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Amateur Radio

CQ

SERVING AMATEUR RADIO SINCE 1945
AUGUST 1998

In This Issue:

U.S. $3.99 / Canada

ry Goldwater, K7UGA (SK)

17

THE RADIO AMATEUR'S JOURNAL

"Our IC-756 hit the ground running – in large part because the steep learning curve encountered with some new transceivers simply didn't exist with the IC-756."

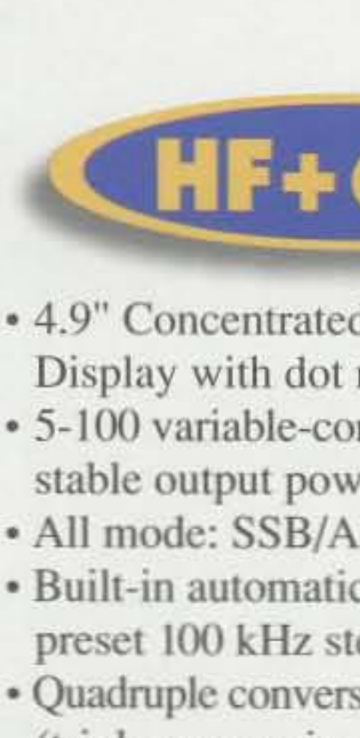
– *QST*, May 1997

ICOM's IC-756: See and HEAR the Performance

Advanced features, in the spirit of the IC-781.
But at a real down-to-Earth price.

HF+6M!

- 4.9" Concentrated Information LCD Display with dot matrix characters
- 5-100 variable-control watts of 100% stable output power (5-40 W on AM)
- All mode: SSB/AM/FM/CW/RTTY
- Built-in automatic antenna tuner with preset 100 kHz steps – RX and TX
- Quadruple conversion superheterodyne (triple conversion on FM)



- **True** dual watch (2 signal simultaneous reception)
- Twin passband tuning
- 2 slots for optional filters
- 101 memory channels
- High performance memory keyer
- Voice synthesizer (opt. UT-102 req.)

- Noise Reduction (NR)
- Auto DSP controlled notch filter
- Selectable Audio Peak Filter (APF)
- Phase Shift Network (PSN) modulation/demodulation

IF-DSP

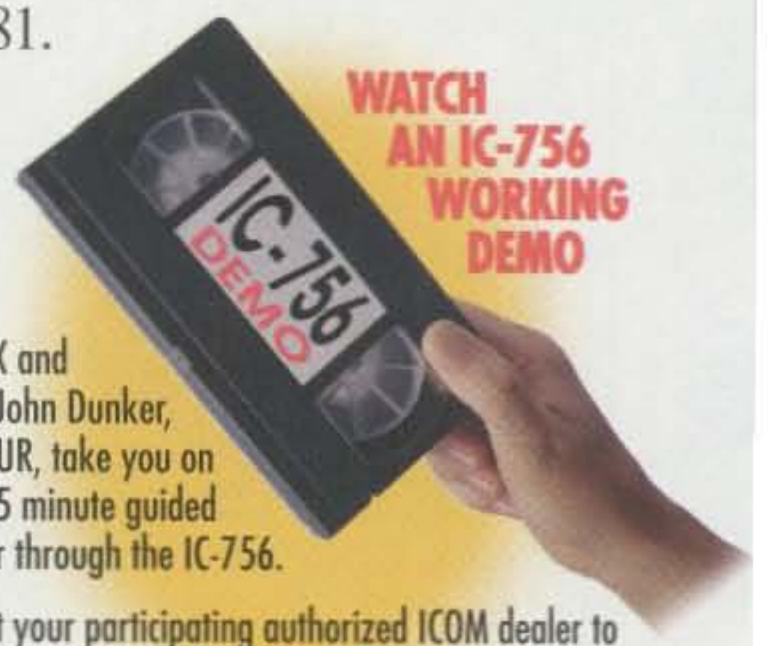
"(Our IC-756) even worked on atmospheric noise, and it did not exhibit that annoying hollow sound we've noticed on some other DSP NR systems.

The ability to tweak transmit audio to taste was a real plus. Everyone's voice is different, and this DSP feature bursts through the old 'one size fits all' mentality…."

– *QST*, May 1997

PC Ready!

BUILT-IN CI-V INTERFACE
Options required for PC programming:
CT-17 CI-V Level Converter,
third party serial cable with pins 1-8 & 20



WATCH AN IC-756 WORKING DEMO

QRX and let John Dunker, W9UR, take you on a 45 minute guided tour through the IC-756.

Visit your participating authorized ICOM dealer to view the video. John will walk you through the on-screen function key operations, memory settings, and band condition controls, plus offer some helpful tips to HF newcomers.

VALUE

Step up to a higher performance rig without paying a higher price.

Call ICOM's brochure hotline today at 425-450-6088 or see the IC-756 at your ICOM dealer!

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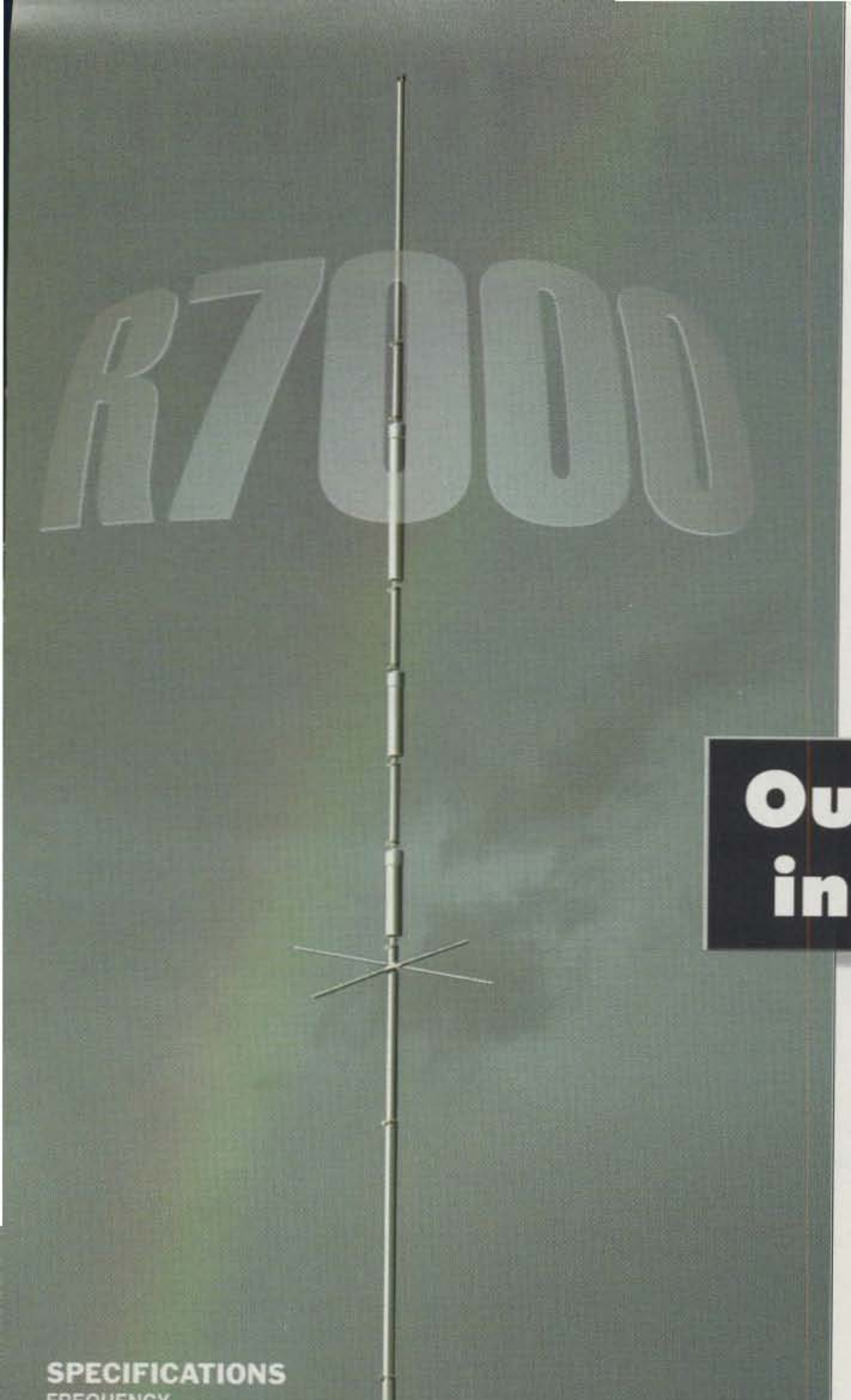

SPECIFICATIONS

FREQUENCY
10, 12, 15, 17, 20, 30, 40 M
(80 M with optional
R80 add-on)

HEIGHT
R7000 - 24 feet (7.3 M)
R7000+ (w/80m)
- 32 feet (9.8 M)

10, 12, 15, 17, 20, 30, 40 Meters

Outstanding Performance, Reliability, and Looks

The Cushcraft R7000 delivers top performance on seven bands in a package ready for home or portable use. The R7000 offers easy assembly, a small footprint, and a "stealthy" appearance in a manageable size. The R7000 is the best choice for all around HF use.

Our customers say it best!

Great Performer

"Making great DX contacts to South America and Europe - in poor propagation conditions. My God what will it be like when conditions improve? . . . can hardly wait . . . will add 80 meters soon. Thank you for an excellent product." N1XAE

Reliable

"The R7000 withstood several New England ice/snow storms with no damage." KA1WIU

Outstanding in its field!

Slim Silhouette

"I have antenna restrictions, but no complaints from neighbors!" KS4VN

Easy Installation and Tuning

"The use of similar size hardware is appreciated as this minimizes the number of tools I have to carry up the ladder . . . After following the R7000 printed instructions the antenna worked the first time. It has been a pleasant experience to put up a vertical antenna which performs to the manufacturer's specifications." K1NB

Automatic Band Changing

"Seven bands right out of the box with no tuning is impressive." WV0H

So, if you want an R7000 in your field…or yard… on the roof, or even on the RV for Field Day, contact your dealer today!

Visit our web site (**http://www.cushcraft.com**) for the latest R7000 news and details of our other fine products. You can review the manual and learn how the R7000 and R7000+ work.

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CQ Amateur Radio

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FEATURES

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DEPARTMENTS

ON THE COVER: The late Barry Goldwater, K7UGA, former US Senator from Arizona. Always straight-talking, always faithful to his conservative view of the American way of life, and always a friend to Amateur Radio. Barry died on May 29, 1998 at the age of 89. We miss him already. (1989 photo by Larry Mulvehill, WB2ZPI)

Intelligent Digital Enhanced Communications System

TS-870S HF TRANSCEIVER

DSP at the IF stage is now a reality with Kenwood's new TS-870S HF transceiver. This new design uses state-of-the-art DSP chips that provide for receiving enhancements to bring signals out of the noise. Imagine over 100dB of noise reduction with no signal loss! Imagine CW band-width adjustable to 50 Hz! Advanced speech processing with transmit equalization that will make you the first in pile-ups! Plus, complete computer operation and control of the TS-870S is possible with supplied MS Windows® software and built-in RS-232C port. Enjoy future technology now with the TS-870S.

FEATURES

- IF Stage Digital Signal Processing
- Multi-Function Digital Filtering (no optional filters required)
- Dual-Mode Noise Reduction
- Beat Canceller
- Auto Notch Filter
- Variable AGC
- Selectable Voice Equalizer (SSB & AM)
- Speech Processor
- Selectable Transmit Equalizer
- High Speed (57.6kbps) Computer Control with MS Windows® Software included (USA only)
- Built-in RS-232C Port
- 100 Watts Output on SSB, CW, FM, FSK; 25 Watts on AM
- 100 kHz ~ 30 MHz General Coverage Receiver
- Full-Function K1 LogiKey Keyer
- Built-in Automatic Antenna Tuner (TX & RX)
- 2 Antenna Terminals
- Receiver Antenna Terminal
- Dual VFOs with 100 Memory Channels Plus 5 Quick Memory Channels
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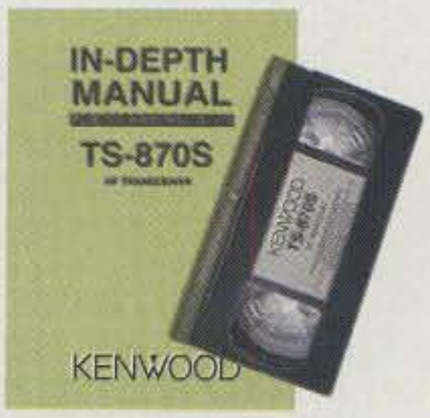
- Built-in Tone Encoder (FM)
- Easy-to-use Menu System for Quick Setting of Functions
- High Quality 60 Second Digital Recording Unit Option (DRU-3)
- Voice Synthesizer Unit Option (VS-2)

Contact Kenwood for your FREE TS-870S Video & Indepth operating manual.

(U.S. & Canadian residence only)



South Sandwich Island DX Team
VP8SSI

Peter I Island DX Team
3Y0PI

Easter Island DX Team
XR0Y

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JQA-1205

Communications Equipment Division
Kenwood Corporation
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ZERO BIAS

AN EDITORIAL

The great move has taken place. After almost 19 years at 76 North Broadway, in June we moved to 25 Newbridge Road, a distance that can better be measured in feet rather than in miles. In fact, as I look out of my "new" window, I clearly can see my old window in our recently emptied offices about a block and a half away. While not physically far, the logistics and emotional upheaval were worthy of a move of hundreds of miles. It's change, and most people are sort of uncomfortable with the idea of something different, unfamiliar, that takes you away from where you've "lived" for so long. A big part of the change process is being forced to examine, evaluate, and discard items and "stuff" that you've accumulated and adopted as your own for many years. When you move on to something new, it isn't always possible or desirable to take everything with you. It's a chance to start over with new items and new "stuff" to build upon.

The greatest logistical battle plan in the world can get bogged down simply by introducing a small, uncooperative elevator that is prone to malfunctioning. A move that was scheduled to occur over a weekend thereby extended into the normal work week. But amidst massive unpacking, a few frayed nerves, getting equipment up and running, a few more frayed nerves, closing out this issue, and no more nerves to fray, a ray of sunshine came down the road and parked in our parking lot. Sporting a big sign that reads "*Hear* Comes The Sun," the ICOM Fun Mobile arrived, set up, and became our first official visitor to our new location. Besides having equipment from their amateur, commercial, marine, and avionics divisions up and running, they also mercifully set up tables and chairs under an awning, whereby a certain editor joyfully relaxed while sipping a cool drink and greeting visitors.

The amateur gear was set up, and visitors were welcome to sit at any of the operating positions and try it out. Pat Marcy, W7PZ, and Mark Entzminger, KB2YQN, were the Fun Mobile team and ably demonstrated equipment and answered questions, including one a passerby had on how they got the great artwork on the Fun Mobile and was it a painting. Pat explained that it actually was a photographic process that was applied to the Fun Mobile in a heat-shrink procedure. The weather was perfect for the demonstration, and a torrential rain shower held off until several minutes after the last visitor left.

The next day Bill Pasternak, WA6ITF, called to say he was in the area visiting relatives and would stop by for lunch and a tour of the new *CQ* World Headquarters. We talked about the move and "unearthing" bits of history, including old photographs taken at hamfests over many years. It also brought up a lot of names of people who have made an impact on the hobby and the industry and who are no longer with us. We noted how much things really have changed over the years. We talked about the circulating rumors concerning changes in amateur radio about to happen and wondered how much was true and how much was wishful thinking. The only certainty was that from a historical perspective everything changes; nothing stays the same. Change, though, has a way of being disturbing to a lot of us. By the time you read this, however, everything here at *CQ* Headquarters should be in place and look like we've been here for a long time. The stock room probably will have the start of the next big build-up of must save "stuff."

One of the first people to tour the ICOM Fun Mobile was Ronie Rosenbaum of W & W Associates (our neighbors down the road here in Hicksville). Here is Ronie on the left being greeted by Pat, W7PZ, and Mark, KB2YQN.

Barry Goldwater, K7UGA, SK

The lead story this month is the passing of Barry Goldwater, K7UGA, and the end of another era. As we approach the end of this millennium, we seem to be losing a lot of "eras"—people who were important to us and who were very instrumental to the hobby. These were the people who made the leap of faith and created technology that hadn't existed, fostered legislation where it actually was needed, and innovated the things that most of us now take for granted. We're losing the "era" of doers, thinkers, and motivators through the normal passage of time. We all get old, and heroes are no exception. It's very hard to replace heroes these days. Generally, we tend to interpose hero with celebrity and think they're the same person. They're not. You didn't have to share Barry's politics to believe that he was a hero who went out of his way to act on our behalf with the same vigor that he applied to everything about which he felt strongly. He was a hero. A hero does things for others; a celebrity is someone everyone knows, a least for a while.

Change Around The Corner

I received an interesting e-mail missive from Phil Salas, AD5X, a regular contributor to amateur periodicals. He said that he was disappointed in last month's editorial basically because I was suggesting that since a law wasn't enforced, it could be broken. No, I wasn't suggesting that. I simply was stating a fact that the situation exists. It really doesn't do any good to anyone to deny what is apparent to the world. It may be nice to discuss the philosophy of how things should be or that society would be better if, but at the moment and historically things aren't that way. We all "tsk, tsk" at some of the QSOs that happen on a very regular basis down where the "unreal" can't go (which on some level I guess protects them from the "real"). Most people would assume that the venom, hatred, or obscenity was illegal or "shouldn't" be done. But it is done, and legal or illegal becomes academic.

Recently I watched an interview on television with Charlton Heston, the new head of the NRA. When asked to comment on a batch of new gun laws designed to stop violence in schools and other places, he replied that there were about 20,000 gun laws on the books in this country to date. It doesn't matter how many more you add if you don't begin to enforce what already exists. You only begin to infringe on those who have always been law abiding. Mr. Heston's comments could just as easily be about amateur radio. He does have the advantage of being a celebrity, and he does make an eloquent spokesman. Maybe the ARRL should try to hire Clint Eastwood as a spokesperson or perhaps vote him in as their next president.

Perhaps from time to time I stray from what may be considered the traditional wonderful world of amateur radio where everything is taken care of by thoughtful, sincere, well-informed people acting on our behalf. The world that many of us have created and call amateur radio doesn't really exist anywhere besides in our imaginations. We ourselves have created this entity which we view as sacrosanct, and in spite of what some of us believe, it's changing. Germany, England, Canada, and Argentina are simply changing the rules that we thought would never change. Our FCC in effect defined what a real ham is in very succinct terms: It's someone in their database. They're not concerned with the emotional baggage of license class or the pecking order of who is important and who isn't. We're in a time when various industries want pieces or big chunks of what we always took for granted as ours. We're in a time when various groups and individuals feel threatened enough and big enough to take on "our" national organization with regard to Bandplan Ruling.

I have no crystal ball, nor do I have any secret information. However, if you look around, you can feel the changes coming. Maybe the Europeans know something we don't. We all would like to have our particular piece of the pie protected and stay the same forever. It's just not going to happen. It didn't happen between the time you got your license and today. We all are going to have to learn to grow with it or be left behind.

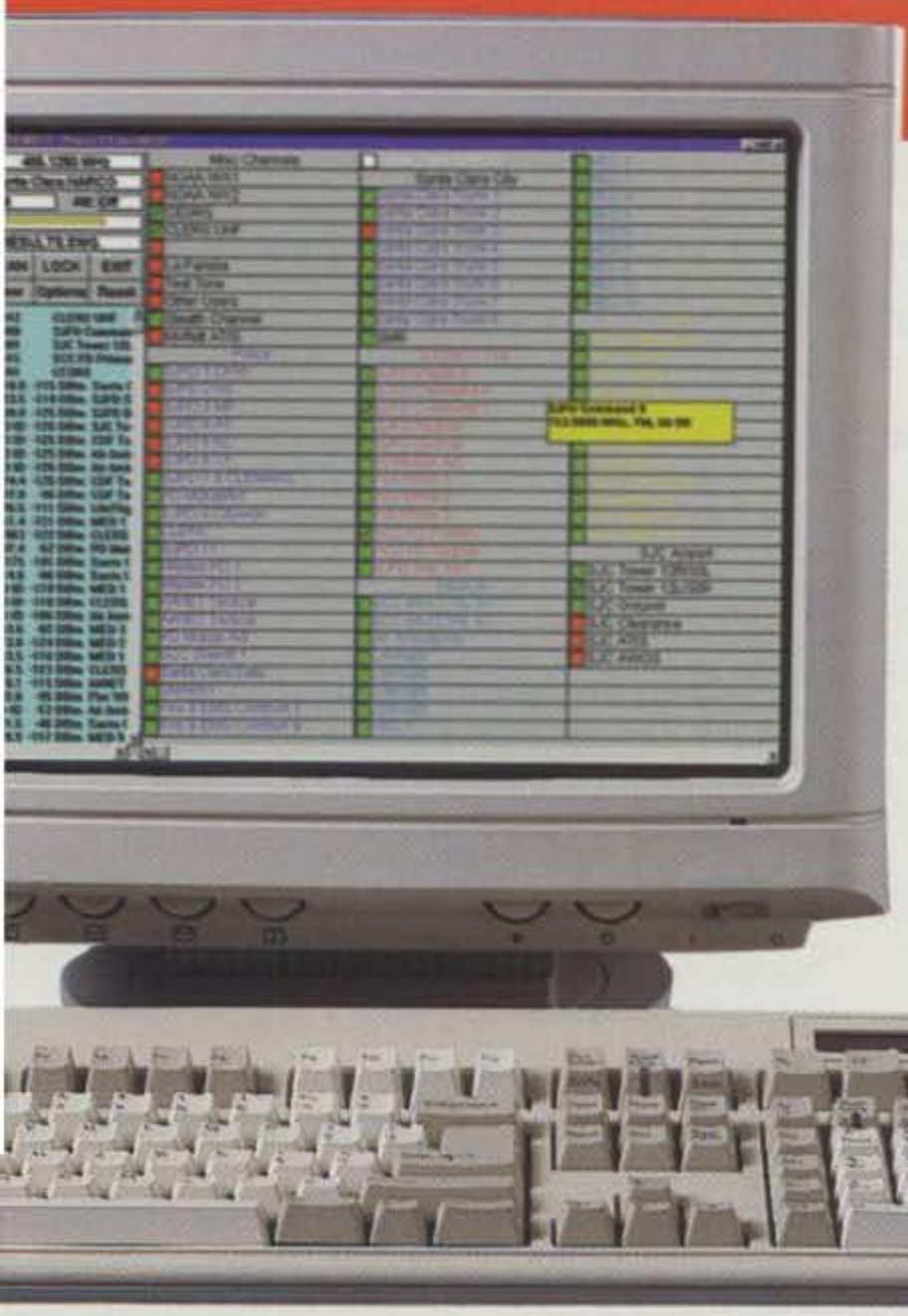
73, Alan, K2EEK

NEW!

TRACK MOTOROLA TYPE I AND II TRUNKED SYSTEMS

using your ICOM CI-V or AOR receivers

THE ALL NEW OPTOTRAKKER®



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ANNOUNCEMENTS

• The following Special Events are scheduled for August:

K2VOA, from Camp Marcella for visually impaired children, Rockaway Township, NJ; Aug. 8; 40 and 20 meter General portion phone bands. QSL direct PARC, P.O. Box 1233, Piscataway, NJ 08854.

N2OB, from National Lighthouse Day, "Old Barney," The Barnegat Lighthouse, Long Beach Island, NJ (IOTA: NA-111 and USI: NJ001S); Old Barney ARC; 1300–2200Z Aug. 8 & 9; lower part of General bands 40–10 meters SSB only. SASE for QSL or 9 × 12 SASE with two units of postage for QSL and certificate to N2OB, P.O. Box 345, Tuckerton, NJ 08087.

W2CM, from NY State Fair , Syracuse, New York; Liverpool Amateur Repeater Club; Aug. 10 AM to 9 PM Aug. 24 to Sept. 7 ; 10–80 meters CW and phone (exact frequencies unavailable at time of publication). For certificate send 9 × 12 SASE to Dick Page, AC1M, 2939 Lafayette Rd., Lafayette, NY 13084.

W2GSB/Lighthouse, will operate from Fire Island Lighthouse, Fire Island National Seashore, Long Island, NY, ref #670 (IOTA NA-026, USIA NY-013-S), 1400–2200Z Aug. 22 & Aug. 23, SSB near IOTA frequencies, CW as announced. For a color QSL certificate send QSL and 9 × 12 SASE or #10 SASE to: Rich Tygar, AC2P, 5 Chelmsford Drive, Wheatley Heights, NY 11798.

AC4RC, from Battleship *USS North Carolina BB 55*; Wilmington, NC; Azalea Coast ARC; 1500–2100Z Aug. 15; on 7.250, 14.250, 21.350, 28.400. QSL to AC4RC, P.O. Box 4044, Wilmington, NC 28406.

W4MN, from Palmetto ARC 70th anniversary; McKissisck Museum, University of South Carolina, SC; 9 AM to 5 PM July 25 & 26; all bands 80–10 meters in the General phone bands. For certificate send QSL card and 9 × 12 SASE with two first-class stamps to: W4MN, Callbook address. (Alumni are asked to identify themselves as such, giving class date at time of contact.)

W5R, from the Texas Ranger Hall of Fame & Museum , Fort Fisher Park, Waco, TX; Central Texas HF Society; 1500Z Aug. 8 to 2400Z Aug. 30; General portion phone and CW 40–10 meter bands. For certificate send QSL and 9 × 12 SASE to: Larry Merritt, KC5BFM, P.O. Box 3501, Waco, TX 76707-0501.

K6MEP, from 60th anniversary of ARRL affiliation of Ventura County ARC, Oxnard, California; 0000–2400Z Aug. 22; on 28.340, 21.400, 7.100. For certificate, QSL to K6MEP, P.O. Box 2103, Oxnard, CA 93034.

K8Y, from the Yankee Air Force Museum, formerly Wurtsmith Air Force Base. MI; Iosco County AR Enthusiasts; 1300Z Aug. 8 to 2100Z Aug. 9; on 3.700, 14.050, 14.270, 3.885. For certificate send SASE to: Ray Knuth, KB8ZYY, P.O. Box 271, Oscoda, MI 48750.

N9CQX, from Radiofest XVII, Holiday Inn, Elgin, IL; Aug. 5–8; AM phone and SSB on 80, 40, 20, 15, 10 meters. For a QSL certificate contact (or receive) station N9CQX and send reception report along with LSASE to ARCI, P.O. Box 1139, LaGrange, IL 60526. For more information, web site: <arci31280 @aol.com> or call Art Bilski, 630-739-1060.

W9DK, from WWII submarine *USS Cobia* to celebrate 54th anniversary of its first war patrol in the Pacific, Manitowoc, WI; 1400–2000Z Aug. 15; on 7250 and 14,250 kHz SSB. For certificate send QSL and #10 SASE to: Fred Neuenfeldt, W6BSF, 4932 So. 10th St., Manitowoc, WI 54220-9121.

W9S, from 42nd anniversary of Northern Illinois Steam Power Show, Sycamore, IL; Kishwaukee ARC, WA9CJN; 1300Z Aug. 13 to 1900Z Aug. 16; 14.030 (CW), 14.250, 7.235, 28.350. For certificate send 9 × 12 SASE to: Bob Yurs, W9ICU, P.O. Box 341, Sycamore, IL 60178.

WAßCJU/9ALD, using vintage E.F. Johnson transmitters on SSB and AM, and possibly CW; from Weseca County Fairgrounds, Waseca, MN; Viking Amateur Radio Society; Aug. 15–16; HF operation 0800–2100 CDT; AM 3885, 7290, 14286, 21400, 2900 kHz; SSB 3900, 7260, 14250, 21350, 28400 kHz; CW 3700, 7125, 14050, 21150, 28050 kHz. For a QSL/certificate send SASE (two units first-class postage) to VARS, P.O. Box 3, Waseca, MN 56093.

GB98RH, from Sherwood 98 (90th anniversary of the publication of Scouting for Boys and the 60th anniversary of the foundation of a campsite), Walesby Forest Scout Activity Centre, Sherwood Forest area of Nottinghamshire, England; Aug. 1–8; operating station expects to be QRV from 0800–2400Z on 80, 40, 20, 18 or 12, 15 or 10 meters, and 6m, 2m, or 70 cm, mainly SSB and CW with possibly some RTTY and packet. For more information about the station contact John, GØGDU.

OE3XAS, from artist Egon Schiele exhibition, Tullner Schiele Museum, Tulln, Austria; June 19 to Sept. 13, every possible mode and all bands. QSL info via operator of the day. For information, contact Herwig Strauss, OE3HAU, A-3430 Tulln, Buchingerstrasse 11 Austria (phone ++43-2272-62942; packet via Willy, OE3ZW@OE3XBS.#OE3. AUT.EU.

•The following hamfests, etc., are scheduled for August:

Aug. 1, **North Texas Hamfest**, National Guard Armory, Denison, TX. Contact North Texas Hamfest, Box 1933, Sherman, TX 75091-1933 (web: <http://www.herriage.com/hamfest/nortex.html>). (Exams)

Aug. 1–2, **25th Annual Greater Jacksonville Amateur Radio & Computer Show**, Osborn Convention Center, Jacksonville, FL. Contact Greater Jacksonville Hamfest, P.O. Box 27033, Jacksonville, FL 32207; web: <http://www.pobox.com/nw4ue/hamfest.html> . (Exams)

Aug. 2, **7th Annual HAMNIC**, Wildwood Park Shelter, Marshfield, WI. Contact Guy Boucher, KF9XX, 107 West Third St., Marshfield,WI 54449 (phone 715-384-4323; e-mail: <guyboucher@tznet.com>; or <KF9XX@W9IHW.E5.AI.WI.USA.NA>.

Aug. 2, **Hamfair '98**, Portage County Fairgrounds, Randolph, OH. Contact Joanne Solak, KJ3O, 330-274-8240.

Aug. 2, **48th Winchester Hamfest & Computer Show**, Clarke County Ruritan Fairgrounds, Berryville, VA. Contact Tom Martin, KF4TNX, 540-539-4301; e-mail: <hamfest@ Vvalley.com>. (Exams)

Aug. 2, **Land of Lakes ARC Hamfest**, Steuben County 4-H Fairgrounds, Angola, IN. Contact Theresa Limestahl, KB9NNR, P.O. Box 346, Fremont, IN 4673; (219-495-5403; fax 219-495-1675; e-mail: <TJLimestahl@DMCI. NET>. (Exams)

Aug. 8, **Juniata Valley ARC Hamfest**, Decatur Township Fire Company grounds, Lewistown, PA. Contact Rich Yingling, WB3COB, 717-242-1882.

Aug. 8, **1998 ICARE Hamfest,** Yankee Air Force Museum, Oscoda Airport, Oscoda, MI. Telephone 517-739-3129 or 517-739-2896, or e-mail <ka8aip @centuryinter.net>. (Exams)

Aug. 8, **TARA Hamfest & Computer Show**, Veteran's Memorial Field House, Huntington, WV. Contact Bernie Mays, WB8ZER, 304-743-5459; e-mail: <wb8zer@juno.com>. (Exams)

Aug. 9, **St. Cloud RC Hamfest**, St. Cloud, MN. Contact St. Cloud Radio Club, WØSV, 401 N. 4th St., Waite Park, MN 56387; e-mail: <jmaus@cloudnet.com>; web: <www.w0sv. org>. (Exams)

Aug. 9, **Central Kentucky ARRL Hamfest**, Western Hills High School, Frankfort, KY. Contact John Barnes, KS4GL, 606-253-1178 eves; e-mail: <KS4GL@juno.com>. (Exams)

Aug. 14–15, **1998 ARRL SW Division Convention**, Town & Country Convention Center, San Diego, CA. Contact Sybil Allbright, W6GIC, 619-278-4284. (Exams)

Aug. 15, **Brantford ARC Hamfest '98**, Burford Fairgrounds, Burford, Ont., Canada. Contact Richard La Rose, VE3RLX, 519-752-2437; e-mail: <rlarose@bfree.on.ca>.

Aug. 15, **Lower Columbia ARA 7th Annual Ham Radio, Computer, Electronic Equipment Swap Meet**, Cowlitz Co. Fairgrounds, Longview, WA. Contact Bob Morehouse, KB7ADO, 360-425-6067 (evenings), e-mail: <KB7ADO@aol.com>.

Aug. 15–16, **Viking ARS 3rd Annual Memorial Hamfest & Craftfair**, Waseca County Fairgrounds, Waseca, MN. Contact Lloyd Schlaak, 507-465-8319; e-mail: <n0vfv@smig.net>. (Exams)

Aug. 16, **Tailgate Electronics, Computer & Amateur Radio Flea Market**, Albany & Main Street, Cambridge, MA. Call 617-253-3776.

Aug. 21–23, **24th Annual VHF/UHF Conference**, Harley Hotel, Enfield, CT. Contact Rae Bristol, K1LXD, 328 Mark Drive, Coventry, CT 06238 (860-742-8650).

Aug. 22, **Bridgewater NJ SCARS Hamfest**, Somerset County 4H Center, Bridgewater, NJ. Contact Pat, N2CQM, 732-873-3394; fax: 732-873-0052 e-mail: <scars@qsl.net>; website: <http://www.qsl.net/scars>.

Aug. 22, **2nd Annual Kosciusko Co. Hamfest & Computer Show**, Kosciusko County Fairgrounds, Warsaw, IN. Call Loren Melton, WB9OST, 219-858-9374 (eves) after 6 PM CDT; e-mail: <wb9ost@waveone.net>. (Exams)

Aug. 23, **Yonkers ARC Hamfest/Computerfest**, Yonkers Municipal Parking Garage, Yonkers, NY. Call John 914-963-1021 or Jim 914-969-5182.

Aug. 23, **Greater Buffalo Hamfest & Computer Show**, Hearthstone Manor, Depew, (suburb of Buffalo), NY. Call Luke, 716-634-4667; e-mail: <lcalianno@aol.com>: web site: <http://hamdate1.sunverie.edu/~larc/greaterbuffalohamfest.html>.

Aug. 23, **AK-SAR-BEN ARC Annual Flea-Market**, Millard Social Hall, Omaha, NE. Contact Dave Kline, WJØZ, 402-592-4930; <http://www.qsl.net/k0usa/>.

Aug. 23, **NoBARC 25th Annual Hamfest**, Bowe Field Fairgrounds, Adams, MA. Contact Todd Shoff, N1XWR, 413-496-8054; e-mail <n1xwr@nobarc.com>.

Aug. 29, **West Virginia State 40th Annual Hamfest & ARRL Convention**, Jackson's Mill Conference Center, Weston, WV. Call Dick Fowler, 304-623-9479; or e-mail: <WVSARC@qsl.net>. (Exams)

Aug. 29, **La Porte County Electronics Assn. Annual Summer Hamfest**, La Porte County Fairgrounds, La Porte, IN. Contact Rich Dugger, WD9ARW, 219-326-6672; e-mail: <lpcea@hotmail.com>.

Aug. 29–30, **MARC Campfest-Swapfest**, Colorado Lions Club Camp, 4 miles north of Woodland Park, CO. Call Judy, KBØWGN, 719-836-0217; or e-mail <dsrtflwr32@aol.com>.

Aug. 30, **Woodstock '98 Hamfest & Computer Extravaganza**, McHenry County Fairgrounds, Woodstock, IL. Call Bob Grosse, N9KXG, 708-944-0500; e-mail: <TCRG@quality-enterprises.com>; web: <http://quality-enterprises.com/TCRG/>.

Aug. 30, **Iowa Hamfest/Radiofest/Computer Expo**, Dubuque County Fairgrounds, Dubuque, IA. Call Jerry Ehlers, WØSAT, 319- 583-1016 <e-mail: <kb0lcj@mwci.net>; web: <http: //grarc.mwci.net/>. (Exams)

Aug. 30, **WECA Summer Radio and Electronics Hamfest**, Yonkers Raceway, Yonkers, NY. Contact Westchester Emergency Communications Assn. info-line at 914-741-6606; web: <www.weca.org>. (Handicapped accessible.)

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Really Having Fun!

Editor, *CQ*:

Buck Rogers, K4ABT, probably gets a bazillion notes like this, but let me quickly add mine.

I'm finally on packet radio. Today is my second day on packet (I've been licensed for about a year) and I'm REALLY having fun! Much of this is due to the help I've received from Buck's columns in *CQ*. Thank you!

David, N1ZHE
N1ZHE@N1KIO.FN43MG.NH.USA.NOAM

A Solid Rovering Base

Editor, *CQ*:

For those of you who ever think about operating portable to put on a new grid square, or think about operating /Rover for a contest some day, I heartily refer you to Joe Lynch's "VHF Plus" column in the April 1998 issue of *CQ*.

Members of this reflector participated in putting together the best collection of operating tips and procedures, helpful to any portable operator, that I have ever seen. Joe combined all of the reports and assembled them into what might be the best primer in print for the Rover.

There are just too many responsibilities and extracurricular activities, and too little time to learn all the different ways to have fun in ham radio, or even time to participate in all of them. How about some of you posing the right questions to give the rest of us an idea of how we who have no experience might join you? I suggest that you would be better equipped to pose the "right" questions that your fellow operators can respond to while the rest of us watch the many good tips and loads of information appear on our 'puter screens. (I've used my printer on more occasions than I care to admit collecting valuable information you guys have published on the VHF reflector.)

From Joe's column (your responses), the inexperienced portable ops learned how to power portable shacks, what kind of RF power many are running, what kind of antennas are used, and how some choose their location. This kind of information will help build a solid base for Rovering in the future. I encourage the EMEers, the HSMS folks, amp builders, DXers, transverter fans, and whatever makes this hobby more fun for you, to enlist those who share your interests and give the rest of us a variety of tips that will not only give the rest of us a chance to learn something new, but possibly open the door that we might join you.

If a significant number of you think that this kind of exchange of information is not good for the hobby, I will discontinue my appeal on the reflector. We have a lot to learn, and hope you will allow us to continue to learn some of it. If you do wish to flame me, please do it directly to me. I will respond and comply more quickly if I see a direct response. A direct response tells me that you want action, not just to be seen and heard. In this I am sincere.

Dave Bostedor, N8NQS, EN72
<vhfuhf@voyager.net>

According To My History Book

Editor, *CQ*:

I am referring to the article on page 38 of the June issue, which I read with great interest ("The Life and Times of J. Harvey McCoy, W2IYX," by Ted Cohen, N4XX). According to my history book about WW II, the meeting between Roosevelt and Churchill took place between August 9 and 12, 1941. Consequently, it must have been later than that autumn that McCoy and Beverage "began a tour of our North Atlantic bases." The list of bases also include North Cape, Norway. The U.S. never had any military bases in Norway, and in particular not in autumn 1941, when Norway had been occupied by Germany for more than a year and we remained occupied until May 1945. To include North Cape, Norway in this connection therefore must be a mistake.

I should also appreciate it if any of the *CQ* readers could give some information about whether it was only specially equipped ships that were using/watching a distress frequency between 80 and 100 kHz. To my knowledge 500 kHz were used/watched for distress purposes throughout the war by the North Atlantic convoys.

The "invention of Frequency-Shift Keying (FSK)" also puzzled me a little bit. I have in my possession a book called *RTTY from A to Z* by Durward J. Tucker, W5VU, issue in 1970 by Cowan Publishing Corp. The book is a reprint of a series of articles from *CQ* (probably started in the late '60s). I find it a little bit strange that W2IYX being the inventor of FSK is not mentioned in that book.

In the same part of the article it is mentioned that FSK remained classified until 1954. When I started my professional career as radio operator within the fixed communication area in 1953, FSK was used on short wave and had been so for several years on our fixed public telegram channel between Oslo and RCA New York via Tangier in North Africa.

Odd-G. Bigseth, LA2TD
Skogveien 23
N-1406 Ski, Norway

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Barry Goldwater was a United States Senator, a candidate for President, and—perhaps most important to amateurs—"one of us." Here's a look back at some amateurs' recollections of "Barry, K7UGA."

The Senator from Amateur Radio

BY RICH MOSESON*, W2VU

When former U.S. Senator Barry Goldwater died at the end of May, the news reports attached many labels to the man, all of them relating to his life in politics. The Associated Press, for example, called him a "Republican Icon" and an "uncompromising defender of conservatism."

As the Republican Party's candidate for President in 1964, Goldwater lost to Democratic incumbent Lyndon Johnson, but set in motion the philosophical change that shifted his party's power base from northeastern moderates, such as New York Governor Nelson Rockefeller (whom he defeated for the GOP nomination in 1964), to southern and western conservatives, such as Ronald Reagan. He is perhaps best remembered for one line in his acceptance speech at the 1964 Republican National Convention: "Extremism in the pursuit of liberty is no vice. . . . Moderation in the pursuit of justice is no virtue."

But amateur radio operators knew a different Barry Goldwater, a ham who loved to play with radios, who wasn't afraid to pick up a soldering iron, and who—during the Vietnam War—organized MARS (Military Affiliate Radio System) volunteers to staff his home station virtually around the clock to provide phone patches from soldiers in southeast Asia to loved ones at home. He was a man who moved in the highest echelons of American political life, but once he knew you were an amateur radio operator, he always introduced himself simply as "Barry, K7UGA."

The late Barry Goldwater, K7UGA, at his station in Scottsdale, Arizona. Among other notable achievements, the former U.S. Senator was responsible for passing legislation that established the Volunteer Examiner program, the Amateur Auxiliary to the FCC, and the ten-year license terms. Despite his celebrity, on the radio and in personal contacts with other amateurs, Senator Goldwater was always just "Barry, K7UGA."

Remembering Barry

We asked a variety of amateurs to share with us their recollections of encounters with Barry, both on and off the air. Virtually all of them echoed the same theme: that amateur radio created an instant bond of friendship, that we (all of us) were Barry's friends and he was our friend.

John Watrous, K6PZB, recalled a typical experience: "I worked K7UGA once from southern California, as a teenager just starting out. He treated me just like anyone else . . . nicely."

Jim Shorney, NU0C, had a similar on-the-air experience:

I had the pleasure of talking with Barry on 20 meter phone on June 6, 1988. . . . The only thing noteworthy about the contact, I suppose, was my luck that day. I had just turned the rig on and hadn't even touched the tuning dial when I heard K7UGA in QSO. I waited until they signed clear and called him, and he came right back to me. Barry was most cordial and gentlemanly, and we had a pleasant QSO about his visits to the Omaha, Nebraska area, where I grew up. I had no sense at all that I was talking to someone who moved in the most powerful circles in the world. Barry was just an "ordinary joe" on the radio. There are a few times in

*c/o CQ magazine

every ham's life, if he or she is lucky, when you get a huge rush from your hobby. My contact with Barry ranks right up there with the best of them.

There is a digitized image of my QSL from Barry on my Web page at <http://homepage.usr.com/j/jshorney/51196.shtml>.

And Lee Wical, KH6BZF, wrote:

I was in the Kaiser Hospital in Honolulu and in bed for two weeks. My XYL brought me my mail daily, and one day there was a QSL card from Barry with "Well wishes for a speedy recovery" written on it, and it was signed "Barry, K7UGA." (It just doesn't get better than that!) I don't know how he found out I was laid up, but it is one of my favorite QSL remembrances.

Instant Friends

The bond of ham radio friendship extended to in-person contacts as well. David Wilcox, KC8CC, lives in Phoenix and relates this tale of Barry at the hardware store:

I spied the thick crowd of humanity parting, as if by command. People were moving away and giving wide berth for the Senator from Arizona. It was just Barry going for a short expedition to the closest Home Depot. The crowd was whispering and averting eyes as he passed down the lumber aisle.

Having visited his shack once with a Scottsdale amateur radio tour, and having briefly met the Senator, I felt no need to slink away. Rather, I walked right up to the delighted personage and shook his hand, announcing, "Dave, KC8CC." Having a chance to exercise the natural politician's urge, he intoned "Barry, K7UGA." We slapped each other on the back and grinned, although he could not have remembered me. We then proceeded to talk about propagation and the weather. Glancing over his shoulder, the patrons of the store were watching it all from afar with wide eyes. Not required. . . . Barry was a people person, especially with other hams.

A similar experience was recalled by Kent Tiburski, WA6TBO. However, his encounter with Barry was at a 4th of July parade:

Many years ago when I was on active duty in the Navy and assigned to Navy Recruiting District San Diego Public Affairs, I was introduced to Senator Goldwater. I was at a parade on the 4th of July, 1983, in Showlow, Arizona, where the state's largest 4th of July celebration took place. I was driving a 40-foot flatbed tractor-trailer carrying an aircraft carrier mockup built of plywood.

The parade participants were at a park in the staging area prior to the parade and I spoke with the parade military coordinator and asked if there was a chance of being introduced to the Senator if it wasn't a problem. Minutes prior to the parade, Skip Peabody (the military coordinator) came over with Senator Goldwater and said, "I've had a young man wanting to meet you." Senator Goldwater, hand outstretched, introduced himself as Barry Goldwater. I shook his hand and instead of giving him my entire name, I introduced myself as "Kent, WA6TBO." He smiled widely and said, "Barry, K7UGA." I was pretty excited and we began to talk about

A Farewell

Here is the full text of the ARRL Bulletin announcing the passing of former Senator Barry Goldwater, K7UGA:

QST de W1AW
ARRL Bulletin 39 ARLB039
From ARRL Headquarters
Newington CT May 29, 1998
To all radio amateurs

SB QST ARL ARLB039
ARLB039 Sen Barry Goldwater,
K7UGA, SK

Former US Senator, one-time presidential candidate, and noted radio amateur Barry Goldwater, K7UGA, died May 29. He was 89. Goldwater had suffered a stroke in 1996 and had been in failing health.

A staunch conservative, Goldwater was the 1964 Republican presidential nominee and served five terms in the US Senate. He also authored the book *Conscience of a Conservative*. Goldwater retired from politics in 1986. His home was in Scottsdale, Arizona.

As a Senator, Goldwater's legacy included several pieces of Amateur Radio-related legislation. In 1964, Goldwater's bill to allow reciprocal operating agreements between the US and other countries was signed into law. It was his work on the bill that prompted the Arizona Senator to renew his interest in ham radio after a long absence.

Goldwater's 1964 presidential campaign tried to tap into his ham radio connections with a "Hams for Barry" fundraising effort. He took time out of the campaign to address the ARRL National Convention in New York City, on the occasion of the League's 50th anniversary. In his remarks, Goldwater reminisced about his youthful foray into Amateur Radio as 6BPI. He was first licensed in 1921, and joined the ARRL in 1923. "You can't imagine what a relaxation ham radio is for me," the campaign-weary Goldwater told the gathering. He related how, during the GOP Convention earlier that summer, he'd made several hundred contacts from his hotel room using a borrowed Collins S-line. The convention presented Goldwater with a certificate of appreciation for his work on behalf of the hobby (see *QST*, Oct. 1964, p. 80). Goldwater lost the 1964 election to Lyndon Johnson.

While serving as chairman of the Senate Communications Subcommittee in 1981, Goldwater introduced landmark legislation proposing several changes to the Communications Act affecting amateurs. In 1982, Congress finally approved and President Reagan signed what came to be known as the Goldwater Amateur Radio legislation, enacted as Public Law 97-259. The measure established the Amateur Auxiliary and the volunteer examination programs, permitted 10-year license terms, and exempted Amateur Radio from the secrecy provisions in the Communications Act. The Goldwater bill also ended years of Congressional wrangling and authorized the FCC to set RFI susceptibility standards for home electronic devices.

A year later, President Reagan signed into law a bill including a Goldwater amendment that allowed the recovery of costs in the Vol-unteer Examiner program (the FCC didn't au-thorize the plan until months later, however).

At one point in his ham radio career, Goldwater operated as K3UIG from his Senate office and as K7UGA when he was home in Arizona. He called his Arizona ham shack "bash-hal-ne-ae," which he said was Navajo for "music from iron" or "metal that talks."

Goldwater was a life member of the ARRL. He was elected president of the Quarter Century Wireless Association in 1971. A pilot during World War II, he held the rank of General in the Air Force Reserve and was an active member of Air Force MARS. During the Vietnam war era, Goldwater handled hundreds of thousands of phone patches. He also held a pilot's license and occasionally operated aeronautical mobile.

In 1983, Amateur Radio paid homage to Goldwater as "its governmental protector and advocate" by establishing the $5000 ARRL Scholarship to Honor Barry Goldwater, K7UGA. In announcing the scholarship, then-ARRL Washington Area Coordinator Perry Williams, W1UED, said that Goldwater's Amateur Radio involvement had "brought joy to thousands of members of the armed services stationed overseas, and through his professional career, he has exemplified the principles of commitment and service to one's country and fellow citizens."

Then-FCC Chairman Mark Fowler said the Amateur Radio community was lucky to have Goldwater as its "elder statesman" in government and noted that the FCC often had Goldwater review ham-related proposals before it took action on them.

The Goldwater scholarship, administered by the ARRL Foundation, is awarded each year to a deserving radio amateur to encourage a spirit of achievement and dedication in the field of communication.

ARRL Executive Director David Sumner, K1ZZ, said that of amateurs in the public sector, Goldwater was "without peer." Southwestern Division Director Fried Heyn called Goldwater "a super ham" who was "concerned about the future of Amateur Radio."

Goldwater's first wife, Peggy, died in 1986. The couple's two sons and two daughters and Goldwater's second wife, Susan, are among his survivors.

radio. It seemed like a long time before the parade coordinator said it was time to get me staged inline. I said goodbye to Barry and went back to my vehicle.

Just as I started the engine, he was at the passenger side window asking, "Can I ride a little ways with you?" You can be sure what my answer was—YES! We continued to talk about radio. I asked him about MARS and the station he ran during the Vietnam war, running countless phone patches back to the States. We chatted for about 20 minutes before he had to leave and I took off in the parade.

It was a unique experience for me. I returned that next week from my trip to be greeted by a "thank you" letter from the Senator sent via my Commanding Officer. Barry Goldwater was an interesting man and a pleasure to converse with, and will be missed by many of us.

Washington Contacts

Gabe Romero, K7NOK, is a TV news cameraman in Washington. His job brought him into contact with the Arizona Senator several times over the years. His recollections:

First came across the man on film at the projection room at ABC when he held a news conference outside the White House saying he had just talked to Nixon and he was a goner; he should quit. That was Goldwater, no BS about him.

Second memory: I was shooting (TV talk for filming or taping) a Senate Armed Services committee of which he was chairman, believe it was with the Joint Chiefs and Secretary of Defense. On a whim, I went up to him before he gaveled it to start and whipped out my "new" ICOM µ4 A/T. We talked for 10 minutes as he played with it, brought up our repeater, the patch. All the while the senators and witnesses were waiting to start. Had his priorities straight.

Third memory: You would never forget if you ever saw his car—radios ranging from low band to aircraft to CB to VHF telephone to 2-meter. All kinds of gauges, even a temperature gauge on his exhaust pipe—well, he was a pilot after all.

Final memory: We were chasing him across the street as he walked from the Senate to his office in the Old Senate Office building. The reporters were shouting, "Tell us, Senator, are you going to run again?" To which he gruffly replied, "No, Goddamm it! I'm too old!" And off he went. That was Barry, telling it like it was.

We need more of his kind back here.

Gabe wasn't the only amateur who found that Barry was a ham first, Senator second. Neil Lauritsen, KA3DBK, relates this story:

My "elmer" told this story to me in 1979 while I was studying for my novice exam. My "elmer" worked as a lawyer to the Senate and belonged to the Senate Office Building Ham club *(W3USS—ed.)*. Senator Goldwater slipped up to the club station whenever he could and was as always the consummate ham.

One day, Senator Goldwater noticed an antenna coax which appeared to need finishing off with the installation of an SO-239 connector and set immediately about that task. And when he finished the soldering job, he cleaned up the antenna run by cutting the few extra feet

The QSL card of the late Senator Barry Goldwater, K7UGA.

off the cable to make it neater in appearance. Senator Goldwater, having completed his good deed, then left the shack and was returning to his own offices as my "elmer" returned from the roof—trying to figure out how he had ended up a few feet short of the coax run he had so meticulously measured a short time before! It wasn't until he went back into the shack and saw the neatly-soldered connector that he realized what had happened. My "elmer," being the good lawyer that he was, and in appreciation of the Senator's efforts, never had the heart to mention it to him. We will miss this good friend to amateur radio.

A Good Friend to Amateur Radio

K7UGA was not only a friend to amateurs as individuals, but an influential friend to the hobby of amateur radio as well. In fact, he came to be known to many as "The Senator from Amateur Radio." The ARRL bulletin announcing Goldwater's passing (see full text elsewhere in this article) quoted former FCC Chairman Mark Fowler as saying that the Commission had often asked the senator to review amateur-radio-related proposals before it acted on them. And Barry was directly or indirectly responsible for the Volunteer Examiner program, ten-year license terms, and the Amateur Auxiliary to the FCC, all of which were included in a bill—now a law—that also gave the FCC the authority to get tough with home-entertainment equipment manufacturers in RFI (Radio Frequency Interference) matters. Longtime amateur and *CQ* author Ted Cohen, N4XX, who was involved in the effort to get that legislation passed, told us:

In the early 1970s, Vic Clark, W4KFC (SK), and I formed the ARRL RFI Task Group. One of the early actions I took was to write an RFI Bill for submission to the House of Representatives (and, eventually, to the Senate as well). The purpose of the bill was to place the burden of fixing RFI problems on the manufacturers of electronic home entertainment equipment (it gave the FCC the authority to require that circuitry be included in equipment designs to reduce the susceptibility to RFI). The bill I wrote was introduced by Congressman Teague of Ohio into several sessions of the House. Later, other Congressmen introduced the legislation. But it wasn't until the 1980s, when Barry put his weight behind it, that the bill was passed into law. Regrettably, while the FCC never was up to the challenge of exercising the provisions of the legislation, they are on the books and, someday, may even be applied. Regardless, we owe a debt of gratitude to Barry for pushing this through on our behalf.

Barry also provided significant support for the amateur satellite program, according to the AMSAT News Service:

Senator Goldwater was a longtime friend of AMSAT, having appeared in a number of ARRL and AMSAT-sponsored videos about satellites over the years. In the early stages of the Phase 3-D effort, he appeared with Roy Neal, K6DUE, in an AMSAT-sponsored fund-raising video for the project. The video was filmed in his well-appointed "shack" at his home in Scottsdale.

"I had the good fortune to be there with the Senator during the filming of portions of our video," said Keith Baker, KB1SF, AMSAT-NA's Executive Vice-President. "He was genuinely enthusiastic about what the Phase-3D satellite would offer to the world's radio amateurs, and that enthusiasm really showed in his on-camera comments. There is no doubt in my mind that we have now lost one of our most ardent supporters of amateur radio, Phase 3-D, and AMSAT," said Keith.

And Len Winkler, KB7LPW, host of the now-defunct "Ham Radio and More" radio

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CIRCLE 130 ON READER SERVICE CARD

program, recalls that Barry had no patience for restrictive antenna ordinances:

As the host of "Ham Radio and More," I had the honor and pleasure to interview Senator Goldwater on two different occasions, two hours at a time. As well, I had the pleasure of being at his home many times, and brought many students and others to his shack for an unbelievable historical experience. *(Len lives in Arizona.—ed.)*

Many of his remarks were priceless. One thing I particularly remember was his response to my question about what we hams can do about all the antenna restrictions in the new housing developments. The Senator responded, "I believe anything from the roof of my house to Heaven is free open space. I want to see somebody remove my antenna." (You can listen to one of these interviews at <http://www.tapr.org/hrm/hrmdigital.html>.)

He was truly a great man, and will be sorely missed.

Barry Behind the Scenes

But perhaps Barry's greatest contribution was the one he spoke least about—his efforts during the Vietnam war that resulted in hundreds of thousands of phone patches being placed through the MARS station in his home between soldiers, sailors, and airmen overseas and their loved ones at home.

Art Goldman, WA3CVG, provided us with the following story from a non-amateur friend of his:

I attach a story related to me by a co-worker, Al Hamilton. Al is not, and was not a ham, but as the story relates, he accompanied his friend Dwight, who was. Al often manned positions at the K7UGA MARS station with Dwight. I have enjoyed these stories on other occasions, and thought your readers would also.

73, Art, WA3CVG

From Alan Hamilton:

During the late 70s, it was my pleasure to be associated with a member of the MARS radio club established by Senator Barry Goldwater in Tempe, AZ. My access to the club was through a Mr. Dwight Pringle, whom I met while working as a government representative on a contract performed by Motorola, Mr. Pringle's employer. On each Thursday evening, Mr. Pringle would man the station and provide phone patches to Stateside locations for servicemen on duty in Southeast Asia. I went along whenever I was in town.

Because Senator Goldwater did not want to capitalize politically on this generous gift he was making, there was a standing rule that no one was to be told from where the phone calls originated or who was responsible for providing the service. While I never met the Senator personally, his spirit was always present in the radio room. His annual Christmas present to the men and women involved was there were no phone charges to the recipients of the calls during the weeks around Christmas and New Year's. His generosity also extended to the men and women who manned the station as well, as he provided soft drinks and coffee for all the operators year around.

One of the most poignant examples of the service provided by Senator Goldwater's radio club was related by Mr. Pringle. It was one of those Thursday night sessions when he was working the station alone. During the course of his shift, the caretaker at the Goldwater home notified Dwight that a woman was at the gate and wanted to speak to the "radio man." Despite all precautions, this local woman knew that there was a MARS station at Goldwater's and that she had received a call from her husband over its facilities. Because she was in a very distraught state, Dwight agreed to speak to her. She produced a telegram that indicated that her husband had been wounded and was being flown to Japan for treatment. Her plea was whether there was any way the "radio man" could find out what was going on.

Doubting the possibility of success but recognizing her concern, Dwight called the net and was able to contact the station at Ton Son Nhut. Relaying the situation, the identity of the individual, and his parent outfit, Dwight asked if there was any way to get further information for the wife. After some period of time, the distant end called to advise that there would be a need to "wait one" while they set up a link. Imagine the joy felt by the woman when she was able to speak to her husband from his stretcher before he was loaded on the aircraft to fly to Japan.

The link was HF to Vietnam and then VHF-FM via a PRC-25 to the flight line. How they found the party involved, got the link established, and then were able to interconnect the two was never defined. Suffice it to say that the lady left the radio room with the knowledge that her loved one was alive and had a good prognosis. As for Dwight, he could never tell anyone that story without getting emotionally tied up. As for me, I just never asked any more questions about how it could have occurred but accepted it as fact and put it away in my memory of stories from AFA7UGA *(Barry's MARS call—ed.)*.

And Finally . . .

To end this remembrance on a somewhat lighter note, but still one which illustrates Barry's essential humility, we conclude with this note from Stephen McCallum, W2ZBY:

I had a brief 75-meter QSO with K7UGA shortly after he lost the election in the '60s. The conversation has always stuck in my mind. After I told him my name and occupation (publicity writer for GE), he said, "My name is Barry. I'm unemployed." I didn't have the guts to tell him I knew very well who he was and why he was "unemployed."

Even those of us who never knew "Barry, K7UGA," should be aware of his importance to our hobby in the second half of the 20th century. And we should all wish him "73." Amateur radio has lost a very good friend. Thank you to all who contributed to this article.

(Note: Due to the historical importance of the topic, this article also appears in the August issue of CQ's sister publication, CQ VHF.*)* ■

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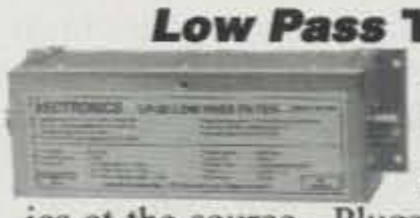

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CIRCLE 157 ON READER SERVICE CARD

Most of us only dream of the perfect amateur radio location, state-of-the-art equipment, and ultimate antenna system. A few of us achieve those goals, and the rest of us bask in the glow of those "if only" dreams and imagine what it would be like to have and operate such a station. Even if we can't do it ourselves, it's nice to see and read about those who can. This month we can follow the ten-year odyssey of Ivor Greenwood, GIØAIJ, as he fulfills his dream.

The GIØAIJ Antenna Farm

It Took Ten Years To Harvest A Bountiful Crop

BY DICK WEBER*, PE, K5IU

As Ivor was reading his August 1986 issue of *CQ*, an idea began to form in his mind. Within a few minutes that idea had turned into a firm goal, a goal that would consume all his free time for the next ten years and result in one of the most impressive amateur radio antenna installations.

What Ivor read was an article by Bob Mitchell, N5RM, called "The TH28." In this article Bob described his 145 foot rotating tower that used four stacked TH7s. Bob covered construction of his tower and its components, his decision process during its design, and the resulting performance. After reading N5RM's article, Ivor decided he had to have a rotating tower with stacks. If fact, he decided to have at least two rotating towers.

With this decision made, Ivor set into motion a series of events that required tremendous effort and commitment. From the time Ivor read N5RM's article until his first rotating tower was operational and on the air was almost exactly ten years.

After Ivor decided to build one or more rotating towers with stacks, there were several immediate problems he had to face. The first major problem was that he lived in Belfast City with room only for simple wire antennas. Therefore, he began looking for a QTH suitable for a several towers, a house, and a facility to house his race-engine building business. After considerable searching, he bought 20 acres in Dundrod. For the next seven years Ivor spent his time building his house, building his race-engine facility including complete machine shop and engine dynamometer, and putting up two self-supporting towers to be able to get on the air. All this time Ivor was gathering information on beams, stacking combinations, towers, feedline types, material and part availability, and antenna designs. Ivor was able to meet with many amateurs in the states while on business trips and during his almost yearly trips to the Dayton Hamvention. Many hours of discussion with K3LR, N4AR, KN8Z, WX8T, W6NL, WA8OSE, and K4TO resulted in good insight into what obstacles lay ahead. With the house and engine facility built it was now time to focus on building beams and the first rotating tower for 40 and 20 meters.

GIØAIJ and GI4WXA machining parts for beams.

Tim Duffy, K3LR, played an initial role by suggesting a stack of three or four 20 meter monobanders along with two 40 meter monobanders on a 210 foot rotating tower. He also suggested another set of stacked monobanders for 10 and 15 meters on a second rotating tower. The first goal was to get the 40/20 system built.

With this in mind, things began to accelerate. An initial design for the 20 meter monobanders was suggested by Bill Maxson, N4AR. Bill's design was optimized and finalized by Dave Leeson,

*P.O. Box 44, Prosper, TX 75078
<dickrts@texoma.net>

← GIØTHZ and K5IU sighting the tower.

GIØAIJ with 40 meter beam under test. ↓

W6NL. Although things were beginning to move in a positive direction, Ivor did not have a tower in place, much less a rotating tower. This lead to the first of a large number of phone calls and letters between Ivor and me. I remember coming home one night after work and having my wife tell me I had a phone call asking about information on building a rotating tower. Since I've been building rotating tower hardware for the past twelve years through Rotating Tower Systems, Inc., phone calls like this happen weekly. However, I was surprised when my wife told me the caller was from Northern Ireland.

After a several phone calls, Ivor and I came to the conclusion that importing Rohn 55G tower sections and my components would be cost prohibitive due to import duties and shipping. Since Ivor has a complete machine shop and welding facilities, we agreed that he should make his own guy wire bearings and base unit using my designs, but modified for the type of locally available tower. At this time the big pieces of the puzzle were falling into place and efforts went into high gear. But due to the pace of events and personal schedules, some last-minute design and fabrication work done was done when the antennas were installed during July of 1996. More on this later.

With drawings and photos in hand, and the untiring help of friend Fred Shaw, GI4WXA, Ivor built four guy wire bearings and a rotating base unit to be used with a tower built by GMT Towers in England. Over several cold December 1995 winter days with intermittent snow, the tower was put up. During this period parts and elements for the 20 meter beams were built in an assembly-line fashion with Ivor and Fred working long days for several weeks. Also during these efforts the design of the 40 meter beam was completed and its parts were put into the GIØAIJ/GI4WXA manufacturing queue.

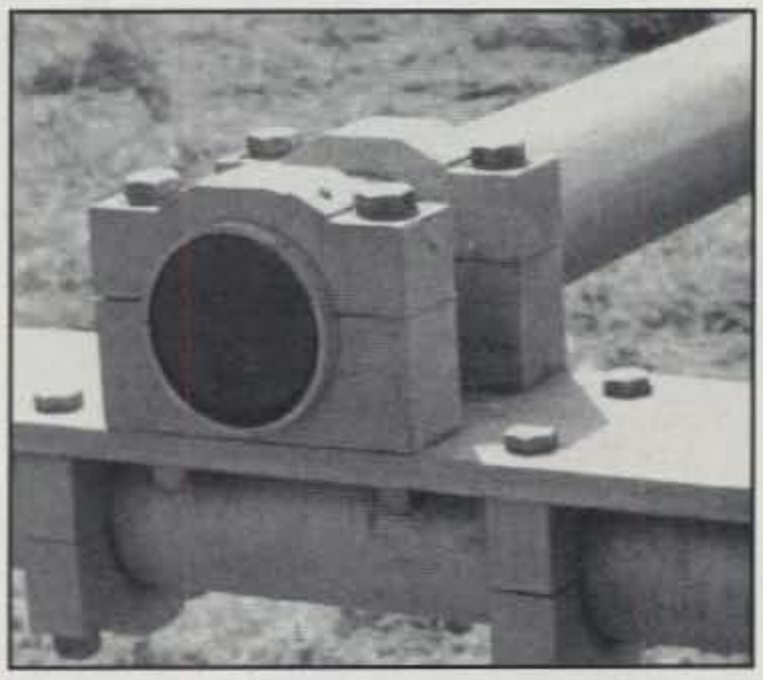
Over the spring months and into early summer of 1996, booms were built and beams were assembled in anticipation of the day when the antennas would be mounted on the tower. Putting full-size 3-element 40 meter beams with 40 foot booms weighing 350 pounds and 48 foot boom 5-element 20 meter beams on a 210 foot tower was seen as a no small job, but was eagerly anticipated nonetheless. However, there was yet no target date to install the antennas on the tower.

During mid-June a plan for the last phase quickly came together. I made plans to travel to Ivor's for a week to help with antenna installation and to work on the final mechanical and electrical design issues. Ivor decided to take a two week holiday from building race engines to be able to get things in ready for the week I was going to be there. Although retired, GI4WXA made sure he'd be able to help out during that time. John Cairns, GIØNNK, and Harry Bonner, GIØTHZ, made work arrangements to be able to help out as much as possible.

Finally it looked as though the end was in sight. Ivor rented a theodolite that we would use to align his tower. He also made arrangements to use a construction bucket lift that could extend to 60 feet. This turned out to be an invaluable asset. Other preparations were made, including building a two-wire sled system to take the beams up the tower, building an electric capstan winch system to pull the sled up its supporting wires, making arrangements with a local farmer to borrow his tractor to be used as an anchor point for the sled wires, and finishing a few last parts for the beams.

During this time I got Ivor copies of NEC-WIN (NEC2) and the latest version of YO to do the final design of the matching systems and to evaluate different stacking designs. I also made copies of numerous programs I've written for use in my consulting business for guy wire system design, for determining structural section properties, for wind balancing structures, and for structural analysis and buckling predictions. A special application finite element analysis structural program to handle statically indeterminate structural problems was thrown in for good measure. It was getting to the point I was afraid customs would think I was smuggling software judging by all the disks I'd be carrying. In addition to these items, Ivor gave me a list of hardware items to bring with me in my luggage. These would be needed when we did the final assembly of the antennas.

After a flight from Dallas to London and then on to Belfast, I was relieved that I didn't have to explain to authorities why I had dozens of disks, several hundred feet of Phillystran, grease fittings, cans of butane fuel, and tower-climbing boots in my suitcase, but almost no clothes.



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The FT-847 changes base station operation forever. Now, three radios in one--HF, VHF/UHF, satellite; technology in its finest application, from the world leader in amateur communication.

With its unequaled combination of features, like DSP filters—notch, NR and BPF, built-in 6-meter, voice monitor, separate sub-band dial, Shuttle Jog dial, Smart Search, and digital meter, the FT-847 is the only radio of its kind! Exclusively for satellite work, 19 memories exceed any other radio. For performance, power-up with 100W for HF/6-meter, and 50W for 2-meter and 430 MHz. Additional "must-haves" include cross-band full duplex, normal/reverse tracking, CTCSS and DCS encode/decode, and direct keypad frequency entry. Plus, the FT-847 is 1200/9600 bps packet-ready.

Take the next step in all-band performance and take home the FT-847 today!

Only one transceiver gives you all mode operations on HF/50/144/430 MHz with full Satellite capability.

NEW Yaesu Patented Design

ATAS-100

Active Tuning Antenna System

Designed for the FT-847. Works on 7/14/21/28/50/144/430 MHz Amateur Bands for mobile operation.

YAESU

Choice of the World's top DX'ers

For the latest Yaesu news; hottest products, visit us on the Internet! http://www.yaesu.com

2m/70cm Mobiles **FT-2500M/FT-7400H**

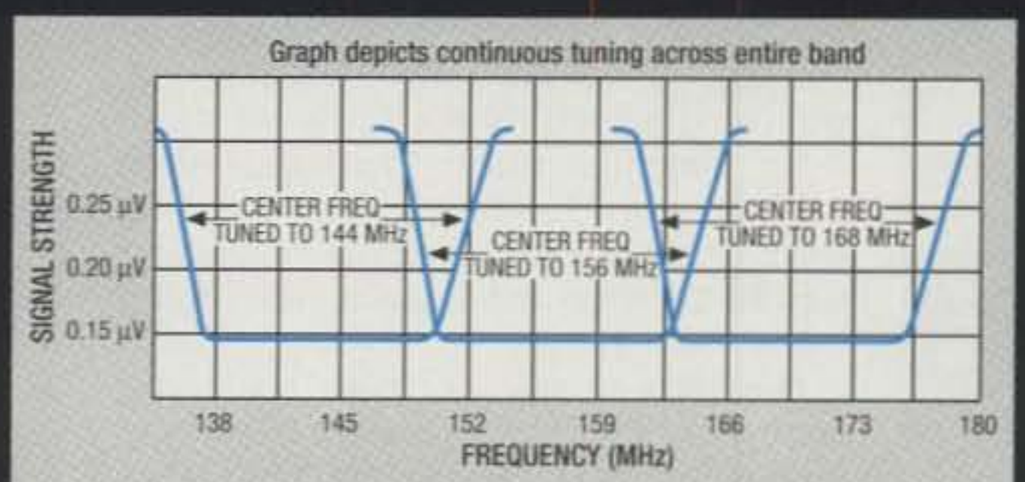
Advanced Track Tuning, Mil Spec, true FM. All in one radio!

Outside, you can easily see why the FT-2500M stands up to the shock and vibration like no other. We engineered the first mobile radio to meet the rigid standards set by the U.S. Military back in the '80s, and that same critical design is in the FT-2500M. From the simplified front panel, rubber coated knobs, durable pebbled finish coating, and huge Omni-Glow™ display to the one-piece die-cast chassis, the FT-2500M can take whatever you throw at it!

Inside, the electrical circuitry meets standards so uncompromising the FT-2500M can respond like no other radio. Built-in 3-Stage Advance Track Tuning (ATT), automatically retunes from 140 to 174 MHz permitting consistent receiver sensitivity across the entire band.

But there's more. Like alpha-numeric display capability! Lets you program a frequency or a 4-character name on any of the 31 memories. With three selectable power output levels and up to 50 watt power output, the FT-2500M extra large heat sink means forced air cooling is not necessary. And, as a bonus, Yaesu's exclusive backlit DTMF mic comes with every FT-2500M.

Experts say the FT-2500M is the only commercial-grade amateur radio available. So, for tough manufacturing standards, inside and out, with true FM clarity, and outstanding performance, the FT-2500M is your mobile.



3-Stage Advance Track Tuning (ATT) – The exclusive 3-Stage Advance Track tuning front end automatically adjusts band width sensitivity across the entire receiver range, while maintaining selectivity specifications. ATT significantly reduces interference from inter-modulation and front end overload.

Specifications

- **Frequency Coverage:**
  FT-2500M
  RX: 140-174 MHz
  TX: 144-148 MHz
  FT-7400H
  RX/TX: 430-450 MHz
- Rugged Military Spec Design
- Advanced Track Tuning (ATT)
- Selectable Alpha-Numeric Display
- Omni-Glow™ Display, largest available
- Power Output:
  FT-2500M 50/20/5 Watts
  FT-7400H 35/15/5 Watts
- Flip Up Front Control Panel hides seldom used buttons
- Backlit DTMF Mic
- 31 Memory Channels
- CTCSS Encode Built-in
- Automatic Power Off (APO)*
- Time-Out Timer (TOT)*
- Manual* or Automatic Backlighting Adjustment
- **Accessories:**

FP-800	20 Amp HD Power Supply w/ Front Mounted Speaker
FRC-6	DTMF Paging Unit
FTS-17A	CTCSS Decode Unit
SP-4	External Mobile Speaker w/ Audio Filters

*FT-2500M

YAESU

Performance without compromise.℠

"Just look inside. Military spec really means something to Yaesu!"

"A QST review says 'the FT-2500M exhibited superior 10 MHz offset IMD dynamic range of 103 db!' "

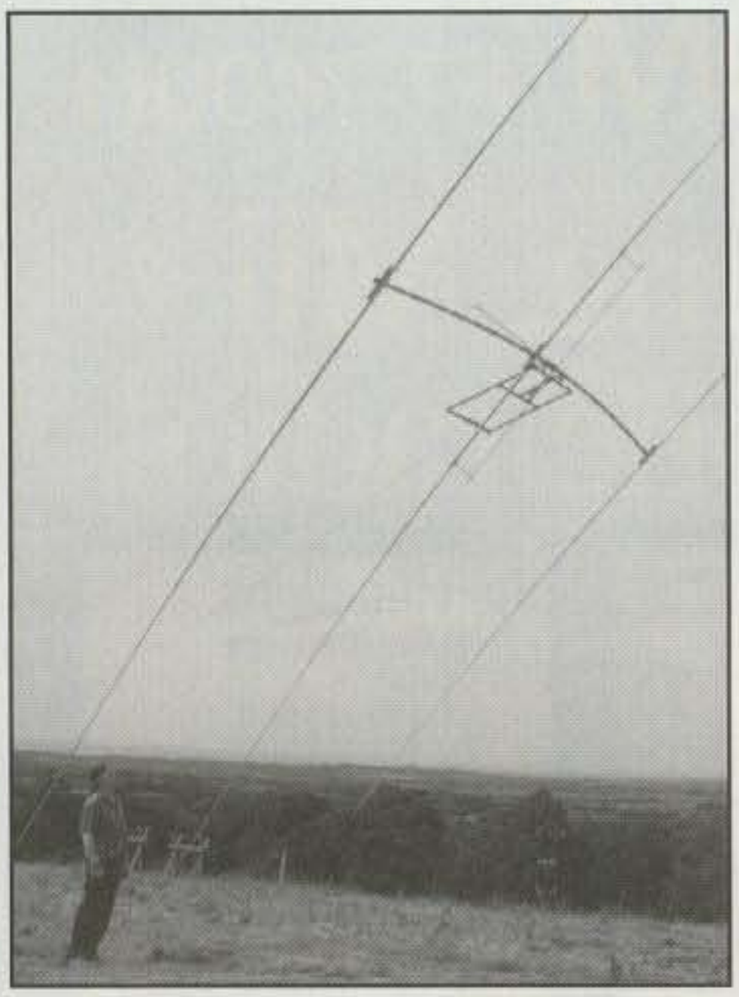
"This Advanced Track Tuning practically eliminates intermod!"

"Yaesu did it again."

US MILITARY APPROVED MIL-SPEC 810

FT-3000M

High-Powered 2-m FM Transceiver
Feature-rich, 70 full watts of TX power, and built to the tough performance standards you've come to expect from Yaesu.
FEATURES • Frequency Coverage Wide Band Receive-- RX:110-180 MHz, 300-520 MHz, 800-999 MHz* TX:144-148 MHz • AM Aircraft Receive • MIL-STD 810 Rating • Interactive Programming • High Power Output: 70 Watts, plus 50, 25 and 10 Watts • Quick-Touch™ Dual Concentric Control Knob • Twin Cooling Fans • ADMS-2 Windows™ Programmable • Digital Coded Squelch (DCS) • 81 Memory Channels • Auto Range Transpond System™ (ARTS™) • 1200/9600 Baud Packet Compatible • Smart-Search™ • Alphanumeric Display • Dual Watch • Full line of accessories
*800 MHz Cellular blocked



GIØTHZ carefully directs sled operation.

After meeting Fred and Ivor at the Belfast City Airport, I was given a quick tour of Belfast as we made our way to Dundrod. Well before turning onto Tully Rusk Road on the way to Ivor's house, his 210 foot tower could easily be seen in the distance. At first I thought my eyes were playing tricks on me due to being awake for the past 36 hours, only to find out that the tower was, indeed, not straight. In fact, the top 100 feet was offset from the lower part by about 3 feet. Ivor and Fred explained that the tower had been put up in a snow storm and had not been straightened at that time. After arriving at Ivor's house, we spent quite a bit of time looking at the beams, taking a detailed look at the tower, and settling in for the full week of work ahead of us.

The first evening was spent making plans for the coming week and loading software. Our plans included: straightening the tower, completing the assembly of the 20 meter and 40 meter beams, figuring out guy clearances and potential stacking arrangements, running YO to do a last-minute check on the beams and matching systems, using NEC-WIN to evaluate the performance of alternate stacking arrangements over real ground, doing a complete structural analysis of the tower for different stacking configurations to make sure the tower could handle the loads under extreme wind conditions, making up coaxial lines including 1/2-wavelength lines for the 40 meter beam 4:1 T matches, making modifications to the sled, tuning all beams before putting them on the tower, aerodynamically and weight balance the beams, and doing many more things.

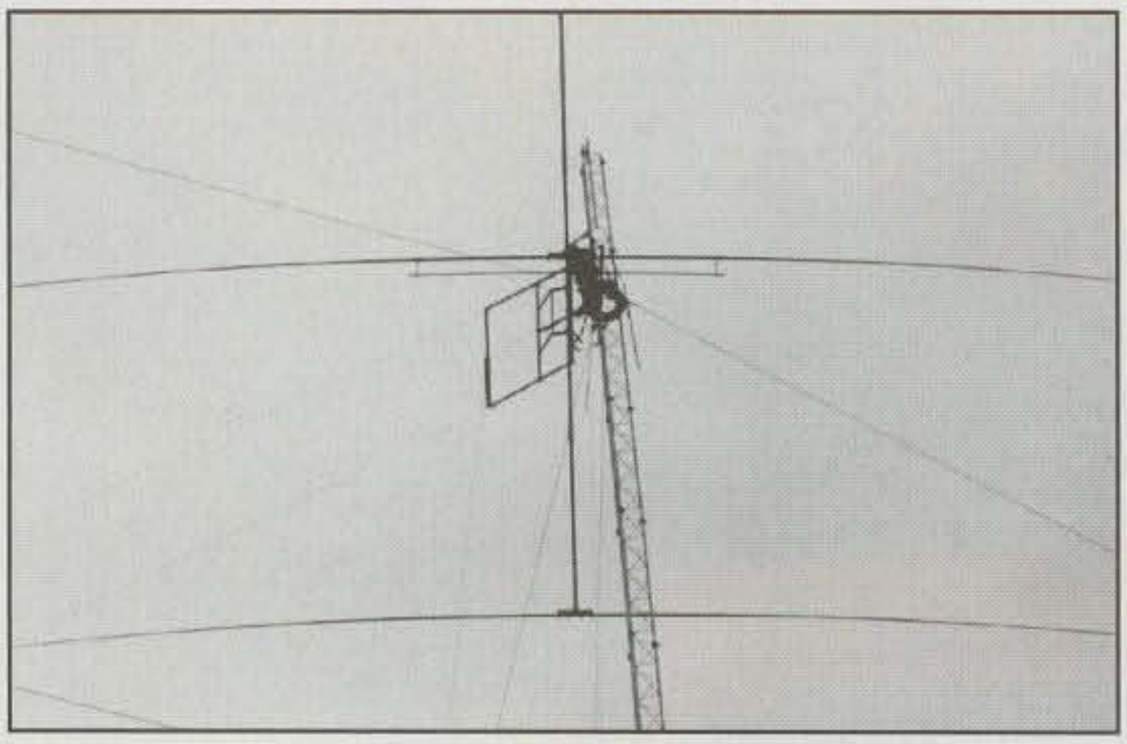
Needless to say, our plan included a seemingly impossible amount of work to do over the next six days. By the time we completed planing the week, it was well past 1 o'clock in the morning. It was time for bed.

It took us the better part of the first day to straighten the tower using the theodolite to check its straightness. With that done we then used the theodolite and some complicated trigonometry to determine the amount of guy clearance at potential antenna mounting locations. That evening well past 1 AM again, we ran NEC-WIN and did structural analysis of the tower to decide on the stacking configurations that gave the best overall performance on both 20 and 40 while being structurally sound. The final configuration had 40 meter beams at 198 and 98 feet with 20 meter beams at 140, 98, and 55 feet. The next several days were spent completing assembly of the beams, setting their matching networks, and testing them.

Testing the beams was made almost painless using the construction bucket lift Ivor had rented for the week. After each beam was completed, it was bolted to the top of the bucket and raised to about 60 feet in the air. Once up, we measured the VSWR. All three 20 meter beam beta matches were set correctly the first time using the settings given by YO. We made no adjustments to these beams at all. The one thing we did while running YO was to be sure we used accurate lengths for the wires from the ferrite bead current balun to where they attach to the beta rods. (I had learned the hard way several months before about the importance of this.) At first, we had problems getting the 40 meter beams adjusted until several hours later John, GIØNNK, found an instrumentation problem. With the problem fixed we now found that the two 40 meter beams were only off 35 kHz from where we wanted them. We saw this as a major triumph for the design methodology we used to set the driven element and T-match dimensions.

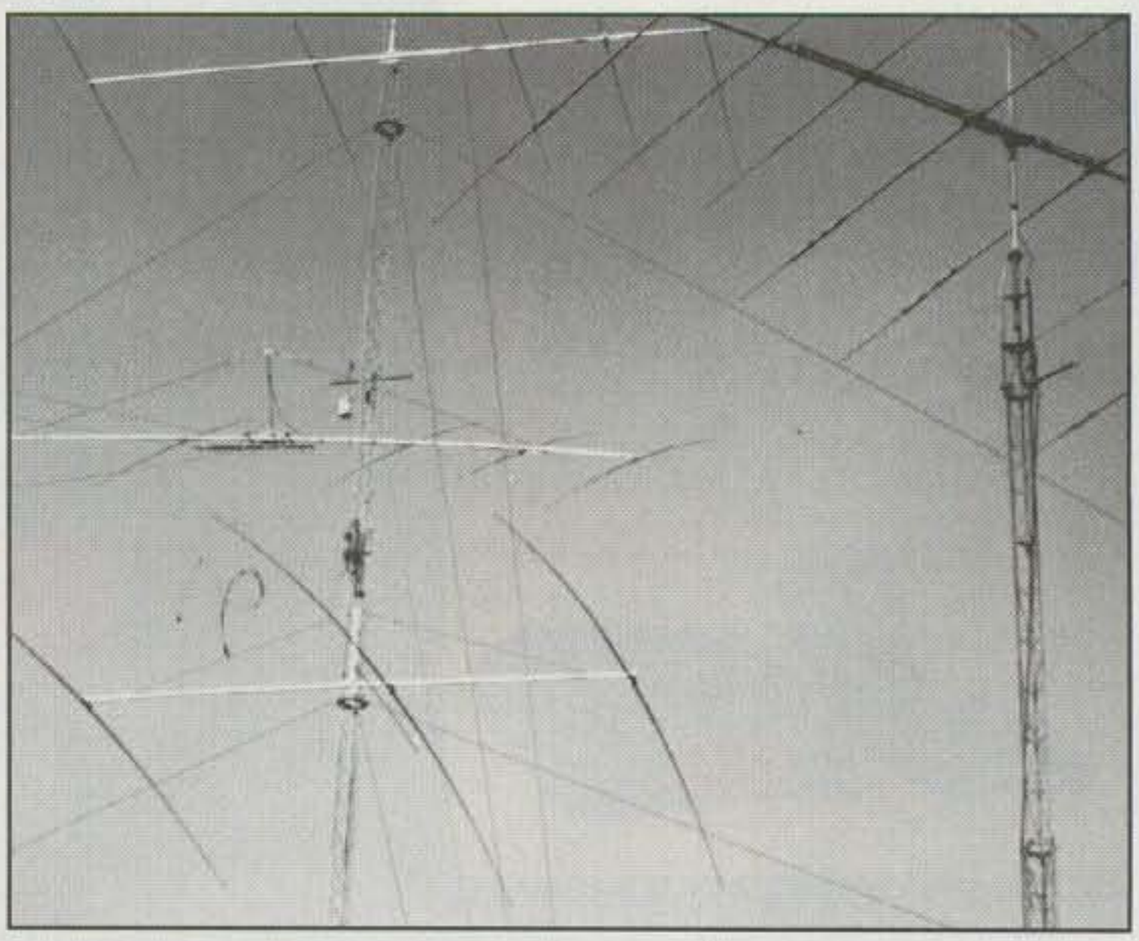
YO was used to find the T-match dimensions for the 40 meter beams, although it doesn't account for the effective change in the driven element diameter due to it being parallel and connected to the tubes of the T match. To get around this we used data from 20 meter and 17 beams I had built earlier that year which used T matches. We scaled the amount of required element lengthening to 40 meters and just about hit it perfectly. Hitting it so close the first time was part luck, as others who have scaled from my data have missed their desired minimum VSWR frequency by 50–100 kHz. Regardless, we were very happy that we didn't have to spend a lot time tuning beams.

With the electrical tuning complete, we aerodynamically balanced the beams. We also had to add weights inside the booms to bring the antennas into weight balance. We did this because the boom locations we used to mount the antennas



↑ *Forty meter beam being transferred to tower.*

GIØAIJ awaits second 20 meter beam. →



AMERITRON . . . 800 Watts . . . $795

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

AL-811H
$795
Suggested Retail

AL-811
$649
Suggested Retail

Only the Ameritron AL-811H gives you *four fully neutralized* 811A transmitting tubes. You get absolute stability and superb performance on higher bands that can't be matched by un-neutralized tubes.

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.

A *quiet*, powerful computer grade blower draws in plenty of cool air. It *pressurizes* the cabinet and efficiently cools your 811A tubes. Our air flow is so quiet, you'll hardly know it's there -- unlike noisy, poorly chosen blowers.

You also get efficient full size heavy duty tank coils, full height computer grade capacitors, heavy duty high silicon core power transformer, slug tuned input coils, operate/standby switch, transmit LED, ALC, dual meters, QSK compatibility with QSK-5 plus much more.

AL-811 has three 811A tubes and gives 600 Watts output for only $649.

Kilowatt Amplifier

AL-80B
$1249
Suggested Retail

Full kilowatt PEP output from a whisper quiet compact desktop linear Only 8½x14x15½ inches. Plugs into nearest 120 VAC outlet. All bands 160-15 Meters, 1000 watts out on SSB, 850 watts out on CW, genuine Amperex 3-500ZG tube has graphie plate, nearly 70% efficiency, inrush current protection, multi-voltage tranformer.

NearLegalLimit™ Amp

AL-572
$1395
Suggested Retail

New class of *Near Legal Limit™* amplifier gives you 1300 Watt PEP SSB power output for *65%* of price of full legal limit amps! Four rugged *Svetlana* Russian 572B tubes. Instant 3-second warm-up. Plugs into 120 VAC. Compact 8½Hx15½Dx14½W. 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.

AMERITRON HF Linear Amps with Eimac™ 3CX800A7

AL-800H
$2295
Two tubes
1500 Watts plus

Suggested Retail
Call your dealer for your best price!

AL-800
$1595
Single tube
1250 Watts

AMERITRON's new AL-800/H amps cover 160-15 Meters including WARC bands. The AL-800 has a single Eimac™ 3CX800A7 tube and produces 1250 Watts PEP. The AL-800H has two 3CX800A7s giving 1500 Watts *plus*.

Both amps have an adjustable slug tuned input circuit, grid protection, ALC control that is front panel adjustable,vernier reduction drives, heavy duty 32 pound grain oriented silicone steel core transformers and high capacitance computer grade filter capacitors.

These amplifiers have multi-voltage operation (14 user selectable AC line voltage from 90-140; 200-250 VAC), quiet pressurized ventilation systems, dual illuminated Cross-Needle meters that read peak forward and reflected power, SWR, high voltage, grid current and plate current.

Vernier reduction drives make tuning adjustments smooth and easy. Ameritron's exclusive *Step-Start Inrush Protection™* stops damage to your amplifier from inrush current. Ameritron amps feature an attractive Lexan front panel decal and superior, all metal construction -- it's built to last! Ultra compact desktop size is perfect for your operating station. 8½x16½x14¼".

AMERITRON offers the best selection of legal limit amplifiers

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

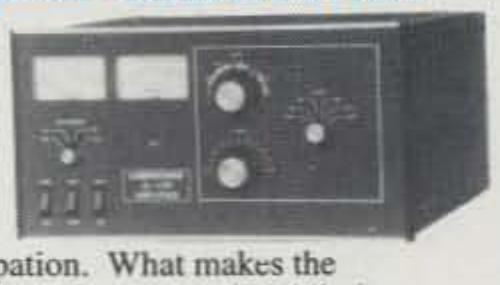
Ameritron's most powerful Amplifier

AL-1500 *with Eimac® 8877 ceramic tube*
$2795
Suggested Retail

Ameritron's *most powerful* amplifier uses the herculean Eimac® 8877 ceramic tube. It's so powerful that 65 watts drive gives you the full legal output -- and it's just loafing because the power supply is capable of 2500 Watts PEP.

Ameritron's toughest legal limit Amp

AL-1200 *with Eimac® 3CX1200A7 tube*
$2295
Suggested Retail



Get ham radio's *toughest* tube with the Ameritron AL-1200 -- the Eimac 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.

Ameritron's Classic legal limit linear amp with a pair of graphite plate

AL-82 *Amperex® 3-500ZG tubes*
$2195
Suggested Retail

Get full legal output using a *pair* of durable 3-500ZGs. Most competing linears using 3-500s *can't* give you 1500 watts because their light-weight power supplies *can't* use these tubes to their full potential. AL-82 is ham radio's *only* super 3-500 amp!

AMERITRON no tune Solid State Amplifiers

Ameritron ALS-500M Mobile no tune Solid State Amp has 500W out, covers 1.5-22 MHz

ALS-500M
$799
Suggested Retail

Ideal Mobile amplifier -- uses 13.8 Vdc mobile electrical system, very compact 3½x9x15 in., extremely quiet, 500W output, 1.5-22 MHz coverage, instant bandswitching, no tuning, no warm up, no tubes, SWR protected.

Ameritron ALS-600 no tune Solid State FET amp includes heavy duty power supply, 600 Watts out

ALS-600
$1299
Suggested Retail

No tuning, no fuss, no worries -- just turn it on and operate. *Includes* AC power supply, 600 W output, continuous 1.5-22 MHz coverage, instant bandswitching, *fully* SWR protected, extremely quiet, very compact. Amp is 6x9½x12 inches.

AMERITRON brings you the finest high power accessories!

RCS-8V Remote Coax Switch . . . $149

Replace 5 coax feedlines with a single coax. 1.2 SWR at 250 MHz. Useable to 450 MHz. 1kW at 150 MHz. **RCS-4, $139.** 4 position remote HF switch.

ADL-1500 Dummy Load with oil . . . $59.95

Oil cooled 50 ohm dummy load handles 1500 W for 5 minutes. SWR under 1.2 up to 30 MHz. Low SWR to 400 MHz.

ICP-120/240 Inrush Current Protector . . . $79

Stops power-up inrush current and absorbs momentary high voltage spikes to your amplifier. 120 or 220VAC models.

ATR-15 Legal Limit Antenna Tuner . . . $399

Designed for legal limit amplifiers! Covers 1.8-30 MHz, peak reading SWR/Wattmeter, 6 pos. antenna switch, 1:1 or 4:1 balun.

ARB-700/702 amp-to-radio interface . . . $39.95

Protects your costly transceiver from damage by *keying line transients*, steady state current and excessive voltages.

QSK-5 Pin Diode T/R Switch . . . $349

Self-contained, connects externally to most HF amps. Handles 2.5 KW PEP, 2 KW CW. Six times faster than vacuum relay. 6x4x9½ in.

ATP-100 Tuning Pulser lets you safely tune your amplifier . . . $49.95

Pulse tuning lets you *safely* tune up your amplifier for full power output and best linearity. Keeps average power to low safe level to prevent overheating, tube damage, power supply stress and premature component failure.

ADL-2500 fan cooled 2500 Watt dry dummy load . . . $199.95

Whisper quiet fan. Handles any legal limit amplifier -- 2500 Watts average power for 1 minute on, ten off. 300 Watts continuous. SWR below 1.25 to 30 MHz and SWR below 1.4 to 60 MHz.

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to the tower were selected to provided the minimum torque to turn in the wind, but did not provide a weight balance. This task was made manageable by slinging the beams beneath the lift bucket as we figured out the correct size for the steel bars we were going to put inside the booms. With complete machine shop capabilities on hand, fabricating the balancing weights was an easy job. Of course, having an expert machinist like Ivor to do the work made the job look easy. Steel bars about 3 feet long were put inside the 20 meter booms with their midpoints at the spot where boom support guys attached. Putting the balance weigh here didn't increase the boom's droop. The 40 meter beams were close to being in weight balance. They only required a short length of steel bar that was secured inside the end of the booms. With all beams tuned and ready to go on the tower, we began the most crucial part of this week. It was time to put the beams on the tower.

Fred and Ivor had spent considerable time and effort preparing for installing the beams on the tower. A two-wire sled system had been built along with an electric capstan winch. The ground end of the sled wires were secured to a borrowed tractor and the top ends were fastened to a cross bar mounted to the tower. Because there would be very high sled wire tensions, we hooked a temporary guy to the back side of the tower where the cross bar was mounted.

With all cables and ropes in place, it was now time to take the first 40 meter beam up to the 198 foot level. This was an awesome sight. The sled effortlessly made its way to the top of the tower, being pulled by the noiseless electric winch expertly operated by GI4WXA. Watching the first beam go up was surrealistic. There was no noise. No one was straining. The beam was effortlessly making its way to the 198 foot level. After several minutes the beam was in place and Ivor climbed the tower and secured the 40 meter monster in place. This turned out to be a gut-wrenching effort.

Based on Ivor's experience with the first beam, we modified our approach. Over the next two days the remaining 40 meter beam and three 20 meter beams were put on the tower. At long last the beams were on the tower. At this point in the plan, six very full days had passed with much left to do. Unfortunately, I had to head back to Texas.

With the beams on the tower, efforts turned to stringing coax, hooking up phasing harnesses, and getting the stacks to play. These efforts spanned a three month period because there were race engines to build and business to tend to. But at long last, the 20 meter stacks were ready.

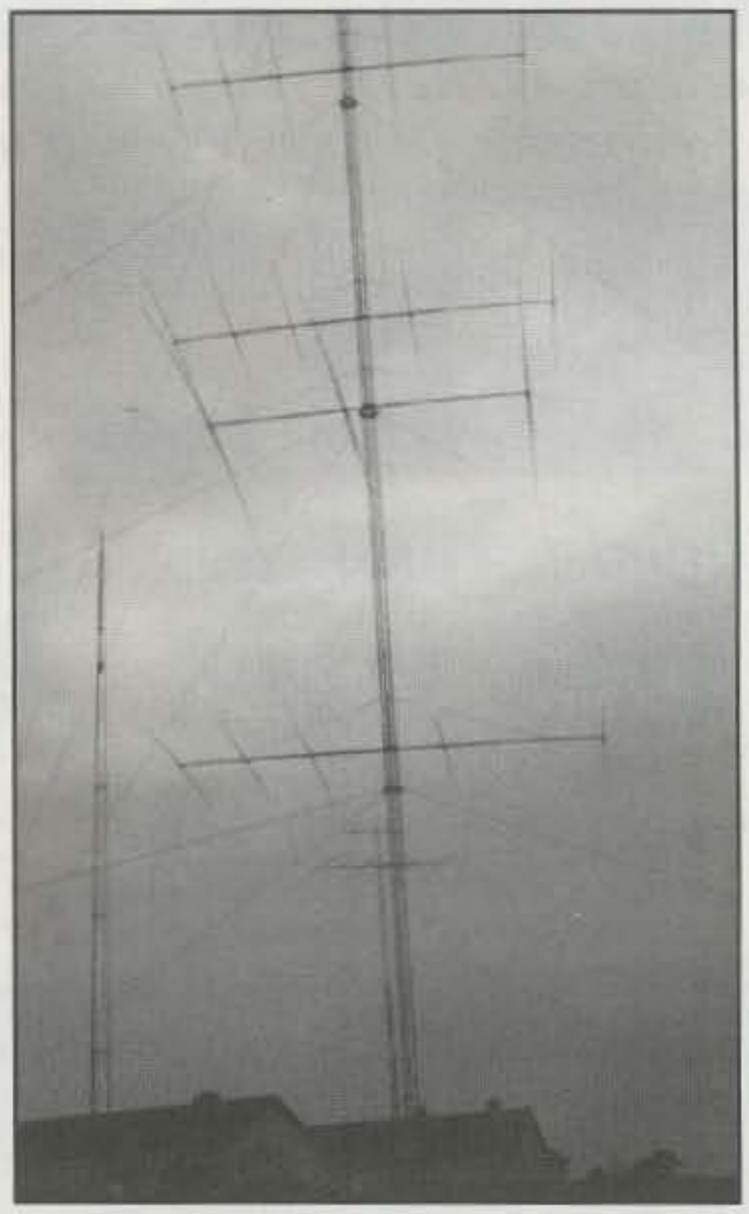
At 17:25 UTC on October 28, 1996 the first QSO was made with W7RM in California. A signal report of 30 dB over S9 was the first reward for almost ten years of effort. After the QSO with W7RM, Ivor and Fred worked a three hour pile-up, amazed at the signal reports that were coming in. Later tests showed the 20 meter stack to have about a 15 dB advantage compared to a TH7 mounted at 60 feet. This was found by switching between the two antenna systems while working stateside and longer path DX stations. Ivor found times when signals were almost nonexistent on the TH7, while they would "boom in" using the stack.

Now that the system was operational, it was time to enjoy it. Time to enjoy the fruits of ten years labor, commitment, and determination. It was also time to begin planing construction of a second rotating tower for 10 and 15 meters.

With the 20/40 rotating tower operational, efforts were now focused on building a second rotating tower for 10 and 15 meters. Within a year the second rotating tower was fabricated, put up, and beams mounted. Four M^2 seven element 10 meter monobanders were installed at 40, 75, 111, and 146 feet while four M^2 6-element 15 meter monobanders were put on at 54, 100, 156, and 205 feet. The primary architect of this system is Tim Duffy, K3LR. Tim designed the switching system for both arrays which uses Transco relays controlled by power supplies he built for Ivor. The switching system allows selection of the upper two, lower two, or all four antennas on each band. With this kind of flexibility, Ivor will be able to take maximum advantage of wide-ranging band conditions over the next sunspot cycle. If you think Ivor is loud on 20, wait until you hear these systems!

Having two rotating towers gives Ivor tremendous capabilities on the higher frequency bands, which leads to questions about 80 and 160 meters. At this time Ivor is thinking about building a beam or perhaps a four-square for 80 meters and possibly a quarter-wave vertical for 160. One thing for sure, whatever he builds it will be well built, big, loud, and impressive.

If you're interested is seeing Ivor's antennas, you can fly to Belfast, get a car for the short drive to Dundrod, and find Tully Rusk Road. You won't miss his towers. Or you can view his antennas at <www.mscomputer.com/gi0aij>. ■



All beams installed.

Determination: GIØAIJ with close friend GI4WXA.

10 Bands -- 1 MFJ Antenna!

Full size performance . . . No ground or radials

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

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

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

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

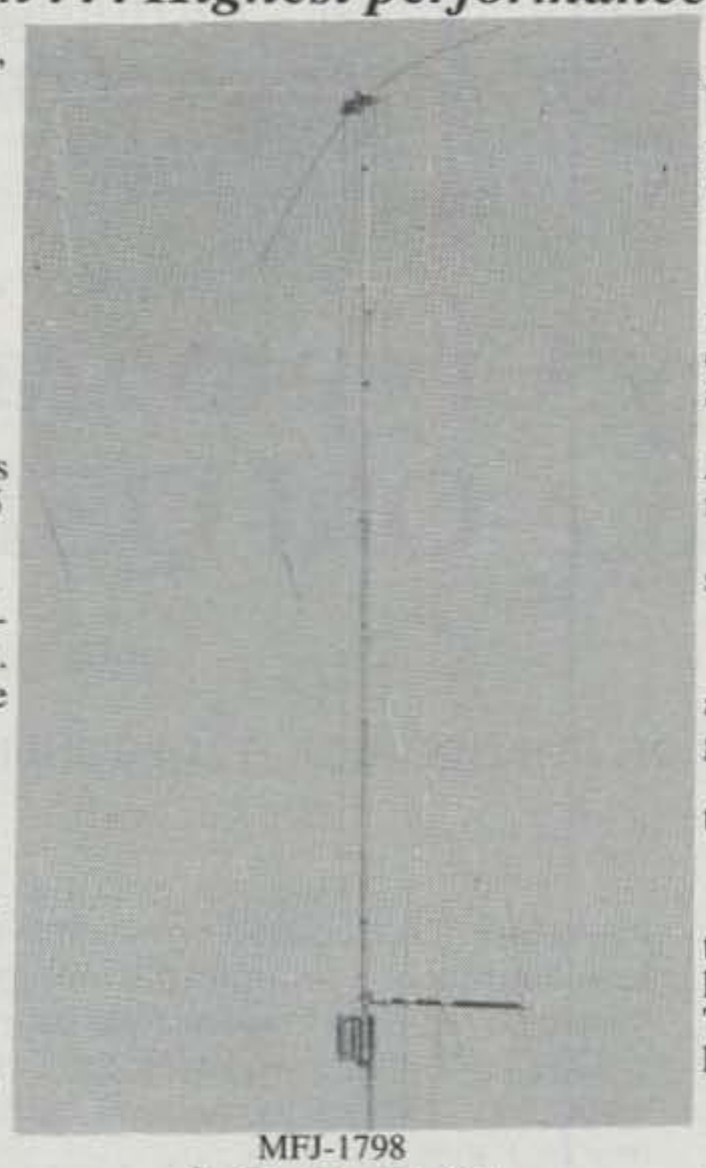
Full size performance is achieved by using separate full size radiators for 2 through 20 Meters and highly efficient end loading for 30, 40 and 75 /80 Meters.

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

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

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

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



MFJ-1798
$269.95

Separate *Full Size* Radiators

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

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

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

These radiator stubs provide automatic bandswitching -- there is absolutely *no loss* due to loading coils or traps.

End Loading

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

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

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

No Ground or Radials Needed

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

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

No Feedline Radiation to Waste Power

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

Built to Last

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

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

Teflon® is registered trademark of Dupont

MFJ *Super Hi-Q Loop*™

MFJ-1786
$319.95

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

It's ideal where space is limited -- apartments, small lots, mobile homes, attics, motor homes.

Enjoy both DX and local contacts when you mount it vertically. You get *both* low angle radiation for excellent DX *and* high angle radiation for local close-in contacts. Handles 150 watts.

Super easy-to-use! Only MFJ-1786 *Super* Remote Control has *Auto Band Selection*™. It auto-tunes to your desired band, then beeps to let you know. No control cable is needed.

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

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

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

A heavy duty 1/8 inch thick ABS plastic housing with ultraviolet inhibitors protects it.

MFJ-1782 $289.95. Same as MFJ-1786 but remote control has only fast/slow tune buttons.

NEW! **MFJ-1788**, $379.95. Same as MFJ-1786 but covers *40 Meter through 15 Meter* continuous. Includes super remote control.

Super 80/40M Vertical

MFJ-1792
$159.95

Designed as a *high performance* antenna for 80 and 40 Meters, the MFJ-1792 features a *full size* quarter wave radiator for 40 Meters - - that's a full 33 feet of ruthless radiating power.

End loading -- the most efficient form of loading -- is used for 80 Meters. It's accomplished by a virtually lossless 4½ foot capacitance hat and a high-Q coil wound with Teflon® wire on a *low-loss* fiberglass form.

The *entire length* radiates power.

High strength 6061-T6 aluminum tubing, super strong solid fiberglass insulator, *Frequency Adaptive L-Network*™, heavy duty *swing* mount. Handles 1500 watts PEP. Requires guying and radials, counterpoises or ground screen.

MFJ-1793, $179.95. Same as MFJ-1792 but includes *full size* 20 Meter quarter wave radiator.

Box Fan Portable Loop

MFJ-1780
$229.95

No, it's not a fan -- it's a high efficiency portable loop antenna that's about the same size and shape as a 2x2 foot box fan, complete with carrying handle.

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Sometimes it takes a little "out-of-the-box" thinking to solve a difficult problem. In this exclusive article for CQ, Ted Cohen, N4XX, discusses potential solutions to the problem of obtaining confirmation for a contact with a DX operator who, for one reason or another, will not QSL direct or via the bureau, but will confirm, by e-mail, that he worked you.

A Public-Key Cryptographic Solution To An Age-Old QSL Problem

BY DR. THEODORE J. (TED) COHEN*, N4XX

Obtaining a QSL card for that rare DX contact you just made seems to be getting harder and harder. It's also getting more expensive. With the Information Age upon us, and with virtually unlimited, worldwide access to the Internet now possible, perhaps the time has come to explore ways by which QSOs can be confirmed electronically using readily available cryptographic software and e-mail. In this article, Ted Cohen explores how this can be accomplished. —K2EEK

I don't know about you, but it seems to be getting harder and harder to obtain QSL cards from amateurs around the world. Not that I haven't tried! In some cases, I have sent as many as three mailings over a year's time, each consisting of a card, self-addressed envelope, QSL, International Reply Coupon (IRC), and even a "green stamp" ($1.00 US) or two, in some cases, all without success. This is downright expensive (depending on the cost of your cards, one mailing overseas can run between $1.70 and $2.00).

More depressing, however, is the fact that distant operators may not even receive your mailings. The latter can be attributed, in large part, to theft of the international mail in many regions of the world. But there also are operators who would prefer to keep the money and IRCs rather than to use them for your benefit. If they QSL at all, it probably will be via the bureau, a route for which transit times are usually measured in years! There's also the problem associated with some contest operations, wherein the operators simply do not want to extend the courtesy of QSLing to those who took the time to work them. Finally, we have to consider the fact that in some countries, many operators have neither the time nor the means by which to QSL, and so you are again left empty-handed.

Over the last few years I have exchanged e-mail messages with several DX operators whom I contacted on the high-frequency (HF) bands. While they readily admitted that they have received my QSL cards and confirmed that I am in their logs, the sought-after pieces of wallpaper never seem to arrive. In one case, an operator even told me on the air and by e-mail that he just put his card for me into the mail. Yet nothing has shown up at my house. What to do? Well, the solution may lie in using the Internet for QSLing purposes. If the Internet were used, however, how could DX operators and award committees be sure that logs submitted by e-mail have not been tampered with? And how could award committees be certain as to the sources (e.g., DX operators and contest clubs) of the logs transmitted? This article presents solutions to both problems!

Cryptography: A Primer

Let's say that I just arrived back from a major DXpedition to Bouvet Island, and I want to send my log to *CQ* so that those holding various awards sponsored by the magazine can receive credit for a contact with me. Dick Ross and I agree that I will encrypt the log (which, in my computer, is in "plaintext" or "cleartext") using a certain process (called the *algorithm*) and a *key*. Everyone may know the algorithm. Indeed, in the real world, cryptographic algorithms developed for use with a single key are well known and readily available. What Dick and I share is a secret: the key. Using this key (which, presumably, only he and I know) and the agreed-upon algorithm (known as a *secret-key encryption algorithm)*, I encrypt the plaintext log and send it to Dick. Using the *same* algorithm and the *same* secret key, Dick decrypts the log and passes the resulting plaintext version along to his award committee so that they can give their award holders credit for a contact with me.

So far, so good, except for two major problems. Mr. I.M. Naughty, a well-known DXer and computer enthusiast who was out of town during my entire stay on Bouvet, has intercepted my transmission to Dick. Furthermore, he has decrypted the message, inserted his call and other information on a fictitious QSO with him into the log, and finally, has re-encrypted the modified log (using the same algorithm and key), which he now sends to Dick. (Don't worry about how Mr. I.M. Naughty figured out which algorithm and key we were using; there are any number of means available today to "break" coded messages.)

In this scenario, how can Dick be sure that the log he received has not been modified? He can't! Furthermore, he can't even be sure that I was the source of the message he ostensibly received from me. Clearly, there has to be a better way . . . one which not only ensures that the data have not been tampered with, but which also authenticates by signature the person who actually sent the data. Here's

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where asymmetric or "public-key" cryptography comes to the rescue.

Asymmetric (Public-Key) Cryptography

Public-key cryptography has received considerable attention over the last few years. Invented independently by Whitfield Diffie and Martin Hellman, and Ralph Merkle, in 1975, the technique employs a special family of public-key algorithms that use different keys for encryption and for decryption. In practice, each person is given two keys: a *public* key and a *private* key. Each person keeps his or her private key a secret unto him or herself; however, the public key (as well as the public keys of others) usually is published in such a way as to be readily available to anybody who wants to communicate with the person. An interesting characteristic of each person's key set is the fact that neither key can be derived from the other. They are truly independent keys.

Here's how public-key cryptography works. Let's say I want to send my Bouvet log to Dick using public-key cryptography. First, Dick creates two sets of keys for each of us. He sends my keys using a moderately secure means (for example, he could use Certified Mail). Now, using well-known public-key algorithms such as *RSA* (named after its inventors, Rivest, Shamir, and Adleman) or *DES* (Digital Encryption Standard), I encrypt my log using Dick's public key and transmit the encrypted message to him. On receipt, Dick decrypts the message using his private key. This is the reason the technique is referred to as *asymmetric* cryptography. Asymmetric algorithms are slower than secret-key algorithms. However, the increasingly faster personal computers coming to market these days have made private-key cryptography more and more popular among users who want to protect information.

Up to this point, public-key cryptography essentially has accomplished the same task we performed above using secret-key cryptography. But wait: There is still one more important step we can take that not only will give evidence of any tampering that may have taken place during transmission or after receipt, but also will authenticate to Dick that it actually was I who sent him the log.

This last step involves creating a security checksum using all of the data in my log. This checksum, also called secure hash function (or *digest*), is created by the holder of the data (me, in this case) using some very intricate algorithms such as *MD5* (developed by Ron Rivest) or the *Secure Hash Algorithm (SHA)* developed by the U.S. National Institute of Science and Technology (NIST). The digest that is created for any given message, which is usually 128 to 256 bits in length, is encrypted by the user using his or her private key. The resulting *encrypted digest is* called the *digital signature.*

So, let's say I first compute the digest for my log and encrypt it with my *private* key. I also encrypt the log with Dick's *public* key, and then I send both the encrypted log and my digital signature to Dick via e-mail. When he receives my encrypted log and the digital signature, he first decrypts the log using his private key. Then, he decrypts the digital signature using my *public* key (remember, everyone's public key is usually well known). Finally, he computes the digest using the plaintext log in the same manner that I did, and compares the digest he obtains with the digest that he just decrypted using my public key. If the two are the same, Dick not only knows that the message (log) had not been altered during transmission or

after receipt, but also, he knows that I was the one who sent it to him. Don't worry about Mr. I.M. Naughty's ability to reconstruct the message (log). Even if he had been able to determine the hash value, it's extremely difficult to do!

Setting Up the Public-Key Infrastructure (PKI)

It may seem that creating an infrastructure in which to process electronic logs (QSLs) is a relatively easy matter. Nothing could be further from the truth. While one could envision that an organization such as CQ Communications or the American Radio Relay League (ARRL) could act as the "trusted agent" for managing key pairs and other matters pertaining to the secure transmission of data, the fact is that this may not be desirable. It wouldn't do, for example, to have the keeper of the keys be the same person (or people) who themselves are competing for DX and other awards. It's not that they are dishonest; it's that they simply have a conflict of interests.

Thus, if a public-key infrastructure were to be developed for the purposes of handling electronic QSLs, it would be preferred that participating amateur organizations collectively contract for the services of an independent PKI provider. This provider—and there are many around—would (1) manage the generation and distribution of public/private key pairs, (2) provide a high degree of confidence that private keys are indeed kept secure, (3) ensure that each public/private key pair is, indeed, linked, (4) ensure that any given person holding a public/private key pair is whom he or she purports to be, and (5) distribute the encryption software to be used by participating organizations and amateurs alike. These and other responsibilities associated with the development and maintenance of a public-key infrastructure are fulfilled every day throughout the world by trusted agents working on behalf of their clients. Without them, far fewer secure transactions would take place on the Internet than are completed today!

Whether amateurs and contest clubs would transmit electronic logs to sponsors of awards is still a matter of conjecture. Some individuals and clubs would probably welcome the opportunity to transfer encrypted logs to organizations sponsoring various awards because it would reduce significantly the number of QSLs they had to prepared and mail. Amateurs seeking an actual QSL card, however, would still be free to do so, although there is no guarantee that they would receive a card in return. The real question is, will DXpeditions participate in such a process? With modern-day DX operations yielding tens of thousands of QSOs within a very short period of time, the use of electronic QSLs could prove a Godsend. However, remembering that many DXpeditions recover their costs through the monies forwarded with QSL cards, the likelihood that sponsors of DXpeditions would use the PKI described here is low unless other means could be found to fund their operations.

Conclusion

We have reviewed, albeit briefly, the principles of secret-key and public-key cryptography, and how the latter technology can be used to effect the secure electronic transmission of logs (QSLs) so that amateurs could obtain credits for various awards. We also have discussed the challenges that face amateur organizations in implementing public-key cryptography, not the least of which are implementing a public-key infrastructure and receiving the support of the DX and other communities on the use of this infrastructure for QSLing purposes.

Clearly, much still needs to be done before CQ Communications, the ARRL, and others who sponsor awards can begin accepting electronic logs (in essence, electronic QSLs) via the Internet. However, it is hoped that this article will, at the least, foster the dialogue necessary to bring such an endeavor to fruition. ■

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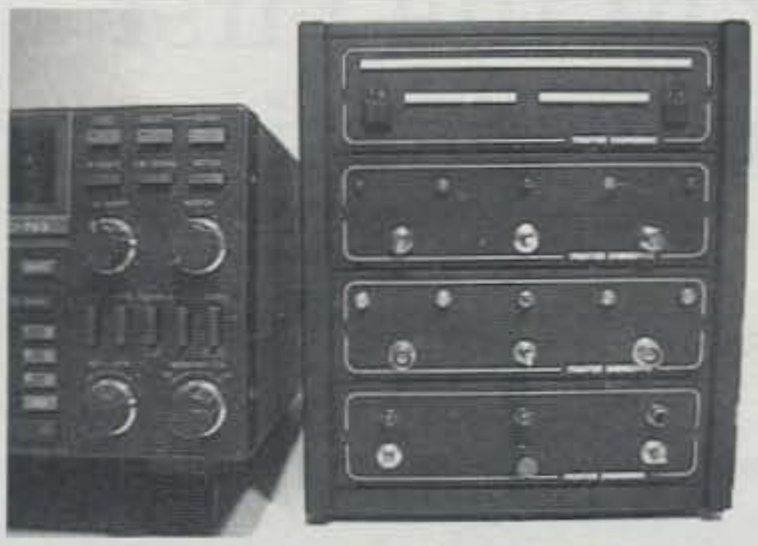

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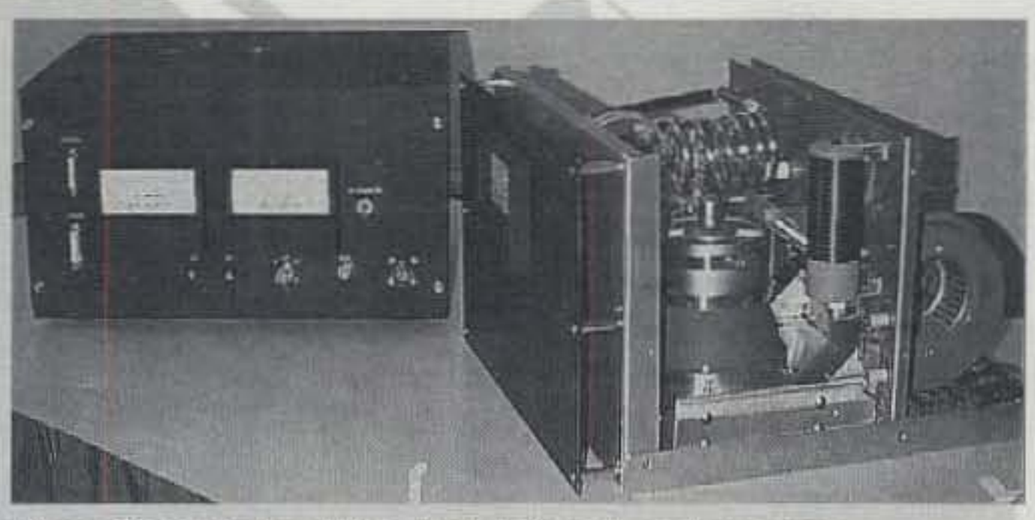

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Most, if not all, of us have never heard of a man named Jerome Green. One-hundred years ago this coming September, he became America's first DXer by transmitting a wireless signal a little over a mile.

The 100th Anniversary of the First North American Wireless Transmission

BY BARRY KEATING*, WD4MSM

Radio, one of the first accomplishments of the twentieth century, has also turned out to be one of the most significant accomplishments of the century. The invention of radio is the contribution of Guglielmo Marconi. A native Italian, son of an Italian father and an Irish mother, Marconi began his experiments in 1895 and gave a memorable address on wireless telegraphy in London in March of 1899. When Marconi died in 1937, radio stations around the world observed a two minute period of silence to honor this inventor of "long distance" radio.

The unique contribution of Marconi was not the discovery of electromagnetic waves (Heinrich Hertz had already done that), but instead his concentration on how far away these waves could be detected. Marconi is truly the father of "long distance" radio, or DX.

But who was the first person to send "long distance" radio signals (that is, radio signals covering a distance of more than just a foot or two) on the North American continent? Many lay claim to this accomplishment; the early days of American radio had plenty of room for backyard experimenters and boastful claims.

One interesting individual, however, documented the record of his experiments in detail and demonstrated his accomplishments in a manner that even the present-day media would enjoy. Jerome Green grew up in Somerset, Ohio and worked for some years after primary school as a carpenter while also teaching in the local schools. After earning enough to begin college, Green enrolled at Ohio State University. He took an extra year to earn his degree because he had never completed high school. He supported himself while attending college by designing cash registers and working in a photographic studio. But electricity was his first love, and soon after he graduated with a degree in electrical engineering, he came to the University of Notre Dame.

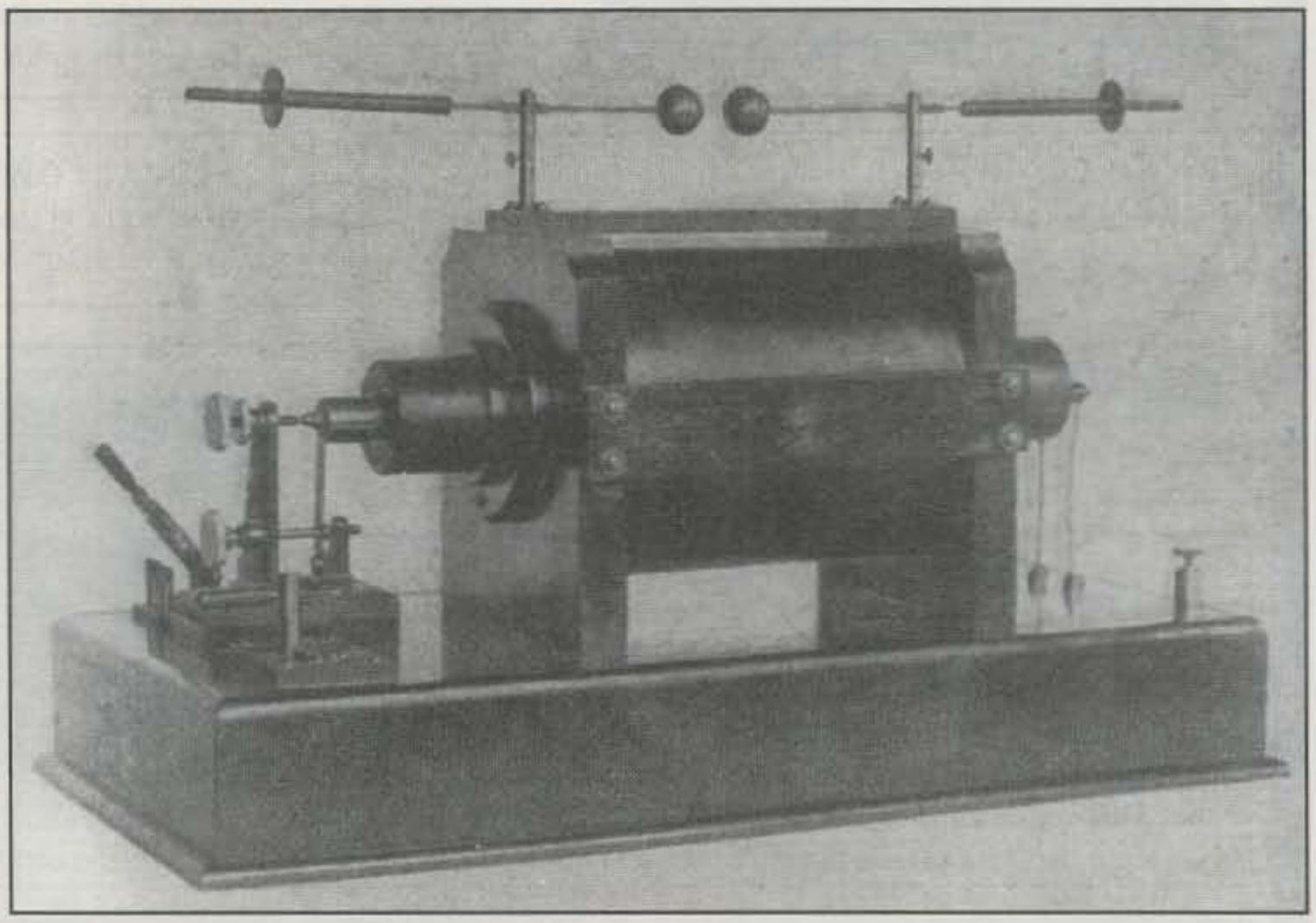

Photo A– Green's transmitter with 8 inch induction coil. Note the double-pole jack-knife switch used to open and close the circuit. This was later replaced by a landline telegraph key with special contacts.

Notre Dame was fortunate to hire Green because a Professor of Telegraphy (yes, Notre Dame actually had a Professor of Telegraphy) had failed to return to the university in the fall of 1894; Green was hired to replace the errant professor. It wasn't long before Green, guided by the news of Europeans Marconi and Ducrette, was attempting to build a long-distance transmitter at Notre Dame.

Green began his experiments in radio at Notre Dame in 1898. He recalled in an interview in the 1940s that "Money was scarce in those days" and it was difficult to get equipment. Green and his students constructed almost all the devices he used for his experiments.

The parts Green used for his first sending station (which was essentially a "spark-gap" transmitter) included an induction coil capable of producing a stream of sparks from one to ten inches in length,

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a battery to operate the coil, and a discharger (or oscillator). The induction coil was obtained from Father John Zahm (who later became President of Notre Dame); the coil had been used in some experiments on x-rays and was repurposed by Green for his radio transmitter. The oscillator was made of two metal spheres placed about half an inch apart on insulating supports. Holes were drilled in the two metal spheres, and the spheres were placed on adjustable points. A vertical wire was attached to one of the adjustable points and a ground wire to the other point. A picture of one of Green's later transmitters and Green's own diagram of the apparatus makes the arrangement simplicity apparent (see photo A and fig. 1).

Of course, Green also needed to construct a receiving set. The receiving station required a coherer with decohering tapper, a sensitive relay, and a sounder. The coherer was the heart of the device. The coherer was made from a small glass tube (about one-eighth inch in diameter and two inches in length) fitted with brass rods at each end. There was a space between the rods inside the tube. To complete the coherer, a small quantity of filings of metal (silver or nickel, or a mixture of the two) was placed in the space between the rods in the glass tube. Apparently, Green and his students in the fall of 1898 mutilated some United States currency in the cause of radio; Green didn't admit this until some 40 years later.

The coherer had the property of changing its resistance value when acted upon by radio waves. A space of one-fourth of an inch inside the tube between the rods filled loosely with metal filings created a resistance of several megohms. But when the radio waves from the sending station struck the vertical wire attached to one of the terminals of the coherer, the resistance fell to about ten ohms. This characteristic of the coherer allowed Green to make a device capable of receiving intelligible radio messages.

The coherer was placed in a circuit with a high-resistance relay and a battery. When no radio waves were present, the resistance of the coherer was so high that the circuit was virtually open. However, when radio waves were present the decrease in the resistance value closed the circuit, the armature of a relay was drawn down and closed the circuit on the sounder, and the dots and dashes of Morse code could be heard. Green's diagram of this first American Morse code receiver is shown with the parts labeled in fig. 2.

The day of the big experiment was a true theatrical production on Green's part. The test was set up between Notre Dame and Saint Mary's (a distance of just over a mile). At Saint Mary's the vertical wire

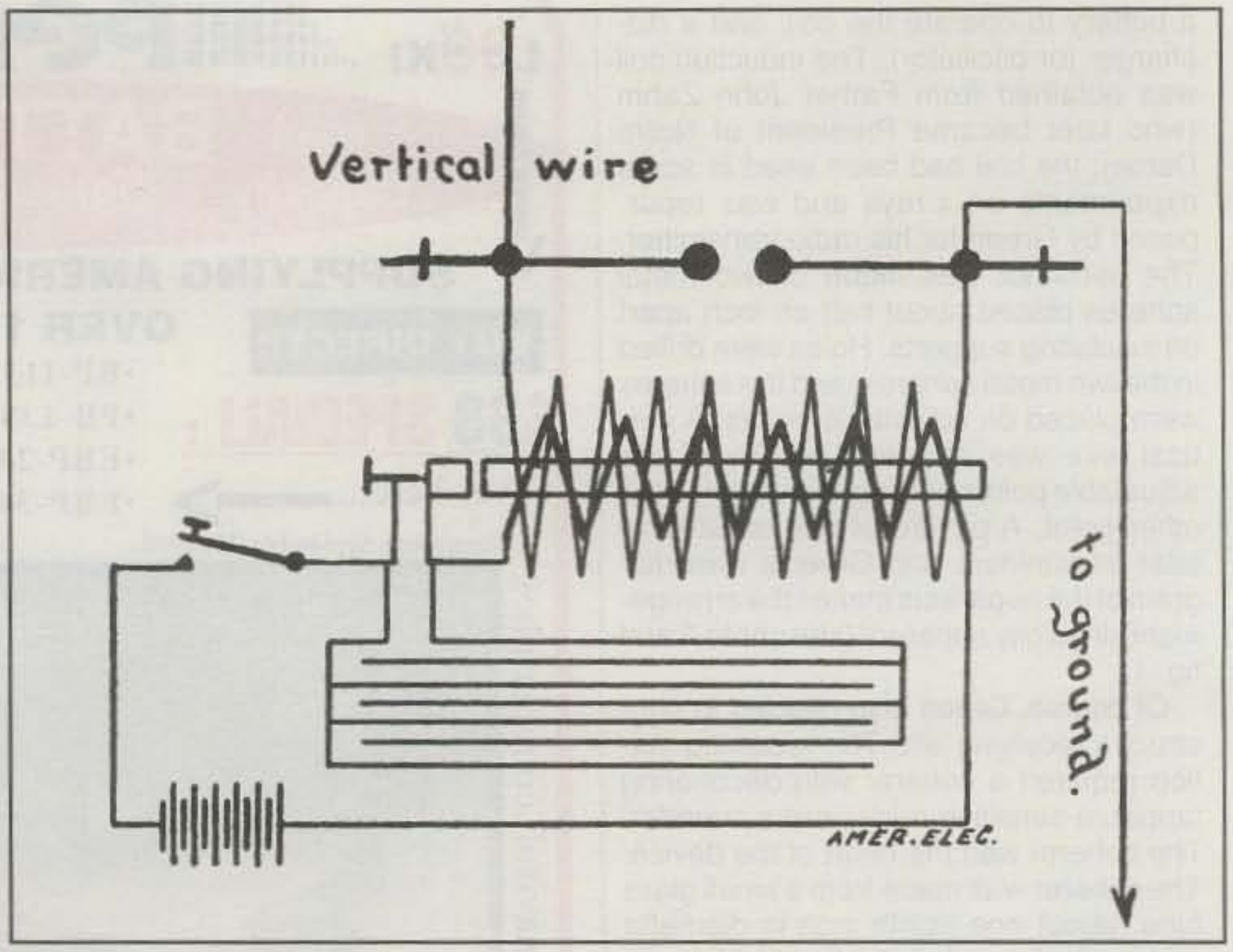

Fig. 1– Green's diagram of the receiving apparatus. "C" is the coherer. The lamps were added as noninductive resistance to prevent sparks at the vibrating tapper and at the tongue of the relay.

which was attached to the coherer was hung from the clock tower on the main building of the convent. The relay itself and the coherer were placed on a table in front of the convent. At Notre Dame, the long vertical wire of the transmitter (which connected to one of the spheres on the induction coil) was hung at first from the University flagpole (later it was hung from the steeple of Sacred Heart Church on the campus). The entire scene was drawn by Green's colleague, Professor F. X. Ackerman for the *Chicago Herald* of April 22, 1899 (photo B).

Sister Antoine of Saint Mary's described the scene that day in a 1937 interview as follows:

I recall the vivid picture of that spring morning when the fragrant air was vibrant with something more than nature's awakening, as we walked about the east porch of the convent, awaiting the call from the telephone room. Sister Bertha (God rest her!) standing in her office

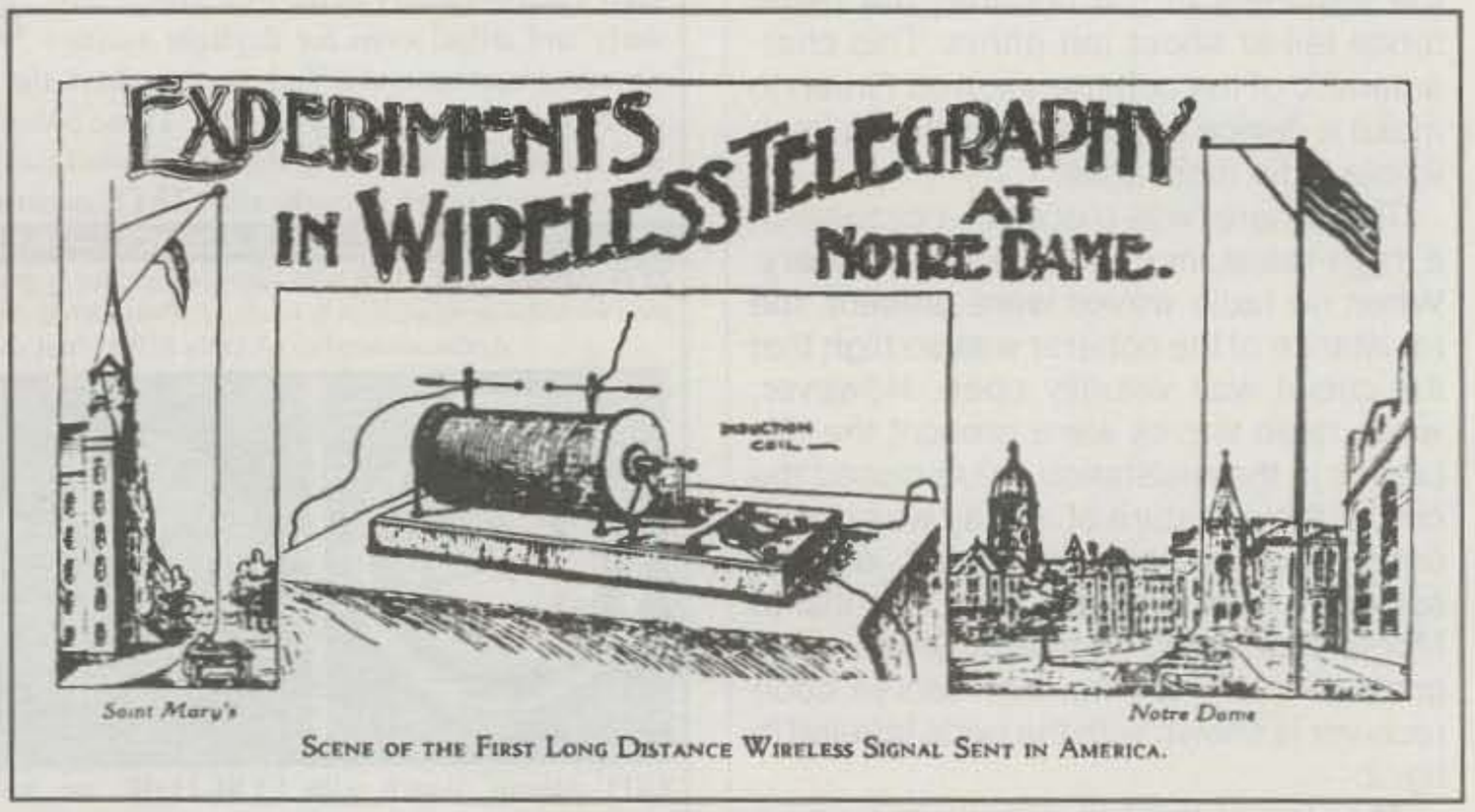

Photo B– F. X. Ackerman's drawing depicting Green's experiment. The Convent Tower of Saint Mary's is on the left with the receiver on a table. To the right is Notre Dame with the familiar Golden Dome in the background. The transmitter is on a table just under the flagpole. This drawing appeared in the April 22, 1899 Chicago Herald.

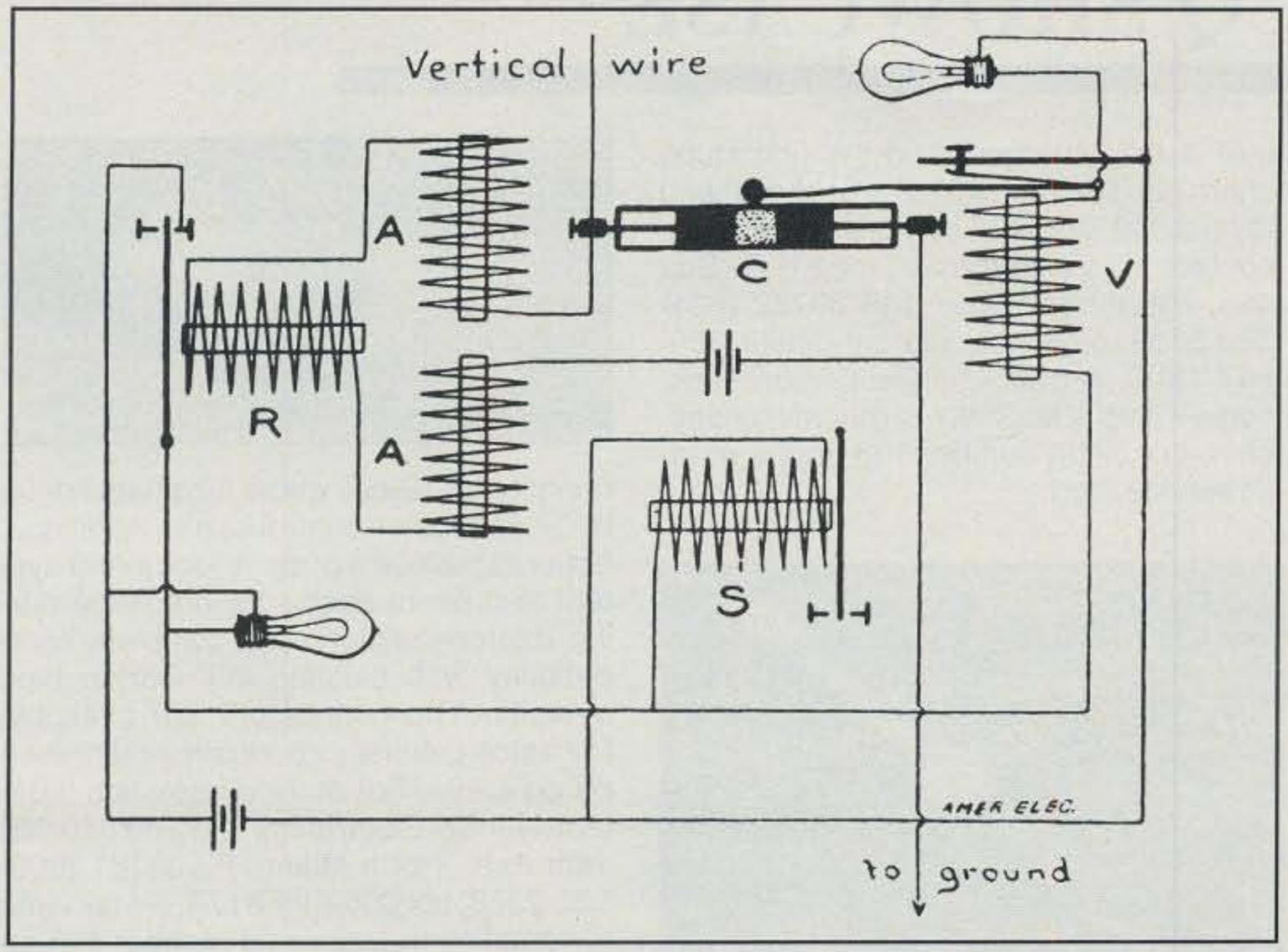

Fig. 2– Green's diagram of the receiving apparatus. "C" is the coherer. The lamps were added as noninductive resistance to prevent sparks at the vibrating tapper and at the tongue of the relay.

all around by locating a sending station at the Polk Street railroad station in Chicago and locating the receiving device on the Chicago Tribune building. He found that steel buildings did have a negative effect on reception. Green also carried out experiments from the life-saving station at the mouth of the Chicago River by placing a receiving set on a tugboat which sailed out into Lake Michigan. This is believed to be the first completed shore-to-ship transmission.

The 100th anniversary of Notre Dame's wireless transmission will be celebrated this fall when the Notre Dame Amateur Radio Club (ND1U) holds a special event station on September 5, 1998 (the day of the Notre Dame-Michigan football game). The operators that day will be current and past Notre Dame students (including 93-year-old George Scheuer, WB9SCC, who demonstrated American amateur radio to Marconi when he visited Notre Dame in 1933). The club has existed at Notre Dame since 1920 and carries on the long tradition of wireless telegraphy at Notre Dame.

Note: A special thanks to Peter Lysy and Charles Lamb, Notre Dame Archives Dept., for their help in securing the illustrations for this article. ■

close to the Saint Mary's one and only telephone, was as excited as I was at the recording machine. Professor Green had arranged to telephone when he was ready. Silently, in the hush of a thrilling expectancy, we looked down the long sweep of the avenue, and up into the brilliant sky, wondering . . .

Then the call came from Notre Dame! At the precise moment agreed upon, the signal came, as clear as if it had come from the machine beside us instead of being "pulled" out of the air by the wire dangling from the convent spire. The result of each attempt that morning was reported at once to Professor Green via the telephone, and his voice betrayed the triumph he had achieved.

The Sisters at Saint Mary's realized that they were witnessing a piece of scientific history, and so carried the recorder into the parlor of the building next to the science room. They had the students of Saint Mary's enter the room single file to witness this conquest of the air. According to Marion McCandless, the students felt like the chorus of some Greek drama—very much a part of it all and yet, in truth, entirely supplementary to the main action. "Finally, we went into the room where mystery presided, and soon the Morse code signals were recorded out of the air." The yards of ticker tape produced by the experiment were given to the students as souvenirs.

Shortly thereafter, Green ran experiments in Chicago at the urging of the local newspapers. He attempted to see what propagation was like with steel buildings

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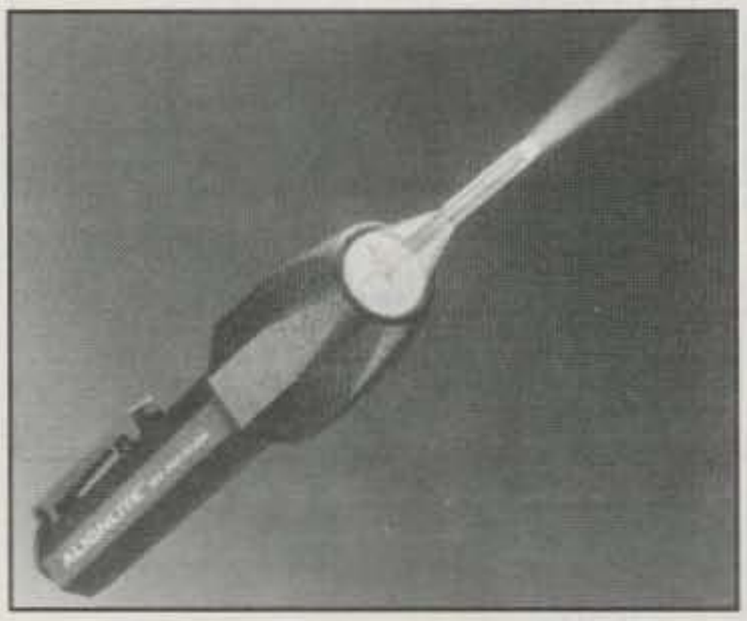

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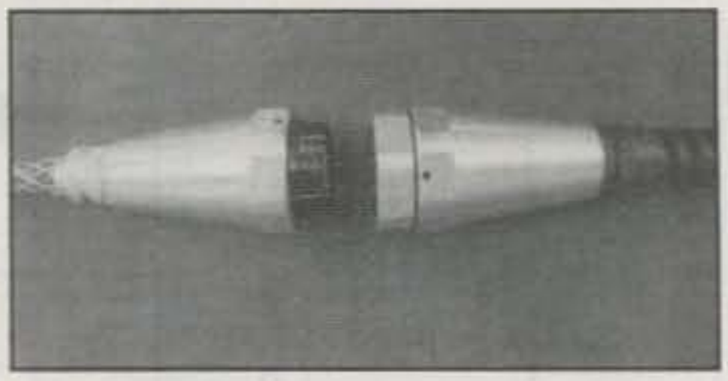
Nemal Electronics 37-Pin Connector

Nemal Electronics has introduced an improved version of the standard FK37 type multi-pin connector. The connector is suitable for use both indoors and in hostile outdoor environments and features a rugged machined body, mil spec black plating, and weatherproof insert. The connector is part of a family including both cable and panel mount versions with either crimp or solder contacts, and is available with a variety of strain-relief options.

Accessories include dust caps and fan-outs and break-out boxes to XLR connectors. Typical applications include termination of 12-pair audio molt cable or up to 37 conductor control cable. Additional features include a positive lock insert system to prevent conductor breakage during interconnection, and complete compatibility with existing ITT Canon type designs. The connectors are available from stock, either individually or terminated on cable. For more information, contact Nemal Electronics Intl., 12240 NE 14th Ave., North Miami, FL 33161 (800-522-2253; fax 305-895-8178; e-mail <info@nemal.com>), or circle number 105 on the reader service card.



PROLOG Logging Program and QSL Route Database

The newest version of PROLOG contains many features that include support for up to 36 logbooks each with its own award tracking for DXCC, WAS, WAC, WAZ, WAITU, WPX, Counties, and IOTA awards, plus sixteen general awards of the user's choice. Supplied prefix and award editor utility programs make adding, editing, and deleting DXCC prefixes and award elements easier. External CD-ROM callbook databases marketed by Flying Horse (RAC), SAM, QRZ, and Buckmaster are supported. For those interested in 1010, PROLOG also supports a 1010 roster database which may be downloaded free of charge from an associate internet web site. When these databases are made available to PROLOG, it will automatically place the contact's name, QTH, state, county and 1010/VP number information into the logging form.

An interactive PacketCluster™ interface with DX spot and WWV report monitoring complete with selectable DX spot scanning and audible alerting is provided. You can generate your own DX spots and converse over the link using the built-in terminal interface. Bi-directional rig control with DX spot switching is supported for all major manufacturers transceivers. PROLOG maintains its own internal 32 channel VFO memory for fast switching to favorite frequencies and modes. PROLOG's print module permits the printing of QSL labels in single, multi-QSO, or SWL formats including a personal comment line. The program also supports both dot matrix pin-feed style labels and laser/ink jet label sheets. PROLOG's QSL route

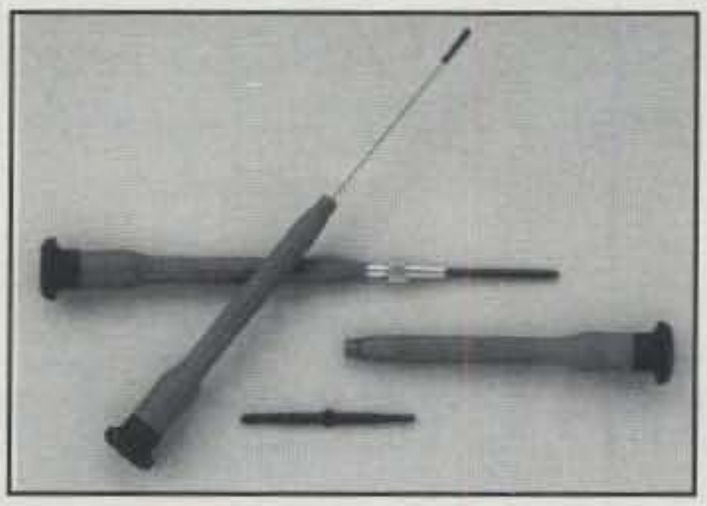
database currently contains 60,000 DX routes and is available as a stand-alone product or may be integrated with the logging program. When integrated with the logger, route information is placed directly into a special field in the logging form.

PROLOG will run in a DOS-only or Windows/Windows95™ environment. For more info, contact Datamatrix, 5560 Jackson Loop, N.E., Rio Rancho, NM 87124 (phone 505-892-5669; orders 1-800-373-6564; e-mail <prolog@rt66.com>; on the Web <http://www.qth.com/prolog>) or circle 102 on the reader service card.

Array Solutions 6 Meter StackMatch

Array Solutions' line has been extended to cover the 6 meter band. The new design allows the user to chose all combinations of two or three stacked 6 meter beams. With the mini-StackMatch the choice will also allow up to six antennas in the stack. The BIP/BOP function is maintained to allow high-angle E skip to be worked. The SWR for a 1:1 match into two or three dummy loads is from 1.8 to 135 MHz.

For more information, contact Array Solutions, 350 Gloria Road, Sunnyvale, TX 75182 (phone 972-203-8810; fax 972-203-8811; or <wx0b@arraysolutions.com>), or circle number 101 on the reader service card.



Acu-Min®Pollicis™ Handles

The Acu-Min® Pollicis™ series by Moody Tools feature anti-static, ergonomically designed handles, to relieve tension on the muscle between thumb and finger which spins the driver. They are available in four handle styles: Multi-Handle sets with blades molded into the handle; Single-Handle sets have one handle with interchangeable blades. There is also a 6-in-1 Reversible Tip Phillips slotted set and an 8-piece Extended Blade set.

Contact Jensen Tools, 7815 S. 46th St., Phoenix, AZ 85044 (602-968-6231; fax 602-438-1690; web <http://www.jensen-tools.com>), or circle 107 on the card.

Let your imagination soar, and you'll never look at high-flying antennas in the same way again. K9ES and AD4ES reached for the stars with this antenna for the CQ 160 Meter DX Contest this year.

A Balloon-Lifted Full-Wave Antenna for 160 Meters

BY ERIC SMITT*, K9ES, AND CHUCK GREEN**, AD4ES

About a month before the 1998 January CQ 160 Meter DX Contest, Chuck, AD4ES, mentioned to me that he had never been on 160 meters in his almost 40 years of operating. He wondered if I would be able to assist him in developing an antenna that he could use to get in the contest.

Chuck has his station at his office, which is located in Melbourne, Florida. The roof space was sufficient to place a full-wave loop on the roof, but my concern was the effect of the roof on a loop's performance. We both pondered how to raise the antenna at least 25 feet above the roof. We looked at PVC piping, electrical conduit, and inexpensive TV mast. We looked into the push-up poles that were available free from the Wireless Cable. Then I came up with the idea of supporting the corners of a full-wave loop with weather balloons, and getting the loop up 40 feet above the roof. With balloons, why not go up a quarter wavelength?

The idea was born—and died—when we saw all the high-tension lines around his building. We knew we could really run into danger should the balloon drift due to wind and move the antenna into a 40 KV line. A quick look at power distribution lines and public parks gave us our location for operating this contest in a "field day" manner. We selected Pelican Beach Park, in Satellite Beach, Florida.

With this idea now a goal, it was necessary to find information on balloon-lifted antennas. One of the earliest articles on the subject appeared in *QST* in the November 1940 issue. R. Carlton Green, W8PWU,[1] discussed using weather balloons as "sky hooks" for vertical antennas. His article included data on lifting capacities for helium- and hydrogen-filled balloons. While the article is over 50 years old, it still provided some interesting physics about lighter than air devices, and their use as lifting devices for antennas using Litz wire, a common wire used in those days.

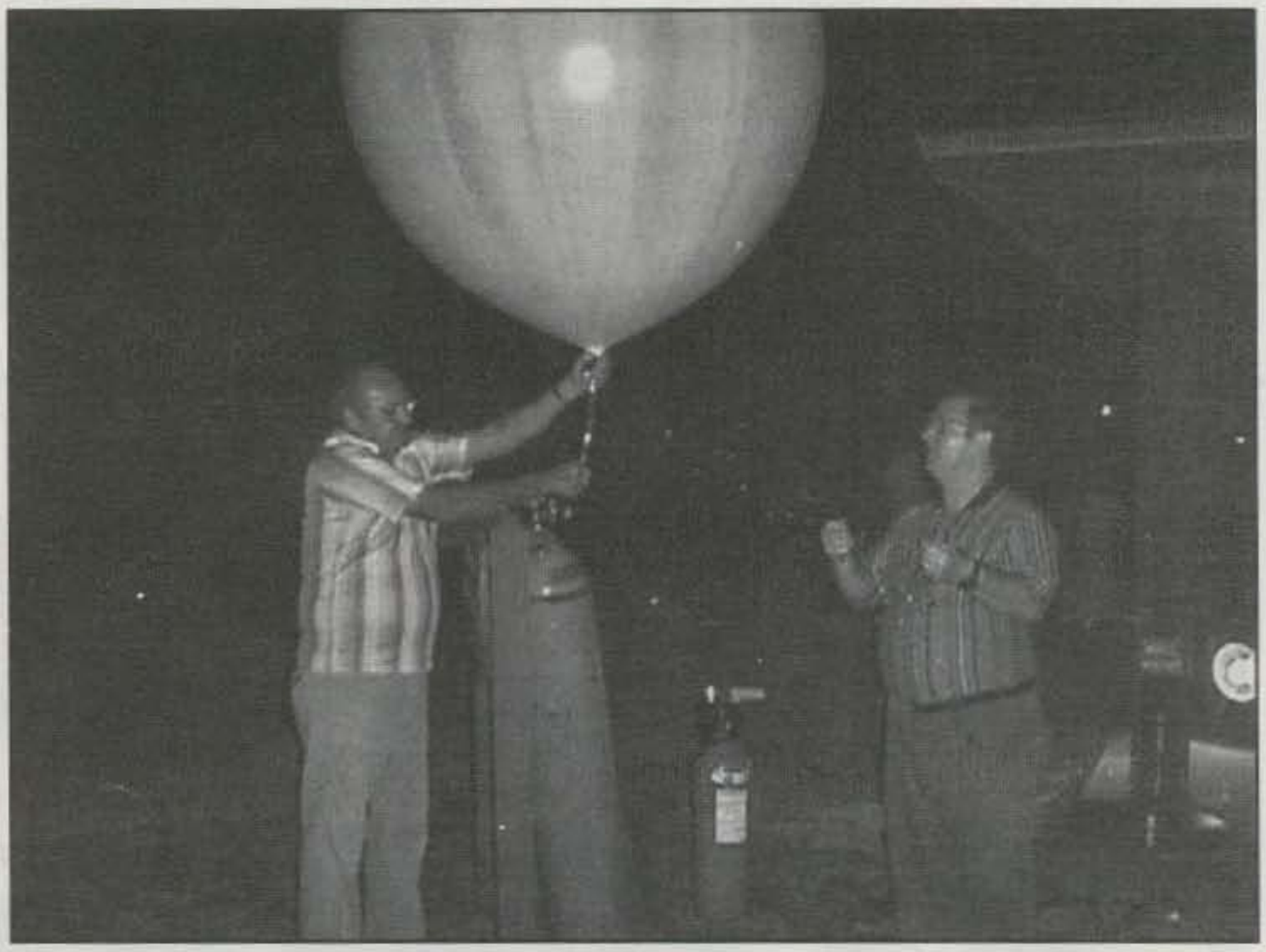


Photo A– AD4ES and KF4RYE are shown here filling the balloon.

A follow-up article, written by David Ferrier, W1LLX, and William Baird, W9RCQ,[2] was the first to mention a device called the Kytoon—a hybrid of a lighter than air balloon shaped aerodynamically to provide lift from the displacement of heavier air with helium or hydrogen, and the aerodynamic lift provided by the airfoil shape. Their article also mentioned the possibilities of using these balloons to lift a long wire. Of interest is the fact that this very support is presently available from Fair Radio Supply[3] as a "Lifting Body" Balloon.

Due to the physical properties of helium, hydrogen was often used as lifting gas. Helium finds the finest pores, even through latex rubber, and leaks out. Helium, in liquid form, will even flow up the side of a dewer flask if left unattended.

Hydrogen is less expensive than helium, but it has a major drawback: It is highly flammable. Hydrogen burns with air in a colorless high-temperature flame, pro-

*107 Atlantic Blvd., Indian Harbour Beach, FL 32937 <k9es@iu.net>
**1720 Canterbury Drive, Indialantic, FL 32903 <green@iu.net>

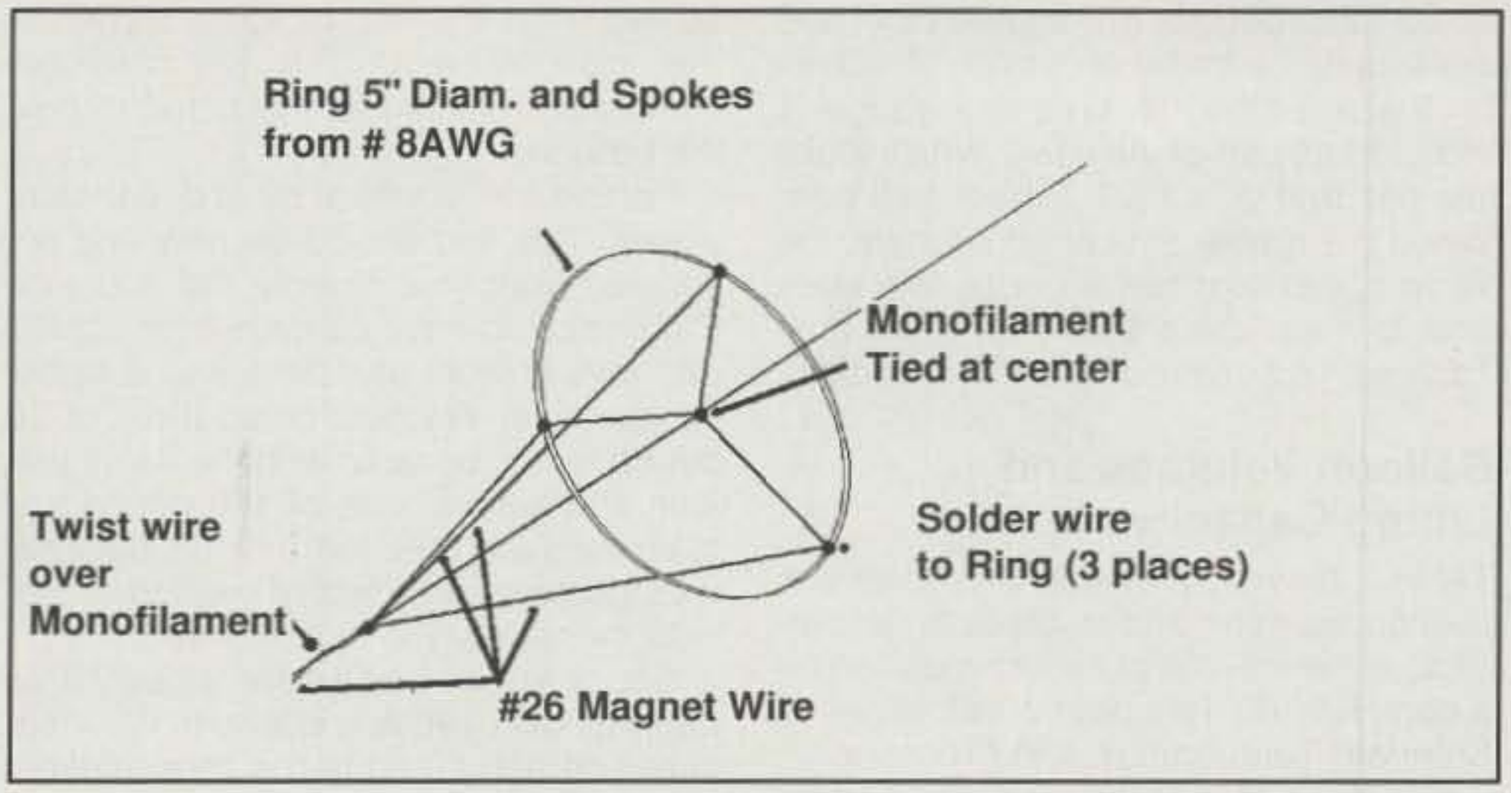


Fig. 1– Corona ring structure.

ducing water. However, it is easily ignited, even by static electricity, and should never be used in a lifting balloon. During World War I, the German Zeppelin proved a major problem for the air war. They traveled rather quickly, with winds aloft and their own power. They could remain aloft longer than the aircraft trying to shoot them down. Because of their huge size, even bullets had difficulty bringing them down. However, once the Allied forces placed white phosphorous tips on their bullets, the Zeppelin became easy prey.

During World War II, the British used tethered balloons to carry antenna wires, and also to provide some form of obstruction for the bombers that were targeting England. These aerostats[4] were special-purpose aerodynamic balloons that maintained tolerable internal pressures by the concept of a balloon within a balloon, or a *ballonet.* At sea level, the balloon chamber was filled with helium (or hydrogen) and the ballonet was pressurized with air, to maintain shape for the aerostat. As the balloon rose, the external atmospheric pressures decreased and the helium naturally expanded. Without additional volume capacity, the expansion could burst the balloon's outer skin. By venting the air within the ballonet, the helium expanded in the volume previously containing ballonet air volume. This allowed operation at higher heights than previously available. If not for the ballonet feature, the aerostat would have burst, as will meteorological balloons, as they soar to altitudes where external atmospheric pressure drops.

Even today, these aerostats are used to carry both military payloads as well as antennas. Lockheed Martin and TCOM currently manufacture and sell them to government agencies and commercial companies. One of the earliest discussions of 160 meter antennas being lifted with Kytoon Balloons comes from the Ohio State University Radio Club (W8LT) experience in the 1975 ARRL 160 Meter Contest, written up in the 160 Meter Contest Results column in *QST.*[5] There are both pictures and text.

Articles have been written on their use as supports for long antennas. In the *ARRL Antenna Compendium Volume 2,* Stan Gibilisco, W1GV,[6] furnishes an overview of balloon-lifted antennas. Don Daso, K4ZA,[7] wrote a rather detailed article about balloon-lifted antennas called "A Skyhook for the 90's." In his article, Don described the operation of what appears

Diameter (ft.)	Helium Capacity (cu. ft.)	Lift Capacity (lbs.)
2	4.19	0.28
3	6.28	0.42
4	33.51	2.25
5	65.45	4.40
8	268.08	18.00
16	2144.66	144.04

Table I– Lifting capacity for helium-filled balloons.

to be the CQ 160 Test for N4ZC's contest station. While the article does not mention an actual contest, it does mention specifically a 160 meter quarter-wave vertical. As recently as during this past CQ·160 Meter Contest, several amateurs (including our station) used balloons as supports for long verticals. However, all other applications used quarter-wave verticals, as evident by the discussions about radials.

Design Goals

It was our intent to produce a half- or full-wave antenna. This antenna would have several advantages over a quarter-wave antenna. The first advantage was slight gain over a quarter-wave antenna. A half-wave antenna has a theoretical 3 dB gain over a quarter-wave antenna, and a full-wave vertical has an approximate 4.5 dB

gain over a quarter wave.

The second advantage was the absence of a radial system. A half-wave antenna feeds with a high voltage instead of a high current (as found in quarter-wave designs). With the computer modeling program NEC, the antenna displayed an impedance ranging from 1400 ohms to 4500 ohms, depending on how the antenna deviated from vertical (due to wind on the balloon). But the ground path also required the same level of feed impedance. Even an 8 foot ground rod in sandy soil produces a lower resistance than 4500 ohms. Without radials, the antenna design was rather an easy task. However, the physics became interesting.

Another design goal was the requirement to handle at least 1 KW RF output.

Physical Reality

When we attempted to find a balloon to hold the antenna, we tried several paths. The Air Force routinely launches weather balloons at the Cape Canaveral Air Station for range safety information for the Kennedy Space Center. Another amateur in the area (who shall not be mentioned) offered us a meteorological balloon which claimed to have a 5 foot diameter with a 4.5 pound lift capacity.

Edmond Scientific [8] lists Giant Weather Balloons in their catalog. The problem we ran into was one of availability, as the balloon was on back order and would not be available for our effort in the CQ 160 Meter CW Contest. However, we were able to order two of them for the phone contest.

As mentioned earlier, Fair Radio Supply lists their Kytoon. However, it too was on back order and not available when we tried to get a balloon.

Helium is readily available from industrial gas companies, welding supply houses, and party outlets. We were fortunate to have all three sources in Melbourne, and selected an industrial gas supply house, part of Praxair Corporation. Their Industrial Helium comes in tanks that contain 250 cubic feet of helium (called K tanks). These tanks are pressurized to about 2200 pounds per square inch, and are supplied with the necessary fill valves for balloon filling. A pressure gauge is included as part of the valve, which looks like the end of a thick rubber ball pen. When the rubber is pushed laterally, the valve opens and helium exits. We were able to negotiate a $ 50 charge for a K-Tank with a deposit of $ 300 for the tank.

Balloon Volumes and Lifting Capacity

Table I shows the relationship between balloon diameter and lift capacity, and indicates the volume of helium required for a complete fill. This data is calculated at Standard Temperature and Pressure.

Our first balloon was a 5 foot diameter meteorological balloon supplied by the Air Force. This balloon only could lift 4.4 pounds. The second balloon was a an 8 foot balloon by Edmond Scientific, and it had a 18 pound lift capacity. However, it did require an entire K-tank to fill it.

Antenna Design for Low Weight

The goal was to make an antenna that could handle at least 1 KW without destroying itself and that would be less than a pound in weight. Most amateurs use large wire, copper weld, for antennas to prevent stretching and lowering of resonant frequency. Since the small balloon can only lift 4.5 pounds, large, heavy wire was out of the question for use in this design. After looking at wire capacities, we determined that magnet wire, 26 gauge or thinner, would be adequate, since the weight would be less than a half pound. However, this wire has a tendency to stretch, so a reinforcing method had to be devised.

Monofilament fishing line is also very low weight, and has low stretch coefficients if used with forces equal to or less than 20 % of the rated load. To allow wind loading effects as well as the free lift effects to be estimated, Chuck and I determined that the wind load could be as much as five times the free lift force applied to the monofilament. The monofilament could also be used as the tether to hold the balloon.

Fishing line is sold at most department stores. This line should be new and not spooled from your favorite rod and reel. Old line could have damage from ultraviolet rays or from use. New line is rather inexpensive. We purchased a roll of 30 pound test to be used with the 5 foot balloon and several rolls of 100 pound test to be used with the 8 foot balloon. But what was a proper and effective method to connect the wire to the monofilament?

Chuck's office had a clear, straight area that was over 140 feet in length. We measured off and taped to the floor markers every 25 feet, and even marked specific additional length to cover the 509 feet. We purchased a large (and heavy) spool of surplus 26-gauge wire, which weighed over 10 pounds.

At one end of this straight length the monofilament was attached and strung the entire length. Chuck and I then spiraled the magnet wire around the monofilament so that there were two turns per foot. Every 10 feet we secured the wire to the monofilament with light-weight 4 inch nylon tie wraps and cut off the free ends. When a length of 127 feet was completed, the length was rolled up on a large spool, and the process was then continued until four lengths were completed. At the end of the first length of monofilament, a loop was tied in the monofilament to secure the lifting balloon holding the first quarter-wave section from the tuner to 127 feet above the station. The remaining 382 feet of monofilament/wire wrap has no additional loops added. The end was soldered to a 5 inch corona hat (see fig. 1).

The corona hat was made from a 16 inch length of #8 AWG copper, like the kind sold for grounding at hardware stores. We bent the piece in a ring, and soldered the ends together. We then placed it on a table (that we could solder on without damaging it) and cut three more pieces of this wire into 2 1/2 inch lengths, which would become the spokes.

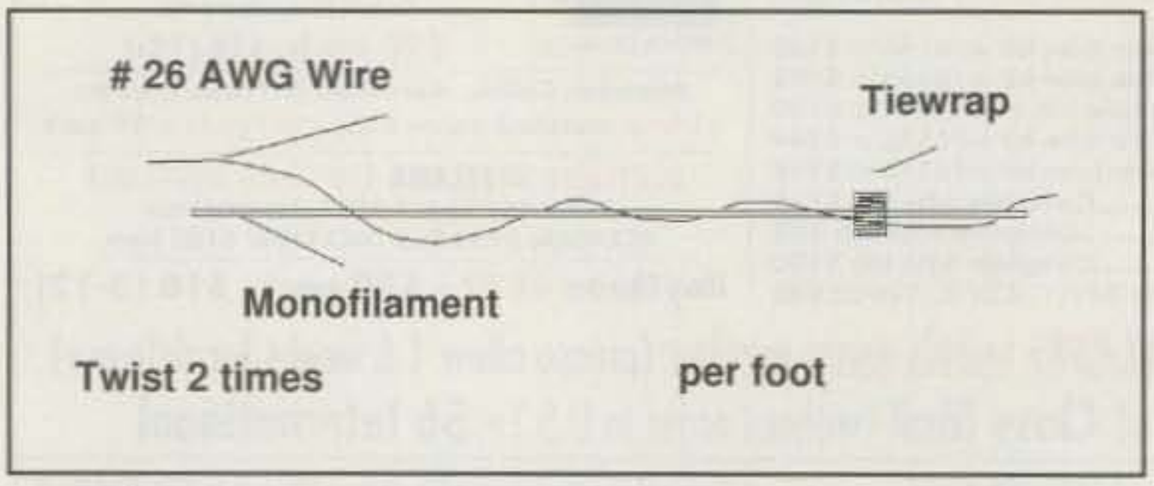


Fig. 2– Securing the wire to the monofilament.

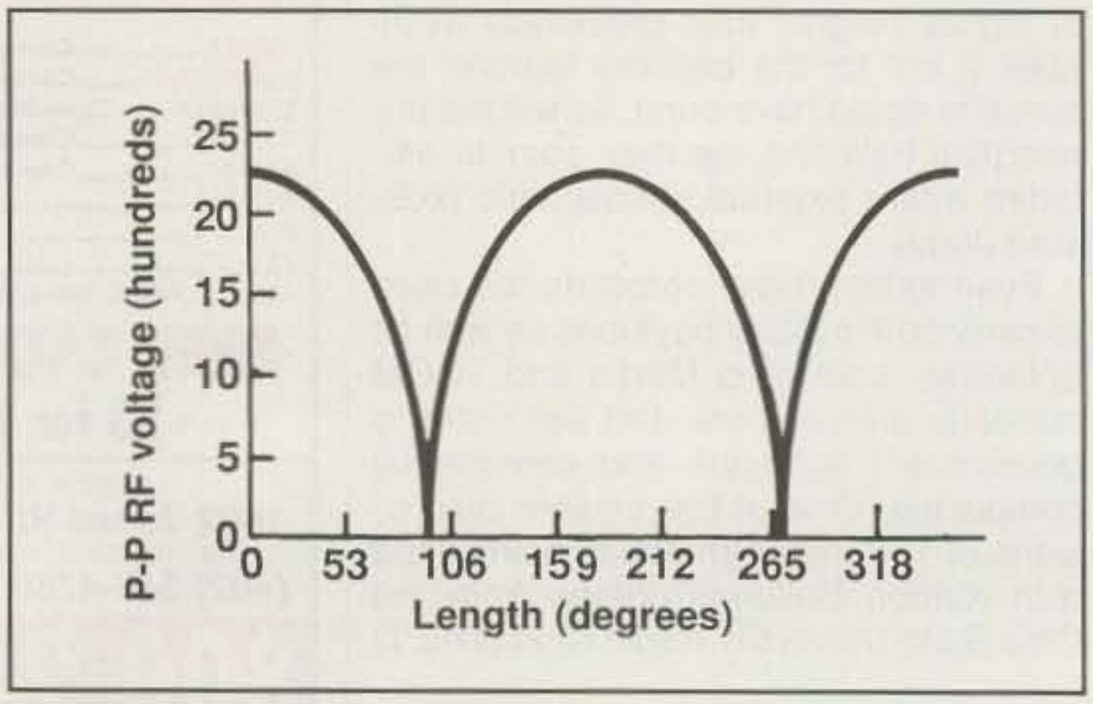


Fig. 3– Voltage distribution on the antenna.

Wire Size	Type	Weight per 600 ft.	Constant Current
30	Solid	0.18	0.3
	Stranded 7 × 38	0.20	0.339
	Stranded 19 × 42	0.22	0.359
28	Solid	0.29	0.48
	Stranded 7 × 36	0.32	0.529
	Stranded 19 × 40	0.33	0.553
26	Solid	0.46	0.77
	Stranded 10 × 36	0.45	0.757
	Stranded 19 × 38	0.55	0.92
	Stranded 7 × 34	0.50	0.841
24	Solid	0.73	1.22
	Stranded 7 × 32	0.82	1.36
	Stranded 10 × 34	0.72	1.2
	Stranded 19 × 36	0.86	1.43
	Stranded 41 × 40	0.70	1.16
22	Solid	1.17	1.95
	Stranded 7 × 30	1.27	2.12
	Stranded 19 × 34	1.37	2.28
	Stranded 26 × 36	1.18	1.97

Table II– Characteristics of small wire. (Information obtained from Belden Wire Technical Information Service.)

We placed them in a "Wye" inside the ring and carefully soldered the center together, and then soldered the ends to the ring at the three points. This became the corona ring.

At the end of the full wavelength antenna wire, we soldered three lengths of #26 AWG magnet wire 1 foot long. We carefully stripped 2 inches from the opposite ends, and wrapped these ends around the corona ring, approximately centered between the points where the spokes were soldered. All soldering to this ring was made so that there were no sharp points, as these would defeat the purpose of this corona hat. Where the end of the antenna (twisted to the monofilament) joined the three 1 foot lengths, we attached this splice to the monofilament with a tie wrap.

Holding the end, we tied the monofilament to the center of the spokes and corona hat, so that under load, the monofilament would absorb the tension, and there would be minimal tension on the wire. We extended the monofilament another 2 feet past the corona hat attachment, and placed a strong loop that would not let go under tension. This point would attach to a line/snap swivel which would come from the balloon assembly.

This corona hat was determined necessary, due to the potential high voltage which would be found at the end of this full-wave antenna. Having a 1 KW (RMS) input, there could be as much as 2300 volts peak to peak RF present on the end. By adding a corona hat, the voltage would be distributed around the perimeter of the corona hat, and not at a point (which would produce sparks).

The entire antenna, with the 100 pound monofilament test, 509 feet of wire, corona hat, and all the tie wraps weighed less than 2 pounds (fig. 2). All of the wire was spooled on a large reel, with the corona hat at the free end.

Antenna Characteristics

A quarter-wave or three-quarter–wave antenna has a low-impedance feed point. A half-wave antenna (or multiple of half-wave antenna) has a high-impedance feed. Fig. 3 indicates the anticipated voltage that could be found along the antenna, assuming that the impedance is 4400 ohms (as indicated by NEC) and being fed with 1KW PEP power.

The current maximums occur at the one-quarter wavelength and three-quarter wavelength point. Assuming the KW PEP power level, the peak currents would be nearly 12 amperes, RMS. The maximum continuous current recommended for the wire is shown (Table II), along with the weight per 600 feet (a little longer than full wave on 160 meters) and type of wire used. This information was obtained from Belden Wire Technical Information Service. The only problem with the current ratings is that they were for a certain heat (temperature) increase which would occur in the wire, had the wire been covered with normal PVC insulation. There was no information available for temperature increase of wire suspended in air, without insulation. Our main concern was that the wire did not heat sufficiently high enough to stretch the copper or melt the monofilament.

Balloon Fabrication

The balloon was of prime concern, because we only had two balloons, and they were both required. We were told that the balloons could not be filled a second time. By proper engineering, the balloons were in fact filled for the second day, and at the

end of our operating period (which was cut short by a severe thunderstorm and tornado watch), they were brought down and stored for next year's contest.

The balloon required a filling device, so that there would be almost no chance of damaging the balloon through holding the neck during filling (photo A). The attachment device consisted of a plug used to seal irrigation tubing for underground sprinklers (with a 1.25 inch diameter, ribbed surface). Also, a nozzle end piece, also purchased from the same hardware store, was used, along with a 1 foot length of 5/8 tygon tubing (fig. 4).

Using "Hot Glue", the nozzle was glued and sealed from the inside to prevent leaks. The ribs of the plug sealed the nozzle of the balloon. Tie wraps were used to secure the balloon throat to the plug, and then four lengths of 100 pound monofilament were wrapped in the rib indents and tied securely so that they could not slip free. The entire throat/plug area was then wrapped with electrical tape to hold any knots from unwrapping.

The ends were prepared to hold tethers and antenna ends (fig. 5). A pair of ends were cut to a 3 foot length, and the other ends were left at a 5 foot length. A snap swivel was used to hold the balloon to the tether or antenna. This swivel allows the balloon to rotate with the wind, without twisting up the antenna or tether. Each large snap swivel was secured with the very best "fisherman's knot" that can be tied. The snap swivel also allows easy attachment to the tether, especially in a windy situation when we are attempting to hold this large balloon to ensure it does not damage itself.

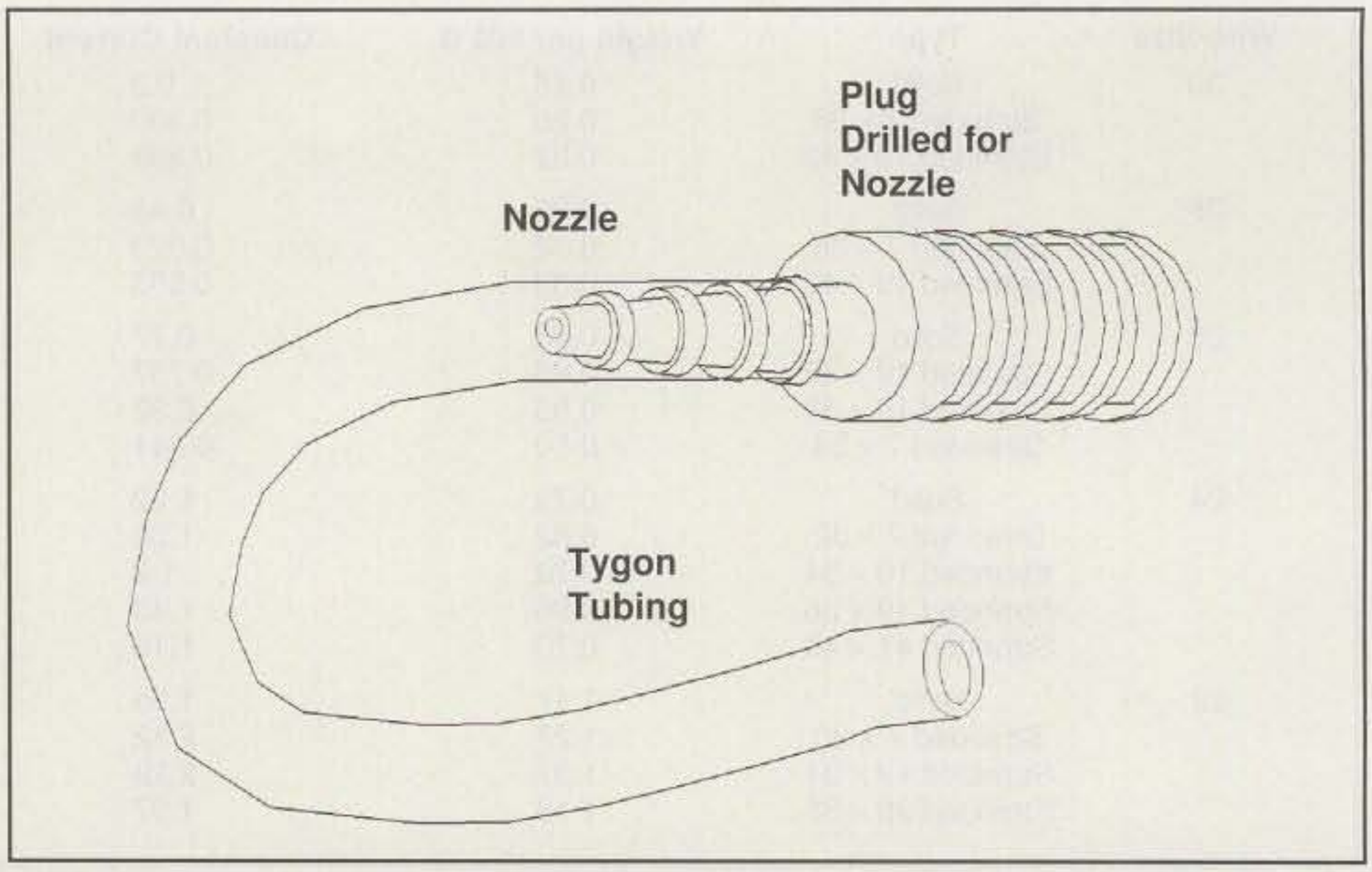


Fig. 4– The balloon filling adapter.

What About the FAA?

Tethered balloons are regulated by the Federal Aviation Administration in the United States. The regulations are found on the Internet, at this URL: <http://www3.landings.com/cgi-bin/get_file?/pass=8110791&FAR/part_101/toc.html>.

In brief, Part 101 covers Moored Balloons, Kites, Unmanned Rockets, and Unmanned Balloons. However, under subpart A, Section 101.1 (Applicability), there is a statement that describes the regulation as only governing a balloon with more than 115 cubic feet of helium, or diameter greater than 6 feet. Thus, except for part 101.7, covering hazardous operations, if your balloon is kept to under 115 cubic feet of helium volume, these regulations are not applicable.

Under part 101.7, covering hazardous operations, the emphasis is that a balloon must not be operated in a manner that creates a hazard to other persons or property. This includes operating the balloon with the possibility of a weight falling and injuring someone or breaking some property. Therefore, operating the balloon in a manner that presents no hazard to anyone, keeping the balloon to 6 feet or less, or keeping the helium volume to under 115 cubic feet, precludes the necessity for FAA approval (however, the FAA should be notified in all cases.)

If the balloon is going to be larger than 6 feet, and have more than 115 cubic feet of helium, the following regulations are applicable:

Section 101.13 has some major limita-

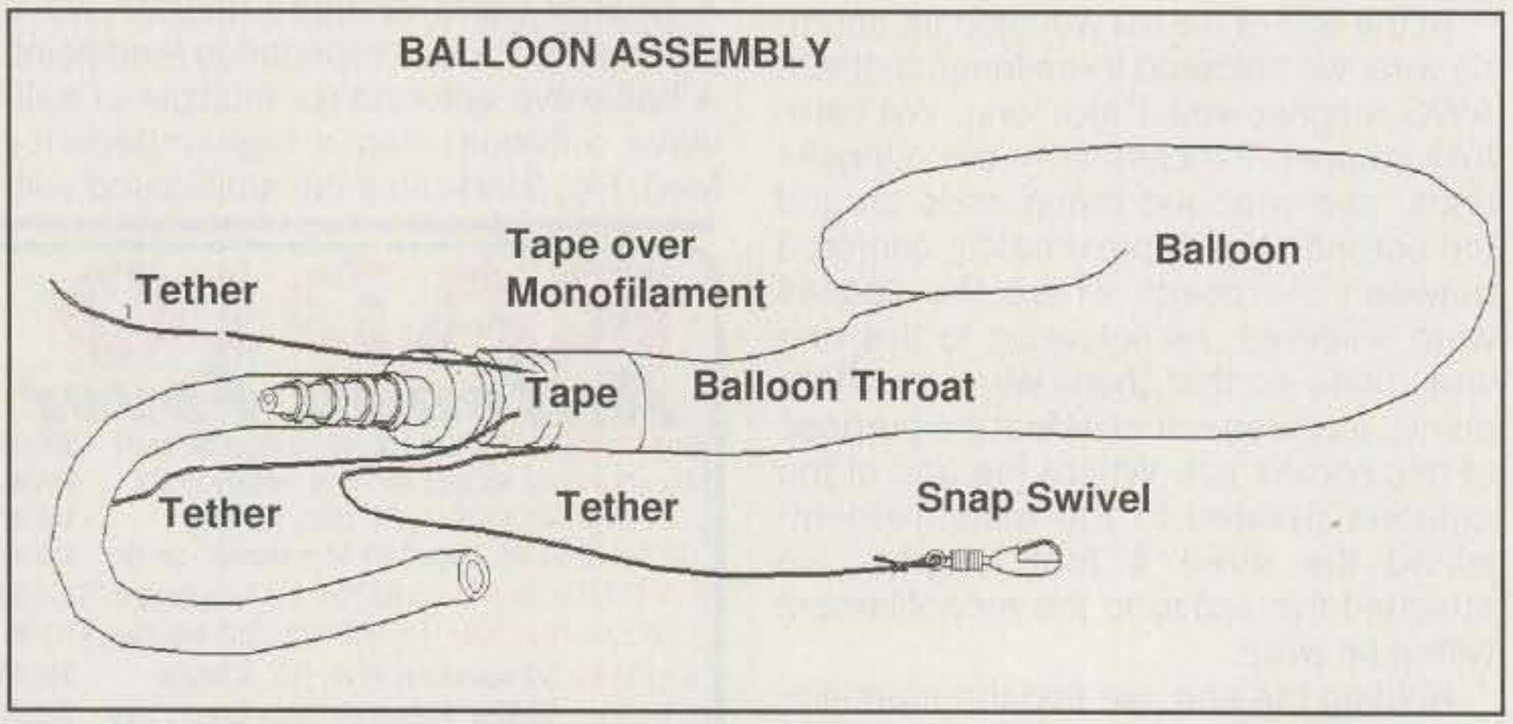


Fig. 5– Assembly of the balloon apparatus.

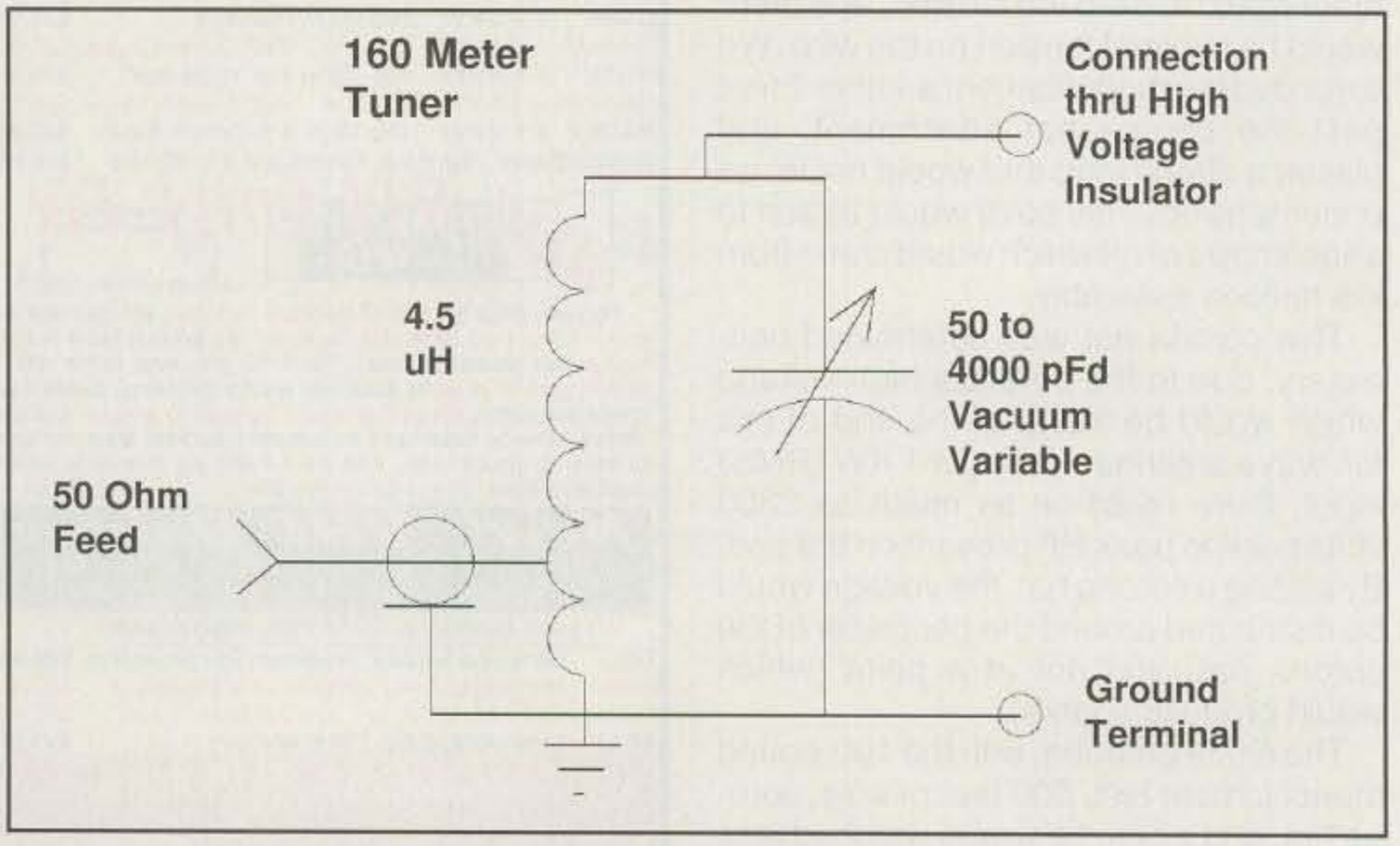


Fig. 6– Schematic of the 160 meter end-fed tuner.

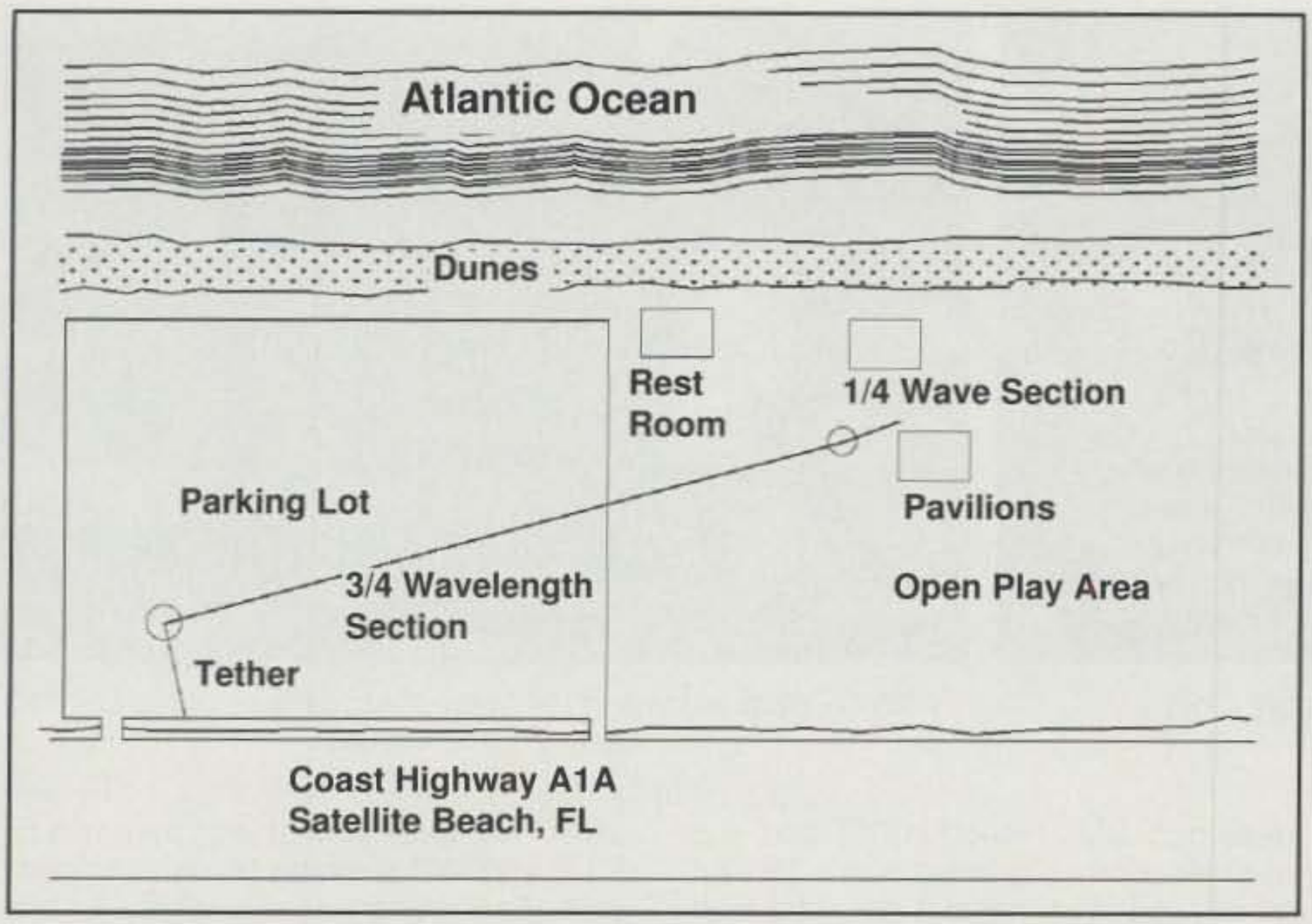


Fig. 7– Site location of the antenna at Pelican Beach Park.

tions, holding the maximum altitude of moored balloons to under 500 feet, or at least 500 feet from the nearest cloud, should the cloud level be below 1000 feet. The balloon cannot be flown from any area where ground visibility is less than 3 miles, or the QTH is within 5 miles of an airport. However, if you are fortunate to be near a tower, you can operate to an altitude below the top of the structure, and within 250 feet of that structure.

Section 101.15 lists the requirements for information to give to the FAA before you launch the balloon (such as names and addresses of operators, size of balloon, location of the balloon launch in terms of azimuth and statute distance from an FAA object that is found on a sectional map, height above the surface of the planned operation, and date and time of the operation).

Section 101.17 deals with lighting and marking of both the tether and balloon. Requirements for flags on the tether and visibility issues are mentioned.

Section 101.19 deals with rapid deflation devices. This means automatic deflation equipment mounted on the balloon and activated once the balloon breaks away from the tether and mooring. Should the deflation not occur properly, the FAA must be notified as to the estimated flight path of the free balloon.

A word to the wise! Keep the balloon

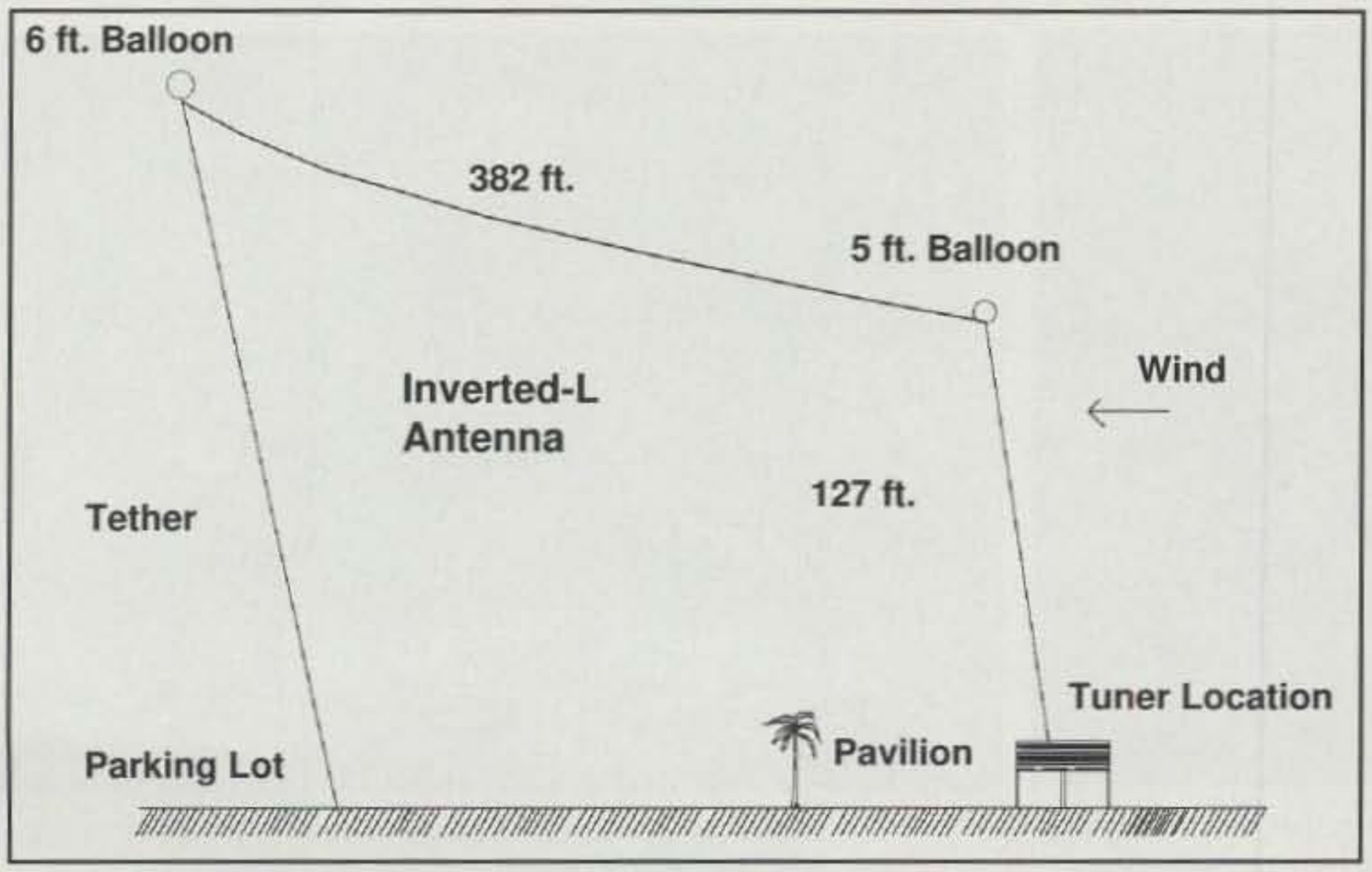


Fig. 8– The 160 meter inverted-L setup.

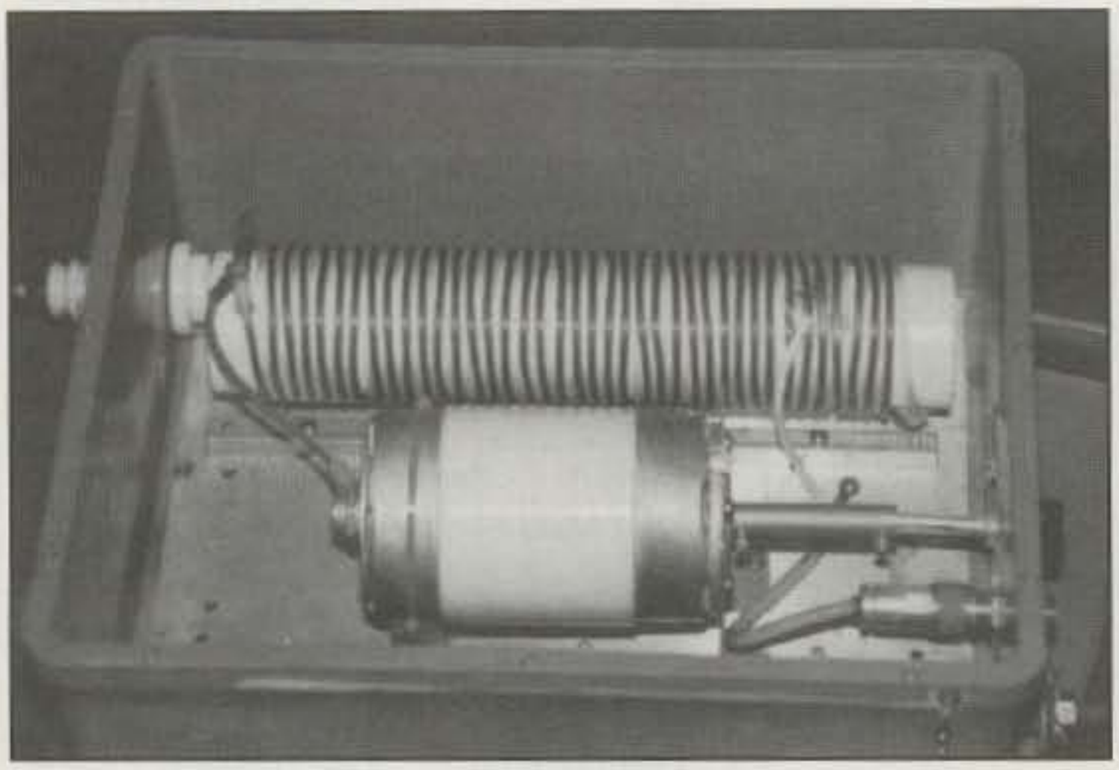


Photo B– The homebrew heavy-duty tuner.

Photo C– Help unloading the truck of equipment for the CQ 160 Meter Phone Contest.

under 6 feet in diameter, and always notify the FAA to issue a Notice to Airman (NOTAM) so that low-flying aircraft do not suddenly suck up your balloon in the middle of the night! Also, never operate a balloon-lifted antenna when lightning is in the area (probably keep it at least 5 miles away), and never operate where the antenna could come down and cross a high-tension line.

Antenna Matching

The full-wave antenna will change impedance as the antenna moves off the vertical plane due to wind shift. This meant that the design goal of the tuner was to match an antenna fed with 50 ohms and having a feed point between 1000 and 5000 ohms (fig. 6). By modeling this requirement on the computer, I came up with a tank circuit tuner that contained a vacuum variable capacitor which had a value of between 50 pFd and 4000 pFd (Jennings CMV1-4000-0005) and was rated for 5000 volts breakdown. This rating allowed me to wind a coil, 11.5 inches long and 2.5 inches in diameter, from #8 AWG Solid Copper Wire (same material used for the corona ring), spaced for four turns per inch.

The tuner was built in a surplus fiberglass case, which housed a Coast Guard tuner and was water-tight. The coil was mounted on one side, and the vacuum variable was mounted near the center (photo B). Using the MFJ-259 analyzer and connecting a 4000 ohm resistor from the top of the tank circuit to ground, the correct point to tap the coil was found. This point was then connected to a piece of RG-213 center, and the braid was connected to the nearest ground point. The other end was connected through an N-type bulkhead female connector. Measurements were made at frequencies from 1800 kHz through 2000 kHz, and with load values from 1000 ohms to 5000 ohms. The tuner was able to resonate to a 1.0:1 VSWR showing 50 ohms impedance. Everything was now ready for the 160 contest.

Selection of Location

Chuck and I wanted to be far from power lines and industrial noise sources. We wanted to be near the ocean or the Indian River. We also wanted to have a place with commercial power. All three criteria were met when we selected the Satellite Beach park called Pelican Beach Park (fig. 7).

We had use of picnic pavilions for shelter, and the Atlantic Ocean was 40 feet to our east. We were located on flat ground, with minimal trees, and with no overhead power. Because January's CQ 160 Meter CW Contest proved to be a chilling experience (temperatures near 35 degrees with winds up to 20 MPH), we knew that tarps had to be used to block winds from freezing us. The weekend of the phone

Photo D– Shown here are AD4ES (third from the left) filling the balloon, KF4RYE (next to right) holding it, and K9ES (left) attaching the tether.

Photo E– K9ES (left), AD4ES (seated) making adjustments, and KF4TQF watching the procedure.

section of the contest was to be a warmer weekend, however, with a possibility of rain storms during Sunday.

Contest Time Arrives

The CQ 160 Meter Phone Contest was scheduled to start on Friday, February 27 at 6 PM local time. We had all the equipment loaded into the vans, and had two K-Tanks of helium also in the back of one van. All the tethers were pre-measured and spooled. The antenna was also spooled, and loaded into the van. Everything was ready to go but the NOTAM, which had been requested for the weekend evening hours between 5 PM and daylight. A call to the St. Petersburg Traffic Control Center gave us some bad news: The NOTAM could not be granted due to regulations. The FAA failed to elaborate, but insisted that the tether be flagged and the balloon carry a strobe and deflation equipment. We had the strobe ready to go, but the deflation equipment and flags on the tether were a crimp in our plans. A quick check with the Internet showed the technicality about balloon size, and Chuck and I agreed to run the contest. Daylight was gone, though, and we had to set up in the dark (photo C).

The tuner was mounted on an upside-down trash can, about 40 feet from the operating position. This was important, since there would be very high RF fields present at the feed point of the antenna. An 8 foot ground rod was driven into the sand, just next to the tuner, and connected to the ground terminal of the tuner. While there was no real need to have a ground plane or counterpoise with this antenna, it was vital to provide a path to discharge any lightning or static which might be induced in this long antenna.

To keep the public clear from the tuner and antenna, yellow police ribbon was placed around the trash can/tuner/antenna. This gave ample warning for people to stay clear.

An Inverted -L

Even with a NOTAM issued a month earlier, while we were deploying the balloon and full-wave delta loop (another article), an MD-80 passenger jet attempted to land and mistook the Patrick Air Force Base runway for Melbourne Airport. When the pilot realized his error, he began a climb and headed south, directly over the beach. Our balloon was at about 250 feet when this huge jet almost ran into it. From the view point of everyone on the ground, it appeared that the jet missed by less than 50 feet, causing the balloon to almost rip from the turbulence.

A full-wave vertical was designed, but that meant having the balloon (now reduced to 6 feet in diameter to avoid FAA restrictions) up to almost 525 feet. Chuck and I worried that even low-flying planes which track nesting turtles and marine mammals along the Brevard County Atlantic Ocean coast might run into the tether or the balloon, destroying both and possibly bringing down an airplane. We came up with an inverted -L design, with the vertical section going up one-quarter wavelength, and the three-quarter wavelength end going north to another balloon. The end balloon was set to hold the end of the antenna approximately 250 feet above a parking lot.

Both balloons were inflated, emptying only one tank of helium (photo D). The second tank was for the second night. To use the city park at Satellite Beach, we had to remove antennas for day activities by the public.

The antenna was attached, the tether was let out, and the antenna flew (fig. 8). I connected the feed end to the tuner, and adjusted the tuner for minimal VSWR. The tuner was then connected to a wattmeter, and the wattmeter was connected through about 40 feet of RG-214 to the linear (AL-572), which was connected to the IC-765. The speaker almost jumped off the table. A quick check verified that both wattmeters measured the same forward power and the same VSWR (photo E). We measured no reflected power with 100 watts forward. The linear was turned on, and we then fed the tuner to 1 KW. There was still no reflected power. I looked at the antenna and noticed no orange spots, indicating heating from the RF current. Everything was working great!

The 2.0:1 VSWR bandwidth was then measured. The antenna was flat at 1845 kHz, and remained under 2:1 from 1800 kHz to 1870 kHz. We were all ready to go!

The contest was going very well with stations being worked from New England out to the Caribbean and out to the West Coast. At the most active period, our run rate was 178 per hour. However, the noise was really bad, and we were not able to hear as well as some other stations who used their arrays of beverages. With only 10 hours of operating the first night and less than 4 hours the second night (due to a severe thunderstorm hitting us at 1 AM Sunday morning, with hail and tornado-like winds), we still made almost 300 QSOs.

The next contest will add receive antennas to this outstanding transmit antenna. I think that reports given said that we were one of the strongest stations from central Florida. All we need now is the ability to hear the many stations that must have been calling us.

Footnotes

1. Greene, R. C., W8PWU. "More on Balloon Supported Antennas," *QST* (Nov. 1940), pp. 38, 39, 82. Newington CT: ARRL.

2. Ferrier, D.T., W1LLX, and Baird, W.G., W9RCQ. "A New Kind of Skyhook," *QST* (Oct. 1946), pp. 24–25. Newington CT: ARRL.

3. Fair Radio Supply, 1016 E. Eureka St., Lima OH 45802. Catalog Item SEB-42-ALV.

4. See Internet URL <http://www.access.digix.net/~tcomlp/aerostat.htm#aerostat>.

5. Editors, "160 Meter Contest Results," *QST* (June 1976), pp. 71–74. Newington CT: ARRL.

6. Gibilisco, S., W1GV. "Balloons as Antenna Supports. *The ARRL Antenna Compendium Volume 2* (1989). Newington CT: ARRL.

7. Daso, D., K4ZA. "A Skyhook for the 90's," *QST* (May 1997), pp. 31–33. Newington CT: ARRL.

8. Edmond Scientific Company, 101 East Gloucester Pike, Barrington, NJ 08007-1380. ■

Operating from India for a non-Indian is not as difficult as it used to be. Follow VK9NS as he obtains his own call, VU2JBS, and operates from New Delhi.

VU2JBS

Amateur Radio Operation From India

BY JIM SMITH*, VK9NS

About a year after my visit to Port Blair, the capital of the Andaman Islands, to visit Mani, VU2JBS, I began to think of the possibility of applying for an Indian amateur radio license. I had been in India a few times over the years but had never really considered amateur radio activity during a vacation or business trip. At one time it had been very difficult for a foreigner to get an VU amateur radio license, but it was said that times had changed. Therefore, in late 1995 I duly made an application to the Ministry of Communications in New Delhi.

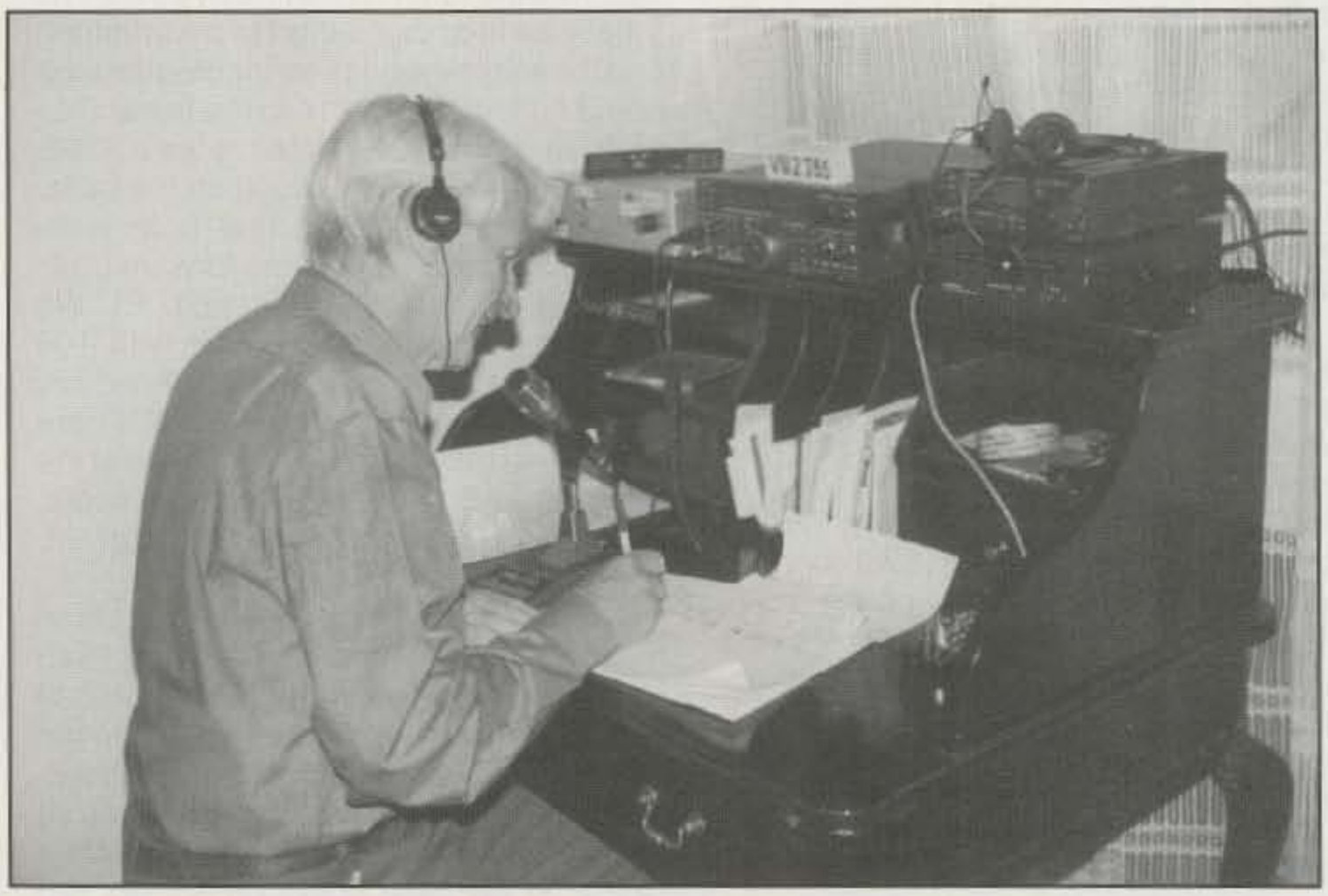
The situation in India regarding the issuing of amateur radio licenses to foreigners is quite complicated, but there is licensing structure in place now to process such applications. Both national and foreign licenses are issued after extensive routine checks are carried out. The license is issued under certain conditions. Most important is the location of the station, which is clearly stated on the license, as is the equipment to be used. Changing any of these points results in the license requiring amendment before it is valid once again.

The Ministry of Communications, W.P.C. Wing, is responsible for the issuing of amateur radio licenses. An application must be made to this department. I would like to say that in my own case my application took about six months to be processed. Given the complications that it was a foreigner making the application, it must be said that in my view the time frame seemed to be very reasonable. The most important thing is to make the application properly (in triplicate), and all matters on the application must be dealt with.

First you must have a valid Indian visa, and the license when issued is only okay for the period of the visa. In my case, I opted to apply for a five year visa, which was issued very quickly. It is noted here that initially my VU2JBS license was issued for a five year period, March 1996 to March 2001. However, around the time of issue in February/March of 1996, there was a change of policy: licenses would have to be renewed on a yearly basis. (This stresses the point that the location of the station must stay the same for the period of the license.) My license was amended to cover one year, and I have since been through the renewal process without any difficulty. I have always found the staff of W.P.C. very courteous and friendly. In fact, during my stay in New Delhi in November 1997 I was able to meet many of the W.P.C. staff in person.

I was worried about my arrival in New Delhi carrying all my radio equipment. All of you who have been on a DXpedition know just how quickly all of the weight builds up. My excess baggage was considerable, and I had left Heathrow Airport in London after paying several hundred dollars in excess baggage charges. I carried a comprehensive list of all major items —rig, antenna, keyer, etc.—and of course my actual VU2 license documentation.

I arrived at around midnight, and in due course proceeded to the customs area for clearance of my baggage. It turned out that all my worries had been unfounded. There is now a new customs system in place in India where the foreign visitors are encouraged and are ably assisted to make a smooth passage through the customs formalities. Basically, you must declare and show all dutiable items, and they



Jim operating SSB from VU2JBS.

*P.O. Box 90, Norfolk Island, Australia 2899

then must be taken out of the country when you depart. A similar system is in place in Bangladesh, and for example items such as video cameras, amateur radio equipment, etc., are marked on your passport. This ensures that these items are with you when you leave the country. I can only say that Indian customs at the airport was very helpful, and after showing my license, equipment list, etc., my clearance was processed very quickly.

My friend Yannick, F6FYD, met me at the airport. As we all know, it is a wonderful feeling to be met after a long flight. I was very tired, as the trip had not been the best (the plane was absolutely full)! The hour-long trip from the airport was quite pleasant, and at 1 AM the road traffic was very light. I was soon settled in my room and very quickly asleep.

The next day we set up the station in Yannick's work room. It did not take long to get everything together. The VU2JBS station was very modest, consisting of a Kenwood TS-690S and my trusty HF6V Butternut multi-band vertical with multi-band radials, which I have used on many DXpeditions. My TS-690S has a built-in antenna tuner, which is a great help with any multi-band antenna system. In India many of the houses have a flat roof; in a crowded country this area adds more space to the home. It can be used for many things, from drying the wash to sitting outside on a cool evening. In any case, the roof was ideal for my antenna and its radial system, and with the help of Yannick the antenna was installed without any problems. The station was more or less ready to go.

Operating from New Delhi was very interesting. Despite the relatively low power of 100 watts and a modest antenna, I made a lot of contacts. I worked a lot of CW, as it was a "quieter" mode. and there was little or no disturbance to the household. In making some 3000 QSOs over the few days of operating, I was satisfied that finally my VU2JBS license had been put to good use.

During my visit to India I was able to do several things, including going to W.P.C., the usual sightseeing, and buying a few souvenirs. New Delhi is, of course, very busy, and the traffic has to be experienced to be believed, especially if one is used to living somewhere like Norfolk Island! Traveling around in the city can be daunting, but there have been extensive moves to make the city and road median strips greener. As in Singapore, trees and shrubs are everywhere, and it certainly helps to absorb some of fumes and pollution. Also, there are many large areas of spacious parks which we visited along with several of the usual tourist attractions.

The various markets are really amazing. Once again when comparing things to Norfolk, the world is alive and kicking

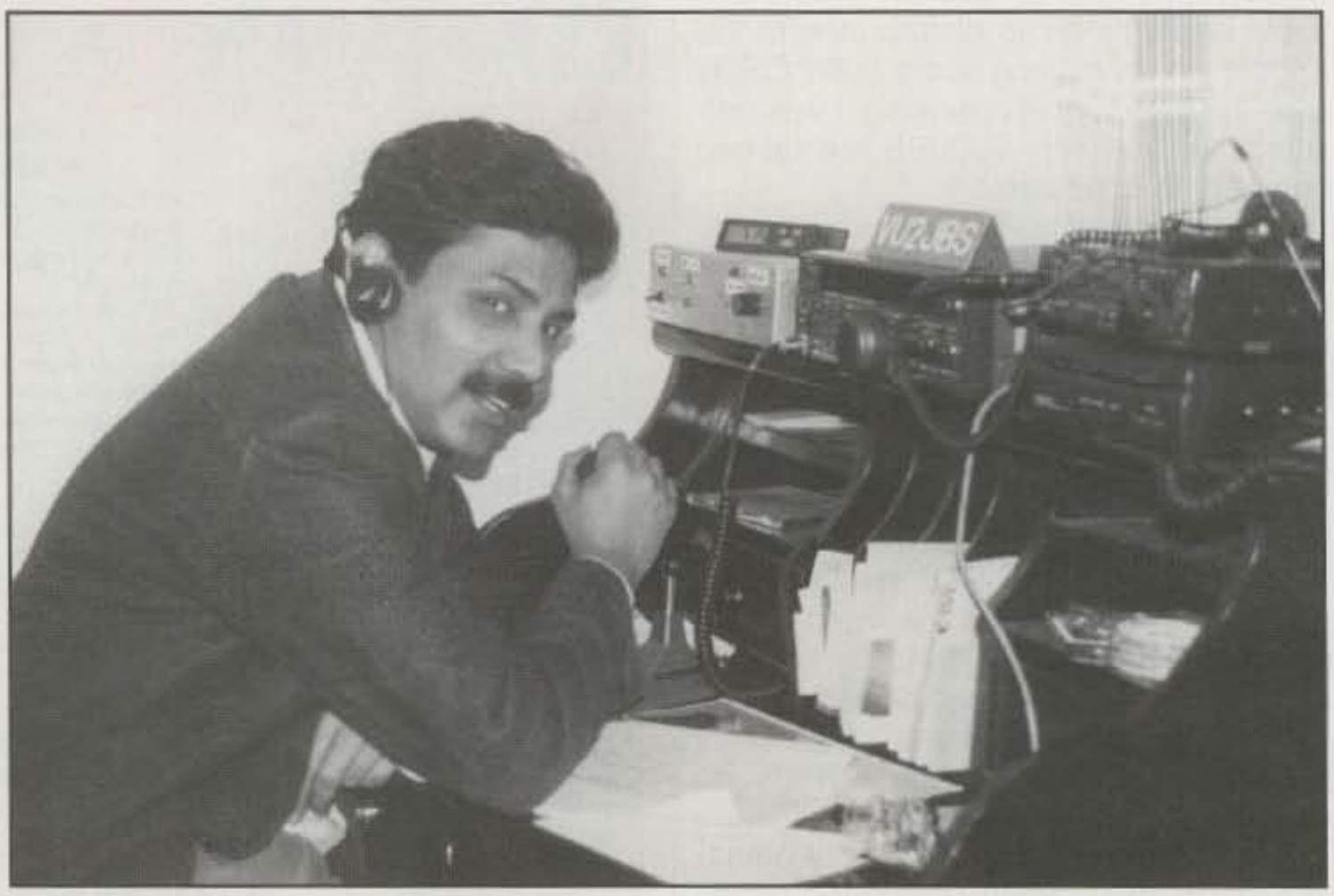
Bharathi, VU2RBI, at the VU2JBS station.

with hundreds of things to catch one's eye, from fruit stands to flower stands, and suitcases to watches, to shirts, shoes, and so on. An endless variety of wares took me back to my earlier days in the Far East, and I enjoyed every minute of it. Maybe that's not quite true. I did have to spend about two hours at the local police station! It wasn't that they wanted to lock me up, but the fact that someone had picked my pocket and I was reporting things to the police. It was a sad experience for me (as I should have know better), but my wallet, money, and credit cards (very important when traveling) were all stolen, including my reading glasses. Anyone who needs glasses to read knows what I mean. Life is just not the same when you cannot read the smaller print!

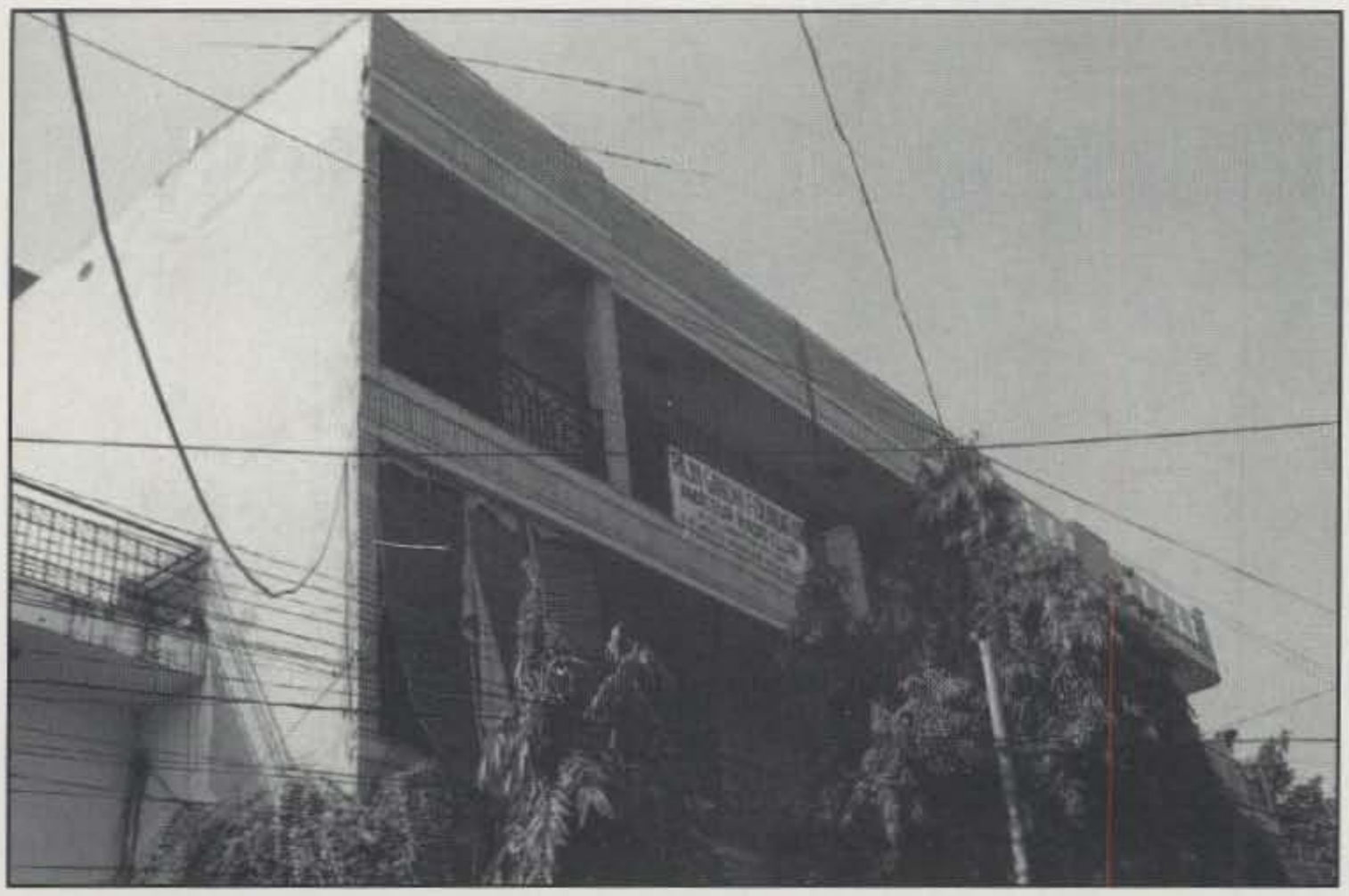
Yannick, his wife Nigiar, and I also visited with Bharathi, VU2RBI, her husband Prasad, VU2DBP, and their family one evening. This was very pleasant. The next day we visited her again at the offices of the Rajiv Gandhi Foundation Amateur Radio Club and tried to help with some equipment problems. I soon found that the antenna, which is a tri-band beam, had seen better days. The beam had a high SWR on all three bands and inspection showed that one side of the balun was not connected; corrosion had eaten through the joint. Also, there was a problem in the driven element with more poor joints between tubing sections. The beam needed a complete overhaul, with all elements requiring attention and cleaning of the joint fittings. With our limited time, it was not possible to do much more. However, Yannick went back a week or so after I had left and tried to do some further maintenance work on the equipment and antenna. The verdict was that a new beam was definitely required. A few days later Bharathi and family visited Yannick and Niagar and of course wanted to see the VU2JBS station.

Several VU license holders were met during my visit to the W.P.C. offices. My amateur radio world started on Car Nicobar, which in those far off days was about to be handed over to India as the country became independent from Britain. I am a Scot and have a British passport, by the way, so it was nice to be able to say hello to a few of the active VU stations. I am a member of the I.A.R.S. so at least they have a small input from my membership.

A highlight of my stay in New Delhi was a visit to The Royal Embassy of Bhutan, where I met Ambassador Nado Rinchhen. The Bhutanese Embassy Building and gardens are magnificent, and on stepping through the gates I felt as though I was transported back to Bhutan. In spending almost an hour with his Excellency during this private visit we discussed many issues, and it was most enjoyable. On my



Prasad, VU2DBP, husband of Bharathi, at the VU2JBS station.



The offices of the Rajiv Gandhi Foundation Amateur Radio Club.

departure I received a gift from His Excellency, who then arranged my return back to Yannick's house in the embassy car, which was very thoughtful of him.

I was able to visit Yonten, who several years ago was better known to the amateur radio world as AC5TY and later A51TY (when the prefix for Bhutan changed). Yonten was in the hospital, and a few days after he underwent surgery. However, Yonten is back home in Bhutan now and recovering very well. It was quite a coincidence our both being in New Delhi at the same time. I had met Yonten on previous visits to Bhutan.

My eleven day stay in India then more or less came to a close. My plans to visit Bangladesh were changed, and I headed for home on Norfolk Island. Since then there have been the usual requests for VU2JBS QSL cards and requests are processed fairly quickly.

I would like to extend my thanks to Yannick and wife Nigiar for their gracious hospitality, and to W.P.C. for their courtesy in processing my VU2JBS license. The callsign has now become very special to me, and I enjoyed operating from India very much. The sights and sounds of New Delhi are a delight to remember. ■

Yannick, F6FYD, checking out equipment at the Foundation club station.

1998 CQ 160 Meter DX Contest High-Claimed Scores

SSB

Call	M	Score	QSOs
C42A	M	569,079	921
P4ØK	S	410,022	512
K1ZM	S	404,250	1175
OT8T	S	316,438	637
VE3DC	M	312,450	852
WB9Z	S	312,080	1335
V47KP	S	300,390	571
S58AB	S	283,920	630
WR8C	M	279,220	1165
LY3BS	S	278,025	980
UA2FJ	S	272,403	875
LX9UN	M	250,575	734
S5ØA	S	240,675	583
IT9EQO	M	232,596	499
UA2AA	M	231,240	727
N8TR	M	225,420	1083
W3GH	M	222,938	1123
9A2NY	S	212,244	532
K1UO	S	211,470	738
K8LN	S	206,394	1019
CT3BX	S	202,998	296
N4RV	S	200,072	912
VE3DO	S	196,275	530
S54DL	S	190,992	491
W3TS	S	179,170	915
HB9CXZ	M	178,530	506
N4SF	M	177,576	884
OZ9KY	M	174,986	572
W4ZR	M	170,814	869
W1NA	S	168,032	630
XE1RCS	M	165,648	496
G6YB/P	M	165,600	422
S5ØR	S	163,556	495
KD9SV	S	155,572	853
N2YR	M	153,750	751
NØKOV	M	152,351	896
WP3X	M	149,800	421
HG1S	S	147,616	509
IV3OWC	S	147,315	389
UU4JMG	S	145,553	567
S53R	S	143,472	443
KØXG	M	141,680	893
AA1BU	M	138,243	554
IR3R	M	135,952	453
KF9IF	M	129,710	825
K1PX	S	129,402	693
NE3F	M	128,800	623
S57M	S	128,154	402
C6AIE	M	127,794	445
LY5A	S	123,119	447
K1VW	S	121,040	602
DKØIW	M	119,280	455
WØETC	S	118,105	812
N3MKZ	S	111,675	622
G3NAS	S	111,360	311
OMØWR	S	110,552	414
N3OUC	M	107,338	500
OZ3SK	S	106,542	376
W6A	S	104,850	561
LY2BTA	S	104,714	489
K8OQL	S	104,390	616
NN3Q	S	103,257	440
N5HV	S	102,375	714
N8KR	S	102,270	641
G3SVL	M	101,145	359
W3BGN	S	101,010	469
K8WT	M	99,634	724
N7KQ	M	99,190	675
KØLIR	M	98,028	706
OH1LEU	S	97,804	394
KBØWY	M	94,878	670
W3GNQ	S	91,910	580
EA4KD	S	91,561	274
NA2A	S	91,195	637
K3IXD	S	89,644	513
W7SE	S	89,160	659
WØAH	S	87,696	620
9A2EU	S	87,108	328
N2BJ	S	86,814	618
VE6JY	S	85,374	337
W4CN	M	83,097	603
OH2BC	M	82,848	331
K1NK	S	82,731	479
WF2W	S	82,112	533
G8Q	M	81,900	303
K2RD	M	81,130	477
K3WW	M	80,700	437
IØSNY	S	80,392	318
W7MMQ	S	79,947	556
LY7A	M	79,396	337
LY3BA	S	79,080	395
N2WM	M	78,078	381
K4PI	S	77,870	539
WY3T	M	77,760	526
K4JRB	S	75,509	502
IKØYUT	S	72,675	335
AA4MM	S	72,224	403
WA1LJD	S	71,955	494
VP5JM	S	71,500	270
K1HAP	S	71,050	372
W2GD	M	753,548	1433
W1FJ	M	734,668	1227
WW2Y	M	711,360	1303
5B4ADA	S	687,609	874
EA3KU	S	685,400	924
TI1C	S	674,836	1004
8P9DX	S	647,584	932
OHØMAM	M	624,068	1243
OZ7YY	S	612,480	1072
UA2AA	M	611,708	1162
9A1A	M	595,840	1045
GØIVZ	S	567,126	900
OK1KSO	M	556,920	925
OT8U	M	555,750	1012
DK1NO	M	541,352	1004
W3AO	S	526,968	1200
UA2FJ	S	511,299	1031
W4ZV	S	499,443	1192
OM7M	M	482,914	977
LY6K	M	480,600	935
9A7A	M	464,135	932
S58A	S	459,100	765
S5ØA	S	451,236	897
W4WA	M	450,312	1130
SM4HCM	M	435,388	832
YL8M	S	420,904	858
PI4COM	M	420,840	883
SL3ZV	M	419,672	852
OH2HE	M	410,410	941
4X4NJ	S	403,777	585
G4BYG	S	401,481	705
HG5A	M	400,344	861
WB9Z	S	397,098	1080
S53R	S	388,110	824
VE7SV	M	387,653	930
K8MK	M	383,748	961
V47KP	S	381,312	670
K8DX	S	380,920	1096
DJ8QP	M	372,795	833
DK6WL	S	366,960	775
KQ2M	S	355,533	846
GM8R	M	351,076	786
W3BGN	S	338,416	837
AAØRS	M	334,020	1007
K8XXX	M	328,962	1091
K3WW	M	326,655	913
SM5HJZ	M	321,530	739
HG1S	S	321,328	809
OK1MR	S	317,422	727
VE3DO	S	316,888	714
OL5Q	M	312,060	882
DF9ZP	S	311,190	711
F6BEE	S	310,592	538
VE1PZ	S	307,393	472
VE3KZ	S	301,800	816
KVØQ	S	301,443	985
W3GH	M	295,301	1010
OL1A	M	292,320	675
OM3RM	S	291,291	706
RM6A	M	290,059	702
S58AM	M	288,666	688
KD9SV	M	287,805	911
W4S	M	284,280	853
LY2WR	S	280,840	754
S57M	M	277,725	706
S58MC	S	273,825	681
JH5FXP	S	273,051	352
I4IKW	S	272,074	516
IT9ZGY	S	269,943	605
VE3DC	M	266,450	745
ES5Q	M	263,276	816
9A2TW	S	262,521	587
OH1MA	S	261,936	704
PAØCLN	S	261,825	640
RU1A	M	260,820	805
PA3BAS	M	258,248	602
K9DX	S	256,215	987
GW3JXN	S	253,827	556
W3TS	S	252,976	880
OMØWR	S	252,747	703
OH1MM	S	251,160	741
WØCD	M	249,998	964
DLØAO	M	245,137	612
OH2BCI	M	245,070	650
YU7AU	S	245,019	648
KH6CC	S	244,818	422
F5IN	S	239,628	524
IK2QEI	M	238,125	601
K9NR	M	235,613	951
HA6BE	S	234,780	616
WT3Q	M	234,352	871
PI4ZLD	M	234,056	643
EA4ML	M	232,102	509
T39Y	S	230,376	758

CW

Call	M	Score	QSOs
EA8BH	S	1,529,000	1227
C42A	M	1,110,596	1153
P49I	S	928,408	898
GW3YDX	S	901,401	1254
CT3FN	S	797,916	817
VE3EJ	S	757,107	1190

1998 High-Claimed Club Scores

Frankford Radio Club	6,322,476
Slovenian Contest Club	5,202,330
Contest Club Finland	4,332,755
Potomac Valley Radio Club	3,542,928
Yankee Clipper Contest Club	3,182,032

ROTATORS

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Model	Application	Mast Size	Rotator Size	Pre-sets	Wind Load
G-450XL	Light/medium-duty	1 3/4 - 2 inches	12 1/2"Hx7 1/2" Dia.	No	10 Sq. Ft.
G-800X	Medium-duty	1 1/2 - 2 1/2 inches	12 1/2"Hx7 1/2" Dia.	No	17 Sq. Ft.
G-800SDX	Medium-duty	1 1/2 - 2 1/2 inches	12 1/2"Hx7 1/2" Dia.	Yes	17 Sq. Ft.
G-1000SDX	Heavy-duty	1 1/2 - 2 1/2 inches	12 1/2"Hx7 1/2" Dia.	Yes	23 Sq. Ft.
G-2800SDX	Extra Heavy-duty	1 7/8 - 2 1/2 inches	13 5/8"Hx 8" Dia.	Yes	34 Sq. Ft.
G-5400B	Azimuth-Elevation Rotator combination	1 1/2 - 2 1/2 inches (Boom Dia.1 1/4 - 1 5/8 in.)	Mounted together 12 1/2"Hx7 1/2" Dia.**	No	11 Sq. Ft.
G-500A	Elevation only	1 1/2 - 2 1/2 inches (Boom Dia.1 1/4 - 1 5/8 in.)	10 1/2" Hx7 1/2" Dia.	No	12 Sq. Ft.

Rotators not shown: G-800S, G-800SDX, G-1000SDX
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*Wind load ratings are valid when rotator is mounted in tower.
**Rotator size mounted together.

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GS-050 Thrust Bearing. **GS-065** Thrust Bearing
GS-23 Computer Interface for G-800/1000/2800.
GS-232 Computer Interface for G-5400B.
GA-2500 Absorber Joint for G-450/800.
GA-3000 Absorber Joint for G-1000/2800.

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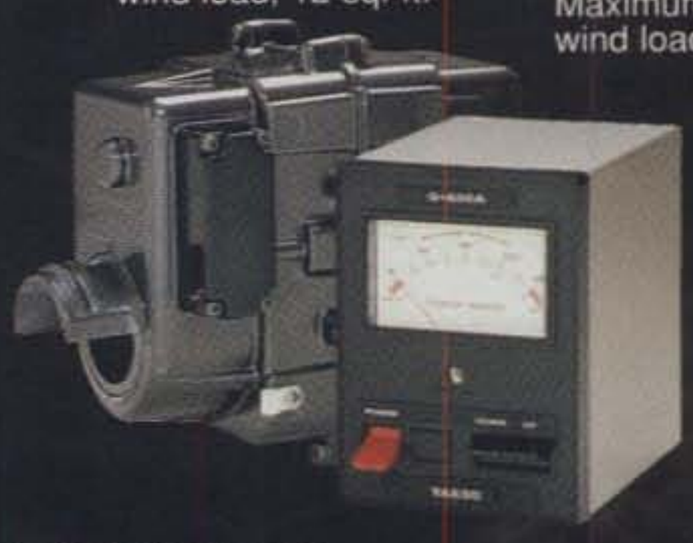
G-450XL
An entry-level rotator priced low, for light to medium duty antennas. Maximum antenna wind load, 10 sq. ft.



G-500A
Elevation rotator for space communication antennas. Maximum antenna wind load, 12 sq. ft.

G-5400B
Azimuth-Elevation combination for space communication antennas. DIN connection provided for computer operation. Maximum antenna wind load, 11 sq. ft.

MATH'S NOTES

WHAT'S NEW AND HOW TO USE IT

BY IRWIN MATH, WA2NDM

A Miniature HF to VHF AM/FM Receiver Using the NE605

It seems that every time we present a circuit for a miniature receiver we get lots of mail, most of which is complimentary and indicates that this type of project is what "tickles a lot of fancies." I am not certain exactly why that is, but if that's what's necessary to spark homebrewing, we will be glad to present such circuitry whenever we become aware of suitable offerings that may be applicable to amateur radio. A resurrection of the homebrewing portion of the hobby is, after all, one of the objectives of this column. As a result, this month we are pleased to present another one!

The Signetics (now Phillips) NE605 is a low- power mixer/IF amplifier integrated circuit normally designed for single-conversion FM receiver applications which can easily be used as the heart of a simple receiver. The circuit to be described, using this chip, will enable you to construct a complete AM and FM receiver that can be used for local monitoring or for casual HF and VHF listening. With the addition of a simple BFO oscillator, it can even form the basis of a simple entry-level communications receiver. Before proceeding, however, be aware of the fact that this is a medium-performance circuit, not the end-all and be-all. Although operation from HF to 500 MHz for the front end is certainly possible, the noise figure is only around 5 dB, so sub-microvolt signals probably will not be received as well (if at all) as with your HT or standard communications receiver, both of which usually offer noise figures of less than a dB at VHF. A low-noise tuned pre-amp ahead of the NE605 will obviously increase performance, but that will not be covered at this time. In addition, the on-chip local oscillator will only go to about 50 MHz using the internal circuitry, limiting operation to 6 meters using the chip alone. An external local oscillator will be required for operation up to 500 MHz. This also will not be covered at this time. However, most simple pre-packed microprocessor-oriented crystal oscillators (with a stage or two of multiplication as required) will work for higher frequency single-channel applications. Nevertheless, keeping the limitations mentioned in mind, a very simple receiver that may suit many needs will be the result, so here goes!

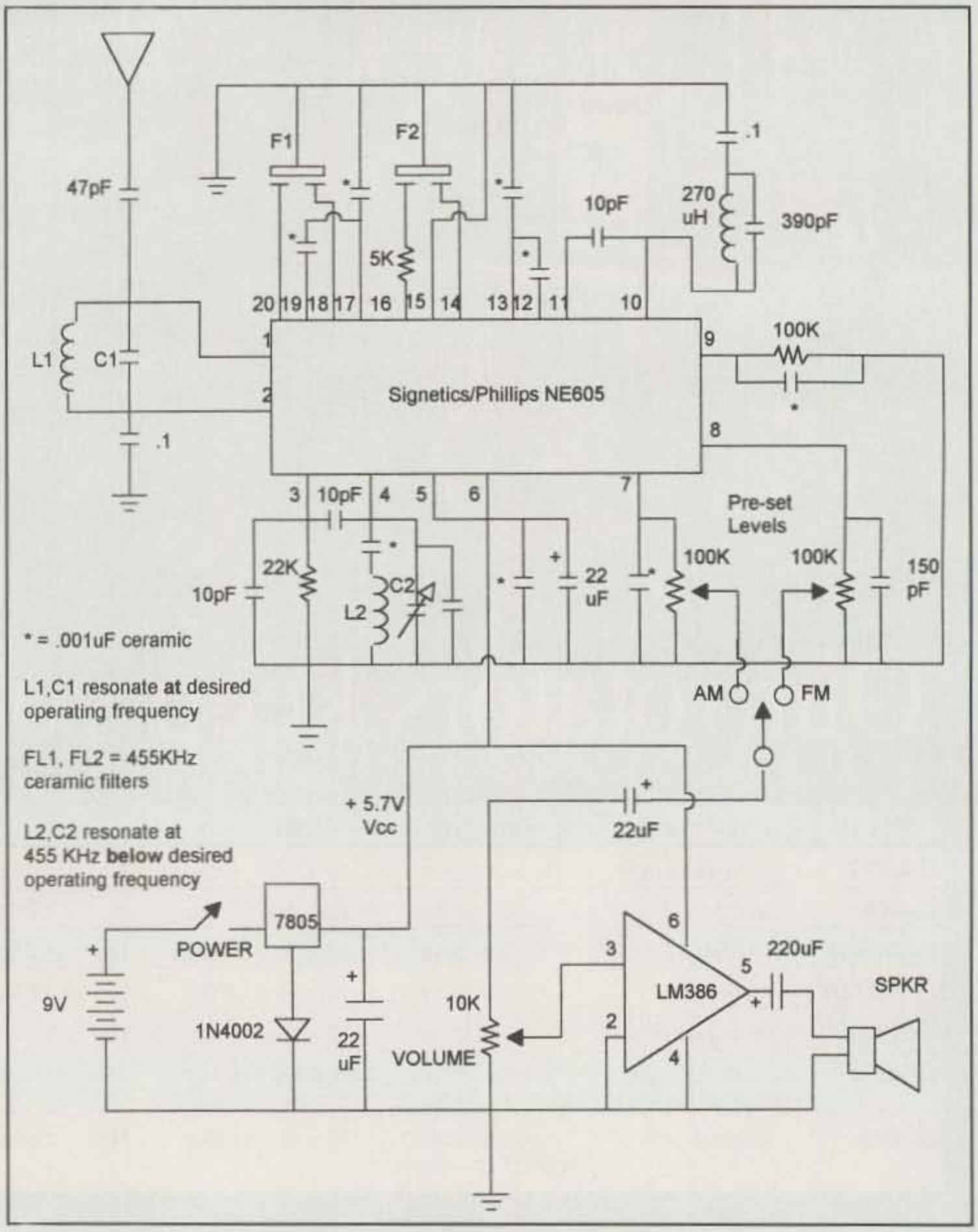


Fig. 1– Simple HF to VHF AM/FM receiver.

Fig. 1 is a schematic of the simple, single-conversion FM and AM receiver using the NE605. Only two tuned circuits are necessary: the input, which will provide some degree of selectivity, and the local oscillator, which should operate at 455 kHz below the desired input frequency. Choice for the absolute values for these circuits will be left to the experimenter and probably will be dedicated by what is in the junk box. The two items labeled FL1 and FL2 are common, low-cost 455 kHz ceramic filters designed for AM radio use and are readily available.

In operation, signals received by the antenna are applied to the input of the NE605. This input goes directly into an internal mixer stage, which accounts for the higher noise figure. Also applied to the mixer is the local oscillator output, the frequency of which is determined by the setting of L2-C2. The difference between the two is the IF frequency, 455 kHz, and the two ceramic filters are used to provide a narrow pass-band IF amplifier at that frequency. You will note that the local oscillator is tunable. If fixed frequency operation is desired, C2 and its parallel padding capacitor can be replaced by a crystal of the appropriate frequency. L2 and the .001 µF capacitor, however, must be left in. If you use the variable-oscillator approach, be sure that C2 and its padding

c/o CQ magazine

capacitor are chosen so that you have a reasonable tuning range. Attempting to make the tuning range too wide will result in instability. Keeping the range to 1–1.5% of a given frequency is a good rule of thumb. Also be sure to use high- quality capacitors and inductors for all circuits. Their overall stability will be directly reflected in the stability of the entire receiver.

The 270 µH coil and 390 pF capacitor connected to pins 10 and 11 form a quadrature detector that detects an incoming FM signal and provides recovered audio at pin 8. Pin 7 is usually used for a received signal strength meter. As a result, its output level is a voltage that is directly proportional to the incoming signal amplitude. Since AM is a variation in signal amplitude, this output makes a neat AM detector. Two pre-set potentiometers are included at the AM and FM audio outputs of the NE605. These are used to equalize the outputs so that switching from one mode to the other provides a roughly equivalent signal. An LM386 audio amplifier completes the circuit, providing adequate drive for a small speaker or headphones. The entire receiver operates from 5 to 6 volts, which is derived from a 9 volt transistor-radio battery and a low-power three-terminal regulator. Current drain is a function of the audio output level.

When building the circuit, take care to use high-frequency layout techniques. This means short leads, keeping input and output components away from each other, and building everything over a good ground plane. So-called "dead-bug or ugly" construction methods are fine as long as you are careful. Overall results are dependent to a great degree on layou,t so be careful.

The completed receiver can be mounted in the enclosure (metal preferred) of your choice. Since it is a single-conversion circuit, strong signals at 455 kHz below as well as above the local oscillator frequency may leak through. This is the price you have to pay for single conversion. A more elaborate bandpass-type input tuned circuit with higher Q that "tracks" the local oscillator can reduce this effect, but that's something you will have to "play" with. Regardless of what your final design is, the NE605 is a chip worth experimenting with.

As a final note, we have not purposely described exact layouts or bills of material for this project, as it is experimental. The whole point of building such a circuit is to "cut and try" until you acheive results with which you are happy. If you need more details, request the data sheet for the NE605 from Phillips Signetics Company, 811 East Arques Avenue, Sunnyvale, CA 94088-3409. Good luck and let me know of your results.

73, Irwin, WA2NDM

BY KARL T. THURBER, JR., W8FX

THE DIGITAL DIPOLE

FROM SOFTWARE THROUGH ANTENNAS FOR THE SHACK

August Fun and Sun

I recall the last time I mentioned that a column was *fun*, it was squarely in the dead of winter! The seasons have changed now: it's coming up August, traditionally a "fun month" that includes lots of tower climbing and other antenna-related activities in the summer sun. In any event, hopefully we'll have fun this month with our regular column happenings, and to kick off the sun and fun we'll first turn our attention to antennas.

The Palstar AT300CN is a compact, high quality antenna tuner that provides adjustable impedance matching for all types of antennas. The unit uses a 48-position switched toroidal inductor with silver-plated double contacts. It measures power and SWR with an illuminated, frequency-compensated, single crossneedle analog meter. (Photo courtesy Palstar, Inc.)

Palstar offers several HF/VHF wattmeters, including the WM150, a dual crossneedle directional HF/VHF RF wattmeter that covers 160 through 2 meters. Its dual crossneedle display offers both peak and average reading. (Photo courtesy Palstar, Inc.)

Antenna Notes

Antenna Goodies from Palstar, Inc. For the past 20 years or so, Paul Hrivnak, VE3UP/W8, has fielded a variety of electronic products for the TV and amateur markets through several of his companies. In 1979 Paul started Viewstar, which produced cable TV converters and other devices, along with a tabletop amateur HF amplifier. He founded Vectronics in 1988, and in the process produced several "private brand" products for AEA and MFJ, including the MFJ-264 1500 watt, 600 MHz dummy load. In 1994 he sold Vectronics, which ultimately came under the MFJ umbrella.

Paul got back into the amateur radio manufacturing business with his founding of Palstar, Inc. and the acquisition of Bramco®, a company that made a variety of signaling-related products for the two-way radio field. Palstar now makes a number of quality amateur accessory products.

Palstar products include the AT1500 and AT300CN antenna tuners. The former ($369.95) is a solidly constructed, high-power (1500 watt PEP) roller inductor tuner using heavy-gauge aluminum for the case and a "beefed up" tuning roller constructed from 10-gauge plated wire on a Delrin coil former. The latter is a compact, 200 watt device that provides adjustable impedance matching for all types of antennas. The unit uses a 48-position switched toroidal inductor with silver-plated double contacts. It measures power and SWR using an illuminated, frequency-compensated, single crossneedle analog meter. The AT-300CN (see photo) is $139.95 and includes a dummy load. Both tuners include a built-in 4:1 balun for balanced wire feeders.

Several other products are available. These include the AA30 active antenna matcher for receiving applications; TCB precision turns counter; DL1500 dummy load with fan; WM150 directional HF/VHF RF wattmeter (see photo); RI28 roller inductor; and various components, including variable capacitors, turns counters, and low-pass filters. By the time this column appears, Paul should offer the AT4K 4000 watt antenna tuner and the PAL700, a 700 watt HF amplifier for 160–2 meters using four 811s.

For more information, contact Palstar, Inc., 9676 N. Looney Rd., P.O. Box 1136, Piqua, OH 45356 (937-773-6255; e-mail <Palstar@erinet.com>; Web <http:// www.palstarinc.com>).

The Rotor Doctor is in! We've mentioned this well-known rotor repair service and parts supplier several times, most recently in August 1994—although at the time we last took note, it was known as "C.A.T.S." Over the years, the firm, operated by Craig Henderson, N8DJB, has expanded its traditional repair services, which it still offers at very modest prices.

Craig's firm now offers several unique accessory products. These are a special QUIK-CONNECT™ locking connector ($6 to $16, depending on configuration) to replace the "infamous" terminal strip in CDE/Hy-Gain rotors, and the "Brak-D-Lay" PC board ($25), which provides a 7 second delay time for brake engagement on CDE/Hy-Gain rotors.

Another popular product is the Super Wedge. The device is an improved "wedge" for the Ham III and Ham IV rotors, to minimize braking problems. The "unbreakable" device holds antennas with boom lengths up to 40 ft. It's $15.

For more information and a flyer, contact The Rotor Doctor, 7368 S.R. 105, Pemberville, OH 43450 (419-352-4465; e-mail <craig@rotordoc.com>; Web <http://www.rotordoc.com>). The flyer includes a handy tabulation of manufacturers' claimed specs for the most popular rotors, as well as a listing of available new and used/rebuilt rotors from manufacturers such as CDE/Hy-Gain, Channel Master, and Alliance.

More on Array Solutions. In a recent issue we noted that the developer of the popular WXØB StackMatch, Jay Terleski, had formed his own company last September to market products which he formerly sold through Dunestar Systems. In a further update, Jay told us that he decided it was time to manufacture and sell his products himself, adding more features, upgrades, and functionality. The main product is, of course, the WXØB StackMatch (see photo). The $185 device and its controller are used to stack, match, and power-split to two or three HF beam antennas, either monoband or multiband, that are mounted on a single tower.

Jay notes that the StackMatch allows the "average" DXer and contester to add a second or third tribander. Then the beams can be pointed in the same direction for power gain, or switched in any combination to adjust the array's take-off angle for maximum power gain to the

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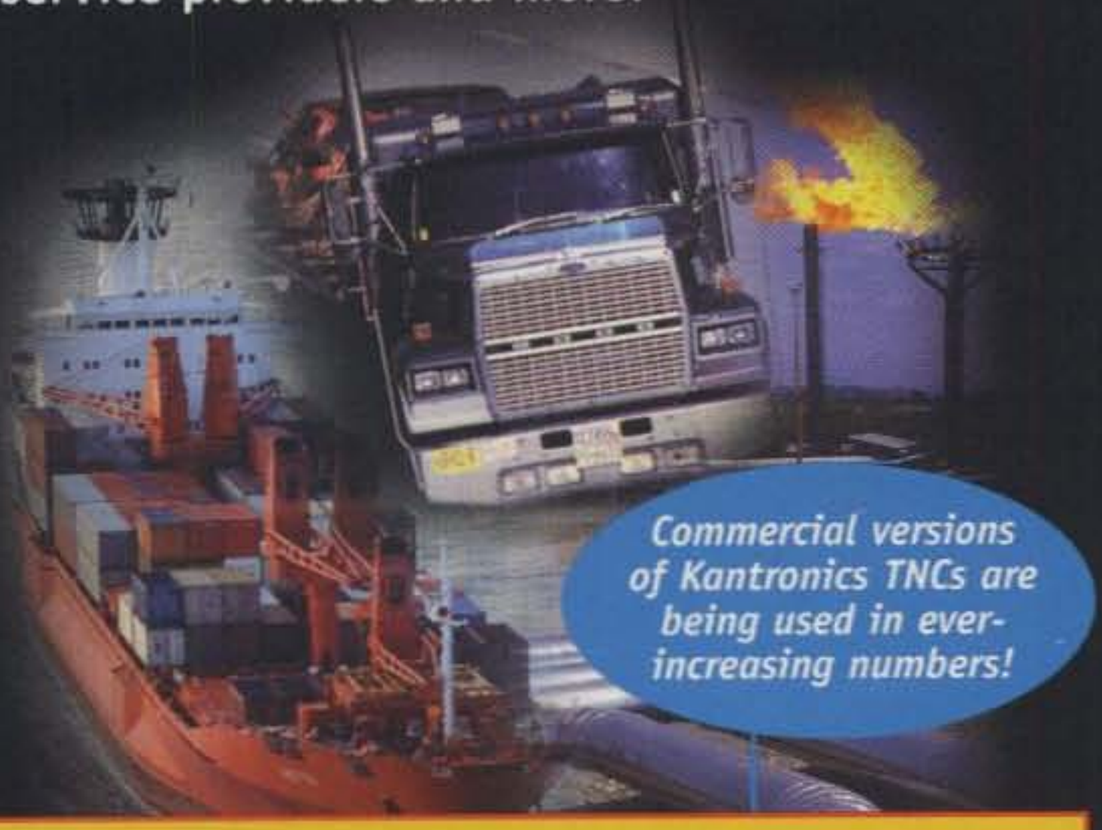

Commercial versions of Kantronics TNCs are being used in ever-increasing numbers!

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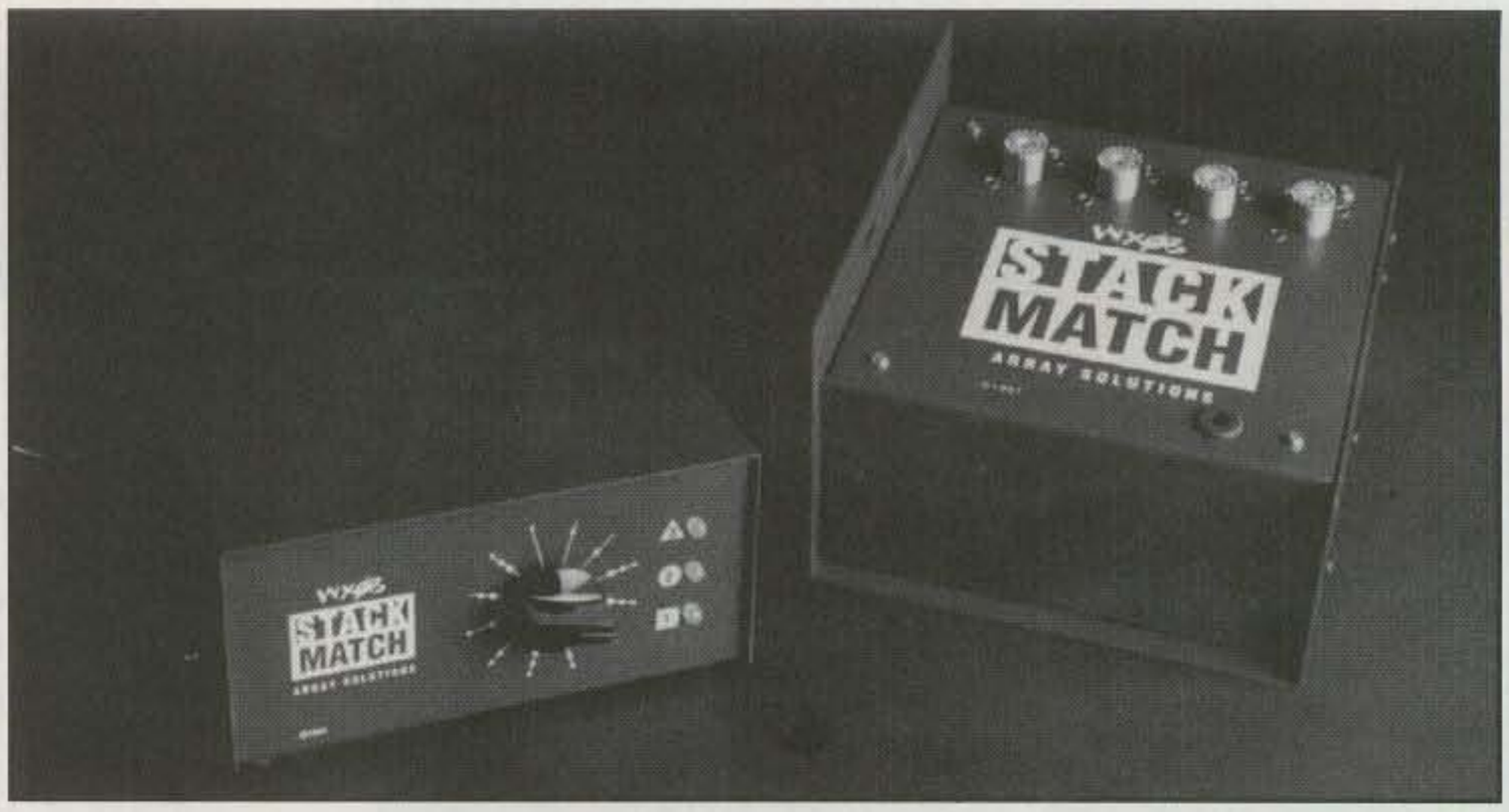

The Array Solutions WXØB StackMatch and its controller are used to stack, match, and power-split to two or three HF beam antennas, either monoband or multiband, that are mounted on a single tower. The StackMatch allows the "average" DXer and contester to easily add a second or third tribander to his or her arsenal. (Photo courtesy Array Solutions, Inc.)

desired area. Or, you can spray your signal in two different directions if needed for, say, coverage of the east and west coasts from mid-America in the Sweepstakes.

The StackMatch for Verticals (also $185) can be used to phase and match verticals, and for diversity transmission and reception, you can employ a combination of antennas, such as a Yagi and a vertical. Also, a Mini StackMatch, without relays and the ability to do any antenna switching, is available at $99.

Jay also added a second feedline option to the StackMatch. This makes it easy for the two-radio, single-operator contester to take a single beam out of the stack and connect it to a second radio for grabbing a multiplier, while the rest of the stack is used to run stations on another frequency.

Of special note, there's the so-called "BIP-BOP" operating mode. Jay tells us that Both-IN-Phase (BIP) and Both-Out-of-Phase (BOP) operation is possible for two monobanders. The reason for BOP operation is that two beams fed 180 degrees out-of-phase will result in a high takeoff lobe. This is useful for making a high stack of antennas that has a low takeoff angle main lobe for local contacts, or a high-angle one for E-skip conditions.

Jay also now offers high-power baluns (see photo) to meet the high-end market of DXers and contesters. These wideband, very heavy-duty baluns are designed to feed Yagis, dipoles, and verticals; they can be ordered for 1:1 or 4:1 impedance matching, to be fed with 50 ohm transmission line. The units, $69 and $79, respectively, are sealed in weatherproof boxes.

For more information, contact Array Solutions, 350 Gloria Rd., Sunnyvale, TX 75182 (972-203-8810; e-mail <wxØb@arraysolutions.com>; Web <http://www.arraysolutions.com>.

As this issue went to press, Jay advised us that he has extended the capability of the StackMatch to cover the 6 meter band, especially welcome news for the VHF DXer and contester. Also, he has introduced the SixPak, a six-antenna, two-radio configurable antenna-to-radio switch. We hope to have details in a future column.

W9INN Antennas Update. On several occasions we profiled Bill Fanckboner, W9INN's amateur multiband slopers and dipoles, and his SWL receiving antennas. W9INN antennas are assembled complete with center connector, Dacron® line, spreaders, and other accessories except for coax, which you supply. The current W9INN catalog includes a number of sketches and configuration suggestions that should give you some good ideas.

Bill has been selling high-quality HF antennas for amateurs and SWLs for years, and making them for well over 50 years. Bill's impressive line features multiband slopers and dipoles (about 35 different antennas in all) that boast coverage from 160 through 10 meters, including the 30, 17, and 12 meter WARC bands. He also handles the MFJ-989, 986, 949E, 948, and 945E tuners, and offers the classic MFJ-912 "W9INN Balun Box" that converts balanced line to coax feed. SWLs aren't left out of the picture, as Bill also offers the popular Eavesdropper, a nine-band shortwave receiving antenna for 500 kHz through 30 MHz.

For a catalog, contact W9INN Antennas, P.O. Box 393, Mt. Prospect, IL 60056 (847-394-3414).

Soft Stuff

VTDATA Tube Software. To many of us,

Array Solutions also now offers high-power baluns to meet the high-end market of DXers and contesters. These wideband, very heavy-duty baluns are designed to feed Yagis, dipoles, and verticals; they can be ordered for 1:1 or 4:1 impedance matching, to be fed with 50 ohm transmission line. The units are sealed in weatherproof boxes. (Photo courtesy Array Solutions, Inc.)

the best part of amateur radio is the nostalgia that goes with the hobby. While most radios today are solid state, and many hobbyists look with disdain on vacuum tubes, some vacuum-tube era equipment still can do a creditable on-the-air job. And there's magic in the old sets—especially those golden-age classics, the tube filaments of which glow brightly and warmly in the dark and possess a unique character not usually found in modern-day radios. Alas, though, detailed tube data is no longer that easy to come by.

To help with this problem, EPS/Solutions offers the VTDATA software, billed as "a complete vacuum tube manual on your computer." The firm claims it provides all the information you'd expect in a tube manual, plus powerful features for using that information. The program boasts electrical specs for over 1200 of the most commonly used tubes. VTDATA's database also includes tubes of historical interest, such as the early "two digit" types (45, 80, etc.) and hi-fi audio types.

The program lets you look up the specs for any vacuum tube in the manual, find all tubes that match your specs, locate tube substitutes, and maintain your personal tube inventory. Easy-to-use, menu-driven screens and a complete, on-disk user's manual are included. The DOS-based program also will run in a DOS window under Windows 95™.

VTDATA is $29 plus $3 S&H from EPS/Solutions, VTDATA Software, P.O. Box 862, Broomall, PA 19008-0862 (e-mail <EPSweb@aol.com>; Web <http://members.aol.com/EPSweb/vtdata>).

ProLog98. We detailed the DOS-based ProLog QSL Route Management System, offered by Datamatrix proprietor Ed Longhi, KI5OG, in August 1994. The System is very useful if you need instant QSL route management information for the DX station you just worked, or to assist friends with route information. Later, in the February 1996 issue, we profiled Ed's "ProLog the Logging Program," a complete, stand-alone logging platform that also included awards tracking for most awards, as well as non-specific award assignment for tracking awards of your choosing.

In a recent letter, Ed let us know that ProLog has finally made it to Windows 95 in the form of the ProLog98 QSL Route Management System for Windows. Ed says he decided to update the QSL routing package first, before undertaking the rewrite of the logging program, a much larger project. He expects to deliver the ProLog98 logging system before the end of the year.

The new ProLog98 lists over 65,000 QSL routes. It's now coupled with the point-and-shoot convenience of Windows 95, with all operational functions being conveniently located on pushbuttons accessible with a single click, or through the use of keyboard shortcuts. A few key features include dual record tracking on both the requested station and the manager, wildcard search, display of route information on a route-by-route basis or in full-screen mode, a built-in DXCC prefix database, full support for all major CD-ROM

callbook databases, and much more.

The program is $26. An annual enrollment in the QSL route database subscription service is $36 for 6 issues, or $70 for 12 issues. (Ed takes off 5% if you order the system program and the subscription service at the same time.) For more info, contact Datamatrix, 5560 Jackson Loop N.E., Rio Rancho, NM 87124 (505-892-5669; e-mail <prolog@rt66.com>; Web <http://www.qth.com/prolog>).

From the Bookshelf

VLF Radio! The Sounds of Longwave. We frequently have stressed the considerable radio hobbyist interest in the *other end* of the electromagnetic (EM) spectrum. We're referring to the radio basement—longwave (LW), which for the sake of discussion we'll consider to be anything below about 500 kHz, well "south" of the standard AM broadcast band.

The LW region still has plenty of activity. There you will find signals from broadcasters, time and frequency stations, military and emergency communications, unlicensed but legal experimenters ("LowFERS"), radioteletype stations, radiodetermination, and some unusual signals, including the so-called "natural" radio emissions at the very low end of the spectrum.

As we mentioned in June 1997, for several years Kevin Carey, WB2QMY, has conducted a respected monthly column in *Monitoring Times*, with news, loggings, and receiving tips related to LW. Kevin's column is called "Below 500 kHz," creatively subtitled "DXing the Basement Band." Now Kevin has put a sort of "audio face" on LW with his new audiocassette, "VLF Radio! The Sounds of Longwave."

Kevin narrates the tape, which lets you hear actual, on-the-air recordings of a variety of low-band signals. These include European broadcasters, maritime weather stations, experimenters, ships at sea, nondirectional radio beacons, military radioteleype stations, WWVB, Omega and Consol stations, and several more.

Some of these signals become rarer by the day, and fortunately are preserved on the tape for their historical value. Included with the tape are reference notes, a LW spectrum chart, and a logsheet. Tapes are $11.95 each postpaid by first-class mail from Kevin Carey, WB2QMY, P.O. Box 56, West Bloomfield, NY 14585 (e-mail <kevinc@mdsroc.com>).

Osborne One-Stop HTML Reference. Are you struggling to get your Web page up and running? HyperText Markup Language (HTML) is the language you must speak, since it's indeed the heart and soul of the 184-million or so Web pages currently found on the Internet. New "authoring tools" are giving the illusion that beautiful and amazing Web sites are merely a drag-and-drop away. But with the instability of HTML and the lack of layout control, authoring pages actually is becoming *more* complex.

Now, with *HTML: The Complete Reference*, by Thomas A. Powell, you have a tool to help you with the daunting task of mastering HTML. If nothing else, the substantial (1073-page) text eliminates the need for an armload of books for you to get the task done. The first half of the book teaches HTML concepts and theory from scratch, while the second half features appendices which provide a wealth of reference information about HTML.

The new book is $39.99 and is available from booksellers. Or contact Osborne/McGraw-Hill, 2600 Tenth Street, Berkeley, CA 94710 (1-800-262-4729; Web <http://www.osborne.com>).

U.S. Government Consumer Information Catalog. Okay, we know this is an amateur radio column. But we wanted to share with you a very useful, general-purpose government publication. It's the "Consumer Information Catalog," which offers free and low-cost federal publications of consumer interest. Over 100 free booklets are listed (there's a $1 service fee per free booklet order), and some 100 inexpensive for-sale booklets are listed as well. There are booklets on diverse subjects such as starting a business, getting an education, buying a house, fixing a car, money management, federal benefits, and more.

Also, check out the Consumer Information Center Online Web site, which you'll find at <http://www.pueblo.gsa.gov>. The site is full of consumer news, updates, and information on cars, money topics, small business, the environment, employment, travel and hobbies, federal programs, and more. The Center also operates a Bulletin Board System (BBS) at 202-208-7679.

To obtain a free printed copy of the latest Consumer Information Catalog, write to the Consumer Information Catalog, Pueblo, CO 81009 (e-mail <catalog.pueblo@gsa.gov>).

Wrap-Up

That's all for this time, gang. Next time more "Digital Dipole" topics of current interest. See you then.

Overheard: When you're on the air, a "communication problem" can mean saying *too much* as well as saying *too little.*

73, Karl, W8FX

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SWITCH SELECTABLE

OUTPUT VOLTAGE: 13.8 VDC

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SS-12	10	12	2.3 x 6 x 9	3.4
SS-18	15	18	2.3 x 6 x 9	3.6
SS-25	20	25	2 7/8 x 7 x 9 3/8	4.2
SS-30	25	30	3 3/4 x 7 x 9 5/8	5
SS-25M*	20	25	2 7/8 x 7 x 9 3/8	4.2
SS-30M*	25	30	3 3/4 x 7 x 9 5/8	5

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BY BUCK ROGERS, K4ABT

PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

We've Come A Long Way

Some say we are at the top; others don't agree. I am one of those who looks at both the forest and the trees, and I can see both. I was born a futurist, and I've always been blessed with the foresight and vision that gives me a glimpse of the future. I'm not sure how it happens, but I do know I have this ability.

Many times in this column I've eluded to some of my feelings about the future. Few times have I cared to glance back at the past. However, for the moment let's look ahead—into the past. If time carries out the age-old phrase "What is now has been, and will be again," then you did not read the above sentence wrong. It's sort of a "back to the future" thing.

I chuckled as I wrote these lines. Let me explain, or at least support, the above text with some rationale.

In May 1973 I was the keynote speaker at a college graduation ceremony. My address was centered around the future of communications, computers, and electronics. Much of my topic addressed the innovations that would occur over the next 28 years, through the year 2000. Some of the closing dialog of my address went something like this:

"In closing, I only hope that the future of electronics and communications will remain secure in the hands of those of you who enter into industry or government, by sharing the wholesome respect for the key role it plays in our democratic society. . . .

"Technological advance may be sociological retrogression, and each must be weighed in terms of its impact upon our free society. If it fails the test of compatibility on the full flow of freedom, then it should be relegated back to the laboratories with the nerve gasses and DDT.

"Ladies and gentlemen, you have embarked upon the threshold of the most challenging occupation available to mankind! Therefore, I wish to welcome each of you as colleagues by asking you to program our future as you have just completed programming yourselves."

With all my foresight and prophetic senses, little did I foresee the curtain of tragedy that loomed about the little-known caveat surrounding the date and time warp that each and every computer on this earth will have to cross: *This is the date; 2000 and time; 0000:00.*

211 Luenburg Drive, Evington, VA 24550
e-mail: K4ABT@PacketRadio.com

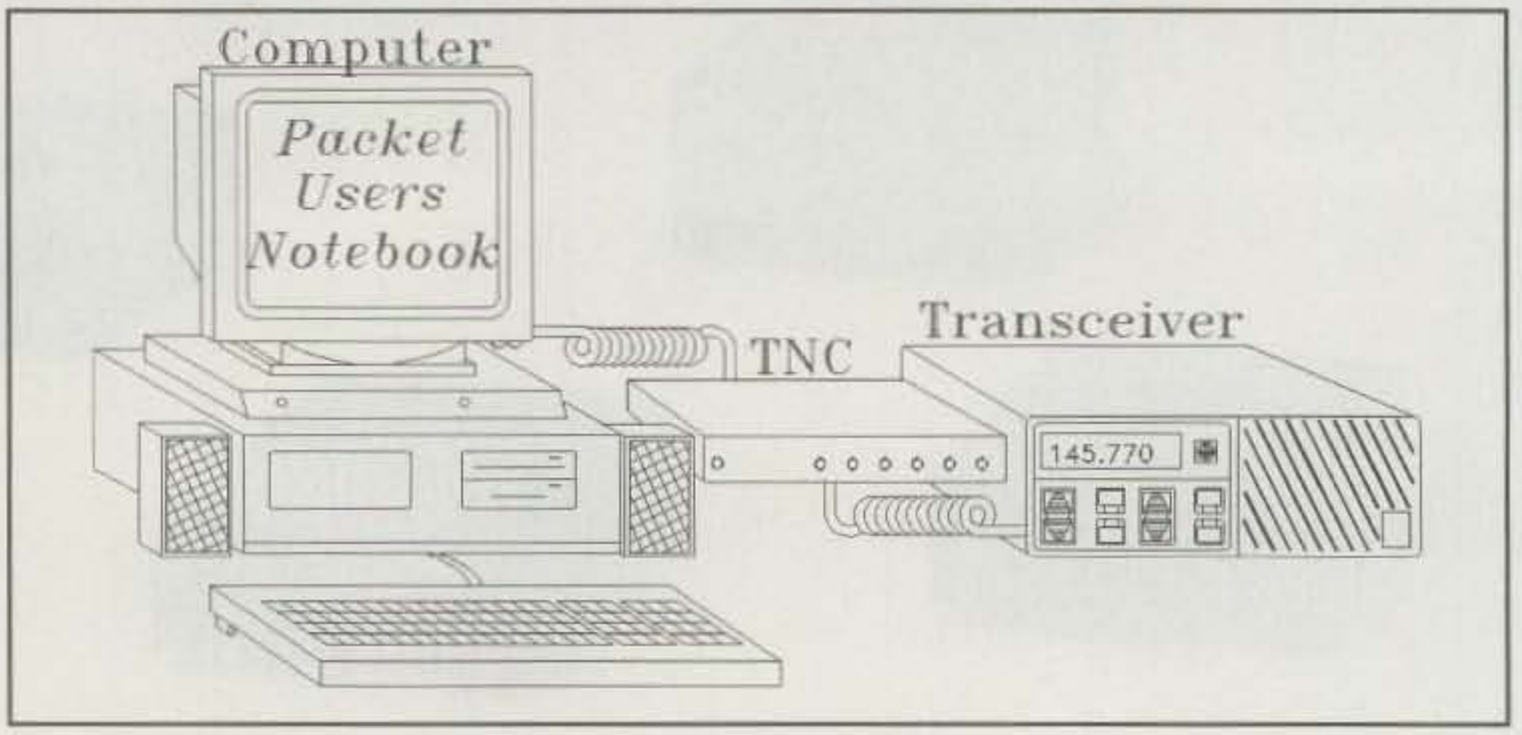

Fig. 1– The basic setup of a packet station.

Back To the Future

Somehow, there was a glitch in the noggins of the early programmers who began wiring boards to set all the ones and zeros for the current date and time. Okay, let's see . . . it will be another 50 years before we'll have to be concerned about the date/time problem, so we'll just set this baby to roll over each millennium to 0000.

In the rush to be first out of the tar-pit and onto the firmament, someone failed to ask what would happen at Y2K (the year 2000) relating to our computer driven society. If all I read, hear, and see in the news print, on the radio, and on television is true, we are in for one heck of a jolt come midnight Y2K. Added to all this data, I was tuning across the AM dial recently when I came across some talk show with Arthur Ding-a-ling or something, who along with his guest was bringing the world to a dead halt on New Year's Day Y2K.

Will All This Really Happen?

Are these doomsday prophets correct? Will the electric companies lose control of

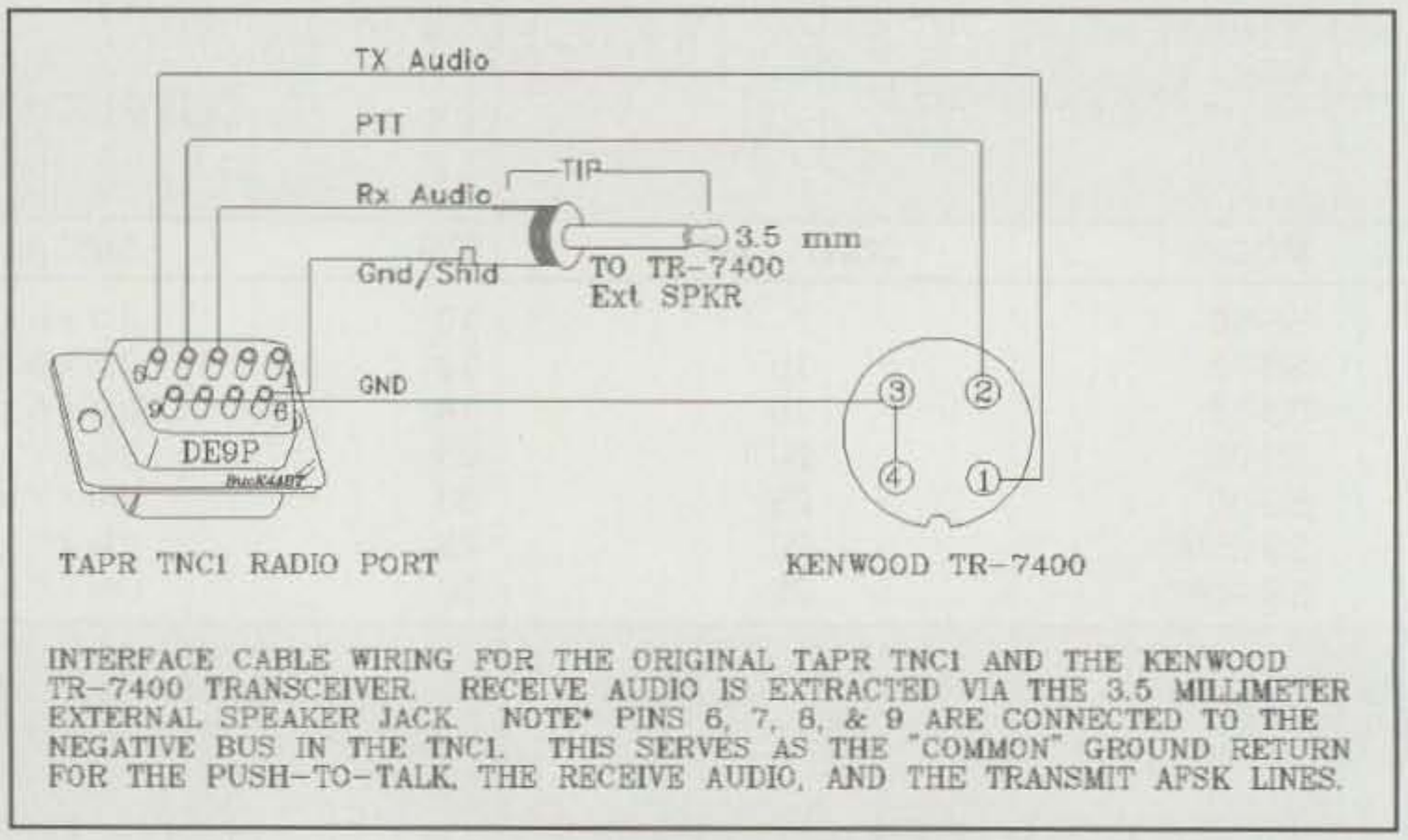

Fig. 2– Interface cable wiring for the original TAPR TNC-1 and the Kenwood TR-7400 transceiver. Receive audio is extracted via the 3.5 mm external speaker jack. Note: Pins 6, 7, 8, and 9 are connected to the negative bus in the TNC-1. This serves as the "common" ground return for the push-to-talk, the receive audio, and the transmit AFSK lines.

all power distribution so everything goes dark? Will all data automatically erase itself from RAM stores? Will we lose all worldwide communications via satellite? Will our global positioning satellites go blank?

I also heard another newscast that all the automobiles manufactured since 1979 that have on-board computers will refuse to start, and those which are running at midnight Y2K will stop in their tracks.

If all this is possible, then someone had better come off TDC (top dead center) and let's either fix the problem, or as I said in 1973: "Technological advance may be sociological retrogression and each must be weighed in terms of its impact upon our free society. If it fails the test of compatibility on the full flow of freedom, then it should be relegated back to the laboratories with the nerve gasses and DDT." Ask any computer guru if this is possible. You will get about 2000 different answers, but none are substantial or are based on hard evidence.

Oh well, so much for the future, let's get real for a moment and talk about having fun with *Packet Radio*.

To the Day, 500 Years After Columbus Discovered America

In October 1992 I wrote a column in *CQ* and the *CQ Buyer's Guide* when packet radio was in its infancy. It's not that I'm fearful of losing the data when Y2K rolls around. However, I do feel it is only fitting to give my readers and packet radio newcomers some insight into that time period.

Our present-day packet technology was developed in the 1960s and was put into practical application in the ARPANET, which had become firmly incorporated into our society in 1969. The first application was for the US Advanced Research Projects Agency.

ARPANET was first a landline-based computer network, and was the first wide area network (WAN) to transfer information using a packetized data transfer concept. Later, in 1970, the ALOHANET, based at the University of Hawaii, became the first large-scale packet radio project.

Amateur packet radio began in Montreal, Canada in 1978, the first transmission occurring on May 31. A year later, the Vancouver Amateur Digital Communication Group did much to advance the technology by developing the first terminal node controller (TNC) unit.

Amateur packet radio was made legal by the Federal Communications Commission (FCC) on March 17, 1980. Shortly thereafter, we began to see the birth of commercially-built TNCs for the amateur radio operator.

The early TNCs were available in prices ranging from $100 to $300. For all practi-

cal purposes, since 1983 the TNC has remained a $100 to $300 item. Like the price of computers, the price of technology appears to be the one single group of commercial items that hold their price from year to year.

Yes, What is a TNC?

Here is some information for the new or prospective packet radio operator. This is important and should be read by both the novice packet Rradio operator and the seasoned veteran.

What is a TNC? A "Terminal Node Controller" is similar to the modem you use when connecting to a telephone BBS or the Internet. There are a couple of distinct differences between the TNC and a conventional telephone modem, though.

A TNC is used to interface a terminal or computer to the "RF" or radio (wireless) medium. There is one other, very significant difference: Inside the TNC we have added some internal firmware called a "PAD." The pad, or "Packet assembler/ dissembler," captures incoming and out-going data and assembles it into "packets" of data that can be sent to and from a data radio or transceiver. In addition to the data stream conversion to and from packets, the PAD also enables the Push-To-Talk (PTT) circuits of the radio transceiver. When you press the enter key of your computer keyboard, the typed-in data is sent out over the air to the target station or a nearby "store-and-forward" device known as a "node." Incoming (received) data from the transceiver is also converted within the PAD, from packets of data into a stream of usable data, and sent to the TNC/modem. From here the data stream is sent to the serial comport of the computer for display on the screen, or it is manipulated by a resident terminal program into on-screen text, pictures, or save-to-disk processing.

When you remove the TNC from the carton, you'll find cables and connectors provided with the TNC. These cables are usually for the TNC end of the interface cable. The other end of the cables that attach to the transceiver and computer are not supplied. The reason is that the TNC manufacturer has no idea what kind of radio or computer to which you might be connecting. The burden is on the user to purchase the correct connector for the transceiver and computer to be used with the TNC. Determine the kind of microphone, speaker jack, and computer serial comport connectors that you are going to use.

In some cases the TNC manufacturer furnishes only the connector for the TNC. This means that you must also furnish the cable that connects the TNC to your computer or terminal. In most cases, a 25-pin RS-232 serial cable is used between the TNC and computer. The later models employ a 9-pin serial connector. Thus, you will need a 9-pin connector/cable. This may vary depending on the type and make of computer terminal being used. Check the serial comport of your computer to be sure of the type connector that you will need. Do this before you go to RadioShack or TechAmerica!

In most cases the computer will have either a 9-pin, or a 25-pin *male* connector as the RS-232 serial comport. If this is the case, you will have to supply the female connector for the computer end of the cable. Be sure to make a written note of the *number* of pins and the *gender* of the computer *serial* comport.

The operating manuals supplied with most TNCs provide adequate directions for use of various computers. Look for the computer to terminal node controller interface section in the TNC manual or consult the information on the internet at: <http: //www.packetradio.org/tnc2rad.htm>.

In most applications the cable for your TNC to transceiver may be purchased ready-made from MFJ Enterprises, Inc. (order line 1-800-647-1800). You should also ask for their latest catalog, which describes many more packet radio related products.

Visit my PacketRadio pages at: <http:// www.packetradio.org> or <http://www. packetradio.com>.

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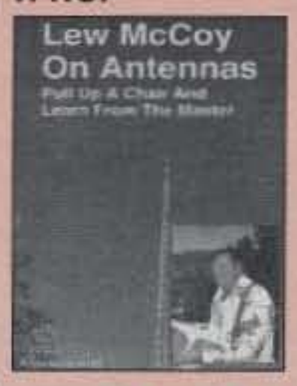

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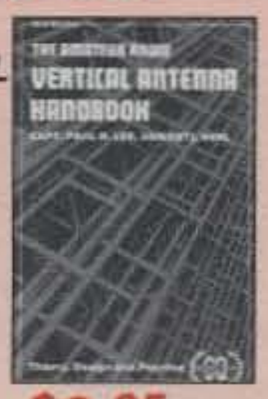

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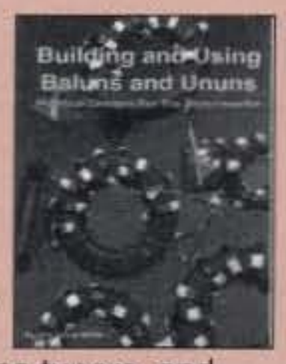

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WORLD OF IDEAS

A LOOK AT THE WORLD AROUND US

QRP '98: News, Views, and Notes—Part II

The good times and new goodies just keep on coming in QRP! If this trend continues, used linear amplifiers may soon be selling for a dollar a pound rather than a dollar a watt. But who's complaining? QRP gear is more affordable, easier to understand and set up, fun to use, and, as I always say, it proves the operator rather than the rig makes the difference!

Remember when you could homebrew a station from readily available parts, exchange circuit ideas and mods with friends, and every long-distance QSO was an exhilarating experience? That same level of excitement continues alive and thriving in QRP today. Yes, and the kinship among QRPers is equally terrific. Come on in with us and join the fun. QRP is upbeat hamming at its best, and there's room for everyone!

QRP's "Four Days In May" extravaganza held in conjunction with the Dayton Hamvention was a rollicking success again this year, and the array of new goodies revealed was simply awesome. I was unable to attend in person, but I was there by proxy, so to speak. Thanks to Bill Kelsey, N8ET, of Kanga US, and QRP guru Rev. George Dobbs, G3RJV, fresh off-the-press copies of my new book *QRP Now!* made their debut (photo 1). Yes, and I must say the "thumbs up" approval from the multitude was the ultimate reward for my efforts. Thanks, gang!

If you have not seen *QRP Now!* here's a peek preview. This all-new 100-page book tells you about what's hot in QRP right now: the clubs, contests, and on-the-air activities; the latest rigs, kits, and accessories; clever power supply ideas; low-profile/high-performance antennas; and true secrets to QRP success. Featured goodies include the new SGC-2020, LDG auto tuners, Pixie, Tixies, Ten-Tecs, SSTs, KnightSmiTes, and more—many cross-compared and analyzed in circuit design. Whether you want guidance on operating effectively or building gear, *QRP Now!* is the answer! Don't expect to see it advertised or on dealer bookshelves until the price is increased, however. High printing costs necessitate starting by selling direct "from my house to yours." Copies are $15 plus shipping and handling ($2 book rate, $3 priority mail, U.S.) to Dave Ingram, K4TWJ, 4941 Scenic View Dr., Birmingham, AL 35210. You'll love it!

Also at Dayton '98, Doug Hendricks, KI6DS, and Jim Cates, WA6GER, of NorCal announced plans to produce an impressive new transceiver kit destined to escalate QRP interest worldwide—the NorCal 20. Limited details were available as this column was being written, but here are the basic facts.

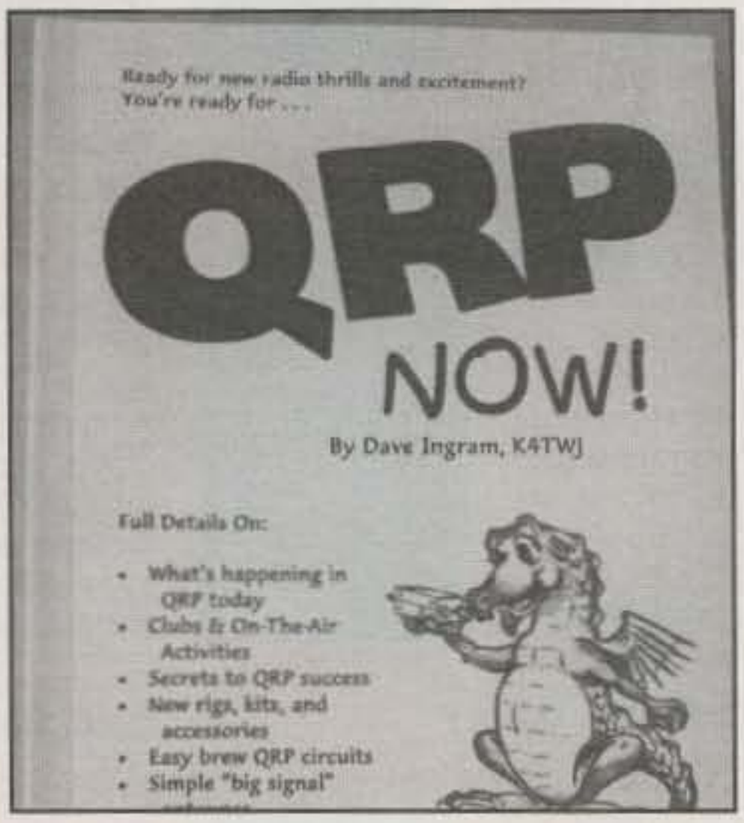


Photo 1– Sporting a cover theme of "Benny Discovers QRP," my new self-published book QRP Now! *made its grand debut at Dayton '98. All available copies were quickly snapped up, but more are ready to zip directly from my house to yours. (Details in text.)*

4941 Scenic View Dr., Birmingham, AL 35210

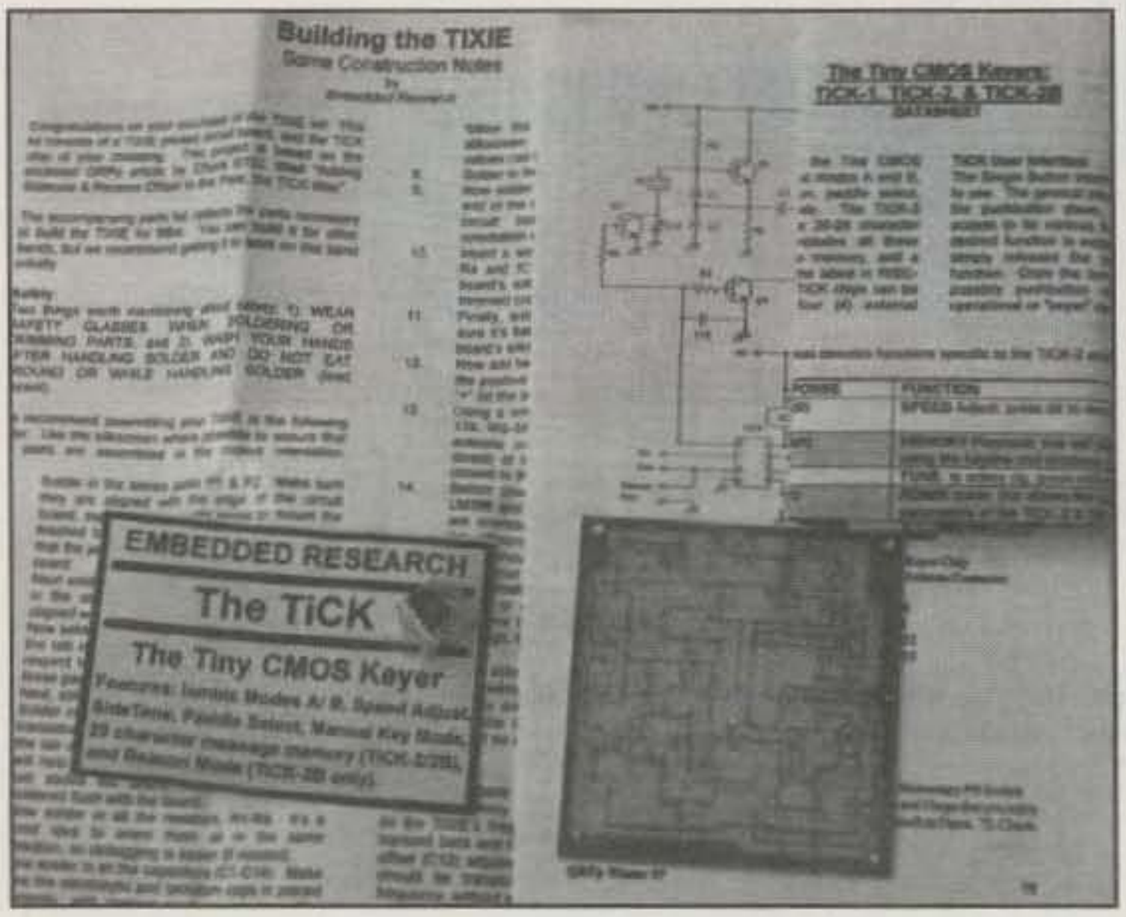


Photo 2– Pixie and Tixie transceivers are hot items in QRP '98, and this mini kit from Embedded Research gets you started building one at the lowest possible cost. Kit consists of PC board, instruction/info sheets, and Tick keyer chip. You add hamfest or junkbox-obtained parts and pocket the savings.

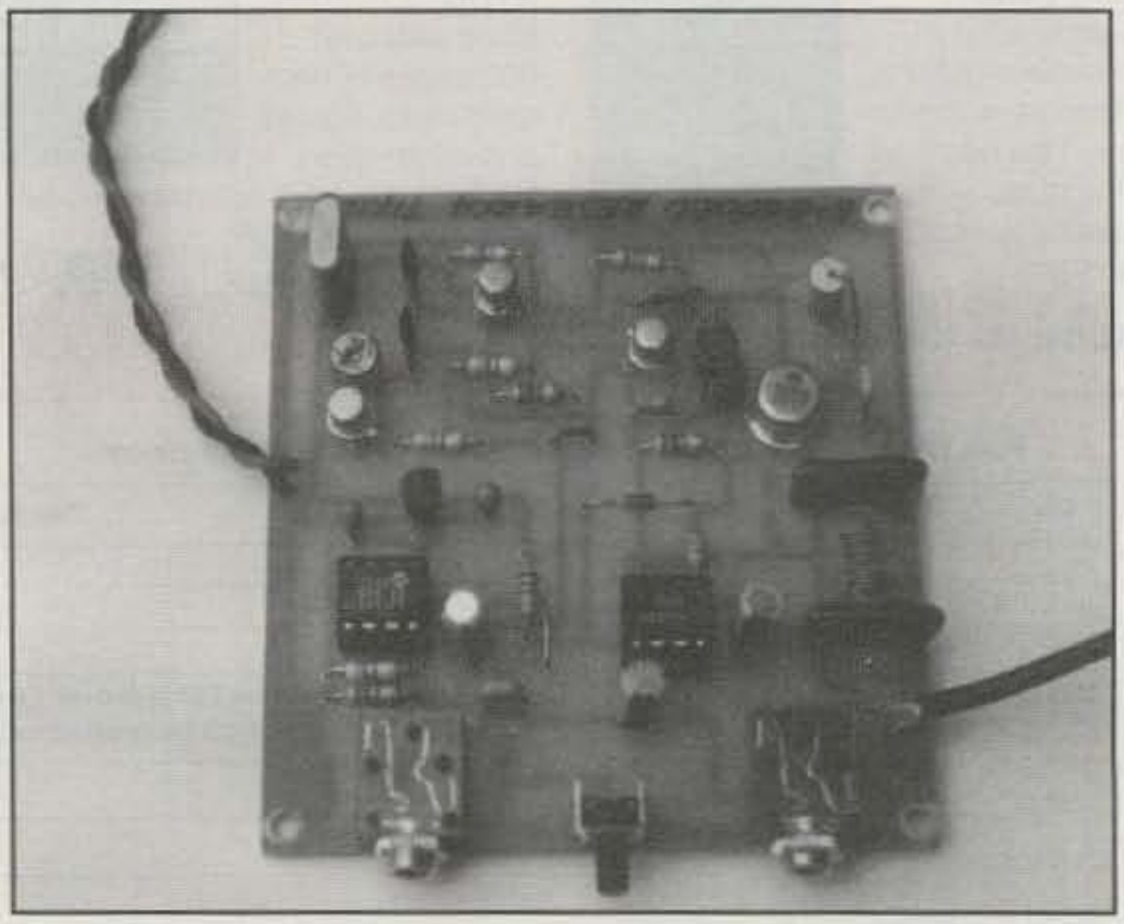
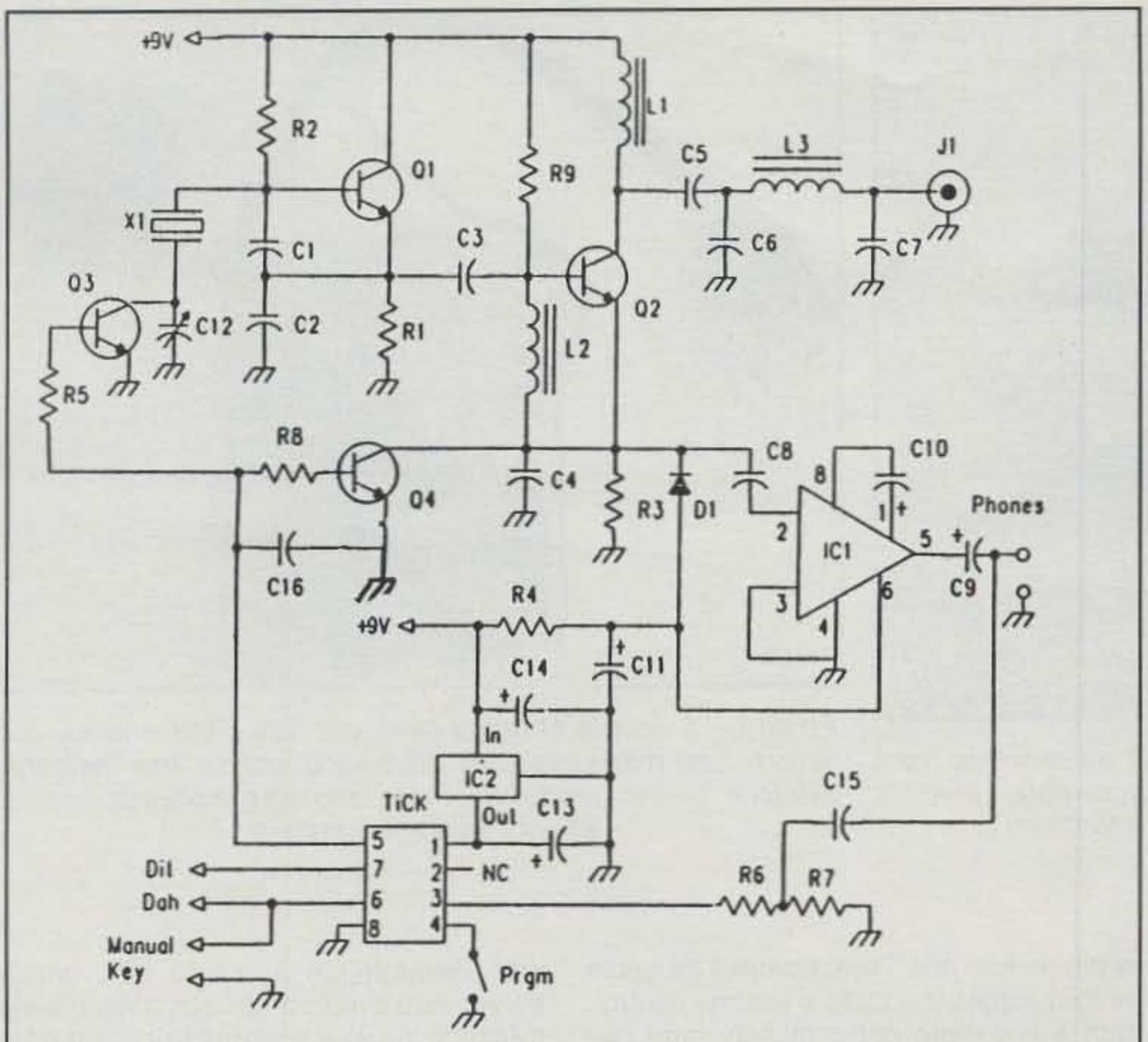


Photo 3– The fully assembled and ready for operation Tixie transceiver. Sockets on the front accept plugs from earphones and paddle. Pushbutton in the center accesses various Tick keyer functions. Check next month's column for more notes on Pixies and Tixies.



Parts List

C1, 2: 100 pF
C3: 82 pF
C4: .05 µF
C5, 15: .01 µF
C6, 7: 820 pF
C8: .1 µF
C9, 10, 11: 10 µF/16V
C12: 5–50 pF variable cap
C13, 14: 1 µF/16V
C16: .001 µF
D1: 1N914
IC1: LM386
IC2: 78L05
IC3: Tick keyer chip
J1: BNC antenna connector
L1: 15 µH
L2: 100 µH
L3: 2.2 µH
Q1, 3, 4: 2N2222
Q2: 2N3053
R1: 1.5K
R2: 47K
R3: 10K
R4: 1K
R5, 6, 8: 4.7K
R7: 8.2K
R9: 33K
SW1: N.O. mementary PB switch

Fig. 1– Circuit diagram of the Tixie transceiver, courtesy Embedded Research. (Discussion in text.)

The NC20 is a 0 to 5 watts output CW transceiver for 20 meters. It sports a hearty receiver with FET front end, high-grade IC mixer, 5-pole crystal filter, and 2 watt output audio amplifier. The rig also has full break-in operation, electronic keyer, and audio annunciator that beeps kHz when tuning and "reads out" the frequency in Morse when tuning stops. The kit will be complete with all the bits, pieces, and a custom case, and will be priced at $95 plus postage and handling ($5 U.S., $10 DX). As Doug, KI6DS, explained, sales of kits will be limited to NorCal members and a production run of 500 units that begins August 1st. Jump now, and you can join NorCal plus receive the *QRPp* magazine and order an NC20 for QRPing in high style. NorCal membership/QRPp subs are $15 a year U.S., $20 DX with checks made payable to Jim Cates, 3241 Eastwood Rd., Sacramento, CA 95821. Orders for NC20s go to (I assume) Doug Hendricks, 862 Frank Avenue, Dos Palos, CA 93620.

Now the big and most commendable surprise: Profits from the sale of each NorCal 20 will be used to donate another NorCal 20 to a third-world area so they too can get on the air with QRP. This venture will be coordinated through the G-QRP Club (of U.K.). Sincere congratulations to both groups on an absolutely remarkable endeavor!

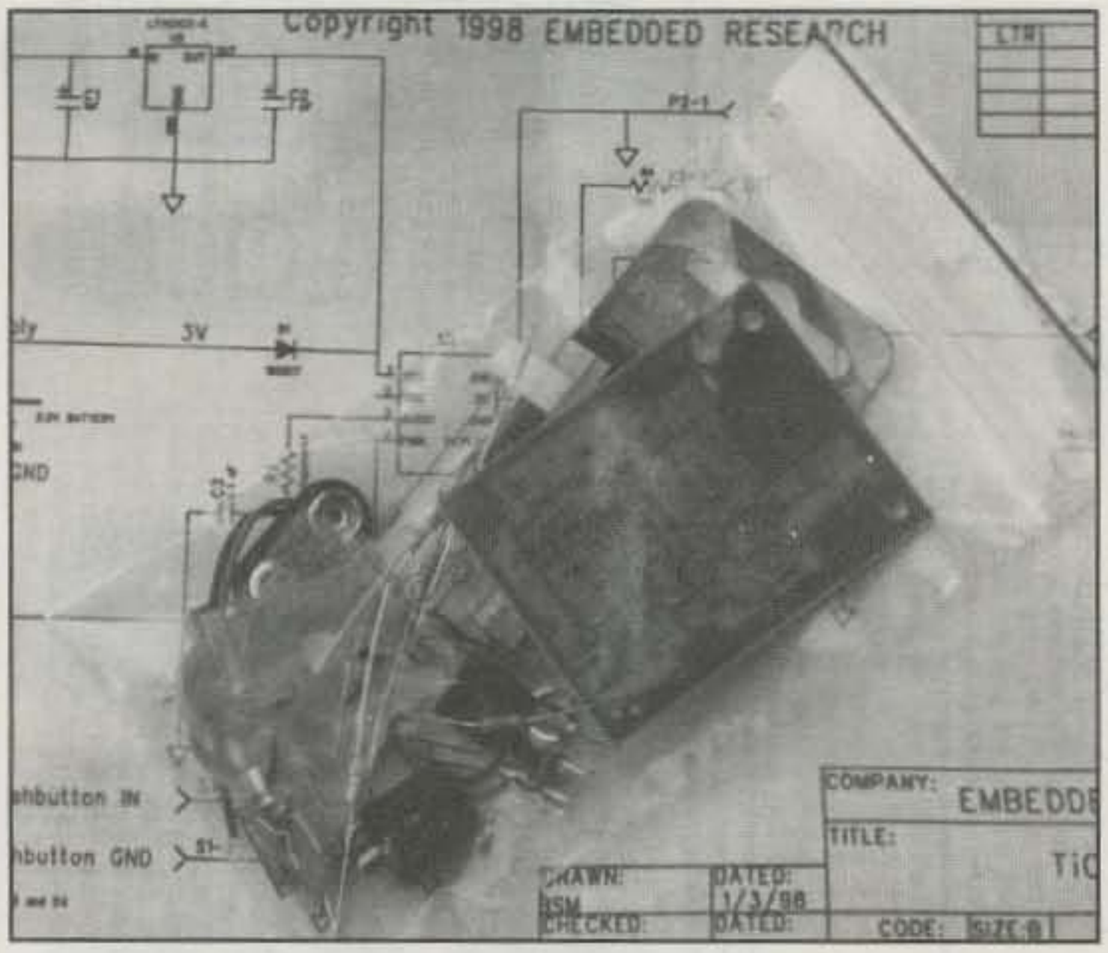


Photo 4– New Tick-EMB deluxe keyer kit as received from Embedded Research and ready for assembly. Item is economically priced and quite deluxe featured.

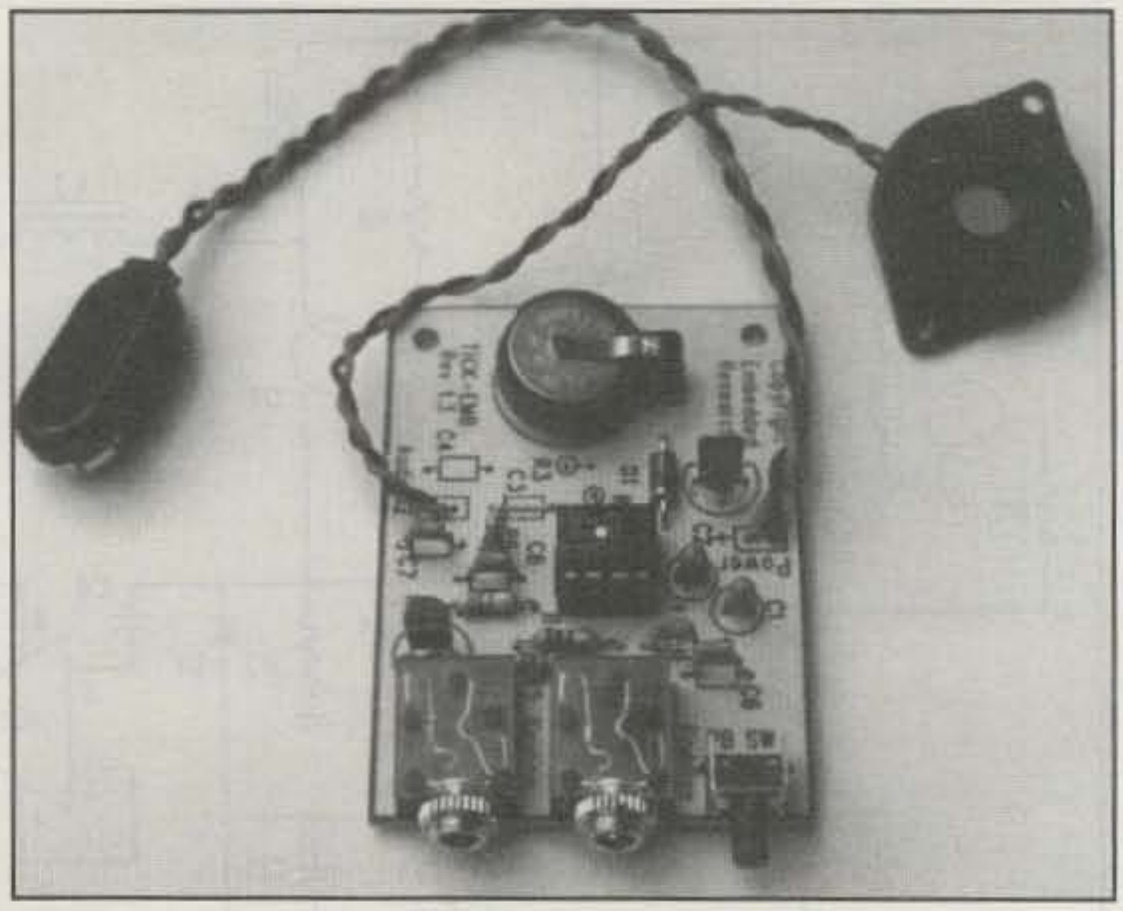


Photo 5– A couple of hours later, our Tick-EMB is ready for action. Item measures only 1.5 by 2.0 inches, has memory, sidetone, beacon mode, and more, and will run several months straight on a 9 volt battery.

New Goodies from Embedded Research

Also vying for well-deserved attention at Dayton '98 were two new items from Embedded Research—a new Tixie mini-transceiver kit and a deluxe Tick EMB keyer kit. The Tixie kit, shown as received and after assembly in photos 2 and 3, consists of a 3 inch by 3 inch silk-screened and predrilled PC board, Tick keyer chip, and several sheets of notes and instructions for quick-assembling the little rig. You add easily obtained parts, controls, and enclosure to produce a low-cost 250 to 500 MW output direct-conversion transceiver with receive offset, full QSK, keyer, and sidetone. Nice! Parts information supplied with the Tixie kit lists tank-circuit values and a crystal for 80 meter operation. The transceiver is easily modified for operation on 40, 30, or 20 meters, however, by changing/scaling down a half-dozen components. Take a few cues from circuits in rigs such as the 38 Special and you could even expand a Tixie into a 3 or 4 watt output rig with MRF510 power amplifier, variactor tuning, and audio CW filter. The finished item, plus a 9 or 12 volt battery, small paddle, and thin roll-up dipole could be fitted into a lunch tin, or the transceiver alone could be mounted in a car's ashtray for "stealth" operation. Add a cassette adapter to the Tixie's earphone output, snap it into the vehicle's tape deck, and you have cockpit-filling volume.

Since direct-conversion receivers typically have rich and full-bodied audio, I like the idea of mounting a Tixie inside a cabinet with an old vacuum-tube AM radio. Replace the radio's tuning capacitor with a trimmer for the Tixie, connect its audio output across the radio's volume control, add a few more personal frills, and you could emerge with a real heartthrob. The possibilities are almost endless.

Embedded's production of the Tixie mini-kit was inspired by an article in the Winter '97 issue of NorCal's *QRPp* magazine describing how Chuck, K1CL, added a keyer, sidetone, and receive offset to a basic Pixie 2 transceiver. A copy of that article is included with the kit. Another article (by Charlie, KX7L) on neat mods, tweaks, and 20 meter conversion for Pixies/Tixies also appeared in the Spring '98 issue of *QRPp*. This little tyke is quickly becoming a "low end" favorite for '98!

Earlier in this column I mentioned QRP rigs are easy to understand. A quick tour of the Tixie's circuit diagram (fig. 1) should illustrate that point. First, let's separate the basic Pixie 2 transceiver (Q1, Q2, and IC1) from its added-on Tick keyer (IC2, Tick, and Q4), receiver offset (Q3 and R5), and sidetone (R6, R7, and C15). Starting at the left top, Q1 (plus R1, R2, C1, C2, C12, and X1) is a Colpitts crystal oscillator at the desired operating frequency. Its output is coupled (through C3) to Q2, which serves as a power amplifier on transmit and as an active mixer/detector on receive. Say what? That's right: Q2 amplifies the oscillator's signal on its base to 500 MW during transmit (or higher if a 12 or 14 volt supply is used), while incoming signals going from the collector to emitter of Q2 heterodyne with the oscillator's signal on its base for detector action on receive. See the 10K resistor R3 between Q2's emitter and ground? Audio developed across it during receive couples through C8 and into IC1, which serves as a simple audio amplifier. During transmit, the Tick's keying transistor (Q4) shorts out R3. This disables the audio amplifier's input while grounding the emitter of Q2 so it delivers full RF output. Cool!

Looking closer at the circuit, D1 and R4 are required to avoid shorting positive voltage to ground on transmit, and C11 is a bypass capacitor. C13, C14, and IC2 make up a 5 volt regulator circuit for the Tick. Its output, in turn (Pin 5), goes to R8 and Q4 for keying and to R5 and Q3, which shorts out receive-offsetting capacitor C12. Values for L3, C6, and C7 look very close to those used in my Micronaut Transmitter, so converting a Tixie for operation on other bands should be easy. My "dink time" has been usurped by *QRP Now!* but after writing this month's column, I hope to confirm that fact. I feel confident that swapping the crystal, plus changing the values for C6 and C7 from 820 pFd to 470 pFd for 40 meters, 330 pFd for 30 meters, or 270 pFd for 20 meters, plus changing L3 from 23 turns to 16 turns for 40 meters, 13 turns for 30 meters, or 12 turns for 20 meters will be "ballpark" close. I will then add or subtract one or two turns to ensure maximum output and spectral purity (spurious emissions at least 40 dB below the main carrier).

Now answer honestly, friends: Doesn't studying the Pixie's circuit kindle your enthusiasm for homebrewing at least one QRP rig? The kit costs only $10 with a standard Tick keyer chip or $12.50 with a deluxe 25-character memory Tick, so give it a shot! Kits are available from Embedded Research, P.O. Box 92492, Rochester, NY 14692. I understand Doug

Photo 6– Heinrich Vandergeuten, PA3FDM, built this pair of Micronauts into flip-top cigarette boxes. Left item is MRX receiver from Steve Bornstein, K8IDN. Right item is my Micronaut transmitter.

Hendricks, KI6DS, also has a nice sack of crystals for 7.040, 7.122, and 10.116 MHz available for $3 each—while supplies last. Go for it!

As mentioned earlier, another Dayton-introduced item from Embedded Research is the new "do it all" Tick-EMB keyer kit shown before and after assembly in photos 4 and 5. If you are not familiar with Ticks, they are multifunction keyers in a single 8-pin IC package. Ticks are available as a single IC with instruction sheets for homebrewers or as a complete kit with IC, all parts, and PC board. The basic Tick-1 features speed adjustment (5 to 60 wpm); sidetone on/off; tune mode; iambic A, B, or manual key operation; and left- or right-hand paddling—all selected from a single pushbutton. The chip is $5, or the full kit is $16. A Tick-2 adds a 25-character memory in the functions and is $10 alone or $21 for the full kit. A Tick-2B includes all Tick-2 functions plus a beacon mode for automatic CQing and is $12.50 chip or $23 kit. All Ticks are interchangeable, so upgrading is a cinch.

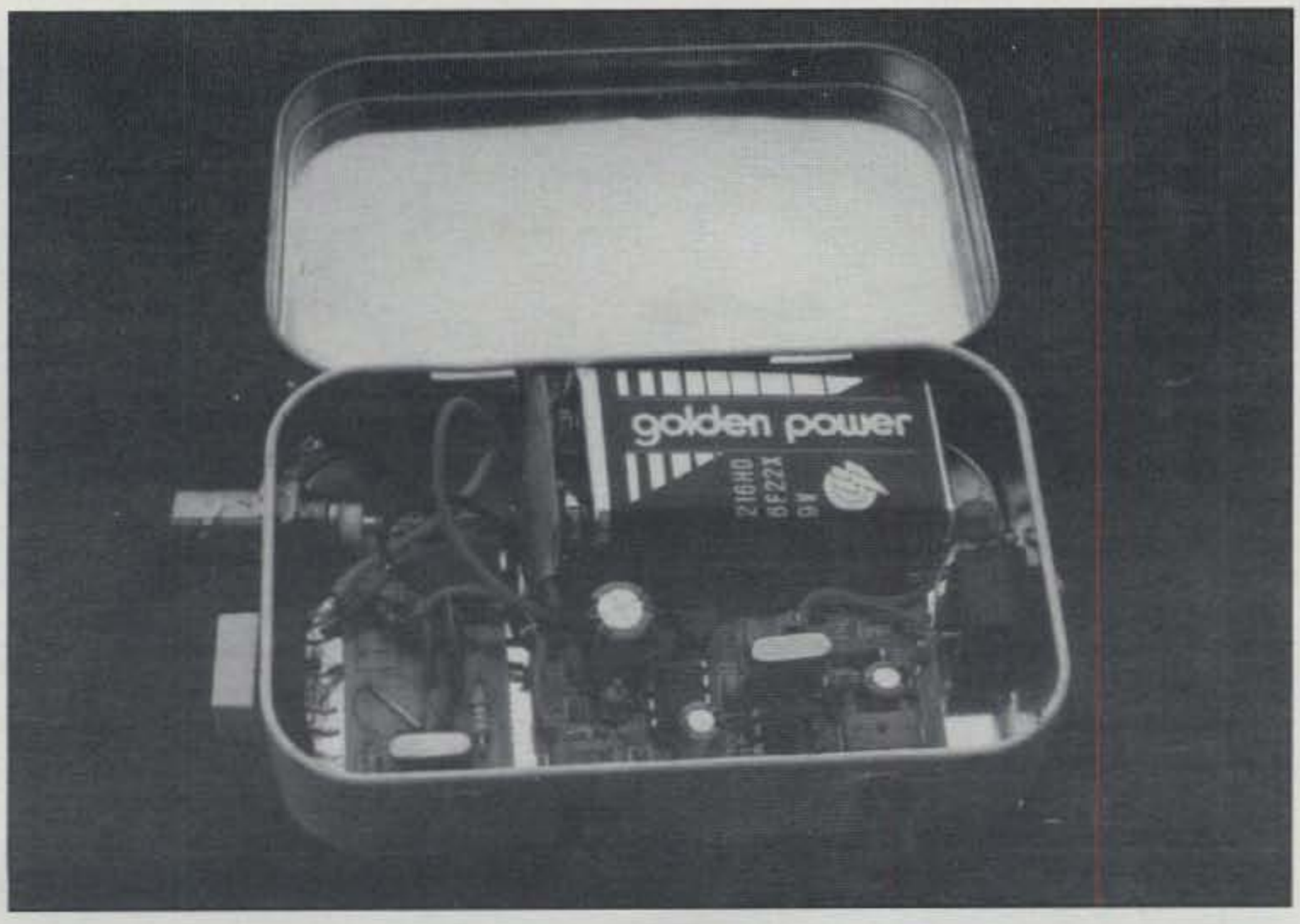


Photo 7– You know it's QRP because it is in an Altoids tin! This twin Micronaut setup was assembled by Sam Imai, KF6ML, and it works as good as it looks—especially when the lid is closed.

Embedded's new Tick-EMB combines all the previously mentioned features plus includes lithium battery backup for the memory and beacon, operates from a 7 to 25 volt DC source, and input/output sockets plus function-controlling push-button are direct-board mounted for super-easy assembly. The keyer is small enough to fit under the base of many paddles or slip into an enclosure of your choice. The Tick-EMB is $33, and it is ideal for home, portable, or mobile use.

Classics Resurrected

Shifting into the "additional news and happenings department," two all-time favorites are presently enjoying a favorable comeback. First, the famous Tuna Tin 2 transmitter designed by Doug DeMaw, W1FB, and featured in May, 1976 *QST* is re-emerging with modern-day coil replacements for no longer available inductors and a fresh new PC board. What a terrific tribute to one of the most outstanding figures in amateur radio! Articles describing this coil-updated version of the Tuna Tin 2 were published in the Spring '98 issues of NorCal's *QRPp* and *QRP ARCI*s quarterly magazines. PC boards are available for $6.50 from FAR Circuits, 18N640 Field Court, Dundee, IL 60118. Latch onto a magazine, order a board, scrounge some parts, and join the milli-watting fun. It's a blast!

Ans speaking of tuna tins, the cover of the June 1983 issue of *CQ* featured Frank Sullivan, NJ4S, and his tuna-can QRP rig, with which he could tweak 250 milliwatts on 40 meters.

Next, a limited number of the classic book *Joy of QRP* written by Ade Weiss, WØRSP, in 1985 have been reprinted and are available directly from Ade at 526 N. Dakota St., Vermillion, SD 57069. The price is $23 first class U.S. mail, $26 DX, $15 seniors 65 and over, or $33 for Ade's dynamic duo of *Joy of QRP* and *History of QRP*. *Joy* is a true collectible filled with enthusiasm, "go QRP" inspiration, and captivating tales of QRP achievements. Used copies are rare. Jump quickly, as these reprints will also go fast!

More Show and Tell

Space is now running tight, but let's quickly squeeze in more views from fellow QRPers as we race for the closing wire. First, Heinrich, PA3FDM, of Holland shares views of his Micronaut twins meticulously assembled and mounted in flip-top cigarette boxes for pocket portable operations (photo 6). The transmitter is my Micronaut kit ($17), and the receiver is K8IDN's MRX-40 kit ($18). Heinrich says he is having a ball with the combo.

Next, Sam, KF6ML, took the "one picture is worth a thousand words" approach to describe his Micronaut twins mounted in—you guessed it—an Altoids tin! Receiver controls are on the front; earphone, key, and antenna sockets are on the sides; and the full mini-station slips into a shirt pocket. QRPp supreme!

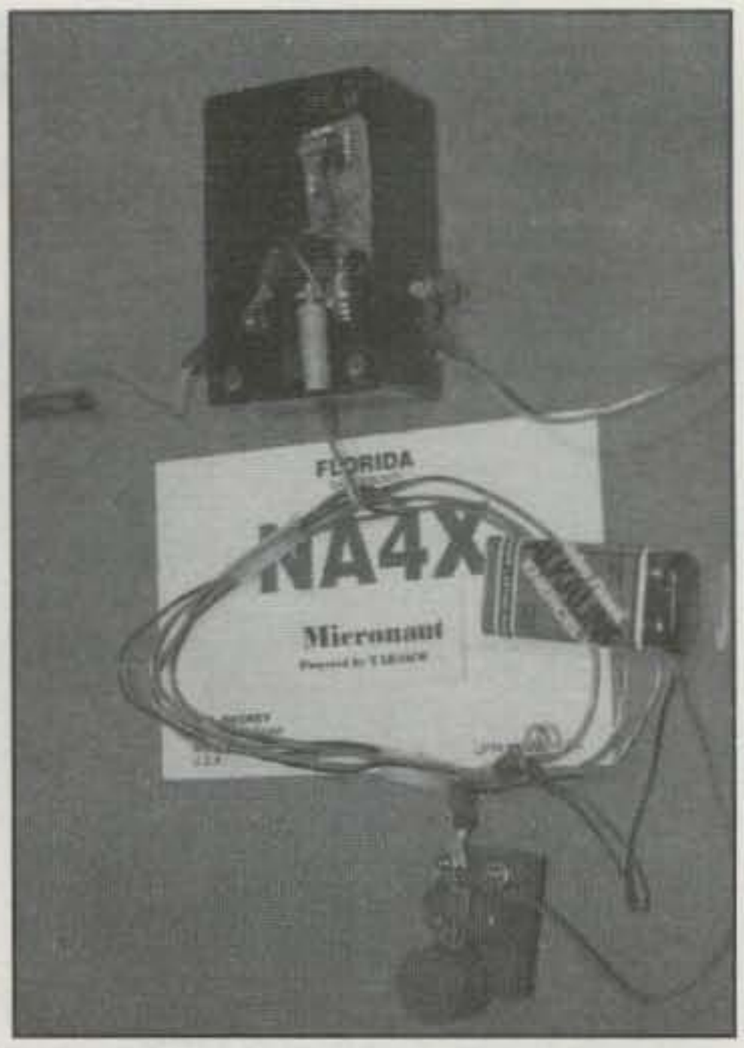


Photo 8– Center insulator of dipole made by Bill Rheney, NA4X, sports a Micronaut transmitter at the feedpoint for zero loss. Unit is operated by keyed voltage on feedline.

And finally, Bill, NA4X, and Chris, WB4NFA, sent photos of Micronaut transmitters they built into center insulators of dipoles for "zero loss" QRPp work. Both chaps used the feedline for routing keyed voltage to their Micronauts, and both did an excellent job of assembly (photos 8 and 9). What else can I say except keep on QRPing, let's QSO on 30 one weeknight, and stay tuned for another killer column next month!

73, Dave, K4TWJ

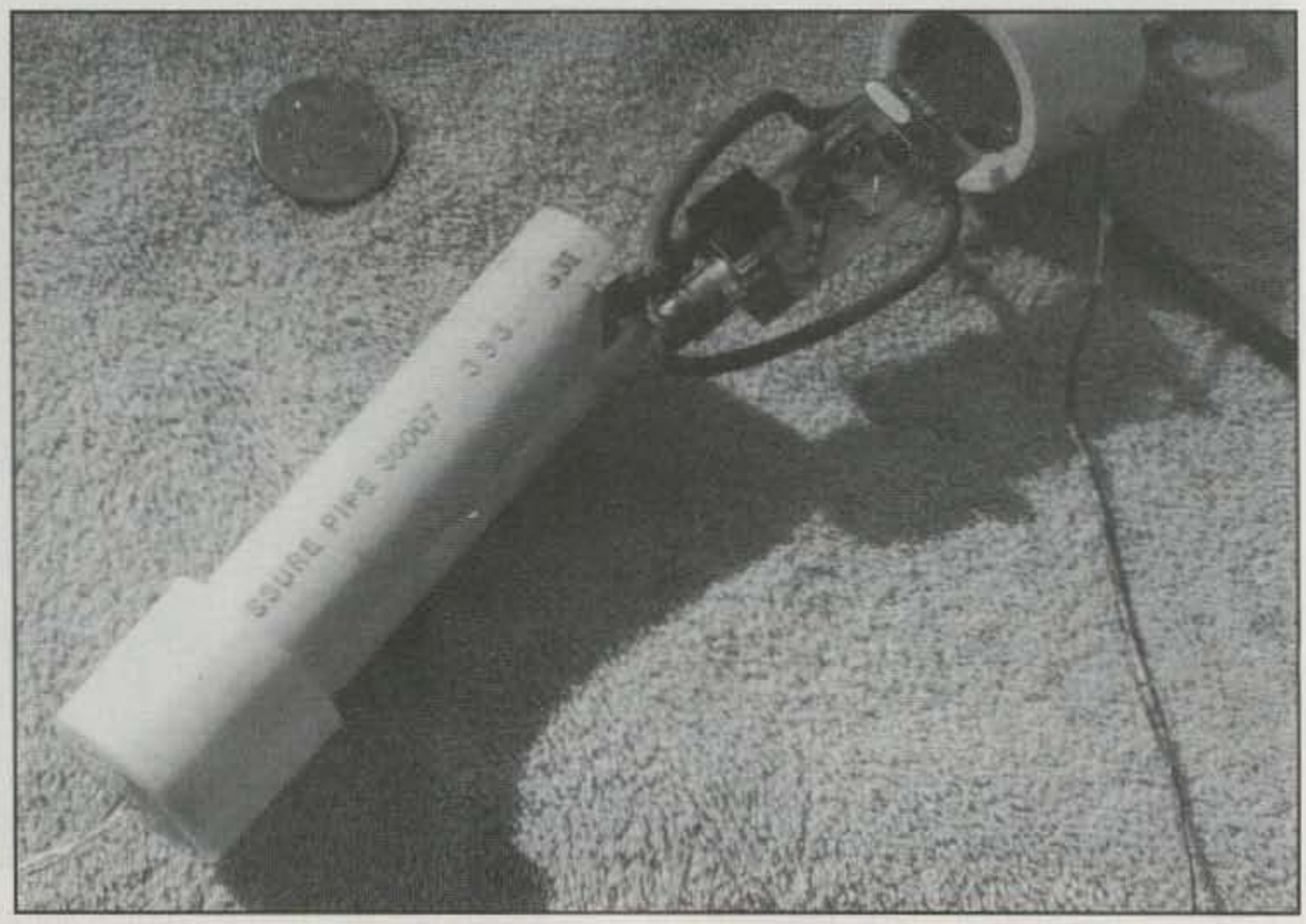


Photo 9– Another dipole center insulator-installed transmitter. This one was made by Chris Mayer, WB4HFA, and is also activated by keyed voltage from shack.

BY JOE LYNCH, N6CL

VHF PLUS

ALL ABOUT THE WORLD ABOVE HF

Oscar Morales, CO2OJ, Par Excellence Weak-Signal Operator

This month I want to feature my friend Oscar Morales, CO2OJ. During the months of May and June, Oscar burned up the 6 and 2 meter airwaves, taking advantage of excellent propagation into Cuba. During one week in May, Oscar worked the following on 2 meters: 65 QSOs in 36 grids. Among the grids worked are the following: EL's 09, 29, 49, 59, 79, 86, 87, 88, 89, 94, 95, 96, and 98; EM's 00, 05, 10, 11, 12, 16, 17, 25, 26, 30, 31, 32, 35, 40, 50, 51, 60, 61, 70, 71, and 90; and FM03, FN41, and DL98. His best DX were the following: DL98, EM17, and FN41. His best days were 8 and 15 May. His best time was after 0300 UTC. Notable contacts were the following: K5CM, EM25ir, 1163.1 miles, 1871.7 km; WØRRY, EM16bi, 1216.6 miles, 1957.8 km; WØEKZ, EM17ij, 1322.8 miles, 2128.7 km; NØJK, EM17jq, 1333.6 miles, 2146.1 km; and W1LP, FN41sr, 1468.8 miles, 2350.0 km.

NØKQY (DM98gk, 1541.8 miles, 2481.1 km) heard CO2OJ twice, but made no QSO. According to Jon Jones, NØJK, if CO2OJ had worked NØKQY, it would have set a new 2 meter Tropo (A) record. According to the "North American Distance Records" compiled by Al Ward, W5LUA, the present record is 2365 km, set by W1JSM and VP5D on May 10, 1988. Tropo (A) are tropo modes across Atlantic, Caribbean, and Gulf of Mexico.

Oscar has also worked a number of stations across the U.S. on 6 meters these past couple of months. To put things in perspective, CO2OJ's 2 meter station consists of a transverter, a 100 watt brick, and a 9-element homebrew Yagi, which is 12 feet over the roof. For 6 meters, he has a linear, but rarely uses it because of TVI. Most of his contacts are made running 5 watts into his 3-element beam.

For the June contest, Oscar reported the following for the COØFRC contest station: 50 MHz, 436 QSOs in 141 grids; 144 MHz, 162 QSOs in 41 grids; 222 MHz, 8 QSOs in 7 grids; 432 MHz, 17 QSOs in 15 grids for a preliminary claimed score of 132,192 points.

Concerning the contest, Oscar reported the following: "This is our best score in any VHF+ contest! COØFRC was under propagation conditions for almost the whole contest time, sometimes tropo and sporadic-*E* at the same time. On 6 meters, the opening lasted for more than 24 hrs. Even on Saturday/Sunday night, we made 6 meter QSOs. The upper bands were only closed for 3–4 hours (and I'm sure it was because operators must rest, hi!). Many stations were logged in 144, 222, and 432 MHz, one band after the other, and almost all of those stations were logged on 6 meters also. This time Mr. Murphy was busy in other places and only visited us a couple of times. (More info about his visit with a couple of photos in our home page: <http://www.infocom.etecsa.cu/cgi-bin/frc/frcuba.htm>.) We had not too many problems with antennas and rigs.

"We managed to have links to the DX Clusters by packet and Internet, and it made it easier 'running' after the spotted stations and got a little more QSOs. We worked a lot of Rovers (K9VV/R, for example, was worked in at least three different grids) and several QRP stations. We also made some cross-mode QSOs and some in CW (yes, I agree that CW is necessary in a contest).

"Thanks to the cooperation of SKØUX Radio Club and particularly of Goran, SMØDRD, the logs were on the 'Online Server' a little after the QSOs. The only exception was because of a mistake of a "tired and old" operator who sent to Sweden the messages, with *no* logs attached, two times. (That was me, hi!)

"In just few words, 'Wow, what a contest!'"

I first met Oscar during my first visit to Cuba in February 1994. I was immediately impressed with his enthusiasm for the hobby. We became fast friends and have maintained our close friendship over the years via the radio and now via the Internet. Oscar has repeatedly taken the most Spartan of a station and turned it into an award-winning effort. Thanks to an anonymous donor, Oscar acquired a commercial radio for 6 meters a few years ago. Through the efforts of Jose, CO2JA, and others, Oscar acquired a transverter for 2 meters which works with the 6 meter radio. With this combination Oscar has achieved so much on these two bands.

XE2/KC5FMT Contest Successes

The following is from Bruce, K2RTH: "My vote for the best mountain portable has to go to XE2/KC5FMT and his wife (whose call I do not know, but equally deserving) for their operation in Monterey, Mexico at a height of 14,000 feet.

"I have a question, though. He was complaining about going outside in the heavy rain and cold (14,000 feet elevation) Sunday night, but did not mention anything about breathing. When you are operating from 14,000 feet, do you merely hold your breath for two days? Somehow I think some of the West Coast guys know the answer to this.

"I listened to him on 432 MHz work the entire state of Florida, and his contact with me was within 25–75 miles of the record.

VHF PLUS CALENDAR

August 1–2	ARRL UHF Contest. See text for details.
August 2	Very poor EME conditions.
August 5	Lowest Moon declination.
August 7	Full Moon.
August 9	Good EME conditions.
August 12	Moon perigee. Predicted peak, *Perseids* meteor shower.
August 14	Last quarter Moon.
August 15–16	First weekend of ARRL 10 GHz and above contest. *(See text for details.)*
August 16	Moderate EME conditions.
August 18	Highest Moon declination.
August 21	New Moon.
August 23	Moderate EME conditions.
August 27	Moon apogee.
August 30	First quarter Moon. Very poor EME conditions.

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(phone 405-528-6625; fax 405-528-0746)
Internet jlynch@post.cis.smu.edu
Compuserve 72124.2734@compuserv.com

If he had worked a little farther up the coast, like Savannah, GA, he would probably have set a new 432 MHz record. By the way, Sunday evening he peaked 59+ on 144 and 59 on 432 in Miami, also 59+40 on 6 meters via sporadic-*E*."

June Contest Propagation

From the reports your editor has read over the Internet, in the June ARRL VHF Contest it appears that the east and gulf coasts areas experienced very good tropo and sporadic-*E* propagation modes for hours on end by operators in these areas.

The west coast and the southwest, however, did not seem to fare so well. The west coast had few sporadic-*E* openings and little tropo. The southwest also was deficient in propagation.

HSCW On the Rise

High-speed meteor scatter CW (HSCW) work in North America is increasing in activity. The following is from Shelby Ennis, W8WN, one of the fathers of HSMS work in this continent: "If you've been around electronics (or a lot of other fields) very long, you know the old saying, 'When all else fails, read the instruction book!' Of course, if you're like most, it's only when all else fails that you bother to open it!

"We have been informed by several people that they didn't even know an instruction book was available. Apparently, a number have just come on HSCW in time for the First NA HSCW Contest, and have missed the many posts, listings, and remarks by myself and several others on the Reflector, and haven't yet found the "Announcements" on the main HSCW Web site.

"So as not to bore the Old Timers (i.e., those on HSCW more than two or three months), the only thing new on the Web site is the Appendix. This updates *all* of the various papers, and it will be updated regularly until enough new material has been collected to justify updating the other papers. So that's all that's new. OTs can now click on the trash can, while those new to HSCW can see what is available.

"There are a number of papers on the W6/PAØZN Web site (URL <http://www.nitehawk.com/rasmit/ws_15.html>), and other papers are hyper linked to it. Also, most of the HSCW (and also VHF and MS) Web sites around the world can be reached from there. (Bookmark some of these that are of particular interest to you).

"If you're *really* new to HSCW, read the Welcome. Then send it on to some other newcomer whom you're trying to help.

"Next, go to the Announcements and see what the Hot News is. This is updated anywhere from several times per day to once every five days or so, depending upon what is happening. (After you've picked up your papers, always start with the Announcements. We will attempt to keep them current. And if there is nothing new, it will say so, for there's nothing older than old news!)

"Your next paper is the Procedures sheet. This explains how HSCW is done in North America. It's as simple (and almost the same) as SSB MS, or EME, or whatever. But there are a few differences, and also enhancements beyond the other types of operating. But if you are from Europe, you will find, somewhere on the main Web page, a link to the European procedures, which are slightly different.

"If you are not on HSCW but are very curious, download the general HSCW 'FAQ' and learn all you ever wanted to know about HSCW. This paper is very general and non-technical. By the way, most of these papers are available for downloading directly in either Text or Word DOC format. And some can be viewed immediately, though most are too long. A few are in only one format for some particular reason. If you find a paper in both TXT and DOC, download and print out the DOC version; it is more readable.

"If you're seriously interested in HSCW but don't feel that you know everything about it yet, try the 'Semi-Technical FAQ.' This goes into more technical stuff, reviews various programs and methods, and gives a tiny bit on MS in general. It does not go into the workings of MSDSP, however. (Also, it does not go into MS in general. None of these papers do. But this refers you to some necessary printed works on the subject.)

"There are several 'helps' available, with more to be uploaded. A "flow chart" showing what to send next (idea by VE5UF) can be viewed or downloaded as a GIF file for printing. There is a listing of the CQ-letter offsets. However, this really isn't needed much right now. Steve, KOØU/1 has designed a page with the CQ-letter offsets, a typical exchange, and the 'Request for Repeat' letters. If you don't already have it as part of the contest material, it should be uploaded separately and now available. There may be a few other little helps on Rein's Web site. Look under the 'HSCW Files Download Page.' I forget, as much has been uploaded over the past few months.

"If you need MSDSP, you can download V. 0.70. You can also get the 'Manual.' It is in html format, so I suggest that you specifically do a "save as" and grab it as a text file, which you can more easily print out and keep, unless you're comfortable with handling the html screen. But get the Manual if you are using MSDSP. And after you get the Manual, download the MSDSP 'Operating Tips.' This is a long document, not to replace but to supplement the Manual. Unless you know everything about MSDSP and never have a crash, get it. Then save up enough money

to buy the paper to print these things out!

"As noted before, all of these papers have had to be updated too often. This cannot be done that often any more (the latest versions are dated approximately 8 April), so *all* of these papers have their most recent updates added to the 'Appendix' paper. This one paper will be updated as new questions, problems, solutions, etc., come in. When any of the papers then really need to be revised, this will be done and the Appendix will start all over again. There is a lot more good stuff on the Main NA Web site, or linked to it.

"Do you use CoolEdit? Probably not for actual on-air use. But you should have it as a diagnostic tool, anyhow. Link to the K0SM Web Page. And, we figure everybody and his brother has OH5IY's MSSOFT. It is the best MS program I am aware of, and its documentation is worth reading just for the background material. Or, if you have a CMOS Super Keyer and want a simpler receiving program, get SBMS (if it isn't linked from the W6/PA0ZN Web site, go to 'Make More Miles on VHF' and link from there). Need a simple circuit? Need to know about modifying a cassette recorder? There's a little on the W6/PA0ZN Web site. But there's a lot more on the N1BUG pages. And more will be added both places soon. Then there's the new Web-based directory just put on line at URL <http://www.tree.net/hsms>. (This may not be linked from the W6/PA0ZN Web pages yet as it is quite new. So you may wish to write down this URL. We will put a link directly from the 'Announcements' later today if we don't forget it).

"Need to know what those with Big Bucks have done with MS? There's a paper available. Need to know how the sporadic background varies through the year? Link to KB0VUK's Web pages. Want to see and read the funny stuff about KM6PO and his grid-hopping adventures? It's all linked. And each of these (and many more) Web sites are also linked back to the W6/PA0ZN Web site, so you don't need to stay lost for very long. (Or, if you need to help ET fone home, this is available on the W6/PA0ZN Web pages, also).

"We hope most of you have not had to read this far, as there's nothing new being said. All this has been put on the Reflector, and on the 'Announcements' Web page, many times over the past few months. But we know that a number of people made a big push to get on HSCW in time for the contest a few months ago and may have had to cut some corners to do so. Now is the time to catch up, read a little bit, and get ready for some skeds!

"Which reminds me: I still need skeds with several of you who are within range but have not been worked yet. And if anyone has asked for a sked and has not received a reply, or has asked a specific

question which has not been acknowledged, please try again. After the long contest weekend, the large amount of E-mail, and just trying to catch up on other things, the spongiform gray matter between the ears is only hitting on one neuron right now. 73 de Shelby, W8WN."

Current Meteor Showers

The big meteor shower for this month is the *Perseids.* As mentioned last month, activity for this shower starts appearing around mid-July. The most intense period is the four days leading up to the predicted peak. There should be several stations operating from rare grids during the peak days.

Our astronomy friends will be particularly interested in our reports this year because of the problem of visual observation due to the waning full Moon, which occurs on August 8.

After too many years of trying to report a predicted peak, and failing miserably, I am staying away from exact times. Nevertheless, your best bet is usually the early morning hours of 11–13 August. For skeds, be sure to check 3818 and 3843 kHz and the VHF reflector on the Internet.

Current Conferences

The following is from the VHF reflector: "The 24th Annual Eastern VHF/UHF Conference will be held August 21–23, 1998 at the Harley Hotel, 1 Bright Meadow Blvd. (off Rt.5), Enfield, CT 06082.

"This year, we have speakers from New England to as far south as Maryland. Again this year is a Technical Laboratory, which will be in operation most of the conference. We encourage you to bring a project to de-bug or tune with some newer type test equipment.

Again, we have Gerry Rodski, K3MKZ, of SSB Electronics to manage the preamp noise figure measurement workshop (50 MHz – 10 GHz) and Joe Reisert, W1JR, to manage the antenna gain measurement range (222 and up, entrants receive a hardcopy plot of their antenna). This will be a great opportunity to check out your preamps and antennas! This year's VHF-SHF Trivia Quiz will be hosted by Ernie Gray, W1MRQ. An ARRL-published Proceedings book with the event schedule and many interesting articles is included with your registration and will be presented to you when you arrive.

"To date, we have secured the following speakers: Dale Clement, AF1T, 903 MHz Moonbounce; Del Schier, KD1DU, DSP on 144 MHz EME; Paul Wade, N1BWT, Microwave Antennas; Dave Olean, K1WHS, 2304 and 3456 Blowtorch; Brian, ND3F, Roving (tentative); and Tom, WA8WZG, Contesting and EME (tentative).

"Overnight rates at the Harley Hotel are $59 per night if you mention The Eastern VHF-UHF conference. Call 800-321-2323 or 860-741-2211 for reservations.

"For more information and a conference registration form, contact Rae Bristol, K1LXD, 328 Mark Drive, Coventry, CT 06238 (phone 860-742-8650).

"The East Coast VHF-UHF Conference is cosponsored by the Eastern VHF/UHF Society and the North East Weak Signal Group. Check out our official web page: <http://uhavax.hartford.edu/~newsvhf>. E-mail: <bdwood@erols.com>.

Current Contests

The annual ARRL UHF contest is scheduled for 1–2 August. The contest period is for 24 hours beginning 1800 UTC Saturday. There are several categories for entry. Scoring: Count 3 points for 222 or 432 MHz contacts, 6 points for 902 and 1296 MHz contacts, and 12 points for contacts on 2.3 GHz and above. Exchange is your four-digit grid square. Again this year pins are availabile. The minimum number of contacts necessary for a pin is five. Submit your log by 2 September to the League to be eligible for awards. What is new this year is Rover scoring is like Rover scoring for all other ARRL VHF contests. For complete rules, see July *QST.*

The dates for the first weekend of the eighth annual ARRL 10 GHz cumulative contest are 15–16 August (the second weekend is 19–20 September). The operating times are 8 AM to 8 PM *local* time each day. The exchange is the *six*-digit Maidenhead grid locator. Scoring is adding the sum of the distances in *kilometers* of each station worked to the sum of each unique callsign worked multiplied by one hundred. For example, if you work four unique stations (two of which operated from two separate locations) that are 97, 107, 154, 205, 157, and 147 km apart (for a total of 867 km), then your final score would be 1267 (867 + 400). To be eligible for contest awards, submit your log by 21 October. Remember, the contest includes all bands, 10 GHz and above. Plus there are two entry categories from which to choose—10 GHz only and 10 GHz and up. For complete rules, see June *QST.*

Note: When submitting your logs to the ARRL, you may do so either in writing or by several electronic ways. Consult their rules for instructions on how to do so.

Remember, 31 August is the deadline for submitting your logs for the CQ WW VHF contest. Please send the completed logs to CQ (25 Newbridge Road, Hicksville, NY 11801) by that date in order to be eligible for scoring awards. If you need logs and/or entry sheets, send an SASE to *CQ* magazine headquarters right away. Do not sent your request to me as I do not have them!

Until next month . . . 73 de Joe, N6CL

DX

BY CHOD HARRIS, VP2ML

NEWS OF COMMUNICATION AROUND THE WORLD

Bob White, W1CW

At the Dayton DX Dinner this year, Steve Bolia, N8BJQ, announced the election of Bob White, W1CW, to the DX Hall of Fame. Anyone who applied for DXCC in the 1950s, '60s, or '70s dealt with, and came away with a good opinion of, Mr. DXCC—Bob White.

Bob was first licensed in 1938 as W6QEZ. After serving in World War II in the Navy, Bob was station engineer for KPOA in Honolulu, where he was active as KH6QJ. In 1952 he and his wife Ellen, then W6YYN and W6YYM, applied for two job openings in the Communications Department at ARRL Headquarters in Connecticut. Late that year Bob became Assistant Communications Manager for CW, while Ellen held the corresponding post for Phone. Bob's primary responsibility was handling the DXCC program, which was growing rapidly. This would be Bob's job for the next 25 years.

If one had to identify the single person who had the most influence in making the DX Century Club the premier award program in DX, it would have to be Bob White. Bob oversaw a program that grew from a single individual and just two awards to the enormous operation that is DXCC today. When such a program grows dramatically, especially an expensive and money-losing program such as DXCC, there is a great temptation to cut corners, gloss over minor errors, reduce scrutiny, relax standards. Throughout this turbulent time for DXCC, Bob never dropped his guard, maintaining the highest standards of integrity and fairness to all aspects of the program.

This involved more than just carefully checking every one of the more than 250,000 cards submitted every year. Bob's tasks encompassed not only handling the DXCC applications, but also taking care of all other DXCC functions, including writing the DXCC rules, determining what constituted a DXCC country, and accrediting DXpeditions.

When Bob arrived at the DXCC desk, there was a vague philosophy of what made a DXCC country. It had to have some degree of political-administrative independence, or have some measure of geographic separation, or have some foreign land between it and a parent country. From those simple ideas to the DXCC rules as they existed before the recent rewrite, the definition of a DXCC country was crafted mostly by Bob White. He settled on the 75- and 225-mile figures in 1960, codifying a seat-of-the-pants rule used previously. He added the 500-mile limit for islands a couple of years later.

Ellen and Bob White, W1YL and W1CW, at Visalia.

Darko Rusman, T95A, a loyal CQ reader, photographed by Jeff Baker, WK3U.

The idea of requiring proof that a DXpedition actually operated from the alleged location was the next major change in the DXCC program. The concept of accreditation was born in a battle that, more than any other single event, shaped DXCC into the highly respected program that it is today. Let's look back 30 years to the clash between Don Miller, W9WNV, and Bob White.

In 1965 Don Miller sent to the ARRL letters granting Don permission to operate from Ebon Atoll and Cormoran Reef, potential new DXCC countries. In the normal way in which such matters were handled at the time, the letters were accepted on face value, and the two "countries" were added to the DXCC list. However, they were subsequently removed from the list without anyone actually making contact, because the information in the letters was discovered to be false. This was the DXCC desk's first salvo against Don Miller, then one of the best known DXpeditioners. This incident led to more rigorous scrutiny of new-country documents, and ultimately to the formation of the DX Advisory Committee a few years later.

Bob continued to delve into matters involving Miller and didn't like what he found. His research showed that Don could not have operated from some of the places he claimed, because he was spotted in other places at about the same time. Further, some of his claimed operating or landing permissions didn't hold up to official review. Bob proposed disqualifying some of Don's operations. Bob felt that not disqualifying Don would be cheating those DXers who worked legitimate operators who were where they said they were and had legal permission.

His efforts to maintain the high standards of the program prevailed, and he deleted DXCC credits for Don's operations as K1IMP/KC4 from Navassa, VU2WNV from the Laccadives, VQ9AA/c from Chagos, PYØXA from St. Peter and St. Paul Rocks, and VK2ADY/Ø from Heard. Ever since, DXpeditioners have had to prove conclusively that they really were where they claimed to be and had valid operating permission. Today, DXpeditioners make sure they have the "DXCC photo"—the shot of the operators with a unmistakable landmark from the country, such as the airport or identification sign. While the present system can be beaten (such as Romeo in Burma), it holds up very well. The number of blatant cheaters in the DXCC program is miniscule, thanks to the dedicated efforts of Bob White.

Following the Miller incident, things began really to pick up at the DXCC desk. The Board greatly expanded the program, adding 5-band DXCC and new awards for

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The WPX Program

SSB

2672 ..... KE4SCY 2674 ..... EA3CRI

CW

2983 ..... IK5RLS 2985 ..... W1XV
2984 ..... YU1BM

Mixed

1811 ..... 5R8DS 1813 ..... F2YT
1812 ..... PY1DBU 1814 ..... W1LIC

CW: 350 IK5RLS. 400 IK5RLS. 450 IK5RLS, 4XØ/G3WQU. 500 IK5RLS. 850 WA3GNW. 1600 I2EAY.
SSB: 350 EA3CRI, KE4SCY. 400 EA3CRI, KE4SCY. 450 EA3CRI, KE4SCY. 500 EA3CRI, KE4SCY. 900 EA7CD. 950 I2EAY, EA7CD. 1000 EA7CD. 1050 EA7CD. 2450 KS3F.
Mixed: 450 PY1DBU, YU1BM, F2YT, RW9QA. 500 PY1DBU, YU1BM, F2YT, RW9QA. 550 PY1DBU, YU1BM, F2YT, RW9GA. 600 PY1DBU, YU1BA, F2YT, RW9QA. 650 PY1DBU, YU1BA, RW9SG, F2YT, RW9QA. 700 PY1DBU, YU1BM, RW9SG, F2YT, RW9QA. 750 YU1BM, RW9SG, F2YT, RW9QA. 800 YU1BM, RW9SG, F2YT, RW9QA. 850 YU1BM, RW9SG, F2YT. 900 YU1BM, K1NU, RW9SG, F2YT. 950 YU1BM, RW9SG, F2YT. 1000 YU1BM, RW9SG, F2YT. 1050 YU1BM, F2YT. 1100 YU1BM, F2YT. 1150 YU1BM, F2YT. 1200 YU1BM, F2YT. 1250 YU1BM, F2YT. 1300 YU1BM, F2YT. 1350 WØIZV, F2YT. 1400 F2YT. 1450 F2YT. 1500 F2YT. 1550 F2YT. 1600 F2YT. 1650 F2YT. 1700 F2YT. 1750 F5NBX, F2YT. 1800 F5NBX, F2YT. 1850 F5NBX, I2EAY, F2YT. 1900 F5NBX, I2EAY, F2YT. 1950 F5NBX, F2YT. 2000 F5NBX, F2YT. 2050 F5NBX, F2YT. 2100 F2YT. 2150 F2YT. 2200 W9IL, F2YT. 2250 W9IL, F2YT. 2300 F2YT. 2350 F2YT. 2400 F2YT. 2450 F2YT. 2500 N4UH, F2YT. 2550 F2YT. 2600 F2YT. 2650 F2YT. 2700 F2YT. 2750 F2YT. 2800 F2YT. 2850 F2YT. 2900 F2YT. 2950 F2YT. 3000 F2YT. 3050 F2YT. 3100 F2YT. 3150 F2YT. 3200 F2YT. 3250 F2YT. 3300 F2YT. 3350 F2YT. 3400 F2YT.

15 meters: RW9QA
20 meters: AA1KS, RW9QA
40 meters: RW9QA
80 meters: AA1KS, RW9QA
160 meters: RW9QA

Asia: RW9SG, RW9QA, JK1VSL
No. America: RW9SG
So. America: AA1KS
Europe: RW9SG, RW9QA

Award of Excellence Plaque Holders: K6JG, N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS. I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, YU2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, S57J, EA8BM, DL1EY, KUØA, KØDEQ, VR2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, I7PXV.

Award of Excellence Plaque Holders with 160 Meter Endorsement: K6JG, N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, K9BG, W1BWS, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, KØDEQ, VR2UW, DJ3JSW, OE6CLD, HB9BIN.

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 88101-9511 USA.

Georg, OE4CSK (ex-OE8CSK), is very active on CW.

160 meters and RTTY. An effort to abolish Phone DXCC to reduce the workload backfired and resulted in the *addition* of a new DXCC award for CW. A second and then a third staffer labored under Bob in the expanded DXCC program.

Meanwhile, Bob was maintaining extremely high standards in other aspects of the program, such as card checking. In the days before field checking, Bob himself personally reviewed almost every card moving through the DXCC branch. With all his other duties, this meant a lot of long hours. I was putting in 80–90 hour work weeks myself at ARRL Headquarters at the time, but there were few late nights or weekends when I was in the office that Bob wasn't bending over his desk in the corner, flipping through stacks of cards.

Just how much unpaid overtime Bob put into the DXCC program became very evident after he left the post in 1976. Despite elevating his number-one assistant to the top job, ensuring continuity and experience, the DXCC program began to run into trouble immediately. There was simply too much work for the staff to handle. Bob did it, but apparently others couldn't work to his standards of excellence and dedication. The then Communications Manager George Hart, W1NJM, said it well: "Losing Bob White from DXCC was a little more serious than losing one person; it was more like losing *two*, both of them with a veritable wealth of experience, knowledge, and wisdom in DXCC lore. No one person could step into those shoes . . . not unless, that is, he was able and willing to devote his life to DXCC, as Bob had practically done for 25 years."

Bob continued to fight for the integrity of the DXCC program to his last days with it. He opposed the addition of Okino Tori Shima 7R1RL to the DXCC countries list, but was overruled by his boss, Dick Baldwin, W1RW. "Baldwin's Reef," as Okino Tori Shima was widely known, was viewed as an aberration in DXCC and was deleted from the list a few years later. When the representative of the JARL showed the film of the 7J1RL operation at ARRL headquarters (the "DXCC photo"), Bob asked Nao Akiyama, now NX1L, if any part of the so-called island was above water at high tide. Nao pointed out a rock about the size of a kitchen table, far smaller than any of the rocks that make up Scarborough Reef.

Bob managed the DXCC branch with dedication toward service to the DXers, as well as to the overall program. I was a fledgling DXpeditioner at the time and was occasionally a bit careless with my confirmations. Some of my QSLs went out with minor errors, corrections, or just handwriting so bad it couldn't be read. When Bob came across one of my cards with such an error, he would walk across

THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive. Lifetime Honor Roll fee is $4.00 (U.S.) for each mode, with no fee for additions.

MIXED

4773 F9RM	3183 YU1AB	2848 K9BG	2542 KØDEQ	2218 F6IGF	2001 OE6CLD	1696 PY2DBU	1371 F6HMJ	1197 KW5USA
4740 9A2AA	3114 YU2NA	2831 KF2O	2520 IK2ILH	2187 9A4RU	1919 SM6CST	1653 AE5B	1328 W9IAL	1151 VE6BMX
3980 W2FXA	3103 I1EEW	2779 I2MQP	2512 JH8BOE	2175 W9IL	1836 F5HBX	1628 JN3SAC	1309 NH6T	1100 KB5OHT
3899 EA2IA	3040 F2YT	2776 W2ME	2500 HA5NK	2169 W8UMR	1778 DJ1YH	1625 KØNL	1293 WØIZV	1088 HB9BIN
3629 K6JG	3039 WA8YTM	2690 WB2YQH	2484 K8LJG	2168 N6JM	1767 IØAOF	1607 OZ1ACB	1257 WT3W	1074 W2EZ
3504 N6JV	3005 PAØSNG	2660 4N7ZZ	2376 HAØIT	2140 YU7JDE	1765 K5IID	1478 I1-21171	1245 N1KC	1073 JR3TOE
3413 VE3XN	2990 HA8XX	2645 I2EOW	2264 K2XF	2165 W6OUL	1732 LU8DY	1396 YU1ZD	1224 AA1KS	1064 WB2PCF
3363 N4MM	2966 YU7SF	2574 S53EO	2254 S58MU	2128 W4UW	1718 VE4ACY	1378 Z32KV	1198 S52QM	1059 RAØFU
3305 SM3EVR	2926 YU7BCD	2546 SM6DHU	2229 K5UR	2019 G4OBK	1711 I2EAY			

SSB

4122 IØZV	2731 HA8XX	2324 CT1AHU	2088 K5RPC	1703 N6FX	1497 DK5WQ	1243 DF7HX	1010 KI7AD	869 JR3TOE
3743 VE1YX	2725 I1EEW	2301 4X6DK	1958 IN3QCI	1703 NBØC	1489 K3IXD	1241 SV3AQR	1004 LU3HBO	804 AG4W
3656 ZL3NS	2707 N4NO	2296 I8KCI	1906 K5UR	1681 YU7SF	1473 K8MCU	1229 YC2OK	954 EA1AX	792 EA5GMB
3404 F6DZU	2638 N5JR	2291 YU7BCD	1881 SM6DHU	1659 K8LJG	1458 IT9SVJ	1196 KØNL	936 IW3AY	779 N3DRO
3371 K6JG	2612 PAØSNG	2281 I2EOW	1867 OE6CLD	1649 EA5CGU	1450 K2EEK	1182 WA2FKF	933 DF1IC	675 VE6BMG
2949 N4MM	2581 I2MQP	2274 EA5AT	1809 LU8DY	1590 KS4S	1395 EA5KY	1125 LU5EWO	924 N1KC	660 F3LIW
2935 EA8AKN	2434 LU8ESU	2203 KD9OT	1802 OE2EGL	1536 HA5NK	1353 K5IID	1145 K4CN	922 DL8AAV	613 SM5DAC
2911 EA2IA	2411 9A2NA	2189 KF7RU	1760 HAØIT	1535 CT1BWW	1346 W9IL	1127 EA8AG	919 CP1FF	608 LU3HL
2855 F2VX	2383 WA8YTM	2131 CX6BZ	1754 W2WC	1522 W6OUL	1335 G4OBK	1030 NH6T	894 EA3EQT	605 N7VY
2757 I4CSP	2378 KF2O	2097 EA1JG	1714 K2XF	1518 AE5B	1288 I3UBL	1016 WT3W		

CW

3790 WA2HZR	2468 W2ME	2124 JA9CWJ	1954 S58MU	1795 W1WAI	1623 LU2YA	1168 AC5K	1032 W4UW	820 K3WWP
3489 N6JV	2401 G4UOL	2104 9A2NA	1954 TI4SU	1755 K5UR	1537 JN3SAC	1136 I2MQP	983 9A3UF	759 VE6BMX
3098 UA3FT	2362 YU7BCD	2050 KA7T	1927 SM6DHU	1750 K2XF	1527 EA6BD	1124 LU3DSI	982 LU7EAR	741 DL3NEO
3073 N4NO	2350 N4MM	2046 HA8XX	1876 HAØIT	1744 I7PXV	1458 I2EAY	1083 4X6DK	949 K2LUQ	730 WT3W
2895 K6JG	2337 N5JR	2035 HA5NK	1863 N6FX	1730 IT9VDQ	1454 EA5YU	1074 W9IL	906 YU1TR	725 KØNL
2887 EA2IA	2335 WA8YTM	1980 KF2O	1857 G4SSH	1690 DJ1YH	1411 SM5DAC	1058 DF6SW	884 PY4WS	678 IK8VRP
2881 N4UU	2319 VE7OP	1973 G3VQO	1816 SM6CST	1641 G4OBK	1293 IK5TSS	1041 W9IAL	847 NH6T	603 OE6CLD
2857 YU7LS	2196 VR2UW	1956 K8LJG	1798 W2WC	1641 W6OUL	1270 K5IID	1033 I2EOW	821 RAØFU	600 N1KC
2674 YU7SF								

the hall to my office and ask me to make out a valid card for the DXCC applicant, watching over my shoulder so that I didn't make a beginner's mistake again. Bob would write back to the applicant that such and such a card wasn't valid for DXCC because of the callsign correction, but that he had obtained a valid card for the contact, and included it with the return QSLs. How's that for service!

Bob's efforts on behalf of DXers didn't end with his retirement from the DXCC desk in 1976. Bob moved upstairs and established the ARRL Out-Going QSL Bureau, bringing the same organizational skills, dedication, and attention to detail to that job as he did with DXCC.

This long run of dedicated service did not go unnoticed, despite Bob's quiet nature and low profile. In 1976 Bob was presented with a plaque by the New England DX Century Club which reads: "New England DX Century Club presents the award to Robert L. White, W1CW, 'Mr. DXCC,' 1952–1976, with appreciation for your honesty, fairness, integrity, and dedication, using one set of rules for all, which made DXCC the premier DX achievement award."

The ARRL Board of Directors acknowledged Bob the next year, saying: "The Board of Directors commends Robert L. White, W1CW, for his outstanding performance of duties during his twenty-five years as Manager of the League's DXCC Program, recognizing that under his conscientious and efficient stewardship, DXCC has become one of Amateur Radio's most respected and sought-after operating performance awards."

To these and other awards and honors Bob can now add membership in the DX Hall of Fame. Congratulations, Bob!

Baldur Drobnica, DJ6SI, operating as 3XA8DX from Guinea last year.

DX Conventions

Don, W5FKX, president of the New Orleans International DX convention, passes on the following about this year's event:

"The 7th Annual New Orleans International DX Convention will be held on Friday and Saturday, August 14–15, 1998 at the Royal Sonesta Hotel on Bourbon Street in the French Quarter of New Orleans, Louisiana.

5 Band WAZ

As of April 30, 1998, 481 stations have attained the 200 Zone level.

New recipients of 5 Band WAZ Award with all 200 Zones confirmed:

N1DG
SP3CB

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

N4WW, 199 (26)
AA4KT, 199 (26)
K7UR, 199 (34)
WØPGI, 199 (26)
W2YY, 199 (26)
W9WAQ, 199 (26)
VE7AHA, 199 (34)
W9CH, 199 (26)
IK8BQE, 199 (31)
JA2IVK,199 (34 on 40)
K1ST, 199 (26)
ABØP, 199 (23)
KL7Y, 199 (34)
UY5XE, 199 (27)
NN7X, 199 (34)
OE6MKG, 199 (31)
HA8IB, 199 (2 on 15)
IK1AOD, 199 (1)
DF3CB, 199 (1)
F6CPO, 199 (1)
W6SR, 199 (37)
W3UR, 199 (23)
KC7V, 199 (34)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W8DX, 199 (34)
N4CH, 199 (18 on 10)
N6AW, 199 (34)
OE1ZL, 199 (1)
W6DN, 199 (17)
UA3AGW, 198 (1, 12)
EA5BCK, 198 (27, 39)
K4PI, 198 (23, 26)
G3KDB, 198 (1, 12)
KG9N, 198 (18, 22)
KM2P, 198 (22, 26)
DKØEE, 198 (19,31)
KØSR, 198 (22, 23)
K3NW, 198 (23, 26)
UA4PO, 198 (1, 2)
K5RT, 198 (22, 23)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K4ZW, 198 (18, 23)
DJ4GJ, 198 (1, 31)
OH2VZ, 198 (1, 31)
W2YC, 198 (24, 26)
NØFW, 198 (18,18on10)

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

N1KC, 151 zones
LX1KC, 161 zones
I7PXV, 168 zones

OZ1ZL, 199 zones
N1DG, 200 zones
GM3WIL, 195 zones
W6DN, 199 zones
SP3CB, 200 zones
JK1AJX, 157 zones

Endorsements:

1078 Stations have attained the 150 Zone level as of April 30, 1998.

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 Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all *CQ* awards is $4.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

The WAZ Program

Single Band WAZ

20 Meter SSB

1028 ..... K6FG
1029 ..... LX1KC
1030 ..... KFØQR

17 Meter CW

23 ..... W1WAI

20 Meter CW

485 ..... F6BDX
486 ..... K6YUI
487 ..... K6FG

40 Meter CW

200 ..... K6FG

160 Meters

130 ..... EA6SX, 32 zones, new
131 ..... HB9CIP, 40 zones, new, all zones
103 ..... W8XD, 35 zones, endorsement

All Band WAZ

SSB

4431 ..... W4SMG
4432 ..... EA5BRE

CW/Phone

7799 ..... HA8BJ (CW)
7800 ..... HA5VQ
7801 ..... PY1BDU
7802 ..... VE3EIM
7803 ..... KUØJ (CW)
7804 ..... OE5CMN
7805 ..... AA2DY
7806 ..... W1TE
7807 ..... OH2KQ (CW)
7808 ..... KFØQR

All CW

116 ..... N1TC
117 ..... W2DES

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 Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all *CQ* awards is $4.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

"The agenda includes DXpedition presentations on Temotu Islands by Bruce Butler, W6OSP; KH5/KH5K by Chuck Brady, N4BQW; ZK1XXP by Tom Harrell, K8XP, and others; technical presentations; reports on ARRL DX Desk and DX Advisory Committee news by Bill Kennamer, K5FUV, Director of ARRL Membership Services; and QSL checking. The activities culminate with a gala banquet on Saturday evening, with the presentation of NOIDXC DXer of the Year award to Frank Smith, AHØW/OH2LVG, followed by the featured DXpedition presentation, XW30 Laos 1998, and ending with the grand prize drawing. A free hospitality suite on Friday and Saturday evenings, with a strolling balcony view of Bourbon Street, is sponsored by Carl Smith, N4AA, of DX Publications.

"In addition to DX, many other family oriented activities are only a short walk away, including restaurants and shops, the Aquarium of the Americas, the great Mississippi River, river boat rides, the Super Dome, and more. New Orleans is well-known for its unique ambience, jazz and blues music, and cuisine par excellence. The Convention site, the Royal Sonesta Hotel, is rated as one of the ten finest hotels in North America by *Conde Nast Travel* magazine.

"Early registration (before July 31): Convention and banquet is $60; non-ham guest ticket for the banquet only is $40. Late registration after July 31 will be $70 and $50, respectively. For early registrations, download (print) a copy of the Advance Registration Form from the Delta DX association web site: <http://www.gnofn.org/~w5ru/DX_Cnex.htm>.

"The hotel offers a special convention rate; to get it, call the local number 504-586-0300 for reservations."

This has grown into a premier event. The facility, food, and DX program are all first-rate, and it's in a great location for

CIRCLE 88 ON READER SERVICE CARD

QSL INFORMATION

4S7TWG to N6TW
5A21PA to ON4APS
8P9JG to W2SC
8S3FRO to SM3CVM
9A8ØØOS to 9A5I
9M2EU to JA2EJI
9U5DX to F2VX
9V1XX to 7K3CKK
AHØT to JA6BSM
CP4CR to IK2UVU
D68YN to HB9CYN
D68YV to HB9CYV
EG9IA to EA4URE
FG5EY to F6EYB
GM6F to GM3ZRC
H4ØAB to VK9NS
HS6CMT to JA7FYF
IR2P to IK2DUW
IQ2W to IK2DUW
IU6F to IK6BOB
J38G to W8KKF
J45RDS to SV5AZP
KG4OX to W4OX
KG4WW to KX4WW
LX4B to LX1TI
M6T to G3XTT
OK5W to OK1AEZ
OL1C to OK1AN
OL2A to OK2RAB
SN7L to SP7HB
SO3IF to DJØIF
T88KH to JM1LJS
TA3ZM to DL5ABL
VI75RAAF to VK4LV
VK9LZ to N0AH
VP9ANV to WB2YQH
VQ9KK to KBØQKK
WA4DAN/VP5 to NØTG
YEØT to YBØPR
YM2ZM to OK1DTP
ZS8IR to ZS6EZ
ZW6C to PT2GTI
ZX6C to PT2GTI
5B4LP to Andreas Mavrides, 8A Salamis Ave., Nicosia 135, Cyprus
7S6KY to Kungsbacka Radioamatorer, P.O. Box 10302, S-434 24 Kungsbacka, Sweden
9H1SV to Stephen Vella, "Alpinia," Censu Muscat St., Naxxar NXR 05, Malta
9M6HZ to Herbert Koh, Locked Bag No. 1, 88990 Kota Kinabalu, Sabah, Malaysia
AH8LG to Larry Gandy, P.O. Box 1618, Pago Pago, AS 96799
BD4DC to Ralph Chian, 573 Fu-Xing-Zhong-Lu, Shanghai 200025, China
BG5IK to X. R. Zeng, P.O. Box 010, Nan Ning, Guang Xi 530001, China
BV3BV to Yo Ki Huang, P.O. Box 3-59, Yangmei 326, Taiwan
CN8KD to Mohamed Kharbouche, P.O. Box 6343, 10101 Rabat, Morocco
CO8TW to c/o Joe Arcure, W3HNK, P.O. Box 73, Edgemont, PA 19028
DS3ACV to Yang Hae Cheon, Karam APT 3-501, Samchun-dong, Seo-gu, Taejon 302-222, Korea
DS3BIS to Wang Jong Ran, Karam APT 3-501, Samchun-dong, Seo-gu, Taejon 302-222, Korea
DS5ASS to Young Ran Han, 101-1008 Hankuk CaproLactam Company House, 665-1, Sunam-dong, Nam-gu, Ulsan 680-100 Korea
DS5AST to Myoung Sun Oh, 101-1008 Hankuk CaproLactam Company House, 665-1, Sunam-dong, Nam-gu, Ulsan 680-100 Korea
DS5SFY to Eunjoo Yang, Hwangsil APT 105/107, 682-1, Songdang-dong, Dalso-ku, Taegu 704-082, Korea
DS5WKW to Jong Ho Jang, Jugong APT 2-501, Jangsung-dong, Pohang 791-260, Korea
DU1ØØSAN to Serafin A. Nepomuceno, P.O. Box 3000 QCCPO, 1170 Quezon City, Metro Manila, Philippines
DU7LA to Peter Sils, P.O. Box 90, Dumaguete PH-6200, Philippines
DX1ØØA to Serafin A. Nepomuceno, P.O. Box 3000 QCCPO, 1170 Quezon City, Metro Manila, Philippines
HC4NAR to Raul Armas, P.O. Box 13-01-326, Portoviejo, Manabi, Ecuador
HJ3YHY to Jairo Hinestroza, A. A. 151273, Santafe de Bogota, Colombia
HKØM/HK3JJH to Pedro J. Allina, A. A. 81119, Santafe de Bogota, Colombia
HLØK to Hankuk Ation University Amateur Radio Club, 00-1 Hwajun-dong, Dukyang-gu, Koyang, Kyonggi 411-791, Korea
HL1XP to Jeon, 58-1 Nonhyun-dong, Kangnam-ku, Seoul 135-010, Korea
HL2BM to Kim Hong Jong, P.O. Box 1, Hoengge, Kangwon 232-950, Korea
HL2DJW to Choi Kyu Bum, Bongyang 1-Ri, Jeongseon-eup, Kangwon 233-800, Korea
HL2DKL to Park Dong Suk, Bongyang 1-Ri, Jeongseon-eup, Kangwon 233-800, Korea
HL2LMW to Bok Gwi Moon, 1007-104 Jukong APT, 550 Eunhaeng-2 dong, Jungwon-ku, Seongnam 462-152, Korea
HL2WA to Dong Kyu Lee, 1007-104 Jukong APT, 550 Eunhaeng-2 dong, Jungwon-ku, Seongnam 462-152, Korea
HL5FBT to Keum Cheol Kim, P.O. Box 34, Namdaegu 705-600, Korea
HL5JAC to Soo Chun Oh, 101-1008 Hankuk CaproLactam Company House, 665-1, Sunam-dong, Nam-gu, Ulsan 680-100 Korea
HL5PRU to Yong Ki Han, APT 3-508, 332-6 Puam 1-dong, Pusanjin-Gu, Pusan 614-091, Korea
HR2JGG to Jorge Giacoman, Apartado Postal 351, 23201 El Progreso, Yoro, Honduras
HS1PDY to Kanok Chantrasmi, P.O. Box 195, Samsennai, Bangkok 10400, Thailand
J43PTR to Radio Amateur Association of West Peloponese, P.O. Box 12,GR-260 03 Patra, Greece
J45KLN to Goran Lundell, SMØCMH, Algovagen 11, SE 13336 Saltjobaden, Sweden
OA6AFS to Edgardo M. Corrales Rodriguez, P.O. Box 109, Arequipa, Peru
SV1AYC to Kostas Monastiriakos, 10 Mesologiou St., GR-141 23 Likovrisis, Athens, Greece
SV2DFA to Giannis Papadopoulos, 40 Eteokleous Str., R-542 50 Thessaloniki, Greece
XX9BB to Leong Kam Po, P.O. Box 6018, Macau
XX9EH to John Leong, P.O. Box 6018, Macau
YBØDX to Ayung, P.O. Box 1004 JKB, Jakarta 11010, Indonesia
YB1GLB to Liebra T., P.O. Box 1042, Bandung 40010, Indonesia
YB7UE to D. A. Farianto, P.O. Box 6731 JKUKP, Jakarta 14250B, Indonesia
YB8ZZ to Amboina Amateur Radio Club, P.O. Box 1140, Ambon, 97000 Indonesia.
YCØGKY to Mulyani Retno, P.O. Box 6731 JKUKP, Jakarta 14250B, Indonesia
YCØIEM to Hotang Siahaan, P.O. Box 7262, Jakarta 12072, Indonesia
YCØLBK to Suryadi Umar, Jl. Kalibata No. 12 Rt. 06/01, Jakarta 12750, Indonesia
YC1VQD to Ir. Jonathan H. Lemuel, P.O. Box 115, Tangerang 15001, Indonesia
YC7KE to Husaini, P.O. Box 188, Banjarmasin 70001, Indonesia
YC8VHU to A. Chalik Usman, P.O. Box 1008, Ambon, 97010 Indonesia
YC8VIP to N. Rangkuti, P.O. Box 1042, Ambon 97010, Indonesia
YF8XOD to Hermansyah Wibowo, P.O. Box 1008, Ambon, 97010 Indonesia
YE8XM to J.D.C. Sihasale, P.O. Box 151, Ambon, 97001 Indonesia
YE8V to Special Call for Banda Award, YE8XM
ZP5BMR to Nene Barboza, Av. San Martin 1799, 1767 Asuncion, Paraguay
ZP5FEL to Felix Echeverria Insfran, C. C. 1969, 1209 Asuncion, Paraguay
ZP7CLA to Carlos Alberto Lohse Kiese, C. C. 36, 5000 Villarica, Paraguay
ZP7CWA to Lorgio Roberto Aguilera, P.O. Box 001, Caaguazu, Paraguay
ZP9CN to Antero Gustavo Carlson N., P.O. Box 145, 6000 Encarnacion, Paraguay
ZP9DZA to Helmut Paster, C. C. 412, 7000 Ciudad del Este, Paraguay
ZP9TVA to Euclides Toledo, C. C. 533, 7000 Ciudad del Este, Paraguay

The table of QSL managers is courtesy of John Shelton, K1XN, editor of The GOLIST, P.O. Box 3071, Paris, TN 38242 (phone 901-641-0109; e-mail: <golist@wk.net>).

non-hams. The hotel rate is a bargain. It's on my list for this year. Note that the program begins at 1 PM Friday and lasts through Saturday night. You have Sunday to continue your exploration of New Orleans. The convention requests evening dress for dinner—i.e., jacket and tie.

The 46th annual W9DXCC Convention and Banquet is Saturday, Sept. 12, at the Holiday Inn in Rolling Meadows, Illinois, which is about 10 miles from Chicago's O'Hare airport. The program includes Tin Totten, N4GN, on the **H40AA** Temotu Island operation; DXCC 2000 presentation by new DXCC Manager Bill Moore, NC1L; an ARRL forum with W9PRN, K9KM, and NC1L; and the W9 QSL bureau by K9BG. The banquet speaker is Fred Laun, K3ZO, LU5HFI, HS1ABD, etc., who always is entertaining and informative. The banquet also includes the presentation of the DX Hog of the Year award. Bill Moore will be checking cards for DXCC. There are hospitality suites both Friday and Saturday evenings. For more information, contact chairman Bill Smith, W9VA, at 847-945-1564, e-mail: <w9va@aol.com>.

Mark, F6JSZ, editor of French *CQ*, passes on the following about this major European DX convention: "The 20th International Convention of the Clipperton DX Club will be held at Brive-la-Gaillarde (Corrèze), on September 19–20, 1998. Located near the center of France, at the frontier of the south-west region, Brive is easily accessible by the road (A20 motorway) and the airport of Brive-Laroche. The local gastronomy is guided by the influence of the Limousin, Périgord, and Quercy regions and satisfies even the most expert tastes. Many local specialities are available, including the traditional 'foie gras,' walnut liquor, and many other tasty things that you'll probably eat at the DX banquet on Saturday evening.

"There are plenty of historical and cultural sites to be seen in town and in the countryside. The convention will be held

CQ DX Awards Program

SSB

2249.....KF4ZR
2250.....AA2FK
2251.....CT1EEN

SSB Endorsements

320.....W7FP/326
320.....VE2GHZ/324
300.....CT1EEN/309
275.....OA4EI/280
250.....WAØVBW/253
200.....4Z5FL/200

CW Endorsements

310.....W3II/310
300.....W7IIT/305
275.....KF8UN/276

Total number of active countries is 328. The basic award fee for subscribers to *CQ* is $4. For non-subscribers, it is $10. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00. Updates not involving the issuance of a sticker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for airmail reply. Please make all checks payable to the awards manager.

at the Mercure hotel of Brive-Ussac, East of Brive. Access to the hotel is rather easy, whether you're coming from north or south via the A20 motorway, or from east or west by the RN89 national road. Special signs will indicate which direction to follow as soon as you arrive at Brive. And if ever you are lost, just give us a call on 145.500 MHz or call us at the hotel. Those DXers coming by train or by plane will be picked up by some volunteer hams who will drive you to the hotel (please tell us how you're going to travel ahead of time). Trains arrive directly from Paris (no change) and TAT will fly you to Brive-Laroche directly from Paris, too. Welcome to Briveá! Info at <cdxc@naonet.fr>."

DXpeditions

Charlie Harpole, K4VUD, returned to Nepal last month. This time he'll stay until mid-November. He plans to be on the air daily as **9N1UD** at his local sunrise and sunset. This is around 0000Z and 1300Z. Try 14023, 14195, and 14215 kHz as the main frequencies, with 21023 and 21295 kHz on 15 and 7023 and 7065 kHz on 40. Other possible frequencies are 3799 and 28490 kHz. QSL via his home address: 3100 North Highway 426, Geneva, FL 32732-9761.

Bruno Filippi, F5JYD, concludes his five-month operation as **FM5JY** this month. His location is on St. Pierre island, off the coast of Martinique. QSL via home call, direct to 189 Rue Barbusse, F-59120 Loos, France, or via the French bureau.

73, Chod, VP2ML

BY JOHN DORR, K1AR

CONTEST CALENDAR

NEWS/VIEWS OF ON-THE-AIR COMPETITION

Do You Have A Favorite Contest?

August's Contest Tip

Have you taken a hard look at your station's layout lately? Comfort is a controllable factor in contest operating. If you have to see your chiropractor after every time you change bands, you probably need to pay attention to this month's contest tip. Think "out of the box" when it comes to your station's physical design. Ask your fellow contesters what they're doing. You'll be surprised how a few small changes can impact your operating enjoyment—and score!

When you ask fellow contesters what they consider to be their favorite contest, you get an incredibly wide range of responses. In part, I think it's because we operate contests for so many reasons. Also, I suspect it's due to the large number of operating events that are sponsored throughout the year (more on that in a minute).

When it comes right down to it, most of us have one or two favorite contests that stand out above all the others. The choice could be based on our station's limitations or strengths, or it simply could be that it is just the first one we ever operated, offering some level of nostalgic value.

Without a doubt, and having nothing to do with where you're reading this (honest!), my favorite event is the CQ World-Wide DX Contest. In fact, I suppose that I have to concede that DX contests in general are where my interests lie. This is, for the most part, a very widely held feeling on the east coast of the U.S. As with any geographical area, the contests that afford the best results are usually the most popular. If you pose the same question to someone in Texas or Nevada, they probably would tell you about the benefits that come from operating domestic contests such as the ARRL Sweepstakes.

As I mentioned earlier, there is a nostalgic part of this equation, too. Like many of you, my first "contest" was the ARRL Field Day. It was my initial exposure to amateur radio as well. For that reason, Field Day has always had a special spot in my contesting interest curve—so much so that I've never missed operating one (albeit from home many times) in 29 years of hamming. I'm sure there are scores of you who can relate a similar story about the once popular ARRL Novice Roundup. When I look back at the 20+ hours of operating I did to make 230 QSOs in the 1969 NR, it's amazing that I ever operated another contest. To tell you the truth, though, it was one of the best times I ever had in a contest!

2 Mitchell Pond Road, Windham, NH 03087
e-mail: K1AR@contesting.com

Calendar of Events

July 25-26	RSGB IOTA Contest
July 25-26	Venezuela CW DX Contest
Aug. 1	EU HF Championship
Aug. 1-2	North American CW QSO Party
Aug. 1-2	10-10 Net Summer Phone QSO Party
Aug. 2	YO DX Contest
Aug. 2	QRP ARCI Summer Daze SSB Sprint
Aug. 8-9	WAE CW Contest
Aug. 8-9	MD-DC QSO Party
Aug. 9	Internet CW Sprint Contest
Aug. 15-16	North American SSB QSO Party
Aug. 15-16	SEANET SSB Contest
Aug. 15-16	SARTG RTTY Contest
Aug. 15-17	New Jersey QSO Party
Aug. 29-30	Hawaii QSO Party
Sept. 5-6	All Asian SSB Contest
Sept. 5-6	LZ DX Contest
Sept. 6	NA CW Sprint
Sept. 6	Panama Anniversary Contest
Sept. 9-11	YLRL Howdy Days Contest
Sept. 12-13	WAE SSB Contest
Sept. 13	NA SSB Sprint
Sept. 19-20	SAC CW Contest
Sept. 19-20	Air Force Anniversary QSO Party
Sept. 19-20	Washington State Salmon Run
Sept. 27-28	**CQ WW RTTY DX Contest**
Sept. 27-28	SAC SSB Contest
Oct. 3-4	VK/ZL Oceania SSB DX Contest
Oct. 3-4	California QSO Party
Oct. 10-11	VK/ZL Oceania CW DX Contest
Oct. 24-25	**CQ WW DX SSB Contest**
Nov. 28-29	**CQ WW DX CW Contest**

From an international perspective, DX contests are hugely popular—and not just the CQ WW and ARRL DX. There are literally dozens of national contests, some permitting international participation and others limited to domestic QSOs. Maybe some of you can recall an experience such as listening to a buzz saw of weak JA stations on 80 meters working each other at high QSO rates, wondering what it would be like to work them yourself.

The Punch Line

The preceding discussion can not be concluded without some comments on the number of contests currently being sponsored throughout the year. One of the most common complaints I receive from non-contesting amateurs is that there are too many darn contests. When you look at the contest calendar (or even better, the annual list in *CQ*'s *Almanac*), it's easy to see that point of view. There are some weekends in which four or five simultaneous operating events are underway at various times.

Hopefully, most contests have some goal in mind. Some are trying to stir up activity from rare states. Others are attempting to increase activity on certain modes or bands. Still others are designed to encourage newcomers or those with small stations to join in on the fun. My question for the contest community to consider is, if there's not a significant goal you're trying to achieve by sponsoring a contest, or the organizational support for the event is minimal at best, then why conduct the contest in the first place? The concept is something like the banking system. The world does not need another generic credit card with a great interest rate.

We've all heard the arguments, however. So many of these contests have little or no activity, so what's the big deal! Well, my view is that this is precisely the point. If a contest has little or no activity, then why sponsor the contest at all? It sure seems like common sense to me.

The contest and non-contest community will never completely see eye-to-eye on the virtues of contest operating. It's no different than the conflicts SSTVers and non-SSTVers suffer from on 20 meter SSB—or, net operators and non-net operators, and 2 meter packet operators and non-packet operators for that matter. The list just goes on and on. Fortunately for the hobby, our self-policing approach works very well for the most part. What are your thoughts on this subject?

Final Comments

The 1998 CQ WW contest will be upon us sooner than you think. Many of you have already booked your airplane tickets to operate from Zone 23 or BV-land. Remember, the CQ WW is the world's most popular contest if you measure it by participation levels. Don't miss out on the fun!

As always, please remember that the deadline for the November issue is September 1st.

73, John, K1AR

ARRL UHF Contest

1800Z Sat. to 1800Z Sun., Aug. 1–2

Activity for this contest starts at 220 MHz and goes all the way up to 2.3 GHz and higher.

Exchange: Grid square locator.

Points: Score three points for 220 or 432 MHz contacts, and six points for 902 or 1296 MHz. Credit 12 points for 2.3 GHz or higher.

Multiplier: Total number of different grid squares worked on each band. Final score is the total QSO points from all bands times the sum of the grid-square multiplier from each band.

An award pin program is available for this contest for making 5 QSOs. Details including the full rules were published in the July issue of *QST*. It is suggested you send a large SASE to the ARRL for official log and summary sheets.

Send logs to ARRL UHF Contest, 225 Main Street, Newington, CT 06111.

Here is Jim Neiger, N6TJ, at the 1998 Dayton Contest Dinner. There are 105 photos from the Dayton Hamvention now up at the "K8CX Ham Gallery" at <http://para-dox2010.com/ham/>. (Photo via Tom Roscoe, K8CX)

YO DX Contest

2000Z to 1600Z Sun., Aug. 1–2

This is the annual running of the YO DX Contest sponsored by the Romanian Amateur Radio Federation. This is a worldwide contest with everyone working each other on SSB and CW.

Classes: Single Operator All Bands/Single Band and Multi-Operator/Single Transmitter.

Frequencies: CW: 3510–60, 7010-40, 14010–60, 21010–60, 28010–60 kHz. SSB: 3700–75, 7040–90, 14150–250, 21200–300, 28400–600 kHz.

Exchange: RS(T) plus ITU zone. YO stations will substitute their two-letter country abbreviation for their zone.

Scoring: 8 points for YO QSOs, 4 points for QSOs outside your continent, and 2 points for QSOs within your continent. QSOs within your own country are valid for multiplier credit only. Final score is computed by multiplying your total QSO points times the sum of YO counties and ITU zones worked on each band.

Deadline for logs is September 2nd and should be mailed to: RARF, P.O. Box 05-50, R-76100 Bucuresti, Romania.

North American QSO Party

CW: 1800Z Sat., Aug. 1 to 0600Z Sun., Aug. 2
SSB: 1800Z Sat., Aug. 16 to 0600Z Sun., Aug. 16

This is a short but fun QSO party that can have some fast rates at times. Any licensed radio amateur may enter, with the object being to work as many North American stations (and/or other stations if you are in North America) as possible during the contest period.

Classes: Single Operator and Multi-Operator, Two Transmitter. Multi-Operator stations shall keep a separate log for each transmitter. Multi-Operator stations must have at least 10 minutes between band changes. Single Operator entrants may only have one transmitted signal at a time. Output power must be limited to 150 watts for eligible entries. Single operator stations may operate 10 out of 12 hours (multi-operators may use the full 12 hour period). Off-times must be at least 30 minutes in length and must be clearly marked in the log.

Mode: CW only in CW parties. Phone only in Phone parties.

Bands: 160, 80, 40, 20, 15, and 10 meters only. You may work a station once per band. Suggested frequencies are: 1815, 3535, 7035, 14035, 21035, and 28035 (35 kHz up from band edge for Novice) on CW, and 1865, 3850, 7225, 14250, 21300, and 28600 (28450 for Novices) on phone. Try 10 meters at 1900Z and 2000Z, 15 meters 1930Z and 2030Z, and 160 meters at 0430Z and 0530Z.

Exchange: Operator name and station location (state, province, or country).

Scoring: Multiply total valid contacts by the sum of the number of multipliers worked on each band. Multipliers are states (including KH6 and KL7), Canadian provinces/territories, and other North American countries (do not count USA, Canada, KH6, or KL7 as countries). Non-North American countries do not count as multipliers, but may be worked for QSO credit.

Team Competition: Team competition is limited to a maximum of five single operator stations as a single entry unit. Groups having more than five members may submit more than one team entry. To qualify as a team entry, the name, callsign of each operator, and callsign of the station operated should the operator be a guest at a station other than his own (e.g., W6EEN operated by KA6SAR) must be registered with K6ZZ on CW and WA7BNM on SSB.

1998 CQ Contest Hall of Fame

We want to congratulate the newest members of the CQ Contest Hall of Fame inducted at this year's Dayton Hamvention. They include: N2AA, G3SXW, K6NA, and WA2AAU. A better group could not have been assembled for this year's induction festivities!

The team registration information must be in written or telegraphic form and must be received before the start of the NAQP. There are neither distance nor meeting requirements for a team entry.

Awards: A total of five plaques will be awarded for the high score for the Single Operator CW, Single Operator Phone, Multi-Operator CW, Multi-Operator Phone, and Single Operator Combined score categories. Certificates of merit will be awarded to the highest scoring entrant with at least 200 QSOs from each state, province, and North American country.

CW contest logs should be sent to Bob Selbrede, K6ZZ, 6200 Natoma Ave., Mojave, CA 93501. SSB logs go to: Bruce Horn, WA7BNM, 4225 Farmdale Ave., Studio City, CA 91604. Entries must be postmarked not later than 30 days after the party to be eligible for trophies and awards. Electronic logs must be submitted in MS-DOS ASCII files format (no binary formats, please). Send CW logs to: <W9NQ@ccis.com> and SSB to: <bhorn @hornucopia.com>.

European DX Contest

CW: Aug. 8–9 SSB: Sept. 12–13
0000Z Saturday to 2400Z Sunday

This is the 45th annual contest sponsored by the DARC. The activity will be between European countries and the rest of the world on all five bands, 3.5–28 MHz. (IARU Region I regulation of frequencies for contest operation.) Note that the WAEDC has returned to a 36-hour limit for single operator entries. In addition, there is no longer a multi-multi category.

Classes: (a) Single Operator, All Band. (b) Multi-Operator, Single Transmitter. Only one signal on any band at the same time. (c) SWL. *Note:* DX packet cluster spotting is allowed for all classes.

Exchange: RS(T) plus a progressive QSO number starting with 001.

Points: One point per QSO and 1 point for each QTC reported.

Multiplier: The multiplier for non-Europeans is determined by the number of European countries worked in each band (see WAE country list). Europeans will use the ARRL DXCC list of non-European countries.

Bonus Multiplier: Multiply your multiplier on 80 meters by 4, on 40 by 3, and on 10/15/20 by 2.

Final Score: Total QSO points plus QTC points times the sum total multiplier from all bands.

SWL: Only the single operator, all-band class may be used. The same callsign, European or non-European, may only be logged once per band. The log must contain both callsigns and at least one of the control numbers. Each QSO logged counts 1 point; each complete QTC 1 point (maximum of 10 per station). Multiplier is determined by the DXCC and WAE country lists.

QTC Traffic: Additional point credit may be earned by making use of the QTC traffic feature. A QTC is a report of a confirmed QSO that took place earlier in the contest and was later sent back to a European station. It can only be sent by a non-European station back to a European. The general idea is that after a number of Europeans have been worked, a list of these stations can be reported back during a QSO with another station. An additional one point credit may be claimed for each station reported.

A QTC contains the time, call, and QSO number of the station being reported (e.g., 1300/DL2DN/134, which means that at 1300Z you worked DL2DN and received #134).

A QSO can be reported only once and not back to the originating station. A maximum of 10 QTCs to a station is allowed. The same station may be worked several times to complete this quota. Only the original contact, however, has QSO value.

Keep a uniform list of QTCs sent; 3/7 indicates that this is the third series of QTCs sent and that 7 are being reported.

If more than 100 QTCs are claimed, a check list must show that the maximum quota of 10 per station was not exceeded.

Club Competition: This rule requires the club to be a local group and not a national organization. Eligible club members must operate within a 500 km diameter. To be listed, a minimum of three logs must be received from a club. Entries must clearly indicate their club name on the summary sheet. A special trophy will be awarded by the DARC to the winning clubs from Europe and non-Europe.

Awards: Certificates will be awarded to the top scorers in each class in each country. Each participant with at least half the score of the continental leader will also receive a certificate. Plaques will go to continental winners in the single- and multi-operator classes and the winning EU and non-EU clubs.

Logs: It is suggested that you use the official DARC or equivalent log form. Use 40 contacts to the page and a separate sheet for each band. Submit a dupe sheet for each band with 200 or more contacts. A summary sheet showing the score and a signed declaration are also required (sample log forms are available with an SASE and/or IRCs). Logs may also be sent via the Internet to: <100712.2226@compuserve.com>.

WAE Country List: C31, CT1, CU, EA, EA6, EI, F, G, GD, GI, GJ, GM, GM Shetland, GU, GW, HA, HB, HB0, HV, I, IS,IT, JW Bear, JW Spitsbergen, JX, LA, LX, LZ, OE, OH, OH0, OJ0, OK, OM, ON, OY, OZ, PA, S5, SM, SP, SV, SV5 Rhodes, SV9 Crete, SY Athos, T7, T9, TA1, TF, TK, UA1346, other EU-CIS republics, YU1267, ZA, ZB2, 1A0, 3A, 4J1M-V, 4U1 Vienna, 9A, and 9H1.

Mailing deadline is September 15th for CW entries and October 15th for SSB to: WAEDC Contest Committee, P.O. Box 1126, D-74370 Sersheim, Germany.

Maryland DC QSO Party

1600Z Sat. to 0400Z Sun. Aug. 8–9
1600Z to 2400Z Sun. Aug. 9

The Maryland/DC QSO Party is sponsored by the Antietam Radio Association. Non-Maryland stations work Maryland/DC operators. Maryland/DC station may work anyone. Stations may be worked once per band/mode and mobiles/portables that change counties may be worked again for QSO credit.

Exchange: QTH (county for MD stations, state/province/DXCC country for

others), and operating category (Club, QRP, Mobile, Novice/Technician, and Standard).

Frequencies: SSB: 3920, 7230, 14268, 21370, 28380, 50150, and 146550 kHz. CW: 3643, 3701, 7035, 7126, 14040, 21115, and 28040 and 28115 kHz (*Note:* Mobiles should try operating 10 kHz above the suggest main operating frequencies.) Try CW on the odd half-hours.

Scoring: Each Maryland county, Baltimore city, and D.C. is a multiplier. Multipliers may only be claimed once (they do not repeat on each band). Score 10 points for club station QSOs, 5 points for mobiles, 4 points for QRP/Novice and Technician QSOs, 3 points for a CW contact, and 1 point for any other valid contact. QSO points are cumulative (i.e., mobile MD stations count 5 points). Final score is total QSO points times multiplier (25 maximum).

Awards: Plaques are available to the high-scoring MD-DC, non-MD-DC, MD-DC Nov./Tech., and MD-DC club. Certificates will be awarded to the high scorer from each state and Canadian province. In addition, there will be awards to the high score from a MD mobile, top 10 MD logs, QRP/state, Novice-Technician/state, DX station, Canadian province, and MD YL. The Antietam Radio Association wishes to thank the Foundation for Amateur Radio (an organization of 85 clubs in the Maryland/DC/Virginia area) for their generous financial grant, which covers the cost of several of the plaques to be awarded this year.

Logs are to be postmarked by September 1st and sent to: Antietam Radio Association, P.O. Box 52, Hagerstown, MD 21741. Be sure to indicate your operating class on the summary sheet. If you want the final results, include an SASE with your entry.

New Jersey QSO Party

2000Z Sat. to 0700Z Sun., Aug. 15–16
1300Z Sun. to 0200Z Mon., Aug. 16–17

This is the 39th annual party sponsored by the Englewood ARA. Phone and CW are part of the same contest. The same station may be worked on each band and mode; NJ stations may contact in-state stations for QSO and multiplier credit.

Exchange: QSO number, RS(T), and QTH; county for NJ, state/province, or country for others.

Scoring: All stations credit 3 points for each contact. Multiply total QSO points by multiplier to compute final score. Out-of-state stations multiply total NJ QSOs by number of NJ counties worked (maximum of 21).

Frequencies: 1810, 3535, 3950, 7035, 7135, 7235, 14035, 14285, 21100, 21355, 28100, 28400 kHz and 50–50.5, and 144–146 MHz. Suggest phone on even hours, 15/10 meters on odd hours, and 160 at 0500Z.

Awards: Certificates to the top scorers in each NJ county, ARRL section, and DX country. Second-place awards if four or more logs are received from that section. Also Novice/Tech. and mobile awards. There are four plaques donated by the section managers for NNJ and SNJ to the winning stations in those sections.

Use UTC time and indicate the multiplier only the first time it is worked. Be sure to include a QSO check sheet, and a summary sheet showing scoring, etc. Send a large SASE if you wish a copy of the results.

Stations planning activity in NJ are requested to advise the EARA by August 1st so that coverage in all counties may be planned.

Logs must be received no later than Sept. 14th and go to: Englewood ARA, P.O. Box 528, Englewood, NJ 07631-0528.

Hawaii QSO Party

1600Z Sat. to 2200Z Sun. Aug. 29–30

Sponsored by the Hawaii DX Society (KH7XX), this one is an excellent opportunity to snag the rare state of Hawaii as well as rare Hawaiian counties. Non-Hawaiian stations work Hawaii operators; KH6 stations may work anyone.

Exchange: Stations use RS(T), and QTH (county for HI stations (maximum 5), state/province/DXCC country for others).

Classes: Single Operator—CW, SSB, Mixed, QRP (CW, SSB, Mixed); Multi-single—CW, SSB, Mixed Mode; Multi-multi—Mixed mode, only.

Frequencies: SSB: Operate 25 kHz above lower General Class segment and 28.300-28.500 MHz. CW: Operate 30 kHz above band edges (including Novice bands).

Scoring: Credit 1 point per SSB QSO with any station; 2 points per CW QSO. Multipliers are the number of Hawaiian counties worked (maximum of 5 counties) for non-KH6 stations; Hawaiians may claim states, Canadian provinces, and DXCC countries (excluding USA, Canada, and Alaska). You may claim and extra 150 points (added to your final score) by working KH7XX on any band.

The Hawaii DX Society will oversee the receipt of logs and issue contest awards. Send logs and summary sheet via mail, diskette, or e-mail by September 30, 1998 to: HDXS—KH7XX, 1056 Kupau Street, Kailua, HI 96734 or via <starcommradio @juno.com>. Final results will be posted on the Internet Contest Reflector or be sent with any log that includes an SASE or e-mail return address.

BY TED MELINOSKY, K1BV

AWARDS

NEWS OF CERTIFICATE AND AWARD COLLECTING

The USA-CA All Counties award #947 was given to Jeff Bechner, W9MSE, on February 19, 1998. After being an SWL for several years, Jeff became KNØWNV in 1959 as a junior in high school through the help of members of the New Ulm (Minnesota) Radio Club. Jeff upgraded to Conditional as KØWNV in 1960 and operated with his Viking Ranger mostly on CW with a little on AM. During college Jeff was fairly inactive. However, in 1968 during graduate school he decided to bring the rig to Iowa and get back on the air. He used the Ranger with a Gotham vertical which was grounded to the roof of the quonset hut in which he lived in married student housing.

It was then that Jeff began county hunting, in mid-1968, as KØWNV/Ø in Iowa. He picked up many counties through state and regional QSO Parties at the time. Jeff also went through his old QSL cards going back to his Novice days to find counties. (It was more work then, as counties were not printed on anyone's QSLs at that time.) In March 1969 he ran across and made his first QSOs on the CWCHN (County HUnters Net) on 14070. The net operated on Saturdays and when a mobile planned a trip. Along with K1ZFQ, Jeff became one of the main NCS stations for the net on 14070.

In the spring of 1969 Jeff purchased a Swan 260 and began to use it for mobile operation (all CW). It was lots of fun (?) using a rig with no CW side tone and which did not have break-in keying (it required turning the knob to switch from send to receive and back each time). However, Jeff gave out about 350 counties, including all of South Dakota on various vacations, trips for the CHN, many QSO Parties, and in the CWCH Contest (many years). In August 1969 Jeff moved to Rapid City, South Dakota. He was there for three years before moving to Fond du Lac, Wisconsin in August 1972, where he became W9MSE. By the late 1970s, however, Jeff was becoming very inactive in amateur radio and basically was completely off the air through the 1980s.

On July 20, 1990, for a reason Jeff doesn't remember, he decided it was time to see if his rigs and antenna still worked, and if so, to get back into amateur radio. He found the CWCHN net, now on 14056.5, and began to get back into county hunting (along with some DXing). Jeff purchased a TS-440S and a new 8-band vertical in September 1990 and became very active in amateur radio again. He got rid of the Swan 260, but still has the Ranger ("as my back-up rig and sentimental first rig") sitting on a shelf after almost 39 years. In March 1996 he again got set up for mobile operation, and throughout 1996 and 1997 he made over 11,500 mobile CW contacts from over 800 counties in 48 states.

Through the years Jeff's major source of counties has been the mobiles on the CHN. However, many counties were worked in numerous contests, many from ragchews, and at the end about 25 of Jeff's last 100 counties were gotten through skeds with fixed stations made via e-mail. Many different mobiles contributed to the county total. As examples of two extremes, Jeff has WA5KQD/M recorded as a station worked in 665 counties. He almost single-handedly gave Jeff the 5th call area completed by 1975 (235 out of 254 in Texas). Jeff worked KØPG/M for eight counties starting in September 1997. As a result of e-mail skeds, he came from SSB to work Jeff on CW and finish up five states in those eight contacts (MN, WI, ND, SD, and NE). Jeff's fourth last county was worked with KF4DIX (a Tech Plus) at his home QTH in Kentucky on the 80 meter Novice band. His last three counties (in Kentucky) were worked in February with K4AVX/M as a result of an e-mail sked with him. Jeff had worked him back in 1972–73 and then once in 1980. It was great for him to work one of the old timers to complete the award.

Jeff says, "To me, though, even more important than the USA-CA #947 award is that the award was worked ALL CW." It put him at #61 on the CW Honor Roll of those who have worked all counties on CW. (Actually, Jeff is the 53rd person in the world to do it. This is because the CW Honor Roll allows repeats to be included, while the actual USA-CA is only for the first time an individual works all counties.) W8RSW was #1 on CW in about 1976.

Dates of QSLs received for each step of the award; 500 on 8-17-68 (most were from before Jeff started county hunting); 1000 on 4-29-70; 1500 on 3-8-71; 2000 on 6-1-72; 2500 on 2-1-76; 3000 on 5-5-97; and 3076 on 2-14-98.

Jeff is now at 30 counties worked for the "second time around." However, now QSLs are not needed for the repeat awards. Congratulations on a job well done, Jeff.

Rule Clarified

A year ago this month there was a notice that a discussion had begun relative to a rewriting of the USA-CA rules to change the way in which contacts from independent cities might count. Shortly thereafter, I was named to administer this program by *CQ*. Upon investigation, I could find no evidence that an official change was ever made in this rule. The rule continues to read: C.4. **In the case of cities, parks, or reservations not within counties proper, applicants may claim any one of the adjoining counties for credit (once).** For example, if you contact a station in Carson City, Nevada, which is an Independent city, that contact may be counted for Douglas, Lyon, Story, or Washoe county—whichever one you need. However, any subsequent contacts with that same station would continue to count for the county you originally chose.

The Delinquent Sponsor

Every month or so I get a request from a frustrated award hunter wondering if a particular award is still active or asking me to check on a delinquent sponsor. I'm glad to do this, but it does point out a common problem. Rules circulate forever, but amateurs die, move on, or lose interest; clubs become inactive; and so forth. How long should you wait for a reply? Good sponsors will not make this necessary; they will answer promptly.

I would suggest taking an active management of your application. Check for the correct address of the sponsor. Then follow up every three months and provide an SASE/IRC to make it easy for the sponsor to reply. Doing this a couple of times should be enough. Believe it or not, some sponsors seem to do their award work one or two times a year! Make sure you use uninteresting stamps on the envelope and avoid callsigns or the word *award*. You might want to let me know about these bad eggs, recognizing that most sponsors are very honorable people.

Awards from the Romanian Amateur Radio Federation

The Romanian Amateur Radio Federation offers a handsome series of awards. Thanks to George Pataki, WB2AQC, I am able to present examples of seven of them this month.

General Requirements. All awards may be endorsed for different modes or bands. SWL okay. Contacts since 23 Aug 1949. Send GCR list and $US3 or 7 IRC fee for each award to: Romanian Amateur Radio Federation, P.O. Box 22-50, R-71100 Bucharest, Romania.

Romania Award. Work at least 30 different YO stations, each in a different YO county. The capital city of Bucharest must

65 Glebe Road, Spofford, NH 03462-4411
e-mail: k1bv@top.monad.net

The Romania award is issued for working at least 30 different YO stations, each in a different YO county. (Certificates this month courtesy WB2AQC.)

be included. All eight YO districts (YO2–9) must be represented.

AB Alba	YO5	HD Hunedoera	YO2
AR Arad	YO2	IL Ialomita	YO9
AG Arges	YO7	IS Iasi	YO8
BC Bacau	YO8		
BH Bihor	YO5	MM Maramures	YO5
BN Bistrita-Nas.	YO5	MH Mehedinti	YO5
BT Botosani	YO8	MS Mures	YO6
BR Braila	YO4		
BV Brasov	YO6	NT Neamt	YO8
BZ Buzau	YO9	OT Olt	YO7
CL Calarasi	YO9		
CS Caras-Sev.	YO2	PH Prahova	YO9
CJ Cluj	YO5	SJ Salaj	YO5
CT Constanta	YO4	SM Satu Mare	YO5
CV Covasna	YO6	SB Sibiu	YO6
DB Dimbovita	YO9	SV Suceava	YO8
DJ Dolj	YO7	TR Teleorman	YO9
GL Galati	YO4	TM Timis	YO2
GJ Gorj	YO7	TL Tulcea	YO4
GR Giurgiu	YO9		
HR Harghita	YO6	VS Vaslui	YO8
HD Hunedoara	YO2	VL Vilcea	YO7
VR Vrancea	YO4		

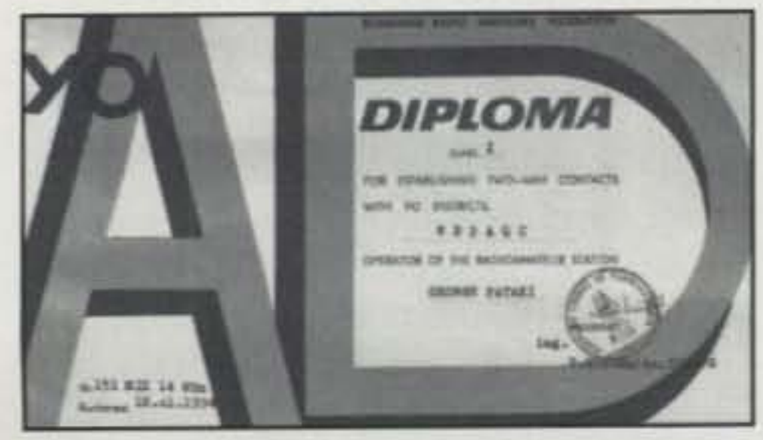
YO—All Districts (YO-AD). Work YO districts according to your CQ Zone as follows:

Stations in Zones 15, 16, 20 need 8 districts and 10 in each district for Class I; 6 districts and 6 in each district for Class II and 3 districts; and 3 in each district for Class III.

Stations in Zones 14, 17, 21, 33, 34 need 8 and 6 for Class I; 6 and 4 for Class II; and 3 and 2 for Class III.

Stations in all other zones need 3 and 3 for Class I; 3 and 2 for Class II; and 3 and 1 for Class III.

There are 8 YO Districts in all: YO2–YO9.



YO-AD All Districts award sponsored by the Romanian Amateur Radio Federation.

The YO-LC Large Cities award.

YO—Large Cities (YO-LC). Work YO stations located in the large cities of Romania as follows:

Class I: Europeans need 30, all others need 20.

Class II: Europeans need 20, all others need 10.

Class III: Europeans need 10, all others need 5.

List of large cities:

YO2—Arad, Deva, Hunedoara, Lugoj, Petrosani, Resita, Timisoara.

YO3—Bucuresti, Capital City of Romania.

YO4—Braila, Constanta, Focsani, Galati, Tecuci, Tulcea.

YO5—Alba Iulia, Baia Mare, Bistrita, Cluj, Dej, Oradea, Satu Mare, Sighetul Marmatiei, Turda, Zalau.

YO6—Brasov, Medias, Miercurea-Ciuc, Odorheiul, Secuiesc, Sfintu Gheorghe, Sibiu, Sigh'soara, Tirgu Mures.

YO7—Craiova, Pitesti, Rimnicu Vilcea, Slatina, Tirgu Jiu, Drobeta-Turnu Severin.

YO8—Bacau, Birlad, Botosani, Iasi, Gheorghe Gheorghiu-Dej, Piatra Neamt, Roman, Suceava.

YO9—Alexandria, Buzau, Calarasi, Giurgiu, Ploiesti, Slobozia, Tirgoviste, Turnu Magurele.

YO—Namesake Calls (YO-NC). Issued for working five different stations having the same one- or two-letter suffix as yours. For instance, K1BV may apply

The YO-NC Namesake Calls award is issued for working five different stations having the same one-or two-letter suffix as yours.

for the award if he worked N6BV, G8BV, DL8BV, ZP5BV, and W4BV. UA3JW would qualify with ON4JW, UA0JW, YO3JW, DL6JW, and VK9JW.

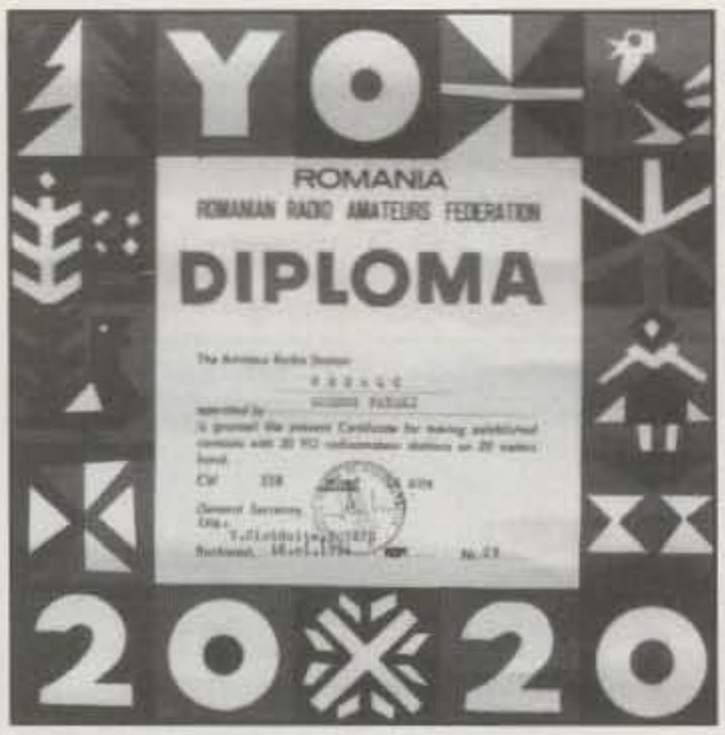
Stations with a three-letter suffix need only three different stations with identical suffixes—e.g., JA1ACD would qualify with UK8ACD, DL4ACD, and G5ACD.

YO by Band Awards Series. Starting with the 2 meter band and going all the way up to 80 meters, an award is issued for contacting the number of YO stations that are in the band you use. For example, on 20 meters you need to contact 20 different YO's. On any combination of mixed bands, one is offered for contacting 100 different YO's.

YO—Zone 20 (YO—20Z). Work countries located in Zone 20: Bulgaria (LZ), Greece (SV), Cyprus (5B4), Israel (4X), Jordan (JY), Lebanon (OD5), Romania (YO), Syria (YK), and Turkey (TA) as follows below:

In zones 15, 16, 20, 21, and 34, Class I requires 10 countries, II 8 countries, and III 6 countries.

In zones 14, 17, 22, 23, 33, 35, 36 and 37, Class I requires 8 countries, II 6, and III 4.



YO by Band award series (see text).

The YO Zone 20 award is issued for working countries located in Zone 20.

The YO 25th Meridian award is issued for working specific countries located on the meridian 25 East.

Rest of world, Class I requires 6 countries, II 4, and III 2.

Note: In all cases, Romania is a required contact among worked countries. The observant reader will note that there are only nine countries listed. This was taken from the official rules, but since Mt. Athos, SV5 and SV9, are also Zone 20, you might try adding one of them.

YO—25th Meridian (YO—25M). This is awarded for working the following countries situated on the meridian 25 East: Norway, Finland, Russia, Romania, Bulgaria, Greece, Libya, Egypt, Sudan, Central African Republic, Zaire, Rwanda, Burundi, Zambia, Zimbabwe, Botswana, South Africa as follows:

HF: Class I twelve countries, Class II eight countries, Class III five countries.

VHF: Class I three countries, Class II two countries, Class III one country.

Note: In all cases, Romania is a mandatory contact.

Internet URL of the Month

There are several excellent on-line callbooks available. One relatively new (isn't almost everything *new* on the Internet?) one is worth checking out. It specializes in Russian and ex-USSR countries which are now part of the CIS, and they are available on this site maintained by the Octavia Company. This includes EK, ER, EU, EX, EY, EZ, UK, UN, UR, RA, 4K, and 4L calls. There are both cyrillic and roman letter sets available. Try <http://www.octavia.com/callbk.htm>.

73, Ted, K1BV

BY FREDERICK O. MAIA, W5YI

WASHINGTON READOUT

REGULATORY NEWS IN THE WORLD OF AMATEUR RADIO

Restructuring U.S. Amateur Radio: It Might Be Right Around the Corner

Just how important is Morse code proficiency in today's communications environment? That's a question more and more countries are asking. Some—such as Germany, the United Kingdom, and others—are doing something about it. The United States could be next!

The current international regulations (ITU RR2735/S25.5) require a person to be proficient at sending and receiving Morse code if he or she wants to operate on the long-distance high-frequency bands. The International Telecommunication Union law does not specify a speed requirement, but most nations believe that 5-6 words per minute satisfies this requirement. The United States is among them.

The exact wording of 2735/S25.5 specifies: "Any person seeking a license to operate the apparatus of an amateur station shall prove that he is able to send correctly by hand and to receive correctly by ear, texts in Morse code signals. The administrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz."

CEPT—the European Conference of Postal and Telecommunications Administrations, a confederation of European radio regulatory agencies—specifies a 12 wpm code speed for their Class 1 all-band license. The CEPT Class 2 license, a VHF/UHF/Microwave class, does not require code. A CEPT compliant license permits amateurs of one European country to operate in another without further licensing.

CEPT also allows countries outside of Europe to participate in their licensing program under Recommendation T/R 61-01. Under this program, non-European nations are permitted to operate in CEPT countries for short periods of time. The non-CEPT country simply designates that their amateur licenses correspond to either of the two CEPT radio-amateur classes. The United States is in the process of joining the agreement for non-CEPT countries.

Our FCC has already proposed an amendment to the Part 97 Rules that would authorize citizens of certain countries in Europe to operate stations while on short visits to the United States and its possessions. The rule change is necessary so that U.S. amateur operators can also operate in 22 European countries without further licensing.

With the U.S. as a participating non-CEPT country, citizens of our country could operate amateur stations temporarily in participating European countries, and their citizens could enjoy similar operating privileges in the U.S.

There are two classes of CEPT radio-amateur licenses. Class 1 requires knowledge of the international Morse code and carries all operating privileges. Class 2 does not require knowledge of telegraphy and permits operation above 30 MHz, similar to the Technician Class operator license. The FCC has proposed to authorize visiting CEPT Class 1 operators the frequency privileges of Amateur Extra Class operators, and for Class 2 operators the frequency privileges of the Technician Class.

Under a very soon to be implemented arrangement, a U.S. Technician license would be recognized as a CEPT Class 2 (VHF/UHF/Microwave only) license, with full privileges above 30 MHz. Holders of Tech Plus through Extra Class tickets would be given CEPT Class 1 license privileges on HF and VHF/UHF/Microwave. Only our Novice license would not be CEPT compatible.

This was sort of a surprise, since the code requirement for the Tech Plus license is 5 words-per-minute! Under the Recommendation T/R 61-01, non-CEPT countries designate how their licenses compare to CEPT country licenses. The U.S. State Department (who negotiates international agreements) and the FCC ruled that our Tech Plus license fulfils the CEPT requirement that amateurs must be Morse code proficient in order to temporarily operate on the HF bands in their countries.

The U.S. application for non-CEPT status has already been approved by the CEPT Radio Regulatory Working Group (WGRR), in Groningen, The Netherlands. They have already "signed off" on the Tech Plus license with its 5 words-per-minute code speed as being acceptable for short periods of all-band (including HF) operation in 22 CEPT (European) countries.

Therefore, the FCC is already on record as believing a 5 words-per-minute code speed is all that is necessary for an all-band license.

Germany Deregulates Amateur Radio

The German Bundesamt fuer Post and Telekommunikation (the BAPT is the equivalent of our FCC) has just completed a major restructuring of Germany's Amateur Radio Service. The previous Amateur Service line-up in Germany consisted of three classes: Class A, B, and C. Class A was similar to our Novice and required a 6 words-per-minute Morse code. The all-band/all-mode Class B required 12 wpm Morse code and a technical exam. Class C was a no-code VHF/UHF license.

The new deregulated German Amateur Service now is called Class 1, 2, and 3:

Class 1 is similar to their old all-band Class B. Power output levels are now based on field strengths in the environment. Class 1 is compatible with CEPT Class 1.

The new Class 2 license yields VHF and higher frequency privileges. It requires the same technical test as Class 1, but without a code examination. Class 2 is compatible with CEPT Class 2.

The new Class 3 only permits operation on 2 meters and 70 cm (450 MHz) with a maximum 10 watt power level. To encourage the public to enter amateur radio, applicants must pass a reduced difficulty technical examination. The new German Class 3 license is not CEPT compatible.

The German DARC (their national amateur radio society) wanted more than three license classes, but that did not happen. There were some surprises in the new German Amateur Service. All currently licensed Class A (6 wpm code and limited HF) and Class B (12 wpm code, full HF) were converted to the new Class 1 with full all-band/all-mode amateur privileges without further examination or restrictions. This would be similar to U.S. Novices and Tech Plus operators being converted to Amateur Extra Class without examination! The old Class C license was converted to Class 2.

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (telephone 817-461-6443 e-mail <fmaia@internetMCI.com>)

The new German law does not limit the power amplifier output for Class 1 and 2 to a certain power. Instead, the new rules specify that the electromagnetic radiation reaching people or electronic equipment must be below certain levels averaged over 6 minutes. In most cases, especially in the larger cities, this means a lower output power than before.

Furthermore, the BAPT proposes to delete S-25.5 at the next WRC. (S-25.5 is the international restriction that requires manual Morse code skills when the operation takes place below 30 MHz.)

RSGB Changes Policy On Morse Code!

Another shocker is the Radio Society of Great Britain (the RSGB is Great Britain's national amateur radio society) will no longer support the retention of the mandatory Morse code test required for access to the amateur bands below 30 MHz.

Accordingly, it will attempt to sway opinion within the International Amateur Radio Union to ensure that the IARU's position at the ITU World Radio Conference in 2001 will be to support the abandonment of the international statutory Morse code proficiency requirement.

As an interim measure, the RSGB has proposed to the Radiocommunications Agency (the RA is the UK equivalent of our FCC) that a new All Band license be introduced in the United Kingdom, which will give all amateurs access to the HF bands below 30 MHz after passing a Morse test of 5 wpm. The RA supports this proposal, and the society hopes that the new license can be introduced as quickly as possible.

This change of policy by the RSGB follows only 18 months after it announced (in December 1996) the results of a survey "The Future of Amateur Radio." Thirty percent of members responded to the survey, and two thirds of those indicated their belief that Morse code should remain as an international licensing requirement.

The Council of the Society has apparently taken further wide-reaching input from members and non-members, sufficient to persuade itself that the results of the 1996 survey relative to the Morse code test should not be taken into account in formulating policy.

Argentina is another country that has reduced its Morse code speed requirements. Up until January 20, 1998, their General and (top of the line) Superior Class licenses required 10 and 15 wpm code speed proficiency. This has now been reduced to 7 wpm.

The point of all of this is it appears that several countries are de-emphasizing Morse code proficiency and are recognizing 5–7 wpm as being all that is required to operate HF. It also looks as if the United States could be doing the same thing shortly.

FCC Looking at U.S. Amateur Service

Last February the FCC announced that the Commission was undertaking 31 proceedings as part of the 1998 Biennial Regulatory Review of all of the radio services that it administers. This review is required by Section 11 of the Communications Act. Section 11 requires that the FCC analyze their rules and determine whether there are outdated regulations that should be deleted or modified.

Bill Cross, W3TN, an FCC official with the Washington, DC Policy and Rules Branch, was the keynote speaker at the FCC Forum held last May at the Dayton Hamvention. Here is what he had to say about the Biennial Review and how it impacts the U.S. Amateur Service:

"The review is aimed at simplifying, eliminating, or modifying regulations that are overly burdensome or no longer serve the public interest. The list of proceedings was compiled following an internal review of all existing regulations and informal input from the industry and the public. The Commission has determined that the first biennial regulatory review presents an excellent opportunity for a serious top-to-bottom examination of all the Commission's regulations, not just those required by statute to be reviewed.

"The proceeding will include a review of the amateur service rules," Bill said. "This review is intended to examine ways to further streamline the administration of the amateur service and to simplify the licensing process. We anticipate that it will look at global issues such as what is the goal the license structure should achieve, is there a way to reach this goal, and whether any changes are needed to the license structure.

"We have received formal and informal petitions that bring up questions of the amateur service license structure and the licensing process. There seems to be a consensus that our structure has too many classes of license, relies too heavily on code proficiency, and may be unnecessarily complicated."

From what Bill Cross said, it appears that the U.S. Amateur Service will be restructured to include less amateur license classes . . . and less emphasis on Morse code. Cross later went on to talk about a petition filed with the FCC which asks for changes in the way code waivers issued to severely handicapped applicants are handled prior to granting examination credit.

"The ARRL has filed RM-9196. This [petition] addresses the licensing process. It requests that we take additional steps to prevent a person without a bona

fide disability from using a physician's certification of disability. The ARRL says that about 8% of the applications contain this certification and that while some are legitimate, it believes others are not. Under the League's proposal, information concerning the nature of the disability would have to be given to the VEC.

"In 1997, the ARRL asked its members to comment on a proposal to change the Morse code examination for General to 10 wpm solid copy, in place of the 13 wpm presently required, and a proposal to delicense Novices who couldn't upgrade to Technician Class by passing an open-book test. Frequency privileges for other classes would also be changed. The ARRL proposal was published in *QST* in March 1997. You might read it.

"Now I know that some of these suggestions cause you great concern or appear to threaten long-standing tenets of ham radio. But this is the kind of thinking that is going on and the kind of proposals that we are receiving from organizations that represent some of you and by individuals who share your frequencies. You might want to make your views known to them. One of the ARRL officers told me they received over 8,000 comments on the March proposal. They ended up deciding not to decide but study this one some more.

"One question that a number of individuals and organizations have been wrestling with is whether the number of license classes still serves the public interest. You have six classes. Most other countries have fewer. CEPT has two. We want to see how you all feel about this and have your input on this and other issues.

"We have a mailbox to receive your comments. The address is <hamcomm @fcc.gov>. Well thought out comments will be appreciated. Label them with something like *Amateur Service Review* to make my life easier. And please run them through your PC's spell checker.

"If anything is proposed, I assure you we won't be taking away any privileges from anybody. We learned that lesson in the 1968 incentive licensing decision. We still hear about that occasionally even today. And if any of this questioning results in proposed rule changes, you will have an opportunity to tell us what you think."

So What is Going To Happen?

At this point, we really do not know. However, we have put all the pieces together and it seems to us that the U.S. Amateur Service is about to be restructured. What we do know is that the FCC shortly will be issuing a Notice of Proposed Rulemaking which looks toward simplifying the amateur radio operator licensing process. The proceeding will be part of the 1998 Biennial Review of outdated regulations.

We also know that there has been a lot of talk about unnecessary Morse code requirements and license classes. Our guess is that we could end up with three license classes and a top code speed of 5 wpm. That speed level would totally eliminate the need for the controversial 13 and 20 wpm code waivers. Here is our guess as to what the FCC will propose. (Remember that it is only a guess at this point.)

Novice Class: Abolished.

Technician Class: Remains as is. Privileges: All VHF/UHF/Microwave bands above 30 MHz.

Tech Plus: Abolished.

General Class: Remains as is, but code speed reduced to 5 wpm.

Advanced Class: Advanced and Extra Class merged into one class. Code speed at 5 wpm.

That would leave us with three license classes and a top code speed of 5 wpm. The Technician Class could be called Class C, General would be called Class B, and Advanced/Extra would be called Class A. We think it could happen. We will just have to wait for the NPRM. It could be issued at any point, maybe as early as this month! However, it could be a while before the restructuring actually takes place due to the required public-comment period.

73, Fred, W5YI

BY GEORGE JACOBS, W3ASK

PROPAGATION

THE SCIENCE OF PREDICTING RADIO CONDITIONS

Latest Predictions For Cycle 23

The Royal Observatory of Belgium reports a mean sunspot number of 53.3 for April 1997. This is based on the weighted average of daily telescopic observations made at a worldwide network of 42 cooperating observatories.

The daily sunspot count varied widely during the month with a high of 125 on April 9th and a low of 12 on the 27th. The mean value for April results in a 12-month running smoothed sunspot number of 32 centered on October 1997. This is an increase of three from last month's smoothed number. The smoothed sunspot number is a 12-month average of monthly mean values, centered on the middle month. This tends to smooth out daily and month-to-month variations. The solar cycle is measured by its smoothed monthly numbers, which are now rapidly increasing. A smoothed sunspot count in the upper 80s is forecast for August 1998.

A corresponding increase was reported in the 10.7 cm solar flux level. Canada's Dominion Radio Astrophysical Observatory in Penticton, B.C. reports a monthly mean of 108 for April 1998. This results in a smoothed value of 89 centered on October 1997. A smoothed level in the lower 120s is forecast for August 1998.

Sunspot Cycle 23 Observations and Predictions

Table I is a listing of smoothed sunspot numbers observed for Cycle 23 from its beginning through October 1997, as well as predictions made by the National Geophysical Data Center, Boulder, Colorado for the remainder of the 20th century.

Where In The World Will W3ASK Be?

My request for suggestions for this year's "salting the ionosphere" location brought forth a considerable number of e-mail responses. Places such as Machu Picchu, Peru and the Western Wall in Jerusalem are appropriate, but we have already been there. Other places suggested are possibilities we are considering.

Greg Gambor, WB2GMK, has made a very interesting suggestion. Although winter in the southern hemisphere is the wrong time of the year to consider a trip to Antarctica, here is what he proposes:

"How about salting the ionosphere from Antarctica? It is the ideal place, insofar as the so-called 'hole' talked about by the environmentalists is located there. The hole would let the "salt" enter the ionosphere much more easily! I've read that several cruise lines call there regularly, so you could go in luxury! . . . "

"Now here is a plan. All luxury cruise ships offer skeet-shooting as a pastime on deck. This is usually under the careful supervision of the ship's safety officer. If you discuss the project with him before hand, I am sure that you can convince him to let you fire a shot straight up into the sky, instead of at a clay bird. For this you will need one of my rock-salt hand loads, which I will gladly loan to you, unless you are also a shot-gunner and can load your own. . . . This should get the salt right into the 'hole' above Antarctica and into the ionosphere, where it can spread around. . . ."

This sounds very interesting, Greg. However, I will wait until next summer in Antarctica to consider it. It is now the middle of winter there, iced in and dark all of the time, with no cruise ships until at least November, which would be too late for this year's CQ WW DX Contest weekends.

August Propagation

Late August and early September are dog-days for propagation forecasters. This is the time when many of us go around in disguise so that we will not be recognized. It is the most difficult time of year for which to make accurate band predictions because conditions can change drastically from day to day. On many days typical summertime conditions will continue much as they were in June and July. On other days conditions may sound typically fall-like, with somewhat higher daytime frequencies and somewhat lower nighttime usable frequencies. Add to this equinoctial conditions which can begin as early as late August. This can often result in optimum openings between the northern and southern hemispheres on the one hand, but periods of severe radio storminess on the other.

Since this is a period of transition, this month's DX Propagation Charts cover only the one-month period from August

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for August 1998

	Expected Signal Quality			
Propagation Index.....	**(4)**	**(3)**	**(2)**	**(1)**
Above Normal: 2, 15-16, 21, 29	A	A	B	C
High Normal: 1, 3, 7-8, 14, 22, 27-28, 30	A	B	C	C-D
Low Normal: 4-6, 9-11, 13, 19-20, 24-26, 31	B	C-B	C-D	D-E
Below Normal: 12, 17, 23	C	C-D	D-E	E
Disturbed: 18	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 and 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 good (B) on August 1st, excellent (A) on the 2nd, good (B) on the 3rd, fair-to-good from the 4th through the 6th, etc.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10	10	10	9	8*	9	8	8	8	9**	10	10
1997	10	11	14	17	18	20	23	25	29	32	*36*	*40*
1998	*46*	*51*	*57*	*62*	*67*	*73*	*80*	*88*	*95*	*102*	*107*	*111*
1999	*116*	*120*	*125*	*131*	*136*	*142*	*146*	*149*	*151*	*154*	*158*	*160*

** May 1996 marks Cycle 23's mathematical beginning.*
*** October 1996 marks the beginning of Cycle 23 according to a consensus of scientists, which NGDC is now using.*

Table I– Smoothed sunspot numbers observed for Cycle 23 through October 1997 and predicted values (in italics) for the remainder of the 20th century. Based on data provided by the National Geophysical Data Center (NGDC), Boulder, Colorado in April 1998. Standard deviations are not shown.

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HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate *daylight* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

August 15 - September 15, 1998
Time Zone: EDT (24-Hour Time)
EASTERN USA TO:

	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe & North Africa	10-12 (1) 14-17 (1)	07-08 (1) 08-10 (2) 10-13 (1) 13-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	18-19 (1) 19-20 (2) 20-00 (3) 00-02 (2) 02-04 (1)	20-21 (1) 21-22 (2) 22-00 (3) 00-02 (2) 02-03 (1) 21-22 (1)* 22-00 (2)* 00-02 (1)*
Northern Europe & CIS	10-12 (1) 14-16 (1)	07-08 (1) 08-10 (2) 10-13 (1) 13-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	19-21 (1) 21-23 (2) 23-01 (3) 01-02 (2) 02-03 (1)	21-23 (1) 23-01 (2) 01-02 (1) 23-01 (1)*
Eastern Mediterranean & Middle East	11-13 (1) 13-15 (2) 15-16 (1)	07-08 (1) 08-09 (2) 09-14 (1) 14-15 (2) 15-16 (3) 16-17 (2) 17-18 (1) 22-00 (1)	19-21 (1) 21-23 (2) 23-00 (1)	22-00 (1)
Western Africa	14-16 (1)** 10-13 (1) 14-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	13-15 (1) 15-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	20-23 (1) 23-02 (2) 02-04 (1)	22-23 (1) 23-01 (2) 01-02 (1) 22-01 (1)*
Eastern & Central Africa	14-16 (1)	15-17 (1) 17-19 (2) 19-20 (1)	20-22 (1) 22-00 (2) 00-01 (1)	22-00 (1)
Southern Africa	12-14 (1)** 09-11 (1) 11-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	07-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1) 23-01 (1)	21-22 (1) 22-01 (2) 01-02 (1)	22-01 (1) 22-01 (1)*
Central & South Asia	Nil	08-11 (1) 20-23 (1)	06-08 (1) 18-21 (1)	07-08 (1) 17-21 (1)
South-east Asia	Nil	08-11 (1) 19-22 (1)	06-08 (1)	06-08 (1)
Far East	17-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 17-19 (1) 19-21 (2) 21-22 (1)	06-08 (1) 18-19 (1)	06-08 (1)
South Pacific & New Zealand	16-19 (1)** 13-16 (1) 16-18 (2) 18-20 (1)	07-08 (1) 08-11 (2) 11-13 (1) 18-21 (1) 21-00 (2) 00-07 (1)	01-02 (1) 02-03 (2) 03-06 (3) 06-08 (2) 08-09 (1)	03-04 (1) 04-07 (2) 07-08 (1) 04-07 (1)*
Austral-asia	17-19 (1)** 16-17 (1) 17-19 (2) 19-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-01 (1)	03-04 (1) 04-07 (2) 07-08 (1)	04-05 (1) 05-06 (2) 06-07 (1) 05-06 (1)*
Caribbean, Central America & Northern Countries of South America	12-14 (1)** 14-16 (2)** 16-17 (1)** 09-11 (1) 11-13 (2) 13-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-08 (2) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-19 (4) 19-21 (3) 21-22 (2) 22-00 (1)	19-20 (1) 20-21 (2) 21-04 (3) 04-06 (2) 06-08 (1)	22-02 (1) 02-04 (2) 04-07 (1) 02-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	14-16 (1)** 16-17 (2)** 17-18 (1)** 09-10 (1) 10-12 (2) 12-15 (1) 15-16 (2) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-11 (2) 11-16 (1) 16-17 (2) 17-19 (4) 19-21 (2) 21-23 (1) 23-00 (2) 00-02 (1)	21-22 (1) 22-23 (2) 23-01 (3) 01-03 (2) 03-05 (3) 05-06 (2) 06-07 (1)	22-02 (1) 02-04 (2) 04-06 (1) 02-05 (1)*
McMurdo Sound, Antarctica	15-18 (1)	07-09 (1) 21-22 (1) 22-00 (2) 00-01 (1)	01-03 (1) 03-06 (2) 06-07 (1)	03-06 (1)

August 15 - September 15, 1998
Time Zones: CDT & MDT
(24-Hour Time)
CENTRAL USA TO:

	15 Meters	20 Meters	40 Meters	80 Meters
Western & Southern Europe & North Africa	09-11 (1) 13-15 (1)	06-07 (1) 07-09 (2) 09-13 (1) 13-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	20-22 (1) 22-01 (2) 01-04 (1)	22-02 (1)
Northern Europe & CIS	10-13 (1)	06-07 (1) 07-09 (2) 09-12 (1) 12-15 (2) 15-17 (1) 21-23 (1)	20-22 (1)	22-01 (1)
Eastern Mediterranean & Middle East	10-14 (1)	07-13 (1) 13-16 (2) 16-18 (1) 21-23 (1)	20-21 (1) 21-23 (2) 23-00 (1)	21-22 (1)
Western Africa	12-14 (1)** 10-12 (1) 12-14 (2) 14-15 (1)	07-09 (1) 13-15 (1) 15-16 (2) 16-18 (3) 18-19 (2) 19-21 (1)	20-22 (1) 22-01 (2) 01-02 (1)	22-23 (1) 23-00 (2) 00-01 (1)

August 15 - September 15, 1998
Time Zone: PDT (24-Hour Time)
WESTERN USA TO:

	15 Meters	*20 Meters*	*40 Meters*	*80 Meters*
Western & Southern Europe & North Africa	Nil	06-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-16 (1) 22-00 (1)	20-21 (1) 21-23 (2) 23-00 (1)	22-23 (1)
Central & Northern Europe & CIS	Nil	06-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-15 (1) 21-23 (1)	19-20 (1) 20-22 (2) 22-23 (1)	21-23 (1)
Eastern & Central Africa	13-15 (1)	07-09 (1) 15-17 (1) 17-19 (2) 19-20 (1)	21-00 (1)	Nil
Southern Africa	12-14 (1)** 10-11 (1) 11-13 (2) 13-14 (1)	07-09 (1) 12-15 (1) 15-18 (2) 18-19 (1) 22-01 (1)	20-21 (1) 21-23 (2) 23-01 (1)	22-00 (1)
Central & South Asia	18-20 (1)	07-08 (1) 08-10 (2) 10-11 (1) 18-21 (1)	06-08 (1) 19-21 (1)	07-08 (1) 20-21 (1)
South-east Asia	17-20 (1)	07-08 (1) 08-10 (2) 10-12 (1) 20-23 (1)	06-08 (1)	06-08 (1)
Far East	16-19 (1)	07-08 (1) 08-10 (2) 10-12 (1) 17-19 (1) 19-22 (2) 22-00 (1)	03-06 (1) 06-07 (2) 07-08 (1)	05-07 (1)
South Pacific & New Zealand	16-18 (1)**	07-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-18 (1) 18-21 (2) 21-23 (3) 23-01 (2) 01-05 (1)	00-01 (1) 01-03 (2) 03-06 (3) 06-08 (2) 08-09 (1)	02-04 (1)
Austral-asia	17-19 (1)** 15-17 (1) 17-19 (2) 19-20 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-10 (2) 10-16 (1) 16-18 (2) 18-20 (1) 20-00 (2) 00-03 (1)	02-04 (1) 04-07 (2) 07-09 (1)	04-05 (1) 05-07 (2) 07-08 (1) 05-07 (1)*
Carib-bean, Central America & Northern Countries of South America	11-14 (1)** 14-16 (2)** 16-17 (1)** 08-10 (1) 10-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-08 (3) 08-10 (4) 10-12 (3) 12-15 (2) 15-17 (3) 17-19 (4) 19-21 (3) 21-22 (2) 22-01 (1)	19-21 (1) 21-23 (2) 23-03 (3) 03-06 (2) 06-07 (1)	21-00 (1) 00-03 (2) 03-06 (1) 03-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	13-15 (1)** 15-16 (2)** 16-17 (1)** 08-09 (1) 09-11 (2) 11-15 (1) 15-16 (2) 16-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	07-08 (1) 08-11 (2) 11-15 (1) 15-17 (2) 17-19 (4) 19-21 (2) 21-23 (1) 23-00 (2) 00-02 (1)	21-22 (1) 22-23 (2) 23-01 (3) 01-03 (2) 03-05 (3) 05-06 (2) 06-07 (1)	20-01 (1) 01-04 (2) 04-06 (1) 02-05 (1)*
McMurdo Sound, Antarctica	15-18 (1)	08-10 (1) 18-20 (1) 20-21 (2) 21-23 (3)	01-03 (1) 03-06 (2) 06-07 (1) 23-00 (1)	03-06 (1)

Eastern Mediter-ranean & Middle East	Nil	07-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-15 (1) 20-22 (1)	20-23 (1) 06-08 (1)	21-22 (1)
Western Africa	12-14 (1)	07-08 (1) 08-09 (2) 09-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	21-01 (1)	21-23 (1)
Eastern & Central Africa	Nil	12-15 (1) 15-17 (2) 17-18 (1)	20-22 (1) 06-08 (1)	Nil
Southern Africa	10-12 (1)	07-09 (1) 12-14 (1) 14-16 (2) 16-18 (1) 22-00 (1)	20-21 (1) 21-22 (2) 22-23 (1)	20-22 (1)
Central & South Asia	17-19 (1)	07-08 (1) 08-10 (2) 10-12 (1) 17-19 (1) 19-20 (2) 20-21 (1)	06-08 (1) 18-20 (1)	06-07 (1)
South-east Asia	16-20 (1)	08-09 (1) 09-11 (2) 11-13 (1) 18-21 (1) 21-23 (2) 23-00 (1)	02-05 (1)	06-07 (1)
Far East	17-19 (1)	07-08 (1) 08-10 (2) 10-12 (1) 12-14 (2) 14-18 (1) 18-19 (2) 19-21 (3) 21-22 (2) 22-23 (1)	01-02 (1) 02-06 (2) 06-07 (3) 07-08 (1)	03-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
South Pacific & New Zealand	16-18 (1)** 12-15 (1) 15-16 (2) 16-19 (3) 19-20 (2) 20-21 (1)	01-07 (1) 07-08 (2) 08-10 (3) 10-11 (2) 11-14 (1) 14-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-01 (2)	22-23 (1) 23-00 (2) 00-06 (3) 06-07 (2) 07-08 (1)	23-02 (1) 02-06 (2) 06-07 (1) 02-06 (1)*
Austral-asia	15-18 (1)** 14-16 (1) 16-17 (2) 17-19 (3) 19-20 (2)	17-19 (1) 19-20 (2) 20-23 (3) 23-01 (2) 01-07 (1) 07-08 (2) 08-10 (3) 10-11 (2) 11-13 (1)	00-02 (1) 02-03 (2) 03-05 (3) 05-07 (2) 07-08 (1)	02-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Carib-bean, Central America & Northern Countries of South America	11-13 (1)** 13-16 (2)** 16-17 (1)** 08-09 (1) 09-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-10 (3) 10-15 (2) 15-16 (3) 16-18 (4) 18-20 (3) 20-22 (2) 22-02 (1)	18-21 (1) 21-22 (2) 22-01 (3) 01-04 (2) 04-07 (1)	20-22 (1) 22-02 (2) 02-05 (1) 23-03 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	12-13 (1)** 13-15 (2)** 15-16 (1)** 08-09 (1) 09-10 (2) 10-12 (1) 12-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-10 (2) 10-15 (1) 15-17 (2) 17-19 (4) 19-20 (3) 20-22 (2) 22-00 (1)	20-22 (1) 22-23 (2) 23-01 (3) 01-03 (2) 03-05 (3) 05-06 (2) 06-07 (1)	22-02 (1) 02-04 (2) 04-05 (1) 02-04 (1)*
McMurdo Sound, Antarctica	13-16 (1) 16-18 (2) 18-19 (1)	08-10 (1) 17-19 (1) 19-21 (2) 21-23 (3) 23-00 (2) 00-02 (1)	00-03 (1) 03-06 (2) 06-07 (1)	03-06 (1)

*Indicates best times to listen for 160 meter openings.
**Indicates best times for 10 meterr openings.
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.

15th through September 15th, rather than the usual two-month period. Short-skip Charts for use during this period appeared in last month's column.

During August 10 and 12 meter DX openings should be possible to southern and tropical areas. The best bet is during the afternoon when conditions are expected to be High Normal or better. Frequent short-skip openings between distances of about 500 and 1400 miles can also be expected.

Look for an occasional 15 meter DX opening towards Europe and the east before noon, but chances should be much better during the afternoon hours, particularly towards Africa, South America, the South Pacific, and Oceania. Expect frequent short-skip openings between distances of about 400 and 1400 miles.

The propagation pattern on 17 meters should be similar to 15 meters. With increasing solar activity and summertime propagation conditions in the northern hemisphere, the somewhat lower frequency range of this band may well prove to be a propagation asset. On many days when conditions will not permit 15 meters to open, check this band for openings. When 15 meters does open, expect the same openings on 17 meters, but the band should remain active up to an hour after 15 meters closes.

During August 20 meters should continue to be the best band for DX propagation. Openings are forecast to most areas of the world between sunrise and midnight, when conditions are at least Low Normal. Peak conditions should occur, with strongest signals, during a two to three hour window just after local sunrise, and again during the late afternoon and evening. When conditions are High Normal or better, 20 meters may remain open through much of the period of darkness, particularly towards southern and tropical areas. Excellent short-skip openings are also expected to continue on 20 meters from shortly after sunrise to almost midnight. These should range from a few hundred miles out to the one-hop limit of about 2300 miles.

Thirty meters can be another propagation asset during the summer months. Peak openings are expected during the nighttime hours, much like 40 meters, but often with higher signal levels and somewhat lower noise levels.

Some fairly good 40 meter DX openings are forecast for the early evening hours towards the east and south. Conditions should improve towards the west and south after midnight, with the band remaining open for DX until sunrise. Look for excellent short-skip openings between about 250 and 750 miles during the daylight hours and between 750 and 2300 miles at night.

Despite seasonally high static levels, some fairly good DX openings should also be possible on 80 meters during the hours of darkness. Conditions should peak just as the sun begins to rise on the "light" side of the path. Try 80 meters for short-skip openings up to about 250 miles during the daylight hours and between 250 and 2300 miles at night.

It's still too early for 160 meter DX openings, but an occasional one may be possible during the hours of darkness and the sunrise period. Short-skip on 160 looks good during the hours of darkness for distances up to at least 1300 miles.

VHF Ionospheric Openings

Although sporadic-*E* ionization is expected to decrease during August, some 6 meter short-skip openings still should be possible. These openings should normally extend from approximately 750 to 1300 miles, but during periods of widespread sporadic-*E* ionization, 6 meter "two-hop" openings may be possible up to as great as 2500 miles. During periods of intense sporadic-*E* ionization also check for possible short-skip openings on 2 meters over a range of about 1100 to 1300 miles.

What is likely to be the year's most prolonged and intensive meteor shower should take place between August 10th and 14th. Called the *Perseids*, it's expected to peak on August 12th with an average count of 50 meteors an hour. Ionization produced by these meteors as they enter the Earth's atmosphere should make possible numerous meteor-scatter-type openings on the 6 and 2 meter bands. The range of such openings could be up to several hundred miles, and at times somewhat greater.

August is not usually a good month for auroral-type propagation on the VHF bands, but some could occur during times when the ionosphere is disturbed. Check the Last-Minute Forecast at the beginning of this column for those days that are expected to be Below Normal or Disturbed. These are the days when chances are best for auroral-type openings on the VHF bands.

Auroral-scatter openings can range from a few hundred up to about a thousand miles, and are usually characterized by very rapid flutter fading and Doppler shift on SSB signals.

For the very patient, check the 6 meter band for possible trans-equatorial (TE) openings between 8 and 11 PM local daylight time. This type of propagation favors openings from the southern tier states into deep South America, with the signal path crossing the magnetic equator at a right angle. TE openings during August are rare, but they can occur. They are usually characterized by very weak signals and severe flutter fading.

73, George, W3ASK

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FOR SALE: **Transmission Line Transformers** (Baluns and Ununs). Due to QTH downsizing, I have to dispose of the many transformers used in my study of these broadband and highly efficient matching transformers. A suggested price is $20, covering labor, packaging, and shipping. Oldest transformers will be shipped first. They will include a short personal note on the particular experiment. Please, no special requests.Most transformers are uncased. Jerry Sevick, W2FMI, 32 Granville Way, Basking Ridge, NJ 07920 (908-766-6122). **Note:** These are one of a kind, for experimental use only.

QSL SUCCESS! Book shares techniques of hams achieving 90%+ return rates. $5.00ppd USA/Canada, includes $5.00 coupon. William Plum, 12 Glenn Road, Flemington, NJ 08822-3322.

AMERICAN HAM GEAR manufactured between 1930 & 1980 needed to illustrate *CQ* book and calendar projects. Photography can be done at your location. Contact Joe Veras, N4QB, P.O. Box 1041, Birmingham, AL 35201. Tel: 205-967-2384 days, 205-967-0639 evenings and weekends.

THE 59(9) DX REPORT: Weekly DX and Contest bulletin. SASE for sample. P.O. Box 73, Spring Brook, NY 14140.

The Web resource for radio hobbyists: www.DXing.com

TELEGRAPH COLLECTOR'S PRICE GUIDE: 250 pictures/prices. $12 postpaid. ARTIFAX BOOKS, Box 88, Maynard, MA 01754.

ASTRON Power Supply, brand new w/warranty, RS20M $99, RS35M $145, RS50M $209, RS70M $249. Call for other models, AVT 626-286-0118.

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PACKET RADIO AND MORE! Join TAPR, connect with the largest amateur radio digital group in the U.S. Creators of the TNC-2 standard, now working on Spread Spectrum technology. Benefits: newsletter, software, discount on kits and publications. $20/year US/Can/Mex; $25 elsewhere. Visa/MC. When joining, mention *CQ* and receive TAPR's Packet Radio: What? Why? How? ($12 value) FREE! Internet: tapr@tapr.org Web: <http://www.tapr.org> Phone: 817-383-0000 Address: 8987-309 E Tanque Verde Road, #337, Tucson, AZ 85749-9399.

WANTED: HAM EQUIPMENT AND RELATED ITEMS. Donate your excess gear—new, old, in any condition—to the Radio Club of Junior High School 22, the Nation's only full time non-profit organization working to get Ham Radio into schools around the country as a teaching tool using our EDUCOM—Education Thru Communication—program. Send your radio to school. Your donated material will be picked up ANYWHERE or shipping arranged, and this means a tax deduction to the full extent of the law for you as we are an IRS 501(c)(3) charity in our 18th year of service. It is always easier to donate and usually more financially rewarding, BUT MOST IMPORTANT your gift will mean a whole new world of educational opportunity for children nationwide. Radios you can write off; kids you can't. Make 1997 the year to help a child and yourself. Write, phone, or FAX the WB2JKJ "22 Crew" today: The RC of JHS 22, P.O. Box 1052, New York, NY 10002. Twenty-four hours call 516-674-4072; fax 516-674-9600; or e-mail <wb2jkj@juno. com>. Join us on the WB2JKJ Classroom Net, 7.238 MHz, 1200–1330 UTC daily and 21.395 MHz from 1400 to 2000 UTC.

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B&B WITH A HAM! Enjoy hamming from Hawaii. Join those who have chased DX from beautiful upcountry Maui! (Non-smokers only, thanks.) "SEA Q MAUI," call 808-572-7914; <kh6sq@seaqmaui.com> <http://www.seaqmaui.com>.

RAINBOW AMATEUR RADIO Association, the gay/lesbian ham club. Active nets, newsletter, uncensored listserv. Privacy respected. E-mail: <RARA@EN.COM> or Dept. A, P.O. Box 191, Chesterland, OH 44026-0191.

Advertiser's Index

(continued on page 99)

CONTEST STATION OR JUST VACATION: Chalet in Colorado Rockies, 40 meter beam, 8-el log periodic, A3S tribander, slopers on 75/160. TS930SAT and Alpha. WØLSD, Ken, Box 156, Buena Vista, CO 81211 (719-395-6547). $0.55 stamp for color brochure. <diverken@chaffee.net>

INTERESTED IN VIEWING the Earth from space? Subscribe to Weather Satellite Report. Since 1992 the international quarterly of Earth and atmospheric imagery. Woodhouse Communication, telephone 616-226-8873; fax 616-226-9073; e-mail <www.view2earth.com>.

Join the LAMBDA AMATEUR RADIO CLUB (LARC) since 1975, the only open and visible public-service oriented ham club for gay and lesbian hams. Monthly newsletter, HF skeds, internet listserv and IRC, hamfest meetings, chapters, DXpeditions. Write LARC, P.O. Box 56069, Philadelphia, PA 19130-6069 or e-mail <LARC@seta.fi>.

CASH FOR COLLINS: Buy any Collins Equipment. Leo, KJ6HI, Phone/Fax 310-670-6969, <radioleo@earthlink.net>.

ATTENTION WEAK-SIGNAL VHFERS: Since 1980 your best source of monthly news information. Send a large SASE to West Coast VHFer, Box 685, Holbrook, AZ 86025.

SIX METER FUN! Alinco MO6 10 watts FM. DX w/Yagi or base vertical 6m mobile antenna included. $250. KB2IPL, 516-681-1761.

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VX-1R POCKET MANUAL. 62 pages covers all features. $6.95 ($4.95 + $2.00 s&h) to Janus Computer Services to: VE3AYR, 610 Barons Court, Burlington, ON L7R 4E4.

WANTED: Nye Viking station monitor Model RFM003 or 005 SWR forward/power meter. Randy Ballard, N5WV, 903-687-3002.

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FOR SALE: Heath SB-200, HL-2200, SA-2500, SB-102, SB-610, SB-620. Some unstarted kits. WA2KHK, 1519A NW Amherst Drive, Pt. St. Lucie, FL 34986-2445.

FREE: Scanner collector's methods and secrets. Learn how to buy, sell, trade, and USE scanners in the most efficient manner. Enclose $2.00 for postage and handling to: P.O. Box 402, Decatur, Texas 76234.

ICOM IC-761 $995, IC-735 $600. Yaesu FT-747 $550. Kenwood TS-820S $450, TS-530S $495. Drake TR4C/AC4 $350. Collins S-1 Line $800. K1BW 413-538-7861.

FOR SALE: HAL electronic keyer with Vibroplex paddle $80. SWR bridge with power meter $10. Cetron 572B, never used, bought as spare, $45. Sony ICF-SW33K portable shortwave receiver $85. N2EUE, 718-897-0750.

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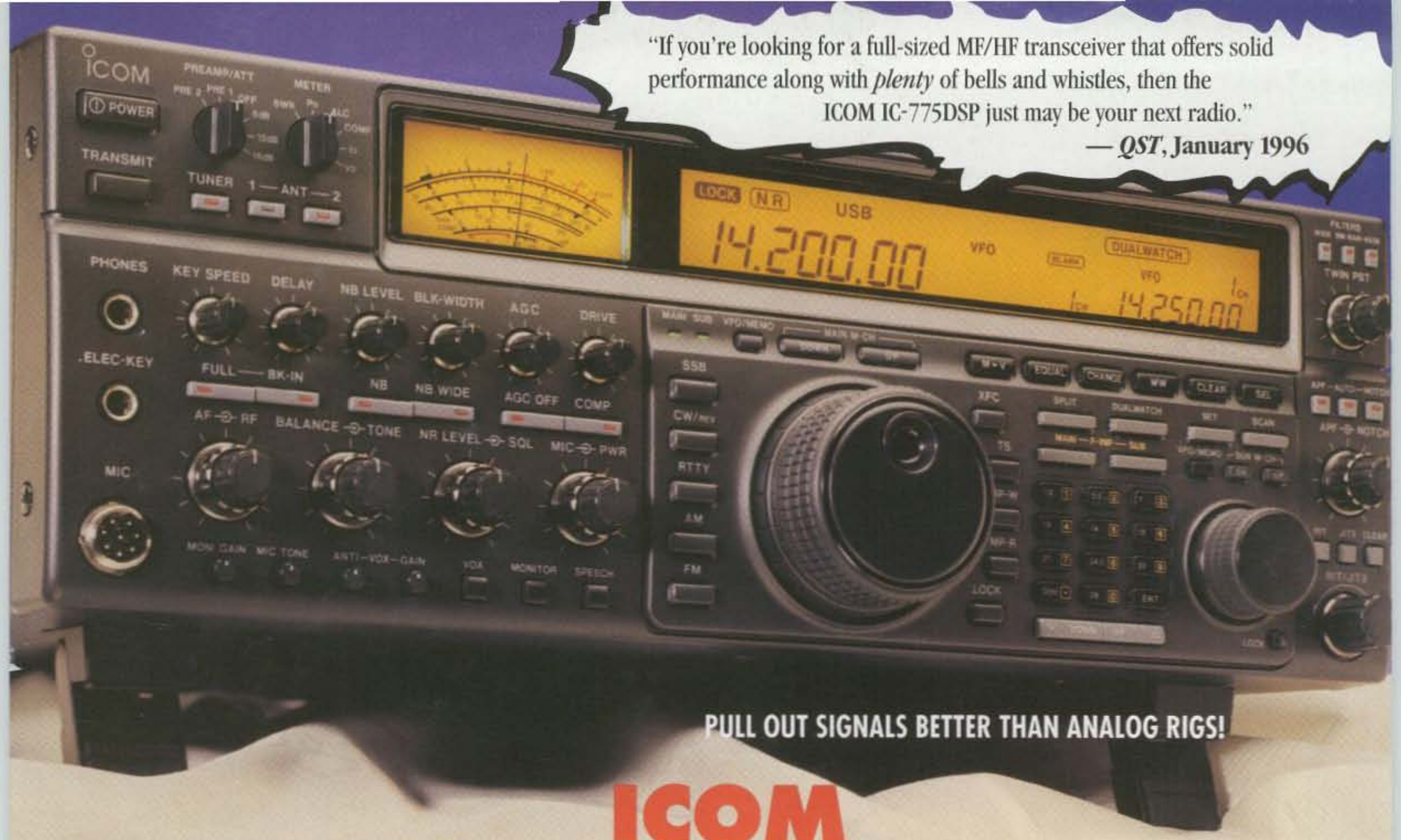

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