpasses, mount antenna on left side to avoid trees, etc. The "Rain Gauge" problem of moisture seeping into the antenna structure was a real puzzler for me for a time.

Al Bell, W4IKV
via e-mail

About *CQ*'s Request for e-mailed Logs...

Editor, *CQ:*

This little pistol will operate in the contest but will not submit a score via e-mail. I refuse to let the (terrorists) win.

73,
Terry Norman, K4TBN

Editor, *CQ:*

Well! I guess, because of the low-tech nature of my ham station, I must cease to be the contester that I have never been. What are hams who work contests, without internet capabilities, to do? I bet there are some good DX contesters out there who do not have e-mail capability. GL in the contest OM!!

73,
Gene McGahey, AL7GQ
via e-mail

Editor, *CQ:*

I'm amazed at your request for electronic logs. As someone with a technical background, you should easily understand the concepts regarding relative risk. You and I are more likely to be in a car accident this afternoon, or fall prey to millions of other very low probability events, than we are to come in contact with, much less be affected by, something that arrives in the mail.

Terrorists can't kill many people this way, but their intent is to create terror. You have already fallen victim. Reconsider and show some leadership.

73,
Hal Kennedy, N4GG
via e-mail

(Still opening all my mail, foreign and domestic, with my bare hands!)

Editor, *CQ:*

You think everybody uses an electronic logging program, anyway, so it won't matter much if you refuse to accept mail-in logs. Well, I prefer not to use electronic logging. Do you also open your daily mail in a glove box? I think not. Your new policy is totally stupid, and will result in your receiving fewer logs. In fact, my 600K point log is meaningless, compared to the contest between elitist megapoint stations. I think I will refuse to send you an e-mail log which will only end up as 10th on a list of 7's next October. So it won't matter if you never open it. I have enjoyed reading your magazine for the past 40 years, but I think I will refuse to renew my subscription.

Tom Meal, N7ZT/KM7TM
via e-mail

Terry, Gene, Hal, and Tom – Your letters (all sent by e-mail, I notice) are representative of many that we received. Frankly, we were amazed at the depth of anger and frustration shown in some of them. We're angry and frustrated, too, but it has nothing to do with contest logs. Terry, we don't feel that requesting logs via e-mail is letting the terrorists win any more than is having police checkpoints at New York City bridges and tunnels. They're being careful, taking reasonable precautions. So are we. Gene and Tom, in 2000, 90% of our CQ WW logs were received by e-mail, so this affects relatively few people; and we never said we wouldn't accept mailed logs, only that they would be held aside unopened until we were confident we could open them safely. And Tom, while we don't open our daily mail in a glove box, we do wear gloves while opening our daily mail. The FBI recommends it. Hal, you're right. We are much more likely to be in a car accident than to be harmed by something that comes in the mail. But it's well established that safety belts greatly reduce your chances of being killed in a car accident. It's a reasonable precaution to use them. We feel that our request is nothing more than buckling our safety belts. Finally, Tom, if you feel you need to cancel your subscription because we put the safety of our staff and volunteers ahead of your convenience, then so be it. We hate to lose a longtime subscriber, but not nearly as much as we'd hate to lose one of our staff members.

World Of Ideas

BY DAVE INGRAM, K4TWJ

A Look At The World Around Us

WARC'n USA: Enjoying These Bands on a Budget

Like to try a new amateur radio pursuit but a mite short on finances, spare time, and/or high-tech electronic expertise? Want an inside tip for big-time fun? Take a closer look at the 30, 17, and 12 meter WARC bands. All three bands are in tip-top condition, uncrowded, and alive with DX, but many amateurs have yet to enjoy operating these newer HF ranges. They are missing a real treat. A barefoot rig and a simple antenna, a mild-mannered mobile system, or even an ultra-light portable setup is all you need for WARC'n fun, and you could easily become a "WARC star" in the process. How so? Just include a special touch such as using a unique rig or an unusual antenna in your operations. You will stand out like a new car on a dusty back road. Folks will even wait in line to contact you!

Are the WARCs as exciting as Doctor Dave suggests? More so, actually. I just try to tone down extreme enthusiasm to avoid slipping into my famed sideshow barker mode. Quickly reviewing some typical log entries, for example, I recently worked FK8GJ, KH8/N5OLS, 9A2DS, and VKs galore on 30 meters; T32CY and numerous Europeans on 17 meters; and Z32XX plus 3D2CI and many JAs on 12 meters. The surprising point here is I used a little Yaesu FT-817 running 5 watts to a vertical antenna to make the QSOs—*only 5 watts*. Good operators, low QRM, plenty of DX, and a friendly atmosphere—natural characteristics of all three WARC bands—made it possible. Interesting? You bet, and joining the action is easy. Read on!

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An Overview of The WARC Bands

As a convenient starting point and introduction, let's begin with a streamlined "copy and use" frequency guide (fig. 1) and a quick overview of each of the WARC bands.

Starting at the top, or upper frequency range, is *12 meters,* a band quite similar to 10 meters but boasting a quieter characteristic and a higher DX-to-U.S.-station ratio. Indeed, a quick tune across 12 meters can lead one to assume the band is "dead" or activity is nil, but turning up receiver gain and hearing DX working DX or calling CQ indicates a favorably different scenario. The times of best signal propagation on 12 meters typically occur when the sun is midway of the path, such as between the U.S. and Europe during mid-morning, North and South America around noon, and the U.S. and Far East in late afternoon. Since 12 meters is noticeably affected by sunspot activity and sunspot counts are starting to decline, there is no better time than the present to get rolling on this band. If your hamming time is limited, check propagation reports from WWV at 18 minutes after each hour, note the time of high sunspot numbers, and remember band conditions flourish right after solar storms. Bear in mind that most operators favor weekends for hamming, and then give 12 meters a go. You'll love it!

Next in line is *17 meters,* a band with idiosyncrasies similar to those of both

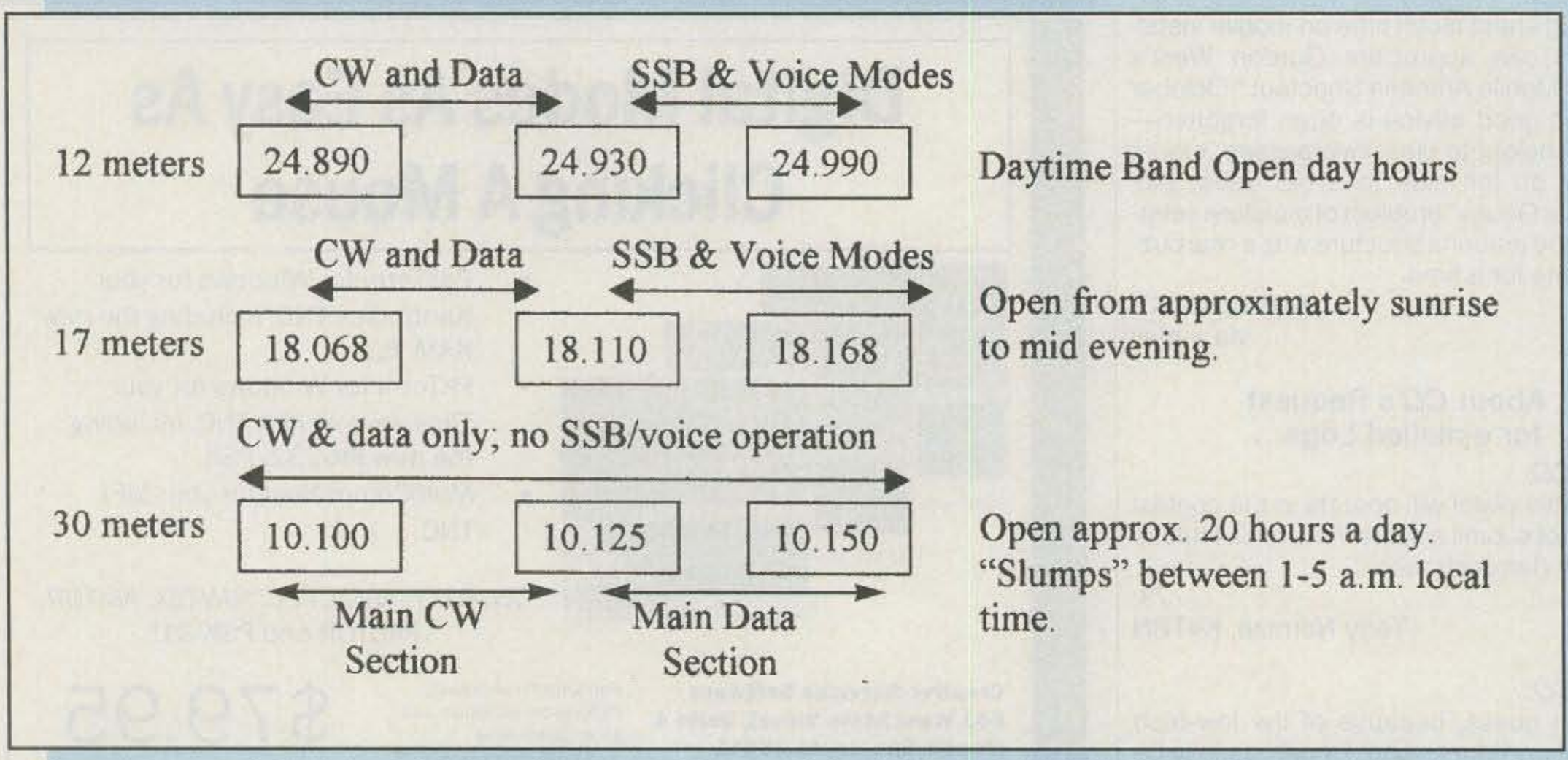


Fig. 1– Check out the WARC bands right now with this handy "clip and use" frequency guide. For convenience, we use a digital dial format to match frequency readouts on modern transceivers.

Photo A– When refurbished and modified for WARC band operation, some classic vacuum-tube transceivers produce marvelous, unequaled SSB signals. This Collins KWM-1, with its 3.1 kHz mechanical filter, is proof of that, and WARC conversion simply involves adding one crystal to its oscillator's bandswitch.

Photo B– There is no better way to enjoy CW operation on 30 meters than with an old-time transmitter and receiver. The transmitters usually sport wide-range circuits that resonate on 10.1 MHz without "mods." The receivers typically "drop down" in performance on the upper bands, but work fine on 10.1 MHz. Very nice!

15 and 20 meters, but with just enough difference to make it intriguing. How so? The band often opens in the morning like 15 meters does and closes in the evening like 20 meters, but that "predictability" also varies with seasons. I have worked into Europe at around 9 PM local time one month, for example, and worked into Australia around the same time a couple of months later on 17 meters. It is a fun band, especially when operating mobile or portable, and it is usually open when 20 meters is open. Many curious investigators do not realize that fact, however, because activity on 17 meters is rather low. Again like 12 meters, a couple of good CQs usually gets the action rolling.

Surely the most unique WARC and HF band is *30 meters.* It is a CW and data-mode-only band, and our only HF band with a maximum power limit of 200 watts. As a result, folks on 30 lean toward low-profile operations, often with their barefoot transceivers set to 50 rather than 100 watts output. Yes, and QRP 5 watt signals "work out" almost as well as those of "big rigs" in this reduced power environment. It is great for fixed, mobile, or portable operations (assuming you are the vehicle's rider, that is. Don't key and drive!).

The general aire on 30 meters is friendly, courteous, and congenial, even when chasing DX. Indeed, some of amateur radio's best CW operators frequent 30 meters. The band is typically "open" 20 hours a day with VKs and JAs kicking off the action at dawn, Europeans "booming in" from dusk until late night, U.S. stations coming in throughout the period, and a lull between 1 and 5 AM one's local time. This band is fantastic!

What's hampering you from joining WARC band action? Gear? Antennas? No problem: We have some encouraging notes worthy of consideration.

Rig Notes

All modern HF transceivers include WARC-band coverage, but maybe you would like a special touch of class to place you above the crowd when working the WARCs. Most operators use stock rigs and microphones, but adding a super-sounding Heil Goldline mic to your setup will ensure your signal stands out in the crowd. "Top off" the mic by adjusting your rig's transmit audio response to fit your voice, and you are ready to shine in high style.

Locating that audio adjustment or menu setting in some transceivers can prove quite challenging. Check the transceiver's operating manual, service manual, and hidden menus, or ask the manufacturer's service department for guidance. While using a dummy load and low power, tune in your transmitted signal on an auxiliary communications-grade receiver. Do not connect an antenna to the auxiliary receiver. Switch on its attenuator or reduce its RF sensitivity so your transmitted signal registers S9 or less to minimize overload. Use earphones, scrutinize your audio, make an adjustment, re-rescrutinize your audio, and continue the process until you reach perfection. Recheck your evaluation the next day, and then enjoy your new "pro sound."

Like to go a few steps further in the special rig and super audio game? Consider refurbishing a classic vacuum-tube-type transceiver and then adding WARC band coverage and a new Heil mic. Many rigs make good candidates here, but my favorite is the famous Collins KWM-1 (photo A). You just calculate and order a new oscillator crystal (a regular "ham-type" crystal works fine), reset front-panel exciter and amplifier stage controls, and you are ready for action. The KWM-1 sports a 3.1 kHz mechanical filter which, combined with the rich and full-bodied audio that only a tube rig can produce plus the Heil mic, sounds absolutely marvelous. Incidentally, Heil mics and impedance-matching transformers for tube rigs are available from Heil Sound, 5800 N. Illinois, Fairview Heights, IL 62208 (telephone 618-257-3000).

If CW is your passion, working 30 meters with a sweet, simple transmitter and receiver setup from eras past is a thrill of the best kind—and it is also low-budget fun supreme. What kind of gear is attractive? That will be influenced by

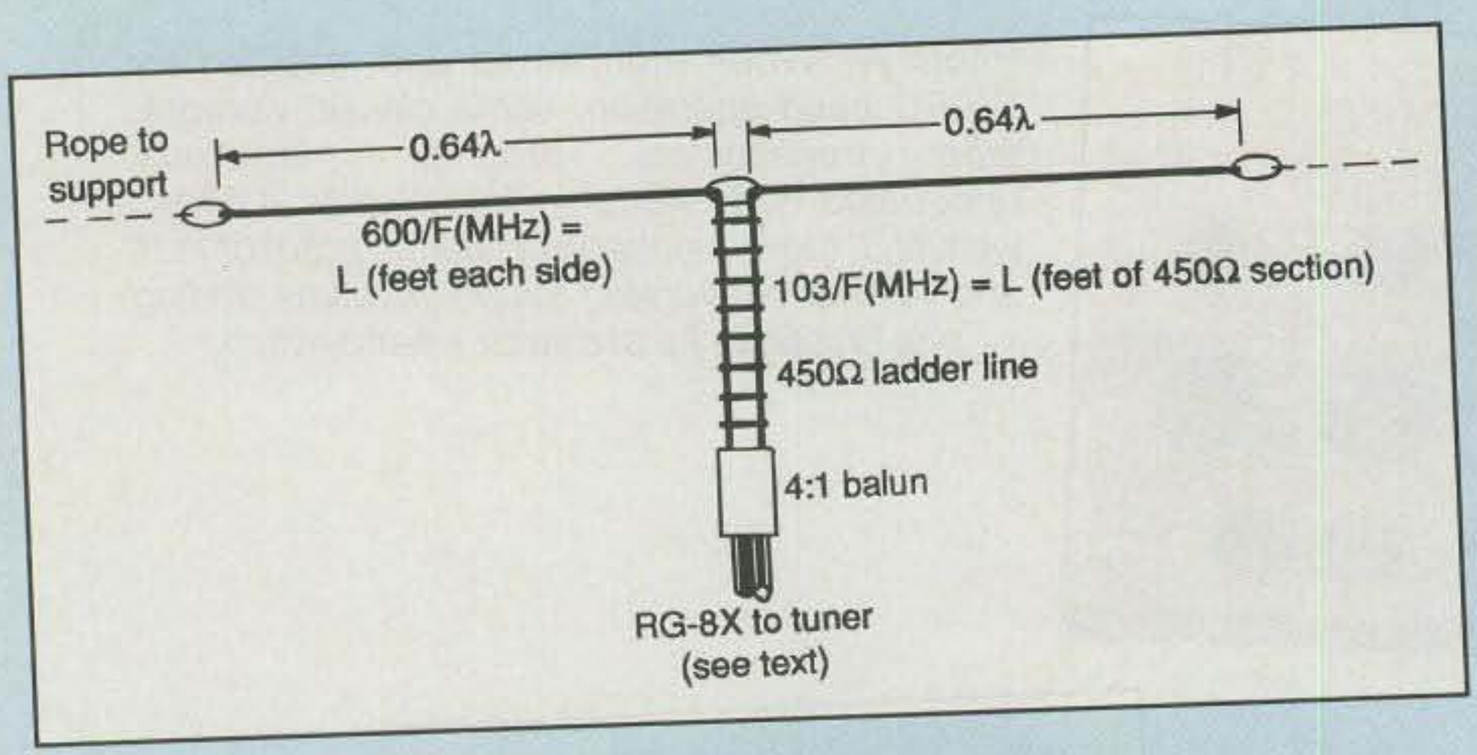


Fig. 2– Outline of the Extended Double Zepp antenna with formulas to calculate lengths for operating 12, 17, or 30 meters. When assembled with thin blue-gray invisible hookup wire and clear insulators/spacers, this high-performance antenna becomes almost invisible against the sky background.

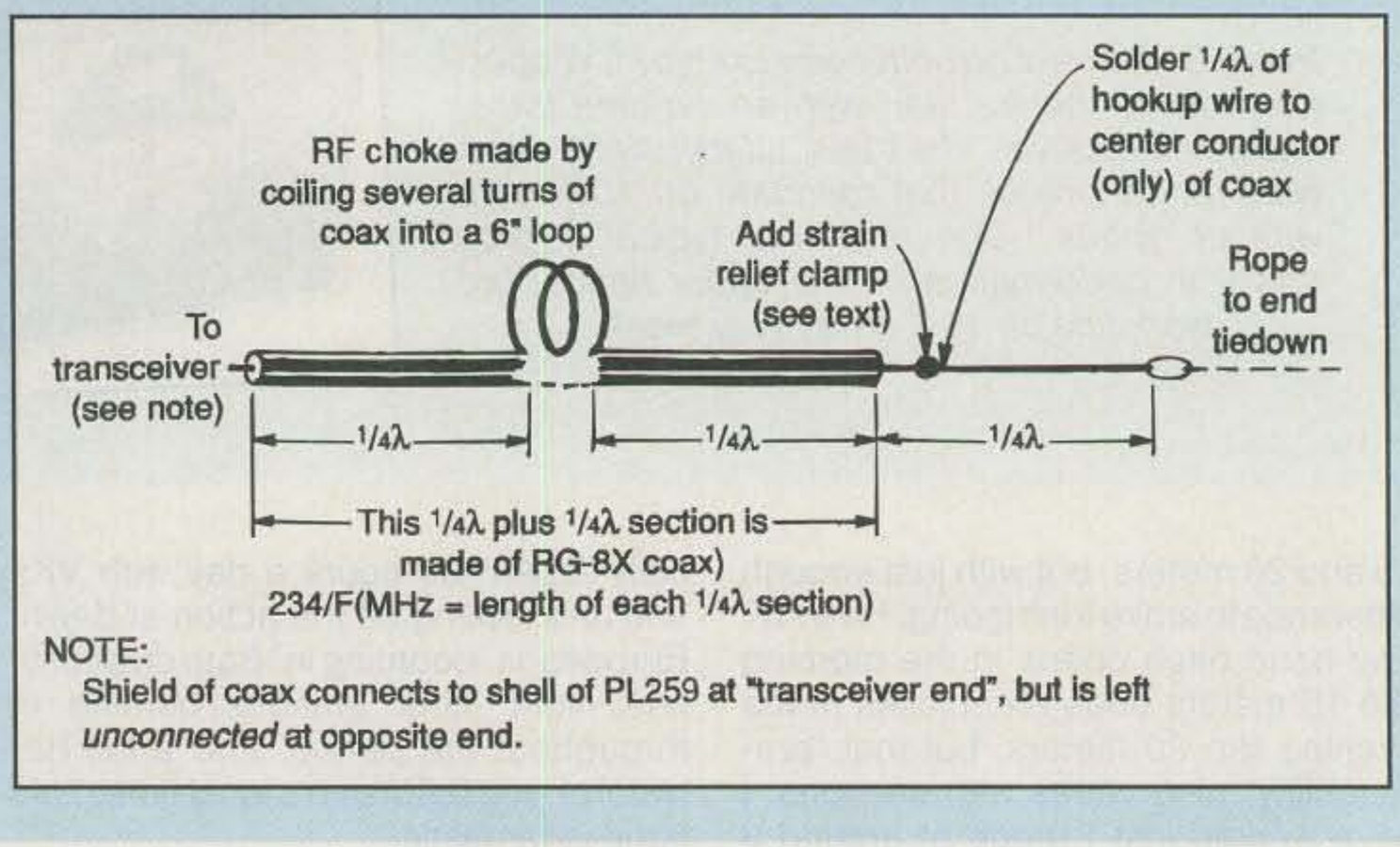


Fig. 3– Assembly details of my own end-fed dipole, with formula for calculating the length of each quarter-wave section. The antenna is ideal for portable operations, as it is easy to assemble and tune, and requires only one end support for "sloping" or "hanging" from a condo window or balcony.

what you find in magazine want ads, at hamfest fleamarkets, and/or on e-Bay. A Heath or Knight Kit transmitter with a wide-range output circuit for "just add a 10.1 MHz crystal and tune-up" operation and a National or Hammarlund receiver with general shortwave coverage is ideal (photo B). Add a barely visible wire antenna, a classic bug, a big "on-the-air" light, and you will be in ham heaven for sure!

Antenna Ideas

Surely the most often cited reason why more amateurs do not work the WARC bands is lack of a good antenna. Ah, but where there is a will, there is a way, I always say. Thin wire antennas with blue-gray insulation that blends with the sky are the all-around perfect answer for restricted neighborhoods or leery eyes. In light of that fact, three mix-and-match delights you can assemble for any preferred WARC band are shown in figs. 2, 3, and 4.

First up is the ever-popular, high-performance Extended Double Zepp (fig. 2). This big-time radiator can be erected horizontally, sloping, or as an inverted-Vee, and since it uses more than a full wavelength of wire, it pumps out a killer signal. That equates to beam-type performance for pennies—well, for low cost, anyway. The antenna's top length can be calculated for any band/frequency with the formula

600/Freq. (MHz) = length of each side (ft.)

As an example,

600/24.930 MHz = 24.06 ft.

Similarly, length of the vertical 450 ohm ladder line section (from top to 4:1 balun) is calculated with the formula:

103/Freq. (MHz) = Length (ft.)

Again use 12 meters as an example,

103/24.930 MHz = 4.13 ft.

A 4:1 ratio or 300 ohm to 50 ohm balun connects to the ladder line's "low end," and then any required length of RG-8X (or equivalent) connects between the balun and your station's antenna tuner. If low visibility is a prime consideration, homebrew the ladder line using clear plastic spreaders and mount the balun on a wall near your shack (after painting it to match the wall). Then have a blast of WARC'n fun!

Our second-featured wire antenna is my own end-fed dipole for quick-and-easy portable or condo use (fig. 3). This marvel utilizes a quarter wavelength of insulated hookup wire connected to the coax cable's center conductor to make half of the dipole, while the coax cable's shield makes up the dipole's other end. The coax cable is then wound into a 6 inch diameter coil to produce an RF choke that isolates its signal-radiating shield and "feedline to rig" sections (both of which are also exactly a quarter wave long, just like the hookup wire section), and that is basically the story.

Need more details? Just calculate the length of each quarter-wave section with the formula:

234/Freq. (MHz) = Length (ft.)

Example:

234/18.100 MHz = 12.9 ft.

For simplicity, measure and cut the hookup wire section first, then use that wire to measure the other sections.

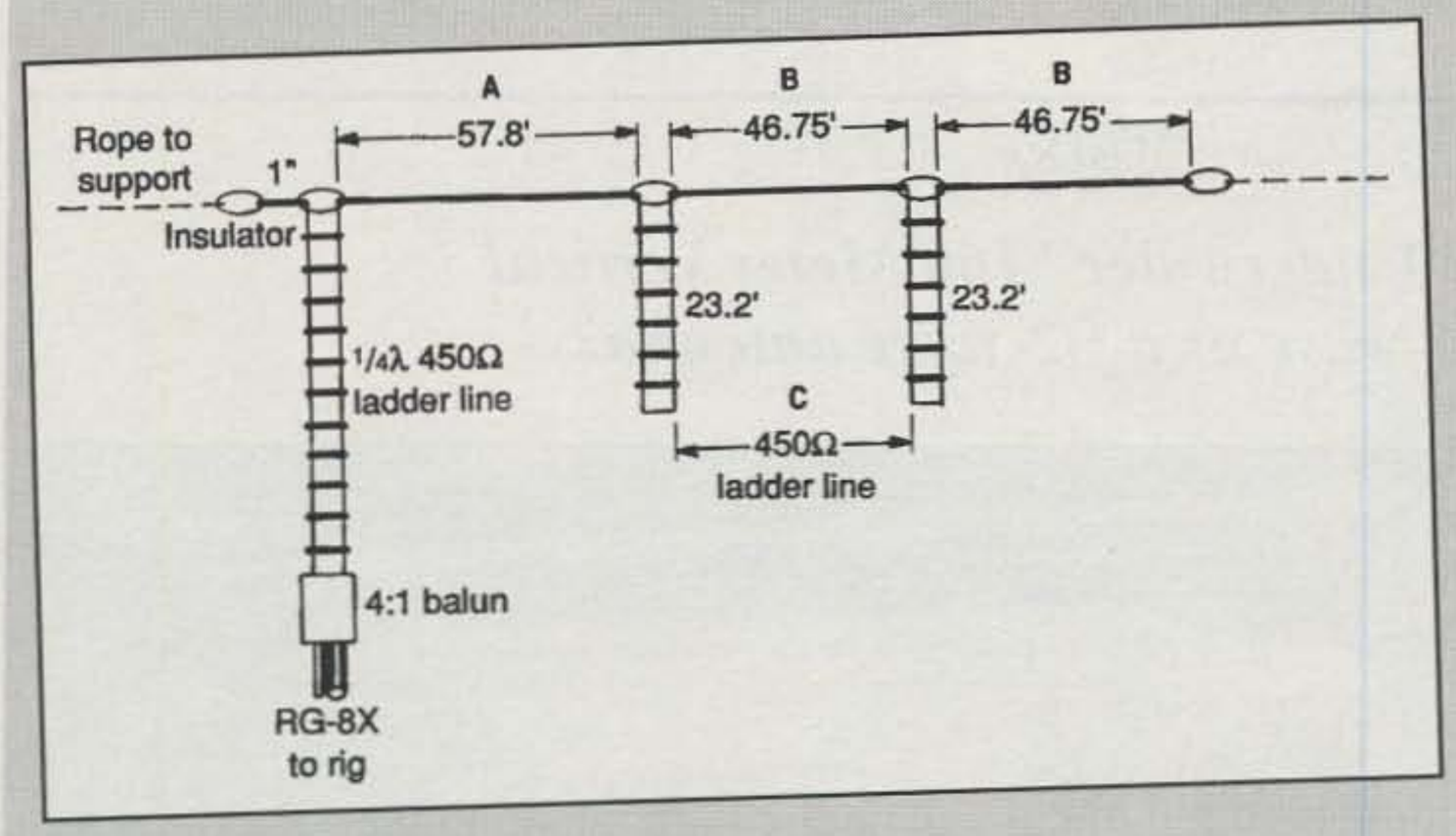


Fig. 4– Layout of the Phased End Fed Zepp built by Bob Cox, AB5X, for operation on 30 meters. Formulas for scaling dimensions to work other WARC bands are discussed in the text.

Remember, however, to wind the coil/RF choke before measuring the feedline's quarter-wave section. Must that feedline section be precisely 1/4 wavelength? Yes. It acts as an impedance-inverting transformer to convert the dipole's high-end impedance to 50 ohms so it will match your rig. With respect to the coil/RF choke, wind 4 turns for 17 meters, 3 turns for 12 meters, or 8 turns for 30 meters. If you want to go first class, add a snap-on toroid core to the coax cable at the coil; it will further help to isolate the feedline and radiating shield sections.

Now look carefully and you will notice a weak spot in this antenna's mechanical design: The hookup wire section tugs excessively on the coax cable's center conductor. You can minimize that stress by looping the hookup wire through a tightly bolted cable clamp installed at the coax cable's end. Finished? You can fine-tune antenna SWR by moving the coil/RF choke slightly in either direction. Just "roll off" a half turn or so from one end while "rolling on" a similar amount at the other end, and then tape the coil securely after reaching perfection.

The neat point of this antenna is it requires only one end support and thus is as easy as a random wire to install. Also, since its shield end usually points toward your rig and an RF choke minimizes feedline radiation, RF feedback is minimized. It is a terrific "rollup" antenna for traveling.

Our third antenna idea (fig. 4) is compliments of Bob Cox, AB5X. I worked Bob on 30 meters, and his low-power signal was so impressive that I invited him to share details of the phased and end-fed Zepp with readers. Bob designed the antenna specifically for 30 meters, but we can quickly modify it for other bands by deriving our own length, determining formulas from his optimized dimensions. Say what?

Go back to our previous (quarter wave) formula, 234/F = L. Apply that same formula here, but assume 234 is an unknown variable called "X." Multiply F times L to determine X, then divide X by your desired frequency of operation to determine L. Starting with section A, for example:

$$10.110 \text{ MHz} \times 57.8 \text{ ft.} = 584$$

Likewise,

$$584/18.100 \text{ MHz} = 32.2 \text{ ft.}$$

Section(s) B is:

$$10.110 \text{ MHz} \times 46.75 \text{ ft. (or X} = 472)$$

Recalculating:

$$472/18.100 = 26 \text{ ft.}$$

Section(s) C is 1/4 wavelength of 450 ohm ladderline (each):

$$23.2 \text{ ft.} \times 10.110 \text{ MHz} = 234$$

Then,

$$234/18.100 = 12.9 \text{ ft.}$$

Now here are a couple of extra notes. The feedline is approximately a half-wave length of 450 ohm ladder line, and the phasing lines of each "element" are also 450 ohm ladderline sections. The feed/ladderline's "left" side does not connect to a wire at the antenna. It just "loops through" the (left) end insulator. A 4:1 or 300 ohm to 50 ohm balun installs near the shack, and a random length of RG-8X connects between the balun and the station's tuner. This antenna is long, but it radiates great!

Closing Views

Whether at home, in the car, or operating ultra-light portable with a battery-powered rig at the beach, WARC'n is a fun and economical way to expand your amateur radio horizons. It is an activity you can pursue in your own way and at your own pace, with your regular rig or with a special setup or antenna for personal expression. As you delve into WARC band operations, you will also find that new pursuits keep amateur radio life extra exciting. With WARC band know-how to your credit, you will also be ready for and capable of pioneering the recently proposed 60 meter band on 5.250 to 5.400 MHz when it becomes available for amateur radio use. A captivating world of big-time radio enjoyment awaits you on the WARC bands. Go for it, and may the force of good signals be with you!

73, Dave, K4TWJ

Antennas

BY ARNIE CORO, CO2KK

Connecting Your Station To The World

PY3CEJ's "Underwater" 160 Meter Vertical Is it a 1/4-wave or a 1/2-wave antenna?

When is a quarter-wave not a quarter-wave? When it's half of a half-wave! This month we bring you an innovative 160 meter antenna designed by Alencar Aldo Fossá, PY3CEJ, translated from Portuguese, with some adaptations, by Antennas Editor Arnie Coro, CO2KK**.* —W2VU

Al Fossá, PY3CEJ, and his station in Porto Alegre, Brazil. Al operates exclusively SSB on 160 meters and has worked at least 260 countries on the band.

I have always used both dipoles and quarter-wave verticals for transmitting on the 160 meter band. For receiving, Beverages and long wires were my choices. In February 1999, when I moved to my new countryside home, I had the idea of doing something different for 160 meters, something that would work better for both receiving and transmitting.

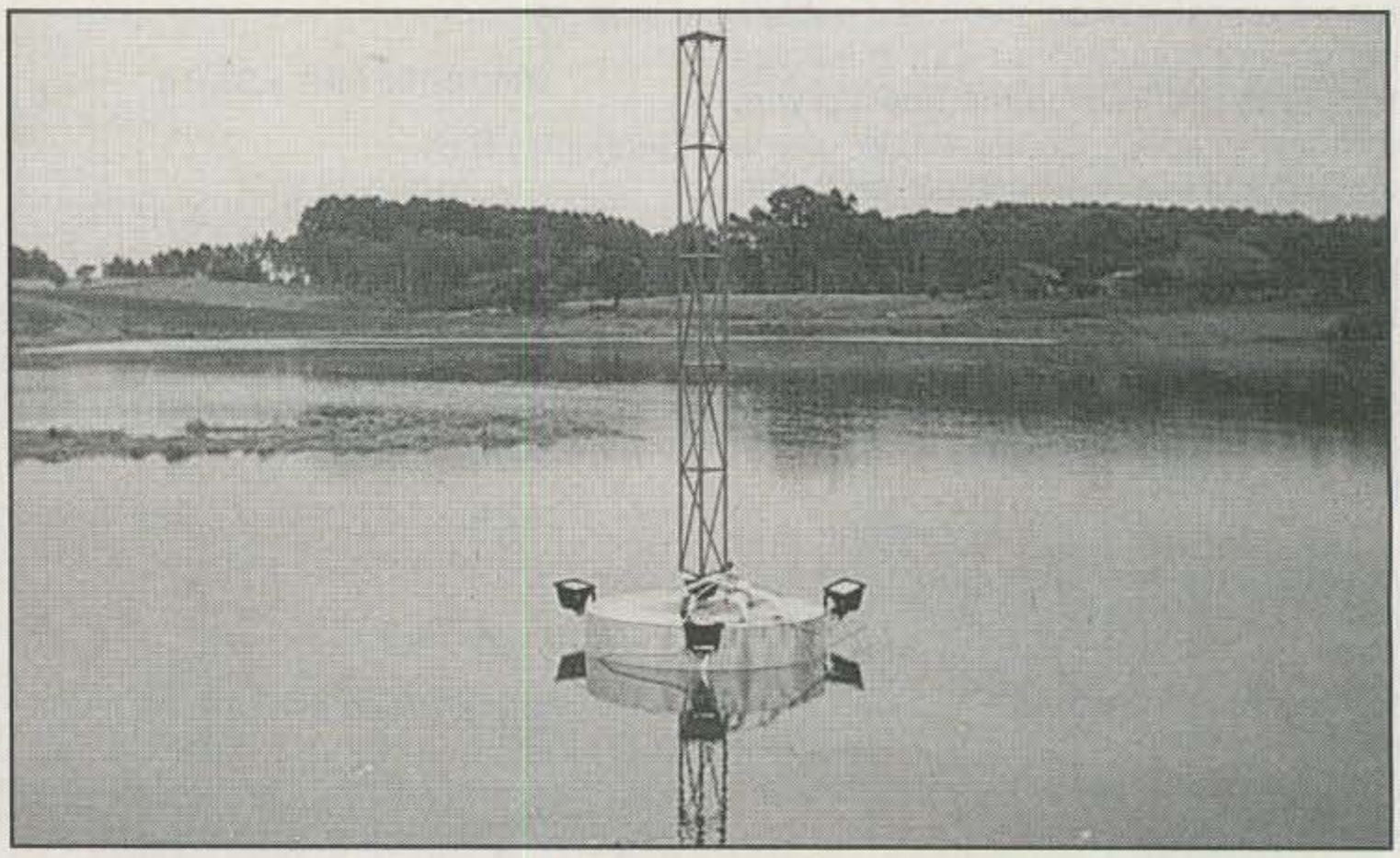
It is well known that the 0.25-wavelength vertical is a noisy antenna for receiving and that 0.5 wavelength dipoles show directional radiation. Because 160 meters is, after all, a medium-wave band with the prevalence of a strong ground-wave component, I decided to make use of a little creativity, hoping that the new approach would work in actual practice.

I decided to install the antenna *in* a small lake on my property, quite near to the house, as it is said that water is a good "mirror" for radio waves. Because I like both the dipole and the vertical, which jointly have provided me with 260 countries on 160 meters, I had the idea of trying to join what's good about both antennas, due to the fact that each new country worked was becoming more and more difficult. I calculated the length of a half-wave dipole for 1.848 kHz as 77.10 meters, with each leg being 38.55 meters long.

A quarter-wave vertical has its image below ground, so here is what I did: Rather than making this image a virtual one as in a classic vertical monopole above the ground, I decided to make it an actual *real physical image.*

During the summer, when the lake's water level was low, I contracted a local drilling rig owner to dig a 40 meter deep hole right at the base of the tower that is the "above ground radiator." The well-like hole was lined with a 40 mm diameter PVC pipe, with its two ends sealed. The tower's concrete base was then cast right next to the PVC pipe, locating the tower's base insulator very near the pipe's upper end and making sure the top of the base stayed above the lake's normal high-water point.

The tower's total length is 38.55 meters, and a heavy copper wire of exactly the same length was then intro-



PY3CEJ's in-the-lake antenna for 160 meters. Not visible here is the "mirror" wire in a PVC pipe that goes 40 meters underground, or underwater radials.

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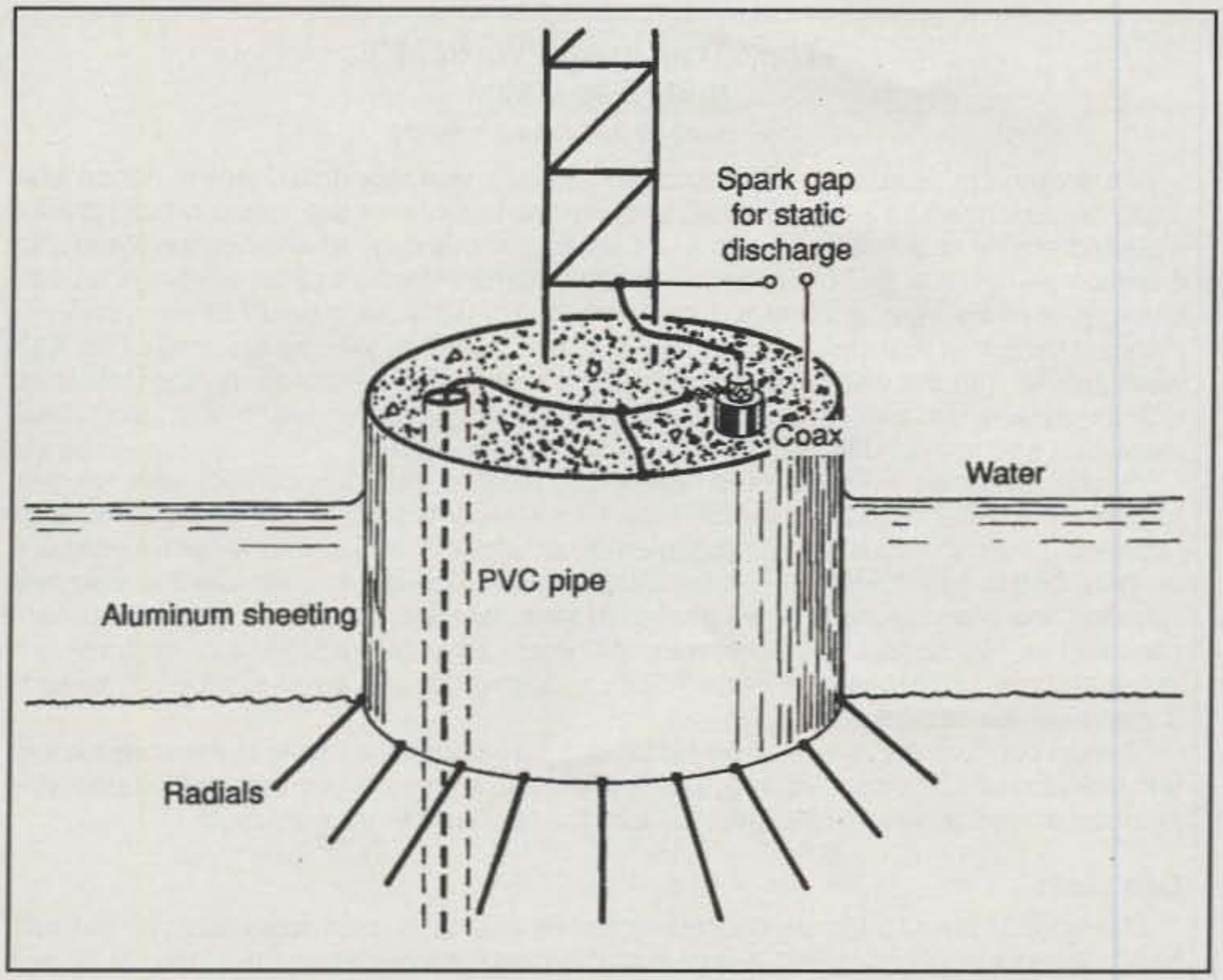


Fig. 1– Schematic of the base of PY3CEJ's 160 meter antenna system. The tower installed on the concrete base is 1/4 wavelength high and is used as the radiating part of the antenna. An identical length of wire is dropped into the sealed PVC pipe which goes 40 meters underground to form the image section of a half-wave dipole. Radials were added in the water to further improve signals.

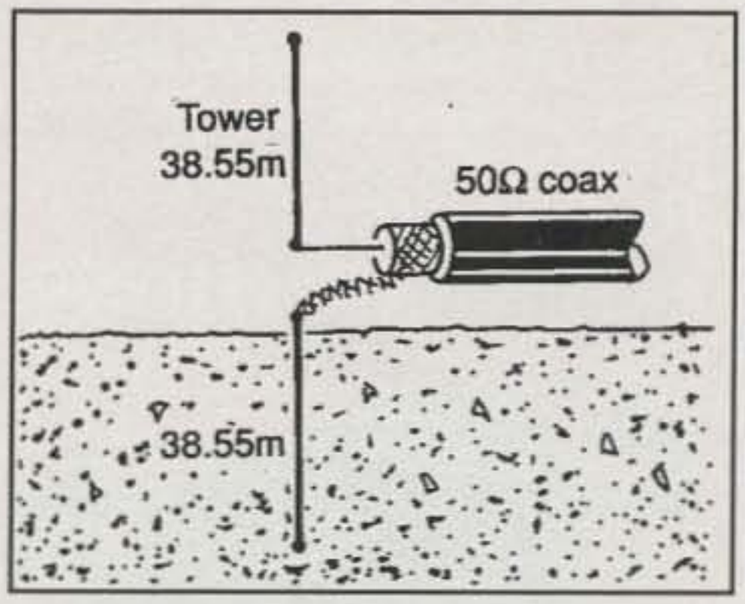
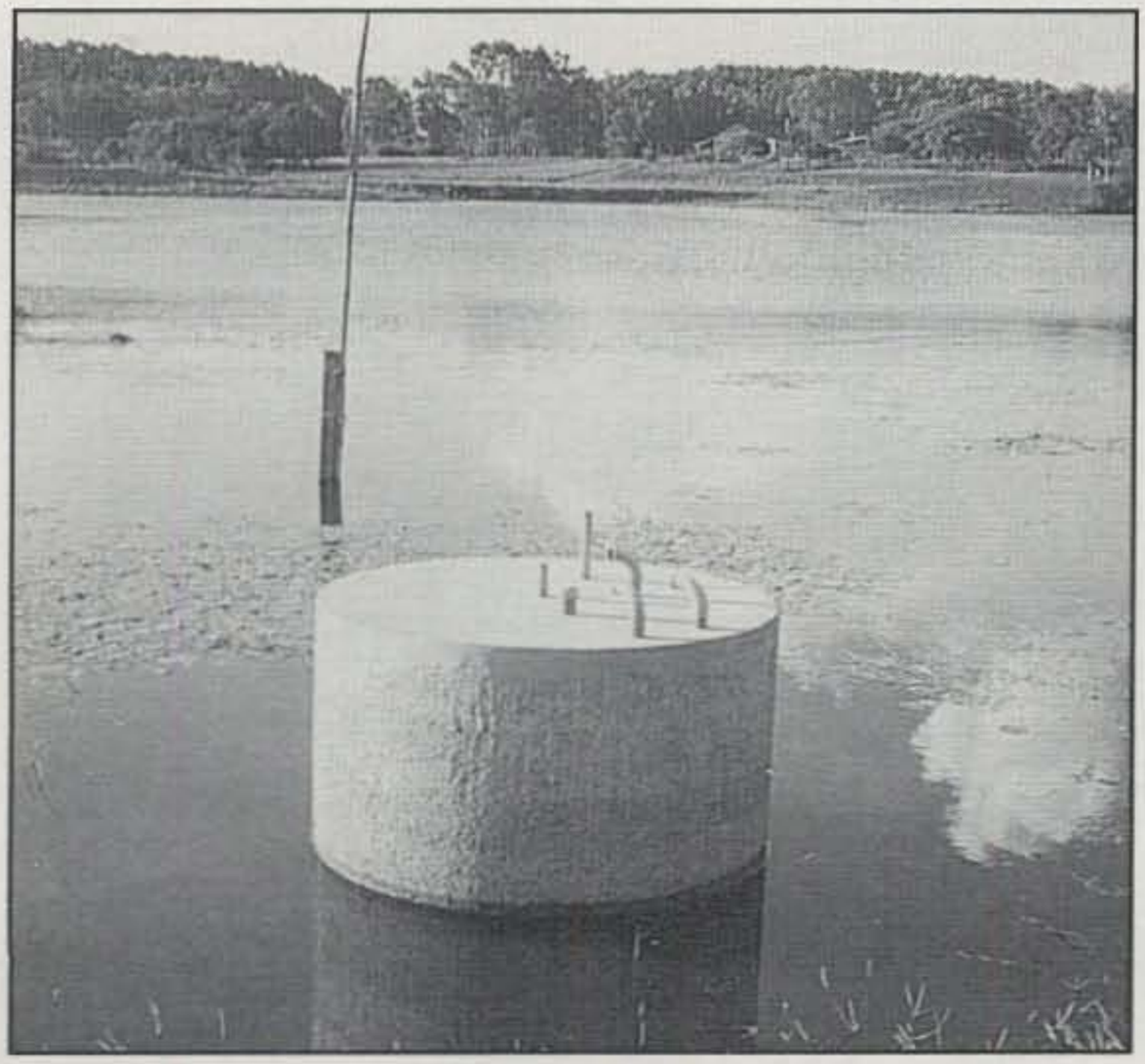


Fig. 2– Simplified view of the PY3CEJ system—one-quarter wave above ground and one-quarter wave below, fed in the center like any other half-wave dipole.

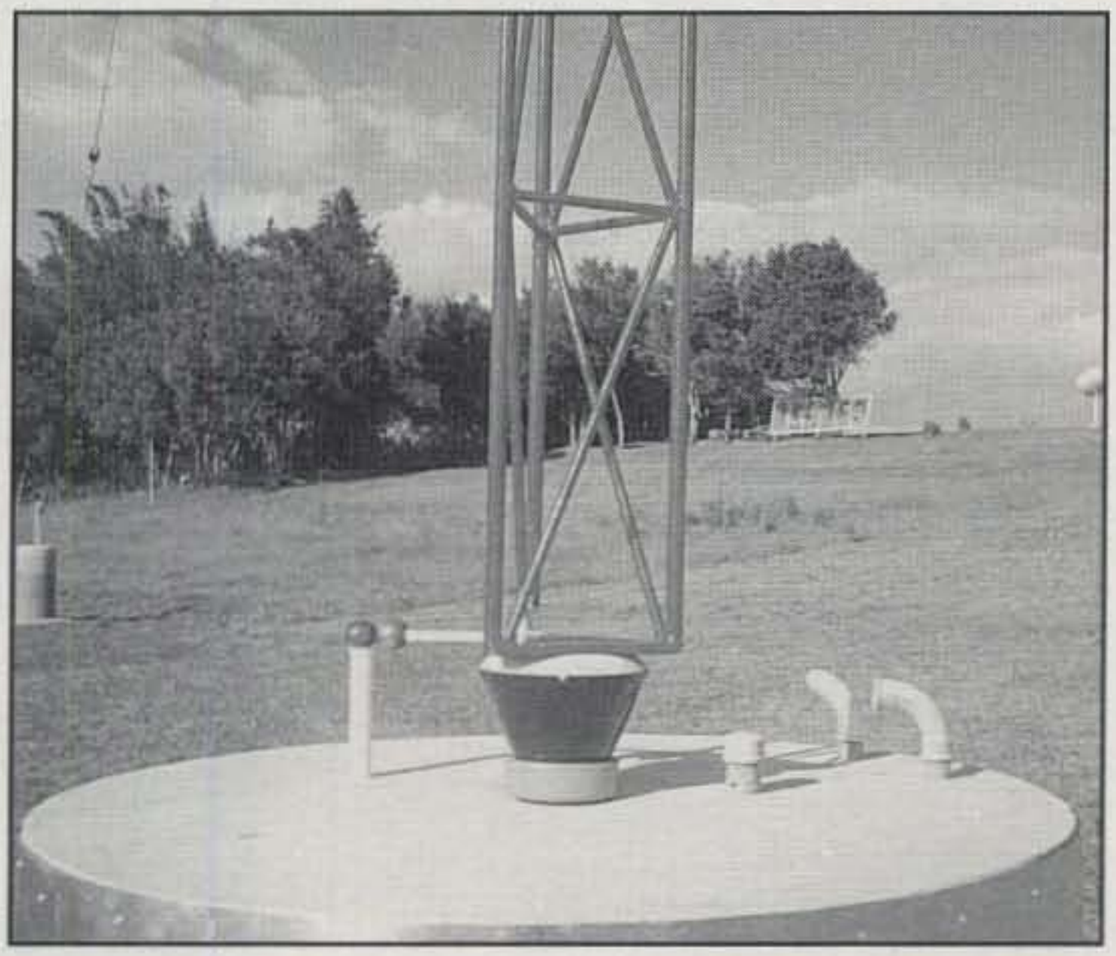
duced into the PVC pipe, effectively isolating the wire from ground, while at the same time having it behave as a perfect real image of the 0.25-wavelength tower radiator. The whole system's geometry was then of a half-wave dipole, one leg formed by the tower itself, and the other end formed by the copper wire placed inside the PVC pipe that ran into the ground 40 meters deep, of which 38.55 meters were "filled" with the copper wire forming the other leg of the vertical dipole. The antenna is fed via a buried coaxial cable that goes to the shack.

When the whole system was completed (notice that there are no quarter-wave horizontal radials installed, as in a typical vertical monopole system), I started calling CQ DX on 160 using the half above and half below earth "dipole." The first tests were good, receiving nice reports. Later, the first international QSOs got me 59+ reports from W8JI and IK7MCJ.

Reception with the new half buried antenna is different from that with the quarter-wave vertical, less noisy and better sounding to the ear, which usually gets tired of the typically high band noise level on 160 meters.



Concrete base before the tower was installed. Capped PVC pipe contains the 0.25-wavelength image wire.



Detail of the PY3CEJ system during the dry season. Note to the right of the tower the capped PVC pipe which contains the image wire, and the spark gap on the left side to help reduce built-up static charges and minimize the antenna's attractiveness to lightning.

The "True Image Vertical" and "Sea Gain"

Comments by Arnie Coro, CO2KK

Al's antenna is certainly unique because it uses a specially drilled well to house what could be described as a "real image" and not a virtual one of the "missing half" of what would otherwise could be described as a very well installed, by all engineering standards, quarter-wave vertical for 160 meters. The fact that the antenna's radial system is, at least during part of the year, submerged in a lagoon also adds significantly to its overall efficiency. I think that Al's idea of drilling the well and installing the "missing half of the half-wave dipole" into the well casing is something that should be tested at other locations, with the system's overall radiation efficiency carefully measured with high-quality instrumentation and standard field-intensity measuring procedures.

Vertical antennas are popular on 160 and 80 meters and enjoy considerable success because the installation of horizontal antennas at heights sufficient to provide low-angle radiation is next to impossible for the average amateur. Full-size quarter-wave verticals, or even better (my favorite), the 0.28-wavelength-high design, do need a very well installed and properly maintained ground system, which if laid on the ground is usually specified as 120 radials of 0.25 wavelength each. Elevated radials have, according to some authors, proven to be more efficient, requiring a much lower number of wires to achieve similar results.

Ground conductivity is a decisive factor when a scientific analysis of the antenna system radiation efficiency is analyzed. This is why some amateurs, with their stations installed in areas of high conductivity, achieve such nice results with their verticals.

Sea Gain

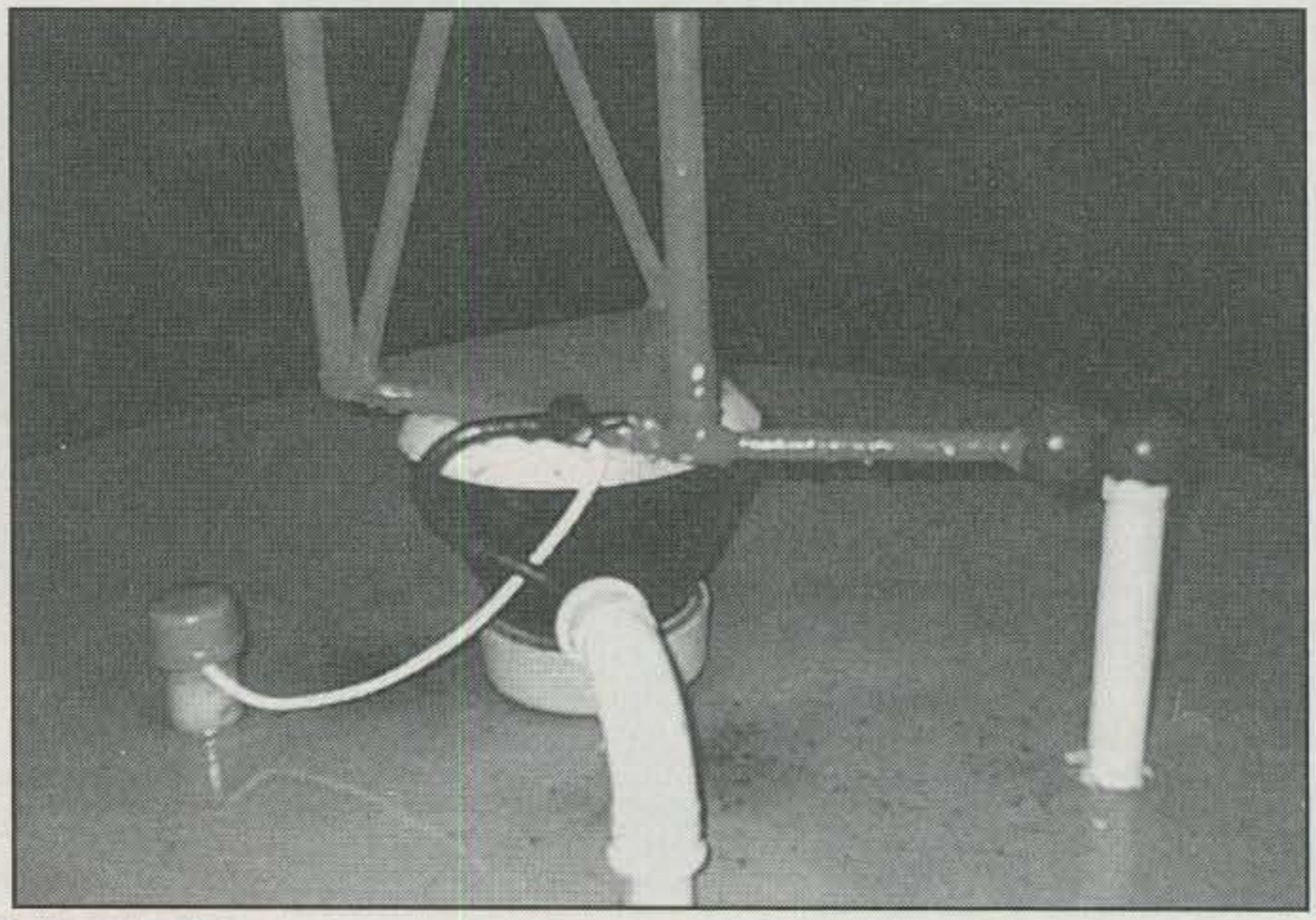
One additional and often overlooked enhancement that is quite noticeable on 160 meter band systems is the so-called *sea gain* that is present even when the station is located up to one or even two miles away from the seashore. Sea gain provides an *extra* boost to 160 meter signals, both for the ground wave and the skywave, even when the antennas used are far from achieving the radiation efficiency of a properly installed reference system, usually specified as a 0.25-wavelength-high vertical radiator working against the classic 120 0.25-wavelength radial system.

Testing the Brazilian "well image" antenna on the 80 and 40 meter bands should be something really interesting to do. If you decide to do it, please keep us up to date on your experiments!

—CO2KK

As I said, the first tests were good, but then it started raining heavily and the tower base flooded. I decided to add four radials, each 40 meters long, and I deployed them into the water, connecting them to an aluminum sheet that surrounds the base of the tower.

After this final addition of the four submerged radials, the antenna's performance improved fantastically. Water in



Close-up of the base with the lake full. The white cable connects the image wire to the shield side of the coaxial cable coming from PY3CEJ's shack.

Resources

For additional information, we recommend the following:

Brown, Lewis, and Epstein, "Ground Systems as a Factor in Antenna Efficiency," *Proc. IRE 25,* pages 753–787, June 1937.

Coro, A., " Eficiencia de los sistemas de radiacion en el rango de frecuencias de 0.5 a 2.0 megaHerz" ("Efficiency of radiating systems in the range of frequencies between 0.5 and 2.0 Megahertz"), unpublished manuscript available from the author.

Jager, K., "Effect of the Earth's Surface on Antenna Patterns in the Short Wave Range," *Int. Electrik Rundsch 24 (4),* pages 101–104 (1970).

Stanley, C., "Optimum Ground Systems for Vertical Antennas," *QST,* Dec. 1976.

contact with the radials seems to help transform the small lake into a 360-degree radial system!

The first QSO was with 7P8AA , who gave me a 59+ 10 dB report, and reception of his signal reached a similar level. Reception improved, and the SWR of the antenna showed a 1.0 to 1 ratio, and my FT-902-DM liked the antenna a lot!

Reports from Europe are now always 59+, and all this is using SSB. Here are just some examples: LA3XI, OH5LF, DJ7AA, G3PQA, and SP6KFH. From the USA and Canada I am also receiving many 59+ reports from stations such as VE2ENM, W3UR, K1ZM, K2KYH, W4NZ, and others.

I wrote this because I wanted to add a bit more to the medium-wave antenna systems knowledge base, which is a mysterious area of antenna theory and practice. Any suggestions, comments, and opinions about this system will be most welcome, as it is my belief that telling the public about our experiences, good or bad, is good.

At this writing, I am using the following equipment at my station: an FT-902-DM transceiver, an FL-2100Z linear amplifier, and something essential for 160 meter DX work—no less than three additional receivers, a Drake R4B, a Kenwood R5000, and a Collins 75A4. For low-frequency work it is important to eliminate mixer noise due to the Voltage Controlled Oscillator (VCO phase noise) and the Phase Locked Loop (PLL), so it is better to use receivers such as the Drake or the Collins, which generate the local oscillator frequency using a crystal. My future equipment, due to the option of having crystal oscillator injection, is the OMNI VI Plus from Ten-Tec, which shows optimum behavior on the low frequencies.

How It Works

BY DAVE INGRAM, K4TWJ

Theory 'n Practice

Speech Compression and ALC Simplified

As you probably have noticed, speech compression, ALC (automatic level control), and general SSB "talk power" are popular topics of discussion among SSBers and equipment manufacturers alike. Exactly what are the purposes and differences between these features, how do they work, and how are they beneficial to you? That is the focus of this month's column, and I am sure you will find our plain-language explanation of these terms useful for expanding your overall knowledge and enjoyment of amateur radio. In addition, we have included some thought-provoking notes on a promising new concept of digital voice communications begging to be developed by modern amateur radio and computer applications pioneers. There is something for everyone, so let's begin with a quick overview of why speech-enhancement concepts are needed and what they do.

Why and How

Unlike single audio tones, speech is a complex, rapidly changing waveform with wide variations in level, or amplitude. Some syllables are strong, some are weak, and the difference between those two levels can measure up to 13 or 14 dB. When used to modulate a 100 watt SSB transceiver, the weaker syllables typically result in 5 or 6 watts of output power while the stronger syllables produce a peak output power of 100 watts (see fig. 1[A]). The average power output in this case is quite low, so speech compression is utilized to increase "talk power." Basically, this speech compression can be implemented in two ways: via *AF compression* or via *RF compression*. Also, ALC and audio equalization can be employed to further enhance signal quality and readability.

The main objective with both AF and RF speech compression is to boost weak audio levels without allowing strong levels to over-modulate and produce adjacent frequency splatter (see fig. 1[B]). An oscilloscope is most useful for visually analyzing a rig's transmitted waveforms while making speech-compressor adjustments, but oscilloscopes are complex, cumbersome, and expensive. Thus, most amateurs use their rig's ALC or compression meter scales for guidance here and the process works out fine, provided one understands a little compression goes a long way.

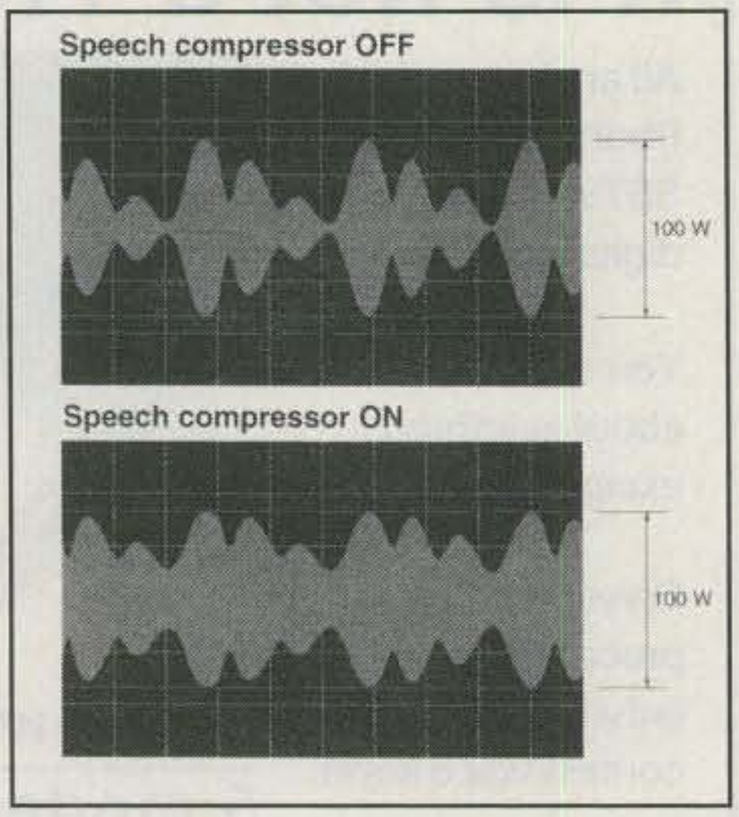


Fig. 1– Simulated oscilloscope display of the RF output from a 100 watt SSB transceiver with and without speech compression. Notice the signal fills more vertical divisions or exhibits a higher average power level with compression than without compression. The example shown is from the brochure of ICOM's IC-756 PRO, which features highly effective RF speech compression. (Discussion in text.)

ALC helps to minimize over-modulation and/or "splatter" caused by overdriving a transceiver's final amplifier stage or an external high-power linear amplifier. Such overdrive, or over-modulation, usually occurs when station exciter or microphone levels are excessive. What, then, is the difference between speech compression and ALC? Speech compression acts faster; it reduces gain of previous stages according to variations in individual syllables of words, whereas ALC reduces gain of previous rig stages according to variations in complete words and sentences. Speech compression increases SSB "talk power." ALC minimizes overdrive.

Audio equalization alters the aural frequency response of a transceiver to favor bass, mid-range, or treble tones and thus enhances a microphone's sound or an operator's voice. This may be accomplished in an AF amplifier stage or at the IF level by shifting the frequency of an injection oscillator and will become easier to understand as we proceed. Before continuing, however, let's "set the stage" for visualizing how speech compression and ALC work by reviewing the basic concepts of SSB signal generation. Fig. 2 is the block diagram of a "bare bones" SSB transmitter such as you might see on a license exam test question, and fig. 3 expands the block diagram so we can study its finer points.

First, audio voltage from the microphone is boosted by the speech amplifier stage (or stages) and applied (along with an IF injection or carrier oscillator signal) to the balance modulator. A regular double-sideband AM signal at the carrier oscillator's frequency would now be directed into the SSB filter, but the balance modulator "nulled out" the AM signal's carrier, leaving only both sidebands. One or more stages of IF amplification then boost the DSB signal's level. Then the SSB crystal filter allows only one of the sidebands to pass. The output single sideband signal is further amplified and mixed or heterodyned with a second oscillator signal, converting it up or down to a desired band and frequency for transmission.

In looking more closely at fig. 2 (and its expanded version, fig. 3), I should point out that the frequencies of oscillators and IF/RF stages (and the number of IF and RF stages before and after mixer stages) are generic for simplicity. The main purpose here is to "keep things simple" with an easy-to-follow diagram. Now with figs. 2 and 3 handy for reference, let's take a closer look at AF and RF speech compression, ALC, and audio equalization.

AF Speech Compression

Audio-level speech compression is the easiest, most economical way to increase an SSB transceiver's average

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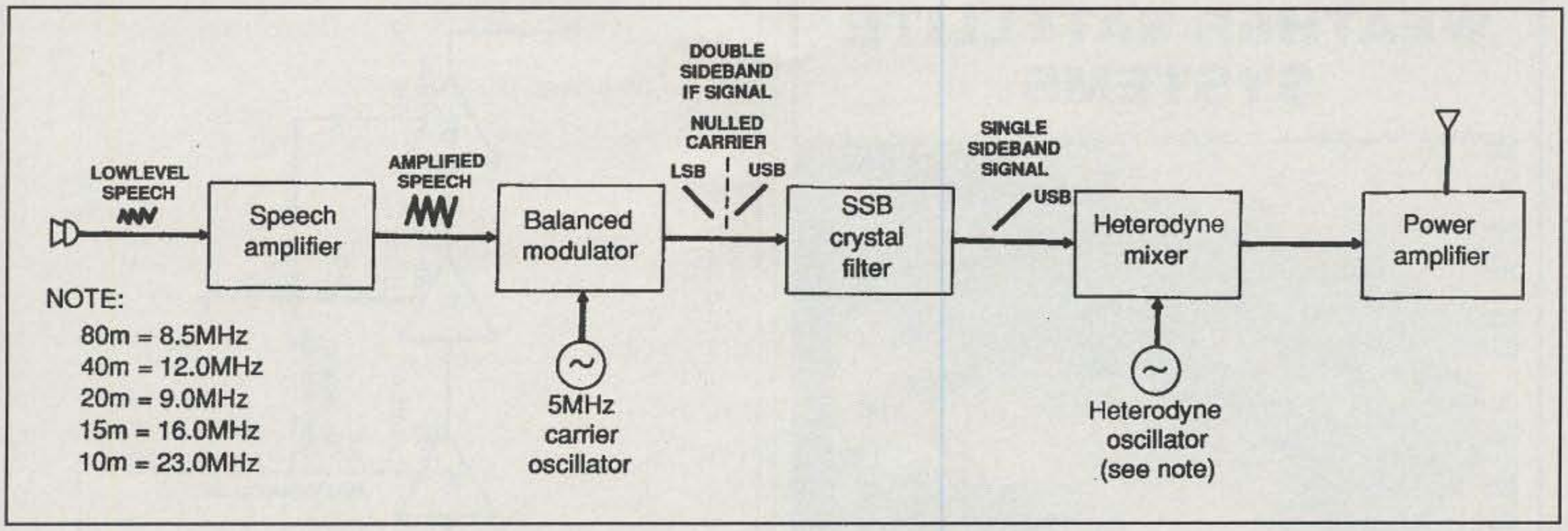

Fig. 2– Simplified, or "streamlined," block diagram of an SSB transmitter similar to that included in test questions on an amateur radio exam. Audio from the microphone is amplified and applied, along with a carrier oscillator, to the balance modulator. Output is an AM signal without a carrier. One of its sidebands is then filtered out, and the resultant SSB signal is amplified for transmission. (Discussion in text.)

Photo A– Like this Kenwood TS-570, most modern SSB transceivers include some form of menu-selectable audio equalization that lets you tailor transmitted speech response to mate with your mic and voice. Here we are setting it to add glamour to a Heil Goldline mic with a slight high tone boost.

output level because it only requires limiting the gain of a microphone amplifier stage. A high level of compression can produce adjacent frequency "splatter," however, so audio-range tailoring and low-pass filtering usually are included in the compressor's circuitry.

The general concept of AF speech compression is illustrated in fig. 3. There are usually two stages of microphone amplification in an SSB transmitter, so output from the "second stage" (U2) is sampled, converted to DC, and fed back to the first stage (U1) to control its gain. Does the technique remind you of AGC concepts used in receivers? Think *fast* AGC rather than *slow* AGC and you are absolutely correct.

Generally speaking, AF speech compression can produce up to 8 dB of compression before generating distortion and/or adjacent frequency splatter. An AF speech compressor need not be pushed to its limit to be effective, however. Even if the transceiver's meter indicates only 3 or 4 dB of compression, the resultant boost in upper tonal response adds a pleasant touch of presence, intelligibility, and glamour to one's signal. Overall, we thus can say AF speech compression is a popular, effective way to enhance any SSB signal.

RF Speech Compression

As a general rule, the more deluxe models of SSB transceivers are usually equipped with RF-level speech compressors, and they do an outstanding job of increasing "talk power." Look back at figs. 1(A) and (B)—which show the "off" versus "on" results of RF speech compression in ICOM's IC-756 PRO—to visualize the effectiveness of that statement. By comparison, incidentally, waveforms for AF compression would be midway between figs. 1(A) and (B)—better than no compression, but not as good as RF compression. Circuitwise, the concept of RF speech compression is also illustrated in fig. 3. When a transceiver's RF output exceeds its full modulation level, a portion of the signal is rectified to DC and fed back to a previous RF or AF stage to reduce drive to the rig's final amplifier stage. This arrangement yields greater control of previous stage levels, and is thus more effective in minimizing adjacent frequency splatter and overdrive of the final amplifier stage.

Typically, RF speech compression can produce up to 14 dB of compression before generating adjacent frequency splatter. As with AF compression, it, too, need not be pushed to the max to reap its rewards. Setting the mic or compressor gain for 6 or 7 dB of compression will give you an excellent-sounding signal (and almost double the "talk power" of AF compression). It's nice! A high level of RF compression also places heavier power demands on your station's power supply and external high-power linear amplifier, so be sure both are "full duty cycle rated" before using a high level of compression.

Automatic Level Control

As mentioned earlier, ALC is employed to minimize over-modulation in an SSB transceiver or to prevent overdriving an externally connected linear amplifier.

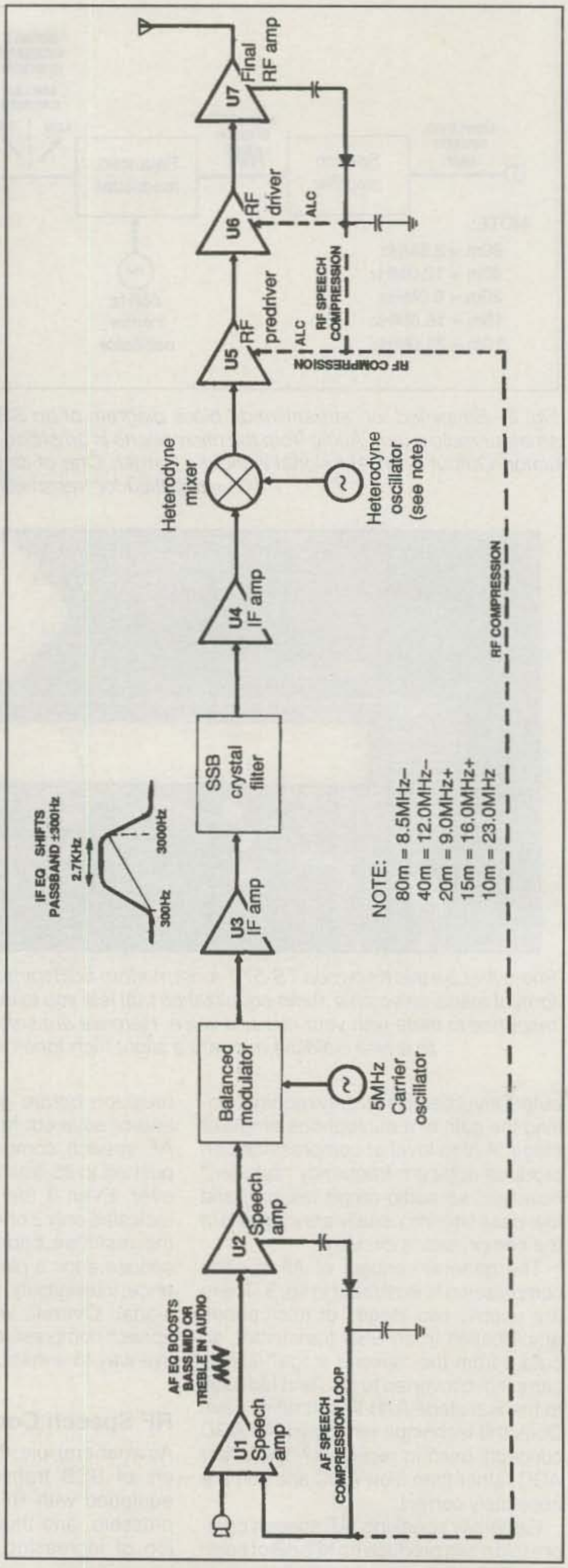

Fig. 3– Expanded block diagram of an SSB transmitter. Although generic in form, it is directly applicable to our discussion. Note that the difference between, and sum of, carrier oscillator and heterodyne oscillator signals explain why LSB is favored on 160–40 meters and USB is favored on 20–10 meters.

This is accomplished by first setting an AGC threshold point, next electronically sensing when a signal exceeds that level, and then producing a DC control voltage proportional to the excess signal strength. That control voltage is then directed back to a lower power driving stage and reduces its output to a level acceptable by the final linear amplifier stage or unit. This arrangement of sampling output power, deriving a control voltage, and applying it to a pre-driver or power amplifier's driver stage in an SSB transceiver is included in fig. 3, the "generic rig" block diagram. If an external linear amplifier is utilized, incidentally, visualize U7 as the amplifier and U5 as the transceiver.

As a working example of ALC use, let's assume you have a high-power linear amplifier that needs only 70 watts of drive to produce full output, and your transceiver can deliver 110 watts output on SSB peaks. You thus adjust the linear's ALC control to yield a "hold back" voltage at 70 watts of input drive. This one-time ALC setting is necessary, because every voice has different audio characteristics and various models of transceivers are designed to work with different ALC levels.

One final and unique example of ALC action is shown in fig. 4. Here a 9 volt battery and a 10k potentiometer are used to "QRPize" a regular 100 watt transceiver so it delivers 5 watts output regardless of any front-panel control setting. That is because the transceiver's power is being "held back" by ALC-simulating voltage from the battery. A linear amplifier's ALC works the same way, but its voltage varies with speech rather than staying constant.

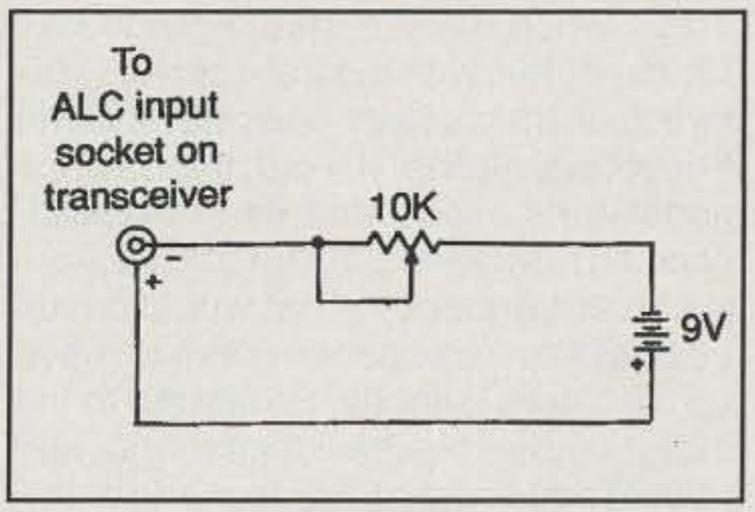

Fig. 4– This "easy QRP mod" circuit lets you set a 100 watt transceiver's output to 5 watts maximum. Unplug the circuit from the transceiver's ALC socket and output is restored to 100 watts. Note reverse polarity at socket.

Audio Equalization

In the same way speech compression boosts "talk power" of an SSB signal, audio equalization enhances the overall sound quality of that signal. Indeed, a good microphone and good audio equalization can make even a weak SSB signal stand apart from the crowd in a most admirable manner. That's because it lets you tailor a transceiver's audio response to precisely fit your microphone and voice characteristics. As with speech compression, equalization can also be performed at the audio and (in deluxe transceivers) IF level.

A familiar example of audio-level equalization is shown in photo A. Here menu selection number 14 (transmit eq) in a Kenwood TS-570 is being set to High Boost; add a touch of treble em-

phasis when using a studio-grade Heil "Goldline" mic with the transceiver. This particular transceiver does not include IF-level equalizing. If it did, the balance modulator's associated carrier oscillator could be shifted ± 200 or 300 Hz from its center frequency. That would cause the SSB filter's response curve to move "up" or "down" slightly, compared to the audio sideband in the filter's range, and it would add or drop bass/low-end or treble/high-end response accordingly.

As you probably have surmised, any and all types of speech processing and enhancement have their good and not-so-good aspects. That is, they can help you pump out a terrific SSB signal, but if abused or misadjusted, they can also cause distortion and adjacent frequency "splatter." You can stay on the right track by avoiding extremes in all audio adjustments and by using an auxiliary receiver to monitor your on-the-air signal quality at regular intervals. Finally, remember that the true pleasure of all your dinking and adjusting is QSOing others, and make a few good on-the-air contacts every day!

New-Era Mode

We have almost overflowed available space, but I wish to briefly share with you some thoughts on a promising new form of voice communications. This idea, which was first detailed in my February 1999 "World of Ideas" column, is condensed into fig. 5. Simply explained, its "version 1.0" form is regular PSK-31 just like you hear around

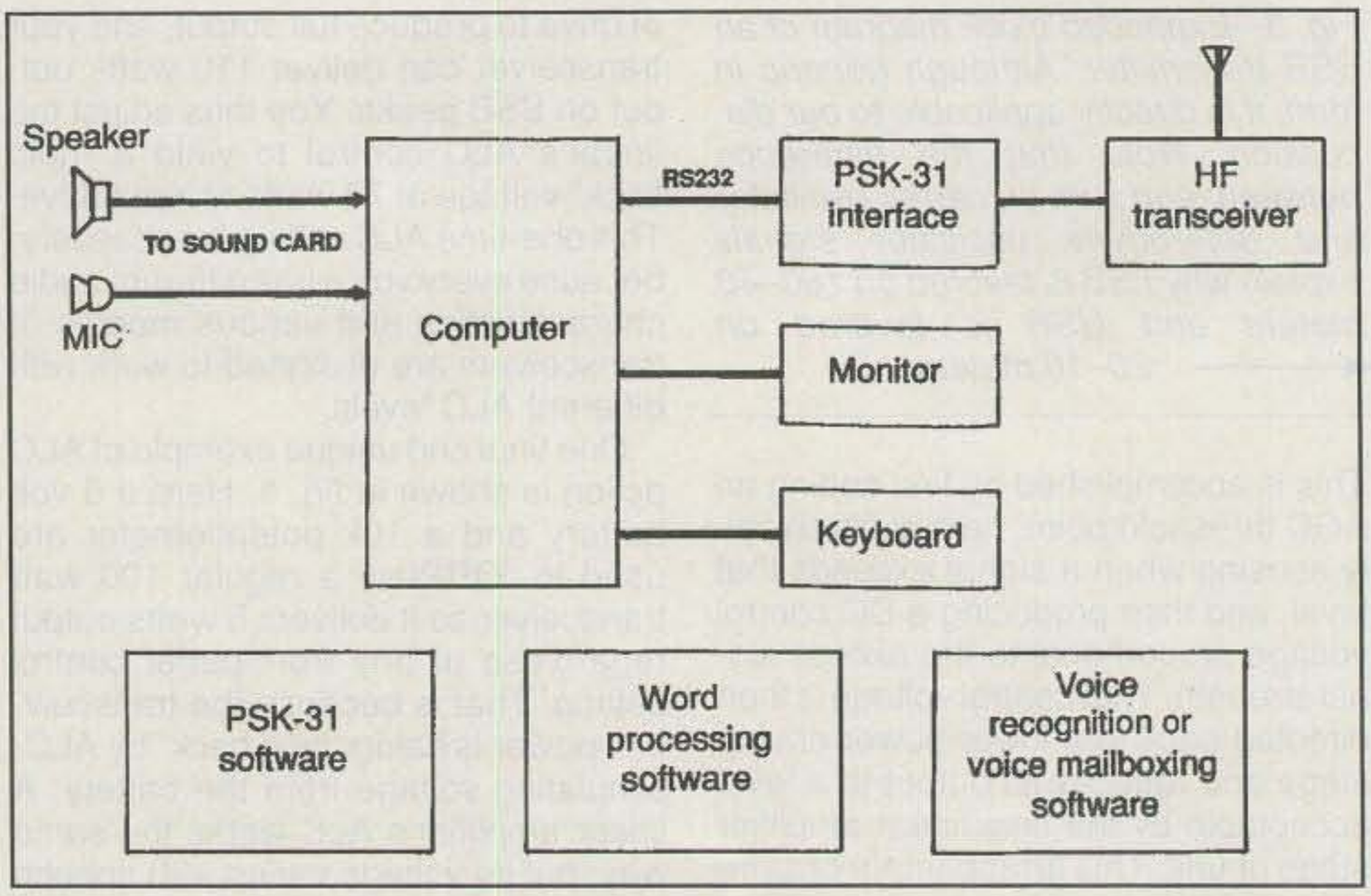

Fig. 5– Outline of a new digital audio communications concept using voice recognition, speech synthesis, and PSK-31. (Discussion in text.)

14.065 MHz, but rather than using a keyboard and monitor for input and output devices, it is completely voice interfaced. You talk and listen, your computer uses word processing and voice interfacing software for converting speech to and from data, and the computer's sound card plus PSK-31 software handle other chores.

After implementation, later versions of this digitized audio concept can support higher speed conversion formats, expanded vocabularies, and language translations. Such language conversions would allow operators in all lands to converse directly in their native tongues, a true revolution in voice communications.

I am describing an idea or concept here, not a "plug-n-play" system you can order as a package from your friendly radio dealer (well, not yet!). That is where you and amateur radio's famed history of pioneering new technologies enter the picture. Most pieces of the package to make this idea a reality are available from software suppliers. A good computer applications specialist and programmer could integrate them in short order.

Presently available voice-mail systems that store telephone messages as data on computers, voice interfacing software such as Dragon, Naturally Speaking and Microsoft Word, plus PSK-31 software are all that is needed. Yes, the word base initially would be limited, but so is usual QSO information. Programming mods can allow the software programs to "reach into each other" and direct-exchange data to produce a working system. This voice concept holds endless possibilities, especially when adapted to cell phones and commercial applications. Someone or some company will pursue the concept soon, and amateur radio is in a position to be there with the best ideas first, setting the pace in cutting-edge technology just as we have done for many decades. Amateur radio still leads the way, and radio amateurs are still proud pioneers in communications technology. May our proud tradition live forever!

73, Dave, K4TWJ

Math's Notes

What's New And How To Use It

BY IRWIN MATH, WA2NDM

Reflections and Ramblings

Well, once again a new year is upon us, and we are in the future—even if some of us don't realize it yet! Those of us who grew up in the early to mid 1900s will understand perhaps even more than others how significant the change of the date from 19-- to 20-- was, and it is now 2002. Amazing! At this time of year I usually reflect on the past and consider how far we have come and think about what I personally have experienced in a relatively short period of time. Please bear with me if dates are a bit out of the correct chronological order. Remember that this is when I experienced the various phases of electronic technology, not necessarily when they made their formal appearance.

When I first became interested in electronics at the tender age of 12 (back in the early 1950s), large vacuum tubes with 4-, 5-, and 6-pin bases were common (or at least readily available to experimenters such as myself as salvage from older radios). Those of you who know what a "type 30, 45" or an "807" is will know exactly what gave me my introduction to electronics. We commonly cut aluminum chassis with chassis punches, mounted terminal strips with 4-40 screws and nuts, and soldered resistors and capacitors with our Weller soldering guns. A surface-mounted component literally was screwed to a surface with screws!

With the proliferation of World War II surplus, however (Those of you who did not experience New York City's Canal Street "Radio Row" will be at a disadvantage here.), the GT series of octal-base tubes (Who can forget the 6SN7GT?) and soon thereafter 7- and 9-pin miniatures such as the 6C4 and 12AX7 made their appearance. Half-watt carbon resistors gave way to 1/4, 1/8, and even 1/10 watt sizes, and small disk-type ceramic capacitors came into play. The size of electronic components and assemblies had begun to shrink.

As the course of miniaturization continued, so-called "subminiature" hearing-aid tubes (with wire bases instead of pins), acorn UHF triodes, and Nuvistors came along to help further shrink the size of our electronic devices. In fact, the very first HT I ever built used a 933 acorn tube in a super-regenerative receiver/modulated-oscillator transmitter for 2 meters. It measured 3" × 3" × 12", had a cut-down 18 inch automobile whip antenna, and used a telephone handset (complete with a carbon microphone). The range was only a mile or two, and the device weighed a couple of pounds (due to the two D cells for the filament of the 933 and the 67.5 volt plate supply battery). However, the thrill of using it is still very fresh in my mind, and yes, it really worked. It certainly wasn't FM, but I must confess it was far more exciting than using a cell phone.

Then "suddenly" we got the transistor. Although the basic device was invented at Bell Labs in 1948, the commercial Raytheon CK722 did not hit the streets until the early '60s, and it cost $11 a pop, if you could get one. Frequency cutoff was about a MHz (we called it a megacycle then), and if you built an AM broadcast-band receiver with the CK722 as an RF amplifier, you sometimes could not even cover the high end of the band. As a result, the transistor usually was only used as an audio amplifier. No filament power was required, however, and only 6 to 9 volts was needed at a few milliamperes (instead of amperes). The CK722, by the way, measured about 1/2" long × 1/4" wide × 1/8" thick—huge by today's standards, but tiny compared to the smallest vacuum tube.

At about that time I graduated from college, went to work for RCA's David Sarnoff Research Center in Princeton, New Jersey, and began to experience the "future" as they saw it. We worked on video tape recorders with 7 inch reels of 1/4 inch wide tape running at 30 to 50 inches per second to try to record TV programs for both consumer and commercial applications. They worked, but the recording time was inadequate (15 minutes per reel), as you could only squeeze about 1800 to 2400 feet of tape on a reel. Helical scan had not yet been developed.

We worked on transistorized TV sets using transistors in the IF, audio, and deflection stages with small metal-enclosed Nuvistor vacuum tubes (6CW4's for those who like details) in the tuner, and we even worked on computers. These were designed to compute, however, not to implement data bases, word-processing programs, or any sort of video game. Even general-purpose CCTV cameras used videcon tubes, high-voltage power supplies, and deflection coils and weighed pounds, not ounces. Also, into the late 1960s electronic devices were, for the most part, collections of individual components interconnected in what today would be considered fairly simple circuitry. Then things started to change.

I remember the development of what was then called the "micro-module" while I was with RCA/Sarnoff. This device was intended to implement a complete circuit function in a single housing. The first micro-modules I came in contact with were rudimentary logic circuits that were housed in round cylinders which were about an inch in diameter, 2 to 3 inches long, and had a 7-pin miniature tube base for connections. Components were 1/8 and 1/10 watt carbon resistors interconnected with transistors and diodes in relatively basic circuits. A bit later these evolved into small, square ceramic devices with resistors that actually were films of carbon deposited directly on the ceramic base. Devices such as these were forerunners of the modern integrated circuit. As technology changed, transistor parameters began to improve and integrated circuits became smaller and smaller as well as more complex. Soon the familiar DIP-type packages made their appearance, and as they say, the rest is history.

In the 40- to 50-year time frame I am discussing, the changes were incredible. A portable radio-telephone that came packaged in a small suitcase the size of two shoe boxes evolved into a pocket-size cell phone with ten times the range and full dialing capabilities. The entire cellular network was developed, and the 800 MHz region of the spectrum became as commonplace as the lower frequencies. The computer revolution occurred, color TV also became pocket-size, and full-color CCD video cameras that could be hidden in a cigarette package (or even smaller container) became available for less than the cost of a single videcon—even at 1960s prices. Today's surplus has components (for less than a dollar) that we could not even dream of in 1960. Just imagine what will happen in the next 40 to 50 years.

My point in all of this is to say that by reflecting on the past we can gain a much better appreciation of where we are today and what it took to get here. If you have the opportunity to look at or "play with" older electronic equipment, do so. If a nearby museum has a display of antique radios, be sure to visit it, and if a local radio club has a fleamarket, browse for an hour or so. I find it fascinating just how much has been developed by man in a few years, I and can only wonder what is yet to come!

73, and a very Happy New Year to all.
Irwin, WA2NDM

c/o CQ magazine

VHF Plus

BY JOE LYNCH, N6CL

All About The World Above HF

2001 Leonids Delights Amateurs Worldwide

What proved to be not as big as predicted in some places but bigger in others, the 2001 *Leonids* meteor shower delighted amateur radio operators and amateur astronomers alike—and in some unpredicted places. Preliminary reports indicate that while Europe was predicted to be pretty much out of the shower, it did experience quite a show. For example, Szigy Iulius, YO2IS, reported on the Moonnet listserv that he heard propagation for several hours. Complementing the European observation, Shelby Ennis, W8WN, commented in his "Hot News" column, "Reports of 100 or more contacts have been received, even though Europe was not expected to get much of a shower."

From Australia, Doug McArthur, VK3UM, reported that the peak occurred between 1700–1800 UTC. He indicated that some bursts lasted as long as six minutes. Doug also commented that there is an unconfirmed report of a VK2-ZL QSO.

As for North America, from my vantage point in the near-central U.S., I observed hams across North America participating in the shower. While the Asher and McNaught prediction indicated a short, intense spike centered on 0955 UTC for North America, those who were on the air much earlier were not disappointed. I started listening about four hours before the predicted peak and eventually logged K4ZOO as my first SSB contact at 0631 UTC. While I had to QRT at around 1200 UTC, others reported contacts as late as 1900 UTC.

During the peak of the shower, the propagation appeared to come in waves. For example, Tim Marek, K7XC, operating rover from an excellent visual vantage point in DM09, observed the following: "Many large rocks exploding near the end of their descent, leaving a visible gas cloud for over a minute. I watched as one to the northwest exploded visually, immediately followed by 2 meters going nuts for over a minute in the same direction, with plenty of stations heard on backscatter as well."

Choosing to remain on 2 meters and working strictly randoms, your editor was pleasantly surprised to notice how many operators spread out. I worked randoms as low as 144.180 MHz and as high 144.225 MHz.

Several operators opted for a particular frequency and hammered away on that frequency. For example, Gene Zimmerman, W3ZZ, was heard quite a bit at approximately 144.220 MHz. This parking on one frequency tactic made it easier for lesser-equipped operators who chose to search and pounce, because as each successive wave of propagation hit, one could return to that frequency to work the operator on that frequency.

Indeed, the waves did hit—wave after wave after wave. When a wave hit, one could spin the dial and hear dozens of stations across a particular area coming in to one's QTH. Because many of the waves lasted long enough (upwards of over a minute at a time), one could make a choice as to whom to work, and those on a fixed frequency could sometimes complete upwards of five QSOs during one wave.

This column's deadline precluded including any operator reports from the *Leonids* this month. Next month's column will have extensive coverage of the shower as well as ongoing coverage of the 6 meter worldwide propagation experienced between mid-November and mid-December.

VHF Plus Calendar

Jan. 3	*Quads* meteor shower predicted peak. (See text for details.)
Jan. 5	Last quarter Moon.
Jan. 6	Highest Moon declination. Good EME conditions.
Jan. 13	New Moon. Very poor EME conditions.
Jan. 18	Moon apogee and lowest Moon declination.
Jan. 19-21	ARRL VHF Sweepstakes. (See text for details.)
Jan. 20	Moderate EME conditions.
Jan. 21	First quarter Moon.
Jan. 27	Poor EME conditions.
Jan. 28	Full Moon.

• *EME conditions courtesy W5LUU*

The "Magic Band" Wakes Up

While the year 2000 did not afford much in the way of 6 meter propagation, the fall of 2001 seems to have made up for it. Dramatic openings during October and November were the rule rather than the exception this past fall. What follows is a summary of a number of different reports received via the internet.

Juan Carlos Munoz, TG9AJR: On 19 October, Juan wrote: "Joe, I have a question: Do you know where I can find distance records and other records? The reason I ask is because this week I had the great pleasure to work Japan on 6 meters long path and want to know some more about this QSOs like distance and if there were any QSOs before between JA and TG on 6 meters."

Frank Moorhus, AA2DR: "Six meters was hot on 21 October. I worked LZ1ZP, also E3ØNA (QSL to DL5NAM). On 4 November the Europeans were in from 1543 UTC to 1730 UTC. I worked GMØEWX, MMØAMW, OZØJX, SM6FHY, OZ8ABA, SM7WDS, OZ1BTE, OZ1CDE, DF7VX, DL8YHR, PE9GC, ON7TL, PBØANX, EI7BMB, ON4KST, EI6IZ, PA6KT, 2E1EMK . . . Then at 1800 I began working west. I worked KA6NU, K6JJ, NN7J, KC6ZWT, W6OMF, AJ6T/M. On 10 November the Europeans again were in from 1401–1525 UTC. Then at 1952 UTC I worked NL7Z with QSB. I also worked KL7FZ, KL7Y, NL7ZW.

"I worked NL7Z from my truck. KL7Z was the first KL in and the last one out at 2115. On 11 November, starting at 1219, I experienced a great band opening. My first QSO was with F1BBK, followed by MØBUT, IK5MEN, and then stations from the following prefixes: G, GW, MU, DL, EH, OE, PE, ON, OQ, LA. At 1438 UTC I worked SP2BDR and SP6TRQ. The band closed at around 1530. I heard some KL7s at around 1900 UTC but they were not workable. On 12 November the band opened at around 1500 UTC; I worked some W6-W7 stations. At 2007 UTC, here came the KL7s again, along with V73AT on 50.088 MHz. The band closed at around 2200 UTC. As far as I am concerned, 6 meters is the place to be!"

Pierre Jolin, VE2PIJ: "From my log of 30 October—Heard D44TD; worked YV4YC, YS1RR; heard TI5KD; worked TI2RPT, HP2CWB, TI4DJ, TG9NX, TI2ALF, TI5BX; heard South American station on 50.120 FM 5-9; heard HP3XUG. VE3AX heard my two-way QSO with HP3XUG. Heard TI2SSI and heard W2CNS. On 3 November I worked GMØEWX. On 8 November I worked WØAMM and WR4K; heard MMØAMW, GØRUZ, and GMØEWX.

"On 9 November, I heard GM4WJA, GMØEWX; worked GW3JXN, GW4VEQ; heard MMØAMW and GM7LUP."

Al Goss, K2ERG: "On 1 November, from a dead band for hours here in FN13, suddenly VP8DBL at S8–S9 signal level popped up for 3 or 4 minutes and worked W2MPK, NQ2O, and myself. Then poof! That was all the stations I heard work him. Then he was gone! He did work across the country various places. I think NØJK/M had a QSO but not able to confirm it. I only heard the 'very' east coast working and hearing anything today, such as FG, TI, TG, XE, PJ2, P4, and such. Magic band? Yeah!"

Brian Allen, NØVSB: "KØGU in DN70 caught VP8DBL earlier this morning when he was working W8/W9s. I couldn't break through with 100 watts. Fortunately, he came back later in the day when several were working KH6's (beacons in most of the afternoon) and a few ZLs and several of us here in Colorado picked him up as well.

"The band was open here to somewhere most of the day. Some really nice conditions

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over the past week or so, unlike the past couple of years, where we might have at least one opening to one spot during the day."

Al Schlaugat, N9ISN: "On 1 November VP8DBL was solid, peaking an honest 20 over S9 here in EN44 (Wisconsin) for almost 45 minutes at about 1900 UTC to 2000 UTC on 50.117. He was on SSB and then switched to CW since nobody was calling him. He made a dozen contacts during that time but it was mostly calling CQ. The day before things were hot into FG, TI, HP, YV for most of the morning but nothing today except for that rogue VP8. Still waiting for that elusive KH6 for WAS on 6 meters!"

Dave Clingerman, W6OAL: "On 1 November the VP8 hung in here for an hour or so this afternoon. He called and called CQ with no takers and was so strong that I gave him a call on CW after working him earlier on SSB just so he wouldn't feel unwanted, hi. Things were hopping here today in DM79. I have one antenna on Hawaii and one on the Falklands, so I only had to twist an antenna switch to work either in the same time frame. The ZLs were in also but marginal here just SE of Denver."

Dave Bernhardt, N7DB: "1 November—After reading the posts of DX in the east and sunbelt, we in the northwest have a little to report on now.

"This week the MUF has had a habit of stalling in the mid-40 MHz region. Yesterday the edge of propagation to ZK1NCP was right in this metro area. 'NCP was 229 for half an hour, still no contact. NN7J, about 30 miles SSW of me, did make contact with ZK1NCP yesterday.

"This morning the MUF made a run up rapidly to the east. Transcon and Spanish language stations were heard up to the 48/49 MHz range. Propagation stalled again in that direction. I had to leave late morning, but when I returned the KH6's were in strong. Worked WH6XM, BK29, 5/5 at 2023 UTC and KH6SX, BK29, 5/9 at 2027 UTC. Also heard KH6HAK for a few moments, but no contact. Both KH6HME/b and KH6HI/b were 599 at 2018 UTC. Not sure if any ZL made it into this area.

"Now, the interesting thing about this afternoon was the amount of backscatter. Between my notes and memory, stations heard via backscatter include: VE7VDX, K6CH, KA7BGR/b (CN82), KI6CG (?), KØYW, W6YM (?), K7ICW, W6JKV/5, K7OFT, KØGU, N7EJ (?), XE2UZL/b, K6GMV, and heard W7RV working JA's (heard both ends). The JA's via a backscatter-type propagation have been heard here via that propagation mode just a few times before in the last 20 some years. JA's were in for a little while, but I was still concentrating on ZK1NCP too much topay attention in that direction.

"Sunday held a number of Pacific Northwest stations in anticipation of a European *F2* opening. Alas, propagation fell short again as experienced during the last two cycles.

"A major solar flare occurred at 1620 UTC (X1 Class, followed by a large earth-directed CME) which probably set up conditions for higher latitude propagation. Transcontinental MUF was up to 46 MHz at 1620 UTC. A short time later (1636 UTC) K2RTH from FL was heard here. Propagation then moved north with some W1's heard here. Some locals did work the east coast from here, but most effort was directed to the EU path. One note was that W1's seemed to be skewed 20–30 degrees north from direct path at times. Signal levels were more in line with what we see during multi-hop summer *E* than direct-path *F2*.

"Later in the day, Guam and JA were in. The JA's were weak here. This was another opening as seen during the last few weeks in that signals were weak here, but made it into the Rocky Mountain states with decent signal levels.

"Got home late Monday afternoon, so missed the first part of the 6 meter opening. Got a report that DU was in here. Good JA opening. Some S9 signals at times. HL was also in and heard a couple. Propagation was mainly the lower half of JA. Worked a couple of Okinawa stations myself.

"Now the propagation of note was the aurora. The solar-flare shock wave hit at around 0130 UTC. This was one of those unusual times in the northwest when the aurora is actually visible. Even with this visible AU, there were *no* stations heard on 6 or 2 meters at 0250 UTC! W7FI (CN87) first appeared on 6 meters a little after 0300 UTC and I worked him on 2 meters 55A at 0320 UTC. I had to lay low on 6 meters due to MFN on CH2 this evening. Got a few shots of the AU on film, even though there were some high, thin cirrus clouds. Saw red AU at 0448 UTC.

"Stations worked on 2 meters include

W7FKI (CN87, 52A) 0323 UTC; WA7GSK (DN13, 52A) 0341 UTC; W7FHI (CN96, 57A) 0355 UTC; W7MQY (CN82, 51A) 0402 UTC; KØGU (DN70, 54A) 0409 UTC, K7HSJ (CN94, 52A) 0415 UTC; WJ7S (CN84, 51A) 0433 UTC; K7IEY (CN88, 52A) 0504 UTC; and KD6OSV (CN70, 51A) 0523 UTC and heard again at 0648 UTC. The most interesting item about Hugh is that the AU was peaking northwest! First time I could ever remember AU sigs peaking in that direction.

"I got back on 6 and worked VE7BEE (DN09, 5/5 AU-E) 0554 UTC; KA7BGR (CN82, 52A stronger earlier) 0618 UTC peaking NW; W7NTF (CN87, 55A) and KB7WJL (CN74, 53A peak 30 deg) 0730 UTC. Again, KA7BGR was peaking NW via AU and was the first time I have worked a station in that direction. Dave, K7RWT, said tonight that the last time he had heard AU peak to the NW was back in the '60s.

"The aurora of 5 November marked the beginning of a very good set of conditions for the fall *F2* season here in the Pacific Northwest. The 90-day solar flux mean value is approaching that seen in the fall of 1990 (217 then vs. 214 the other day). Propagation conditions during this past week are also reminiscent of the past two cycles.

"For those who did not get to experience the transcontinental openings during the previous two cycles, Monday 11/12 was as good as any seen then (exception being when the F2 shorted to W8's back then). VE1YX was heard at 1628 UTC that morning to start things out. W1CWU was the first one in the log for me at 1718 UTC at 5/5. Through the morning there were numerous stations in at 5/9+ out here. Although the bulk of stations were from the upper Atlantic seaboard, there were some stations worked as far south as FL locally. There were some strong indications of propagation in the direction of South America (loud CE Muzak,) but no contacts that I know of. Beacons heard Monday morning include W1RA/b, K2ZD/b, WA1OJB/b, VE1SMU/b, and W3VD/b. Although not worked, VO2AG was heard 5/3 at 1840 UTC.

"Yesterday morning the propagation for us was stretched out into the Atlantic. VE1YX was in weakly at 1602 UTC and FL was reported about 1615 UTC. There were a few new grid squares active in eastern Canada, not much heard from the NE US. Stations worked here include VA1LW (FN84), VY2SS/p (FN87), VY2RU/m (FN77), VE1QJ (FN57), and VE1MR (FN84). Beacons heard in the first half of the morning include WA1OJB/b and W1RA/b. This station is still looking for his first EU contact.

"Later in the afternoon the JA's were back in force. This was a strong opening primarily to the northern half of JA. Lots of 5/9 signals during this one. I had to leave for a period of time, so I took my IC-502 and Larsen 2 meter 5/8 mag mount in the car. To my surprise, worked JA8TSG (519/529), JA8ISU (599/569), and JA5FMP (599/529) while waiting in the car in a parking lot. Haven't worked JA with the QRP rig since '79, so this was a very good opening. Beacons heard this afternoon include JE7YNQ/b (529 2314 UTC) and JA2IGY/b. The only other DX action was 9M6JU heard/possibly worked by some local(s).

"16 November: Propagation Thursday began with backscatter from N0VSB as he was working EU at 1615 UTC. A short time later the VE1s were in. This was another opening to W1s and eastern Canada with easy copy signals for the most part. Beacons heard this morning: VE1SMU/b, WA1OJB/b, and W1RA/b. A magnetic disturbance cut things short in the morning so the band was pretty much shot by mid-morning.

Jordan Mash, WB2QLP: "On 7 November I worked OA4/N6XQ (FH-17) on CW and SSB. Jack was 20 over S9 on 50.102 MHz."

Mike King, KMØT: "9 November worked 20 JAs tonight from 2302 until 2314 UTC. They were 5×9 until the end, where they dropped quickly into never land.

"I was on my tower repairing my rotor for the hour before that. I had purchased a climbing belt/tower lanyard and arrest lanyard two days earlier because my rotor had been freezing up, diagnosed previously as bad connector, electrolysis. My rotor would stick in one spot, and then work again for whatever reason, unpredictable.

"Thank goodness the climbing belt came today via UPS and I got home at 4:00 PM and scampered up the tower to take a look. (Thank you, Champion Radio Products!)

"You may ask, 'Don't you have a crank up tower?' Well, yes, but when the antennas stick in the wrong direction, one can't lay the tower over or the antennas will stick in the ground. And its a lengthy process. So I cranked it down as much as possible, blocked the sections very well with wood so they would not shift and drop, thus cutting my fingers and toes off.

"Right before I got home, listened in the mobile and heard KL7 on my 6 -meter hamstick. Sure enough, got in the shack and W7XU was calling CQ like there is no tomorrow. I had to act quickly. Got up the tower and disconnected the rotator quick-disconnect and there was a lot of electrolysis-type corrosion. Cleaned it up and hooked it back up.

"Ran downstairs at about 2250 and with the tower basically as low as it could go, W7XU was running a huge JA pile-up. I ran upstairs to crank the tower up as quickly as I could.

"Then got an audio tape and rewound that, posted on the internet that I was going to get on 50.107. As soon as the tape rewound, I hit record and called CQ DX from KMØT. The pile-up of JAs was immediate. It's like they saw the post on the net and were waiting patiently for me to get my act together.

"It was very exciting stuff! The tape was neat to listen to as well! They dropped out pretty quickly and I found W7XU still working stations I could not hear. I figure I could have worked 40 or more, but I just wasn't done doing the tower work. If the belt had not come, I probably would have worked *zero* JAs. I put my fear of high places aside and got done what had to be done!

"I missed 9G when Arliss was there; probably would have worked him but I was deer hunting in EN37HH. I heard Caribbean stations that morning from the mobile, but that was it. Got a deer;, not sure if that makes up for it. Can get steak at the butcher ya know!

"November 10: Heard EU this morning, from 1643 till 1710, GMØEWX. Heard him first 5x9+ for 10 seconds just as tuning by 50.176 (meteor burn) before 1643, then he moved and heard him on and off on CW. Got his attention a number of times (QRZ?), but never got my call back from him. Either I don't run enough power or he does not hear well. He was 519 many times with QSB.

"Arliss, W7XU/Ø, was hearing and calling him quite a bit later around 1742, but I don't think he ever got anything back from him.

"Nothing else heard. EN30 and EN40 and EN53 seemed to be working them. KL7 was in here from 1920 until 1940, much earlier than yesterday it seems."

Pete Petri, WA5JCI: "November 10 and 11 found good DX into EM21. Worked DLs and OKs for DXCC numbers 99 and 100 and squeezed out enough grid locators to put me over 700. Nice two days, to say the least!"

Jerry Daugherty, W9FS: "Shouldn't have spoken so soon about not working any DX at my QTH., I worked AL7OC, NL7ZW, KL7CDG, KL7BK, and KL7BO. That is a total of 13 Alaskans I have worked on 6 meters.

"In addition to the text below I worked GIØOTC, in Ireland. The other part of the miracle is this is Alan Doherty, the original spelling of my last name "Daugherty," and may be distantly related. I wish I could trace my roots back a little further than the 1500s.

"This morning I beat the QRN (living in the city) and worked GMØEWX Grid IO67 4×2,

then 10 minutes later worked him 5×9. Also heard GMØPBB 3×2, serious QSB. First Scotland.

"Yesterday worked KL7HBK, KL7RZ, KL7FH, WL7HE, KL7HFQ, and KL7FZ, some of which were 30/S9. That opening lasted a little over four hours. A little over a week ago I worked VP8DBL in GD18 5×8 (new grid). Not too bad for November and it is only the 13th. All of that into the RF hole EN61. I *really* believe in miracles.

"14 November: Started the day off by hearing GØRUZ. He was a 419. Could not blast through the stateside QRM. Then heard and called GW3JXN who was 419 with no luck. Tuned up the band and heard CT1FMX in IM59. Jorge who was 5×9 +15 dB worked him. Then found CT1FJC IM57. He was 5V3 and QSB took him out; don't know if he copied my info or not so may not be a contact. Heard but did not work GM7PBB. Also heard GM3JIJ. Heard today TF3FK and ON4GG. Then I heard the gang from KL7 land; all seemed to be 20 over S9. I later worked VY1VY in CP20 for a new grid. I later found out that CT1FJC didn't receive my report so no contact there. The last few days have been the best conditions I've seen in a long time.

"15 November: This morning I worked from what used to be the RF Black Hole GØRUZ, G8BCG, GØJHC, G6LUE, GW3JXN, OY9JD, and OX3OX.

"I've heard many Iceland, Norway, Sweden, France stations; four days in a row the band was open. This evening brought the Alaskans not as loud, but all at once heard JA8JRC, JA8NAE, JA7OQ. They got up to a 5×7 but didn't stay long. Sorry to say I didn't work any. I heard a lot of stations off backscatter. Deepest 6 meter backscatter I've ever heard."

John Fridenstine, W8PAT: "13 November—Finally a new one! Worked SM3GSX this morning for #85. Not listed in QRZ or Buckmaster's. Anyone know a QSL route?

"I have been comparing 6 meter DX in Cycles 21, 22, 23, which is as far back as I go. I figure working WAC is a pretty good indicator of general conditions from this QTH (EN81).

"Cycle 23—year 2000, it took 51 days to work WAC (10-13 to 12-3); year 2001 it took 23 days to work WAC (10-23 to 11-15). Cycle 22—year 1989 it took 4 days to work WAC (11-16 to 11-19). Cycle 21—it took 730 days to work WAC (10-27-79 to 10-25-81).

"Many more 6 meter operators today than during Cycle 21 and many more countries with 6 meter privileges of course. The last three days have been the best at this QTH, since 11-16-89 through 11-19-89. I worked SM, OZ, and OY for new countries on 6 meters on the 14th and 15th. SM and OZ were last worked from here on 6/10 meter cross band in 1979.

"Working conditions here have been the same for more than 20 years. I have used a single 6- or 7-element Yagi at 50 feet and 100 to 150 watts. I'm on the Ohio plain. Elevation is 830 feet above sea level and nothing much higher for 20 miles. If I could convince the three local power companies to turn off all electrical service when the band is open it would be a super site.

"My conclusion is that Cycle 23 is a good one and the best part is that it is not over. Only 13 countries to go!"

Sam Whitley, K5SW: "30 October—I've been on VHF since the late '50s. Some days are better than others. I've gotten my share and listened while other areas got theirs. I'm retired so I can be around the radio much more. Still I can't get enough of that *magic band*.

"I've had a fair station: 400 watts from an old Johnson T bolt (built by Bob Cooper, ZL4AAA, when he lived in the states). I drive it with about 4 watts so it doesn't draw grid current) and I can live with neighbors and run 400 watts. Rig is old TS-600 circa 1960s (one VFO—no split frequency).

"My antenna is 7-element 21 ft. boom at 80 feet—average town location on flat ground. I've learned to listen a lot, watch *especially* as band shifts for a possible long haul contact as in early November late in the morning when FR, Reunion Island, 10,330 miles came in. Also in was 9G5AN on the same days within a couple of minutes of same time.

"On November 13 I worked VK4PU then had to duck out to church revival missing ZK1 and VK9. The next day I worked D44TD on Cape Verde Island along with YV, 9Y, PP,

P43, PZ, HK, FY, FG, TI, and KH6. 9G5AN was country number 100 yesterday; this double peak is hitting great timing for this fall season. I am enjoying 'smelling the roses' as Ed Tilton would say.

"Along the lines of John, W8PAT, I did some checking of my logs for Cycles 20, 21, 22, and 23. Continents worked: Cycle 20 (1967–70) worked SA, NA, and OC. My first SA was HC1FS, first OC was KH6IJ. For Cycle 21, the peak '79 worked all continents. For Cycle 22, the peak '89 worked all continents. For Cycle 23, Oct.–Nov. 200, worked all continents.

"In my opinion 1979 was better than this one (so far), as only station in Europe was EI2W. Even so, I did work 12 countries on 28–50 MHz cross band.

"It was great to hear the EU video Channel 1 roll through then as an in-band signal at 50 MHz. The difference this time is the internet making it very productive.

"This is what I worked in Cycle 21 (1979) cross band from Oklahoma. Nov. 17, 1506-1630 UTC, SM, DL, G; Nov. 18, 1551–1600 UTC, HB, DL; Nov. 19, 1459–1627 UTC, G, DL, GM; Nov. 20, 1505–1654 UTC, G, EI; Nov. 21, 1604–1630 UTC, G, GW; Nov. 22, Nil; Nov. 23, 1537–1620 UTC, DL, G; Dec. 08, 1504–1609 UTC, DL, G; Dec. 11, 1609–1649 UTC, DL, OZ, G, GM, GI; Dec. 13, 1551–1609 UTC, G, F; Dec. 15, 151–1530 UTC, EA.

"I didn't show it, but during this time frame Oct. 19 – Dec. 15 1979 I worked 25 JAs, 11 KL7s, 1 VO1 NFLD, 2 VO2 LABR, 1 KX6 (now V73), 1 VE8 NWT, 1 VY1 Yukon, VE1/P Sable Island, 2 KG6s Guam (now KH2), 4 KH6s, and on Dec. 11 the only licensed EU station, EI2W, plus G6SIX on No. 20, who didn't have a proper license."

Rich Moseson, W2VU: "November 14—At 1615 UTC I heard TF3FK on 50.129 MHz, working W2s & 3s, plus possibly Europe, but I'm not sure. Very big pile-up! Nov. 15 worked VE6 & 7; Nov. 16 got 1st EU opening with QSOs to G, GI, GM, and GW."

Jake Tennant, K8JWT: "Finally, I got to work some real DX today with my meager mobile station, GMØEWX, his 59+ to my 52 from my truck! This was my first ever European station."

Tomas Hood, NW7US: "15 November—Great open on 6! I worked Maine and Quebec (FN44, FN46) with a 20 meter Hustler element, tuned with a Versa Tuner for 6 meters, up about 30 feet on my main mast. I ran 50 watts. What an opening!"

Jeff Kadet, K1MOD: "I thought for sure (being new to 6 meters) that last November was the best Cycle 23 would get. This was a profound disappointment. However, the past six days (up to 16 November) has changed all of that! A lot of this stuff probably seems common to the east coast, but in most cases it's the first time any of it has been into EN40 since I started in mid-1998. New countries in the past 5 days: GW, G, PAØ, GM, GI, OX, GW, OY, SM, OZ, and SP. Total now at 70 countries."

Andy Clarke, VA6SZ: "I received a phone call from Andy Clarke, VA6SZ, concerning about an hour-long 6 meter opening to Japan. Beginning at 2259 UTC on 9 November Andy worked 85 JA stations in 17 new grids throughout Japan.

"Thinking that the band might open, Andy started calling CQ on 50.150 MHz. Almost immediately he noticed that he was spotted on the international DX packet cluster. He was quickly answered by one JA after another until 2356 UTC. For Andy, this was a first in being involved in a DX pile-up. During his six-plus years as a ham he has spent almost all of them on VHF, operating as a rover for many contests throughout the years. About a year and a half ago Andy moved to his new QTH, which is on a ridge about 400 feet above the average terrain. Presently, Andy uses a 756 Pro, running 80 watts into a M^2 6M2WLC up about 20 meters. He hopes to add a linear at a future date.

"On November 10 Andy worked six more stations but he had another good opening on 11 November. Between 2230 UTC and 0300 UTC on 12 November, Andy worked 46 JAs. The total was 137 less six dupes, for 131 different callsigns. The total number of grids worked was 25 and they are as follows: PM43, 53, 63, 64, 65, 74, 75, 84, 85, 86, 87, 94, 95, 96, 97, QM05, 06, 07, 08, 09, and QN00, 02, 03, 13, 23.

"On Friday, 9 November, the flux number was 271 with a *K*-index of 1. On Saturday the flux had dropped over 30 points, and on Sunday the flux seemed to recover some lost ground.

"Not as many JAs were worked on Sunday night probably due to the fact that it was Monday morning in Japan and a lot of people were working. All in all, a great weekend."

Kevin Bishop, WB8XX: "It's not been too bad here either. I have missed many more not listed. By the way, this is my first cycle. I have been on 6 meters for six years and

On the Cover

The two bands with names as well as numbers are the favorites of Brent Lemons, N5TML, of Marlow, Oklahoma. Almost any night you'll find him on "top band," 160 meters, rag-chewing with friends on 1990 kHz; and when 6 meters—the "magic band" —is open, you'll find him there, too.

Brent has been a ham for 11 years, and has enjoyed VHF/UHF single-sideband work almost from the beginning. He's earned VUCC (VHF-UHF Century Club award) on 6, 2, and 432, and counts among his all-time best contacts talking on 2 meters to Cuba, Mexico, and Canada.

You can see Brent's dedication to 6 meters in the photo on the cover, as virtually everything above his main operating desk is for the Magic Band. On the desk (hand-built from oak, by the way), is a Yaesu FT-102 HF transceiver, a Yaesu FT-990, and a stacked pair of ICOM VHF/UHF rigs, the IC-271 and 471. Moving up, there's an ICOM IC-551D (6 meters) and an AEA 6 meter amplifier (he had to go to Canada for that one); and on the shelf above that, a Drake TR-6 (6 meters) with matching speaker and a Dentron Super Super Tuner.

Brent's wife, Stephanie, is also a ham (N5YNR) and is about to celebrate her 10th anniversary as an amateur. Their home in Marlow is about an hour southwest of Oklahoma City, "where the winds blow," says Brent, often over 100 miles per hour.

What's Brent's favorite aspect of amateur radio? "Lots of friends who help with stuff," he says. "It's nice to be able to help somebody and then have them come help you." (Cover photo by Larry Mulvehill, WB2ZPI)

have worked 80 countries. My log for November includes: 3 November, 9G5AN, 7Q7SIX/b, G, GW, CT, EH, PYØFF/b. On 4 November I heard 9G5AN and worked or heard CT, DL, G, GD, GM, GW, EH, F, ON, OZ, PA, ES, and OY6/b. On 6 November, I had a big aurora opening. On 10 November I worked EH8, heard 3C5 video, heard OY9, worked OZ1JXY, heard OX3SIX/b, worked KL7. On 11 November I worked F, ON, EI, HB, CT, EH, GW, and then 5B4FL for WAC, then worked V73AT.

"On 12 November I worked or heard V73AT, and KL7.

"On 15 November I worked or heard GM, GW, G, TF, ON, OY, LA, (SM, OH, OHØ heard) OX3/b, OY6/b, OX3OX, KL7, and then worked two JA8s. Then the band went dead!"

Ken Neubeck, WB2AMU: "On 30 October, I worked FR5DN using 60 watts and 2-element beam in tree up 10 feet. Also heard YV4YC, YC1DIG, IK3RLP, P43JB, and EH2AGZ. On 4 November I worked the following using 20 watts and dipole: PAØOOS, MMØAMW, OZ4VV, PAØLSB, G4HBA, PA5TA, G4IFX (I used 10 watts for this QSO.). I heard F2YT, PA2VST, GW3MFY, and G3RDX. On 8 November I worked GMØEWX using 60 watts and a 2-element beam in tree up 10 feet. I also heard MMØAMW and K4MZ in Florida calling him (*Es* skip). On 9 November I worked GW3JXN. On 11 November I worked ON4ANT and GW3JXN using 20 watts and dipole.

"On 12 November I worked the following while mobile, running 60 watts and mag-mount vertical: WA6STC, W6QYV, AJ6S, NU6S, K7IE, K6ME, VE7DXG, KN6W, W6OMF, WX7R, KØJJ, N7BLS, K7LJ, W7KK, K7CW, W7NTF, and W7DMN. I heard KL7FZ, AL7OC, and KL7HFQ from 2100 to 2130 UTC but could not get them through the pile-up. On 13 November I used a 2-element beam in a tree and 50 watts to work GMØEWX."

Your Editor, N6CL: "On 16 November around 1500 UTC the band opened to the Caribbean. Several stations worked into Puerto Rico and PJ2, P4, as well as other Caribbean locations. I worked WP4Q in FK78, using the 706 into a HF Windom."

Tim Marek, K7XC: "The K7XC Beacon is back online at 144.288 MHz atop a small ridge in extreme eastern DM09. Equipment is a Drake TR22 driving a 10 Ramsey H/T brick to 10W into homebrew 1/2-wave loop 15 feet in the air. I have heard it 70 miles away on the 5/8 vertical atop my truck. All my 2 meter loops are broken from extreme use. Current plan is to have 50 MHz and 432 MHz beacons up and running there by spring."

CEØX Expected QRV

Next month CEØX is expected to be activated for three weeks. As you know, this is very rare, even though an operator went there and made 7000 QSOs last year.

Current Contest

ARRL VHF Sweepstakes: This annual winter classic takes place from 19–21 January, beginning 1800 UTC, 19 January and ending 0300 UTC, 21 January. Exchange is your grid square. This is the only VHF contest that features club competition. The complete rules appear in December 2001 *QST*. Rules plus log/summary sheets are also available electronically from the League on their home page <http://www.arrl.org> on the web. As always, send to or electronically file your log and summary sheets with the League.

Current Meteor Shower

The *Quandrantids*, or *Quads*, is a brief but very active meteor shower. According to OH5IY's meteor-scatter software, the expected peak should be at around 1650 UTC on 3 January. The actual peak can occur ±3 hours of the predicted peak. The best paths are north-south. Long-duration meteors can be expected about 1± hours after the predicted peak. As always, look to 3818 or 3843 kHz in the evening hours for opportunities for schedules.

Next month I will have more to report on in the aftermath of the *Leonids* meteor shower. If you want your report to appear here, please send it to me. My *CQ* e-mail address has been having some problems lately, so send your reports to <n6cl@fuller.edu>.

73, Joe, N6CL

Awards

BY TED MELINOSKY, K1BV

News Of Certificate And Award Collecting

The January 2002 column begins the fifth year I've written this column for *CQ*. Where does the time go? I want to thank all the contributors who have provided the continuous stream of interesting information, comments, and award samples that have made the job of writing this column a pleasure. Award chasing (including county hunting) is just one of the specialty interests in our great hobby. It appeals to those who love a challenge, set performance goals for themselves, and probably have a history of accomplishment in their personal lives as well.

This month we begin by hearing from Tom Pennebaker, N4RS, USA-CA #1031, September 24, 2001.

The Quest

It's hard to believe the quest is actually finished, done! It all started in late 1976, early 1977. As a Novice I thought I could, with perseverance and diligence, get USA-CA by making CW QSOs. I had no idea about a county net where mobiles congregate, so I concentrated on working as many QSOs as I could, participating in all the state QSO parties and the Novice Roundup (which I still miss terribly). Over the years I have accumulated three shoe boxes full of cards for USA-CA. I was surprised that approximately half are QSL cards the others are MRCs.

Some where along the way I heard about a county mobile net. I found the CW frequency on 20 meters and kept hearing KK7X, so I dropped Dennis an e-mail and he was gracious enough to tell me the details. Soon thereafter I joined MARAC and was on the net as time permitted. Now that I have time to reflect, I really don't believe one could achieve USA-CA in one's lifetime by making just standard QSOs.

My beginnings were humble at best, but they were very enjoyable days I shall always cherish. I got on the air with a BC348 receiver and a Heathkit HX10 and used a ceramic knife switch for a TR switch. It didn't take long to get tired of the knife switch, so I built an electronic TR switch. Wow—full QSK!! I was in heaven! That served me well through several upgrades, until I scraped together enough for a used Omni D. I've used Ten-Tec equipment ever since, and obviously retired the electronic TR switch. One thing about the BC348: You could put it in the middle of the 40 meter Novice band and work anyone; it was as broad as a barn door. That's where I learned to do the filtering between my ears.

I took the information KK7X gave me and found the place to be, and that's when I really got serious about county hunting. This has been a 30-plus-year endeavor for me, and I have some other goals I'll be shooting for. One is worked all counties five bands, all CW. Somewhere someone said it couldn't be done . . . They shouldn't have said that! I'm just crazy enough to think I can do it.

My present passion is running counties and helping others, and building the best mobile CW system on the road. I bought a newer vehicle and have rigorously done all the dos and don'ts. I went to another antenna system and have made some rather remarkable improvements. I was running a Hustler system and was doing quite well with it. Then I went to the MARAC convention this year and saw what the pros were running.

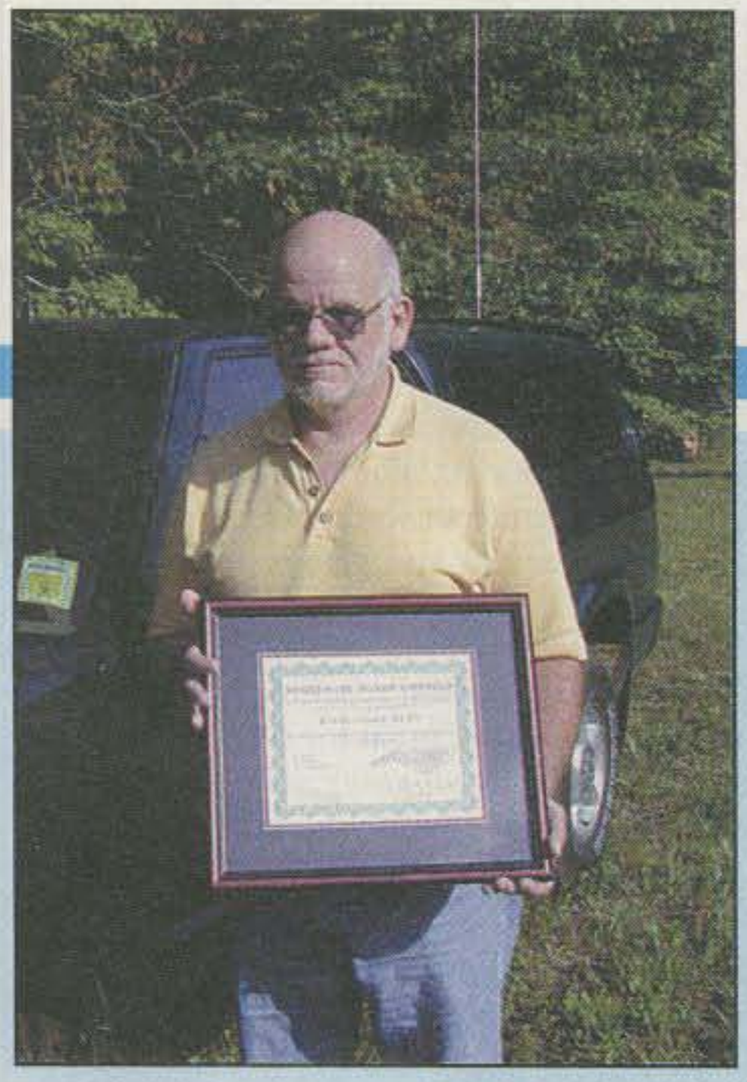
65 Glebe Road, Spofford, NH 03462-4411
e-mail: <k1bv@cq-amateur-radio.com>

USA-CA Special Honor Roll
Robert E. Matthew, WØNAC
USA-CA All Counties #1032
October 9, 2001

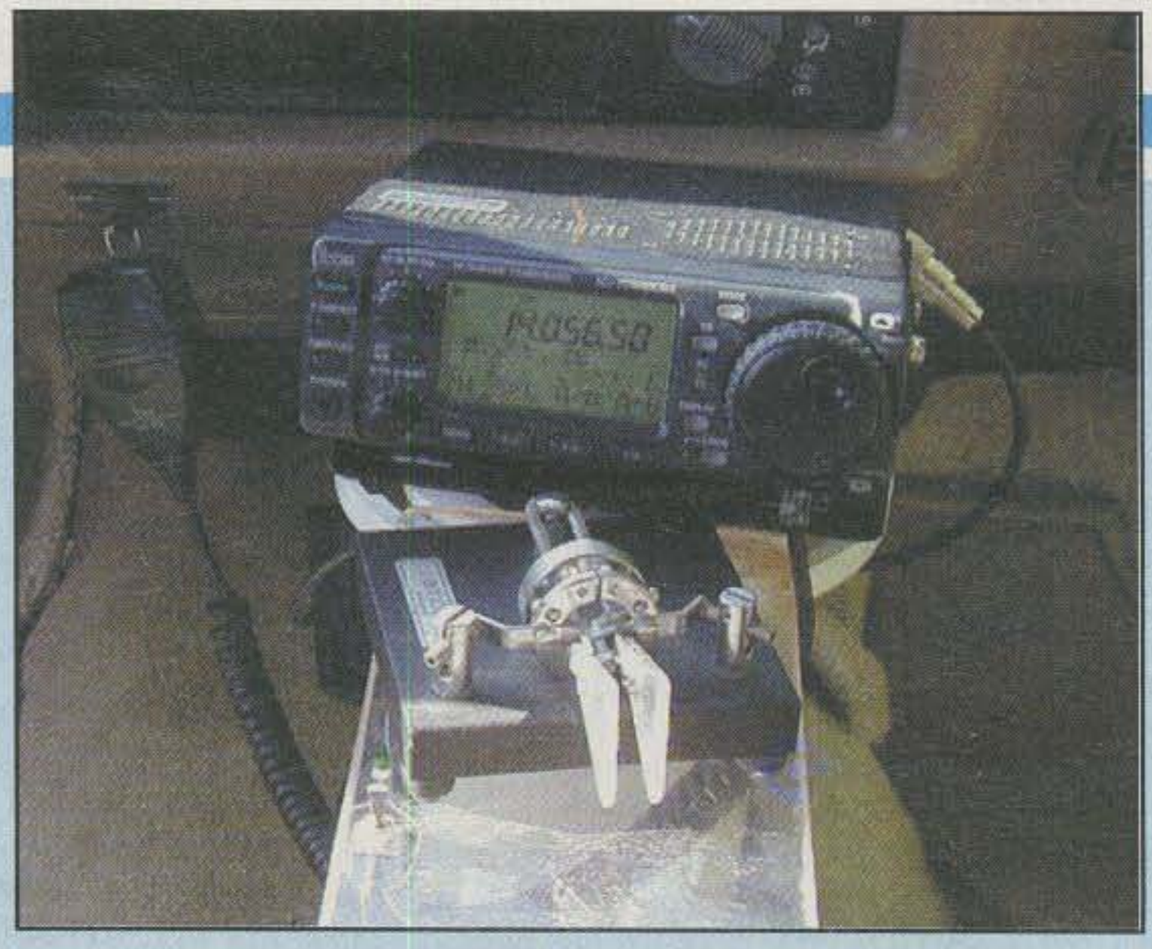
USA-CA Honor Roll

500	2000
WØNAC.....3174	WØNAC.....1222
1000	**2500**
WØNAC.....1585	WØNAC.....1144
1500	**3000**
WØNAC.....1322	WØNAC.....1052

The total number of counties for credit for the United States of America Counties Award is 3076. The basic award fee for subscribers is $6.00. For nonsubscribers it is $12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 65 Glebe Road, Spofford, NH 03462-4411 USA. DX stations must include extra postage for airmail reply.



Tom Pennebaker, N4RS, USA-CA #1031, is shown here holding his Worked All North Carolina Counties award certificate, #1 CW.



The CW mobile setup of Tom, N4RS.

That's when I came home and started building a better mouse trap. My test station is about 6–7 miles away. I improved my signal on 20 meters by three S-units, on 40 by a little over two S-units, and it is showing in my mobile logs. It's difficult to sit at the house on weekends. For anyone who hasn't run counties, give yourself an adrenaline rush and try it. It will set a fire under you that can't be put out!

How in the world do I thank everyone?! I could fill a book with calls and names. There are a few I wish to mention, those who have gone beyond the average county runner: Dennis, KK7X; Andy (SK), W3XE; Jeff, W9MSE; Jim, N9JF; Jack, WA9QN; Esther, KA4IFF; Joyce, KD8HB; Harry, NFØX; Ed, KN4Y; Rick, AI5P; Al, KG5J; Elwood, KA3MMM; Norm, W3DYA; Red, N5QLZ; Gene, W1TEE; Bob, N4CD; Pete, K4QFK; and Jim, KB4XK. There are many, many more, too. These folks go back a few years and my shoe boxes are full of cards with these calls. One I can't leave out is my CW mentor, Ed Sanders, WA6VJP (SK). What a joy it was to copy his flawless fist. It was an honor to be involved within his net control.

I have to thank Brian, KG4CRJ, who ran the last county for me. Brian is an elmer's dream. I helped Brian from the start, finally got him infected with the county hunting bug, and now it looks as if I've set another fire under him—county running! He is one of those students for whom you need to drive a stake in the ground and tell him to stop when he gets to the stake; otherwise he just keeps going. It's been a real pleasure to elmer Brian. I also must thank a long-time friend, Harold, WA4QBG, who acted as co-pilot/driver for KG4CRJ on the run to Charles City County, VA.

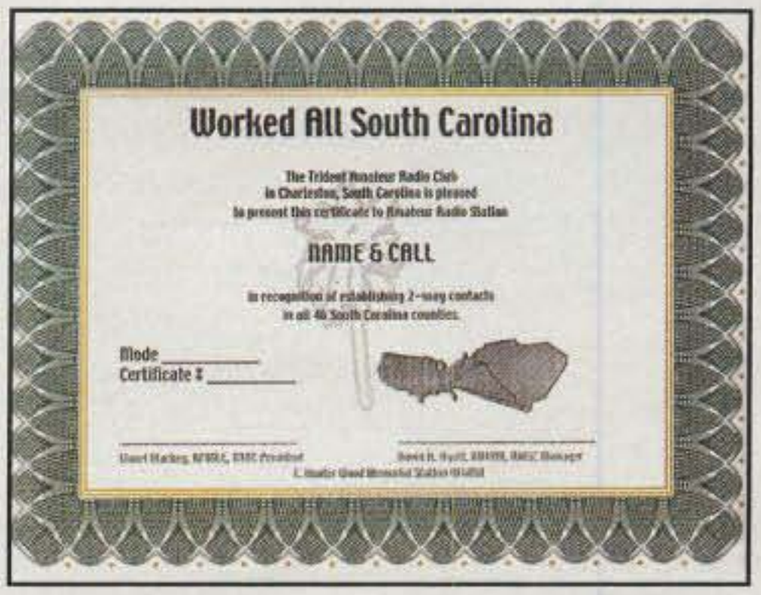
To all those who sent me those dits and dahs and a new one, a very heartfelt thank you! Am I going for second time? You betcha! All CW? As long as I can find two wires to smack together. —*Tom, N4RS*

Defining GCR

Whenever you see the letters "GCR" shown in awards rules, this is shorthand for General Certification Rule, which means that the sponsor will accept the signatures of two witnesses who certify that they have personally viewed the cards you are submitting for an award. Most sponsors don't want to see, handle, and ship back to you the actual cards and will accept a GCR list. Notable exceptions include the ARRL's DXCC award and *CQ*'s WAZ and WPX awards, which require cards to be checked by the organization itself, the award managers, or trained volunteers.

Awards Available

Worked All South Carolina Counties Award. This one is for county hunters. South Carolina is a combination of easy-to-get "interstate" counties as well as a good bunch of those rare ones way off the interstate. KU4YM and the Trident Amateur Radio Club recently made this award available.



The Worked All South Carolina Counties award is issued for having worked all 46 counties in that state all on the same mode.

The award is available to all amateurs who provide proof of two-way contact with all 46 counties in South Carolina. All bands and modes may be used, but all QSOs must be made on the same mode, possibly making the award more difficult than it appears at first. No use of repeaters or cross mode. A GCR list is acceptable, and the sponsor requires the use of a special application which is available for an SASE. All other requirements are waived for USA-CA holders, who just have to state their USA-CA number and award date. The WASC manager reserves the right to spot check any cards for validity by contacting any of the stations that are claimed QSOs. Fee for the award is $US5. Apply to: Dave Hyatt, KU4YM, 116 Old Course Road, Summerville, SC 29485-6208 (<ku4ym@arrl.net>).

The Netherlands Helderland Award.

Netherlands Helderland Award. The 12 provinces of the Netherlands are further broken up into 50 "Regio." Regio 23 is one of the 8 located in the province of North Holland.

Earn 10 points by contacting Regio 23 stations after 1 January 1983. Each station = 1 point; special station PI4ADH = 2 points. SWL okay. Send GCR list and fee of FL5 or $US3 to VRZA Helderland, Postbus 393, 1780 AJ DenHelder, Netherlands.

The NAFRAS YL Award features an Alouette III search and rescue helicopter and is issued for contacting YL members/ sponsors and club station PI4NAF.

This basic Netherlands Air Force Amateur Radio Society Award features an F-16 Fighting Falcon and is issued for contacting NAFRAS members and sponsors.

NAFRAS Award Series. The Netherlands Air Force Amateur Radio Society sponsors a series of awards, and two of them are featured here this month. The basic NAFRAS Award shows a full-color image of an F-16 Fighting Falcon heading skyward at an extreme angle over the peaceful Dutch countryside. The YL Award features the Alouette III search and rescue helicopter flying over breaking waves in the North Sea.

General Requirements: Contacts must have been made after 1 June 1987. SWL okay. All modes and bands, except no use of repeater or satellite. NAFRAS members have numbers, and their QSLs will show that number. There are also sponsor members, and their QSLs will show that number with a "D" (i.e., D44). Apply with GCR list and a fee of 5 Euro, FL10, 10 IRCs, or $US5 for each award to: L. Ansems, PA2LAD, P.O. Box 9011, 3301 AA Dordrecht, Netherlands.

Basic NAFRAS Award. Contact members and sponsors as follows:

CW All Bands: PA stations need five contacts, all others need three.

HF All Modes: PA stations need ten contacts, EU stations need seven, and all others five.

Nafras YL Award. Contacts must be made as follows:

VHF/UHF: Contact five YL members/sponsors and club station PI4NAF.

HF: Contact two YLs and PI4NAF. (PI4NAF only when operated by a member.)

Islands of Scotland Award. A look at the map of the coastline of Scotland shows hundreds of islands. GM4UZY has taken advantage of this and created another of the country-specific island awards. He is encouraging operation by providing a separate category for "activators," those folks who actually put the islands on the air. For the rest of us, working even a fraction of the 120 available islands will be a challenge in itself.

The islands of Scotland have been divided into ten distinct island groups, and for the award there are a total of 120 different islands. Contact islands since 1 November 1947 in four award levels. All bands may be used, 1.8 to 144 MHz. SWL okay.

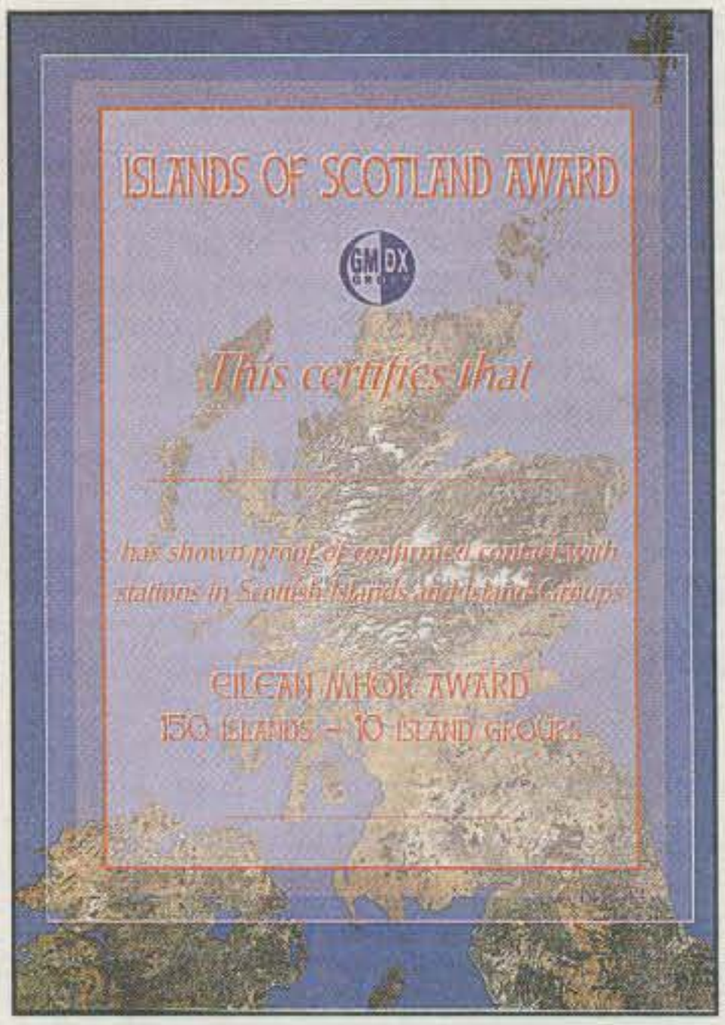
There are two classes of the award, one for island chasers and one for island activators. Requirements are as follows.

Basic: Chasers contact10 islands in 6 groups; activators contact 5 islands in 3 groups.

Silver: Chasers contact 25 islands in 7 groups; activators 12 islands in 4 groups.

Gold: Chasers contact 50 islands in 8 groups; activators 25 islands in 5 groups.

Supreme: Chasers contact 75 islands



The Islands of Scotland Award is available in four levels.

in 10 groups; activators 40 islands in 7 groups.

Chasers must submit proof of contact (i.e., QSL card). Activators must show log evidence that they have made a minimum of 100 contacts from each island claimed. Those interested in the award should send for the Scottish Islands Director, which gives full details of the award and lists all valid islands and groups. It is available from GMØLVI, La Vista, High Street, Errol, Perthshire, Scotland, UK PH2 7QQ. Cost is $US10, 16 IRCs, or £6 and the fee also covers the cost of the Basic certificate. (The island list may also be found at <dxawards.com>.) Fee for the other levels of the award is $US8, 12 IRCs, or £5. Apply to: Charlie Wilson, GM4UZY, Golden Acre, 1 Borrowfield Crescent, Montrose, Scotland, UK DD10 9BR.

Internet Site of the Month

The Radio Club of Costa Rica sponsors a series of awards based on working varying numbers of the callsign prefixes of this Central American country. Some of the call areas are fairly hard to get due to low population. The URL is: <http://www.qsl.net/ti0rc/diploma.htm>. I checked my card collection and was surprised to find I've worked all of the regular prefixes plus some very interesting anniversary or special calls, as well as some of the "TE" prefixes also in use in Costa Rica.

I'm still looking for your club's award rules and sample certificate for publication in a future column.

73, Ted, K1BV

DX

BY CARL SMITH, N4AA

News Of Communication Around The World

North Korea – P5 and a Report from Kabul

The last week of October I had an appointment with an eye clinic to check on intermittent, blurry vision in my right eye. Upon examination, it was discovered that I had a torn retina that required immediate attention. The very next day I was sitting in the chair of a retinal surgeon who proceeded to use laser surgery to work on the torn retina. He had to use another procedure to complete closing up the "hole," as the laser could not "see" all of the area that needed attention. Upon completion of all this, I was informed that I should go home and "do not read, do not use a computer, do not lift anything over a few pounds, and be careful about bending, etc." Oh, I could watch all the television I wanted—for the next two weeks! Needless to say, everything came to a screeching halt in my home office. I wonder if any of you have tried to do nothing but watch TV for two weeks? I got sick of TV news and almost everything else available on my local cable service. Thank goodness the doctor gave me a "green light" on November 8 to return to normal activity.

I really had not given much thought to my eyes, although I've worn glasses for over 20 years. Not too different from most folks, I just took for granted my vision would be there, and I didn't worry about it. If you have experienced any eye/vision problems such as this, you understand. If you have not experienced these problems, don't take your vision for granted. You never realize how much you miss something until you don't have it anymore.

These ex-ZD Ops at the home of Roger Western, G3SXW. (Left to right) Roger, GSXW/ZD9SXW; Bob, G3SEM/ZD9ZM/5B4AGN; and Andy, G4ZVJ/ZD7VJ/ZD8VJ. (Photo courtesy Roger, G3SXW)

North Korea – P5

Could this one be real? Will Ed really get a written license authorizing his operation? On November 12 we were surprised to see a press release from KK5DO about Ed, P5/4L4FN, operating from North Korea. Most of you will have seen the press release, or at least heard about it, by the time you read this so I won't repeat the entire thing here. Suffice it to say that by the time you read this we hope to hear that Ed has actually received the written permission that he has been promised, and we can only also hope that the permission will be backdated to early November. If it is not, then everyone who worked him prior to the effective date will just have to do it all over again. We're told that Ed is with the UN World Food Programme and will be working in North Korea until June or July of 2002. Keep your fingers crossed, as this will be a new one for all but a few hundred who had managed a QSO with previous operations. KK5DO will be handling the QSL chores—once Ed actually gets a license. No cards were to be printed until the license was actually in hand.

Ducie Island – VP6

This all-time new one is scheduled to make a one-week appearance starting

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

The WPX Program

CW

3080.....DS4BGR

Mixed

1887.....DF7ZS

CW: 750 4X0/G3WQU. 800 E4/G3WQU. 1050 K6UXO. 1300 AA1KS.

SSB: 600 VK2FHN

MIXED: 950 DF7ZS. 1100 K6UXO. 1300 WD6CKT

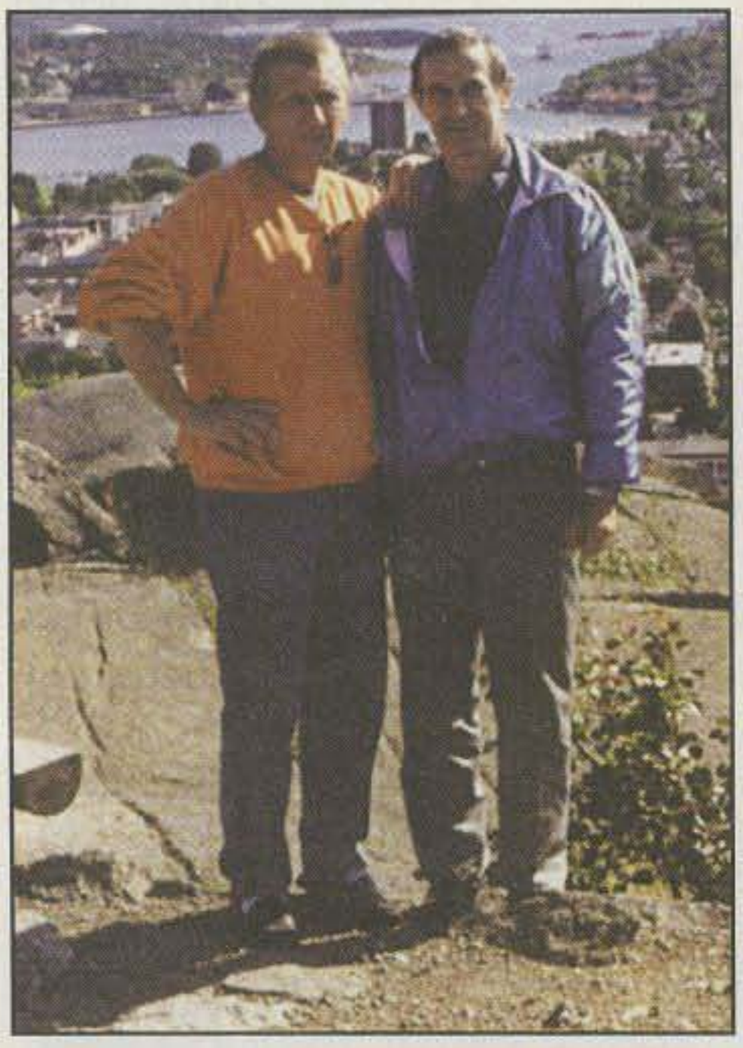
80 meters: AA1KS

Europe: VE3NQK

Award of Excellence Holders: K6JG, N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, I0JX, WA1JMP K0JN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SM0AJU, N5TV, W6OUL, WB8ZRL, WA8YM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, DK4SY, UR2QD, AB0P, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KB0G, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1PO, K9LNJ, YB0TK, K9QFR, 9A2NA, W4UW, NX0I, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MC, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DE0DAQ, I1WXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, W0ULU, K9XR, JA0SU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, KZ1R, CT4UW, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, I7PXV, S57J, EA8BM, DL1EY, K0DEQ, KU0A, DJ1YH, OE6CLD, VR2UW, 9A9R, UA0FZ, DJ3JSW, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RA0FU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, W4GP.

160 Meter Endorsement: K6JG, N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF N4NX, SM0DJZ, DK3AD, W3ARK, LA7JO, SM0AJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DE0DXM, UR1QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N8JV, ONL-4003, W5AWT, KB0G, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YB0TK, K9QFR, W4UW, NX0I, WB4RUA, I1EEW ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, WB0DD, I0RIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JA0SU, I5ZJK, I2EOW, KS4S, KA5CLV, K0IFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, K0DEQ, DJ1YH, OE6CLE, HB9BIN, N1KC, SM5DAC, S51U, RA0FU, UA0FZ, 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.*



Ken, LA5JX (left), and Alex, EY8JJ, with Sandefjord, Norway in the background. Ken uses an IC-746 with a 4-element tribander and a 6-element mono-bander for 10 meters (his favorite band). (Photo courtesy John, KDØJL)

on November 16. This being a new addition to the DXCC list, it will be new for every DXer. Hopefully, you were able to work them on one or more bands during their stay on the island.

Libya – 5A

In mid-November Abubaker, 5A1A, confirmed that some of his students had passed the exam and were now licensed. Also, there is a new callsign for the Assaker Club Station, 5A1ASC, with QSLs to be handled by DK4HB. The other new licensees are Tark Abu Kris, 5A1TA, with QSLs to be handled by EA3GIP, and Haytm Hashim, 5A1HA, whose QSLing will be done by none other than Franz, DJ9ZB.

Abubaker himself will be going to Germany to study for an advanced degree. He will have a German address while there, and hopefully I'll be able to provide that next time.

A word of caution: Abubaker says the new licensees are not fluent in English, so please be patient with them on the air.

Australia to Expand Operating Frequencies on 75 m

The Wireless Institute of Australia apparently has negotiated with the Australian Communications Authority for expansion of the operating frequencies on 75 meters. After considerable dialog between commercial users, the WIA, and the ACA, the ACA has decided to proceed with a change in the allocation of the band 3776–3800 kHz. The ACA's intention is to reallocate this band to the amateur service on a primary basis effective January 1, 2004. Australian amateurs are presently limited to a 4 kHz segment around 3798. Good news for our friends "down under."

Malawi – 7Q7TV and 7Q7RV

These calls belong to Missionaries Trudie and Richard, respectively. They are newly licensed amateurs in Malawi. They have antennas for 40, 30, and 20 meters and have been active on SSB, soon to be active on CW on 30. They also plan to put up antennas and be active on other bands. QSLs are being handled by ZS6DX.

An interesting view of the flower gardens around the home of Bob, AP2JZB, in Karachi, Pakistan. He enjoys gardening almost as much as ham radio. (Photo courtesy John, KDØJL)

The WAZ Program

10 Meter SSB

527 .....UA6LV

15 Meter SSB

559 .....DS5ACV

20 Meter SSB

1084 .....DU3BBY

10 Meter CW

169 .....KØCA

12 Meter CW

26 .....OH2DW

15 Meter CW

292 .....WO3Z
293 .....OH4UB

20 Meter CW

518 .....IK2MRZ
519 .....UA6LV

All Band WAZ SSB

4700 .....WB5SYT
4701 .....DK6CQ
4702 .....SM4VPZ
4703 .....K3SUE
4704 .....WA2CKP
4705 .....KQ4TJ
4706 .....W7DH
4707 .....AA6K
4708 .....IZ1AOK
4709 .....EA1ET
4710 .....EA2BE

Mixed

8080 .....KM6KO
8081 .....BA4RF
8082 .....K4YJ

All CW

275 .....KØGY
276 .....KA5KLU
277 .....JG3NKP
278 .....S55ZZ

RTTY

130 .....K6FG

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>.

YASME History

Jim Cain, K1TN, has been working on a book of the history of The YASME Foundation. He would like to obtain copies of the "YASME News," published from September 1959 through May 1960 and of the "Yasme Newsletter," published from June 1960 through March 1963. He also seeks issues of the "West Coast DX Bulletin" from the 1950s through the mid-1960s (to borrow/copy). If you can help with any of these items, please contact Jim via e-mail: <cainjim@mindspring.com>.

From Peter, ON6TT

During my recovery period I received a story from Peter, ON6TT, about Af-

ghanistan. Peter works for the UN and has been involved in humanitarian relief efforts in many countries around the world. He was in Pakistan, as well as Afghanistan, when all of the military action commenced in October. I hope you will appreciate his story, which was written in late October. It follows a bit of background about Peter. My good wishes for his safety and that of all of his co-workers, and my thanks to all of them for the work they do for the people of the world. —*N4AA*

Since becoming licensed in 1989, I have been active from close to 70 countries around the world. My most well-known endeavours are the 3YØPI, VKØIR, AH1A, and FOØCI DXpeditions. I was the co-DXpedition leader of VKØIR. I am also an active contester.

Originally a printing engineer, I worked in IT management until 1993, when I gave up my job

5 Band WAZ

As of November 15, 2001, 574 stations have attained the 200 zone level and 1227 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:
None

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

N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
WØPGI, 199 (26)
W2YY, 199 (26)
VE7AHA, 199 (34)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
ABØP, 199 (23)
KL7Y, 199 (34)
NN7X, 199 (34)
IK1AOD, 199 (1)
DF3CB, 199 (1)
F6CPO, 199 (1)
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)
K2UU, 199 (26)
W1FZ, 199 (26)
UT4UZ, 199 (6)
SM7BIP, 199 (31)
K4ZW, 199 (23)
W9RPM, 199 (19)
PY5EG, 199 (23)
SP5DVP, 199 (31 on 40)
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)
VE3XO, 198 (23,23 on 40)
K4CN, 198 (23,26)
KF2O, 198 (24,26)
W6BCQ, 198 (37,34on40)
G3KMQ, 198 (1, 27)
W5BOS, 198 (18,23)
N2QT, 198 (23,24)
OK1DWC, 198 (6,31)
K7FL, 198 (23,37)
W4UM, 198 (18,23)
UU2JQ, 198 (30on40&20)

The following have qualified for the basic 5 Band WAZ Award:
None

Endorsements: None

****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>.

to go on the Peter I expedition (3YØPI) and do what I really wanted in life—radio, travel, and work with and for people. I think I found the ideal combination.

I have been working in the humanitarian relief telecoms since 1994 and have traveled to close to 100 countries since then, mostly for work. I have worked for one of the frontline UN humanitarian relief agencies, the UN World Food Programme, since 1995. I have two main functions in the organization. First, I head the regional technical support team (supporting telecoms, IT, and emergency electricity) for Central Asia (covering Pakistan, Afghanistan, Iran, Turkmenistan, Uzbekistan, Kyrgystan, Tajikistan), which is also responsible for key telecoms aspects for all UN agencies. My second hat (what I spend most of my time on) is as the head of the UN WFP fast intervention team for technical support (called FITTEST—Fast IT and Telecoms Emergency and Support team), which supports all WFP operations worldwide. Any natural disaster, armed conflict, or other incidents where there is a sudden and acute food need, we provide the installation, training, and support for the telecoms, IT, and emergency power systems.

Normally, I take about 15 to 20 international plane flights per month, traveling to places off the beaten track. Last year alone I was in about 30 countries, from Uganda to Kosovo, East Timor, Bhutan, India, Sri Lanka, Myanmar, Cambodia, Afghanistan, Pakistan, Turkey, Georgia, Armenia, Tajikistan, etc. This is interesting work! At work I have three small crates in the stock room, which I call "home." They hold my clothes—one crate for tropical gear, one for artic weather, and one for "Belgian weather." One day we find ourselves at 4000 meters high in 3 feet of snow installing a generator up a mountain in Bhutan, and a few days later we can be working at +50 degrees installing a microwave system in a desert town in the north of Chad, or on a speed boat ferrying between the islands off the coast of Myanmar trying to find a suitable site for a repeater.

Also working with our intervention team are Mats, SM7PKK/5X1Z, and Robert, S53R/AP2ARS, and we have had many hams pass through our team in the past.

Normally I work in shifts of two months on duty and one month at home with my wife Tine, ON9CTT, and my two daughters Lana (7) and Hannah (4). The funny thing is, when I come home for leave, what does my wife want? "Honey, I have been home for two months now, so now I want to travel, too, so let's go." This means I have spent exactly four weeks

One busy lady, Lia, 4L1TL, works on documentary movies and is active in a small TV company. She does enjoy working the states on 15 meters. (Photo courtesy John, KDØJL)

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 333 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement sticker s is $1.00 each plus SASE. Please make checks payable to the awards manager, Billy F. Williams. All updates should be mailed to P.O. Box 9673, Jacksonville, FL 32208.

CW

K2TQC 333	W2FXA 333	W8XD 332	I4LCK 330	N4CH 327	I5XIM 325	KE5PO 322	CT1YH 313	KH6CF 301
K2FL 333	EA2IA 333	WA4IUM 331	VE7CNE 330	I1JQJ 327	K5UO 325	K6CU 321	K9OW 313	K9HQW 299
K6JG 333	F3AT 333	K6LEB 331	IT9QDS 329	YU1TR 327	N5HB 325	HA5DA 321	N7WO 312	F6HMJ 296
K9BWQ 333	DJ2PJ 333	N5FG 331	N4AH 329	I4EAT 327	YU1AB 325	VE7DX 320	K9DDO 312	WG7A 295
K2ENT 333	K2JLA 333	PT2TF 331	KZ4V 329	NC9T 326	IK2ILH 325	HA5NK 319	W3II 312	KD8IW 288
N7FU 333	W7CNL 333	WØJLC 331	K9IW 329	I2EOW 326	W4UW 325	W7IIT 318	N4OT 311	W9IL 282
K3UA 333	YU1HA 333	N4JF 331	K7LAY 329	NØFW 326	N5FW 325	K1FK 318	KF8UN 308	EA3BHK 282
K9MM 333	PA5PQ 333	VE3XN 331	WB4UBD 328	IT9TQH 326	K8LJG 324	SM5HV/HK7 317	PY4WS 308	YC2OK 282
K2OWE 333	N7RO 332	W1WAI 331	DL8CM 327	K7JS 326	DL3DXX 324	G3KMQ 317	IKØADY 307	XE1MD 278
N4MM 333	WØHZ 332	K2JF 331	SM6CST 327	9A2AA 325	LA7JO 324	K8JJC 315	W6YQ 305	EA2CIN 278
W4OEL 333	K6GJ 332	4N7ZZ 330	N4KG 327	OK1MP 325	W6SR 323	WG5G/QRPp 315	YT1AT 304	I3ZSX 276
W7OM 333	K4IQJ 332	W6DN 330	K8PV 327	W4LI 325	9A2AJ 323	OZ5UR 315	LU3DSI 302	G3DPX 275
F3TH 333	K4CN 332	W2UE 330	W4QB 327	K3JGJ 325	K4JLD 323	HB9DDZ 314	F5OIU 302	
WB5MTV 333	G4BWP 332	KA7T 330	K1HDO 327	WA8DXA 325	KUØS 322	N1HN 313	YU7FW 301	

SSB

K4MZU 333	IK8CNT 333	W2FXA 332	YZ7AA 331	4Z4DX 329	N5ORT 327	NI5D 322	CP2DL 314	K7ZM 292
K2TQC 333	VK4LC 333	W8ZET 332	YV1JV 331	VE7DX 329	N4KG 326	PY2DBU 322	K9YY 313	OA4EI 292
K2FL 333	N5FG 333	WØYDB 332	WA4WTG 331	KZ4V 328	W4QB 326	K6CF 322	YT1AT 313	KØOZ 291
W6EUF 333	DJ9ZB 333	OE2EGL 332	N4JF 331	W2FKF 328	K8PV 326	N3RX 321	NØMI 313	KE4SCY 291
K2JLA 333	EA2IA 333	K4JLD 332	EA1JG 331	KD8IW 328	DL6KG 326	EA8TE 321	KD5ZD 312	I3ZSX 290
K6JG 333	XE1L 333	KSØZ 332	K1UO 331	KE4VU 328	W4LI 326	XE1CI 321	WZ3E 311	KK4TR 290
K6GJ 333	W6BCQ 333	N5ZM 332	YV5IVB 331	K1HDO 328	K6BZ 326	W6MFC 321	VE3CKP 311	YV5NWG 287
K2ENT 333	XE1AE 333	WB4UBD 332	K8CSG 330	K5UO 328	W4WX 326	KØFP 320	CT1YH 311	N5WYR 286
K6YRA 333	4N7ZZ 333	WB3DNA 332	ZL3NS 330	KF8UN 328	W6SR 326	N4CSF 320	HA6NF 310	RW9SG 286
K4MQG 333	KE5PO 333	CT1EEB 332	W5RUK 330	EA3EQT 328	IØSGF 326	N4HK 320	LU3HBO 310	VE7HAM 285
K7LAY 333	PY4OY 333	K4CN 332	EA3KB 330	KB2MY 328	YV5AIP 325	DL3DXX 320	SV3AQR 310	F5RRS 284
IK1GPG 333	VE1YX 333	K9PP 332	LA7JO 330	AE5DX 328	K9IW 325	WA4ZZ 320	EA3BHK 307	CT1CFH 284
K5OVC 333	XE1VIC 333	W6SHY 332	W9SS 330	W2JZK 328	WA4JTI 325	WØULU 320	N1ALR 306	WØIKD 283
NØFW 333	IN3DEI 333	I8KCI 332	W7FP 330	IT9TQH 327	NI5D 325	EA1JG 320	XE1MDX 305	EA3CYM 283
OZ5EV 333	I4LCK 333	VE4ACY 332	WDØBNC 330	IT9TGO 327	KC4MJ 325	EA7TV 320	EA5OL 305	WN6J 281
K9MM 333	VE3XN 333	LU4DXU 332	K3UA 330	WD8MGQ 327	IKØIOL 325	SV1RK 320	WB2AQC 305	F5JSK 281
ZL3NS 333	OE7SEL 333	VE3MRS 332	WA4IUM 330	I1EEW 327	K1EY 325	K3LC 320	N1KC 305	YU1TR 280
N4MM 333	W2JZK 333	KX5V 331	W2CC 330	SV1ADG 327	K3JGJ 324	N6RJY 319	KC4FW 304	KK5UY 280
OZ3SK 333	EA4DO 333	VE7WJ 331	VE2GHZ 330	DL8CM 327	K7HG 324	WA4DAN 319	YC2OK 303	KA5OER 280
N4CH 333	VE3MR 333	I8LEL 331	VE4ROY 330	W2FGY 327	AC7DX 324	CE1YI 318	WB2NQT 303	EA3CWT 278
IØZV 333	K5TVC 333	K9OW 331	YV1CLM 330	I1JQJ 327	KØHQW 324	YV4VN 317	VK3IR 303	VE2DRN 277
YU1AB 333	PA5PQ 333	PT2TF 331	W6DN 330	F9RM 327	ZL1BOQ 324	EA5GMB 317	W5GZI 302	XE2NLD 277
W7OM 333	W4UW 332	VE2WY 331	CT1EEN 329	XE1MD 327	EA3BKI 323	W5OXA 317	N5QDE 302	9A9R 277
KZ2P 333	K9BWQ 332	W8KS 331	WS9V 329	I4EAT 327	K4JDJ 323	CT1AHU 316	KD4YT 302	W6UPI 276
K7JS 333	KØKG 332	W8AXI 331	I2EOW 329	W3GG 327	W9IL 323	N5HSF 316	SV3AQR 302	VE2AJT 275
DU9RG 333	W4NKI 332	W3AZD 331	K2JF 329	AA6BB 327	WW1N 322	K6RO 316	YT7TY 300	Z31JA 275
W4UNP 333	VE2PJ 332	OE3WWB 331	ZL1AGO 329	SM6CST 327	F6BFI 322	K7TCL 315	SV2CWY 300	G4URW 275
N7BK 333	YV1KZ 332	DL9OH 331	N5FG 329	W9OKL 327	LU7HJM 322	WR5Y 315	K6GFJ 299	
N7RO 333	YV1AJ 332	N2VW 331	DU1KT 329	CX4HS 327	K5NP 322	LU5DV 315	4X6DK 297	

RTTY

K2ENT 331	W2JGR 316	G4BWP 307	KE5PO 297	I2EOW 291	EA5FKI 284	W4QB 280	YC2OK 280	PAØXPQ 272
WB4UBD 325	K3UA 315	NI4H 305	W4EEU 291	I1JQJ 289				

The first week of September 2001 Peter, ON6TT, flew out of Kabul on this UN aircraft to Pakistan, where he and Robert, S53R, were active from AP2ARS. (Photo courtesy Peter, ON6TT)

in total in Belgium since the beginning of this year!

—73, Peter, ON6TT/AP2ARS

Tales of the Horizon—Kabul

By Peter Casier, ON6TT/AP2ARS

Kabul: It is afternoon. The late summer sun descends low over the horizon, giving the yellow scenery a golden glow with long, exotic shadows. During this time of the year the temperature is nice. In between the battering dry heat of summer and the biting cold of the long winters are those short periods which tourist brochures would describe as a "moderate Mediterranean climate."

We are sitting on the stairs of Kabul International Airport facing the tarmac looking over the airstrip. There are a bunch of us, all relief workers and reporters. We are waiting for the UN plane to pick us up, and the plane pretty much has its own time schedule defined by the "Chaos Theory" dominated by Taliban air clearances, weather patterns, and the number of people getting stuck at immigration each time the plane lands.

The airport is heavily damaged, probably having happened over 20 or 30 years. There are traces of shrapnel and grenade explosions, bullet holes in windows and walls. Most of the cardboard ceiling tiles are gone, and one can see the building skeleton through the aluminum frames of the false ceiling. Cables run left and right in metallic gutters, now rendered useless, as it has been many years since Kabul International Airport had its last spark of electricity. Pieces of old artillery and tipped-over radar equipment lie outside. There are Antonov and Ilhutsin cargo planes in disrepair, hangers with caved-in roofs, which crushed fuel and supply trucks underneath their vast weight, MI-8 Russian helicopter gunships with big, dark, ragged holes in their sides. On top of a pickup truck a man leisurely rests his arm over a heavy machine gun bolted onto the roof.

That is probably why everything is so quiet. It calls for respectful silence. Or are sounds just absorbed in the vast empty space which is now what's left of the airport? It seems people do speak more softly, move more discretely through the different parts of the airport which are now nothing more than "remains." What would have been the last regular flight which left Kabul International Airport? Flight 1203 at 10:15 to Tblisi sometime in the dark past, it says in Cyrillic on check-in counter 5.

Some Taliban officials sit outside the door of Gate 2, through which we came. One of them I recognize. He has a turban with Scottish tartan squares, and a sleeveless vest over his long traditional coat and pants. He has the most amazing friendly blue eyes and speaks German. He is a hydraulic engineer and studied in East Germany many years ago. He traveled around a fair bit of the world, and right now he is a Taliban, watching over the immigration procedures at Kabul International Airport. He shouts a few words at the two Taliban guards, who are lying on their sides on an iron bed frame on the side of the stairs. Their AK47's loosely lean against their shoulders. The guns are worn out, no more varnish on the wood pieces, but like an old car, they are probably reliable pieces of machinery.

Three Boeing 727's from Ariana, the official Afghan national airline, have their cockpit windows covered with a large cotton sheet, and their engines are closed off with shutters. These are the last remains of the Afghanistan national fleet. They still fly within the country, but maintenance and getting parts have become difficult. The sanctions do not allow the import of plane parts, nor do they allow international commercial flights. A few times per year one international Ariana flight is allowed

CQ DX Awards Program

SSB

2357.....DU3BBY

SSB Endorsements

320.....VE3MR/333
320.....PA5PQ/333
320.....VE3MRS/332
320.....WA4ZZ/320
310.....W5OXA/317
275.....KK4TR/290
250.....JR4NUN/261

CW Endorsements

320.....PA5PQ/333
320.....W8XD/332

The basic award fee for subscribers to *CQ* is $6. For non-subscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 333 active countries. Please make all checks payable to the award manager.

Looking Ahead in CQ

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

• "A New Look at 'Top-Band' Propagation," by VK6BZ, VK6HD, and NM7M

• "Build a Station Controller," by AF1US

• "SSB Results: 2001 CQ WW WPX Contest"

Plus:

• "Transforming a Transformer," by VE3ERP

• "Add Scanning to Converted CBs," by WB9YBM

• "An Aviator's Solution," by KF2LF

to transport children for treatment in Frankfurt, if I remember well.

This is a magical moment. Italian opera music plays in my head. The movie camera in my mind slowly zooms out to show the emptiness of the apron, the voidness of the airport, the acknowledgement of existence and persistence in this war-torn country. As the camera continues to zoom out, a Taliban with his Khalashnikov over his shoulder, on an old Chinese bicycle rides into the left of the picture. He has a bundle of hay on the back of his bicycle as he slowly cycles off the runway and at his own pace moves out of the picture, past the taxiing UN plane which has come to pick us up. The plane shuts off the engine, and before we know it, it has become integrated into the late-summer scenery of an afternoon in Kabul. The operatic voice fades out, and so does the picture.

Exactly one week later, at almost exactly the same time of day in Kabul, the first plane crashed into the World Trade Center.—*ON6TT*

Correction

In the photo caption on page 87 of the September issue Stepic, 9A4A, was incorrectly identified as having held the callsigns 9A2AA and 9A6AA. In fact, his callsigns were 4N2AA and 9A4AA. Sorry for the error, and thanks to Emir, 9A6AA, for calling this to my attention.

In Closing . . .

The big CQ WW DX Contests are over for another year, but the ARRL DX contests are coming up soon. Activity as well as propagation was great for the CQ WW contests, and I hope it holds over for the ARRL activities.

Since I am running late this month, due to my eye problems, I'll try to bring you more information next month, perhaps even some good news about operation from Afghanistan, now that things have started to turn around over there. The UN has some good people in the vicinity and perhaps they will be able to gain permission to operate from this rare one. Peter, ON6TT,and Robert, S53R, have been very active from AP2ARS during the conflict, and Pakistan is right next door to YA. Keep your fingers crossed for activity from there soon. Until next month . . .

GL, Good DX, and 73—Carl, N4AA

QSL Information

3B6RF via HB9AGH
3D2NV via JA1NVF
3W2LC via VK6LC
4O1W via YZ1AU
4W/N5KO via KU9C
4W/W3UR via KU9C
4X21C via PA3AJW
4X22C via PA3AJW
4X23C via PA3AJW
4X24C via PA3AJW
4X2C via PA3AJW
5B4/T97Y via W2FB
5R8GY via PA3GIO
5T5U via JA1UT
5U7JK via I2YSB
5V7TD via IV3TDM
5X1D via SM5BFJ
7X3WDK via EA5KB
8J1SAI via JA1CG
8P9BK via DL1DA
8Q7QY via JA1JQY
8S5T via DF6JC
9GØARS via UA3AGW
9G1OH via EA5KB
9M6BG via VR2BG
9M6ONT via ON4ON
9N7WU via JA8MWU
9Q5BO via HB9AMO
9Q5TE via SM5BFJ
9U5D via SM5BFJ
9X/SM5DIC via SM5BFJ
A71BY via F5PYI
AX3ITU via VK3ER
BA1RB via EA7FTR
C91MR/3 via G3MRC
CE3HKF via EA7FTR
CM6YD via EA5KB
CO8OT via EA5KB
CR7DKG via W7LPF
CT1DKG via W7LPF
CVØZ via EA5KB
CV1Z via EA5KB
CX1CCC via EA5KB
CX2SA via EA5KB
CX3VB via EA5KB
D5ØDX via DL1YAW
DL2GG/YV5 via DL3AMA
DSØZR via DS5UCP
E29DX via HSØGBI
EA8ASJ via EA8ASJ
EI/W2YL via W3BW
EI/W3BW via W3BW
EK17ØØJJ via W6QKB
EN1MKN via UX7MA
EO56JM via KG6AR
EP3SP via W3HC
ET3VSC via K3IRV
F5KEF via F5ODF
FG/KC8QKF via RN3OA
FH/JJ1LIB via JN1HOW
FOØEEN via LA2KD
FOØMCA via JA3MCA
FOØRTY via JJ8DEN
FOØSCH via W6UFT
FP/K4JZ via K4JZ
H4ØAA via KU9C
HC3RJ via EA7FTR
HP1AC via EA5KB
HR1BY via EA7FTR
HR1RGA via EA7FTR
HR1RQF via EA7FTR
HR4/TI5KD via TI5KD
HV5PUK via IWØDJB
J28VS via F4DBF
J49DX via HA4DX
J49HW via HAØHW
J49NG via HA5NG
J8PA via PA5ET
JT1Y via IØSNY
JWØPK via SP5DRH
JX7DFA via LA2KD
JY4NE via K3IRV
JY9NX via JH7FQK
K6KO/HC8 via WM6A
K6TA/HC8 via WM6A
KH2/JM1YGG via JA1RTG
KP2/VE5RA via VA5DX
LP1F via LU5FC
M2H via GØREP
OD5/JY4NE via K3IRV
OD5UT via K3IRV
OHØZ via OH1EH
OJØU via JP1NWZ
OTØA via ON7LR
OZ3UD via DL8UD
P41T via VE3HO
PJ2Y via G3SWH
PVØF via KU9C
PY5EG via W3HC
S92TX via W7KNT
SN45KDU via SP9KDU
SO1VOX via DL7VOX
TAØ/IT9WDY via IT9YRE
TAØ/IT9YRE via IT9YRE
TI5X via NØKE
TL8DV via W3MC
TMØS via F5ODF
TM6TGV via F5ODF
TM9O via F5ODF
TT8JE via F6FNU
TZ6BAX via EA5KB
UA1PBP/9 via RK1PWA
UX5VL via EA5KB
V26AU via DL6LAU
V26OC via N3OC
V31GC via AKØA
VK6GIO via PA3GIO
VK9CXF via G3TXF
VK9CXJ via G3MXJ
VK9CXW via G3SXW
VP2MR via W5PB
VP8DBL via G3WOS
XX9TKW via OH2KW
YBØZZ via YBØFMT
YC3MM/5 via IZ8CCW
YO/F6AJA via F6AJA
YV5/DL2GG via DL3AMA
YV6AZC via EA5KB
Z36W via NN6C
ZB2FX via G3RFX
ZC6A via K3IRV
ZD8R via N6ND
ZD8Z via VE3HO
ZF2RS via KD5LYB
ZF2SG via KD5LYA
ZL7H via ZL1AA
ZP6EM via EA7FTR
ZP6GG via ZP6CU
ZV5A via W3HC
ZW5B via W3HC
ZX2B via PY2MNL

(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," P.O. Box 3071, Paris, TN 38242; phone 901-641-0109; e-mail: <golist@wk.net>.)

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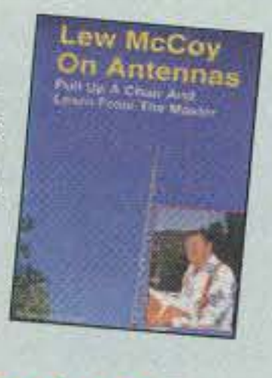

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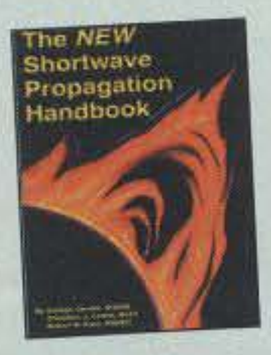

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Announcing:

The 2002 CQ/RJ World-Wide RTTY WPX Contest

Sponsored by *CQ* magazine and *The New RTTY Journal*

February 9–10, 2002

Starts: 0000 GMT Saturday Ends: 2400 GMT Sunday

I. Period of Operation: Single Operator stations may operate only 30 hours of the 48-hour contest period. Off time periods must be a minimum of 60 minutes in length. Paper logs must clearly indicate off times on the Summary Sheet *(see Rule XIII.4. for submitting paper logs)*. Multi-Operator stations may operate the entire 48-hour contest period.

II. Objective: The object of the contest is for amateurs around the world to use RTTY (Baudot only) to contact as many amateurs in other parts of the world as possible during the contest period.

III. Bands: The 3.5, 7, 14, 21, and 28 MHz bands may be used. No 1.8 MHz or WARC band contacts are permitted.

IV. Terms of Competition (for all categories): All entrants must operate within the limits of their chosen category when performing any activity that could impact their submitted score. Transmitters and receivers must be located within a 500 meter diameter circle or within the property limits of the station licensee, whichever is greater. All antennas must be physically connected by wires to the transmitters and receivers used by the entrant. All high power categories must not exceed 1500 watts total output power on any band. Only the entrant's callsign may be used to aid the entrant's score.

Any form of DX alerting assistance is permitted in ALL categories.

V. Categories:

1. Single Operator (Single Band and All Band):

(a) Single Operator stations are those at which one person performs all of the operating, logging, and spotting functions. Only one transmitted signal is allowed at any time.

(b) Low Power: Same as 1(a) except that output power is 150 watts or less. Stations in this category compete with other low power stations only. However, only all-band entries may be classed as low power.

(c) Rookie: An entrant in this category shall, at the time of the contest, have been licensed as a radio amateur three years or less. If you are entering this category, please indicate it on your Summary Sheet.

2. Multi-Operator (All band operation only):

(a) Single-Transmitter: Only one transmitted signal at any time. Limited to six (6) band changes in any clock hour (0 through 59 minutes). For example, a change from 20 meters to 40 meters and then back to 20 meters constitutes two band changes. Violation of the six-band change rule will result in reclassification to the Multi-Multi category.

(b) Two-Transmitter: A maximum of two transmitted signals is allowed as long as each transmitter is on a different band. Each of the two transmitters is limited to six (6) band changes in any clock hour (0 through 59 minutes). Again, for example, a change from 20 meters to 40 meters and then back to 20 meters constitutes two band changes. Violation of the six-band change rule will result in reclassification of the entry to the Multi-Multi category.

(c) Multi-Transmitter: No limit to transmitters, but only one signal and running station allowed per band.

3. SWL: SWLs are required to log the callsigns of both the heard and correspondent station. Scores are based only upon the heard station, using the same rules as transmitting stations. Correspondent callsigns may not appear more than three times per band in your log.

VI. Exchange: RS(T) report plus a progressive contact three-digit serial number starting with 001 for the first contact. (Continue to four digits if past 999.)

VII. Serial Numbers and Identification of Transmitters: Single Operator log entries must contain a progressive three- (or four-) digit serial number sequence starting with 001 for the first contact. Multi-Single log entries must follow the same serial number scheme and are required to identify which transmitter made each QSO in the log. Multi-Two and Multi-Multi entries must provide a separate log and serial number sequence for each transmitter.

VIII. Points:

1. Contacts between stations on different continents are worth three (3) points on 28, 21, and 14 MHz and six (6) points on 7 and 3.5 MHz.

2. Contacts between stations on the same continent but in different countries, and contacts with maritime mobile stations, are worth two (2) points on 28, 21, and 14 MHz and four (4) points on 7 and 3.5 MHz.

3. Contacts between stations in the same country are worth one (1) point on 28, 21, and 14 MHz, and two (2) points on 7 and 3.5 MHz.

IX. Multiplier: The multiplier is the number of "valid" prefixes worked. A prefix is counted only once regardless of the number of times the same prefix is worked.

1. A prefix is the letter/numeral combination which forms the first part of the amateur call. Examples: N8, W8, AB8, DL5, DJ2, HG1, WD200, WF96, 3DAØ, GB75, ZS66, U3, etc. Any difference in the numbering, lettering, or order of same shall constitute a separate prefix. A station operating from a DXCC country different from that indicated by its callsign is required to sign portable. The portable prefix must be an authorized prefix of the

country/call area of operation. In cases of portable operation, the portable designator will then become the prefix. Example: AB5KD operating from Wake Island would sign AB5KD/KH9 or AB5KD/NH9. American DX (KL7, KH6, KP2, KH3, etc.) operating within the 48 states must sign with a full designator of their choice. KH6XXX operating from Ohio must use an authorized prefix for the U.S. 8th district (W8, K8, etc.). United States portable stations are not permitted to select a portable prefix designation. For example, WS7I/2 is permitted, but WS7I/WY2 or WS7I/KZ2 is not. Portable designators without numbers will be assigned a zero (Ø) after the second letter of the portable designator to form a prefix. Example: N8BJQ/PA would become PAØ. All calls without numbers will be assigned a zero (Ø) after the first two letters to form the prefix. Example: XEFTJW would count as XEØ. Maritime mobile, mobile, /A, /E, /J, /P, or interim license class identifiers do not count as prefixes.

2. Special event, commemorative, and other unique prefix stations are encouraged to participate. Prefixes must be assigned by the licensing authority of the country of operation.

X. Scoring:

1. Single Operator: **(a)** All Band score = total QSO points from all bands multiplied by the number of different prefixes worked (prefixes are counted only once). **(b)** Single Band score = total QSO points on the band multiplied by the number of different prefixes worked.

2. Multi Operator: Scoring is the same as Single Operator, All Band.

3. A station may be worked once on each band for QSO point credit.

XI. Awards: First-place certificates will be awarded in each category listed under Section V in every participating country and in each call area of the United States, Canada, Australia, and Japan. All scores will be published. To be eligible for an award a Single Operator station must show a minimum of 12 hours of operation. Multi-operator stations must operate a minimum of 24 hours. A single-band log is eligible for a single-band award only. (Single-band entrants who also operate on other bands are encouraged to submit their logs to aid in the log-checking process. *Note:* If a log contains more than one band, it will judged as an all-band entry unless specified otherwise.) In countries or sections where returns justify, second- and third-place awards will be made. All certificates and plaques will be issued to the licensee of the station used.

XII. Plaques: Plaques will be awarded in the following categories, *to the extent sponsors are available.* Note that winners in any category may purchase a plaque. Please contact the Contest Director if you wish to be a sponsor or to purchase a plaque.

Single Operator, All Band: World, USA, N.A, S.A, Oceania, Africa, Europe, Asia, Canada, Japan.

Single Operator, Single Band: World 28 MHz, World 21 MHz, World 14 MHz, World 7 MHz, World 3.5 MHz.

Single Operator Low Power, All Band: World, USA, N.A., S.A., Oceania, Africa, Europe, Asia, Canada.

Multi-Single: World, USA, N.A., S.A., Oceania, Europe, Asia, Canada.

Multi-Two: World, USA, N.A., S.A., Oceania, Europe, Asia.

Multi-Multi: World, Europe.

Rookie of the Year Award.

XIII. Instructions for Preparation of Logs:

1. Logs must be e-mailed or postmarked by March 13, 2002.

2. We request an electronic log in the Cabrillo format. We require an electronic log for any possible high score. All logs containing more than 100 QSOs and which were generated using a computer program must be submitted via e-mail or on a 3.5 inch floppy disk. In the Subject: line of your e-mail message please include your callsign and the category you entered—e.g., SOABL, M2, MS, etc. (If you submit a floppy disk, please be sure to use a proper disk mailer to protect your log.) If the Cabrillo format is unavailable, then logs must be prepared in accordance with paragraph 4 below and submitted via e-mail or on a 3.5 inch floppy disk containing files in plain ASCII text. Submit and name your files as follows:

Summary Sheet: *yourcall.sum*
Chronological log: *yourcall.log*
Dupe sheet: *yourcall.dup*
Prefix list: *yourcall.wpx*

3. Logs submitted via e-mail should be sent to <wpxrtty@kkn.net>. In the Subject: line of your e-mail message please include your callsign and the category you entered—e.g., SOABL, M2, MS, etc. Receipt of all e-mailed logs will be confirmed via return e-mail.

4. If paper logs are submitted, your log must contain the date, time in GMT, band, callsign of the station worked, sent and received exchanges, multiplier claimed, and points claimed for each contest QSO. Prefix multipliers should be logged only the FIRST TIME they are worked. All duplicate contacts must be shown and indicate zero points claimed. ***Note, however, that as of October 2001, CQ requests that logs be sent via e-mail and not postal mail if at all possible.***

(a) Single Operator entries must be submitted in chronological order and show clearly marked off-times in the log and on the Summary Sheet. Off-times must be at least one hour in length. Your off-time begins one minute of clock time after you log your last QSO and ends as soon as you log another QSO.

(b) Entries from Multi-Single and Multi-Two stations must be merged into a single chronological log that clearly indicates which transmitter made each QSO. Multi-Multi logs must be submitted chronologically by band.

(c) An alphanumeric checklist of all callsigns worked (dupe sheet) and a list of claimed prefix multipliers must be submitted with your log.

(d) Each entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, the entrant's e-mail address, and the entrant's name and mailing address in BLOCK LETTERS. Also submit a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.

(e) If you do submit a paper log, please submit the originals. All mailed logs should be sent to:

CQ WPX RTTY Contest
25 Newbridge Road
Hicksville, NY 11801 USA

Questions pertaining to the WPX RTTY Contest may be sent to the WPX RTTY Contest Director, Glenn Vinson, W6OTC, 488 Locust Street #401, San Francisco, CA 94118 USA; e-mail: <w6otc@garlic.com>.

5. Official log forms and summary sheets are available for an SASE with sufficient postage from: Wayne Matlock, K7WM, Rt. 2 Box 102, Cibola, AZ 85328 USA; e-mail: <k7wm@i10net.com>.

XIV. Disqualification: Violation of amateur radio regulations in the country of the contestant or the rules of the contest, unsportsmanlike conduct, taking credit for excessive duplicate contacts, or unverifiable QSOs or multipliers will be deemed sufficient cause for disqualification. An entrant whose log is deemed by the WPX RTTY Contest Committee to contain a large number of discrepancies may be disqualified as a participant operator or station for a period of one year. If within a five-year period the operator is disqualified a second time, he/she will be ineligible for any *CQ* contest awards for three years.

XV. Deadline: All entries must be submitted or postmarked NO LATER than **March 13, 2002.** E-mail logs are also subject to this deadline. Logs submitted or postmarked after the deadline may be listed in the results but will be ineligible for any awards.

Small Station Contesting—A Perspective from Finland

January's Contest Tip of the Month

Ever oversleep during a contest? Well, I did for the first time in last year's CQ WW SSB Contest. The combination of business travel and a new job had me poorly prepared for the contest this time around. Thus, even with an alarm clock, I still managed to shut it off and fall back to sleep. Here are a couple of tips. Redundancy is a good thing in this context. Use two (or even three) alarm clocks during a contest, especially if you have trouble waking normally or you're especially tired before the contest. Also, place the clocks slightly out of reach so that you're forced to get out of bed to turn them off. While I was amazingly rested on Sunday, so was my score this time around, too! Don't let it happen to you.

Calendar of Events

Dec. 15	OK DX RTTY Contest
Dec. 15-16	Croatian CW Contest
Dec. 15-16	ARRL 10M Contest
Dec. 29	RAC Canada Winter Contest
Dec. 29-30	Stew Perry Topband Distance Challenge
Dec. 31	Straight Key Night
Jan. 5-6	ARRL RTTY Roundup
Jan. 11-13	Japan Int'l DX Contest
Jan. 12-13	North American CW QSO Party
Jan. 19	LZ Open Championship
Jan. 19-20	North Amer. SSB QSO Party
Jan. 19-21	ARRL Jan. VHF Sweepstakes
Jan. 20	HA DX Contest
Jan. 25-27	**CQ WW 160 M CW Contest**
Jan. 26-27	UBA SSB DX Contest
Feb. 16-17	ARRL CW DX Contest
Feb. 22-24	**CQ WW 160 M SSB Contest**

Occasionally I pass the pen (or in this case the keyboard) to another writer. Jari Jokiniemi, OH3BU, is a well-known contester who wanted to provide *CQ*'s readers with a small station perspective from a European point of view. I'm sure you'll enjoy his comments as much as I did. Without further ado, I present Jari, OH3BU.

Small Station Contesting

By Jari Jokiniemi, OH3BU
e-mail: <jari.jokiniemi@nokia.com>

Introduction to the Concept

A serious contester usually has a big station. Using a large tower with stacked monobanders for the high bands and shortened Yagis for 40 meters is nothing nowadays *(especially in Finland!—ed.)*. The minimum requirement is to have at least two towers and directional arrays for 80 and 160 meters as well. With a complete two-radio setup, automatic linears, and a large two-tower system you may qualify for winning in a small European country in the CQ WW. To win for an entire continent requires an equivalent hardware investment installed at a reasonably rare location, such as HBØ (Liechtenstein). In order to be in the world top ten, one has to build a respectable station in a good location in North Africa or the Caribbean. In addition to excellent radios and antennas, the operator needs exceptional talent and experience and must be in good physical condition to endure the whole contest without sleep. A special diet and turning one's internal clock to the desired orientation during the week before the contest are common among the winners.

The combination of computer-based propagation analysis and contest operations pre-announced beforehand in press releases helps some top-class contesters create an awareness that attracts callers from all around the world. To squeeze out the last few points, one needs a support team similar to those found in Formula One car racing. This is serious stuff! I call this "large contesting."

In contrast, "small contesting" is exactly the opposite concept. It is for the little pistols who have limited resources and do not have the will to invest all of their life to winning a major contest. It is for the ordinary participants who form the great majority of almost any contest, with perhaps WRTC being the only notable exception. It is for those who enjoy participating and who like to occasionally win in some way, perhaps a minor category or obscure location.

The basic principle of small contesting comes from the notion of doing one's best, taking into account the limitations that one has in other parts of life. One may be limited by money, time, family duties, or other hobbies that one deems to be important. Whatever the case, contesters exercising the "small contesting" concept do not sacrifice other important aspects of life for contesting, but make contests fit into their other activities.

Selecting the Class Based on Antennas

For the small contester, this still leaves many possibilities and options. The first task in any type of contesting effort, whether it is serious or casual, is to understand the rules and study the results from previous years. Then it is the time to honestly analyze one's own strengths compared to others and to select a suitable class in which to participate.

Your antenna system is really the most important part of your station, and here you probably already know where you are strong and where you are not. You might have a monoband Yagi for one band, say 10 meters, and only wires for the others. By looking at the old results it should be obvious if participating in a 10 meter single-band effort would bring you a better relative score compared to operating multi-band. Suppose you don't have a monoband Yagi, but you do have a high tree in your backyard. Maybe you could gain a respectable signal on 80 meters by putting up a wire vertical array supported by that tree. Again this would lead to a single-band entry, but this time on 80 meters.

Selecting Antennas Based on Class

With some imagination you can look at the selection process in other ways. The Tribander/Single-Element class is especially nice for doing some station optimization without the big bucks required in the Single Operator All Band class. Once again, you'll only know about this category by reading the rules.

The CQ WW WPX Contest rules say that in the TS class you are allowed to use "one tribander for 10, 15, 20 meters and single-element antennas on 40, 80, 160." The rules do not specify that the tribander needs to be the typical three-element trap Yagi that is very often seen just above the roof level of a house. You can put up a six-element cubical quad with a long boom on a 40 meter high tower and still comply with this rule.

Nor do the rules specify that your antenna system be equally effective for all bands. You can easily build an open-sleeve-fed Yagi that operates somehow on 15 and 20 meters and has performance equal to a six-element mono-

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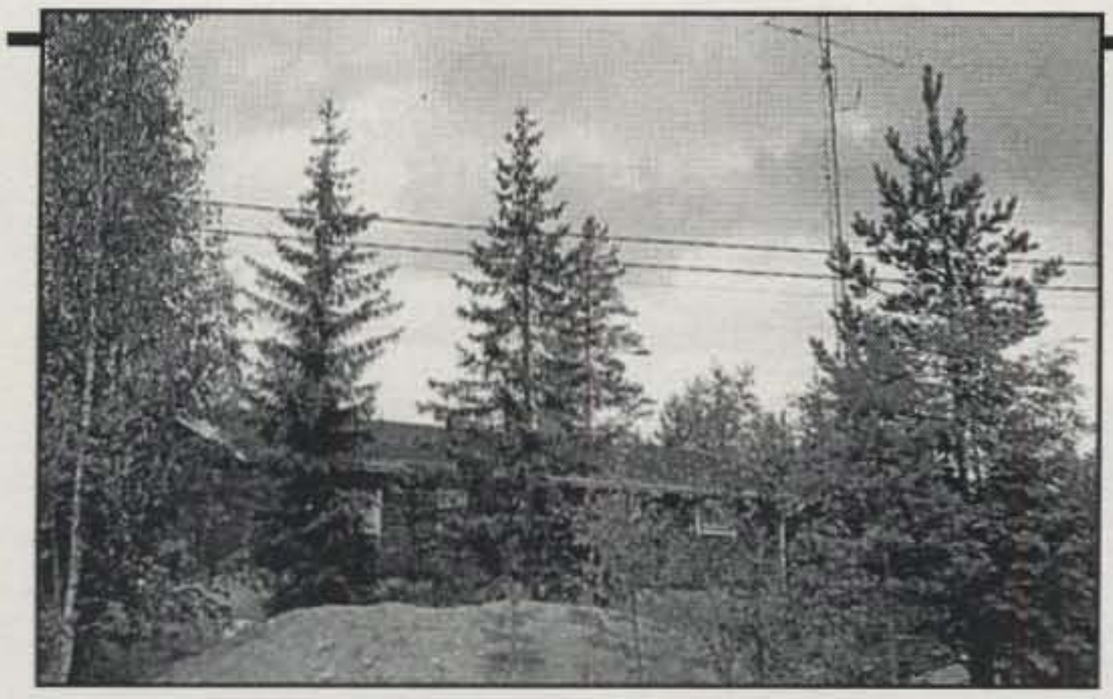


Here's an example of sharing the expense of contesting. The summer cottage of OH2BYS, OH3BU, OH6MF, and OH6SM.

bander on 10. Once again, a way to get a competitive advantage on TS, single-band 10 meters.

What about the low bands? You are allowed to build a full-size vertical for 80 and simultaneously only have a small trap vertical for 10, 15, and 20. You are complying with the rules and at the same time you have a remarkable signal for TS single-band 80 meters!

Finding Less-Active Classes

Some classes are more popular than the others. The obvious choice in the spirit of the small contesting concept is to find a class that does not have many participants and try to win it. The tribander/Single-Element class in the WPX contest is one of those. It has the potential of becoming the most popular class of them all, as there are more small tribander stations than there are monoband stacks, but the TS class has not yet become the leading class. This is especially true for TS single-band efforts. For several years there have been no, or only a few, participants in the low-band variations of TS.

If TS increases its participation rate, then this window for opportunity closes. But it is still there waiting for you, so take an advantage of it now. If you don't, you may be sorry later.

Weak Winning Scores

Another opportunity that can be seen by looking at the published results is in the big contests there usually are classes or sections that have lower winning scores than some closely related categories. This is especially so with the Assisted class. Never has the winning score in the CQ WW All Band Assisted class been higher than the winning score in the All Band non-assisted class. This is so despite the fact that packet spotting is supposed to increase the score. Thus, it might a good idea to consider operating assisted next time.

Note that you should be comparing classes that actually are similar in nature, not the ones that simply show vast differences in scores. Don't be misled by the low scores of the QRP class compared to the high-power classes. If you are used to running a kilowatt and getting what you want in a few calls, you'll be surprised to see how tough the competition is at the top of the QRP ranks.

Selecting the Contest

So far we've mostly been talking about how to win something in a particular contest. Now it's time to think in broader terms. Perhaps you can gain an advantage by selecting the contest a bit differently this year.

No big gun has the resources to compete in every single contest. Most of the big guns concentrate on a few major contests they like the best. This leaves a lot of mid-size contests for the little pistols. Winning the CQ WW may be impossible for the most part, but what about trying to perform well in the IARU, All Asian, SAC, or Russian DX Contest? These are big enough events to produce small runs and to require strategic planning in order to win. At the same time they are small enough to allow good scores for relatively small stations. Typically, the mid-size contests are also good for those who have time limitations.

You should note that many of the previously mentioned possibilities of gaining a competitive edge are valid for the mid-size contests, too. For example, low-band single-band classes of the All Asian contest are less popular than high-band classes, thus giving a natural opportunity for those who perform well on 40, 80, or 160 meters. According to the published scores, those living in European Russia have a definite advantage here.

Guest Operating

What if you don't have a station with strengths you can exploit? Well, do any of your friends have one you can use? Is there a club nearby? Why not combine your efforts with those of your friends and create a better station than one individual alone could afford? There are possibilities. You just have to recognize your limiting factors and then see if there is an easy way to bypass them.

A Small "Contest-pedition"

Many equipment and antenna limitations can be overcome by a superior QTH. If you don't happen to have one already, you still can definitely enhance your score by going on a small-scale contest-pedition. It is not a major effort to put EA8, OHØ, or PJ7 on the air with a small 100 watt transceiver and simple wire antennas. There are also rental QTHs that contain everything you need in order to participate—no need to build a station by yourself; just go there and enjoy the sun and pile-ups. This might be a way to spend more time with the family and achieve a good score, too.

Choosing the Competition

It may be that you can't beat the whole world, but what about beating your neighbors? It always surprises me how one's ego can be boosted from winning a small country section or a call area in a major contest. Last year our local contest club even arranged to sponsored plaques for the local WPX single- band winners. Can you imagine?!

Your contest goal may also be to beat just one particular individual. There is nothing like a good competition; it keeps you focused.

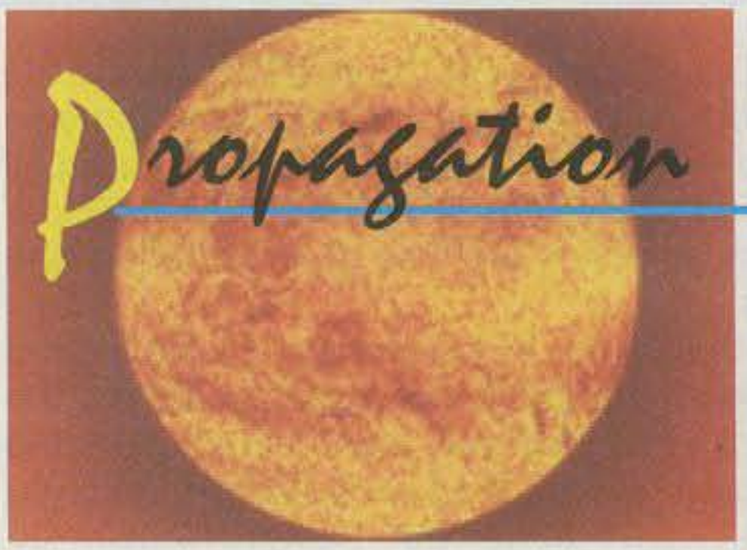
Conclusion

The "small contesting" concept offers countless possibilities for those who want to balance contesting with other activities. Some of the basic principles covered in this article combined with a little thinking most probably will help you discover many new alternatives. The point is that even without huge resources and sacrificing everything to contesting, you can participate and have your share of fun and victory. The only limitation is your imagination. *—Jari, OH3BU*

Final Comments

I don't know if you noticed it this past fall, but conditions seemed to make a comeback; not only during some of the contests, but overall. It's like the solar cycle is teasing us on its way down.

Here's to a great contest year in 2002. For that matter, here's to a good year overall. There has been so much pain and tragedy over the past months. I pray that 2002 is better year for all of us. 73, John, K1AR



Propagation

BY TOMAS HOOD, NW7US

The Science Of Predicting Radio Conditions

Great HF Openings Expected for 2002

Flash!

The 2001 CQ World-Wide DX SSB Contest weekend of October 27–28 kicked off with reasonable conditions, but nothing like the last two years. Just before the weekend, solar activity ranged from low to high levels. Four major flares occurred during October 22, 23, and 25. Three of these produced Earth-directed coronal mass ejections (CME), causing a major geomagnetic storm before the contest. Thankfully, the severe storm levels were limited to high latitudes and subsided before the starting time. As the contest got underway, quiet to unsettled levels prevailed, with a high flux number on the first day. Contesters enjoyed moderate to great openings until early October 28, when a geomagnetic storm occurred due to a CME passage. Active to major storm levels degraded conditions during the last day. Contesters in higher latitudes reported closure of 20 through 160 meters, as well as poor east-west path conditions.

A period of high geomagnetic storminess from about 0600 to 2300 UT on October 28 created a challenge for many 2001 WW DX SSB contesters. Even though conditions for the contest period were not as hot as for the previous two years, a number of contesters reported that they exceeded their expectations in the number of contacts. Ten and 15 meters were exciting bands, with 20 meters remaining solid for most of the contest. While contesters in higher latitudes were suffering on 40, 80, and 160 meters, many other contesters enjoyed great and numerous QSOs with many parts of the world.

Check out the "Contesting" column in this issue for more detailed information concerning the outcome of the 2001 CQ WW DX SSB Contest weekend.

Table I summarizes the key geomagnetic, solar, and ionospheric data recorded during the contest. Sunspot Cycle 23 might be on the decline, but results indicate that HF is still alive with great openings worldwide despite geomagnetic and solar storminess.

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LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for January 2002

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 6-7, 13, 15-16, 22-23	A	A	B	C
High Normal: 2-5, 8-9, 14, 19-20, 26, 29-31	A	B	C	C-D
Low Normal: 12, 18, 24-25, 27	B	C-B	C-D	D-E
Below Normal: 1, 21, 28	C	C-D	D-E	E
Disturbed: 10-11, 17	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 fair to poor (C-D) on Jan. 1st, good (B) on the 2nd through the 5th, excellent (A) on the 6th, etc.**

Sunspot Cycle 23 Progress

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 126 for October 2001. The low for the month was 99 on October 9. The high of 289 occurred on October 1. Cycle 23 continues to exhibit wide variations on a day-to-day basis.

September 2001's mean sunspot value of 151 results in a smoothed running sunspot number of 108 centered on March 2001. This is about a two-point increase over the previous month. However, the cycle is declining. March 2000 saw a smoothed number of 120, a large 12-point difference from March 2001. Following the assumption that Cycle 23 peaked in 2000 and is in a slow, seven-year decline, a smoothed sunspot level of 108 and a 10.7 cm solar flux of about 155 are predicted for January 2002.

The level of sunspot activity expected during 2002 should not significantly change HF propagation conditions from those observed in the latter part of 2001. However, stronger storms and disturbances than those seen in 2001 will degrade HF communications during

de NW7US

I have been interested in the sun and radio-wave propagation since I was nine years old. I discovered the world of shortwave radio and HF on a portable Sony four-band portable radio. When I came across the radio station WWV, I became fascinated with the atomic clock and with solar and geomagnetic information. At the same time, I began to hear stations from around the world coming out of thin air and through the radio's speaker. I was hooked!

For many years I read all I could obtain regarding the science of the sun and propagation. At the end of high school I was playing with creating computer programs to perform simple propagation prediction. By 1989 I had become an amateur radio operator, and I began to experience the propagation modes first-hand. The excitement of hearing my CQ call answered from the other side of the world as a result of the complex interaction of the ionosphere, the geomagnetic field, and radio waves continues to fascinate me to this day.

When the internet became a public phenomenon, I decided to create a website where I could share all that I had learned. The internet has allowed me to discover a great amount of new information about the science from websites provided by NOAA and others. I have a comprehensive, concise collection of links, data, and resources. This is located at <http://hfradio.org>.

Imagine my surprise when *CQ* magazine contacted me to explore the idea of my following in the footsteps of George, W3ASK. This is an exciting challenge and a dream come true. After years of amateur study and research since the early 1970s, I am now given this opportunity to share with you the wealth and excitement of this hobby. I am looking forward to our journey together in the years ahead. If you would like to contact me, please e-mail me at <cq-prop-man@hfradio.org>. I welcome your comments, stories about propagation, and questions.

2002. Several models predict that the planetary index (*Ap*) will increase during 2002. The *Ap* index tracks the daily summaries of the 3-hourly *K* indices derived at a network of geomagnetic observatories. Predictions based on the *Ap* index show that Cycle 23 will resemble Cycle 22 in terms of overall geomagnetic activity. An in-depth summary on this is located at <http://www.sec.noaa.gov/info/Cycle23.html>. The current trend of the *Ap,* as well as the 10.7 cm radio flux and solar spot numbers, is shown at <http://www.sec.noaa.gov/SolarCycle/>.

Storminess aside, expect great openings with exciting QSOs on HF throughout 2002. The smoothed sunspot, 10.7 cm, and *Ap* numbers forecast for 2002 indicate that solar activity remains in the Very High range.

Geographical Area	October 27	October 28
Polar	Low Normal	Below Normal/Disturbed
Auroral	Low Normal	Below Normal/Disturbed
Middle Latitude	High/Low Normal	Low/Below Normal
Low Latitude	High Normal	High Normal
Equatorial	Above/High Normal	Above Normal
10.7 cm Radio Flux	247	227
Daily Sunspot Number	225	229
WW Geomagnetic *Ap* Index	6	41
WW Geomagnetic *Kp* Index	2	4.5

A geomagnetic storm began at 0318 UTC on 28 October.

Table I– Summary of HF propagation conditions based on reports from NOAA during the CQ WW DX SSB Contest weekend of October 27–28, 2001.

Great Conditions Ahead

Here is an overview of expected propagation conditions on each amateur band between 6 and 160 meters for 2002.

6 Meters: As in 2001, there will be many *F2*-layer ionospheric DX openings to many areas of the world during the daylight hours of 2002, especially during the winter and equinox months. During the summer, improved short-skip openings are expected because of seasonal sporadic-*E* activity.

10 Meters: This band will continue to be active with great openings worldwide. Expect an increasing number of DX openings for longer periods during the daylight hours, especially during the equinox and winter months. DX openings to many areas of the world should also be possible during the summer months, sometimes lasting well into the early evening hours. Expect improved short-skip openings during the summer sporadic-*E* season.

12 Meters: This band usually experiences the best of both 10 and 15 meters. Expect openings more often than on 10 meters, to more areas of the world and for an hour or two longer, with more quiet conditions than on 15 meters.

15 Meters: Probably being the optimum DX band for 2002, 15 meters will see worldwide openings during the daylight hours of all seasons. Expect the band to remain open well into the evening hours, with excellent opportunities for DX QSOs during summer evenings.

17 Meters: This band should behave much like 15 meters, but you will find it open more often, with it remaining open for DX an hour or two longer than 15.

20 Meters: This band is in its prime during periods of very high solar activity. Expect excellent conditions during the daylight hours, with worldwide DX openings possible throughout the year. DX conditions on this band tend to peak for a few hours after local sunrise and again during the sunset period. During the summer, expect this band to remain open for DX well past midnight and occasionally throughout the entire period of darkness. In the winter months of 2002, increased nighttime DX openings are expected.

30 Meters: As Cycle 23 gradually declines in activity, this band will experience stronger and longer openings, especially a few hours before sunset until a few hours after sunrise. In 2002, 30 meters will be an exciting band for those low-power digital signals. Winter brings longer nights, providing the right mix for exceptional worldwide DX.

40, 80, and 160 Meters: These are nighttime DX bands. Great worldwide DX should continue on 40 meters from about two hours before sunset to approximately two hours after sunrise during all seasons. DX openings on 80 and 160 meters should peak during the equinox and winter months. Expect somewhat weaker and noisier signals than those in 2001. The *Ap* is predicted to average higher this year, peaking during the late summer of 2002.

January Conditions

It should be a toss-up among 10, 12, and 15 meters for DX propagation openings during the daylight hours. These bands should open to most areas of the world, often with very strong signals. Ten meters may have a slight edge before noon, with 12 and 15 meters taking the lead after noon and becoming optimum DX bands during the late afternoon hours. Short-skip openings between distances of about 1200 and 2300 miles should be great during the daylight hours. Excellent short-skip openings are expected on 12, 15, and 17 meters from shortly after sunrise through the early evening hours for distances between 1000 and 2300 miles.

Twenty meters is expected to be a solid band with excellent around-the-clock openings for both DX and short-skip. DX conditions should peak during a window of an hour or so right after sunrise, and again during the late afternoon and early evening hours. On many days the band should remain open well past midnight. Short-skip openings between approximately 1300 and 2300 miles should be possible from just after sunrise to as late as midnight. Shorter distance openings should also be possible from mid-morning to mid-afternoon.

The optimum band for DX conditions during the hours of darkness should be 40 meters. Expect openings to most areas of the world from shortly before sundown, through the hours of darkness, and until shortly after sunrise. Signal levels may be exceptionally strong at times. During the daylight hours short-skip conditions should be optimum for openings between approximately 100 and 600 miles. Skip will lengthen during the late afternoon, and by nightfall short-skip conditions should be optimum for openings between 800 and 2300 miles.

Atmospheric noise levels will be at seasonally minimum levels in the northern hemisphere during January. This should result in peak conditions on both the 80 and 160 meter bands. Expect some good openings to many parts of the world on 80 meters during the hours of darkness and the sunrise period. Short-skip openings between distances of 50 and 250 miles should be optimum on 80 meters during the daylight hours. During the late afternoon and early evening hours short-skip openings should increase to between 250 and 1500 miles, and by nightfall openings up to and beyond 2300 miles should be possible.

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An * indicates the best time to listen for 80 meter openings.

2. The propagation index is the number that appears in ( ) after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. 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.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 AM; 13 is 1 PM, etc. In the Short-Skip Chart appropriate *standard* time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EST, on a circuit between New York and Texas, the time at the midpoint would be CST, etc. Times shown in the Hawaii Chart are in HST. To convert to standard time in other USA time zones add 2 hours in the PST zone; 3 hours in the MST zone; 4 hours in the CST zone; and 5 hours in the EST zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14 or 2 PM in Los Angeles; 17 or 5 PM in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to *standard* time in other areas of the USA subtract 8 hours in the PST zone; 7 hours in the MST zone; 6 hours in the CST zone; and 5 hours in the EST zone. For example, at 20 GMT it is 15 or 3 PM in New York City.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave 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.

5. 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.

CQ Short-Skip Propagation Chart
January & February 2002
Local Standard Time at Path Mid-Point (24-Hour Time System)

Band (Meters)	*Distance From Transmitter (Miles)*			
	50-250	250-750	750-1300	1300-230
10	Nil	Nil	07-09 (0-1) 09-15 (0-2) 15-17 (0-1)	07-09 (1) 09-11 (2) 11-15 (2-3) 15-17 (1-2) 17-19 (0-1)
15	Nil	08-16 (0-2)	07*08 (0-1) 08-09 (2) 09-11 (2-3) 11-16 (2-4) 16-18 (0-2) 18-20 (0-1)	07-08 (1-2) 08-09 (2) 09-11 (3) 11-16 (4) 16-18 (2-3) 18-20 (1)
20	11-15 (0-1)	08-09 (0-2) 09-11 (0-3) 11-15 (1-4) 15-17 (0-2) 17-00 (0-1)	08-09 (2-3) 09-11 (3-4) 11-15 (4) 15-17 (2-4) 17-18 (1-4) 18-21 (1-2) 21-00 (1) 00-08 (0-1)	08-09 (3-4) 09-10 (4) 10-14 (4-3) 14-18 (4) 18-21 (2-3) 21-00 (1-2) 00-07 (1) 07-08 (1-2)
40	07-08 (0-1) 08-09 (1-3) 09-10 (2-4) 10-16 (4)	02-07 (0-1))07-08 (1-2) 08-09 (3) 09-11 (4-3)	07-08 (2) 08-11 (3-1) 11-15 (2-1) 15-17 (4-2)	07-08 (2-1) 08-15 (1-0) 15-17 (2) 17-19 (4-3)
80	07-08 (2-3) 08-09 (3-4) 09-20 (4) 20-22 (3-4) 22-03 (2-3) 03-07 (1-2)	07-08 (3) 08-09 (4-2) 09-16 (4-1) 16-18 (4-2) 18-22 (4) 22-03 (3-4) 03-07 (2-3)	07-08 (3-1) 08-09 (2-0) 09-16 (1-0) 16-18 (2-1) 18-20 (4-3) 20-03 (4) 03-05 (3) 05-07 (3-2)	07-08 (1) 08-16 (0) 16-18 (1-0) 18-20 (3-2) 20-02 (4) 02-03 (4-3) 03-05 (3-2) 05-07 (2-1)
160	09-17 (1-0) 17-19 (3-2) 19-05 (4) 05-07 (3-2) 07-09 (2-1)	17-19 (2-1) 19-21 (4-2) 21-04 (4) 04-05 (4-3) 05-07 (2-1) 07-09 (1-0) 11-15 (4-2) 15-17 (4) 17-19 (3-4) 19-20 (2-3) 20-21 (1-2) 21-00 (1-2) 00-02 (0-2)	17-18 (1-0) 18-19 (1) 19-21 (2-1) 21-04 (4-3) 04-05 (3-2) 05-06 (1) 06-08 (1-0) 17-19 (4) 19-20 (3-4) 20-23 (2-4) 23-02 (2-3) 02-04 (1-3) 04-07 (1-2)	18-20 (1-0) 20-21 (1) 21-01 (3-2) 01-03 (3) 03-04 (3-2) 04-05 (2-1) 05-07 (1-0) 19-23 (4) 23-02 (3-4) 02-04 (3) 04-07 (2)

ALASKA
January & February 2002
Openings Given In GMT#

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Eastern USA	18-20 (1) 20-22 (2) 20-23 (1)	17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	11-16 (1) 16-18 (2) 18-21 (1) 21-22 (2) 22-00 (3) 00-01 (2) 01-03 (1)	04-13 (1) 07-12 (1)*
Central USA	18-20 (1) 20-23 (2) 23-01 (1)	16-19 (1) 19-21 (2) 21-00 (3) 00-01 (2) 01-03 (1)	11-17 (1) 17-19 (2) 19-21 (1) 21-23 (2) 23-01 (3) 01-02 (2) 02-04 (1)	03-14 (1) 07-12 (1)*
Western USA	18-21 (1) 21-00 (2) 00-02 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-02 (2) 02-04 (1)	11-17 (1) 17-20 (2) 20-21 (3) 21-00 (4) 00-01 (3) 01-03 (2) 03-05 (1)	04-05 (1) 05-12 (2) 12-15 (1) 15-16 (2) 16-17 (1) 05-12 (1)* 12-15 (2)* 15-17 (1)*

HAWAII
January & February 2002
Openings Given in Hawaiian Standard Time

To:	*10 Meters*	*15 Meters*	*20 Meters*	*40/80 Meters*
Eastern USA	07-08 (1) 08-11 (2) 11-13 (3) 13-14 (2) 14-15 (1)	06-07 (1) 07-10 (2) 10-12 (3) 12-14 (4) 14-15 (3) 15-16 (2) 16-17 (1)	12-15 (2) 15-17 (3) 17-20 (2) 20-02 (1) 02-04 (2) 04-12 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-03 (2) 03-04 (1) 19-21 (1)* 21-01 (2)* 01-03 (1)*
Central USA	07-08 (1) 08-10 (2) 10-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-08 (2) 08-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	13-14 (3) 14-17 (4) 17-19 (3) 19-21 (2) 21-04 (1) 04-06 (2) 06-08 (3) 08-13 (2)	17-19 (1) 19-20 (2) 20-03 (3) 03-04 (2) 04-06 (1) 19-21 (1)* 21-03 (2)* 03-05 (1)*
Western USA	06-08 (1) 08-10 (2) 10-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-15 (4) 15-16 (3) 16-18 (2) 18-19 (1)	06-07 (2) 07-10 (4) 10-14 (3) 14-16 (4) 16-18 (3) 18-22 (2) 22-06 (1)	16-18 (1) 18-19 (2) 19-22 (4) 22-02 (3) 02-04 (2) 04-09 (1) 19-20 (1)* 20-22 (2)* 22-04 (3)* 04-05 (2)* 05-07 (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.*
***Indicates best times to listen for F-2 layer openings on 6 meters.*
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.

Expect some DX openings on the 160 meter band during the hours of darkness. Openings towards Europe and the east should peak at about midnight. Openings towards the South Pacific and in a generally southerly direction, as well as openings into Asia and the north Pacific, may be possible just before daybreak. Short-skip openings up to 1300 miles should be possible during the hours of darkness, and frequently the skip will extend out as far as 2300 miles. During the daylight hours intense ionospheric absorption will severely limit openings, although at times some may be possible up to 150 miles or so.

With the CQ 160 Meter CW Contest starting at 2200 UT on January 25, and continuing until 1600 UT on January 27, 2002, there is a good opportunity to make great progress toward working all states or grabbing a new country on 160 meters. Remember to look for DX an hour or so before sunrise. Check out <http://solar.spacew.com/www/160pred.html> for up-to-the-day forecasts during the contest.

On the Cutting Edge—Looking to the Far Side

Using a technique called "helioseismic holography," SOHO scientists are able to see the far side of the sun! This new way of seeing the sun is a result of many years of analysis and modeling. First noticed in 1962, patches of the surface of the sun oscillate up and down with a typical period of about 5 minutes. These waves were a mystery for many years. The study of this phenomenon is "helioseismology."

In 1970 scientists identified the mysterious source of these oscillations, and the discovery was confirmed by 1975. The oscillations we see on the surface are due to sound waves generated and trapped inside the sun. Pressure fluctuations in the turbulent convective motions of the sun's interior cause sound waves. After many years of careful

January VHF Report *Provided by Ken Neubeck, WB2AMU*

F2 propagation on 6 meters may continue to be a big story for January 2002. *F2* skip on 6 meters may appear during some days during the early part of January, depending on how high the solar flux values are. If this is so, some east-to-west activity, such as Europe into the U.S. or transcontinental U.S., is likely. Again, use the 27-day solar rotation as a guide and check the daily sunspot and solar flux values from November and December 2001. Also, keep an ear open on 10 meters for high amounts of *F2* activity as a guide for possible 6 meter *F2* openings.

January 2001 was a very disappointing month for *F2* based on reports. However, based on the experience of the previous cycle, January often can yield some good *F2* openings. I remember in January 1992 working Europe on a Saturday on 6 meters. On the next day, Sunday, I worked into the West Coast. This cycle may yield some very similar type openings, particularly if the peak is a double-peak configuration as some experts believe. The tremendous *F2* activity that was seen in the northern hemisphere during the latter part of October is a good indication that *F2* may continue to be good for the early part of 2002.

Typically, based on experience, sporadic-*E* activity can appear from three to four days during this month on 6 meters for stations in the northern hemisphere with the average time of duration lasting an hour or two with distances of 1000 km covered. A particularly good time to monitor for sporadic-*E* (*Es*) activity is during the ARRL VHF contest during the third weekend of January. A surprise one- or two-hour opening has been known to occur during the contest in the past, and this has led to increased multiplier counts for contest efforts.

Aurora openings that are caused by high geomagnetic activity are possible during January, although not usually with any great duration or number, based on both amateur radio observations and scientific data. I remember hearing a short opening on 6 meters during the VHF contest in 2000. If the solar flux should reach very high numbers, then it is possible that solar flares may also occur, and this could increase geomagnetic activity, which will cause an extension of the aurora into the lower latitudes.

The *Quadrantids* meteor shower is the major shower in January, and it can appear any time during the first week of the month. This sometimes can be quite intense, so it may be a good idea to set up some 2 and 6 meter schedules. Morning meteor openings may be the best bet this month.

—73, Ken, WB2AMU

observation and analysis, today's helioseismologists use these sound waves, and the modes of vibration they produce, to probe the interior of the sun the same way geologists use seismic waves from earthquakes to probe the inside of the Earth.

A new technique of seeing the far side of the sun using helioseismic information results in the holography that gives propagation forecasters and scientists a view of what is coming around to the visible side. A full week or so before a group of sunspots rotates into the Earth-facing side, we can detect the progress of old activity and detect new activity before it arrives. Check out <http://www.spaceweather.com/glossary farside.html> for an overview of this cutting-edge technology.

and . . . Something Ancient

I have received several e-mail messages over the last few years from an individual who is not an amateur radio operator. It seems that he has been finding a correlation between the *Ap* index and the ability of his racing pigeons to find their way around. When the *Ap* index is high, the pigeons are not easily trained and they simply get lost and confused. This group of pigeon racers is using the Propagation eAlert service which I provide at <http://hfradio.org/propagation.html> to help them plan when they should train or race their unique navigators.

This year will be rough at times on all who depend on the geomagnetic field. For amateur radio hobbyists, there will be moments of very high storminess. In general, however, HF propagation conditions will remain at a very high level, providing another great year of HF communications around the world.

73, Tomas, NW7US

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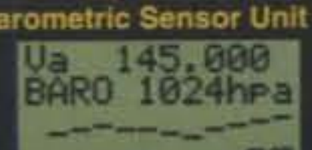

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THINK OF IT AS A 32 BIT IF-DSP HOT ROD!

New IC-746PRO.

Supercharged Performance!

REVVVVV up your HF/6M + 2M ops with ICOMs new IC-746PRO. This Hot Rod combines the latest cutting edge technology from the digital and analog world! The new, all mode, 746PRO has the familiar look and feel of the '746 - but that's where the similarity ends! Sharing the same powerplant as the '756PROII, the 746PRO offers great 32 bit IF-DSP performance and many new features not normally found on rigs in this class. Features like selectable IF Filter Shape characteristics; SSB/CW Synchronous Tuning; Rx Equalizer for great audio; Variable Level Noise Blanker; and much more. Pick up a '746PRO and leave the competition in the dust. Coming soon to your authorized ICOM dealer.

IC-746PRO. Leave the competition in the dust.

HF/6M/2M • 100W • All Mode • Enhanced Rx • 9600 Baud Ready • 32 Bit IF-DSP & 24 Bit AD/DA Converter • Independently Selectable IF Filter Shapes For SSB & CW • SSB/CW Synchronous Tuning • Built-in RTTY • Variable Level Noise Blanker • Auto & Manual Notch Filter • Digital Twin Passband Tuning • Mic Equalizer • CW Memory Keyer • VOX • Auto Antenna Tuner

IC-746PRO Features

• **32 BIT FLOATING POINT DSP & 24 BIT AD/DA CONVERTER.** At the heart of the '746PRO, the DSP is an incredible tool for handling the QRM found on the bands.

• **SELECTABLE DIGITAL IF FILTER SHAPES FOR SSB & CW.** Tailor the filter shape & bandwidth to your personal operating preferences or band conditions. Sharp for selectivity and signal fidelity or soft for readability.

• **AGC LOOP MANAGEMENT.** Multiple AGC loops, controlled by the 32 bit DSP, filter out unwanted interfering signals, eliminating pumping of the AGC.

• **AUTOMATIC NOTCH FILTER.** Perfect for SSB operation to eliminate annoying heterodynes and "tune up", without effecting the receive audio.

• **MANUAL NOTCH FILTER.** Perfect for CW or digital operations, the 70db manual notch filter eliminates unwanted signal without effecting the actual passband of your filters.

• **DIGITAL TWIN PASSBAND TUNING.** Great for crowded bands, or contests, eliminates interfering signals by narrowing or or shifting the IF passband.

• **BUILT-IN RTTY DEMODULATOR & DECODER.** External units or PCs are no longer required for RTTY decoding. Twin peak audio filter, using the DSP unit, significantly reduces interfereing signals overlapping the tones.

• **TWIN PEAK AUDIO FILTERS.** Peak the signal audio used in the digital modes.

FAST AND EASY FILTER SHAPING!

CHANGE FILTER SHAPES WITH THE PUSH OF A BUTTON AND THE TURN OF A KNOB - IT'S THAT EASY!

• **DIGITAL RF SPEECH COMPRESSOR.** Utilizes the 32 Bit DSP to provide the maximum punch without the fuzzy sound.

• **MICROPHONE EQUALIZER.** A total of 121 varieties of equalized audio can be set with the built-in microphone audio equalizer, tailored to operating style & microphone characteristics.

• **TX AUDIO PASSBAND.** Great for the "Perfect Audio" you are looking for by selecting from 2.2, 2.4, & 2.8 kHz bandwidths.

• **RECEIVE AUDIO EQUALIZER.** Allows you to set the audio style to ease listening fatigue during long hours of operation.

• **SSB/CW SYNCHRONOUS TUNING.** You no longer have to worry about changing from SSB to CW, the radio automatically shifts the VFO without losing the CW station you were copying.

• **ADJUSTABLE NOISE BLANKER.** Adjustable in 101 steps, this gives you control of the level of the noise blanker, to eliminate distortion of the desired signal.

Get in the drivers seat

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