

# Amateur Radio

SERVING AMATEUR RADIO SINCE 1945

MAY 1988 \$2.50

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**CQ**

**Results Of The 1987  
CQ WW WPX CW Contest**

**The Western Sahara Story**

**The 1987 CQ WW DX SSB  
Contest High-Claimed Scores**



**THE RADIO AMATEUR'S JOURNAL**

# KENWOOD

...pacesetter in Amateur Radio

DX-celence!

## #1 Rated HF!

### TS-940S Competition class HF transceiver

TS-940S—the standard of performance by which all other transceivers are judged. Pushing the state-of-the-art in HF transceiver design and construction, no one has been able to match the TS-940S in performance, value and reliability. The product reviews glow with superlatives, and the field-proven performance shows that the TS-940S is "The Number One Rated HF Transceiver!"

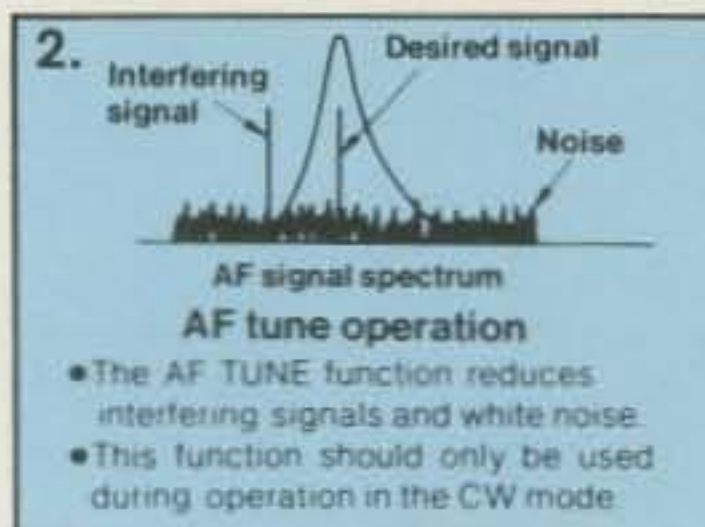
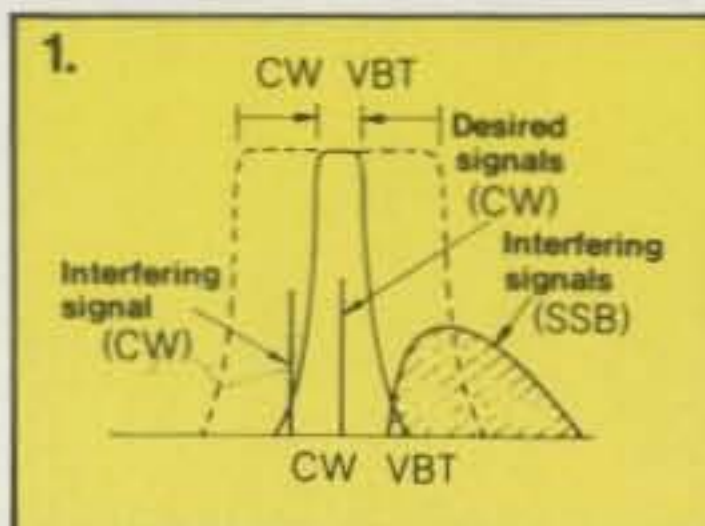
- **100% duty cycle transmitter.** Kenwood specifies transmit duty cycle **time**. The TS-940S is guaranteed to operate at full power output for periods **exceeding one hour**. (14.250 MHz, CW, 110 watts.) Perfect for RTTY, SSTV, and other long-duration modes.
- **First with a full one-year limited warranty.**
- **Extremely stable phase locked loop (PLL) VFO.** Reference frequency accuracy is measured in **parts per million!**

#### Optional accessories:

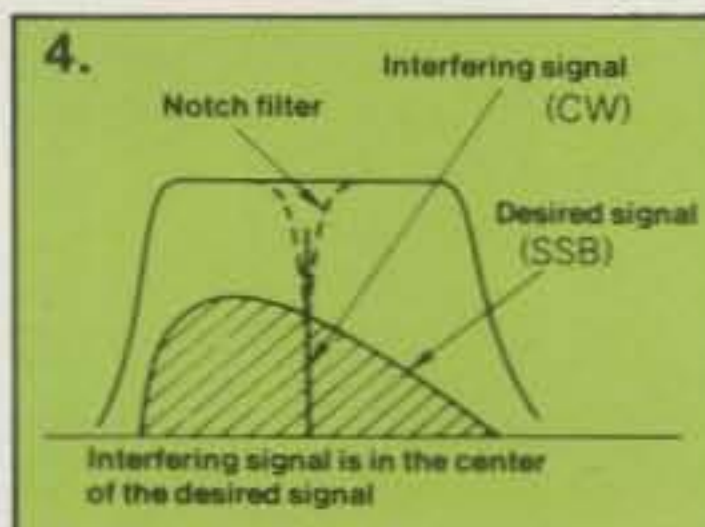
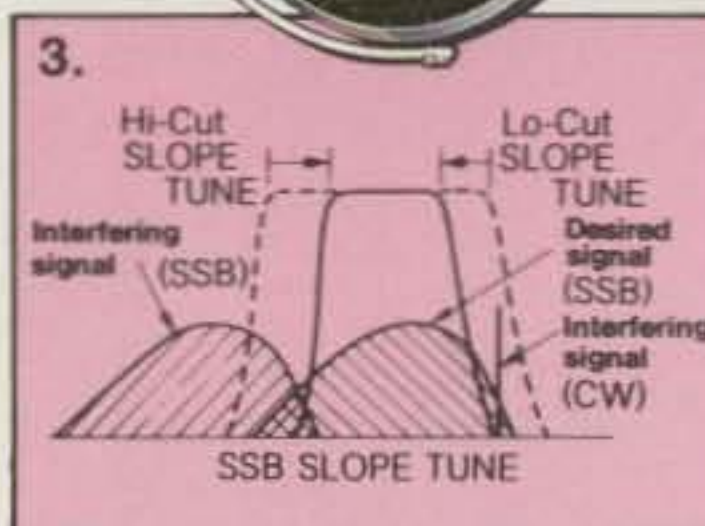
- AT-940 full range (160-10m) automatic antenna tuner
- SP-940 external speaker with audio filtering
- YG-455C-1 (500 Hz), YG-455CN-1 (250 Hz), YK-88C-1 (500 Hz) CW filters; YK-88A-1 (6 kHz) AM filter
- VS-1 voice synthesizer
- SO-1 temperature compensated

- crystal oscillator
- MC-43S UP/DOWN hand mic.
- MC-60A, MC-80, MC-85 deluxe base station mics.
- PC-1A phone patch
- TL-922A linear amplifier
- SM-220 station monitor
- BS-8 pan display
- SW-200A and SW-2000 SWR and power meters
- IF-232C/IF-10B computer interface.

Complete service manuals are available for all Kenwood transceivers and most accessories. Specifications, features, and prices are subject to change without notice or obligation.



- 1) **CW Variable Bandwidth Tuning.** Vary the passband width continuously in the CW, FSK, and AM modes, without affecting the center frequency. This effectively minimizes QRM from nearby SSB and CW signals.
- 2) **AF Tune.** Enabled with the push of a button, this CW interference fighter inserts a tunable, three pole active filter between the SSB/CW demodulator and the audio amplifier. During CW QSOs, this control can be used to reduce interfering signals and noise, and peaks audio frequency response for optimum CW performance.



- 3) **SSB Slope Tuning.** Operating in the LSB and USB modes, this front panel control allows independent, continuously variable adjustment of the high or low frequency slopes of the IF passband. The LCD sub display illustrates the filtering position.
- 4) **IF Notch Filter.** The tunable notch filter sharply attenuates interfering signals by as much as 40 dB. As shown here, the interfering signal is reduced, while the desired signal remains unaffected. The notch filter works in all modes except FM.

- **Complete all band, all mode transceiver with general coverage receiver.** Receiver covers 150 kHz-30 MHz. All modes built-in: AM, FM, CW, FSK, LSB, USB.
- **Superb, human engineered front panel layout for the DX-minded or contesting ham.** Large fluorescent tube main display with dimmer; direct keyboard input of frequency; flywheel type main tuning knob with optical encoder mechanism all combine to make the TS-940S a joy to operate.
- **One-touch frequency check (T-F SET) during split operations.**
- **Unique LCD sub display indicates VFO, graphic indication of VBT and SSB Slope tuning, and time.**
- **Simple one step mode changing with CW announcement.**
- **Other vital operating functions.** Selectable semi or full break-in CW (QSK), RIT/XIT, all mode squelch, RF attenuator, filter select switch, selectable AGC, CW variable pitch control, speech processor, and RF power output control, programmable band scan or 40 channel memory scan.

## KENWOOD

KENWOOD U.S.A. CORPORATION  
2201 E. Dominguez St., Long Beach, CA 90810  
P.O. Box 22745, Long Beach, CA 90801-5745

# KENWOOD

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ALL NEW!

## Double Vision



ACTUAL SIZE FRONT PANEL

### TM-721A Deluxe FM dual bander

The Kenwood TM-721A re-defines the original Kenwood "Dual Bander" concept. The wide range of innovative features includes a dual channel watch function, selectable full duplex operation, 30 memory channels, extended frequency coverage, large multi-color dual digital LCD displays, programmable scanning, and more with 45 watts of output on VHF and 35 watts on UHF. TM-721A—Truly the finest full-featured FM Dual Band mobile transceiver!

- **Extended receiver range** (138.000-173.995 MHz) on 2 meters; 70 cm coverage is 438.000-449.995 MHz. (Specifications guaranteed on Amateur bands only. Two meter transmit range is 144-148 MHz. Modifiable for MARS/CAP. Permits required.)
- **30 multi-function memory channels.** 14 memory channels and one call channel for each band store frequency, repeater offset, CTCSS, and reverse. Channels "A" and "b" establish upper and lower limits for programmable band scan. Channels "C" and "d" store transmit and receive frequencies independently for "odd splits."

#### Optional Accessories:

- **RC-10** Multi-function handset/remote controller • **PS-430** Power supply • **TSU-6** CTCSS decode unit • **SW-100B** Compact SWR/power/volt meter • **SW-200B** Deluxe SWR/power meter • **SWT-1** 2m antenna tuner • **SWT-2** 70 cm antenna tuner • **SP-40**

- **Separate frequency display for "main" and "sub-band"**
- **45 Watts on 2 meters, 35 watts on 70 cm.** Approx. 5 watts low power.
- **Call channel function.** A special memory channel for each band stores frequency, offset, and sub-tone of your favorite channel. Simply press the CALL key, and your favorite channel is selected!
- **Automatic Band Change (A.B.C.)** Automatically changes between main and sub-band when a signal is present.
- **Dual watch function allows VHF and UHF receive simultaneously.**
- **CTCSS encode/decode selectable from front panel** or UP/DWN keys on microphone. (Encode built-in, optional TSU-6 needed for decode.)
- **Balance control and separate squelch controls for each band.**

- **Dual antenna ports.**
- **Full duplex operation.**
- **Programmable memory and band scanning, with memory channel lock-out and priority watch function.**
- **Each function key has a unique tone for positive feedback.**
- **Illuminated front panel controls and keys.**
- **Dimmer control.**
- **16 key DTMF mic. included.**
- **Handset/remote control option (RC-10).**
- **Frequency (dial) lock.**
- **Supplied accessories:** 16-key DTMF hand mic., mounting bracket, DC cable.

Complete service manuals are available for all Kenwood transceivers and most accessories. Specifications, features, and prices are subject to change without notice or obligation.



TM-721A shown with optional RC-10.

- Compact mobile speaker • **SP-50B** Deluxe mobile speaker • **PG-2N** DC cable • **PG-3B** DC line noise filter • **MC-60A, MC-80, MC-85** Base station mics. • **MA-4000** Dual band mobile antenna (mount not supplied) • **MB-11** Mobile bracket • **MC-43S** UP/DWN hand mic. • **MC-48B** 16-key DTMF hand mic.

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NEW!

## Affordable DX-ing!

### TS-140S

HF transceiver with general coverage receiver.

Compact, easy-to-use, full of operating enhancements, and feature packed. These words describe the new TS-140S HF transceiver. Setting the pace once again, Kenwood introduces new innovations in the world of "look-alike" transceivers!

- **Covers all HF Amateur bands with 100 W output.** General coverage receiver tunes from 50 kHz to 35 MHz. (Receiver specifications guaranteed from 500 kHz to 30 MHz.) Modifiable for HF MARS operation. (Permit required).
- **All modes built-in.** LSB, USB, CW, FM and AM.
- **Superior receiver dynamic range** Kenwood DynaMix™ high sensitivity direct mixing system ensures true 102 dB receiver dynamic range.



- **New Feature! Programmable band marker.** Useful for staying within the limits of your ham license. For contesters, program in the suggested frequencies to prevent QRM to non-participants.
- **Famous Kenwood interference reducing circuits.** IF shift, dual noise blankers, RIT, RF attenuator, selectable AGC, and FM squelch.

- **M. CH/VFO CH sub-dial.** 10 kHz step tuning for quick QSY at VFO mode, and UP/DOWN memory channel for easy operation.
- **Selectable full (QSK) or semi break-in CW.**
- **31 memory channels.** Store frequency, mode and CW wide/narrow selection. Split frequencies may be stored in 10 channels for repeater operation.
- **RF power output control.**
- **AMTOR/PACKET compatible!**
- **Built-in VOX circuit.**
- **MC-43S UP/DOWN mic. included.**

#### Optional Accessories:

- **AT-130** compact antenna tuner • **AT-250** automatic antenna tuner • **HS-5/HS-6/HS-7** headphones • **IF-232C/IF-10C** computer interface
- **MA-5/VP-1** HF mobile antenna (5 bands)
- **MB-430** mobile bracket • **MC-43S** extra UP/DOWN hand mic. • **MC-55** (8-pin) goose neck mobile mic. • **MC-60A/MC-80/MC-85** desk mics.
- **PG-2S** extra DC cable • **PS-430** power supply
- **SP-40/SP-50B** mobile speakers • **SP-430** external speaker • **SW-100A/SW-200A/SW-2000** SWR/power meters • **TL-922A** 2 kW PEP linear amplifier (not for CW QSK) • **TU-8** CTCSS tone unit
- **YG-455C-1** 500 Hz deluxe CW filter, **YK-455C-1** New 500 Hz CW filter.



### TS-680S

All-mode multi-bander

- 6m (50-54 MHz) 10 W output plus all HF Amateur bands (100 W output).
- Extended 6m receiver frequency range 45 MHz to 60 MHz. Specs. guaranteed from 50 to 54 MHz.
- Same functions of the TS-140S except optional VOX (VOX-4 required for VOX operation).
- Preamplifier for 6 and 10 meter band.



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Offices: 76 North Broadway, Hicksville, NY 11801. Telephone: 516 681-2922. FAX (516) 681-2926. CQ (ISSN 0007-893X) is published monthly by CQ Communications Inc. Second Class postage paid at Hicksville, NY and additional offices. Subscription prices: Domestic—one year \$19.95, two years \$38.00, three years \$57.00; Canada/Mexico—one year \$22.00, two years \$42.00, three years \$63.00; Foreign—one year \$24.00, two years \$46.00, three years \$69.00; Foreign Air Mail—one year \$77.00, two years \$152.00, three years \$228.00. Entire contents copyrighted CQ Communications Inc. 1988. CQ does not assume responsibility for unsolicited manuscripts. Allow six weeks for change of address. Printed in the United States of America.

Postmaster: Please send change of address to CQ Magazine, 76 North Broadway, Hicksville, NY 11801.



# The Radio Amateur's Journal



**ON THE COVER:** Here's leading DXer Pedro Pizo, NP4A, at his QTH outside of Ponce, Puerto Rico. Pedro's new beam is burning up the airwaves. Photo by Larry Mulvehill, WB2ZPI.

MAY 1988

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## AN EDITORIAL

Since my last report on the Miami Hamfest we've been to two more hamfests with two more to go before the big one. The end of February introduced a new one for CQ, the Cincinnati Hamfest. Steve Bolla, N8BJQ, drove down from Dayton and helped me out for the two-day affair. The first thing I expected for late February was extremely cold weather. I was wrong. The weather was much milder than in New York. There are two other things you have to learn about Cincinnati. First there is the fact that the airport is in Kentucky and not in Ohio. Second, the highway that takes you to the site of the hamfest, Norwood, has an anomaly in its numbering system. The exits run 5, 6, 8, and 7, and when you see number 8 come up first, panic sets in. The locals all seem to know about it and take it in stride.

I had expected 1500 to 2000 people at this event, and it seemed as though about twice that number showed up. There was a small commercial area set aside from the major portion, which was a large flea-market. The less said about the food concession the better. I sampled most of the items and would say that you'd be better off bringing food from home next year. I picked up some great stuff at the flea-market, including a yacht. Yes, I figured that it was time for me to get a yacht, and someone had a 38 foot one for sale. Getting it home was no problem, as it fit under the seat in my carry-on luggage. The interesting part was that the person from whom I bought it apparently is a cousin of mine. Although he spells his name differently, it is one of the general forms of the name. Mike Doerhoefer, WB4AJZ, of Louisville, Kentucky and I swapped stories about the name and other members of the family.

Two weeks later Dick, Arnie, and I were at the Orlando Hamfest. This one seemed much larger than last year, and for a while on Saturday it was wall to wall people in the commercial area as well as the fleamarket. We were joined at the booth by Don McClenon, N4IN, Larry Brockman, N6AR/4, and Ade Weiss, W0RSP. Buck Rogers, K4ABT, CQ's new staffer, also spent some time at the booth. Most of his time was taken up giving packet radio demonstrations at a nearby booth. There was plenty to see, and it's hard to imagine anyone leaving there empty-handed. I did manage to stuff some goodies from the fleamarket into my suitcase and get them home in good shape.

Peter represented us at the HARC Hamfest on the same weekend up in



*The flagship of the CQ fleet.*

Westchester county, New York. Although this was a one-day affair, from what he said it sounded like a good one. The hamfest season is really heating up now, and as of this writing we still have two more to go before the BIG ONE. We head off this weekend to Charlotte, and then we expect to be at the Kansas City Hamfest about two weeks before Dayton.

So far there's no winner or even strong contender for a food prize. It's all been pretty bad. However, if you're into airline food (domestic, that is) Delta leads the rest in good food so far this year.

### Service Notes

The other day I called Bernie Welch, W8IMZ, and during the course of the conversation he asked me to let all of you Drake fans know that the R.L. Drake Co. service department is still going strong. In fact, they have taken to updating some of their equipment at a very reasonable price. The service department is located at 540 Richards St., Miamisburg, Ohio 45342. You can call them at 513-866-3211. Ask for Bill Frost. TNX, Bernie.

### CQ Notes

This month we're changing the name of Fred Maia's, W5YI, column from "Ticket Talk" to "Washington Readout." Since a great deal of what Fred reports on concerns itself with regulatory matters and legislation, the name change seemed in order. Of course, any information about licensing will still be included. If you have any questions about licensing or regulations, ask Fred. His "mailbag" section of the column regularly answers reader mail.

Also this month we introduce a new column called "The Packet User's Notebook." The editor of this column is Buck Rogers, K4ABT. You may have noticed

Buck's byline in last month's issue or read some of his work in other amateur periodicals. Facing the first installment of Buck's column this month is a story on Buck himself. Also shown in that article are pictures of the many operating packet positions at K4ABT.

In the next couple of months we will have a few QRP construction articles by Ade Weiss, W0RSP. Ade has been churning out some homebrew projects lately, and they do look good. Dig out your tools and catalogs and clear some space on your workbench.

73, Alan, K2EEK

### A. Edward Hopper, W2GT

Sometimes it takes someone's passing to find out a little-known fact about him. Ed Hopper, W2GT, was always Ed to me, although we continually listed him on the masthead as A. Edward Hopper. I don't know whether it was too embarrassing or too petty a thing to ask what the A. stood for, so for all these years I never did. Death is neither embarrassing nor petty, and so we find out all sorts of things we never knew about a person.

A. is for Andrew. Andrew Edward Hopper passed away on February 25 after a long illness. W2GT became a regular part of CQ in December 1964 when he took over the reins of the USA-CA Column. Ed also was an engineer for WHN, a New York radio station, and he eventually retired from there. For over 18 years he guided the USA-CA Award and the Awards column, until June of 1983 when he turned over the responsibility to Dorothy Johnson, WB9RCY.

Ed's life, the part that he shared with us, was not easy. He never complained about his lot. He was devoted to his wife, Helen Mae, who was ill and required continual attention. He was very proud of his daughter and in general always expressed a very positive attitude about everything, in spite of mounting medical problems.

So, when a man dies you learn certain facts, such as he was 81 years old, he won a Bronze Star during WW II, and that his first name was Andrew. What can't be capsulized is a 25-year relationship, which is emotional and therefore leaves a sense of loss. Ed brightened all of our lives, and we'll all miss the glow.



# Handheld DX with the DX Handy™

The idea of handheld DX seems far-fetched, but it's actually very simple. The DX Handy is a battery powered (six penlight AA drycells included) SSB/CW transceiver with two watts output. DX Handy can also use nicad rechargeable batteries, or be powered with 9 VDC.

Two variable crystal oscillators (VXOs), each with 50 KHz range, can be selected with a top panel switch. Crystals for 28.250 to 28.300 and 28.300 to 28.350 Mhz are included, and other crystal ranges for the 10 meter band are also available at a nominal cost.

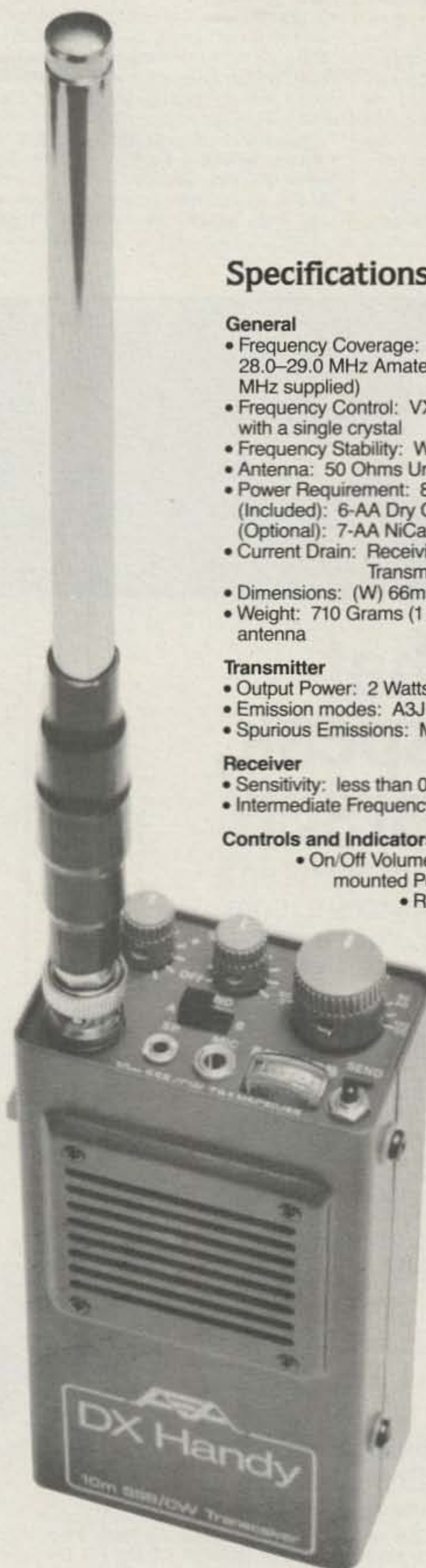
CW operation can be by either the built-in push button or with an external key or keyer. External speaker and microphone jacks are also provided, and the telescoping antenna is included. The DX Handy also has a top panel S-meter/ output power meter and an effective noise blanker circuit. DX Handy is housed in an attractive gray metal case comparing in size to popular VHF FM handhelds.

Ten meters is coming back strong. With DX Handy all amateurs, novice to extra class, can enjoy the thrill of working handheld DX.

**AEA**  
**Advanced Electronic Applications**  
P.O. Box C2160  
Lynnwood, WA 98036-0918  
(206) 775-7373

**AEA Retail \$379.95**

**Amateur Net \$319.95**



## Specifications

### General

- Frequency Coverage: Any two 50 KHz segments in the 28.0–29.0 MHz Amateur Band (28.25–28.30 and 28.30–28.35 MHz supplied)
- Frequency Control: VXO provides 50 KHz of continuous tuning with a single crystal
- Frequency Stability: Within  $\pm 500$  Hz from a cold start
- Antenna: 50 Ohms Unbalanced, BNC connector
- Power Requirement: 8.4–9.0 VDC  
(Included): 6-AA Dry Cells (1.5 volt/cell) = 9.0 VDC  
(Optional): 7-AA NiCads (1.2 Volt/cell) = 8.4 VDC
- Current Drain: Receiving - Approx. 70 mA  
Transmitting - Approx. 620 mA
- Dimensions: (W) 66mm  $\times$  (H) 39mm  $\times$  (D) 142mm
- Weight: 710 Grams (1 lb. 9 oz.) with batteries and antenna

### Transmitter

- Output Power: 2 Watts at 9.0 VDC
- Emission modes: A3J (USB) and A1 (CW)
- Spurious Emissions: More than 40 dB down

### Receiver

- Sensitivity: less than 0.5  $\mu$ V for 15 dB S/N
- Intermediate Frequency: 11.2735 MHz

### Controls and Indicators

- On/Off Volume control Top mounted Potentiometer
- Receiver Incremental Tuning (RIT): Top mounted Potentiometer with center off detent position
- Frequency: Top mounted 50 KHz VXO
- Frequency Range: Top mounted 2-position switch
- Noise Blanker: Top mounted On/Off switch
- S/RF meter: Top mounted S/RF meter
- Built in CW key: Top mounted momentary switch
- External Speaker output: Top mounted  $\frac{1}{16}$ " phone jack
- External Microphone input: Top mounted  $\frac{1}{8}$ " phone jack
- Antenna Connector: Top mounted Female BNC
- Transmit Indicator: Top mounted Transmit LED
- Push-To-Talk: Side mounted momentary switch
- External Power: Bottom mounted 2.1 mm coaxial
- External key input: Bottom mounted  $\frac{1}{8}$ " phone jack
- Mode Selector Switch: Bottom mounted 2-position switch
- Charge/External Power: Bottom mounted 2-position switch selecting 12 VDC external power function

Specifications and prices subject to change without notice or obligation.

# Announcing

• **AEA Third Annual Amateur Ambassador Award**— Advanced Electronic Applications is again offering a special award for the radio amateur who demonstrates extraordinary action in presenting the amateur service to those outside amateur radio. The award includes a \$1000 cash prize and round-trip airfare, hotel, and meals to the ARRL National Convention in Portland, Oregon in September, where the award will be presented. The award is judged on the criteria of dedication to amateur radio, positive influence on those outside amateur radio, and the initiation of special projects or programs to promote amateur radio. Nominations will be accepted until August 1, 1988 and can be made by requesting the AEA Ama-

teur Ambassador Award nomination form from: AEA, Amateur Ambassador Award, P.O. Box C-2160, Lynnwood, WA 98036.

• **Bristol, Virginia**— The Bristol ARC will hold a Special Event on May 6 from 2000–0100Z and on May 7 from 1300– 2200Z to commemorate National Hospital Week. WB4DKI will operate on 7.110 for Novice CW and for phone 50 kHz up from the lower end of General SSB. For QSL and certificate send QSL to Steve Ferguson, 2220 High St., Bristol, VA 24201.

• **Barton, Vermont**— On May 6–7 the Boy Scouts, Green Mountain Council of Vermont, Indian Lakes District, will hold their annual Scout Show and Camporee. They will operate on CW 3710–3740, 7110–

7140, 21110–21190, 28200–28300; on SSB 3910–3990, 7225–7390, 21325–21425, 28300–28500 kHz. On 2 meters (maybe) on 146.475, 940, 880, 760. A request has gone to the FCC for a special call sign.

• **Springfield, Illinois**— The Sagamon Valley Radio Club will operate W9DUA from May 6–8 to honor the dedication of the Vietnam War Memorial at Springfield, IL. Operation will be in the General portion of 80–10 meters, up 35 kHz, including 10 meter Novice portion. Time is from 1400–2000Z. For a certificate send your QSL and large SASE to Sangamon Valley RC, Red Cross Bldg., 1025 South 6th St., Springfield, IL 62703.

• **Wheaton, Illinois**— Boy Scouts of the DuPage Area Council will operate the Wheaton ARC club station, W9CCU, from 0400–0900Z on May 7. The event is intended to encourage amateur radio as a hobby for local youths. Suggested frequencies: 28.390, 14.290 MHz, and 146.490 FM. For certificate send an SASE to WCRA, P.O. Box QSL, Wheaton, IL 60189, Attn. Scoutarama.

• **Schenectady, New York**— SARA will operate K2AE from Saratoga Spa State Park on May 14 for Region II, Eastern Cluster, Boy Scouts from 1300–2000Z on 14.330 and 28.360. For a QSL send your QSL and SASE to WB2STS, 2 Union St., Schenectady, NY 12305.

• **Fairfield, Connecticut**— The Greater Fairfield ARA will operate a Special Event station during the annual Dogwood Festival from 1300–2200Z on May 14 on 3.975, 7.235, 14.330, 21.420, and 28.310 MHz. For a certificate and QSL send a large SASE to FARA, P.O. Box 486, Southport, CT 06490-0486.

• **Wellesley, Massachusetts**— The Wellesley ARS will sponsor an FCC exam on May 14 at 10:30 a.m. at the Wellesley Red Cross Building. All exams will be given. Contact Vern Valero, ND1Z at 617-533-6822 by May 7.

• **Batavia, New York**— The Genesee Radio Amateurs will operate W2RCX on May 14 from 1300–2200Z to celebrate their 25th anniversary. Suggested frequencies: 3.913, 7.213, 14.313, 21.313, 28.313, and 147.225. For QSL send your QSL and SASE to GRAM, P.O. Box 572, Batavia, NY 14020.

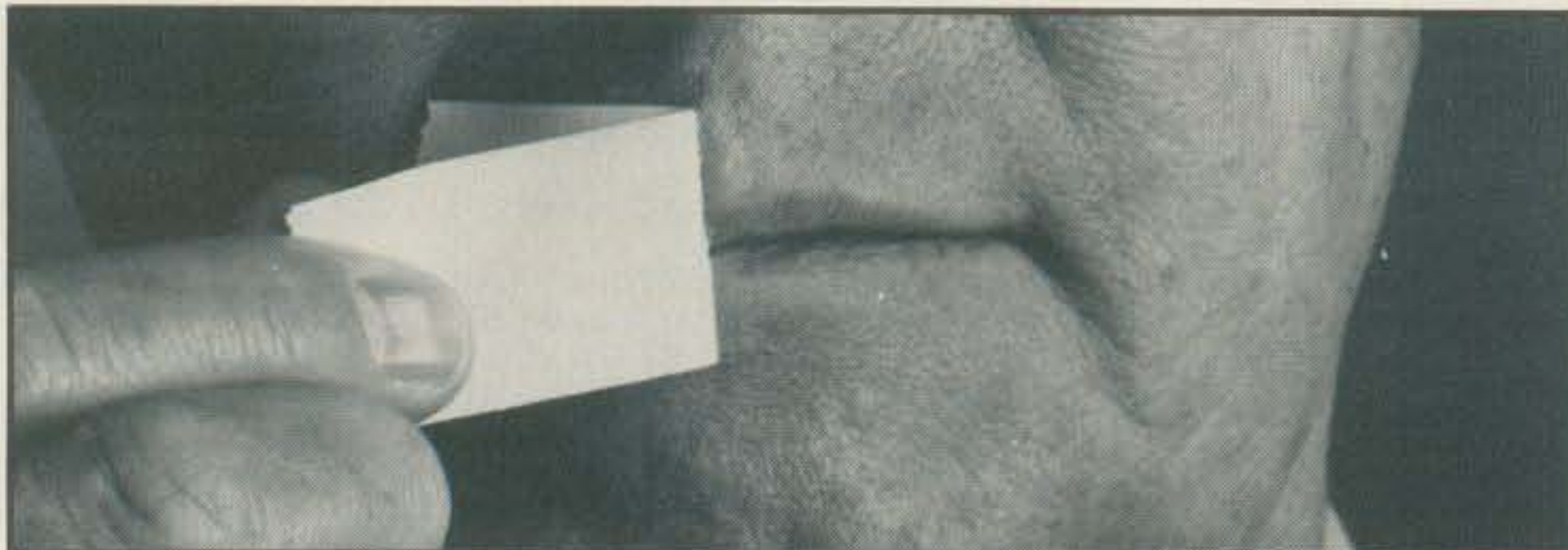
• **Oklahoma City, Oklahoma**— N5FM will commemorate National Salvation Army week from 0100Z May 14 through 0100Z May 15 on 3.875, 7.245, 14.250, and 28.495 MHz. For a certificate send QSL and 9 by 12 SASE (39 cents) to N5FM, The Salvation Army, P.O. Box 12600, Oklahoma City, OK 73157.

• **Uniontown, PA**— The Uniontown ARC will operate W3PIE May 14–15, 1700 to 0300 UTC to commemorate the 50th anniversary of UARC/W3PIE. Suggested frequencies: lower portions of the 20, 40, and 80 meter General class phone bands, 28.333 MHz Novice phone, 146.55 MHz FM, and 50-, 144-, 220-, and 432-MHz SSB. For certificate, send QSL and large SASE to Uniontown ARC, c/o John Cermak, Box 433, Republic, PA 15475.

• **Colorado Springs, CO**— The Pikes Peak Radio Amateur Association will hold its 1988 Swapfest on May 21 from 8:30 a.m. until 4 p.m. at the Rustic Hills Mall at Palmer Park and Academy Blvd. Free Admission. Table rental, \$8.00 in advance, \$10.00 at the door. Talk in on 146.37/97. VE testing on site. For more information, contact Al, N0CMW, 303-473-1660 or write PPRAA Swapfest, PO Box 16521, Colorado Springs, CO 80935.

• **Baltimore, MD**— The Maryland Mobileers Amateur Radio Club will operate its annual special events station aboard the U. S. Submarine Torsk at Pier 3 in the Baltimore Inner Harbor May 21st from 9:30 a.m. to 4:00 p.m. EST. MMARC has selected Armed Forces Day to honor the Submarine Service. SSB Frequencies: 3.880, 4.240, 14.240 MHz, and the 10-meter Novice band SSB and 146.805 MHz FM. The public is cordially invited to come aboard and watch.

• **Dubuque, IA**— The Great River ARC will operate NS0U from 1500Z until 2200Z May 21 at the site of the annual Dubuquefest. Operation will be in the lower 20 kHz of the 75, 40, 20 and 15 meter General bands. Station N9FVN will simultaneously operate voice in the 10-meter Novice band. For QSL card,



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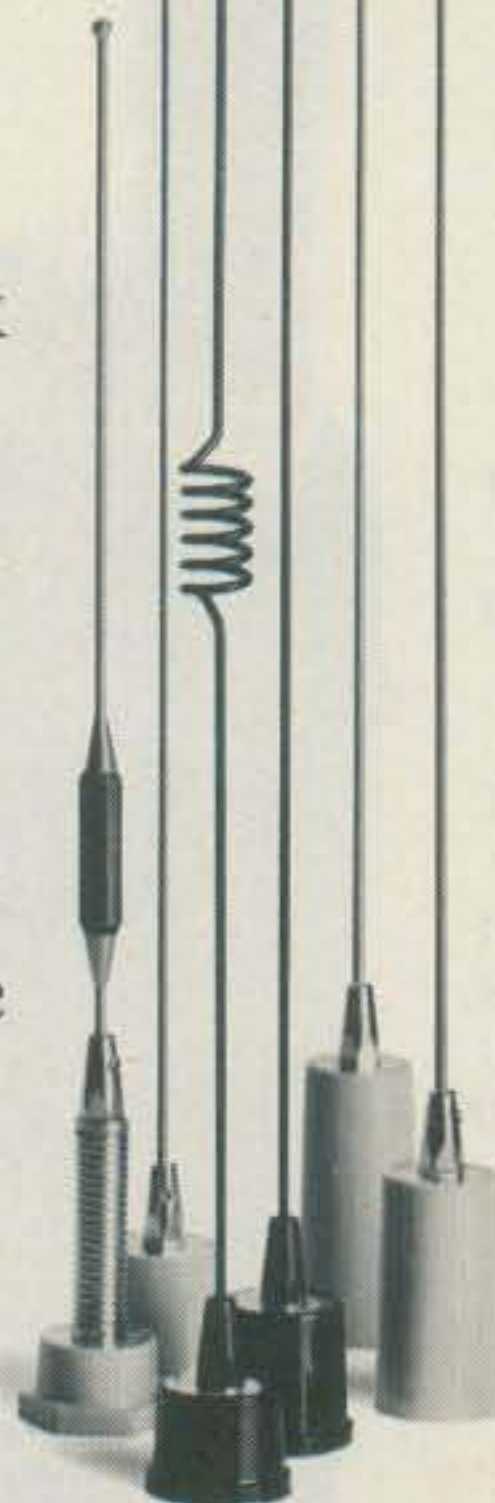
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(continued on page 110)



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CIRCLE 137 ON READER SERVICE CARD

# Our Readers Say:

## Put Some Fun Back Into Amateur Radio

Editor, CQ:

As an Air Force member, I'm presently stationed in Sicily. This has curtailed my ham radio activities, except by keeping in touch through CQ magazine. But this hasn't

quenched my ambitions to operate, contest, and build. I hope some of our amateurs at home made it a point to switch ON their HF rigs, dial up 10 meters, and welcome a new Novice or Technician. Sure wish I was there the day their new privileges were put into effect. I can imagine 10 meters opened up just for them. Have some fun. Work a Novice or

two, or more! Don't forget 220 or 1.2 gigs.

Also, I hope to see familiar faces at K5TYP, the ham club at Keesler AFB, Mississippi, where I'm stationed next. This club is supported financially by the USAF due to its timely assistance during Hurricane Elena on Labor

(continued on page 110)

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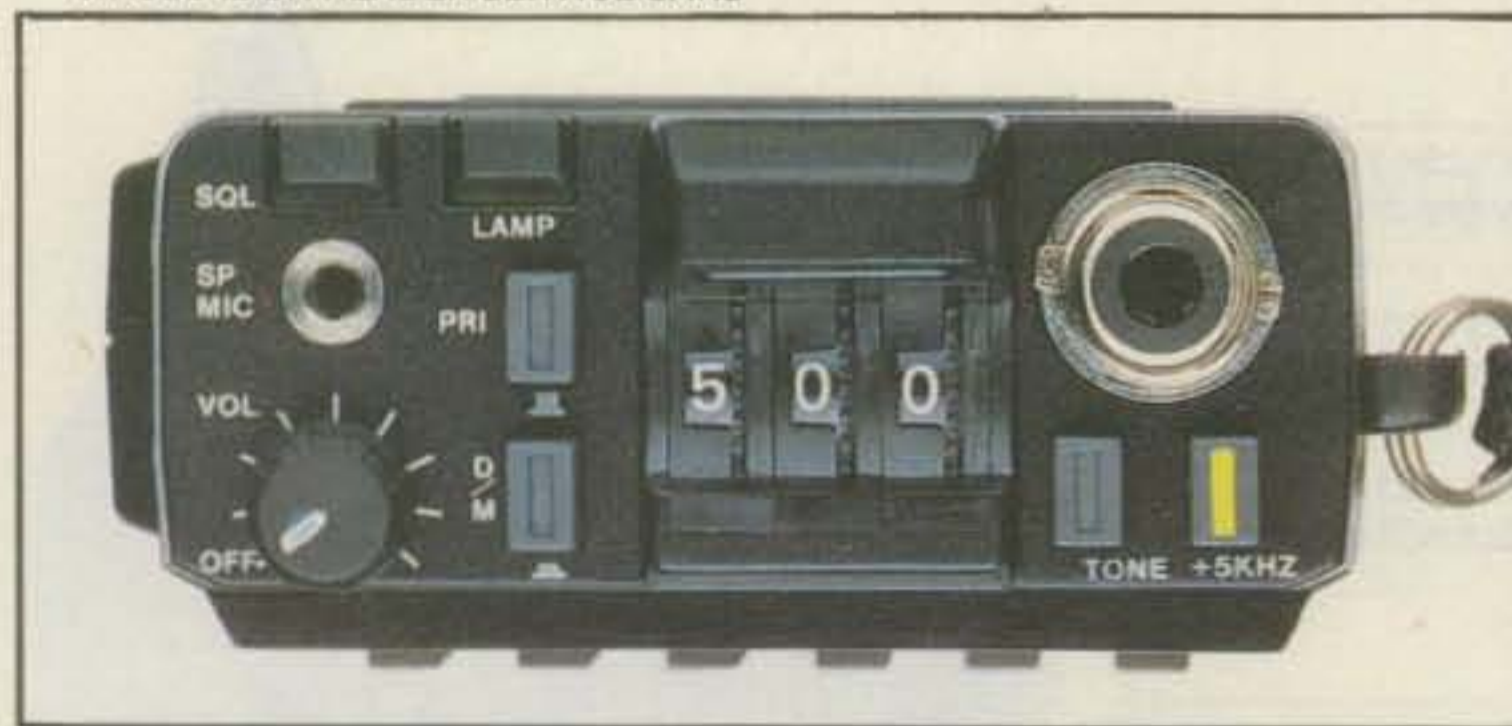
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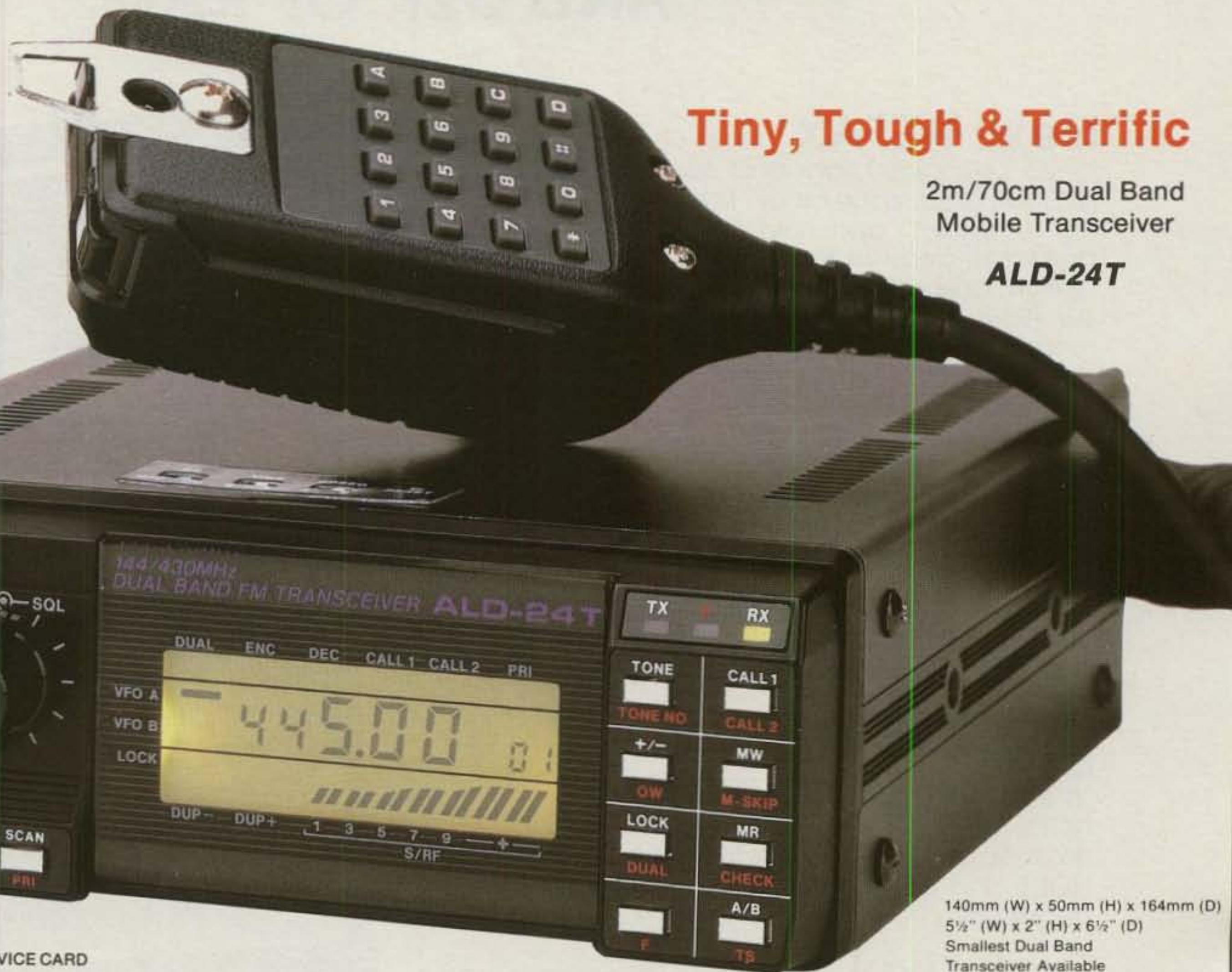
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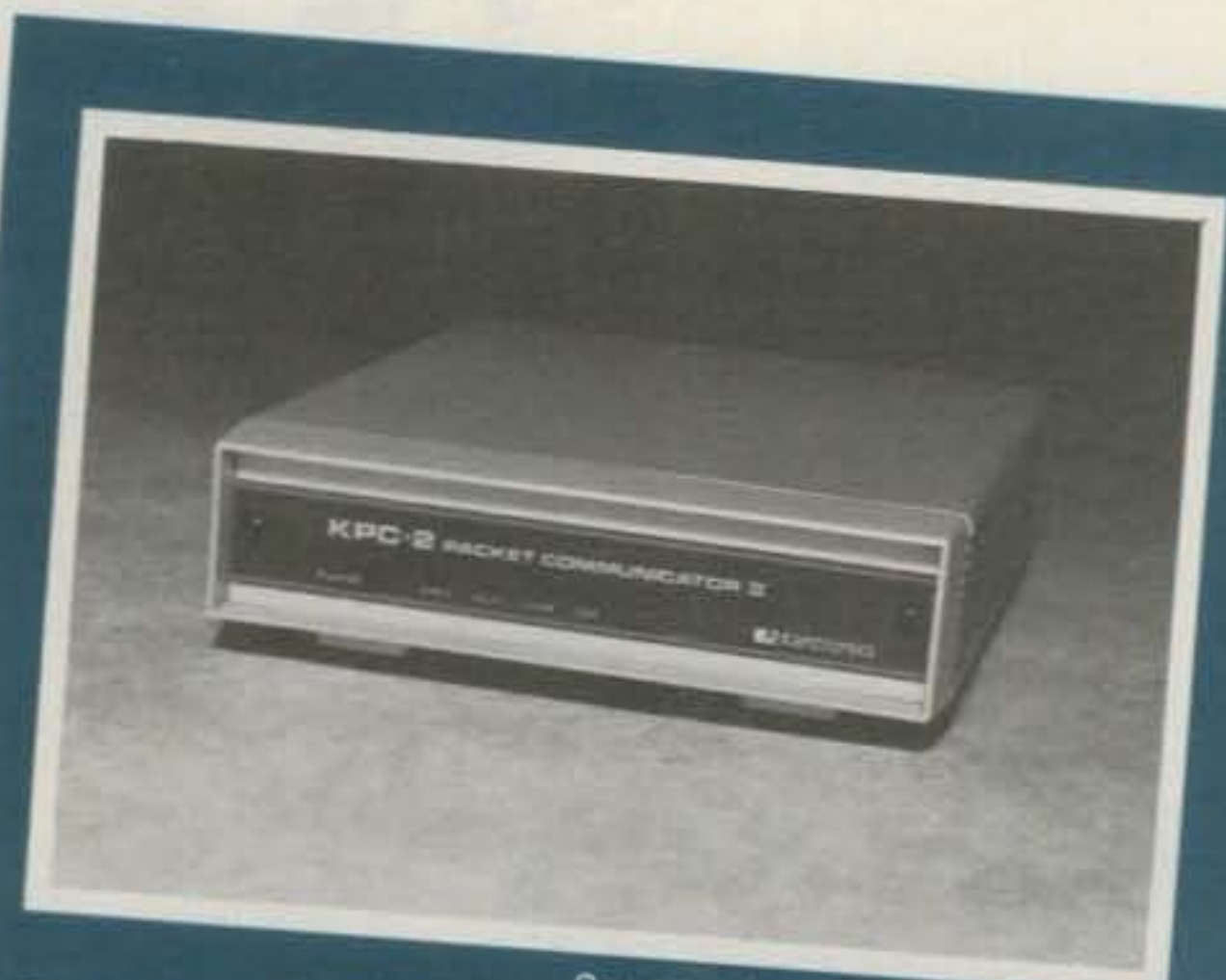
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## **The Western Sahara Story Part I**

### **How DXCC Country No. 319 Was Born**

BY MARTTI LAINE\*, OH2BH

*Martti put together Part I in rapid time in order for it to make this issue. He will be giving talks on this trip at the DX convention in Visalia, CA and at the Dayton Hamvention. Part II, the actual operation, will follow later on.*

—K2EEK

One of the ultimate realities in DXing is that new DXCC country counters seem to be few and far between by the time you have toiled in the DX vineyards long enough—say, a bare minimum of a couple of decades. This is one of the fundamental truths of life appreciated by all right-thinking DXers—those who have seen the light, those who are true believers, as Cass would say.

The same, of course, applies to the birth of new DXCC countries in this big wide world of ours. With the choice of countries possibly qualifying for our recognition—be they kingdoms, republics, or empires—leaving us nowhere to go, the DX community has demonstrated its ingenuity in starting to collect buildings and monuments. Well, a few submerged islands may have slipped in there, too. Deserving DXers have gone out of their way to identify new counters just because life must go on.

Every once in a while some of the questioning types get together to ponder over whether or not some genuine counters might have gone unnoticed—countries constituting a separate entity by reason of government; countries with their own individual identity, language, and culture, their own constitution, specific geographic area, flag, and coat of arms. That may seem a rather remote possibility to many of us, since the days of Christopher Columbus—not to mention explorers of younger vintage—are long gone. Or, might there still be something out there that has escaped our attention? Spinning that globe on your operating desk is always worth the exer-

\*Nuottaniement. 10D, 02230 ESPOO, Finland



*Justo, EA9EJ, was handing out Rio de Oro contacts in the late '60s. He was running wild, and today's Old Timers were all excited.*

cise. One of the basic truths of DXing is that you should always keep trying. For one thing, DXers are believers. They believe in things that ordinary mortals have difficulty in comprehending. But then that's the way it has always been and always will be.

#### **Meeting in Marbella, Spain Sunny EA7**

Juan Rosales, EA9IE, is one of the notables known to all Big Gun DXers and local QRP types in the Spanish-speaking areas and throughout the world. Mr. Rosales is president

of the Lynx DX Group in Spain, today's prominent group of DX aficionados in southern Europe. With his immediate group including Arseli, EA2JG, he hit upon a grand idea: the world should not forget the Saharawi people living in the middle of their African homeland, a vast expanse of empty desert situated in the northwestern corner of that continent. The idea was to study whether the Saharawi situation might provide some clues of value to the worldwide DX scene, something cherished by the deserving in all corners of the world. It was one of those sunny days caressing the shores of Costa Del Sol when we all met in Marbella, Spain at a cozy seaport restaurant, tasting the best of

REPUBLICA ARABE  
SAHARAUI DEMOCRATICA  
MINISTERIO DE INFORMACION



الجمهورية العربية  
الصحراوية الديمقراطية  
وزارة الإعلام

REF: 803/87

AUTORIZACION

El Ministerio de Información en aplicación de las normas sobre la materia, ha autorizado a efectuar transmisiones de radio aficionado dentro del territorio nacional de la Republica Arabe Saharaui Democrática bajo las siguientes condiciones:

TITULARES: Sr. Arseli Etueguren BARDECI. EA2JG  
Sr. Agustín Lorez Ibarra. EA2ANC  
Sr. Martti Laine. OH2BH

INDICATIVO: Será de utilización el indicativo y estación propias de la Asociación de Radioaficionados Saharaui S/RASD.

BANDAS: 2,10,12,15,17,20,30,40,80,160 metros.

PERIODO AUTORIZADO: Del 18 al 25 de Octubre 1987.

La presente autorización estará sujeta a las normas propias sobre la materia de la Republica Arabe Saharaui Democrática y a las de caracter internacional que le sean de aplicación.

Bir Lahlu a 7 de Septiembre de 1987.



The first Western Sahara-RASD license which provided the basis for an initial amateur operation and another new country.

Mediterranean seafood and engaging in plain DX talk. Many hours were spent studying the local wine list and talking about the plight of the Saharawi people—how to make a new DXCC counter out of their Saharan home country.

By the time April rolled in, the plan had assumed concrete shape and another meeting was called to order in Andorra, C3-land, in May. The May meeting saw the formation of an organizing body which charged itself with defining and finalizing the structure of a plan to activate Western Sahara and establishing contact with the Polisario Front—the military arm of the Saharawi liberation movement in the RASD (Saharan Arab Democratic Republic).

Conscious of the fact that a country always gains international status through its admission to the DXCC countries list operated by the American Radio Relay League in Newington, Connecticut, I was authorized to be the Lynx DX Group spokesman in our dealings with the ARRL—to be the RASD representative while presenting our case to a DXCC workshop at League headquarters. My assignment was to collect basic information, do a presentation, and in general make things jell. It turned out to

be a somewhat discouraging assignment in view of the scarcity of available information and the difficulty in obtaining it. But with DXers being the smartest ones around, they eventually learn that there are things that are known to be true although they cannot always be proven. One must learn to believe.

In this particular case, there was a war situation with part of the RASD territory occupied by Morocco, and this meant that most of the information, facts, and figures had to be gleaned from a variety of sources such as the International Court of Justice at the Hague, old Spanish laws going back to the Franco era, United Nations resolutions filed with the world organization in New York, and Organization of African Unity (OAU) documents held in Addis Ababa, Ethiopia. The whole matter was considered quite complicated, and our understanding was that Moroccan occupation of the area was fully supported by the United States. How could the ARRL support the Saharawi case in a war fought by the Saharans against an ally of the United States, we thought. Hmmmm—impossible. A new DXCC country seemed out of range.

## Taking the Bull By The Horns— Heading To Newington

Following preliminary consultation with League headquarters, a meeting was scheduled and I found myself on a Pan Am jumbo to present the case to the DXCC types in Newington, in the hopes of delivering a new one for the deserving. I was on my way to see the ubiquitous DXCC Desk and try out the chair of Don Search, W3AZD, to meet up with John F. Lindholm, W1XX, shake hands with Dave Sumner, K1ZZ, and spend part of a day at the IARU section with Naoki Akiyama, JH1VRQ.

Although it is true that DXers have been everywhere, known everybody, and seen everything, it came as a total surprise to me to realize that the HQ gang had conducted an in-depth study of Western Sahara from a U.S. point of view and were all prepared for a detailed discussion of the matter. They had filed highly valuable U.S. State Department notes describing Washington's position on the RASD. Those documents stated in no uncertain terms that the United States was not recognizing Morocco's claim to the area or its presence there. Instead, the U.S. fully supported the United Nations Declaration on the Granting of Independence to Colonial Peoples and Countries. Morocco's decision to press its claim to Western Sahara had in fact complicated its relations with the U.S. and had brought official U.S. protests. The U.S. had also consistently supported OAU efforts to bring the conflict to an end. At the Newington conference many of the open questions were sorted out and settled; the road was cleared for a final presentation of the case to members of the DX Advisory Committee—16 men representing all ARRL divisions.

Newington was a lot of fun, but our mission had to go on to cover the length and breadth of the United States. This meant flying south to Florida and from there over the Rockies to the Pacific coastline to meet with all the dignitaries of the Stateside DX scene, to reach out to the DX gurus scattered all over the country. It was a well-defined crusade which took this Old Timer with his 60-page presentation to the hub of DX politics.

## So, What Is This Country Anyway? Is It A Country?

Most of us ancient DXers the world over remember Spanish Sahara, EA9. A good many of us Old Timers, tall with towers, strong with power, tireless in tuning, worked Justo, EA9EJ, for a new one before the Spanish withdrew their presence from the territory of *Rio de Oro* by February 26, 1976 when the country was deleted from the DXCC list. Spain had signed off this one—one of its former colonies—to be handed over to the people of Sahara with the country to be reorganized in keeping with the Charter of the United Nations. But as the Spanish pulled out in accordance with the treaty they had concluded with the other parties involved, Morocco and Mauritania moved into the territory, pushing a good part of the one million Saharawis to the middle of the desert—to a refugee camp situation. All this came to pass because the highly valuable natural resources found in the region tended to divert attention away from the plight and rights of the Saharawi nation. The truth is simple, and when one hears it, there is an end to all speculation.

Very soon in the aftermath of these developments unfolding in the middle of nowhere, in



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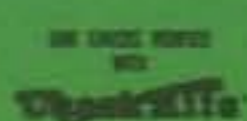
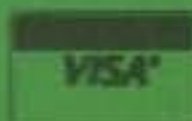
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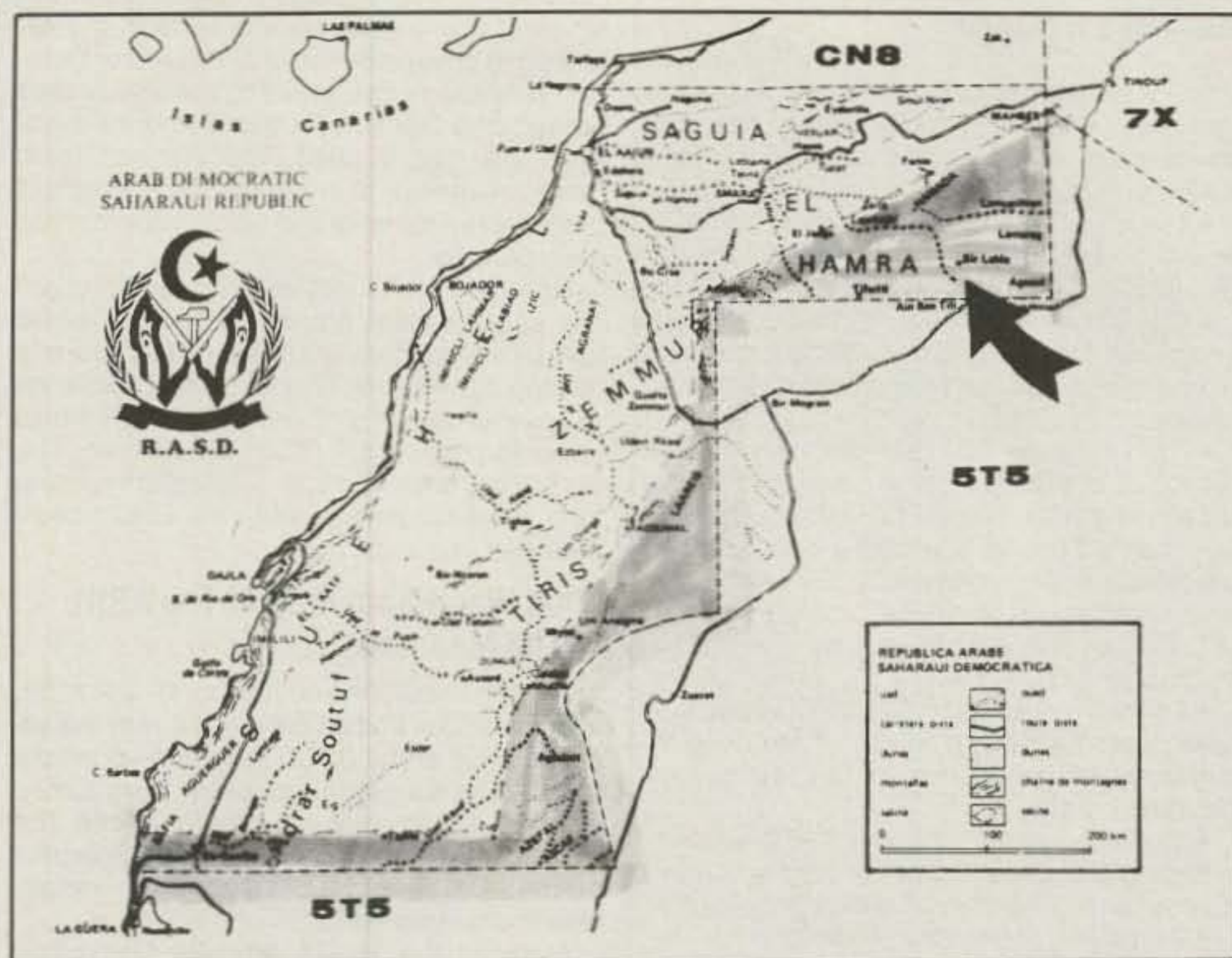
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Western Sahara comprises an area of some 150,000 square miles mostly under Moroccan occupation. Only a vast desert area along the eastern borderline is controlled by the RASD. The administrative center is located in Bir Lehlu.

the Saharan desert, the Saharan Arab Democratic Republic was officially proclaimed and its constitution was adopted. At the same time a long-drawn-out desert war had begun in that part of the newly established republic occupied by foreign armies. These hardships have now afflicted the country for 11 years, only making world headlines in times of major military conflict.

### Who Wants To Go To The Middle of a Desert War?

It is a truism that all DXers eventually learn how things are, DXers seeing, hearing, and understanding things very easily that others have difficulty in comprehending. To that end, many studies and contacts were made through diplomatic channels to obtain more current and detailed information on the RASD situation and the civilian population of the country. All indicators were pointing in the same direction: what we saw before our eyes was an endless desert war, and the people inhabiting the country seemed nothing short of a band of guerrilla fighters armed to the teeth. But no information was available on the civilian population or on their daily problems back home in their simple native surroundings. No word on the Saharawi people. Were there any people or human beings in the first place in that country, or was it a case of military personnel fighting along a 1,200 mile fortified wall built by the Moroccan-occupied zone and a territory controlled by the Saharawi nation? There had to exist a part of the country with which we were not yet familiar. There had to be friendly people down there who would be willing to talk to us and who would probably be prepared to help us make this a new DXCC counter.

Yes, all the diplomatic parameters were the same. To highlight my point, I would like to quote the bottom line of a piece of advice re-

ceived from the U.S. Embassy in Helsinki: "It is the political officer's opinion that there are better ways to spend your holiday time than possibly getting shot at. The Moroccans have built earthen walls around this territory and if you are caught in it, you are fair game for target practice. I hope this helps you make your decisions!"

My own Foreign Ministry disclaimed all responsibility and recommended that I stay at home with Mom. How simple. But they did not

realize that DX is a state of mind and that the top of the line is the only place for a DXer to be.

### Contacts Established With The Government of Western Sahara

The RASD has established many embassies and representative offices throughout the world, particularly in countries maintaining diplomatic relations with the Saharawi republic. The Saharans rely on those missions for their supply of outside assistance, which has proved crucial to their survival. Ties with Spain are obviously close because of their former colonial relationship dating back to the 1880s and because of their shared history and language. Arseli, EA2JG, did a superb job of establishing close cooperation with RASD officials in Spain. He had a fair part of his heart devoted to Sahara, not so much because of its potential for separate DXCC status, but more because of recollections of his younger years spent in Western Sahara doing his military service. Jose Garcia, EA2AA, turned out to be another DX knower who even mastered the Saharawi dialect of the Spanish language. He often used to say that when you understand the dialect, you will understand everything—possibly even one of the mysteries of the ages generally appreciated only by the anointed ones, mysteries exemplified by that famous line *DX is!*

Following the formation of a highly successful leadership group of true-blue DXers to head this project, the idea of establishing amateur radio in Western Sahara on a permanent basis and embarking on an introductory DXpedition there gradually began gaining ground. Contacts were made with high-ranking officials right up to President Mohamed Abdelaziz of the RASD. The organizing party on their side was the RASD Ministry of Information. Somehow the interests of amateur radio coincided with the broader national interests of the RASD, as the Saharawis were looking for ways of letting the whole world know that they were there, not to be forgotten.

The original license came in early July with



This is the DXCC country workshop at the ARRL in Newington, Connecticut. From left: John, W1XX; Martti, OH2BH; Jules, W2JGR; and Don, W3AZD.

## Western Sahara—RASD— In a Nutshell

The origins of the conflict in Western Sahara can be traced back to the beginnings of Spanish colonial rule in the 1880s. In 1884 Spain declared a protectorate over Western Sahara. By the outbreak of World War I it had established formal jurisdiction over the territory. The first modern challenge to colonial rule came at the end of the 1950s in the form of a Saharawi guerrilla revolt. This was suppressed in 1958 by French and Spanish forces, but resistance to colonial rule had taken root, and in 1973 the Polisario Front was born.

Polisario sought to gain independence from Spain and full territorial sovereignty. There were also claims on Western Sahara—made explicit in the mid-1950s—by two of its neighbors, Morocco and Mauritania. Polisario had to move quickly and decisively to stake its claim for Saharawi self-determination. It began a series of actions against Spanish troops in May 1973. The Saharawi case began to attract international attention. The United Nations General Assembly had resolved in favor of a referendum on self-determination in 1966. In 1972 and 1973 the U.N. General Assembly further acknowledged the Saharawis' right to independence.

What follows is a chronological list of some of the highlights marking the history of the Western Sahara-RASD situation:

- The Polisario Front was born in 1973 to seek independence from Spain.
- Spain served notice in August 1974 of its intention to withdraw its presence and to hold a referendum.
- In October 1975 Morocco staged "the Green March" with 350,000 Moroccan troops crossing the border into Spanish Sahara.
- On October 19, 1975 the International Court of Justice at the Hague delivered an advisory opinion not lending support to Morocco's claims of sovereignty over Western Sahara.
- On November 14, 1975 Spain, Mauritania, and Morocco signed a tripartite agreement on temporary administration of Western Sahara to complete transfer of power to the Saharawi people.

- On November 19, 1975 the tripartite agreement resulted in the passage of Spanish legislation on Spain's withdrawal from Western Sahara—scheduled for February 28, 1976.

- The last amateur radio operation from Rio de Oro, EA8CR/EA9, commenced on January 24, 1976.

- On February 27, 1976 the RASD, the Saharan Arab Democratic Republic, proclaimed its independence and its constitution was adopted.

- By February 28, 1976 Spanish forces pulled out of Western Sahara and Rio de Oro became a deleted country for DXCC purposes.

- The RASD and Mauritania concluded a peace agreement on August 5, 1979. As Mauritania withdrew its presence, Morocco moved in to occupy the area previously claimed by Mauritania.

- On November 21, 1979 the United Nations passed a resolution urging Morocco to terminate its occupation of the territory of Western Sahara.

- On February 22, 1982 the RASD was admitted to the Organization of African Unity, thus becoming the 51st OAU member country.

- President Mohamed Abdelaziz of the RASD was elected vice-chairman of the OAU on July 20, 1985.

- By October 25, 1986 sixty-five different countries representing all continents had recognized the RASD and established diplomatic relations with the country.

- On August 1, 1987 the Lynx DX Group submitted its petition to the ARRL DX Advisory Committee for granting separate DXCC status to Western Sahara-RASD.

- On October 18, 1987 the first amateur radio group entered RASD territory launching the SØRASD operation and initiating a training program for the Saharawi people.

- On November 25, 1987 a United Nations delegation arrived in Western Sahara to conduct negotiations with the parties involved in the conflict—the RASD and Morocco.

- On February 12, 1988 the ARRL Awards Committee announced a unanimous decision, based on the DXAC opinion, to add the RASD to the DXCC list of current countries.

our operation scheduled for August. Later the terms of the license were amended and extended to cover a period until the end of October. This was necessitated by the unexpected assault of a German DX group and the problems this had created. The German team made an attempt to enter the country without proper arrangements and without appropriate entry permits.

Now the license was on hand. Go or no go? The choices were not many. The trip would take us across heavily armed military bases in the south of Algeria. Was this a real challenge or an exercise in stupidity? Only God would know. But then again, DXers are different. DXers are the ones who appreciate poetry, literature, classical music, and new DXCC countries every now and then.

## What Was Happening At The ARRL In The Meantime

Moving ahead on another front—the ARRL and its various bodies concerned with the administration of the DXCC program—proved a lengthy but successful process. Ours turned out to be a solid case, not a marginal one. The matter was making headway with the prospect of a new DXCC country listing in sight—totally new and no trade-offs.

Many of the 16 DX Advisory Committee members stood out as highly knowledgeable DX stalwarts with deep insight into the details of the issues involved. Additional information had to be provided and was collected accordingly. Eventually it all came to a happy end with the DXAC voting 15 in favor and one abstaining. Not a single "no" vote. Hip hip hooray!

A new country was born for the deserving. A big round of applause was due for the Saharawi people. Their existence was recognized. Noted for its great solidarity, the worldwide amateur radio community had demonstrated its goodwill toward the forgotten people of Sahara. Now their message and radio signals would be taken to every home throughout the world of amateur radio.

The ARRL Awards Committee had no trouble proceeding with its formal announcement, based on a unanimous 7 to 0 vote, of granting DXCC status to Western Sahara-RASD and adding it to the current countries list to bring the new total to 319 countries.

## Destination Sahara—A Desert War And a New Counter

It was time to start packing for the trip to Africa. Also, it was time for many wistful moments and tears with the immediate family and friends. Dad was going to war! Should I take my white shirt and a tie or a white flag for safety and surrender? Should I bring along a machine gun or a TH3? My mind was getting dizzy with all sorts of troubled thoughts, and the success with our petition for new country status immediately took a back seat to my preoccupation with what lay in store for us. At least I would need God's blessing and the backing of a sincere ham spirit to be able to promote amateur radio in a war situation. I needed everybody's moral support and participation. I needed my family's understanding and my children's wish for Dad's return.

Hopefully I would have all of that now that I was boarding a plane for a flight to Western Sahara to be left there in the middle of a desert war. See you in the pile-up!

(To Be Continued)



The original group behind the first successful effort to put Western Sahara on the air. From left to right are Angel, EA1QF, Juan, EA9IE, and Arseli, EA2JG.



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AT-150 Automatic antenna tuner	445.00	389 <sup>95</sup>
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AH-2A Antenna tuner system, only	519.00	449 <sup>95</sup>	
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AG-1* Mast mounted preamplifier	99.50	
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PS-35 Internal power supply	219.00	199 <sup>95</sup>
AG-35* Mast mounted preamplifier	99.75	

\*Preamp \$99<sup>95</sup> with 471A or 471H Purchase

Accessories common to 271A/H and 471A/H

SM-6 Desk microphone	47.95
EX-310 Voice synthesizer	59.00
TS-32 CommSpec encode/decoder	59.95
UT-15 Encoder/decoder interface	34.00
UT-15S UT-15S w/TS-32 installed	96.00

VHF/UHF mobile multi-modes		Regular	SALE
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IC-490A 10W 430-440	Closeout	699.00	399 <sup>95</sup>

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EX-310 Voice synthesizer	59.00	
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**There is light at the end of the tunnel!  
W1ICP helps us to understand the causes and  
cures of RFI. In this concluding part we learn  
about the benefit of ferrite chokes.**

## **RFI and The Novice Some Basic Information Part II—Conclusion**

BY LEW McCOY\*, W1ICP

Last month we covered some of the history of RFI and the very important problem of public relations and interference. Also, we went into the direct approach of high- and low-pass filtering for TVI plus discussed VCR problems. In this concluding article we will go into ferrite choke lead filtering.

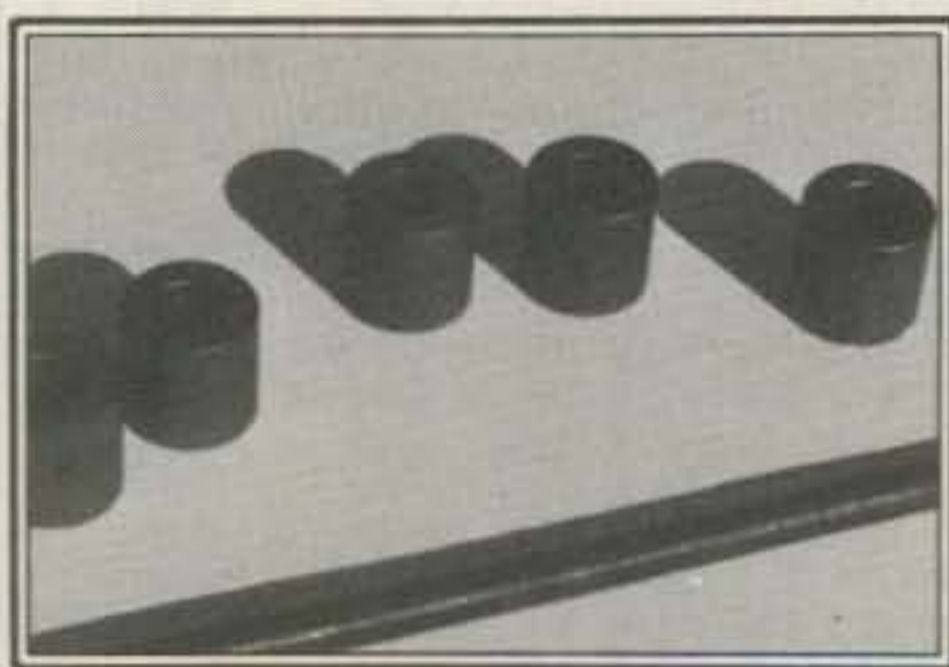
### **Ferrite Chokes**

As far as I know, the Germans (during World War II) pioneered the use of ferrite or powdered iron core chokes. They used chokes on the outside of cables to prevent radiation from the outside of the cable, thus ensuring better security of signal theft or spying. Normally, when using coaxial cables to feed an antenna, we expect all the RF to be inside the cable with none on the outside. The ferrites serve to "choke" off the RF, and the only thing that would radiate would be the antenna. The British also did considerable pioneering in the use of ferrite materials as chokes. In fact, I would heartily recommend the *RSGB Radio Communication Handbook* chapter on interference as a study guide. This handbook is better than most American books simply because it appears they have a more serious RFI problem than we do.

A high-pass filter will stop the RF fundamental signal from your station at the TV front end. For the "back door" or AC line, we need additional filtering. The simplest (and very effective method) is with a ferrite choke. This type of choke is something that I recommend very highly for most types of RFI.

There are several types of ferrites available, and I have provided a list of sources and the types available at the end of this article. The snap-on type and split type ferrites are a recent development. This type of ferrite is easy to install on cables and conductors that have large fittings at the ends. In other words, you don't have to remove any fittings to install the ferrite choke.

The "choke" part of a ferrite choke refers to the choking effect of placing such a device in a



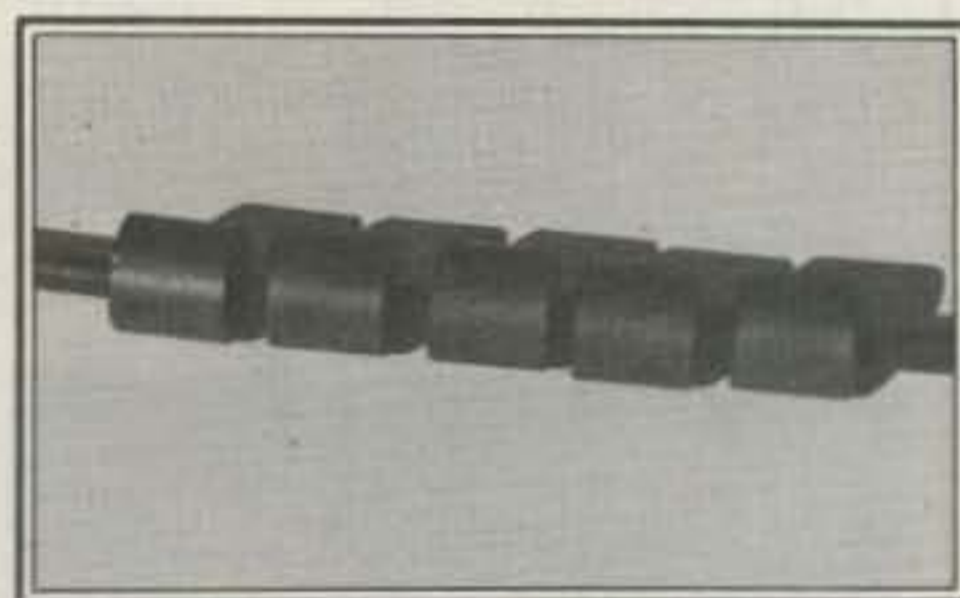
These are the ferrite "tubes" distributed by Radiokit. The piece of coax is RG/8U.

line that may be susceptible to RF pickup. The ferrite material in itself will have certain impedances, or reactance, at certain frequencies. By winding turns of the lead in question around the ferrite, we improve the effectiveness of the choke.

A snap-on ferrite is one that snaps open as shown in the photos. The lead winding is put on and then the ferrite snapped back together. In the case of filtering the AC lead going to a TV set, I would recommend the use of two snap-on chokes as shown at F in the photos. This consists of four zip-cord turns on each choke. The choke should be placed as close as possible to the AC entrance point of the TV set. Keep in mind that if a VCR is used, a similar choke should be placed on the VCR. This type of choke will provide at least 25 dB of RF attenuation, which should be adequate to clean up an AC line.

It wouldn't be fair to the reader if I talked about ferrites and then didn't give sources of supply, so at the end of this article there is such a list.

To repeat—a ferrite choke consists of a ferrite (or sometimes powdered iron) core (see photographs) and wire wound on the ferrite core. In our case, the wire wound on the core is the wire or cable we want to filter. These chokes act the same as a resistor in the line and serve to choke back, or choke off, the RF flowing on the line. They will not hinder DC or very low frequencies of RF, but will offer a high resistance (reactance) path to the RF about which we are concerned.



The ferrites are slipped over the coax to make a very effective choke for the outside shield of the coax. This eliminates the need for a balun.

I would never recommend that the amateur do any kind of work to the *inside* of a neighbor's piece of equipment. When *anything* goes wrong, you will be blamed for it. However, the ferrite choke approach to filtering leads can be tried, particularly on AC and speaker leads. I won't guarantee it, but ferrite chokes work like magic and can clear up most problem cases.

The two steps, a high-pass filter and RF chokes, are usually all that is required to clean up a TV set or VCR. There are some things you can do at your station to avoid incidental RF radiation, and by doing so you just may reduce the possibility of fundamental overload at the TV set.

### **Your End—What Is Needed**

Avoid using cheap coaxial feed line. What you find with the cheaper lines is the lack of good braid shielding. In other words, the outer conductor of cheap coax doesn't really have good shielding and the RF can "leak" through and get on the outside of the braid. Buy only reputable brands.

Also, avoid having any outer "shield" radiation. Such radiation could cause problems. Again, ferrite material can be used on your coaxial feeders to make chokes. I have shown a heavy-duty type of ferrite bead that can be slipped over the coax (you need six of them for an effective choke) and then taped in place. Last time I checked, these cost \$1.50 each and you need six for each choke. I would recommend two such chokes, one at the anten-

\*Technical Editor, CQ, 200 Idaho St., Silver City, NM 88061



This is the ferrite kit sold by Palomar Engineers. It is a wide assortment of ferrites. They can be used on leads of equipment or for actual lead filtering at the insides of transmitters or equipment being interfered with.

na and the other at the rig. I have never been very enthusiastic about using baluns simply because they may or may not work. However, the entire explanation is too long to go into here. You don't need a balun if you use these chokes. Incidentally, some manufacturers may call these ferrite chokes baluns. The name "balun" is derived from feeding a balanced antenna with an unbalanced line, hence **balun**. I'll get back to feed lines and antennas in a moment.

I touched on low-pass filter installations and your station operation, but there is more to the subject. The primary problem in your station operation is the generation of unwanted harmonics. Such harmonics, if they fall in an amateur band, can cause interference. The visible interference can take many forms. Think for a moment about your communications receiver. In order to hear a CW signal you must generate another signal via a "beat frequency oscillator" and "beat" that oscillator against the incoming CW signal you wish to hear. If you didn't have the beat, all you would hear is a thump-thump-thump of the CW signal, which would be very difficult to copy.

When your harmonic signal enters the TV set, it beats against the TV carrier signal and produces a visible crosshatching on the screen. How bad the crosshatching is depends on the TV signal strength, the strength of your harmonic, and the relationship in frequency of the two signals. The farther apart they are, the less visible the interference.

Your transmitter (in fact, all transmitters) will generate harmonics to some degree. Let's say you are operating on 28.300 MHz on 10 meters and running 100 watts. Your second harmonic would be at exactly twice 28.3, or at 56.6 MHz, which incidentally is Channel 2 TV. Channel 2 is 54 to 60 MHz and the TV carrier is just above 55 MHz. Your harmonic, if strong

enough, will cause a very visible crosshatching. (Your 10 meter fourth harmonic falls in Channel 6.)

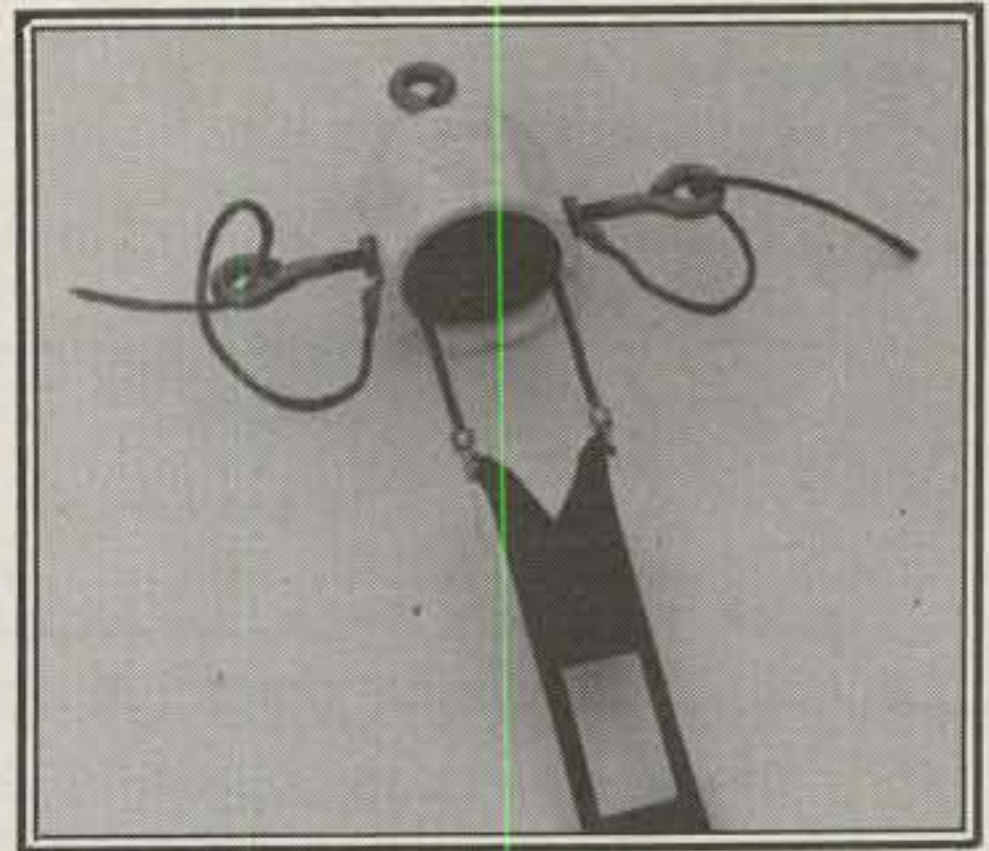
The attenuation of the second harmonic will depend a great deal on the design and operation of the final stage in your rig. Normally, we can think in terms of at least 40 dB attenuation of all harmonics in modern rigs (40 dB is required by FCC rules). With 40 dB and assuming 100 watts output, this would mean a second harmonic of .01 watt. This may appear insignificant, but take my word for it, such a signal under the right condition could cause some bad interference. The reader is likely to say, "But my rig is all shielded and completely modern, so why should I worry?" Shielded or not, that harmonic is going to go out the antenna terminal to the antenna right along with your fundamental signal at 28.3. Not only that, but so will the third harmonic that falls in TV Channel 6.

So what is the answer? It's really quite simple: install a low-pass filter on the output of your rig. As I said in Part I, a low-pass filter is just the opposite of a high-pass filter. Everything above the cutoff frequency (usually around 35 MHz) is attenuated, but everything below the cutoff goes right on through. The attenuation is usually on the order of 70 dB, and this is just fine for our purposes. This is assuming one very important point—that the amplifier stage of the transmitter is well shielded so that *all* signals must pass through the filter and not *around* it.

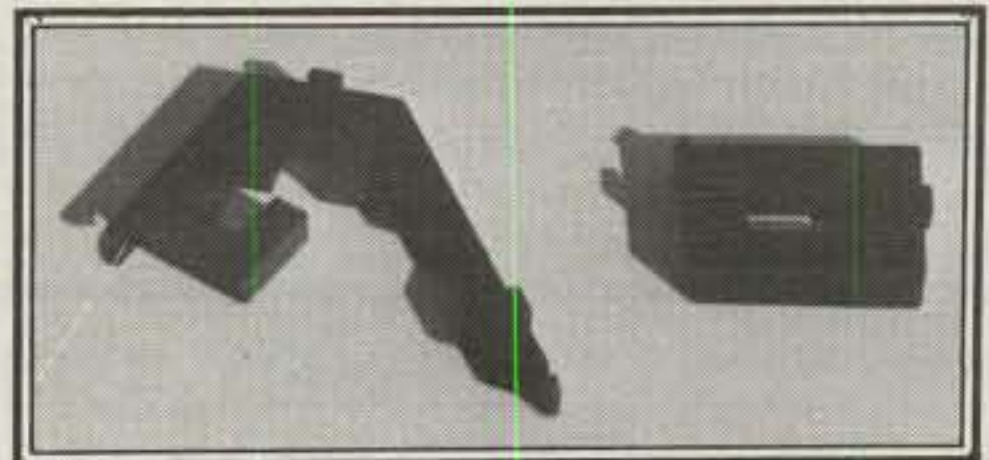
To sum up, we need a low-pass filter on the transmitter. At the TV receiver end there must be a high-pass filter installed and ferrite chokes on the AC line.

### Feed Lines and Antennas

It has been found from experience that normally you don't encounter harmonic TVI from operating on 160, 80, or 40 meters. The har-



As pointed out in the text, good connections are needed at the antenna. This is a solidly made center connector available from Certified Communications.



This is the snap-on choke described in the text. These are very easy to use.

monics don't have a strong enough amplitude to do any harm. However, from 20 meters on up you can have problems. Also, from experience, the use of a beam antenna mounted on a tower and fed with coax should ease any problems. A beam will "shape" the field of your signal and help keep it away from neighbors' sets, assuming of course you aim the beam in the right direction!

As I pointed out earlier, an RF choke or two on your transmitting feed line might also help. Many amateurs use open-wire feeders, and there is no reason why such feeders should cause TVI, regardless of what you might hear from other amateurs. Feed lines are not supposed to radiate. If they do, they become antennas. It is as simple as that. The inverted-Vee antenna has become very popular over the years simply because it only requires a single support. However, it should be made very clear that a horizontal dipole is better both in gain and general operation (and better as far as TVI is concerned).

Make sure that all antenna and feed-line connections are solidly made—no loose joints. A bad connection can set up RF arcing. The connection becomes a nonlinear rectifier and will actually generate harmonics and interference, so no sloppy connections.

There are many other types of TVI which are more specialized. For example, 6 meter operation can cause what is known as "adjacent channel TVI" because 6 meters is directly next to Channel 2 in frequency. There are also some forms of UHF TV interference. In any event, if you are experiencing some odd-ball type of TVI, I would recommend studying the various amateur handbooks for more information.

### Computer Clean Up

More and more amateurs are using comput-

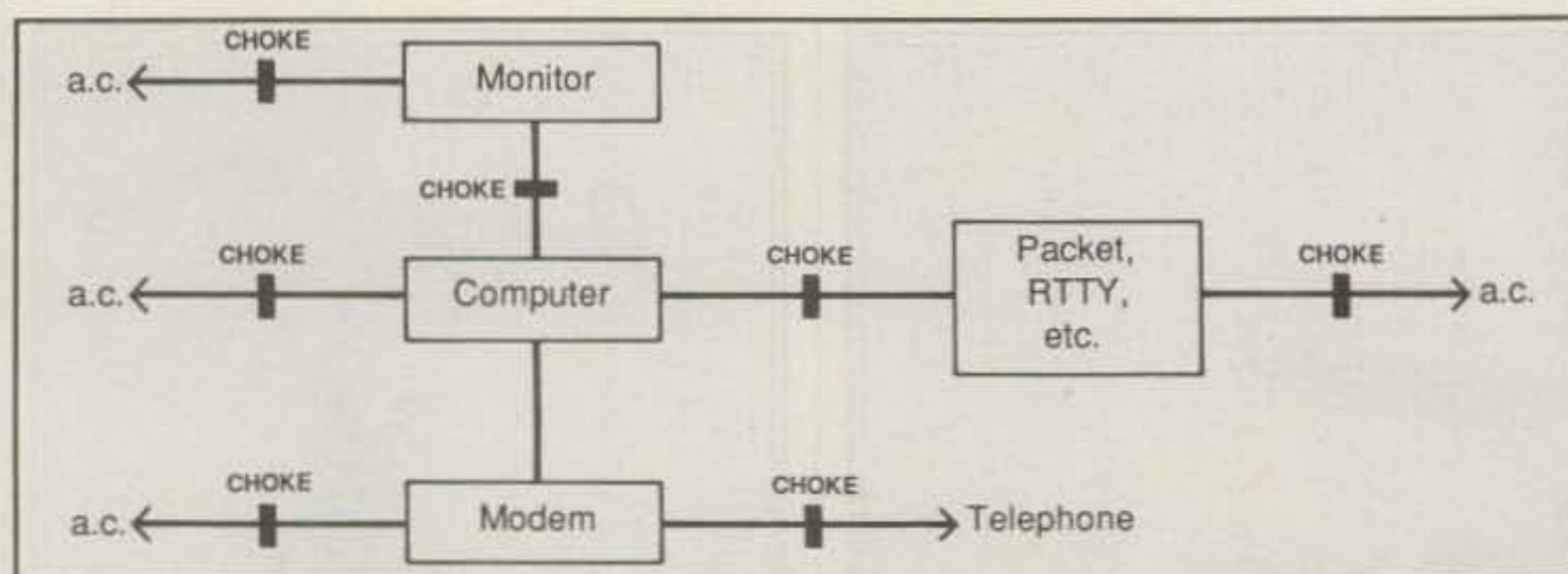


Fig. 1— Placement of ferrite chokes to clean up a computer and its accessories.

ers in close conjunction with their station operation. Packet radio depends on computers for that type of operation, as do many forms of RTTY and other modes. Computers are notorious for creating interference. I have cleaned up many computers so that they could be operated directly alongside my amateur equip-

ment. The approach to doing a good job is lots of lead filtering using ferrite chokes.

Fig. 1 shows a computer and its various devices and where ferrite chokes should be placed. It is best to use the "shotgun" method in this case and filter every lead that leaves or enters the computer. Once the cleanup is ac-



Here we see the AC line wound over four snap-on chokes, in groups of two. This would provide about 30 dB of attenuation from the broadcast band to 300 MHz or so.

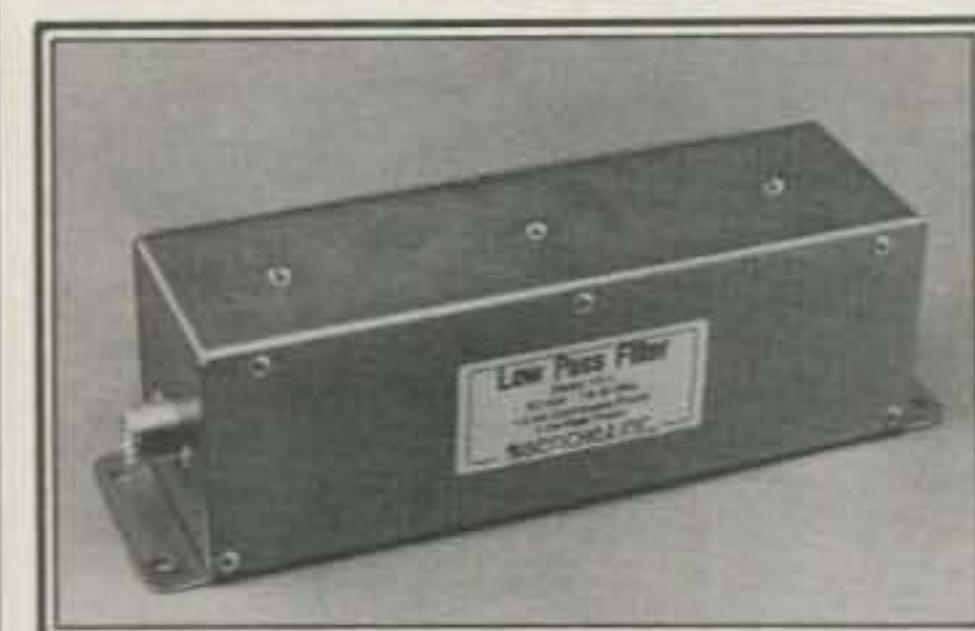
complished, you can remove filters, one at a time, checking to see which ones are really necessary.

There are cases of interference to computers resulting from the operation of a station. However, the steps outlined above should work to clean up such problems. And sometimes even more important, the operation of the computer won't cause interference to you.

### Telephone RFI

RFI from your station to telephones is not your responsibility. In the good old days when Ma Bell owned all the telephones, the company would take care of cleaning up their phones. These days the story is different because many companies make telephones and peddle them to the public. You may be successful in getting the owner of the offending telephone to write to the manufacturer of the telephone to get service information. You can be sure that the manufacturer of the equipment knows about interference and how to cure it, but getting answers is a problem in itself. Telephone interference is similar to stereo problems. RF from your station gets into the telephone and is rectified by the phone electronics, and your voice is then heard on the phone.

Ferrite chokes will help, but may not always do the job. It may take bypassing and filtering of circuits within the telephone itself. Bell systems and A.T. & T. have methods for filtering their phones and equipment. The ARRL *Radio Amateurs' Handbook* RFI chapter has detailed information on this subject, and I would strongly recommend the material. The problem is keeping RF out of the phone itself. Keep in mind that some phones with answering service also have AC connections. It is important that all leads be filtered.



The Bencher YA-1 low-pass filter.

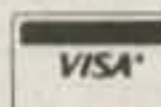
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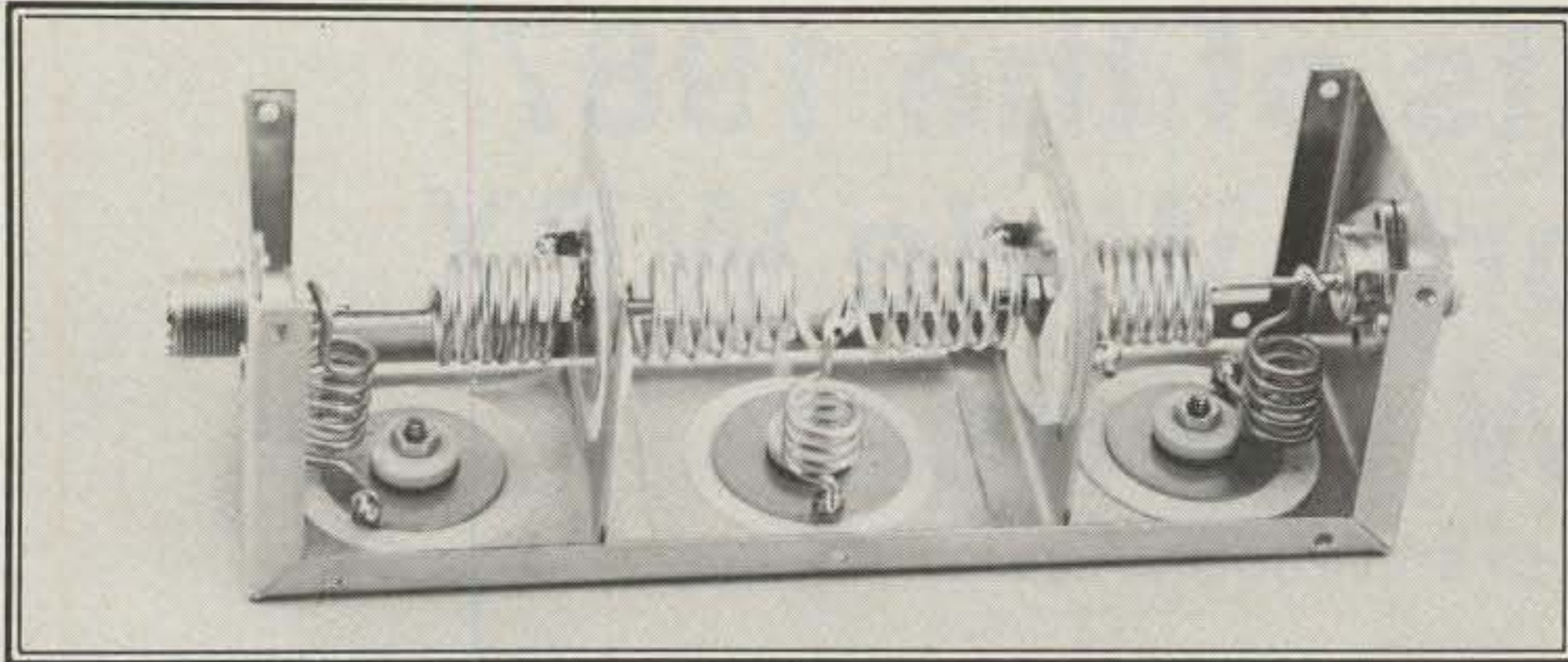
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Interior view of the YA-1 filter. It is rated at 1.5 kw continuous power and 5 kw peak power.

There was a good article on telephone interference in *CQ's* sister publication *Popular Communications* in the February issue of this year. Julian Macassey, N6ARE, writes a monthly column called "On The Line" which covers telephone technology, and in the February issue he devotes two pages to the subject of telephone interferences, its causes and cures.

By now you should have a good idea of how to tackle any RFI problem. The important steps have been outlined, and in addition I would suggest studying the handbooks I have mentioned. Also, an excellent handbook on the whole field of RFI is available from *CQ*. The author is W.R. Nelson and the name of the book is *Interference Handbook*. On the subject

of individual consulting, for myself, I have to apologize but I just don't have the time to research and answer specific questions. Time is getting too precious for me to answer a lot of mail, and there is a free technical information service available.

The ARRL has a technical service and ATC program. The ATC stands for "Assistant Technical Coordinator," and most areas of the USA have ATCs who can assist you. If you have a specific problem, write to the ARRL with your letter addressed to the attention of the ATC program.

#### Suppliers of Ferrite Materials

There are several suppliers of materials for

making up ferrite chokes. The *Snap-On chokes* are available from:

**Computeradio**, P.O. Box 282, Pine Brook, NJ 07058 (201-227-0712).

**MFJ Enterprises**, Box 494, Mississippi State, MS 39762 (800-647-1800).

In Canada, **TEXPRO Sales**, 4087 Harvester Rd. Unit #10, Burlington, Ont, Canada L7L 5M3.

Ferrite RFI kits can be obtained from:

**Palomar Engineers**, Box 455, Escondido, CA 92025 (619-747-3343). Palomar has a kit of ferrites specifically designed for RFI. One of the items they have is split ferrites, which can be slipped over cables and then taped together. This eliminates the problem of removing fittings to get the cable through the ferrites. In addition, they have an excellent tip sheet on RFI that comes with the kit.

**RADIOKIT**, P.O. Box 973-C, Pelham, NH 03076 (603-635-2235). Radiokit sells ferrite material, and they also market the large ferrite units for slipping over RG-8/U style coax. Catalog available.

**Certified Communications**, Rt 2, Pittman Rd., Landrum, SC 29356 (803-895-4195), makes the coaxial ferrites chokes shown in the photograph. They also make the center insulator for use with open-wire line shown. Catalog available.

**Amidon Associates**, 12033 Otsego St., North Hollywood, CA 91607. Amidon sells powdered iron and ferrite material. Catalog available.

Low-pass filters are made by:

**Bencher, Inc.**, 333 W. Lake St., Chicago, IL 60606 (312-263-1808).

**Barker & Williamson**, 10 Canal St., Bristol, PA 19007 (215-788-5581).

Radio Shack stores market high-pass filters.

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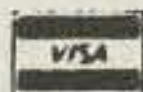
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# Results of the 1987 CQ World-Wide WPX CW Contest

BY STEVE BOLIA\*, N8BJQ

**A** new single op record, two multi records, a new club record, 853 prefixes worked, several continental records, a K index of 6, erratic conditions, plenty of DX and lots of fun. These are some of the highs, and the lows of the 1987 running of the WPX CW contest. Old Sol did not do us any favors during the weekend, except for those who worked on their tans; however, increased participation and some good operating kept scores rising.

The top single op performance was turned in by 5L7T, operated by YU1RL. His first attempt at contesting from Africa netted him a world record 8.6M points, more than doubling L8DQ's 1983 score. Second place goes to ZZ5EG, operated by Jorge, LU8DQ, with a new South American record. NP4A, operated by NP4Z is the new North American record holder, and world third high. Fourth spot goes to expedition trophy winner, N5RM/CT3 with VP2VCW rounding out the top five. The top five all broke L8DQ's 1983 record.

No single band stations broke world records, but outstanding scores were turned in from almost everywhere in the world. Special prefix station 4M7A operated by YV7QP was the high scorer on 10 meters, followed by YB4FNN and UB5INO. 15 meter honors go to ZY4OD, with African entries 5T5CJ and 9J2EZ taking second and third. Europe claims the 20 meter title with YT3AA in the top spot. Second goes to Brian, VO1QU, with K2VV in third. The top three spots on 40 go to South America, with YX5A operated by YV5ANT narrowly missing three million points. CX8BBH and OA4ZV were second and third respectively.

Less than 4,000 points separated the top two on 80 meters with UA9TS just edging out North American record holder HK3MAE/HK0 for the top spot. HA3MY was also in the race, finishing less than 10,000 points behind the leader. Top band honors go to UA2FF, who fell just a little short in his attempt to break the UP3BP/UF's 1985 world record, but did

\*4121 Garden View, Beavercreek, OH 45431



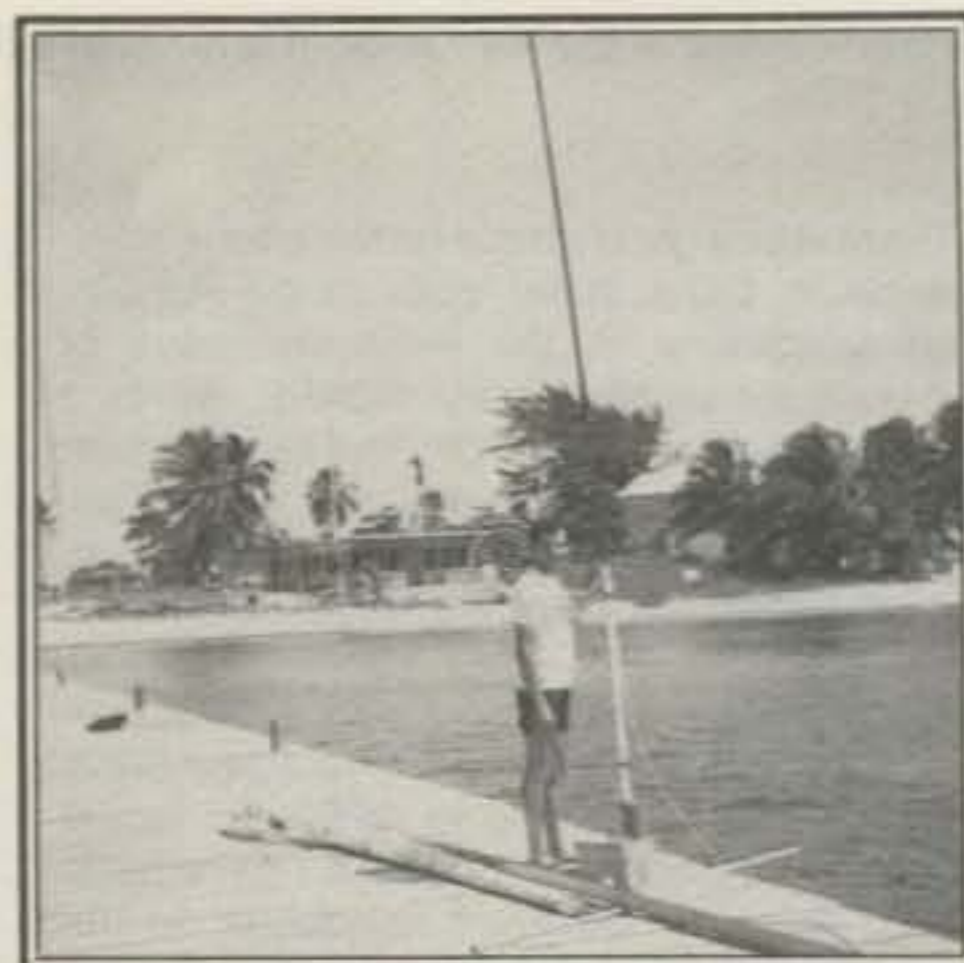
Wilf, DJ6TK, having a good time on 40 meters.

set a new European standard. LZ2CJ and UB5ZAL provided lots of competition.

The big signal among the QRP stations was Ralph, 4X6IF, with N3RS only 8K behind. On 10 meters, EA3EGV managed to be heard often enough to capture the top spot, with UR2CR leading the pack on 15 and UB5FDM the leader on 20 meters. OK1IOA, UP2BFE and RA3AUU were the champions on 40, 75 and 160.

V31A, operated by KR0Y and K5RX, overcame lost luggage, TVI and RFI problems, and poor band conditions to set a new world mark with 8.5M points. Second place goes to perennial European power LZ9A with the gang at UZ9AYA setting a new Asiatic record on their way to third place.

The top Multi-Multi station is UP7A, who narrowly missed being the first station over 10 million points. Look for them this year with a new call sign for the contest. 4N2E did not win the world, however they did manage to set a new prefix record with 853 worked. The PACRATS group at KH6XX were the top Oceania entry and third overall.



K5RX working on the 40 meter array at Multi-Single champ V31A. It sure worked.

No records were established in the USA but competition was extremely close everywhere. The top four single ops all broke 2 million, with three of them coming from the same area. Number one is Phil, KT3Y with 2.5M points, followed by Mike, KC8C/3, at 2.3M. Sneaking in among the Maryland gang was Gary, WA6VEF at KI6P, at 2.2M, with KM3T and NS0Z (KM9P op) rounding out the top five. NU4Y grabbed a North American championship on 10 meters, with N4VZ doing likewise on 15. K2VV edged out K1TO for the top spot on 20. On 40, K1XA topped all North American stations with N3AD and NE6I battling it out on 80 meters. K5UR returned to the top on 160, with K5NA/2 second. N3RS was the top USA QRP station and second world wide, with WB0GOB, KB9S and KU7Y leading the US on 15, 20 and 80 meters.

N4WW moved up from second last year, to lead the multi-single stations, followed by WC4E, NJ1F and NR5M. Multi-Multi honors go to the gang at K3TUP in their first attempt at multi-multi. Not a bad start. Close n their heels were NI6W and WX5S.

In the combined club category, the North Texas Contest Club unseated the Northern California Contest Club as champions, with a new record 62,727,586 points. The USA championship goes to



Alan, VK8AV, takes a well deserved rest after handing out 406 VK8 multipliers.

the Northern Cal gang, with almost 48 million points. The top non US club is the Northern Lithuania DX Group. Rounding out the top five are the PVRC and one of the up and coming contest clubs, Les Nouvelles DX Group from France. Remember, to get proper credit for your club, please put your club name on your summary sheet. One log could make a difference in the club competition.

Several interesting DX calls turned up for the contest. Among them were TE1T, TE4T, 6Y6A, 5L7T, 7P8DX, 5T5CJ, 9J2EZ, 5B4UK, VU2UR, XX9MF, HS0B, SV1RP/SV5, AH2AE/Y2, GJ0/K2TNO, LB8JC, JW5VAA, FO5JP, VK8AV, C21XX, PQ8ZZ, PU5YPI, YW1D, 4M7A, YX5A, 4M3A, V31A, VS6DO, FF3TV, FV7NDX, TV6MYT, I2DMK/IE9, 4U2ITU, and HB4FE. Many of these were expeditions or special calls just for the contest. Thanks guys for the multipliers.

We are still looking for more trophy donors. There are openings in several categories and we are always willing to add a new category. Any one interested for either the SSB or CW contest please get in touch with me. The deadline for the 1989 contest is the first part of September when the new rules go to press.

There are still a couple of old world and US records waiting to be broken. LU8DQ's 10 meter mark from 1980 and HD0E's 15 meter mark from the same year. Also N4ZC's 1981 US 10 meter record and K6LL/7's 15 meter record from 1981 are the oldest US records. With conditions generally on the upswing, perhaps some of these will fall in the 1988 contest. We still have not had an entrant on 1.8 MHz from Africa. Who will be the first? It will be a record.

Thanks to all who helped to make the contest a success. Those who went on an expedition, got a special call, or just participated. Also thanks again to W8IMZ and N9AG for their assistance. Without them, it would be extremely difficult to get all this done on time.

We are always looking for interesting photos of your expedition or contest activity. If you have any that you would like to share, send them along with your log.

When I get desperate, I publish pictures of my antenna farm. You'll get tired of seeing my one picture of my one antenna shortly.

The 1988 contest dates are 28 and 29 May. Please send your logs to CQ WPX CW CONTEST, CQ Magazine, 76 North Broadway, Hicksville, NY, 11801. Please write CW Contest on the outside of the log. Forms and rules can also be obtained from CQ with an SASE. Again thanks to all, and hope to see many of you at Dayton. See you in the contest.

73, de N8BJQ

### Random Comments

I am beginner on CW QSO, and participated in this contest for the first time . . . JA1YAG. Station located on 17th floor of tower with beam 10 stories below and vee's 150 feet up . . . SK0LM. NP4A was the only station from Caribbean Sea I worked . . . JA8RW. This is my first DX's contest . . . JA2BCQ. I was in Tokyo when contest started and had power failure during the operation . . . HS0B. Condx wasn't that bad, but still not good for real big DX contest . . . JA7YFB. Tried to put quad up during contest in the rain. Only had half the parts and lost contest time . . . XX9MF. The QRN from the local power co. makes me crazy . . . K9QVB.

Need to improve a lot in my junk-gear. Already began working. Hi . . . CX8BBH. Finished installing new antenna 2 hrs. into contest. Glad it works . . . WA8YTM. First experience in WPX CW contest. Too much sleep. Sorry . . . YB0ZAA. A great contest. Am negotiating with my bride to see which continent I operate from next year . . . N5RM/CT3. Lost amp Sunday morning. Lost 4 hrs. to rain static. Good first try at WPX . . . KE7X. Amazing number of contestants operating without receivers . . . VK8AV. Very poor conditions to everywhere except USA on 80 meters . . . NE6I. Band conditions were so poor I gave up after 28.5 hrs. It was not worth the loss of sleep . . . K1BAZ/DV1. Next year—I'll win (Maybe) . . . KF7AD. The condx was too bad, so hope it will become good next time . . . JS1OSP. Serious damage to the ZD because porters didn't see FRAGILE label . . . SV1RP/SV5. Not bad for apartment dwelling . . . WB5M/4. In SSB contest couldn't work USA. In CW contest almost no DX around for 10 meter only entry . . . KD1U/4. Condx better than 1986 . . . YB2FEA. Condx poor May 31st. Really had to scratch . . . KH6WT. Hope to have full QSK rig for next contest. It will make operations easier . . . KA7FEF. I am happy to work in this fine contest . . . YO6AW. Finding out upon arrival that visitors are limited to 150 watts (implemented to discourage visitors . . . VP2VCW. Used borrowed rig. 10 meters is dead here . . . C21XX.

### TROPHY WINNERS

#### SINGLE OPERATOR-ALL BAND

**WORLD:** Terry Baxter, N6CW Trophy. Winner: Station 5L7T operated by Radivoje Lazarevic, YU1RL.

**U.S.A.:** Steve Bolia, N8BJQ Trophy. Winner: Philip Allardice, KT3Y.

**CANADA:** Canadian Amateur Radio Federation Trophy. Winner: Station VE7UBC operated by Koji Tahara, JM1CAX.

**JAPAN:** The DX Family Foundation Trophy. Winner: Tatsuya Sasaki, JH7WKQ.

**OCEANIA:** Tom Morton, KT6V Trophy. Winner: M. Maruto, YB0TK.

**WORLD QRP/p:** QRP Amateur Radio Club International Trophy. Winner: Ralph Rosenbaum, 4X6IF.

#### SINGLE OPERATOR-SINGLE BAND

**WORLD:** Pedro Piza Jr., NP4A (Pedro Piza, Sr., KP4ES Memorial) Trophy. Winner: Jose Castejon, YX5A.

**U.S.A.:** Kansas City DX Club Trophy. Winner: John C. Yodis, K2VV.

**U.S.A. 21 MHz:** Wayne Carroll, W4MPY Trophy. Winner: Robert D. Peterson, N4VZ.

**U.S.A. 14 MHz:** Gene Walsh, N2AA Trophy. Winner: Dan Street, K1TQ.

**U.S.A. 7 MHz:** Dennis Younker, NE6I Trophy. Winner: Robert J. Halprin, K1XA.

**ASIA:** Bruce Frahm, K0BJ Trophy. Winner: Algis Kregzde, UP2NK/UF.

**WORLD 3.5 MHz:** Lance Johnson Engineering Trophy. Winner: Wasily Kravets, UA9TS.

**OCEANIA 3.5 MHz:** Les Myers, Jr., K0SCM Trophy. No entrant.

#### MULTI OPERATOR SINGLE TRANSMITTER

**WORLD:** Ron Blake, N4KE Trophy. Winner: Station V31A operated by KR0Y & K5RX.

**U.S.A.:** Austin Regal, N4WW Trophy. Winner: Station N4WW operated by N4WW, K0LUZ & NX4N.

#### MULTI OPERATOR-MULTI TRANSMITTER

**NORTH AMERICA:** CQ Magazine Trophy. Winner: Station K3TUP operated by K3TUP, K3LR, KJ3L, N3BJ, WB3KKX, K8CC, KB8IZ, NQ8V.

#### CONTEST EXPEDITION

**WORLD:** Ed Roller, K4IA Trophy. Winner: R. H. Mitchell, N5RM/CT3.

#### CLUB (SSB & CW)

**WORLD:** CQ Magazine Trophy. Winner: North Texas Contest Club.

**U.S.A.:** Northern Ohio Amateur Radio Society (NOARS). Winner: Northern California Contest Club.

## CW & SSB CLUB COMPETITION

North Texas Contest Club	62,727,586	Southeastern DX Club	823,248
Northern California Contest Club	47,959,556	Western Washington DX Club	777,797
Northern Lithuania DX Group	27,359,056	YU1EXY Alligators (Yugoslavia)	762,784
Potomac Valley Radio Club	20,170,141	Grand Mesa Contesters	698,473
Les Nouvelles DX Group (France)	19,444,121	Ontario Contest Club	682,696
Yankee Clipper Contest Club	19,351,225	Delta DX Association	674,506
Texas DX Society	16,394,304	San Diego DX Club	635,560
YU DX Club (Yugoslavia)	12,024,004	Utah Amateur Radio Club	495,702
Kaunas Polytechnic Institute (Lithuania)	10,561,213	Southern California DX Club	428,181
Chelyabinsk Radio Club (Asiatic U.S.S.R.)	8,511,574	Maxwelltown Amateur Radio Club (England)	261,392
Pacrats (Hawaii)	8,082,900	The Winnipeg DX Club	183,148
Northern Ohio Amateur Radio Society (NOARS)	7,720,371	West Texas DX Assoc.	163,833
Southern California Contest Club	7,365,583	Long Island Contest Club	143,868
North Florida DX Association	6,913,599	Bavarian Contest Club (FRG)	137,610
Osaka Univ. Radio Club (Japan)	5,820,562	Steel City A.R.C.	133,322
Albany Amateur Radio Assoc.	5,352,153	Willamette Valley DX Club	128,412
Stellio's Family Restaurant Contest Club	4,663,700	Mississippi Valley DX & Contest Club	121,000
Society of Midwest Contesters	4,565,823	Eastern Michigan Amateur Radio Club	110,172
Redwood Empire DX Association	4,534,466	Alamo DX Amigos Club	107,160
Rhein-Ruhr DX Association (frg)	4,348,827	Northern Illinois DX Assoc.	104,643
Hoosier Contesters	4,292,386	Dixie DX'ers	100,513
Frankford Radio Club	4,136,459	Fox River Radio League	99,115
Mad River Radio Club	4,012,935	LZ Contest Group (Bulgaria)	97,800
Lithuanian Contest Group	3,902,587Kw	Old Swinford Hospital A.R.S. (England)	85,782
Central Arizona DX Association	3,350,735	South Pickering A.R.C. (Canada)	74,368
Ashton University Radio Society (England)	3,080,525	Northern Ohio DX Association	68,640
Northern Finland Contest Club	2,447,269	Kiev Radio Club (Ukraine)	61,215
Kansas City DX Club	2,302,375	Penn Wireless Assoc.	56,151
Uruguay DX Club	2,002,104	Murphy's Marauders	56,052
Rubber Circle Contest Club	1,798,848	Northern California DX Club	46,034
Sevilla Contest Club (Spain)	1,693,564	Order of Boiled Owls	40,950
Western Washington DX Association	1,530,282	Great South Bay A.R.C.	39,330
SP DX Club (Poland)	1,506,911	River City Contesters	30,282
Northsea Contest Club (FRG)	1,397,322	Minnesota Wireless Assoc.	15,620
Ashtabula County A.R.C.	1,304,715	Fraser Valley DX Club	12,283
Southwest Ohio DX Association	1,212,101	Farout A.R.C.	11,050
Bullmertz of Sweden	1,130,220	Utica Amateur Radio Club	9,476
St. Louis Amateur Radio Club	974,550	Long Island DX Association	1,113
Students Radio Club (Poland)	943,105	Poway A.R.S.	720

I had a hard time deciding when to sleep and it wasn't because band conditions were so good... *KI2P*. As the weekend approached, I grimly watched the solar flux fall and the A-index rise... *KS1J*. This is my favorite DX contest. Tnx to all who gave me a call... *YV7QP*. Next year more than 9 hours of operating, I hope... *VE6OU/3*. Hard to be a big gun on 40 with just a vertical... *N18L*. Condx so bad I had time to recopy my log during contest. For that matter I could have painted house... *K2VV*. Biggest problem—staying awake when the band was sleeping... *KU2Q*. I am novice. Tnx for contest... *IK1GKD*. Enjoy very much my 1st CW contest. See you next year... *CX6BM*. My first single-op dxpedition—what a ball!... *GJ0/K2TNO*. Where were all the yanks? Only 23 worked on 40 meters... *G4UO*. The action was fast and furious... *KA1OWM/AG*. Not so many USA stations but an enjoyable contest. 21 MHz excellent conditions... *G3ESF*. I sold my house during one of the rest periods... *K1CLN*. Straight key + poor propagation + thunderstorms = low score + much fun... *KN8D*. Surprised how loud the PY stations were with the 3.5 MHz QRN... *K7UR*. Computer contest program bombed out Sat. nite. Found 5T5CJ as only signal on 15 meters... *K5DB*. Where was Africa and South America... *NY6M/KH2*. Vy FB contest. My score is best all time. I'm 63 yrs... *OH3N*. Lousy DX condx... *KX7J*. Very big contest with very good

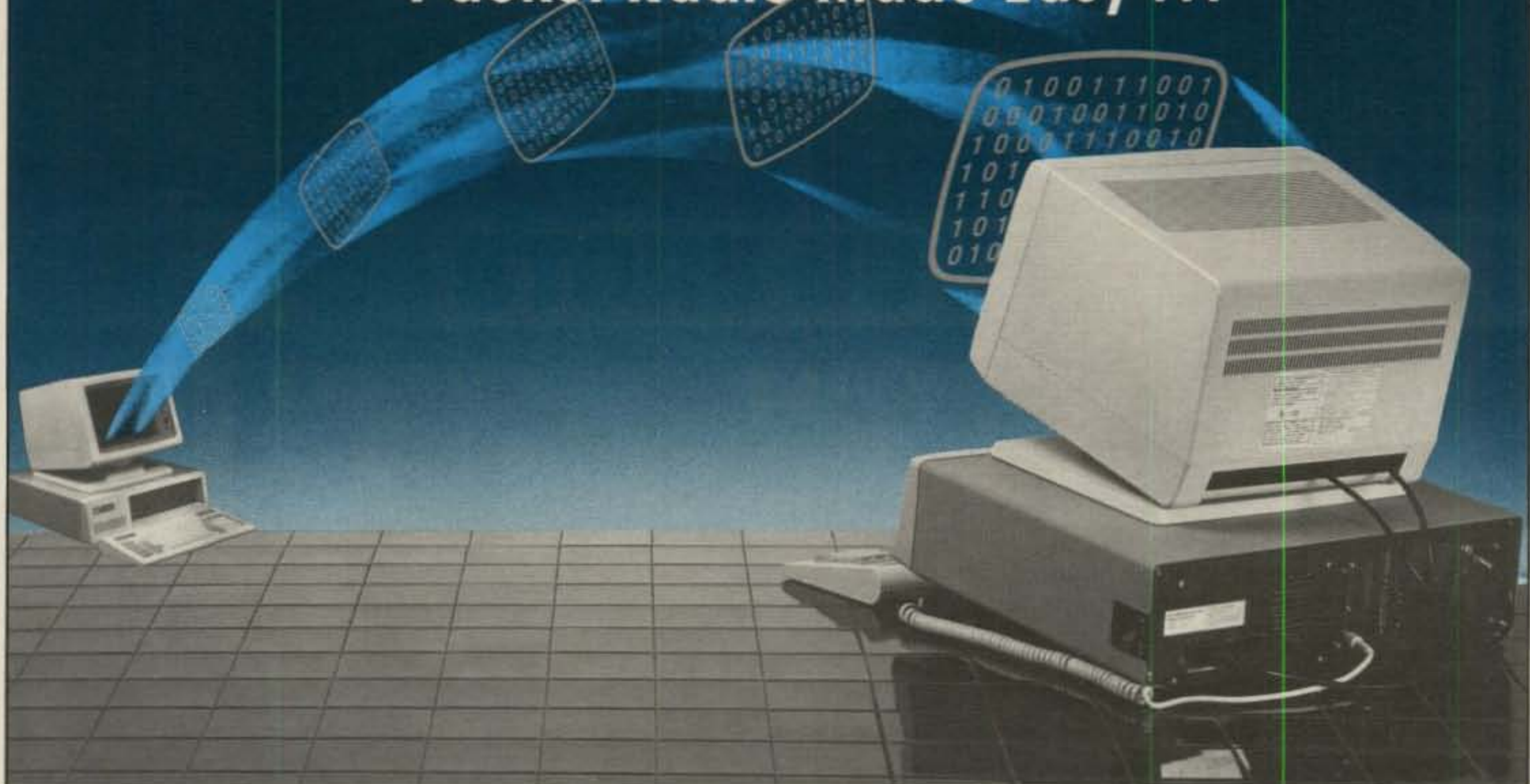
operators... *IK4GNK*. Many excellent oprs., but why do a few send at 50 wpm... *W6JTI*. Condx still bad for contest. No pileups... *ZY4OD*. Have not done bad for a battery power supply. Hi... *VU2UR*. Contest disk crashed during test and had to pull off QSO's one-by-one... *CR7DKG*. Tnx to Canadian Government, I could take part in the contest at last. It was a great experience... *VE7UBC (op JM1CAX)*. Had to miss last half-hour to catch a plane. Didn't get to sleep till 3:00 AM Monday... *KU2C*.

TVI next door shut me down during prime-time TV Saturday. Heard 40M prop was great. Rats... *KG5U*. When Boulder gave K index of 6 on Fri. I smeared on suntan lotion just in case... *K0RF*. Conditions poor but lots of fun... *KZ5D*. Condx so bad that East Coast stations occasionally had their beams turned state-side (out west)... *N7TT*. Always a favorite contest, but propagation was very bad plus power line noise... *H18LC*. Finally a good score, but what do I do next year for an encore... *VO1QU*. Conditions poor with severe electrical storms... *N8BC*. I love this contest, even if JA runs didn't last long enough... *KM0L*. Poor conditions, but I really enjoyed the time I was on... *W5FO*. Barefoot, dipoles and eyeball logging - super fun. Tnx all ops and CQ magazine... *NW7S*. East Coast USA where were you guys?... *YB0TK*. Always many stations around the world QRV... *DL1TH*. Biggest

thrill—to break 150 mark on CW... *VE3NXQ*. Has been a pleasure to receive a champion to operate my station... *ZZ5EG*. Two new countries on 40 meters... *W5EIJ*. A giant step. My first CW contest. Look forward to many more... *NJ0C*. Thanks for comfortable contest... *OH6NEX*. Lots of tall buildings around to absorb RF but manage to do ok... *KD2HE*. My 1st WPX CW—hope to work again next time... *NX5H*. Tnx to the JA's on 40 meters... *KL7UR*. Father (OH6VR) using same rig in contest so real working time very limited... *OH6NTO*. I was just receiving my high school diploma as the contest began at 000Z. Beware next year... *KE0MZ*. Could not hear anything on 10 meters... *VE3OMU*. Jolt cola doesn't work. I still fell asleep at 1 am... *KT2D*. This contest is my first time biggest contest on CW mode. I will try again... *JR2IGV*. Nice contest with lots of multipliers... *PA0DIN*. Fairly good px representation... *GM3CFS*. Rained all weekend—noisy... *ZL1BSG*. My right hand is faster dupe checker than computer... *VK2BQQ*. With KC8C/3 and KT3Y at nearby stations, contest was fun as we kept each other going... *KM3T*.

Hey guys, I am a YL. Don't forget it, please... *HK7IMB*. I'm very glad as I could make many contacts with USA stations with my new antenna on 7 MHz band... *JR1ZTT*. First time operating from Africa. Condx - great. Only if the low band antennas could grow higher... *5L7T*. WPX Contest is the best! See you next year -

# From The Creative Minds at HAL Communications Packet Radio Made Easy ...

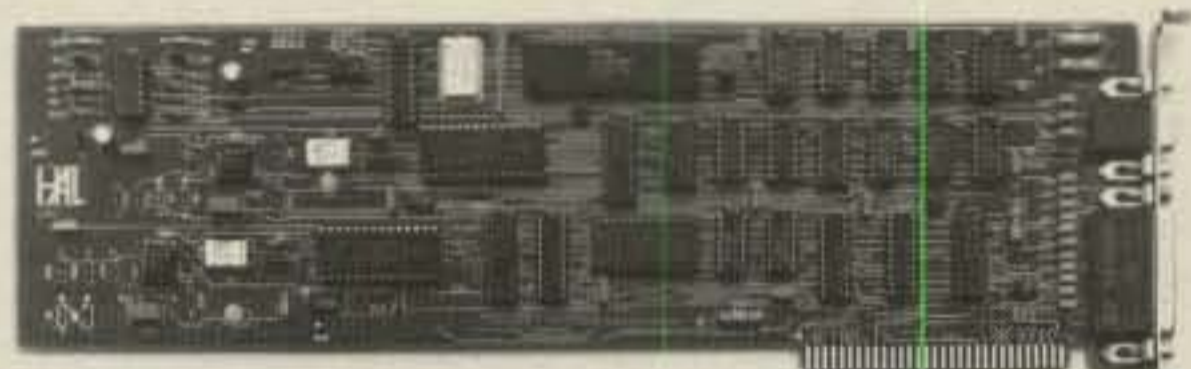


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CIRCLE 133 ON READER SERVICE CARD







## WORLD TOP SCORES

### SINGLE OPERATOR ALL BAND

5L7T	8,619,226	IO4IND	2,942,388
ZZ5EG	7,228,440	KT3Y	2,570,006
NP4A	5,724,342	YT3M	2,537,240
N5RM/CT3	5,233,151	KC8C/3	2,345,000
VP2VCW	4,358,844	6Y6A	2,340,976
YW1D	4,001,330	G3FXB	2,338,672
K5KG/LU	3,025,638	KI6P	2,226,860

### 28 MHz

4M7A	111,389
YB4FNN	84,224
UB5INO	56,480
LU5UL	50,932
UA6LQ	47,736
YU2OB	46,080
SP5DIR	37,856

### 7 MHz

YX5A	2,999,977
CX8BBH	2,002,104
OA4ZV	1,684,240
UP2NK/UF	1,600,950
OK3YX	1,264,770
K1XA	1,091,608
YU1WR	1,079,120

### 21 MHz

ZY4OD	2,197,272
5T5CJ	1,469,314
9J2EZ	1,288,650
LU4FD	1,023,069
YU1LA	762,784
UJ8JA	691,207
EA7CFW	631,582

### 3.5 MHz

UA9TS	460,000
HK3MAE/HK0	456,280
HA3MY	450,640
UA9SP	415,880
4N1A	382,968
HA3PD	344,160
OK7MM	318,716

### 14 MHz

YT3AA	2,216,680
VO1QU	1,878,240
K2VV	1,805,859
VD1ASJ	1,536,485
K1T0	1,469,820
UA9YI	1,446,240
OH2BH	1,365,660

### 1.8 MHz

UA2FF	117,424
LZ2CJ	97,800
UB5ZAL	57,120
OK1BLN	53,500
I1BAY	49,938
GB8DX	45,652
OK1DRO	41,170

### QRP/p

4X6IF	A	410,48	UB5FDM	14	108,080
N3RS	A	402,868	OK1IOA	7	16,524
LZ2QV	A	283,044	UP2BFE	3.5	108,480
EA3EGV	28	7,866	RA3AUU	1.8	39,600
UR2CR	21	44,023			

### MULTI-OPERATOR SINGLE TRANSMITTER

V31A	8,544,76	HG9R	3,936,306
LZ9A	5,683,682	HG1S	3,875,530
UZ9AYA	5,263,256	HG6N	3,839,824
HK1QQ	5,084,436	EA3VY	3,773,124
HG7B	4,687,900	N4WW	3,629,44
HG5A	4,486,225	FF3TV	3,325,122
UL8LYA	4,319,422	YU3MM	3,279,465

### MULTI-OPERATOR MULTI-TRANSMITTER

UP7A	9,920,442	NI6W	3,398,748
4N2E	8,978,678	JA2YKA	3,297,028
KH6XX	8,082,900	UB2JWS	2,715,939
K3TUP	3,780,081	WX5S	2,333,718
YZ1U	3,639,616	K5ZD/1	1,532,800

Ciao ... IO4IND. This is my first ever CW contest - enjoyed it! ... ZL1ANJ. I worked my special call sign of DF8AN/60 in memory of 60 years of Amateur Radio in Germany ... DF8AN/60. Bad condx, but a wonderful contest ... OK1DXW. Very hard with such unusual callsign ... AH3AE/Y2. Charming and correct contest. Congratulations ... CT1CWT. Still the most amusing contest. A few rare countries, but many many many rare prefixes ...

EA1CIM. The computer spent 6 hours to sort & check qso's and dupes, and I did too! ... ED2DMU. Many, many ... watts! ... EA3DBO. I am 22 yrs old and a medical university student. I'm most active contest operator in Japan ... JH4UYB. The 30 hours rule is a fine one, especially for me / 55 years old, hi ... OK3EA. High level of QRN and poor activity in Europe! ... UP2NK/UF. Band propagation to US and bad tactics led to this low score; de-

## U.S.A. TOP SCORES

### SINGLE OPERATOR ALL BAND

KT3Y	2,570,006	KU2C	1,394,204
KC8C/3	2,345,000	AJ6V	1,243,920
KI6P	2,226,860	K4PQL	1,222,018
KM3T	2,044,218	AB2E	940,380
NS0Z	1,941,702	KM9L	927,808
KZ2S	1,795,794	KB0G	916,596
K0RF	1,414,270	WM5G	861,045

### SINGLE BAND

#### 28 MHz

NU4Y	13,440
KU2Q	5,460
KD1U/4	4,480
KN8D	1,239
WA6FGV	924

#### 7 MHz

K1XA	1,091,608
W5WMU	983,280
NT5G	196,784
NI8L	116,224
W3BGN	99,484
KC5DX	70,224

#### 21 MHz

N4VZ	81,055
N2GUV	54,540
KE0MZ	4,368
K4TKM/6	3,300
NE2W	2,280

#### 3.5 MHz

N3AD	90,610
NE6I	84,360
W9LT/4	12,144
W8IMZ	11,050
K7UR	3,800

#### 14 MHz

K2VV	1,805,859
K1T0	1,469,820
KM9S	976,435
KI2P	782,273
NJ2L	772,952
N7TT	667,800
WB4TDH	588,141

#### 1.8 MHz

K5UR	8,946
K5NA/2	5,760
K8NW	360

### QRP/p

N3RS	A	402,868	WB0GOB	21	936
W8VSK	A	214,272	KB9S	14	22,984
NS6G	A	163,020	KU7Y	3.5	2,604

### MULTI OPERATOR SINGLE TRANSMITTER

N4WW	3,629,44	KJ9D	1,822,048
WC4E	3,103,230	N6VR	1,707,945
NJ1F	2,714,912	AG6D	1,463,820
NR5M	2,205,158	WC6H	1,331,330
AI6V	2,034,396	K0HLB/4	626,875

### MULTI OPERATOR MULTI-TRANSMITTER

K3TUP	3,780,08	K5ZD/1	1,532,800
NI6W	3,398,748	KN3T	231,275
WX5S	2,333,718		



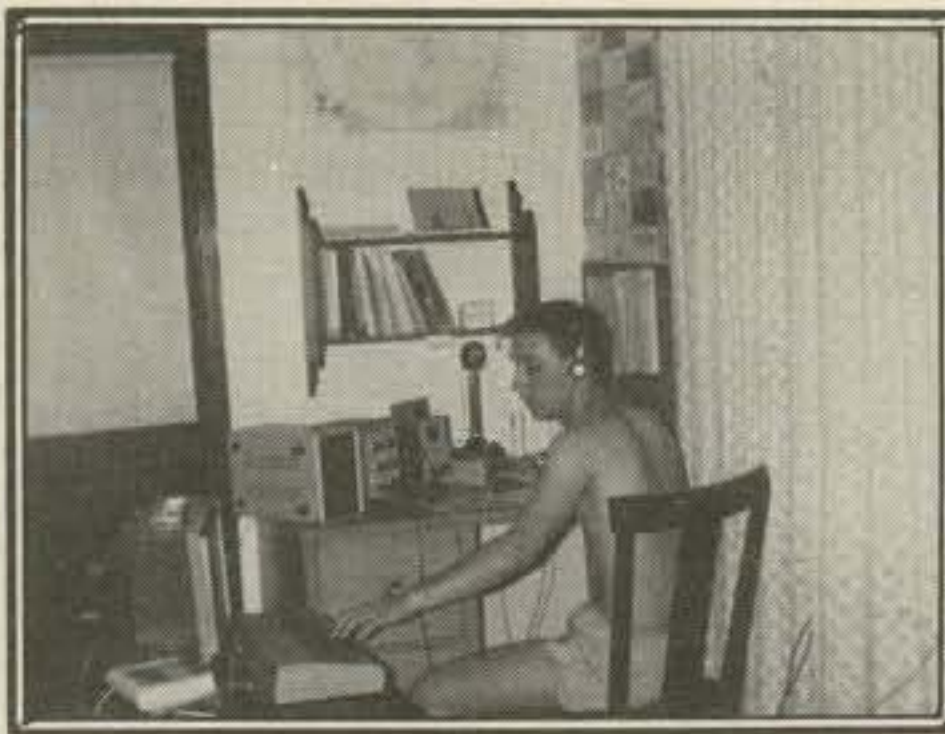
One of the consistent top scores from Japan is JH4UYB, who is 22 and a medical student.

spite this liked the contest . . . **UB5WE**. Where were the thousands of US contesters? Hi! . . . **UA2FZ**. HG7B, 9J2EZ, 5L7T, TU4CG - outstanding sigs hr . . . !**UW9AG**. Needed only 3hr 40 min for WAC. Would be more lucky if **HS0B** heard me . . . **UA2FF**. Spent the first evening getting the bugs out of the newly written logging program . . . **W3KWH**. Nice to work with this new antenna installation by **OH8QD**. Cu next year . . . **OH2AQ**. Didn't hear that many high scores . . . **PA3CEF**. We had lost luggage, TVI complaints, RFI(telephone) problems, line noise and very poor propagation . . . **V31A**. Storms in ionosphere, storms in troposphere make for a dull test, indeed . . . **NR5M**. Surprised at just how bad propagation can get. i.e. how few USA QSO's . . . **VS6DO**. Is there still a 10 meter ham band? . . . **AC6H**. Saturday conditions were fair. Sunday they were rotten. Sunday was a bust . . . **KJ9D**. Logging was easy compared to past efforts . . . **WR6R**. Nice having **DK2GZ** operating here . . . **N6VR**. No fun at all to find someone to make the logs. A newcomer made it in 6 weeks . . . **FF3TV**. First time using this call sign. Hard to copy by other hams . . . **4N3G**.

Tnx nice DX contest . . . **UQ1GZW**. Funny weekend with pile of prefixes! . . . **UR1RWX**. Conditions were awful . . . **K5ZD/1**. Had a lot of fun in spite of the lousy propagation conditions . . . **WX5S**. Poor band conditions held score down in our first multi-multi adventure . . . **K3TUP**. First multi-multi. I have lots to learn! . . . **KN3T**. One more QSO than last year . . . which was at medium power. Also a brand new DX country - **FO5JP** . . . **W0NGB**. C21XX in 7 minutes and **FO5JP** in 8 minutes of calling QRP . . . **K8DD**. Very pleased to work so many DX with only 5 watts . . . **PA2REH**. Painting the house during weekend certainly affects the score . . . **SM5CCT**. First attempt to operate QRP in a contest. Amazing what 5 watts will do . . . **NC7K**. New QTH on top of hill at 5000 ft. seems like it might be a good spot . . . **KU7Y**. One of these days WPX CW will fall into great condx. Missed it by one week - but still good fun . . . **K7SS**. First CW WPX test QRP . . . **VE3NVP**. Had I run power . . . I would have been very bored with the poor conditions . . . **NS6G**. Conditions like this make QRP ops work hard . . . **KB9S**. Had to operate in between thunder storms . . . **NU4B**. Working 5T5CJ - new one - I have 99 DX confirmed - His QSL will be QRP DXCC . . . **W2JEK**. Oh for a ten meter opening . . . **WB6JMS**. My first WPX test with only 10 WPM speed . . . **YC2UDH**. Very poor condx than last year . . . **JA2DN**. It was hard work between all this KW linears and high and very high speeders for QRP! . . . **HB9XY**. This was a lovely contest! . . . **LZ2QV**. I was half expecting to make a run at my old score of 1983 . . . but old sol didn't cooperate . . . **N3RS**. Thanks QRO for contacts . . . particularly **PY2DP**. He spent abt 10 min to receive my poor QRP signal . . . **UP2BFE**.

### Station Operators Multi-Operator Single Transmitter

**4N3G**: YU3JZ & YU3BU. **4U2ITU**: DL1HBT & DL3HAH. **AC6H** & **W6LEN**, **W6ENZ**. **AG6D** & **WC6I**, **N1EE**, **W6NWS**. **A16V** & **N6TR**. **AK6T** & **CE3AQI/W6**, **K4UVT**, **K6ZM**, **K16EZ**, **NB6L**. **AL7IB** & **KL7PJ**, **KL7U**, **NL7G**, **NL7P**. **EA3VY**: **EA3AIR**, **EA3DXD**, **EA3FER**, **EA3KU**. **FF3TV**: **F5IN**, **F6ARC**, **F6BEE**, **FD1LGE**. **FV7NDX**: **F6CEL**, **F6DKV**, **F6ENO**, **FD1JVP**, **F5WA**. **HA0KLE**: **HA0LC**, **HA0NNN**, **HA0MK**, **HA0VI**, **HA0VN**. **HA3KNA**: **HA3OU**, **HA3FTA**, **HA3OC**, **HA3NS**, **HA3NU**, **HA5FM**, **HA5MK**, Szabo. **HA5KDB**: Kincse, Zelei, Osvat. **HA6KNX**: Jozsef, Gyula, Nandor, Zsolt. **HA7KMP**: Janos & Tamas. **HA7KRX**: Dezso & Laszlo. **HA8KWG**: Barac-



High scorer on 21 MHz from zero land is Jack, KE0MZ.

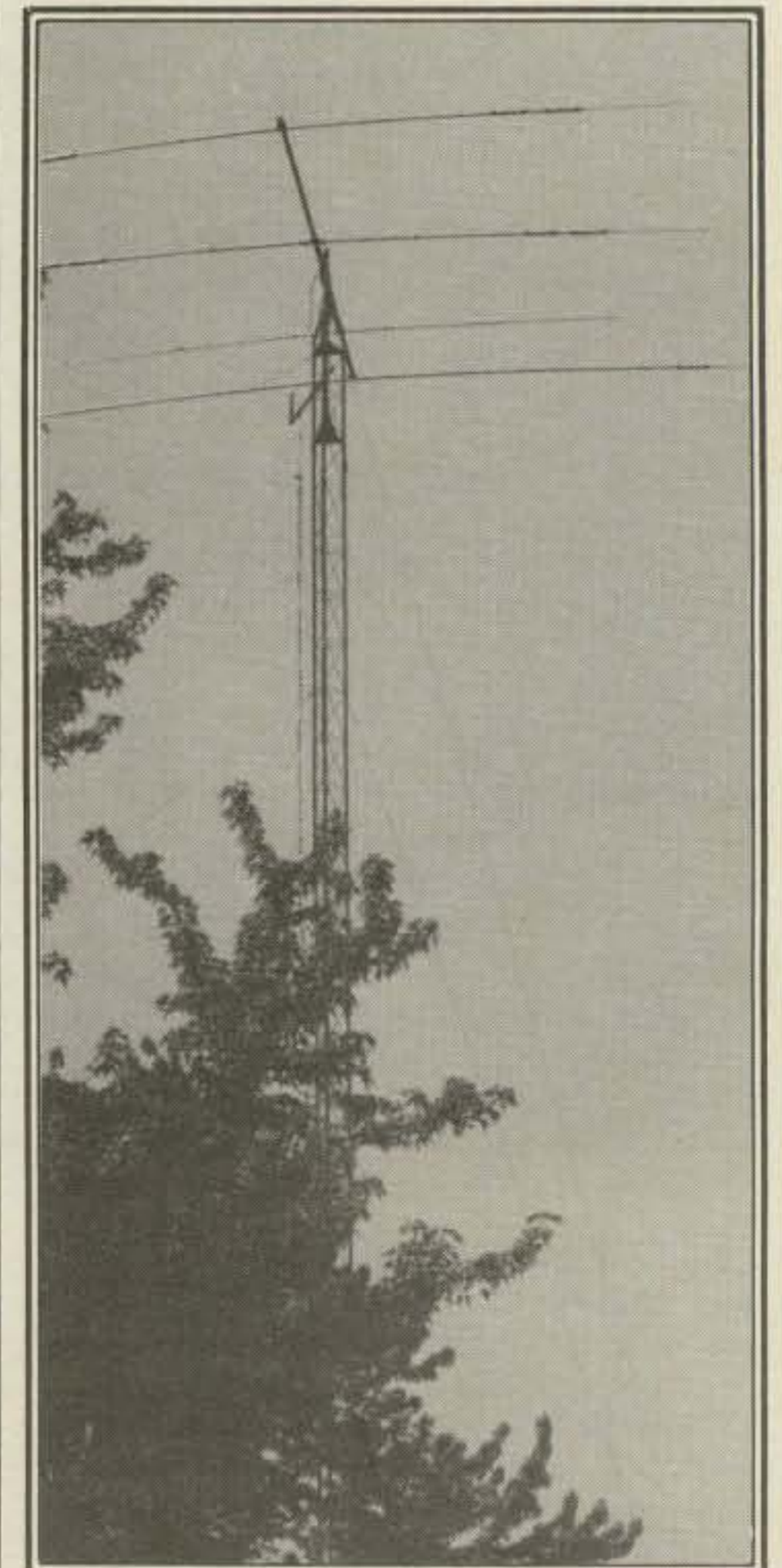
si, Gyani, Pantya, Bajer, Vrbovszki. **HB4FE**: **HB9APJ**, **HB9BEY**, **HB9CHY**, **HB9MPU**, **HB9PJM**. **HG1S**: **HA1TJ**, **HA1TV**, **HA1TD**, **HA1DAC**, **HA1009**, Finita. **HG5A**: **HA5UA**, **HA7RY**, **HA5GF**, **HA5OM**, **HA5HO**, **HA7SU**, **HA5LN**, **HA5WE**. **HG6N**: **HA6ND**, **HA6ON**, **HA6OQ**, **HA6NY**, **HA6NQ**, **HA6NF**. **HG6V**: Laszlo, Jozsef, Zoltan, Gyula, Tibor, Ferenc. **HG7B**: **HA5DW**, **HA7UG**, **HA8FM**, **HA7UO**, **HA5PP**, **HA7UL**, **HA0DU**, **HA5WA**. **HG9R**: **HA9OA**, **HA9RP**, **HA9RG**, **HA9PP**, **HA9RU**, **HA9SU**. **HK10Q**: **HK1AMW**, **HK1KYR**, **HK1ANP**, **HK1HHX**, **HK1KXA**, **HK3AHM/1**. **I1ZEU** & **I1XPQ**, **I2VXJ**. **I2DMK/I2E9**: **I2DMK** & **I2NYN**. **JA1YAD**: **JA9UFS**, **JF2IWL**, **JH7UIC**, **JH5GHM**, **JP1DMY**, **JN1HYU**, **JN1AWY**. **JA1YFG**: **J01RUR** & **JP10GL**. **JA1YJR**: **JA0SWT** & **JR6GHN**. **JA1YWX**: **JM1MCF**, **J01BMV**, **J12GUT**, **JN3PYQ**, **JR4NIV**, **JH5DXO**, **JH9GGH**. **JA3YBF**: **JN1DPL**, **JJ2ICA**, **JJ3IMX**, **JJ3KGS**, **J03DWD**, **JF3NXH**, **JH9GRM**. **JA3YDS**: **JG1LNY**, **JG3HFE**, **JG3QBJ**, **J13GAB**, **J13OPT**, **JJ3FJS**, **JR4WEI**. **JA3YKC**: **JG3MRT**, **JG3WDN**, **J13ERV**, **JH4RHF**, **JR5WLA**, **JR4PMX**. **JA4YJA**: **JJ3LJU**, **JM3ILK**, **J03GPL**, **JR4KTO**, **JE4DNQ**, **JF4BNH**, **JF4BVU**. **JA7YAB**: **JJ1NNJ**, **JQ1HKN**, **JH8RGO**, **JH0TIS**, **JH0MGJ**. **JA8YBY**: **JH8PNE**, **J01DFG**, **JH8WBR**, **JF7MEV**, **JE8BRO**, **JH8GFB**. **JA9YBA**: **JA9LNJ**, **JA9VDA**, **JH9VSF**, **JJ3URK**, **MiaJF4MOX**, **JG4AFB**, **JR5SGL**, **JG6PAF**, **JH9JFH**, **Kamik**, **Yamane**. **K0HLB/4** & **W0MHS**. **KJ9D** & **WA8YVR**, **KM9R**, **KK9V**. **V31A**: & **K5RX** **VS6DO** & **W0UN**. **W3KWH**: **N3EQF**, **KA3KSD**, **NG3H**, **NG3L**, **KA30YI**, **W3PDK**. **WC4E** & **K4XS**. **WC6H** & **AD6E**. **WR6R** & **Net**. **WV6N** & **W6UQF**. **WZ6Z** & **W7IL**. **Y35L**: **Y33VL**, **Y33UL**, **Y33ZL**, **Y26IL**. **Y37BER**: **Y37ZO**, **Y37WO**, **Y37MO**, **Y28FO**. **Y82ZL**: **Y82ZL** & **Y82AL**. **Y05KTB**: **Y05CUO** & **Y05AXF**. **YT3T**: **YU3BQ** & **YT3EW**. **YU3MM** & **YU3AI**, **YU3EO**, **YT3WW**.

### Multi Operator Multi Transmitter

**4N2E**: **YU2AW**, **YU2CT**, **YU2CU**, **YU2DU**, **YU2EU**, **YU2HO**, **YU2HW**, **YU2MY**, **YU2NW**, **YU2OG**, **YU2PA**, **YU2QS**, **YU2RA**, **YU2SD**, **YU2TS**, **YU4YA**, **YT2KW**, **Bob**, **Ida**, **Ognjen**, **Davor**, **Grigor**, **Ivan**, **Robert**, **Hrvoje**, **Marijan**. **JA1YAL**: **JH0RRR**, **J01JOZ**, **Ogawa**. **JA2YKA**: **JF2DQJ**, **JF2HPN**, **JF2UTL**, **JG2MTC**, **JG2VTD**, **JE2JCV**, **JE2VBZ**, **JE2VYM**, **J12UHH**, **J12KVV**, **JL2DQE**, **JJ2FAU**, **JJ2NJJ**, **JK2CZL**, **JG3OET**, **JE4LIK**, **JE7BIZ**, **JA9XXS**, **JR0IRB**, **Kei**. **JE3ZFS**: **J13JGJ** & **JK3HZH**. **K3TUP**: **K3TUP**, **K3LR**, **KJ3L**, **N3BJ**, **WB3KKX**, **K8CC**, **KB8IZ**, **NQ8V**. **K5ZD/1** & **KA1GQW**, **Packet**. **KH6XX**: **KH6XX**, **4X6AI**, **N5CT**, **N2IC**. **KN3T** & **KN3T** & **K3NA**. **N16W** & **NC6U**, **NN6U**, **N6ND**, **W6TMD**, **K6JYO**, **K9VV**. **OK3KYH**: Club Group. **UB2JWS**: **UB5-067-2250**, **UB4JFR**, **UB5JMR**. **UP7A**: **UP2BAW**, **UP2BEI**, **UP2BIG**, **UP2BIL**, **UP2BKJ**, **UP2BRF**, **UP2PAJ**, **UP3BF**. **UZ9SWY**: **UA9-167-463**, **UA9SGW**, **UA9SAW**. **WX5S** & **N5EA**, **W5ASP**, **NM5M**, **K5TU**, **WB5N**. **YZ1U**: **YU1JZ**, **YU1FY**, **YU1XA**, **YU1JW**, **YU1UN**, **YU1QD**, **YU1ZZ**, **YU1BL**, **Miladin**, **Brane**, **Mire**.

**LX/PA3CNH/P**: **PA3BDK**, **PA3CNH**, **PA3EBT**. **LZ1KOZ**: **Aleko**, **Mike**, **Dimitar**. **LZ1KVF**: **LZ1C92**, **LZ1C94**, **LZ1C76**. **LZ2KSQ**: **LZ1F-156**, **LZ2F-230**, **Ogi**. **LZ9A**: **LZ2CC**, **LZ2PO**, **LZ2HE**, **LZ2DF**, **LZ2-E-44**. **N4WW** & **K0LUZ**, **NX4N**. **N6VR** & **Z**, **N6ADI**, **AD6C**, **N6IC**, **AC6T**, **N6MANJ1F** & **K1RQ**, **KB1W**, **KB1KE**, **WA1ZAM**. **NR5M**: **K5GN**, **KN5H**, **WM5K**. **OH2AQ**: **OH2BCI**, **OH2BQW**, **OH2BUQ**. **OH6AK**: **OH6LP** & **OH6RC**. **OH8SR** & **OH8PF**, **OH8LP**. **OK1KGR/p**: Club Group. **OK1KOK**: Club Group. **OK2KMR**: **OK2SSS**, **OK2BQZ**, **OK2-31097**, **OK2-30624**. **OK2KPS**: Club Group. **OK2KVI**: Club Group. **OK3KEE**: **OK3CGG**, **OK3CTL**, **OK3MB**, **OK3YEC**.

**OK3KGQ**: Club Group. **OK3KII**: **OK3CDV** & **OK3CWZ**. **ON4GQ**: **BRUSSELS DX TEAM**. **OZ10XZ**: **OZ1JNR**, **OZ2MY**, **OZ4RS**, **OZ8AE**. **PA3CEF** & **PA3CEE**, **PA3DMH**. **RB4IYJ**: **UB5-073-3972**, **RB4IUU**, **UB5-073-3985**. **RZ9HYY**: **Vasilyev**, **Sidzenko**, **Sozochan**. **SK2AU**: **SM2NPR**, **SM2PDW**, **SM2PDQ**, **SM2PTR**, **SM2RMG**, **SM2RJK**, **SM2DQS**. **SK4EA**: **SM4EPR** & **SM00GQ/4**. **SK6EI**: **SM6REA**, **SM6BWQ**, **SM6GOR**, **SM6CST**, **SM6CMR**, **SM6DYK**, **SM6LPG**, **SM6MCW**. **SP2ZBE**: **SP2IHG** & **SP2DEH**. **SP5PBE**: **SP5ELA**, **SP5ANJ**, **SP5JTF**. **SP9PEY**: **SP9FKQ** & **SP9HMC**. **TV6MYT**: **F6EKS**, **F6FYA**, **F6GGR**, **FD1LBM**. **UB2JWS**: **UB5-067-2250**, **UB4JFR**, **UB5JMR**. **UB4DWW**: Club Group. **UB4EXU**: **UB5EJB**, **UB5EPT**, **Pavel**. **UB4IWI**: **UB5INT**, **UB5IOV**, **UB5IQW**. **UB4QWV**: **Borisov**, **Grigorenko**, **Klimenko**, **Leonovitch**, **Tarassenko**. **UB4TWA**: **Nikitschuk**, **Usik**, **Baurin**. **UB4TWL**: Club Group. **UB4WZB**: **UB5-068-1014**, **UB5-068-1013**, **UB5-068-974**. **UB4XWB**: **UB5-062-240**, **UT5QG**, **UB5-062-56**, **UB5-062-647**. **UC1AWZ**: **UC2-188-148**, **UC2-188-123**. **UL8BWW**: **UL7BB**, **UL7-016-389**, **UL7BY**. **UL8CWW**: Club Group. **UL8GWC**: **UL7-190-40**, **UL8GBL**. **UL8LYA**: **UL7LEZ**, **UL7LO**, **UL7LER**, **UL7-026-733**. **UP1BWW**: **UP2BAS**, **UP2BIJ**, **UP2BKW**, **UP2BMW**, **UP2PX**, **Aldo**, **Alex**. **UP1BXR**: **UP2BN**, **UP2BZ**, **UP2BPI**, **UP2BJK**. **UP1BYC**: Club group. **UP1BZM**: **UP2BQN**, **UP2-038-1751**. **UP1BZO**: **UP2BMT**, **UC2IAP**, **UP2-038-346**, **UP2-038-728**. **UP1BZQ**: **UP2BMQ**, **UP2BAT**, **UP2-038-1682**. **UQ1GWX**: **UQ2-037-085**, **UQ2-037-514**. **UQ1GYT**: **UQ2GNL**, **UR2RDZ**. **UQ1GZW**: **UQ2GKL**, **UQ2GID**, **RQ2GN**, **UQ2GM**, **UQ2GKA**. **UR1RWX**: **UR2RRR**, **UR2RDJ**, **UR2RJ**, **UR2-083-165**. **UR1RYO**: Club Group. **UZ0QWA**: **UA0QDL**, **UA0QN**, **UA0QAS**. **UZ0SWA**: **UA0SG**, **UA0-124-237**, **UA0SJQ**. **UZ1AWO**: **RV1AW**, **UA1AKC**, **UA1-169-2392**. **UZ1AWT**: **UA1ALZ**, **RA1CA**, **UA1-169-169**, **UA1ARF**, **UA1ANA**. **UZ2FWN**: **UA2-125-574**, **UA2DC**. **UZ4LWL**: **Dirchencow**, **Kalinin**, **Solovjev**. **UZ4WWB**: **Klepanov**, **Krylov**. **UZ4WWR**: **UA4-095-683**, **UA4WES**, **UA4-095-732**. **UZ9AYA**: **UA9QCC**, **UA9165-983**, **UL7LT**, **UM8NR**, **UW9AN**, **UW9AR**. **UZ9CYP**: **UA9CKF**, **UA9CUA**, **UA9-154-2105**. **UZ9FWR**: **UA9FAL**, **UA9FM**, **UA9-140-171**. **UZ9XWV**: **UA9-090-1053**, **UA9-090-717**, **UA9XDG**.



The N8BJQ antenna farm.

# Best Amateur Tribanders Available — KT-34A\*/KT-34XA

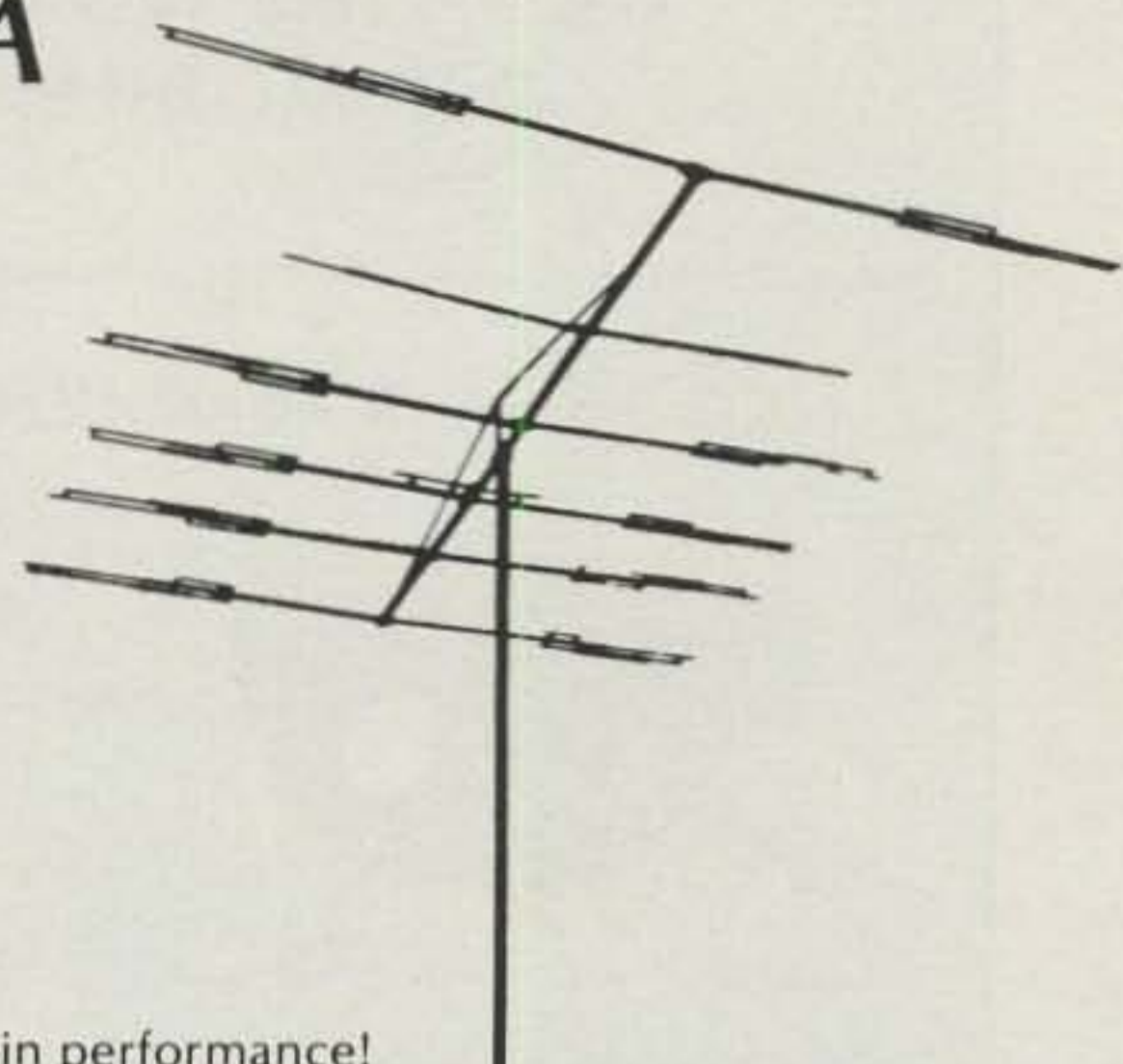
## SPECIFICATIONS — KT-34XA

### ELECTRICAL

- Bandwidth ..... 14.0-14.350 MHz
- Gain ..... 8.5-9 dB
- VSWR ..... 1.5:1
- F/B ..... 20 dB
- F/S ..... 40 dB
- Feed Imp ..... 50 Ohms with balun
- Balun ..... 4:1, 5 kW PEP
- Bandwidth ..... 21.0-21.450 MHz
- Gain ..... 9-9.5 dB
- Bandwidth ..... 28-29.7 MHz
- Gain ..... 11-11.3 dB

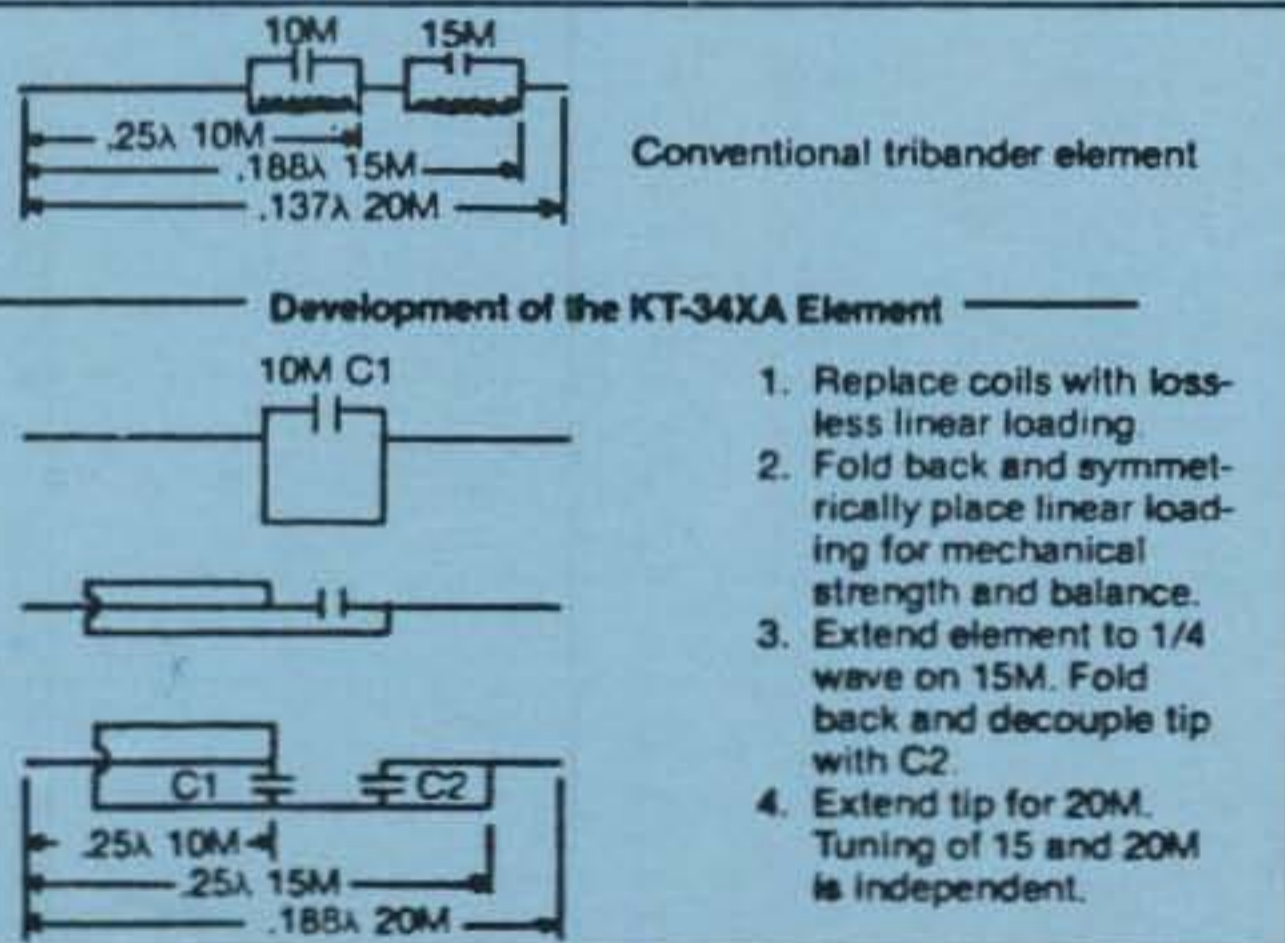
### MECHANICAL

- Element Length ..... 24 ft.
- Boom Length ..... 32 ft.
- Turn Radius ..... 21.5 ft.
- Windload ..... 9 sq. ft.
- Weight ..... 68 lbs.
- Mast ..... 2 in. O.D.



\*Lack of space or funds? How about a KT-34A? It's upgradable to a KT-34XA and similar in performance!

## KT-34XA Gain vs. VSWR



The KT-34XA's design represents the first major advancement in tribander technology in over 20 years! The conventional traps, coils, and capacitors have been discarded in favor of integral linear loading and hi-Q air capacitors, all composed of aluminum tubing. These give the KT-34XA a conservative power handling capability of 5KW PEP and an unusually high level of operating efficiency. Linear loading also makes full 1/4-wave elements possible on 10 and 15 meters, and brings 20 meters much closer to the desirable 1/4-wave than any conventional tribander. The etch above diagrams the profound differences between the KT-34XA and a typical tribander element and the electrical activity of its various sections. Note also the lower windloading profile!

Mr. W.M. Scott  
Mirage/KLM  
P. O. Box 1000  
Morgan Hill, Ca. 95037

Hello Scotty

Just want you to know that once again your KT34XA is the king of the 10/15/20 meter bands!

In 1987, just closed, I worked 268 countries on 10/15/20 SSB with your KT34XA - and this was done in only 11 months - (since I spent October in China at BY4 RA and BY4 AOM in Shanghai - away from my home qth.) -congratulations, Scotty, on providing the finest tri-bander available anywhere - and you can quote me!

73/Ken Miller  
KG9R/3

(See the Feb. issue of S.E.R.A. Repeater Journal's "Dream Farm" story — reprints available).

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### CIRCLE 73 ON READER SERVICE CARD

Number groups after call letters denote following: Band (A=all), Final Score, Number of QSOs, Zones, and Countries. Certificate winners are listed in Bold Face.

### QRPp SECTION WORLDWIDE

4X6IF	A	410,484	589	237
N3RS	A	402,868	497	302
LZ2QV	A	283,044	549	229
WBVSK	A	214,272	392	288
UA3DPX	A	195,520	580	188
FB1LMJ	A	180,575	484	233
DL5FBL	A	167,233	426	253
NS6G	A	163,020	385	285
(Op. W6REC)				
I4KRF	A	149,343	410	201
G3KDB	A	144,584	410	212
K7SS	A	144,000	350	200
DL3NCI	"	113,386	354	182
YU1LM	A	112,574	385	187
Y05BLA	A	110,474	376	182
AA2U	A	103,950	259	189
SP4GFG	A	92,800	343	160
UA6LIG	"	77,877	363	153
VE3NVP	A	77,220	192	130
PA8PUR	A	74,104	261	157
EA1KC	A	70,200	282	156
NR2H	"	54,085	211	145
OZ1JVN	A	53,130	256	138
WB6JMS	"	50,568	191	147
NC7K	"	49,000	185	140
VE1NH	A	41,516	156	107
OK1DZD	A	41,000	194	125
PA8ADT	"	39,712	205	136
Y23TL	A	33,572	172	109
KZ1L	A	32,868	126	99
GWBARK	A	32,640	173	120
N1AFC	"	32,330	141	122
IS8LDT	A	30,591	157	99
KB4GID	A	28,952	193	154
K8DD	"	22,572	120	114
NU4B	"	21,624	159	136
JH3TXP	A	21,164	92	74
IS0LYN	"	20,800	131	100
PA3CAL	"	17,575	150	95
HB9XY	A	16,434	109	83
DF3BH	"	12,792	108	82
N8CQA	"	12,711	107	57
Y22DK/P	"	11,398	115	82

N05W	A	7,469	107	97
WBNGB	A	5,888	87	79
OE10PW	A	4,128	57	43
CX8DT	A	4,114	39	34
OK1DHJ/M	"	3,690	50	41
VE7EKS	A	2,905	43	35
PA3AFF	"	1,504	45	32
W2JEK	"	903	23	21
EA3EGV	28	7,866	94	63
OK1DKW	28	2,880	45	32
Y02AQB	28	2,214	51	41
EA6VQ	28	1,862	49	38
LZ1KSP	28	1,488	44	31
(Op. Savi)				
UB5REN	28	864	32	27
J13AUD	28	792	48	33
JH1LBR	"	720	39	30
OK1DRQ	"	616	23	22
JR3RWB/2	"	340	24	20
OK2KR	"	221	17	13
UR2CR	21	44,023	244	133
PA2REH	21	39,825	227	135
YC2UDH	21	22,036	102	79
JABBS/1	21	3,036	53	44
UB5MQS	21	1,428	24	21
WB8GGB	21	936	26	24
J01LDY	"	255	21	17
UB5FDM	14	106,080	356	204
JA2DN	14	100,800	233	180
EA8ACL	14	95,734	213	151
UA3DJE	14	69,927	392	163
SM5CCT	14	44,936	206	137
UC2WG	14	38,634	220	136
OH3GD	14	34,500	182	125
OK2BMA	14	24,966	159	114
K89S	14	22,984	170	136
KF1H	14	13,439	103	89
RA8JD	14	10,250	93	67
G3DOP	14	3,956	68	52
SP2FAP	14	3,648	50	48
N60J	14	3,064	58	51
G3CWL/A	"	594	25	22
WB9VK	14	341	34	31
OK110A	7	16,524	105	81
JH7XGN	7	7,742	50	49
JF2LTH	"	2,838	35	33
UP2BFE	3.5	108,480	323	160
OK3CUG	3.5	57,318	228	123
OK3CGN	"	46,331	211	107
OK3CRW	"	12,880	100	70
Y28QH	3.5	8,932	77	58
KU7Y	3.5	2,604	90	62
OK1JDJ	"	882	21	21
RA3AUU	1.8	39,600	190	99

### SINGLE OPERATOR NORTH AMERICA UNITED STATES

KS1J	A	842,434	882	397
K8HVT/1	A	523,250	598	325
K1CLN	"	72,216	196	153
K2MN/1	"	7,293	53	51
W10PJ	"	3,311	44	43
K1TO	14	1,469,820	1260	524
K5MA/1	14	154,062	346	243
K1XM	"	53,618	168	142
W1LQQ	"	37,714	123	109
NG1J	"	27,300	155	130
K01F	"	1,920	40	40
KA10WM	"			
/AG	"	26	14	13
K1XA	7	1,091,608	692	386
KZ2S	A	1,795,794	1233	483
KU2C	A	1,394,204	1164	476
AB2E	A	940,380	943	420
K2TOC	"	400,879	502	311
N2AZS	"	197,046	337	246
KT2D	"	118,560	268	190
W2FTY	"	105,726	256	201
KW2J	"	90,454	239	182
NA2M	"	40,950	127	117
W2GKZ	"	38,610	151	117
N2GDW	"	36,036	140	117
KF20	"	18,432	104	96
KU2Q	28	5,460	126	84
N2GUV	21	54,540	250	180
NE2W	"	2,280	82	60
K2VV	14	1,805,859	1375	561
K12P	14	782,273	912	419
NJ2L	"	772,952	909	424
K2SX	"	66,364	236	188
W2FUI	"	16,146	82	69
KD2HE	7	58,520	179	133
K5NA/2	1.8	5,760	83	64
KT3Y	A	2,570,006	1514	554
KC8C/3	A	2,345,000	1502	500
KM3T	A	2,044,218	1359	517
KS3F	"	601,520	763	365
W3UM	"	588,669	623	349

WB3CAC	"	482,076	502	252
K3IPK	"	276,602	393	251
W3ARK	"	185,496	330	236
W3EAX	"	61,761	231	173
(Op. WB2EKK)				
KY3M	"	56,151	210	153
N6CQ/3	"	47,244	202	186
N3EMD	"	41,783	161	127
W3FOE	"	23,384	93	74
KA3GXP	"	2,784	26	24
WA3VPL	"	2,016	37	36
W38GN	7	99,484	166	133
N3AD	3.5	90,610	227	205
K4PQL	A	1,222,018	975	457
K4PR	A	191,595	362	241
W60KX/4	"	169,000	345	250
N4ZR	"	74,664	198	136
K40D	"	69,680	172	130
N4UH	"	46,155	124	85
WB4FOT	"	4,512	49	47
NU4Y	28	13,440	260	140
KD1U/4	28	4,480	105	80
N4VZ	21	81,055	312	215
WB4TDH	14	588,141	826	411
W4KMS	"	11,562	82	82
N4UZ	"	2,900	60	58
N4MM	"	2,490	30	30
WA4SSB	7	46,368	164	138
KF4CI	"	36,519	122	111
WB5M/4	"	12,168	91	78
W9LT/4	3.5	12,144	85	69
WM5G	A	861,045	973	419
(Op. KM5R)				
K65U	A	617,142	852	438
KZ5D	"	488,436	675	404
KA5W	"	402,773	625	353
K50B	"	154,250	326	250
WB58IR	"	106,260	338	210
W5MW	"	76,788	204	158
WC5D	"	62,556	194	156
K13L/5	"	21,500	167	125
W50B	"	19,536	89	88
W5EJ	"	11,424	67	51
N5UA	"	5,016	51	44
W5FO	14	232,050	562	325
WF5E	"	163,833	449	291
NX5H	"	87,096	275	228
KN5H	"	2,744	52	49
W5WMU	7	983,280	710	408
(Op. K5GA)				
NT5G	"	196,784	312	251
KC5DX	"	70,224	213	168

### CONTINENTAL LEADERS

ASIA		OCEANIA	
AB HZ1HZ	1,787,187	AB YB0TK	1,625,250
28 JA2IVY	2,907	28 YB4FNN	86,224
21 UJBJA	691,207	21 YB4FN	396,960
14 UA9YI	1,446,240	14 FO5JP	1,143,000
7 UP2NK/UF	1,600,950	7 VK2BQQ	237,614
3.5 UA9TS	460,000	3.5 No Entrant	
1.8 UA9QDA	26,244	1.8 No Entrant	

AFRICA		SOUTH AMERICA	
AB 5L7T	8,619,226	AB ZZ5EG	7,228,440
28 No Entrant		28 4M7A	111,389
21 5T5CJ	1,469,314	21 ZY4OD	2,197,272
14 EA8BCJ	76,590	14 OA4BCZ	78,600
7 No Entrant		7 YX5A	2,999,97
3.5 No Entrant		3.5 HK7IMB	184,736
1.8 No Entrant		1.8 4M3A	3,492

EUROPE		MULTI-SINGLE	
AB IO4IND	2,942,388	AF No Entrant	
28 UB5INO	56,480	AS UZ9AYA	5,263,256
21 YU1LA	762,784	EU LZ9A	5,683,682
14 YT3AA	2,216,680	NA V31A	8,544,768
7 OK3YX	1,264,770	OC No Entrant	
3.5 HA3MY	450,640	SA HK1QQ	5,084,436
1.8 UA2FF	117,424		

NORTH AMERICA		MULTI-MULTI	
AB NP4A	5,724,342	AF No Entrant	
28 NU4Y	13,440	AS JA2YKA	3,297,028
21 N4VZ	81,055	EU UP7A	9,920,442
14 VO1QU	1,878,240	NA K3TUP	3,780,081
7 K1XA	1,091,60	OC KH6XX	8,082,900
3.5 HK3MAE/HK8	456,280	SA No Entrant	
1.8 K5UR	8,946		



Y42HA	"	4,452	61	53	Y05ANN	"	11,482	130	98	UB5FAN	"	106,500	326	150	NAURU				
Y41UF	"	986	23	17	Y03AC	"	7,200	53	50	RBSIA	"	84,960	264	144	C21XX	A	959,445	861	345
Y23EL	14	67,396	283	166	Y02ADQ	"	6,800	64	50	UB5IHQ	"	84,600	271	141	THE PHILIPPINES				
Y22UB	"	53,424	214	144	Y06BHN	28	2,900	57	50	UB5EEP	"	65,780	234	130	K1BAZ/DV1	A	734,524	857	259
Y26WM	"	19,104	124	96	Y05ALI	21	20,196	128	102	UB5MLP	"	61,976	212	127	SOUTH AMERICA				
Y21UL	"	4,158	60	54	Y02GZ	"	9,052	80	62	UB5FAK	"	43,452	218	102	ARGENTINA				
Y49ZD	7	4,788	54	42	Y05ALH	14	34,692	184	118	UB5ZAL	1.8	57,120	209	119	K5KG/LU	A	3,025,638	1705	518
Y25GH	"	1,056	24	22	Y03BWK	"	14,421	79	69	UT5UJO	"	8,322	98	57	LU1EWL	"	80,920	191	140
Y33UL	1.8	6,210	63	45	Y08KOS	7	223,060	427	215	BYELORUSSIA				LU5UL	28	50,932	150	119	
Y26IL/A	"	4,704	55	42	(Op. Y08AXP)				UC20R				A	1,389,141	1744	403			
Y24LO	"	96	10	8	Y04DCF	"	43,120	152	110	UC2WA0	A	386,694	715	217	K777	"	206,910	585	198
HUNGARY					Y02DFA	"	16,470	70	61	RC2AU	"	63,072	250	146	LU4FD	21	1,023,069	868	397
HA8MM	A	1,356,500	1337	500	Y05BRZ	"	15,872	73	62	UC0AG	"	19,440	113	81	BRAZIL				
HA5LZ	A	477,638	710	313	Y04BSZ	"	3,192	53	28	UC0AR	"	13,912	125	74	ZZ5EG	A	7,228,440	2741	690
HA7UI	"	393,820	699	290	Y04AAC	"	1,806	43	21	UC0AP	"	10,658	106	73	(Op. LU8DQ)				
HA6NL	"	381,972	697	278	Y02A00	3.5	105,120	361	146	UC2AB	14	7,670	118	95	PY18VY	A	387,900	439	300
HA4XX	"	224,434	578	238	Y08CMB/B	"	12,896	111	62	UC1WWD	7	612	19	17	PY2DRP	"	31,360	90	80
HA8XX	"	136,713	311	199	Y06VF	"	4,218	53	37	MOLDAVIA				PY2TN	"	384	14	12	
HA1SL	"	101,520	342	180	Y06BTY	"	504	18	14	RO40A				7	15,795	71	65		
HA4YK	"	98,100	299	180	SCOTLAND				LITHUANIA				PY5AKW	28	19,635	89	77		
HA8HG	"	96,822	360	163	GM3CFS	A	236,682	516	243	UP2CY	A	1,297,175	1301	445	ZY40D	21	2,197,272	1592	462
HA5ARR	21	128,940	370	210	GM4CXM	14	565,504	895	376	UP380	A	701,760	941	344	PU5YPI	"	152,720	283	184
HA2RP	14	937,988	1076	421	GM3RA0	"	452,920	759	338	UP3BU	"	617,862	1019	313	PY2RLQ	"	53,244	155	116
HA9PV	"	679,932	1001	396	SPAIN				UP2DM	"	286,192	612	248	P08ZZ	"	820	22	20	
HA5PS	"	147,186	369	234	EA1CIM	A	550,193	704	371	UP3BP	"	284,885	551	251	PY2MKL	7	235,994	228	187
HA8DT	"	121,608	358	216	ED2DMU	A	418,015	819	295	UP2PAQ	"	245,784	590	231	ZY5BVL	"	120,648	159	132
HA9RE	7	1,027,464	885	372	EA3DBO	"	165,737	398	209	UP2BEO	"	190,698	463	222	PY2DP	3.5	137,544	180	132
HA8UT	"	331,776	514	256	EA7AZA	"	107,880	329	186	UP2BPO	"	70,176	255	129	COLOMBIA				
HA3PT	"	266,498	501	227	EA1BCH	"	103,428	365	169	UP2BOO	"	68,264	290	161	HK7IMB	3.5	184,736	224	184
HA3MY	3.5	450,640	741	262	EA1EMI	"	82,164	348	167	UP2BQA	"	56,940	185	130	PERU				
HA3PD	"	344,160	703	240	EA7FUR	"	61,776	229	176	UP2BOA	3.5	234,080	502	209	OA4BCZ	14	78,600	200	131
HA1XR	"	295,000	591	236	EA7XC	"	35,805	93	77	UP2BLF/A	3.5	191,760	445	188	OA4ZV	7	1,684,240	772	370
HA6PX	"	198,602	390	199	EA7BHO	"	12,960	108	80	UP2BKM	"	145,008	385	171	URUGUAY				
HA6PQ	"	60,960	250	120	EA2CR	28	1,820	46	35	UP2BLC	"	61,992	228	126	CX68M	21	163,085	288	193
ICELAND					EA5DNO	28	1,050	31	25	UP2BOS	"	5,880	62	42	CX88BH	7	2,002,104	857	403
TF3DC	A	4,851	51	49	EA7CFW	21	631,582	992	394	UP2BIC	"	4,256	52	38	VENEZUELA				
ITALY					EA7AAW	14	32,508	198	129	UP2BJA	"	1,768	30	26	YW1D	A	4,001,330	1958	565
ID4IND	A	2,942,388	1856	564	EA7TH	7	1,061,982	878	369	UP2BIB	"	1,768	30	26	(Op. YV1DIG)				
IK4DCT	"	146,856	460	232	SVALBARD				UP2BIA	"	1,768	30	26	4M7A	28	111,389	232	167	
IK1CBG	28	10,720	120	80	JW5VAA	A	2,250	35	30	UP2BIB	"	1,768	30	26	(Op. YV7QP)				
I5YDI	"	7,980	87	76	SWEDEN				UP2BIB	"	1,768	30	26	YX5A	7	2,999,977	1076	479	
IO8KHP	"	3,504	63	48	SK8LM	A	760,362	1159	359	UP2BIB	"	1,768	30	26	(Op. YV5ANT)				
I1XSG	14	218,040	626	276	(Op. SM8DRD)				UP2BIB	"	1,768	30	26	YV4ABR	"	125,496	173	126	
IOVUZ	"	80,150	296	175	SM68GG	A	193,930	463	205	UP2BIB	"	1,768	30	26	YV7QP	"	13,869	77	67
IK1GKD	"	27,642	195	118	SM5RE	"	79,424	356	146	UP2BIB	"	1,768	30	26	4M3A	1.8	3,492	21	18
IK4GNK	"	4,200	50	50	SM7LAZ/6	"	52,890	300	123	UP2BIB	"	1,768	30	26	(Op. YV3AGT)				
I1BAY	1.8	49,938	206	123	SM6DER/7	"	18,656	130	88	UP2BIB	"	1,768	30	26	YV10B	"	648	12	12
JERSEY					SM3CVM	"	17,091	96	81	UP2BIB	"	1,768	30	26	MULTI OPERATOR SINGLE TRANSMITTER				
GJ8/K2TNO	A	790,803	1254	351	SM8COP	"	9,490	97	73	UP2BIB	"	1,768	30	26	UNITED STATES				
THE NETHERLANDS					SM5PAX	"	6,496	60	56	UP2BIB	"	1,768	30	26	N4WW		3,629,444	1992	67
PA3CWL	A	301,392	694	234	SM5DEV	"	2,769	39	39	UP2BIB	"	1,768	30	26	WC4E		3,103,230	1700	654
PA80IN	A	103,788	243	186	SM5CSS	"	220	10	10	UP2BIB	"	1,768	30	26	NJ1F		2,714,912	1734	592
PA38TH	"	70,848	256	144	SM5IMO	28	21,188	184	108	UP2BIB	"	1,768	30	26	NR5M		2,205,158	1511	617
PA3BNT	"	35,616	142	106	SM5MX	"	14,014	152	91	UP2BIB	"	1,768	30	26	AI6V		2,034,396	1554	548
PA8LKR	"	23,484	149	103	SM5DUT	"	484	25	22	UP2BIB	"	1,768	30	26	KJ9D		1,822,048	1329	58
PA8VDV	"	10,132	72	68	SK6AW	21	76,466	350	173	UP2BIB	"	1,768	30	26	NGVR		1,713,482	1208	466
PA3EOB	"	4,674	42	38	SM6CUK	"	43,500	184	150	UP2BIB	"	1,768	30	26	AG6D		1,463,820	1218	465
PA8UV	21	11,476	89	76	SM8KV/8	"	21,293	150	107	UP2BIB	"	1,768	30	26	WC6H		1,331,330	1214	455
PA3BEJ	"	84	6	6	SM8FO/8	"	6,365	82	67	UP2BIB	"	1,768	30	26	K8HLB/4		626,875	857	425
PA2GER	14	48,363	343	141	SM7TV	14	59,532	256	164	UP2BIB	"	1,768	30	26	AK6T		436,563	721	333
PA8PLN	"	22,018	140	109	SM6DUR	"	7,956	88	78	UP2BIB	"	1,768	30	26	AC6H		224,688	564	302
NORWAY					SM6JY	"	5,775	65	55	UP2BIB	"	1,768	30	26	WV6N		200,187	397	261
LB8JC	A	30,694	193	103	SM7PKK	7	362,082	562	259	UP2BIB	"	1,768	30	26	W3KWH		133,322	279	17
LA1HCA	14	36,942	178	131	SM5ARR	"	320	8	8	UP2BIB	"	1,768	30	26	WZ6Z		14,352	122	104
LA4YW	3.5	408	14	12	SWITZERLAND				UP2BIB	"	1,768	30	26	WR6R		8,288	91	74	
POLAND					HB9DDZ	A	73,964	223	164	UP2BIB	"	1,768	30	26	NORTH AMERICA				
SP9DWT	A	274,670	534	242	HB9KC	"	32,896	140	128	UP2BIB	"	1,768	30	26	V31A		8,544,768	3414	768
SP9AKD	"	30,552	165	114	HB9DFY	"	14,400	118	72	UP2BIB	"	1,768	30	26	AL7IB		3,141,831	1776	53
SP5DIR	28	37,856	176	104	HB9ADD	7	200,672	353	211	UP2BIB	"	1,768	30	26	ASIA				
SP2JKC/3	21	220,920	480	263	YUGOSLAVIA				UP2BIB	"	1,768	30	26	JA3YKC		2,033,262	1376	489	
SP4EEZ	"	50,127	236	147	YT3M	A	2,537,240	1617	548	UP2BIB	"	1,768	30	26	JA3YBF		2,000,862	1410	486
SP8ITU	14	1,069,404	1316	439	(Op. YU3ZV)				UP2BIB	"	1,768	30	26	VS6DO		1,994,106	2081	42	
(Op. SP6CYX)					YU3EA	A	1,098,650	1095	430	UP2BIB	"	1,768	30	26	JA9YBA		1,699,188	1284	444
SP22FJ	"	365,023	733	307	YT7KW	"	319,280	614	260	UP2BIB	"	1,768	30	26	JA1YWX		1,327,832	1118	382
SP4JWR	"	326,018	583	319	YU7KM	"	37,734	160	114	UP2BIB	"	1,768	30	26	JA1YFG		1,022,912	948	352
SP5JTR	7	281,260	415	245	YU3SX	"	4,928	69	56	UP2BIB	"	1,768	30	26	JA7YAB		957,136	1013	367
SP5CJQ	"	193,440	370	208	YU20B	28	46,080	290	144	UP2BIB	"	1,768	30	26	JA1YAD		908,305	864	345
SP5GH	1.8	35,910	165	95	YU1HA	"	33,320	209	140	UP2BIB	"	1,768							

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HG9R	3,936,306	2882	627
HG1S	3,875,530	2634	647
HG6N	3,839,824	2591	646
EA3VY	3,773,124	2501	652
FF3TV	3,325,122	2473	606
YU3MM	3,279,465	2172	609
Y35L	2,483,028	2195	554
OH8SR	2,447,269	2294	56
YT3T	2,439,288	1900	552
PA3CEF	2,340,520	1994	52
FV7NDX	2,212,350	2040	490
I1ZEU	2,202,896	1871	524
SK4EA	2,100,196	1692	74
TV6MYT	1,999,888	2095	484
OH2AO	1,718,552	1638	472
SP5PBE	1,641,388	1522	434
OK3KEE	1,637,090	1469	49
HG6V	1,621,650	1675	475
OK3KII	1,576,008	1558	477
LZ1KOZ	1,375,826	1686	439
HA8KWG	1,285,734	1501	421
ON4GO	1,230,409	1372	46
I2DMK/IE9	1,122,264	1372	429
HA3KNA	1,096,860	1328	404
SK6EI	989,100	1100	450
HA8KLE	985,800	1297	424
4U2ITU	770,058	1244	35
Y37BER	717,213	1214	343
4N3G	715,125	914	375
HA6KNX	588,273	848	327
OK2KMR	586,504	850	334
SP9PEY	391,408	731	272
HB4FE	383,145	710	28
SK2AU	207,932	477	229
HA7KRX	204,897	522	231
LX/PA3CNH/P	204,373	492	19
OK1KGR/p	195,480	519	216
OK3KGO	189,841	457	229
OK2KPS	152,640	465	212
HA7KMP	142,805	422	205
Y82ZL	120,714	373	186
Y05KTB	115,362	299	15
LZ2KSQ	113,950	430	265
OH6AK	85,988	300	166
HA5KDB	73,392	200	132
LZ1KVF	69,888	252	168
OK1KOK	63,840	209	152
OZ10XZ	37,960	196	13
SP2ZBE	25,351	145	101
OK2KVI	17,266	130	89

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**CLUB STATIONS**

**ASIA**

UZ9AYA	5,263,256	2403	604
UL8LYA	4,319,422	2345	57
UZ9FWR	2,829,680	1687	496
UL8CWW	2,450,890	1687	501
UL8BWW	1,644,112	1087	422
UZ9QWA	1,233,180	1111	51
UZ9XWV	816,768	806	288
UZ9SSWA	635,014	752	383
UZ9CYP	288,456	450	202
RZ9HYH	200,277	400	187
UL8GWC	10,432	79	64

**EUROPE**

UP1BWW	2,769,903	2129	593
UQ1GZW	2,582,210	2222	545
UZ1AWT	2,382,880	2019	562
UR1RWX	2,286,588	1982	53
UP1BZO	1,983,780	1816	515
UB4XWB	1,880,525	1653	53
UP1BXR	1,480,734	1529	459
UZ4LWL	1,414,266	1499	453
UB4QWV	1,058,229	1325	383
UZ1AWO	957,528	1542	372
UZ4WWR	639,285	1000	345
UQ1GWX	578,522	1019	301
UP1BZQ	501,858	894	294
UB4EXU	498,560	784	328
UQ1GYT	419,923	904	251
UP1BZM	305,500	544	235
UC1AWZ	296,060	600	26
UB4TWA	249,760	496	280
RB4IYJ	234,398	700	233
UB4IWI	187,480	520	218
UB4TWL	125,316	430	177
UB4DWW	93,786	213	154
UZ4WWB	54,944	242	136
UR1RYO	47,705	185	145
UP1BYC	30,098	184	101
UB4WZB	14,700	140	84
UZ2FWN	4,290	49	3

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UP7A	9,920,442	5593	823
4N2E	8,978,678	4595	853
KH6XX	8,082,900	3413	630
K3TUP	3,780,081	2285	733
Y21U	3,639,616	3299	592
NI6W	3,398,748	2252	642
JA2YKA	3,297,028	2023	524
UB2JWS	2,715,939	2225	577
WX5S	2,333,718	1768	621
K5ZD/1	1,532,800	1101	479
JE3ZFS	307,174	482	259
UZ9SWY	235,807	431	18
KN3T	231,275	460	275
JA1YAL	21,736	111	76
OK3KYH	9,272	100	62

Correction to SSB Records: The QRP/p record holder should be KTSS/WH6 ('86) with 2,078,490 points.

Disqualified: KH6CP/\*—did not sign portable correctly: Rule VII. WL7AFB/7 did not sign portable correctly: Rule VII.

The following logs were used for cross-checking. Check logs and SWL logs are always appreciated. Thank you.

4N2D, AA2Z/1, CT1AOZ, EA1CYL, EA3JC, EA4EBE, EA8ACH, EA8BJU, HA8DD, HA8LG, HA8NAP, HA4YG, JA2GU, JA6FYM, K8MZV, K4TX, K6JG, KH6CP, KO4D, LA4NL, LA7SI, LA8CE, LA8XM, LA9OI, LA9XG, LZ1EO, LZ1HY, LZ2AG, N2WT, OE1DEW, OH2BAH, OH5FA, OH6NEV, OH6RC, OH6XL, OK1DWJ, OK1DZL, OK1MIN, OK1OND, OK1US, OK2PAY, OK2SWD, OK3CQR, OK3CSQ, OK3KYH/P, ON5CW, OZ1BUR, OZ1EUO, OZ1IQC, OZ1JMN, OZ1JNR, OZ2JI, OZ3G, OZ4RS, OZ5PA, OZ5UR, PP1RR, PP2CE, PP2WV, PT7AA, PY2LMA, PY2MT, PY2RRG, PY3CJI, RA3ALA, RA3AR,

RA3EA, RA3NB, RA4SAE, RA9HW, RA9JX, RB5HB, RB5IPT, RB5MU, RM8MA, RT4UZ, RT5UE, RV6AA, RV6AF, RV9CFA, RZ3DM, SM8CSX, SM3CBB, SM5FNU, SM5FUA, SM6BZE, SM6CDN, SM6KMD, SM6OLL, SM7EH, SP1CGP, SP6FER, SP6FZA, SP6HEK, SP7LHX, SP8BBK, SP8JUX, SP9ENV, SP9HRP, SP9JPA, UA8BEC, UA8FDX, UA8KJ, UA8KDB, UA8KDH, UA8QCA, UA8QO, UA8SY, UA8ZDE, UA1ANA, UA1OML, UA2DM, UA3AAJ, UA3ABW, UA3DQS, UA3IDT, UA3MED, UA3NEM, UA3PB, UA3PDW, UA3QIP, UA3QJC, UA3RB, UA3RNM, UA3TAM, UA3XBB, UA4AO, UA4CDL, UA4CSV, UA4HFK, UA4QK, UA4WH, UA4YA, UA4YCY, UA4YZ, UA6AUT, UA6HOF, UA6PCH, UA6YAH, UA6YHR, UA9AKW, UA9CQB, UA9DC, UA9FZ, UA9MAC, UA9MQ, UA9OF, UA9OJ, UA9QCP, UA9SGW, UA9XS, UA9YJP, UB4EYJ, UB4JA, UB4LDD, UB4WZA, UB5CAL, UB5EF, UB5EFW, UB5IMD, UB5JS, UB5KAF, UB5KEG, UB5LAL, UB5MTM, UB5PAG, UB5UCH, UB5ZKQ, UC8AC, UC8AH, UC10WG, UC1SWL, UF6FCZ, UF6FDS, UJ8AQ, UL7BY, UL8FWL, UL8GBI, UL8GBV, UP1BFX, UP28KT, UR2RCO, UR2RNG, UT4UH, UT5CF, UT5UCK, UT5UDG, UT5UFI, UV3ACX, UV3DK, UV3DN, UV3TD, UV6AGF, UV9CJ, UW3DX, UW3GL, UW3HY, UW3PN, UW9AO, UW9CP, UY5GG, UZ8BWL, UZ8XO, UZ1NWA, UZ1OWA, UZ2FXE, UZ4HYC, UZ6AYG, UZ6EWF, UZ6HO, UZ9AZO, UZ9CXE, UZ9OWD, UZ9XWA, UZ9YXO, VD1ACK, VE1ACK, VO1AW, VO1SA, W1WY, WA4VAP, WB9LTN, Y21DG/A, Y21UD, Y22TO, Y23BF, Y23QD, Y23XD, Y24EA, Y24FA, Y25GM/A, Y25MG, Y25XL, Y26JD, Y26SO, Y26VL, Y27QO, Y27YH, Y32HK, Y36SG, Y42ZB, Y45RJ, Y54ZA, Y55VJ, Y56YF, Y57ZA, Y61XM, Y64ZL, Y02BKK, Y02KAC, Y02KHG, Y03NL/3, Y04CAH, Y06LV, Y08CEZ, Y09HH, YU4EJC, YU7DR, ZV2BW, ZY1OL.



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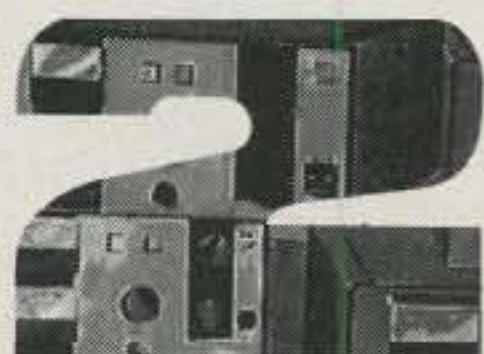
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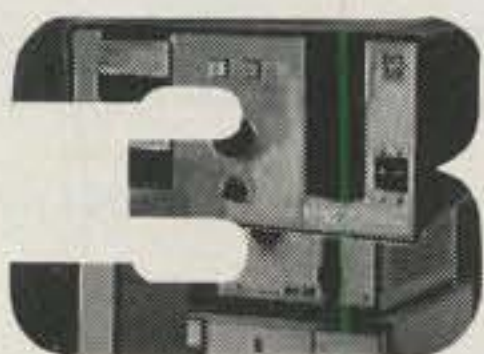
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**Look out William Tell! A little target practice is in order so that you can aim your antenna at those DX targets.**

## Wire Antennas and Trees The Easy Way

BY HARRY M. JOHNSON\*, NV7K, and C.A. JUSTINAK†, W7GBI

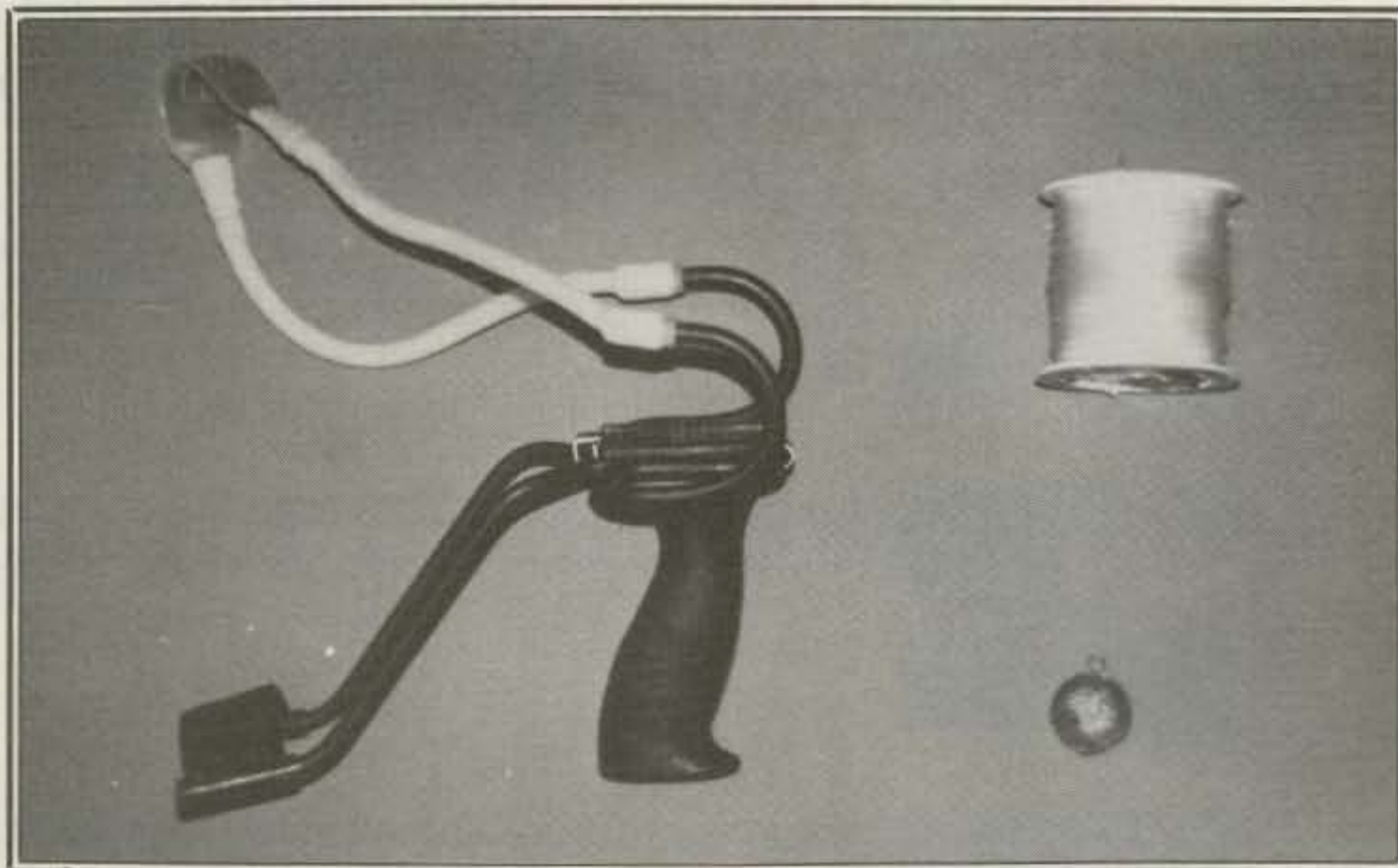
**W**hen spring and summer roll around again, many amateurs will look to the trees for antenna support. These natural wonders can make great substitutes for towers if they can be taken advantage of. The old trick of using a slingshot, bow and arrows, etc., to put a line through a tree at the proper place has been used many times, but there are several places where difficulty can occur. The proven procedures presented here will help to minimize the difficulty.

This method uses a minimal amount of time and equipment and has given us good results. The idea is to shoot a 20 pound test nylon monofilament line through the appropriate place in the tree so that an intermediate pulling line or the final antenna rope can be pulled back through.

A commercially available slingshot, such as the one made by Saunders (see photo) and available in sporting-goods stores, is ideal for the job. A 2 ounce oval fishing sinker was used by the authors, but a regular swivel type can be used as long as the weight is the same. A stevedore knot, used often with fishing gear, is used to attach the line to the sinker. A square knot with a half-hitch can also be used.

In the following procedure an assistant can handle the line. However, if no one is available, it may be done as follows.

The line spool is slipped on to a ¼ inch steel rod (or suitable substitute) about 12 inches long. The rod is clamped to the top of a sawhorse with vise-grip-type pliers. A second vise grip is used to keep the spool from spinning off the end of the rod as the line runs out (see photo). It is advisable to strip off about 20 feet of line and carefully lay it out on the ground between the sawhorse and the target. This allows the pro-



*Clockwise from left, Saunders slingshot, 300 yard spool of 20 pound test nylon monofilament line and 2 ounce oval fishing sinker.*

jectile to gain enough momentum to strip line off the spool as the 20 feet is extended out toward the target.

Just a few comments are in order about placement of the sawhorse and line spool, which must be done before the first shot is fired. We place the sawhorse back from the base of the tree at a distance approximately equal to the height we're shooting for. We stand to the left of and slightly in front of the sawhorse with the drawn-out line to our right and slightly in front of us.

There are many ways to aim with a slingshot and a few practice shots will show you where yours shoots. It might be wise to practice before attempting to shoot a line through a tree. We hold the slingshot in the left hand and use the right to draw it back. We sight over the left side rubber attachment while the slingshot is canted about 45 degrees to the right. Full draw is usually required to place a line at

about 60 feet elevation in an evergreen tree such as a douglas fir or ponderosa pine.

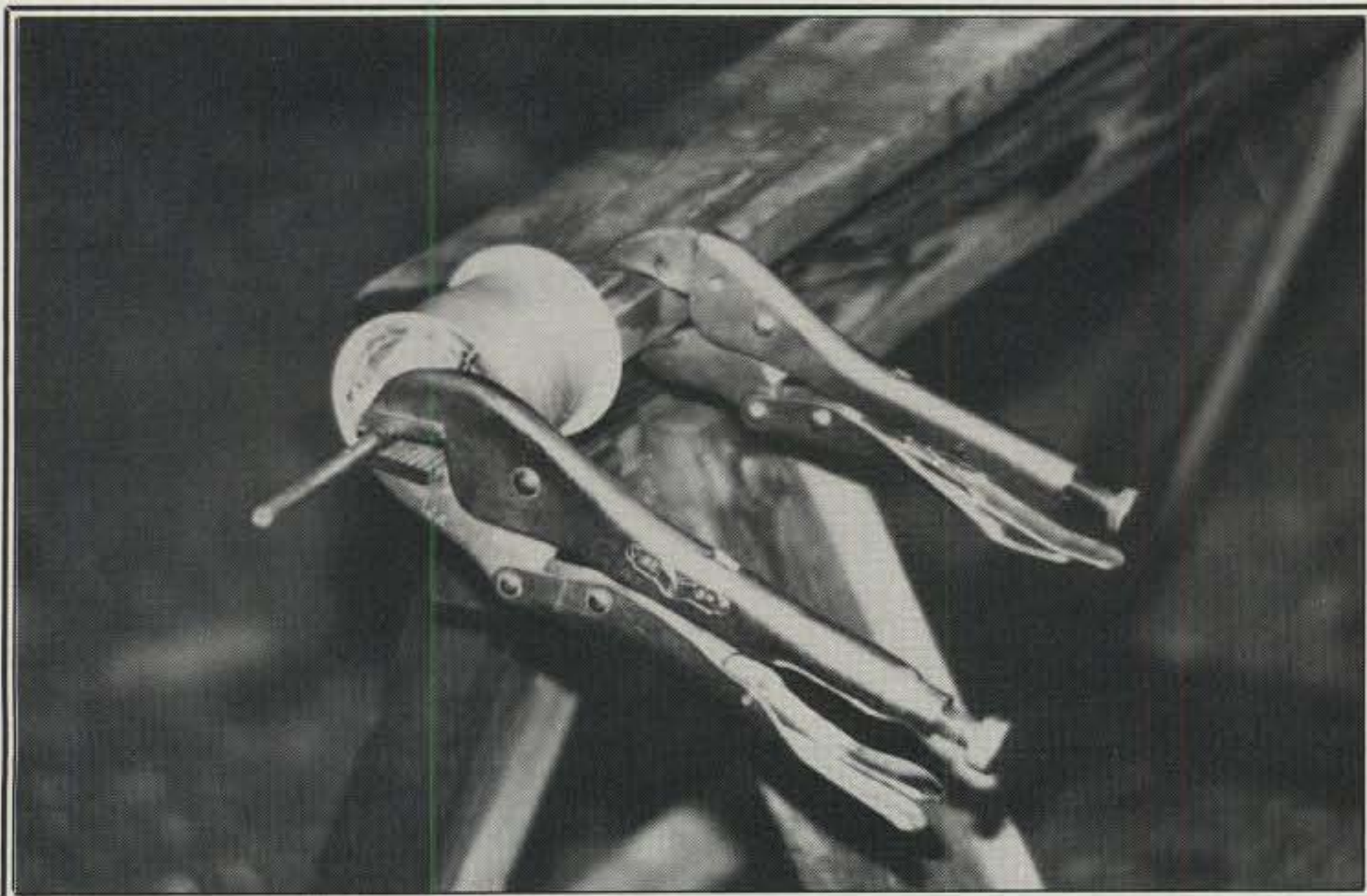
Upon release of the projectile, follow through with the slingshot down to your left (or right) side to keep it clear of the line.

After a bit of experience you'll probably find yourself hitting just the right place on the first shot. If things are carefully set up in advance, sinker well tied, line carefully stripped out, and sawhorse correctly placed, the shooting is just the easiest part.

The sinker will usually fall to the ground on the other side of the tree of its own weight. Rarely, it will land on a large branch and require you to grasp the line and raise the sinker slightly and let it fall. It can be coaxed around any obstructions and will then drop cleanly to the ground.

There are many ways of securing antennas to trees (pulleys, weights, springs,

\* 1185 Lost Creek Dr., Kalispell, MT 59901  
† 7045 N. 69th Place, Scottsdale, AZ 85253



Line spool runs on 1/4 inch steel rod held to sawhorse by vise grips. Second pair of vise grips keeps spool from spinning off as line goes out.

etc.) and we won't cover them here. We will present a foolproof way of getting the rope you are using up over the branch and down the other side.

Cut the sinker from the monofilament shooting line and put it in your pocket so it won't get lost. Take your rope and tie a

half hitch about 1 inch from the end. Pass the end of the monofilament through the half hitch and wrap about three turns around the rope. Tie it off with a square knot and a half hitch on top to ensure against slippage. Take a roll of black vinyl electrical tape, begin at the trailing por-

tion of the rope-monofilament junction, and tape it tightly and smoothly over the knots much as an electrician tapes a bundle of wires before pulling through conduit. The idea is to allow the smooth passage of the rope-monofilament junction over the branch that will ultimately support it (and any other branches along the way).

You can then go back to the sawhorse and begin pulling in the monofilament line to raise the rope up and over your selected branch. Be sure your rope runs free of kinks and twists and handle the monofilament by spinning the spool to reel it in. If you handle it in your hands, **wear gloves!** There is enough weight provided by the rope to cause the monofilament to cut into tender finger flesh!

One further note at this point. If you are attempting to place heavy rope, such as 1/4 inch or larger, in the tree, we would advise pulling a nylon string like mason's line through the tree first and then using it to pull your rope. This eliminates the possibility of breaking or severely stressing the monofilament. Use the same method of attachment with taping as described above for monofilament-to-mason's line and mason's-line-to-rope.

So there you have it! The way you use it and the type of antenna you are erecting are up to you, but we think you will find this a foolproof way to get it up to a good workable height in your available trees. **CQ**



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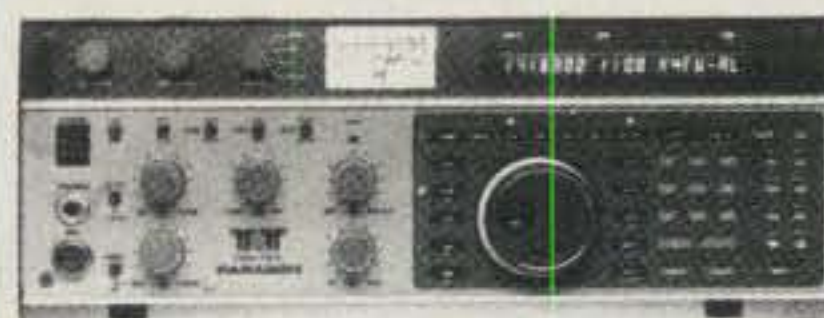
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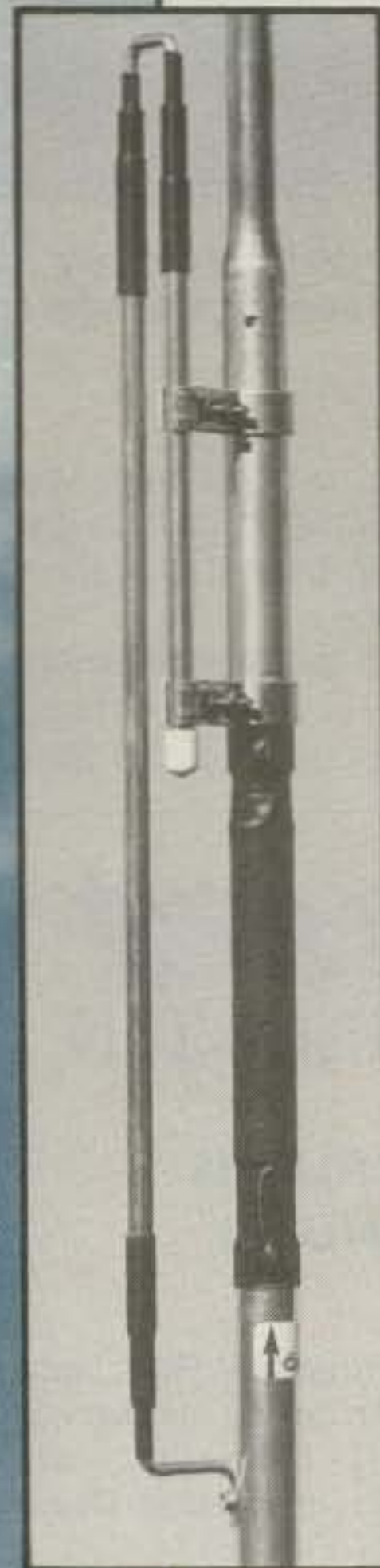
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# CQ REVIEWS:

## The ICOM IC-900 A/E Super Multi-Bander System

BY LEW MCCOY\*, W1ICP

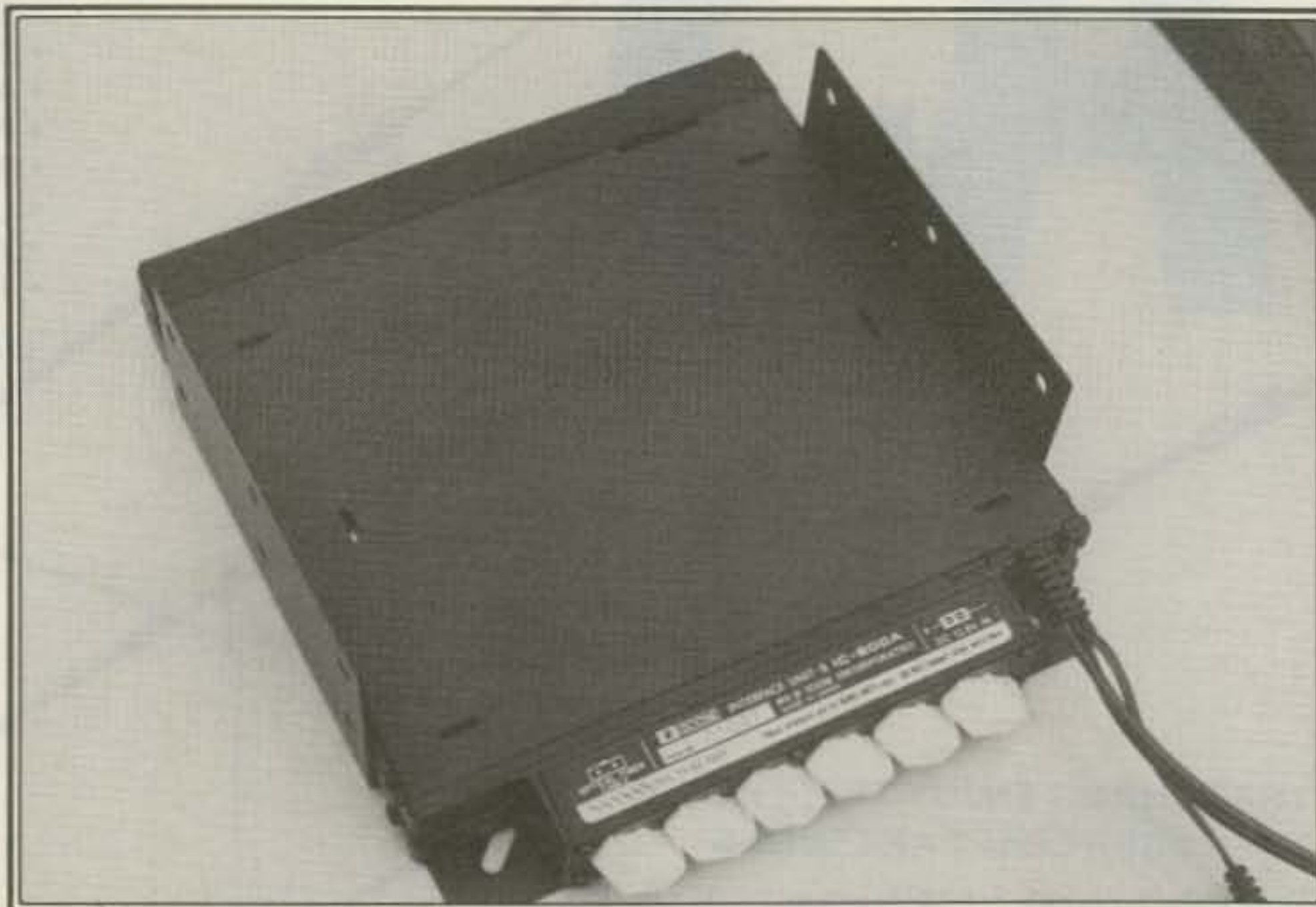
**T**he cliché goes "There is always something new under the sun," and it seems that ICOM devotedly follows that adage. In this case it is their "Super Multi-Bander System," the ICOM 900A/E.

Basically, the 900 consists of RF and digital conversion modules that can be integrated into an FM system that covers up to six bands in a completely flexible manner. What bands? Modules are available for 144 MHz, 25 or 45 watts; 450 and 220 MHz, 25 watts; 50 MHz, 10 watts; and (available soon) 1.2 GHz and 28 Hz, 10 watts.

These modules are all mounted remotely from the main interface unit. This means that in a mobile installation the RF modules can be installed in the trunk, for example, close to the antenna. The modules are all approximately 7 inches wide, 7½ inches deep, and 1 inch high. In a typical installation, going backwards from the RF units, the remote units are connected to the main interface, and then the main interface has connections for the mike, a speaker, and the tuning unit/display (which is a gem in itself).

Up to this point I haven't mentioned what I consider, and what I am sure ICOM considers also, an outstanding feature of this system. A fiber-optic cable is used to pass data signals between the main interface and the remote units. One of the advantages in using fiber optics to carry the RF signals (which are converted to data and logic signals at the interface mounted with the remote units) is the freedom from interference and noise, particularly in mobile installations.

However, the savvy VHF/UHF enthusiast will probably ask the million-dollar question. What are the losses in fiber-optic cable compared to coaxial lines? If the fiber-optic cable is carrying data and not RF, how far apart can you mount these remote units and still use the fiber-optic cable? In other words, can I reduce the horrendous losses that RF transmission



*This is the remote interface and mounting bracket which would be installed near the base of the antenna. The fiber-optic cable is installed in a terminal at the left. The white receptacles along the bottom are for the various band inputs. The power input is shown here at the right.*

lines give me? ICOM informs me that you can use up to 300 meters (900 feet plus) of fiber-optic cable. This means that the station can be mounted at the antenna with no feed line to speak of. And, I am sure there are plenty of amateurs reading this who know how to design data amplifiers that can be used with fiber optics to permit much longer runs of the cable if such a thing were needed.

For the neophyte, think of the fiber-optic cable as simply a two-conductor cable. In one conductor the data is flowing towards the remote units, and in the other conductor the opposite direction.

In as simple terms as possible, a signal is received at the antenna and fed into the remote RF unit. In the unit the signals are detected and converted to data. The data is then fed to a photocoupler and then down one of the fiber-optic lines to the interface unit. At the interface a photo-

coupler receives the data and converts the information to audio. The outgoing procedure is just a reverse process. You speak into the microphone, and the audio is fed to the interface where it is converted to an FM signal which is then changed to data. This is fed out the other fiber-optic cable and then to the remote unit.

I did a little research and found that fiber-optic cable sells for a little more than a dollar per foot. One supplier shows 500 feet at \$530 per spool. This cable is specified at 5 dB loss per kilometer (!) at 400 MHz. To me, the advantages over expensive hardline would certainly be worth investigating. There isn't any doubt in my mind that we will see a lot more of the fiber optic techniques simply because such a system could possibly overcome the long feed-line loss and interference problems.

\*Technical Editor, CQ, 200 Idaho St., Silver City, NM 88061

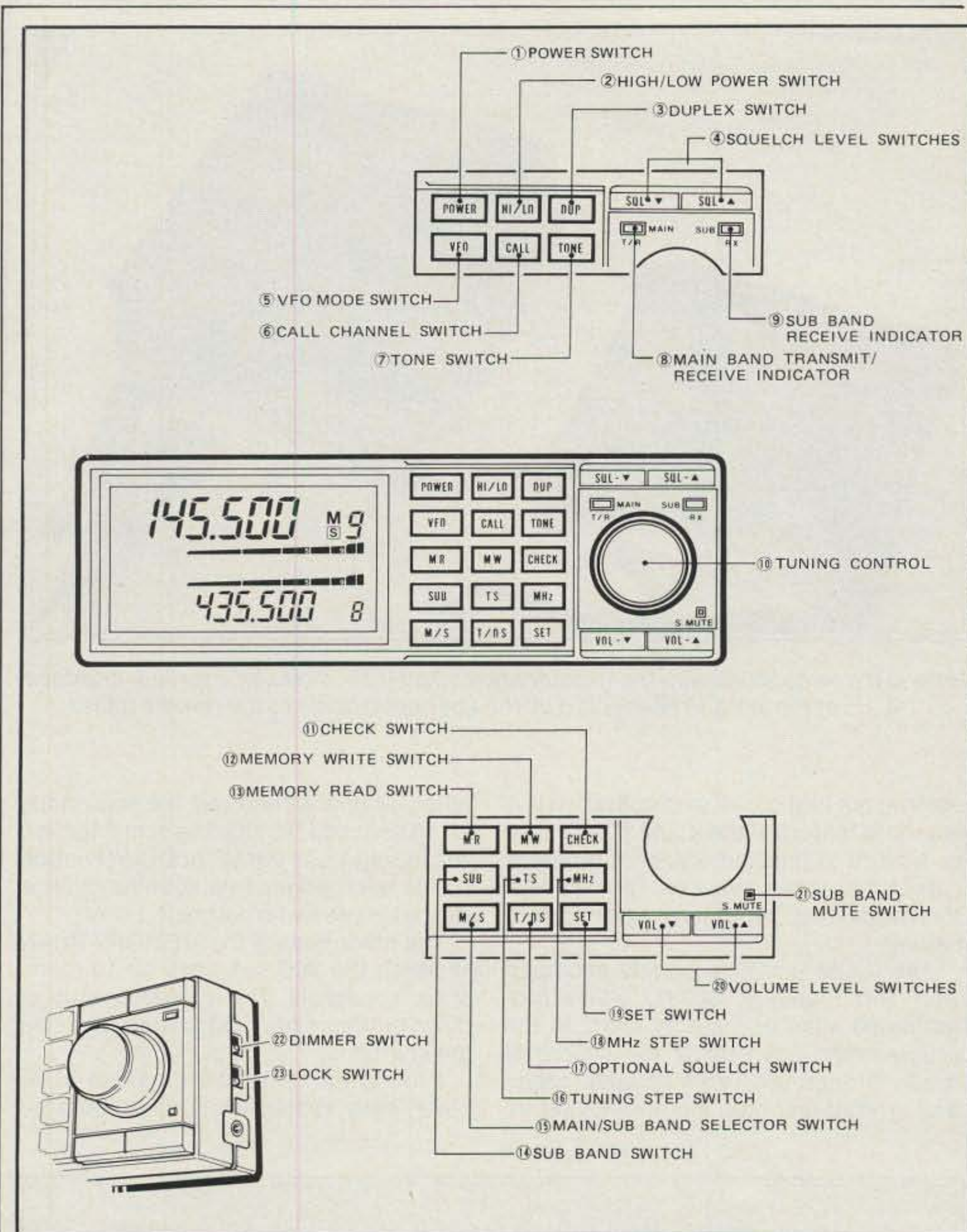


Fig. 1— This shows the LED readouts on the controller head.

The remote controller measures 5 3/4 inches wide, 2 inches high, and 1 inch deep. As I said, this is a little gem, because in a mobile setup modern automobiles leave very little dashboard space, but even the smallest car has plenty of room for this control head. All tuning functions are accomplished with the controller. The LED readout is large 1 1/2 by 2 1/2 inches) and truly easy to see and read. Fig. 1 is taken from the ICOM manual and shows the various functions and frequencies that are displayed on the readout. There are 14 push-button switches on the front of the controller, plus the main tuning knob.

Two bands can be displayed simultaneously, and in fact, audio from each band can be heard at the same time. Ideally, assuming one can listen to two conversations at one time (walk and chew gum at the same time!), two different speakers can be used for separate audio. If only

one band is used (one remote unit), only the frequency of that unit will be displayed, and the other section of the display that would normally show the other chosen subband shows "OFF."

The display shows the "MAIN" band at the top and "SUB-BAND" below. You can only transmit in the main band. However, if you push the M/S switch, transmissions can be made on the subband. The complete frequency is shown on both main bands and subbands. For example, 449.000 is shown with the 6 digits, as would be 146.760 if it were the subband. The frequencies are set in via the tuning knob. The tuning step switch is pushed and the desired tuning increment is selected. The tuning knob is turned until the desired frequency is reached. This frequency and the desired offset can then be programmed into memory, if desired. There are ten memories available for each band module. It should also be

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MRF455,A	Q 60W	11.75	26.50	
MRF485*	15W	6.00	16.00	
MRF492	Q 90W	16.00	35.00	
SRF2072	Q 65W	12.75	28.50	
SRF3662	Q 110W	24.00	53.00	
SRF3775	Q 75W	13.00	29.00	
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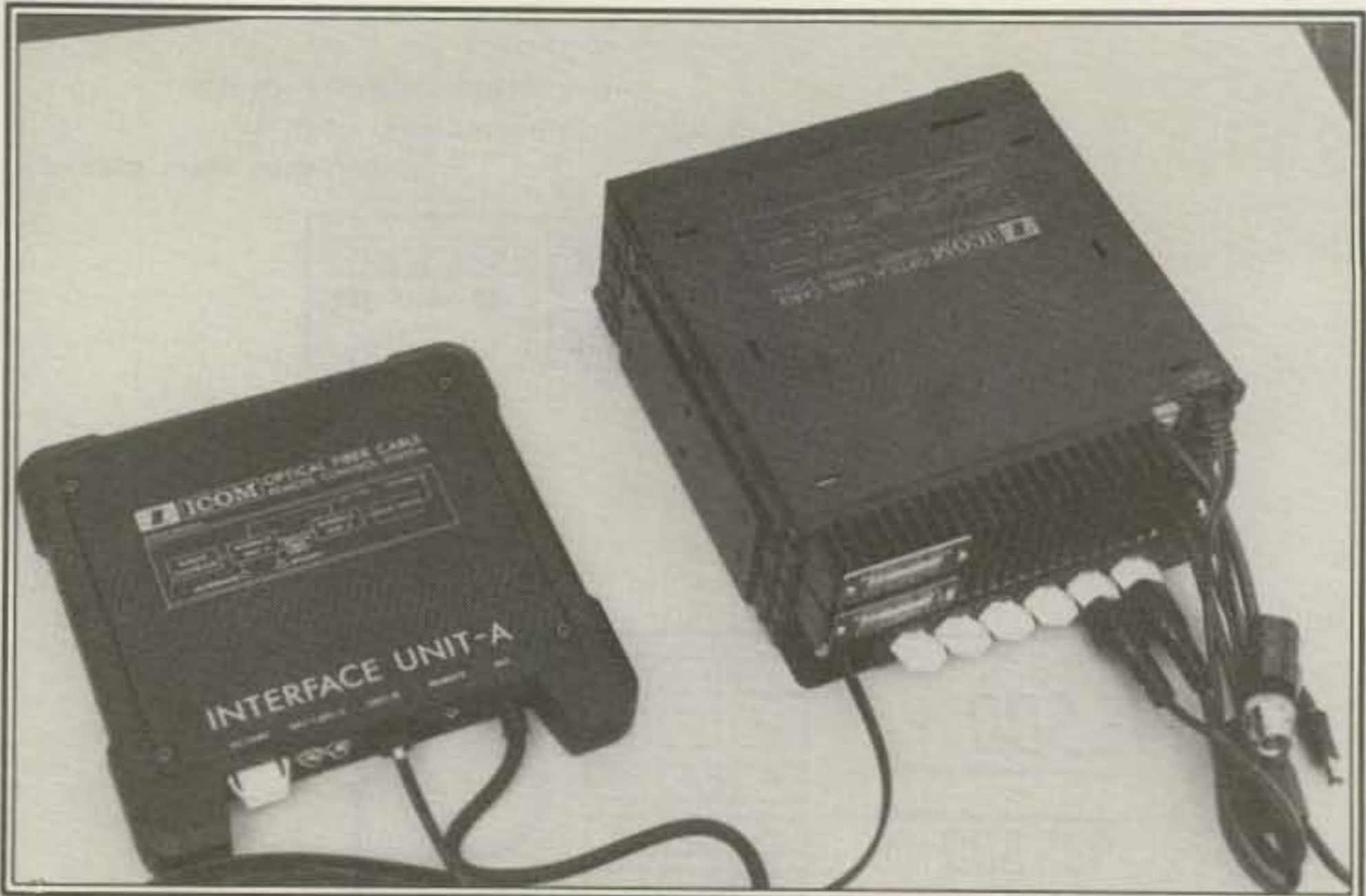
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Here is the remote unit with the 2 meter and 450 MHz RF modules installed. Interface "A" is at the left and connected by the fiber-optic cable to the remote units.

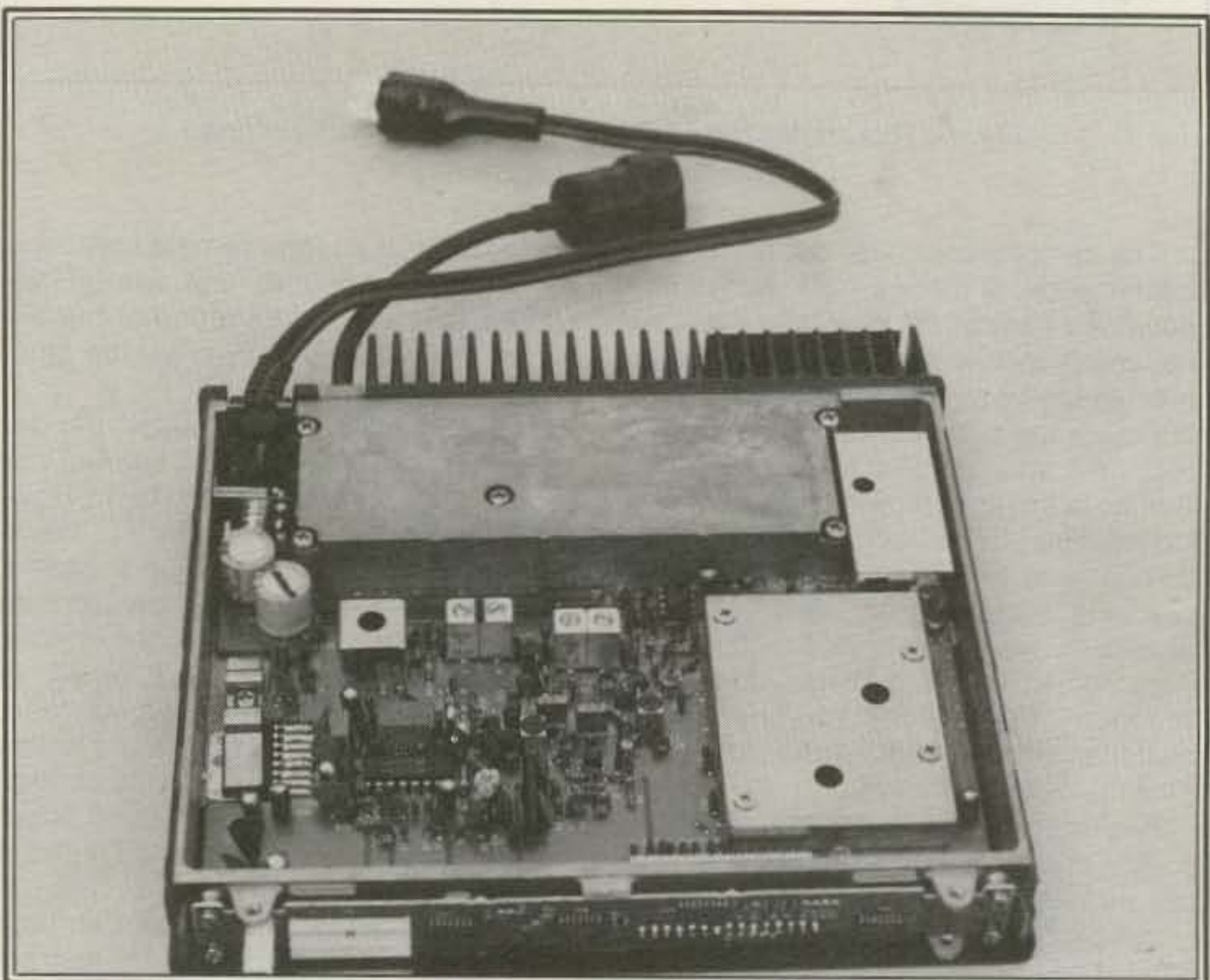
pointed out that crossband operation is a standard feature of the ICOM 900. Another feature is that there are 38 different subaudible tones available for use with tone-accessed repeaters and remote bases.

The ICOM 900 also comes equipped with two types of SCAN, either programmed scan or memory scan. In the programmed scan mode the search is made through programmed scan edges and in whatever step increments set in.

When a signal is received, the scan stops for 10 seconds. To stop the scan function you merely push the UP or DOWN button on the microphone (the scan function is started in the same manner).

The other scan is the MEMORY SCAN in which the 900 searches all 10 memories for signals. The microphone up or down button is pressed to start and stop the search.

I found the instruction manual to be clear, easy to follow, and quite detailed



This is an interior top view of the 450 MHz RF module.





This is the 900 with everything shown except the speaker. The mounting bracket with the two RF modules is at the upper left and Interface A is at the left.

when it comes to installing and operating the 900. If I have any complaint, it is that I would have liked a circuit description and more details about this wonderful piece of equipment. My guess is that it will take a while for amateurs to realize the potential for the use of fiber optics. Certainly the ability to mount a station like this directly at the antenna and control the tuning, etc., from the station offers really unusual possibilities.

I tested two of the units, 2 meters and

450 MHz. I found that all spurious signals were well below manufacturer's specs (60 dB below the carrier). Intermodulation is something about which I have always been concerned simply because in some areas there are literally scores of VHF and UHF stations close together and they create problems. One of the worst spots for me is downtown El Paso, and I gave this system a thorough workout in this area. Intermod was no problem—and in fact, not worth mentioning.




Here is the control head. See fig. 1 for all the various switch functions.

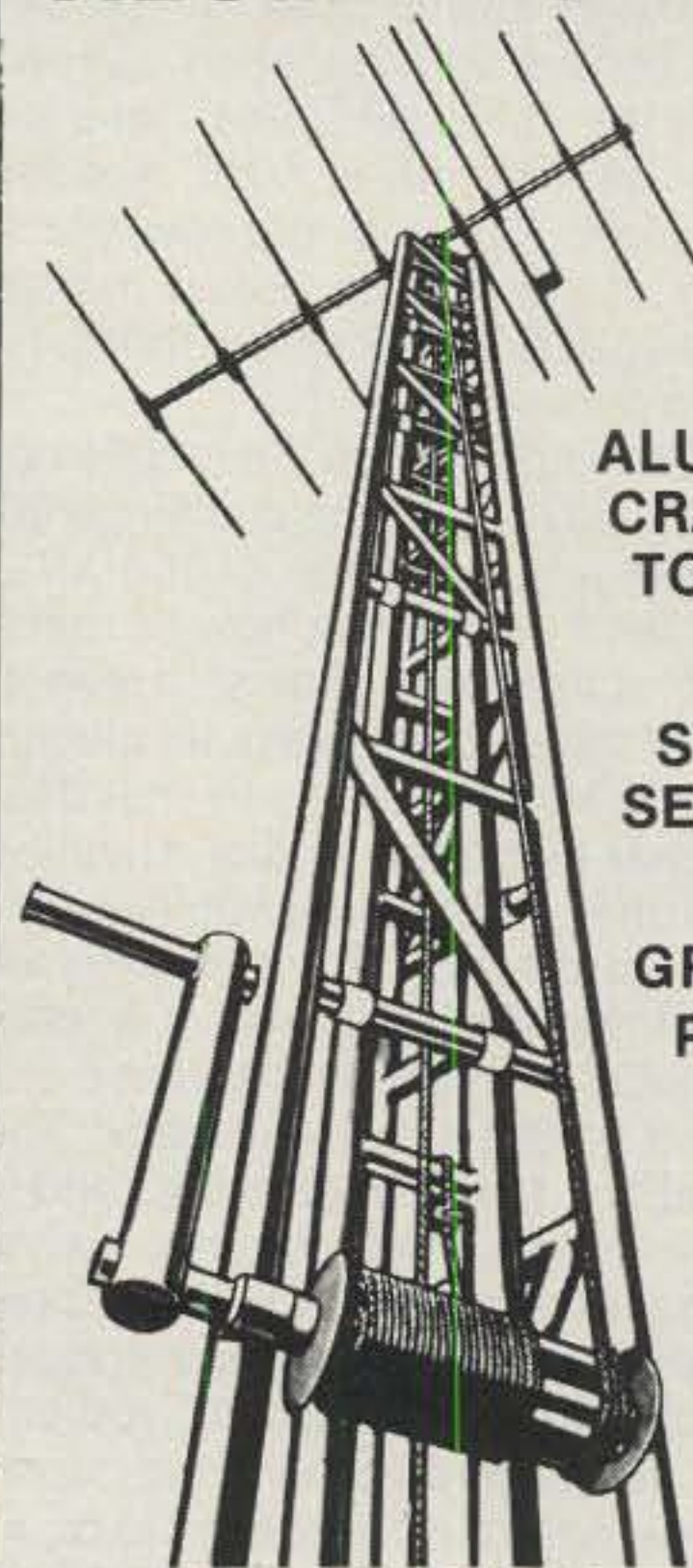
Frequency range of the 2 meter unit (operational) is 138.00 to 174 MHz receive and 140.1 to 150.0 transmit. Transmit current is 6 amps for the UX-29A, 25 watt unit, and 3 amps for the low-power (5 watts) position (250 ma receive). The UX-29 H is 9.5 amps for the 45 watt position and 3.5 amps for the 5 watt position.

The 450 MHz unit draws 7.5 amps on transmit for 25 watts out and 3.5 amps for 5 watts out. Receive current drain is 350 ma. Frequency coverage is 440.0 to 450 MHz receive and the same for transmit. Sensitivity on both units (2 meters and 450 MHz) is 0.18  $\mu$ V for 12 dB SINAD, and squelch sensitivity is less than -19 dBu (0.11  $\mu$ V). Selectivity is 12.5 kHz at 6 dB and 60 dB at 25.0 kHz.

The ICOM 900 is priced with remote band units separate. The basic setup without an RF band unit is listed at \$589. This includes the controller head, microphone, speaker, two interface units, and all cabling. There are two 2 meter RF units available—one with 25 watts for \$295 and a 45 watt unit for \$339. Six meters is \$339, as is the 450 MHz unit. For 220 the list price is \$349. No price is available yet for 10 meters and 1.2 GHz.

For additional information, contact ICOM America, Inc., 2380 116th Ave. NE, Bellevue, WA 98004. Their customer service hotline is 206-454-7619. 

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## The RF Concepts MM-1 Mobile Mount

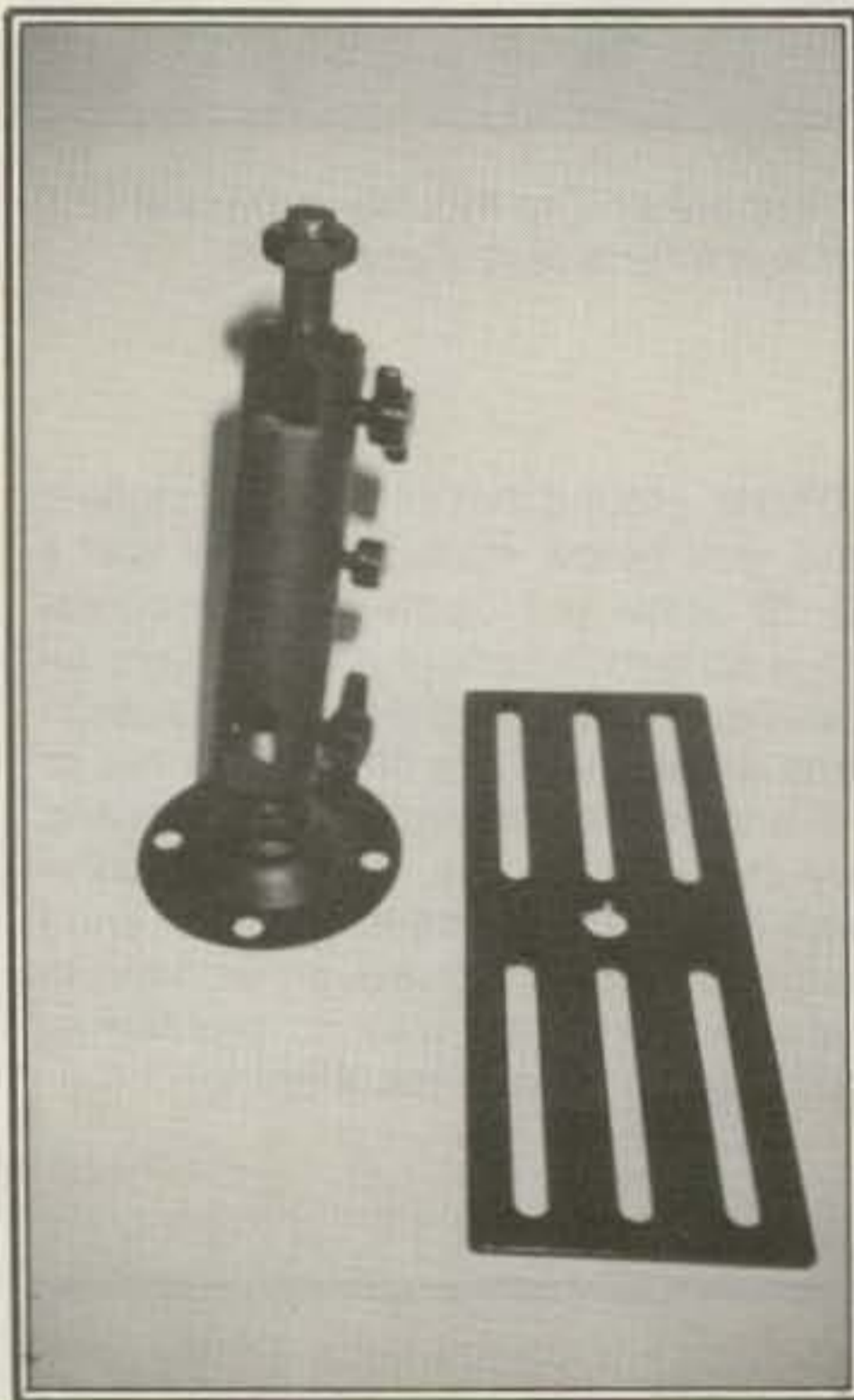
BY ALAN M. DORHOFFER\*, K2EEK

I first saw the RFC MM-1 mobile mount at the Scottsdale Hamfest. Now if you're anything like me, the sight of such a mechanical marvel certainly gets your attention. It's simple, efficient, and down-right ingenious. Best of all, it's small.

One of the problems in laying out a mobile installation is deciding where to place the rig so that it looks good and most of all is accessible. Some folks opt for bolting the mounting bracket under the passenger side of the dashboard. Granted, this keeps the usually more cramped driver's side free of "knee-bangers," but we've long since passed the days of the "Morrow Twins," and today's rigs, be they HF or VHF, are far more compact. This with our love for a multiplicity of controls to adjust makes putting the rig at a distance from the operator quite a nuisance.

Getting the rig closer to the mobile operator has always been the challenge for the amateur and the bane of the XYL. We've all seen articles on how to make consoles that fit around gear-shift levers, and some of these ideas are quite clever. However, the MM-1 obviates the need for anything that elaborate and/or anything that will further mutilate the family car.

The standard 4 inch mount features a 4 inch barrel. Hence, its name. It is constructed out of heavy-duty machined aluminum and finished in basic black. The barrel is about 1 inch in diameter and is split in the middle. There are two swivel joints, top and bottom, so that just about any mounting angle can be accommodated. Looking at the photograph, you can see three thumb screws along the barrel. The top one controls one swivel joint, as does the bottom one. The middle thumb

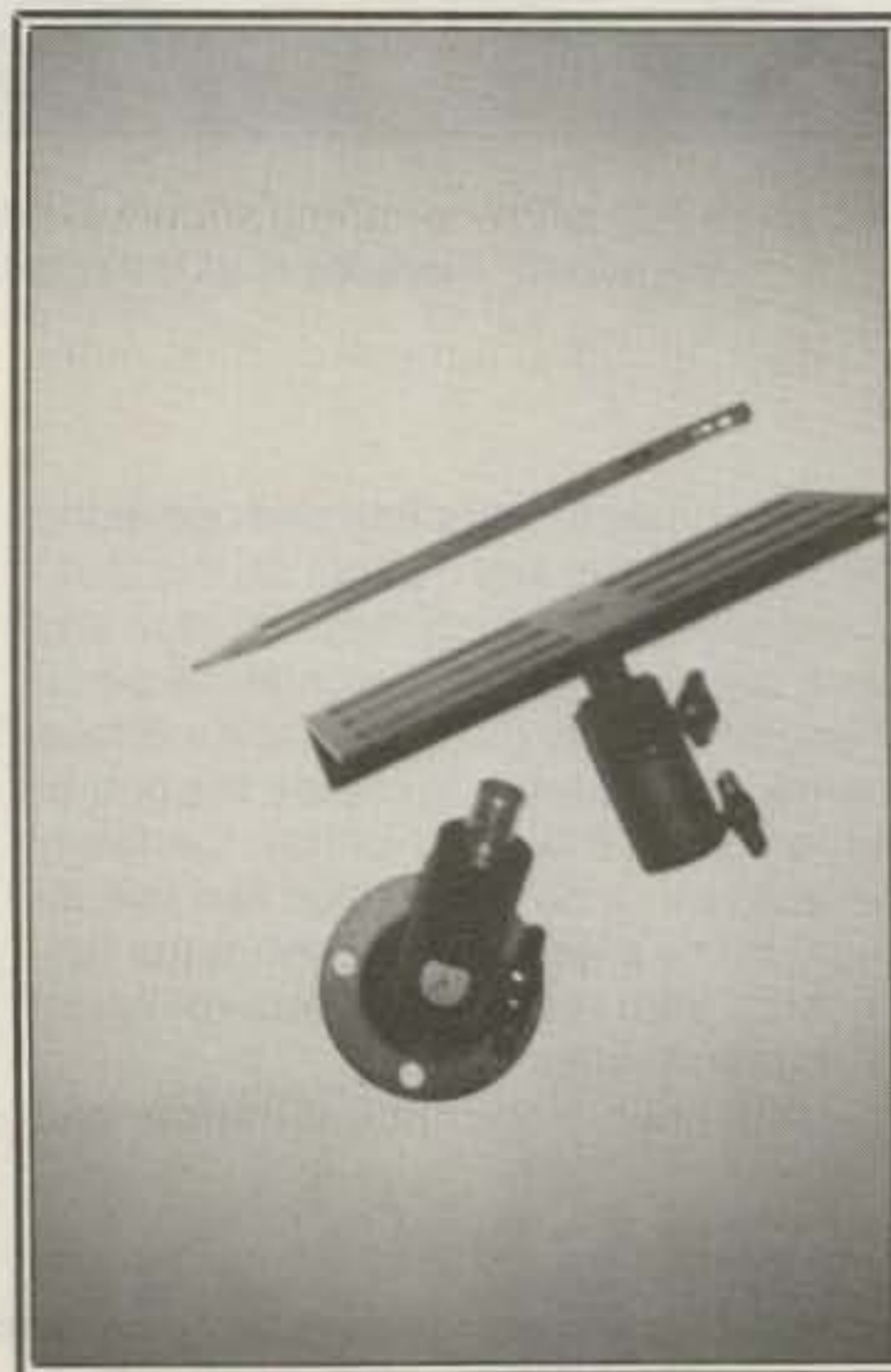


The MM-1 mobile mount. The three thumb screws are explained in the text.

screw provides rotation as well as a quick release. In these times it is often a necessity to be able to easily protect your gear from theft when you leave your car.

The adjoining top-plate is a universal mount for your rig's mounting bracket. The center hole is threaded to match the bolt on top of the barrel. The MM-1 also come with Allen screws and wrenches to replace the thumb screws in more permanent or secure locations.

Mounting the MM-1 itself is done via



Just disconnect the antenna and power cables, loosen the middle thumb screw, and presto, it all comes off nice and easy.

the 2½ inch diameter round mounting plate. It has four predrilled mounting holes. Where you decide to put it is really up to you. Remember that the rig should be accessible and preferably out of the sunlight so that you can see the dial or meter and all those wonderful controls.

The RF Concepts MM-1 mobile mount has a suggested list price of \$29.95. For more information on their product, contact them at 2000 Humbolt Street, Reno, NV 89509.

\*Editor, CQ

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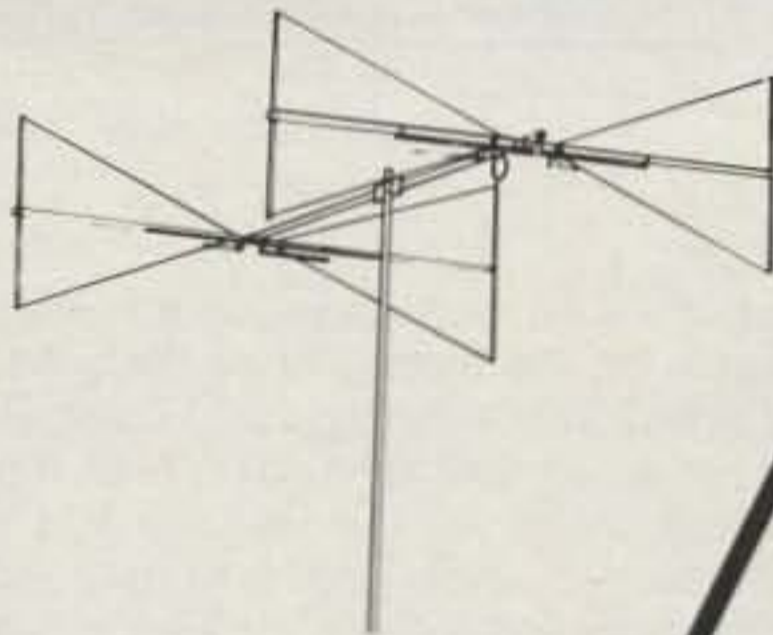
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No-49-50

# CQ REVIEWS:

## Ten-Tec's Paragon HF Transceiver Part II – Operating Features

BY JOHN J. SCHULTZ\*, W4FA/SV0DX

The Paragon's front panel measures about 5 $\frac{3}{4}$ " x 14 $\frac{3}{4}$ ". All of the controls, indicators, and switches are widely spaced, and you need not worry that if you adjust one control another nearby control might inadvertently be moved. All controls including the main tuning knob have a very smooth feel to them. In spite of the fact that the front panel of the Paragon contains enough knobs, switches, and LED indicators to rival an airliner cockpit, everything is very simply and logically arranged. The transceiver, in fact, is very simple to operate and enjoy once you just take the time to appreciate the basic grouping and functioning of the controls. The grouping of the controls and indicators can basically be divided into the mostly analog ones (to the left of the main tuning knob), the analog meter and digital displays above the main tuning knob, and the large array of pushbutton switches and LED indicators on a raised panel around the main tuning knob.

### Left Side Panel

The controls located here are those which, more or less, are found on most transceivers. They include controls for noise blanker width, speech processing level, AF gain/tone, AF selectivity tuning, passband tuning, notch tuning, microphone gain, RF power level, RF gain, and squelch level. There are switches for the meter function, noise blanker on/off, PTT or VOX selection, QSK fast/slow, AGC fast/slow, attenuator in/out, and speech processor on/off. There are LED indicators associated with the latter two switches, plus a separate LED indicator for ALC level. Finally, there are the microphone and headphone connectors plus an on/off switch for an external power supply. A photograph shows the layout of the left side panel.

The functioning of most of these controls is fairly obvious, although it might be worthwhile to highlight a few features. The meter selection switch allows monitoring via the analog meter of forward power (peak reading when SSB is used), reflected power, final amplifier collector current, and speech processing level. All this is very logical, but note that there is no ALC scale on the meter. ALC peak indication is provided by an LED located to the right of the microphone Gain/RF power output level



The left or "analog" side of the front panel on the Paragon.

control. It's a far better idea than having an ALC scale on the meter, since there hardly would be any point to having the ALC set to less than its effective operating point. Also, the arrangement allows you to check the ALC level and processor level *simultaneously* when speech processing is being used—a very convenient feature.

The attenuator switch effectively bypasses the receive RF preamplifier. The LED indicator below the switch provides a very clear indication that the "attenuator" has been activated.

The control marked **FADE/BP** will be a new one to most transceiver users. The controls are for a built-in tunable audio filter. The **BP** control (bandpass) controls the center frequency of the filter which is continuously tunable over 220 to 1700 Hz. The concentrically located **FADE** control is really more of a bandwidth control. For any given frequency setting of the BP control, the FADE control pulls in the AF filter skirts from a flat response to a moderately sharp one. Both controls are effective in any mode of reception. They can almost eliminate the need for an optional CW IF filter for the

casual CW operator and enhance SSB reception under QRM conditions. The use of the controls is also quite useful for general shortwave broadcast station reception when trying to eliminate various forms of QRM.

The PBT (Pass Band Tuning)/Notch control is the main selectivity feature of the Paragon. The PBT control adjusts the bandpass of one shiftable IF crystal filter in relation to the bandpass of a fixed IF crystal filter. In effect, the IF fixed and IF shiftable bandwidths slide or shadow over each other such that a variable bandpass is produced. The pass-band tuning control covers  $\pm 1.2$  kHz. This equates to less than a 1 kHz bandwidth being available for CW. This is certainly adequate for casual CW operation, although more devoted CW buffs will want one of the optional CW filters. For RTTY, the standard filter using the PBT controls can be nicely set to pass just the 2295 and 2125 Hz tones. The Notch control covers from 250 to 2200 Hz and is very effective with a deep, clean notch throughout its range. It can easily take a tune-up tone out of an SSB transmission to preserve perfect copy, for instance. It has a slight de-

\*c/o CQ magazine



Fig. 1—This diagram illustrates just about all of the displays possible. You have to imagine that the large display is a soft fluorescent green color while the annunciators above are a backlighted yellow. The one display that is not shown is the one that will tell you which software version on an EPROM is installed in a Paragon.

sign fault, in my opinion, in that no on/off switch is associated with it. You must turn it fully CCW to effectively remove it. This is a plus in the sense that it is always ready to use, but on the other hand if you forget that the control is set at midrange, for instance, you might have to think for a moment or two as to why an SSB signal sounds a bit odd.

The Microphone/RF Power controls are straightforward. An LED indicator signals that the processor switch has been activated. The concentric RF Gain/Squelch controls carry forward the Ten-Tec idea of trying to keep the AF and RF gain controls separated, as most CW users would prefer. The squelch is operative in all modes and can be set for a sensitivity of down to 0.5  $\mu$ V.

### Indicators

The analog meter is nicely placed to the left of the main tuning knob such that one can easily glance at it or at the digital display. The meter is softly backlit, and its scales are easy to read and checked out quite accurately. One might note, however, that the SWR scale readings are true only with 100 watts carrier output.

The digital display is a soft green fluorescent type. It looks simple enough, but in fact it has an extraordinary range of display functions. Fig. 1 presents a diagram of most of the display possibilities. There are eight annunciators above the digital display to indicate whether VFO A or VFO B has been selected, if Split frequency operation is being used, if Offset tuning is in use, if a Memory channel has been called up, Date if the date is called up, Time if time is called up, and Tag if you are entering memo information.

The left side of the digital display always indicates frequency (VFO A, B, or memory). A

front-panel key selects, at will, if the readout should be to 100 or 10 Hz. The center display concerns itself with offset tuning information if either receive or transmit offset tuning has been selected (only one offset function can be used at a time). The display will indicate from +99.9 kHz to -99.9 kHz, a uniquely broad offset tuning range. In fact, for many split-frequency operations it obviates the need to get VFO A/B operation involved, thus adding a new dimension of versatility (a quality which is evident throughout the transceiver's design). The center display will display the memory channel number when a memory channel is called. Each memory channel stores frequency, mode, filter selected, and the alphanumeric tag. A display of all of these parameters comes up on the digital display and on LEDs when a memory channel is recalled. Besides channel number, the center display might indicate an L or a T to the left or right of the channel number. L means that the memory channel is locked out or bypassed during memory scan. T does not refer to a specific memory channel; it means that the main tuning knob is being used to tune through each of the programmed memories (including those locked out from scanning).

The Tag display is another unique feature of the Paragon. Essentially, it's an electronic notepad. It can be used with either VFO, and a separate tag can be stored in each of the 62 memory channels. The uses for it, especially with the memory channels, are almost limitless. You can store next to a frequency the name of a net, alternate frequencies, an operator's name, a DX station's call, beacon locations, etc.—whatever you can make up using seven space locations, where each space location can contain any letter of the alphabet or any number from 0 to 9. A bonus feature of the tag display is quite interesting. The instruc-

Mode	Normal		Fast	
	Normal	Shifted	Fast	Shifted
CW/SSB/FSK	4.8	9.6	9.6	24
AM/FM	24	48	49	240

Table 1—Tuning rates, kiloHertz per turn of the main tuning knob.

tions for the microprocessor which controls the Paragon are stored in an EPROM. As more and more Paragons are produced and used, Ten-Tec may improve the EPROM software to add updates, improvements, and even better features. By some simple keypad entries, the tag display can be commanded to display the version number of the EPROM installed (e.g., VER 3-0). If an updated EPROM becomes available, and you feel it is worthwhile, you plug in the updated EPROM and the tag will display the version number installed—nifty modernistic feature, to say the least.

### Main Tuning Field

The main tuning field is dominated by the main tuning knob and then a large array of pushbutton or keypad switches and many LED indicators. A photograph illustrates the field.

First, as to the main tuning knob. It is slightly over 2 inches in diameter (excluding the metal skirt) and has a rubberized, textured, non-slip surface. There is also a convenient, recessed finger-tip indent for fast tuning. As with any transceiver, describing the tuning "feel" becomes quite subjective. So, rather than try to make superfluous statements, I would only say that the tuning "feel" is, by far, the best I have found on any Ten-Tec transceiver and extremely smooth. It's responsive yet comfortable to use for protracted operating periods.

The tuning rate depends upon both a key entry (normal, unless a fast option is chosen) and a shift feature which automatically increases the tuning rate when the main tuning knob is spun at a fast rate, regardless of whether the normal or fast tuning mode was selected. The various possibilities are summarized in Table 1. I found the 4.8 kHz per turn rate to be excellent for normal SSB or CW operation, and when I wanted to shift quickly to a radically different part of a band, I found that selecting a different mode temporarily (e.g., AM) provided a quick, comfortable frequency change and was easier than spinning the tuning knob at a fast rate in the SSB mode. Only one-hand operation is required.

The reason why the just-described frequency change method was easy to use sort of leads me into the description of the very functional and easy-to-use keypad and LED display field around the main tuning knob.

The keys for mode selection (CW, USB, LSB, AM, and FM) are all very obvious to the left of the main tuning knob. A green LED indicator is associated with each key. Centered above the main tuning knob are keys marked 6.0, 2.4, 1.8, .50, and .25 with associated green LED indicators. These keys easily choose the various IF filters (6.0 and 2.4 kHz are standard; other filters are optional). To the top of the mode keys and to the left of the filter keys is a very functional one marked TUNE with an associated LED. Pressing the key automatically puts the transceiver into the CW mode and closes the PTT line. The protective circuitry keeps the



The right or "digital" side of the front panel.

output power at a suitable level if you have to adjust an antenna tuner, and the power output will rise to its full level as the SWR level falls below 1:1.5. Alternatively, any level of power output below the full value can be set by adjustment of the RF Power control. One presses the key again to return the transceiver to whatever

mode it had previously been set up to use. It's an extremely convenient tuning method.

To the right of the main tuning knob are various keys associated with offset tuning and the use of the dual VFOs. Most of them are quite self-explanatory. The RX and TX offset keys activate those functions and each has an associ-

ated LED. The A/B and Split keys provide switching between either VFO, equalizing the frequencies in each VFO and setting up split operation such that one VFO controls the receive frequency and the other VFO controls the transmit frequency. Split operation may be in-band or cross-band. An interesting bonus is that when you use the main tuning while the split feature is activated, only the frequency displayed (VFO A or B) is changed.

The SPOT key allows you to zero-beat the transmit signal with the received one in CW.

The keys marked 1 through 0 and the decimal point (.) simply provide for direct frequency entry and will be touched upon later.

If we quickly jump to the keys marked HBD, HBU, and SHIFT at the lower right edge of the panel, you can appreciate the simple yet sophisticated bandswitching operation of the transceiver. When the FAST tuning key is off, the HBD or HBU keys move the displayed VFO frequency up or down in continuous 100 kHz steps. If the FAST key is on, the step amount is 1 MHz. If the shift key is activated, the HBD/HBU keys will move the transceiver continuously up or down through the amateur bands only until one of the keys is released. The less obvious advantages of this particular bandswitching scheme really can only be appreciated when you actually use it. For instance, for normal amateur band operation you can switch between amateur bands as desired (SHIFT key on) and then when you are within a desired band, use the HBD or HBU keys (FAST key off) to get immediately to the desired 100 kHz portion of a band. It's immensely convenient compared to the endless manipulation of the main tuning knob required on many trans-

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ceivers to get, for instance, from the SSB portion of 10 meters to the FM portion of the band.

If you are comfortable with understanding just the basic features of the Paragon, the foregoing description should be sufficient to illustrate that the Paragon is an extremely versatile and unique transceiver. It really is an easy transceiver to operate and has a tremendous array of advanced features most of which are easily controlled by the keys to the extreme right of the main tuning field. All of the keys are easy to use and understand. A "blow by blow" description of each key would probably not prove too much, so I will just highlight a few of the features.

- **Storing information in a memory channel.** You set up the frequency, mode, VFO (A or B), and filter selection. Then you press the STO key and the desired two-digit memory channel number. All the information described will be stored. If you don't know which channel number to use, press the STO key followed by the ENTER key. The transceiver will automatically choose the next available memory channel, and the display will then show the memory channel used! The notation FULL will be displayed if all memory channels are full, since you then have to erase a memory channel if new entries are to be stored.

- **Recalling a memory channel.** This operation is extremely simple. Just press the RCL key and then from the numeric keypad the two-digit memory channel number. You can recall any of the 62 memory channels in this manner. If the main tuning knob is adjusted during recall, the memory frequency is immediately transferred to a VFO and it becomes completely tunable. If you are within an amateur band, transmit operation is immediately available.

- **MT (Memory Tune).** When this function is used, the main tuning knob controls the manual selection of all of the programmed memories. It sounds like a simple control, but in fact it can be extremely useful and powerful. Depending upon how you have programmed the memories, you can check various amateur bands, beacons, SW broadcast stations, etc., in an extremely quick fashion. I think a DXer will find it to be a very powerful tool.

- **Scratch Pad Memory.** This function provides a method by simple key manipulation whereby you can temporarily store and recall a single frequency without affecting any memories. Entering a new frequency erases the previous entry.

- **Memory Scan.** The transceiver will scan through all of the memory channels except those which are locked out. The length of time that the transceiver stops at each memory location is adjustable. A RATE key allows you to choose from 10 different scan rates, ranging from a few seconds' hold on each memory channel to a very fast sweep. Scanning must be manually stopped.

- **Memory Lockout.** You can simply lock out from scanning any given memory channel or sort of do the reverse. That is, you can temporarily lock out all of the memory channels and then just selectively unlock several desired channels. None of the information in memory is changed during these operations.

- **Frequency Readout.** One key function determines if the frequency readout will be down to 10 Hz or 100 Hz.

- **Tag Entry.** You might note that many keys have a single letter as a sub-label. The function of those keys can be shifted temporarily to allow the entry of any letter for a frequency tag.

- **Frequency Entry.** Frequencies can be selected by the main tuning knob or by keypad entry. The keypad entry system is very straightforward. You simply punch in the frequency immediately and then press the ENTER key. Entering the decimal point tells the transceiver when the MHz portion of the entry has ended. Leading or trailing zeros do not have to be entered. It's so simple that I very often use it to bandswitch the transceiver.

The Paragon has a lot of powerful features and a lot of controls. However, I feel the controls are all logically and conveniently arranged. You might need a "crib sheet" when first using the transceiver, but after a few hours of trying out its features, it should no longer be necessary. All of the most often used controls are on the front panel. There are no hatch covers, recessed controls, etc.

### Memory Retention

The memory-retention system used in the Paragon requires for normal operation that the transceiver continue to be supplied with power supply voltage when not being operated. (The front-panel power switch does not remove power to the logic circuits.) When the unit is being transported, an ordinary 9 volt alkaline bat-

tery can be installed and will provide about 150 hours of backup power. Of course, it can be left installed at all times to provide backup during AC line power outages.

The idea of having a power supply turned on all of the time may disturb some operators, but you should evaluate the situation. The Ten-Tec power supply draws 25-30 watts from the AC line on standby. That equates to a cost of 50 cents to \$2.00 per month, depending on the kw/hour rate in your location. That has to be balanced against the fact that no special battery ever has to be replaced within the transceiver. There are alternatives such as using a 9 volt rechargeable battery which is kept under trickle charge or a separate 9 volt supply. However, I've had the Ten-Tec power supply "on" for months without any problem. Perhaps the idea doesn't disturb me because for years I've lived with transformers in broadcasting or power distribution systems that are never turned off and, in fact, have been "on" for over 30 years.

Part III of this article will be devoted to personal operating experiences and impressions concerning on-the-air use of the Paragon, plus a review of some accessories.

CQ


(To Be Continued)

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**You** get both the American Western Union and the international CCITT character sets, Autostart for unattended reception and selectable "Diddle".

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**You** also get a random code generator that'll help you copy CW faster.

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**Any** Epson graphics compatible printer will print a wealth of interesting pictures and maps.

**Automatic** sync and stop lets you set it and leave it for no hassle printing.

**You** can save FAX pictures and WEFAX maps to disk if your terminal program lets you save ASCII files to disk.

**Pictures** and maps can be printed to screen in real time or from disk on IBM and compatibles with the MFJ-1284 Starter Pack.

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**You** can transmit slow scan pictures right off disk -- there's no need to set up lights and a camera for a casual contact.

**You** can save slow scan pictures on disk from over-the-air QSOs if your terminal program lets you save ASCII files.

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**You** get automatic incrementing serial numbering. In a contest it can make the difference between winning and losing.

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July/August 1987

Volume 15, Number 4

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# The Fourth Annual CQ World-Wide VHF WPX Contest

Starts: 0000 UTC Saturday, July 16, 1988  
Ends: 2400 UTC Sunday, July 17, 1988

**I. Contest Period:** 48 hours for all stations, single or multi-operator. Operate any portion of the contest period you wish.

**II. Objectives:** The objectives of this contest are for amateurs around the world to contact as many amateurs as possible in the allotted 48-hour period, to promote VHF/UHF activity, and to allow VHFers the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF prefixes for award credit.

**III. Bands:** The 50, 70, 144, 220, 432, 902, and 1296 MHz bands may be used, as authorized by local law and license class.

**IV. Type of Competition:** 1. Single operator—(a) all band; (b) single band; (c) all band, low power; (d) single band, low power. 2. Multi-operator—(a) all band; (b) single band. 3. Portable (with temporary power source only). 4. FM only. The "portable" category is for single or multi-operator stations. Low power is defined as 30 watts PEP output or less. Stations may select one category of competition only. All transmitters must be located within a 500 meter diameter, or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitters.

**V. Exchange:** Callsign and "Maidenhead" locator grid square (4 digits, e.g., FN20). Signal reports are optional and need not be included in the log entry.

**VI. Scoring:** One point per QSO on 50, 70, and 144 MHz; 2 points per QSO on 220 and 432 MHz; 4 points per QSO on 902 and 1296 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times the total number of prefixes (PX) worked. This differs from the scoring for the *CQ HF WW WPX* Contest, where a prefix counts only once regardless of band.

Example: W1XX works stations as follows:

37 QSO's and 12 PX's on 50 MHz

45 QSO's and 18 PX's on 144 MHz

26 QSO's and 10 PX's on 220 MHz

38 QSO's and 11 PX's on 432 MHz

6 QSO's and 3 PX's on 1296 MHz

W1XX's total score is: 234 QSO points × 54 PX's = 12636.

**VII. Multipliers:** The multiplier is the number of prefixes worked, additive on a band-to-band basis. A prefix is considered to be the three letter/number combination which forms the first part of an amateur radio callsign (N1, W2,

WB3, K4, AA6, WD8, 4X4, DL7, G3, IT9, NP2, PY7, VK4, Y32, Y33, KT4, JE3, etc.). A station in a call area different from that indicated by his callsign is required to sign portable. This applies even for home stations (e.g., WB2OTK has a licensed station location in SC, but is required to sign /4 for contest purposes only. In all cases, the portable prefix is the multiplier. Example: NV6O/2 counts as NV2; KT2B/VE3 counts as VE3; KR2Q/C6A counts as C6A; 4X4FN/W2 counts as W2. Special-event, commemorative, and other unique prefix stations are encouraged to participate. A station who changes location during the course of the contest is free to contact as many other stations as he wishes; however, the moving station counts as only one QSO and PX unless he changes call areas during the course of operations, in which case his prefix changes by definition, thus becoming a new QSO and PX.

Example: K2SMN operates from the NJ/PA border; he may be counted as K2SMN for one QSO and one PX (K2) by all those he contacts from NJ. He may be counted as K2SMN/3 for one QSO and one PX (K3) by all those he contacts from PA, including stations previously worked from NJ. Changing "grid squares" does not justify a new contact.

**VIII. Awards:** Engraved trophies will be awarded to the top-scoring stations in each category and major geographic area where competition is indicated. Parchment certificates suitable for framing will be awarded to the top-scoring stations in each category and minor geographic area where competition is indicated. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Major geographic areas include North America, Europe, and Japan as of this writing, but may be extended to include other areas as justified by competitive entries. Minor geographic areas include states (U.S.), provinces (Canada), countries (Europe), and call areas (Japan), and may also be extended to include other subdivisions as justified by competitive entries.

Logs must be postmarked no later than August 31, 1988 to be eligible for awards. Logs should be mailed to the *CQ VHF WPX* Contest, c/o S.C.O.R.E., P.O. Box 1325, Eatontown, NJ 07724 (note this is a new address), or to *CQ Magazine*, 76 N. Broadway, Hicksville, NY 11801.



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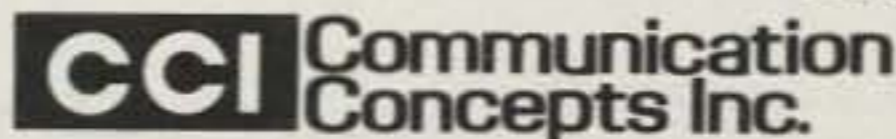
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## A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

### More Utilities for the IBM-PC

**P**erks: Most anyone who owns an IBM-PC or compatible has heard of *SideKick*<sup>™</sup>, Borland's super do-most-anything desktop utility; it's had the pop-up desktop market almost to itself. But some competition should be in store for *SideKick* in the form of Barry A. Watzman, WA4PCC's *Perks*<sup>™</sup> program, available for both the IBM-PC and Zenith Z-100 computers.

*Perks* is a memory-resident background program; it remains dormant until activated. Once you activate it, usually while running another program, any of its functions may be used singly or in tandem with others. Following deactivation, you're returned to the application program you were running.

*Perks* has many of the features of its old-line competitor, and then some. It includes a four-function calculator that operates in both decimal and hex modes, with a nine-digit floating display; a perpetual calendar with an associated appointment calendar; an ASCII code table that gives the hex and decimal values for characters; a typewriter module that allows the computer to simulate a typewriter, useful for pesky tasks such as addressing envelopes; and a screen saver that automatically blanks the monitor screen after a set period of computer inactivity.

Other handy features include a text editor or "notepad" that operates very similarly to *WordStar*<sup>™</sup>; an "import" feature that allows you to transfer text from an application program's screen display and feed it into the notepad for editing; a modem module that facilitates two-way landline file and text transfers; a phone dialer that lets you dial any number from the notepad buffer; context sensitive help screens that provide information about the particular *Perks* function in use at a given time; and an electronic cardfile that allows you to store about 3000 "cards," each of which may contain up to five lines, and retrieve them using various search techniques.

In addition, *Perks* has a nice cut-and-paste function which lets you capture your application program's foreground screen contents and insert or "paste" what you've "cut" into another application program or save it to disk. Also, a filer and setup module lets you access DOS (the disk operating system) from within your application program and also permits you to conveniently preset many parameters for next-time use.

I was highly impressed with *Perks*, and feel that it, like desktop programs such as *SideKick*, can be of real use in the hamshack whether you use your PC for logging, packet, RTTY, or more conventional pursuits. While *Perks* isn't sold as a "ham program," it was written and published by an amateur, one who incidentally was associated with both Heathkit and Zenith, and who played a large part in



Above, the "old" Radio Shack coaxial cable. Note the lack of tight shielding, promoting considerable signal loss and unpopularity in amateur circles. (Photo courtesy Radio Shack)

bringing the popular "Z" (Z-100) computer to market. At \$69.95 it's a very competitive program.

For more information, write Barry A. Watzman at Microcomputer Systems & Consulting, 560 Sunset Rd., Benton Harbor MI 49022-7142. Fig. 1 shows a typical *Perks* screen with several of its features up-and-running.

**Lettrix:** Are you embarrassed to have your dot-matrix printouts seen in public? I was. A first corrective step I took was to buy a good quality printer that had a built-in NLQ (near letter quality) feature. This helped dress things up, but printouts still lacked somewhat in overall print quality and I hadn't the ability to use different typefaces or fonts.

A second step I took in trying to teach my printer some good manners was to try out *Lettrix*<sup>™</sup>, a memory-resident print enhancement program that allows your existing PC software to print proportionally spaced, microjustified

text in over 20 different, essentially letter-quality typefaces and languages (including Greek, Russian, and Hebrew) on an ordinary 9-pin (read: inexpensive) dot matrix printer.

Although you don't have to create a special print file or use special commands to use *Lettrix*, there are some imbedded commands available to allow some rather sophisticated "presentation formatting" to wordprocessor, database, or spreadsheet software. IBM's full 244 character set is included in many of the typefaces, and you can design your own custom typefaces if you're so inclined.

I've found that *Lettrix* takes my \$150 Star NX-10 and makes its output come suspiciously close to that which a high-priced laser printer might produce. As such, *Lettrix* is great for publishing amateur and computer club newsletters (especially those produced in languages other than English) on a very ordinary PC, wordprocessing program, and printer. It works nicely with most Epson, Okidata, IBM, Panasonic, and Star printers, among others.

*Lettrix* is priced at \$98.50 and carries a ten-day return privilege. It is sold by Hammerlab Corporation, 938 Chapel Street, New Haven CT 06510. Fig. 2 shows the *Lettrix* menu.

### Amateur Software Snapshot

**QSO PRO:** A nice logging program for the IBM-PC that I came across several months ago when I received a beta (test) version in the mail is *QSO PRO*, authored by Mark and Mary Moran. It's available now, and it looks like a competent logger indeed.

If you keep a handwritten log, you know how difficult and time-consuming it is to keep track of the little things, such as states worked. As you're well aware, the problem compounds when you must track countries worked, especially so when you need to include QSL card sent-and-received status. Logging programs such as this tend to make life easier in the DX lane.

The program requires that you enter each QSO but once, letting the program know when you receive the QSL. It will summarize for you which states (or countries) you've worked and how many QSLs you've sent or received. The program will also print QSL labels, return address labels, and your logbook (in its entirety or selectively by date).

*QSO PRO* is designed to be easy to use, and it is largely self-documenting through a series of online help screens. It has a real-time logging feature which allows you to use the computer system's time and date in logging; a preset capability which lets you enter routine information that seldom changes; an intelligent dupe feature that checks all logged contacts for duplicates; a memo line that lets you store personal notes about each contact; and a tally capability that counts QSOs, QSLs sent, and QSLs received by state and country.

These are all nice "bells and whistles," as

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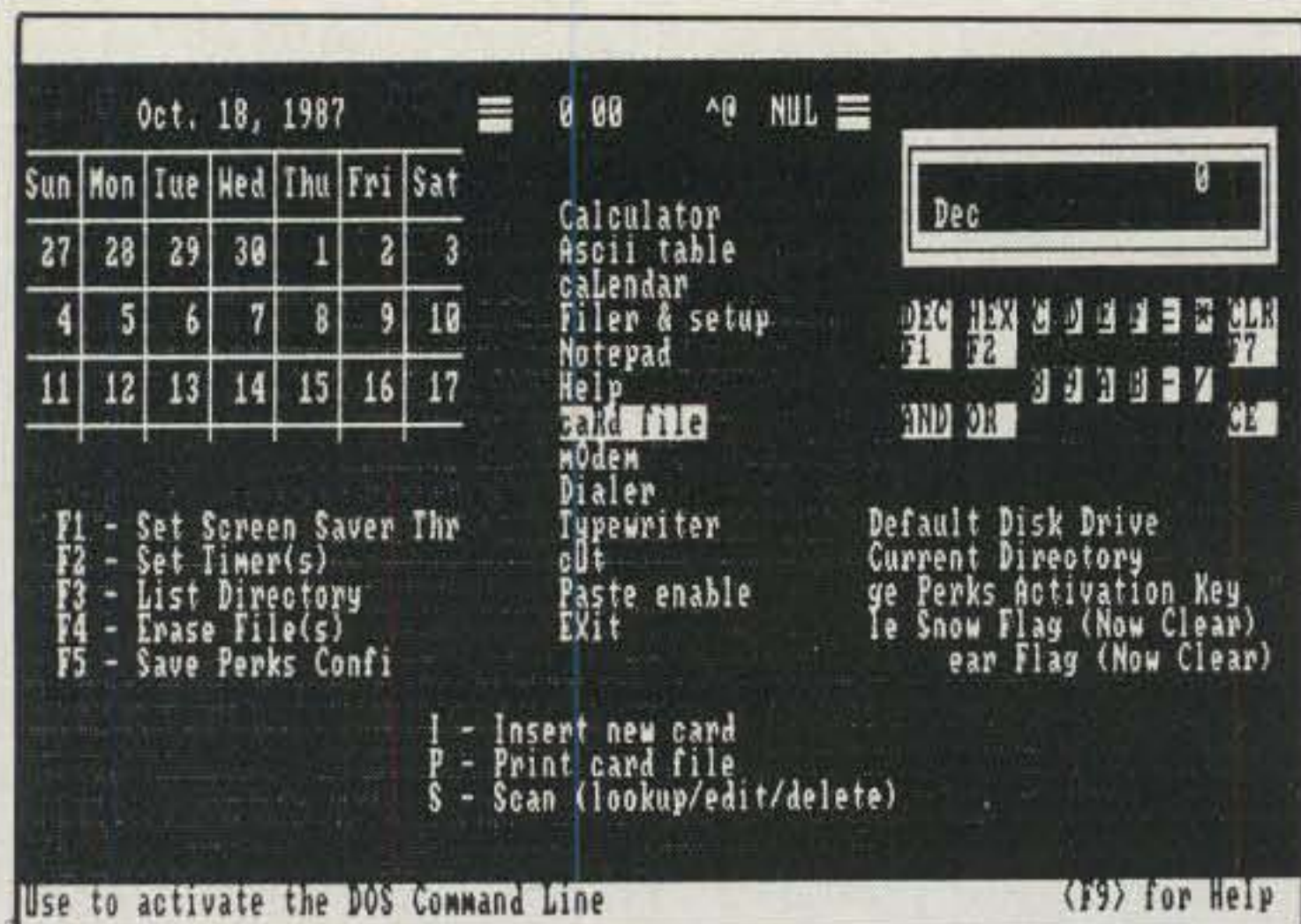


Fig. 1—Shown above is a typical Perks desktop screen, with several applications up and running. Although not amateur software as such, it is designed and marketed by an amateur, Barry A. Watzman, WA4PCC.

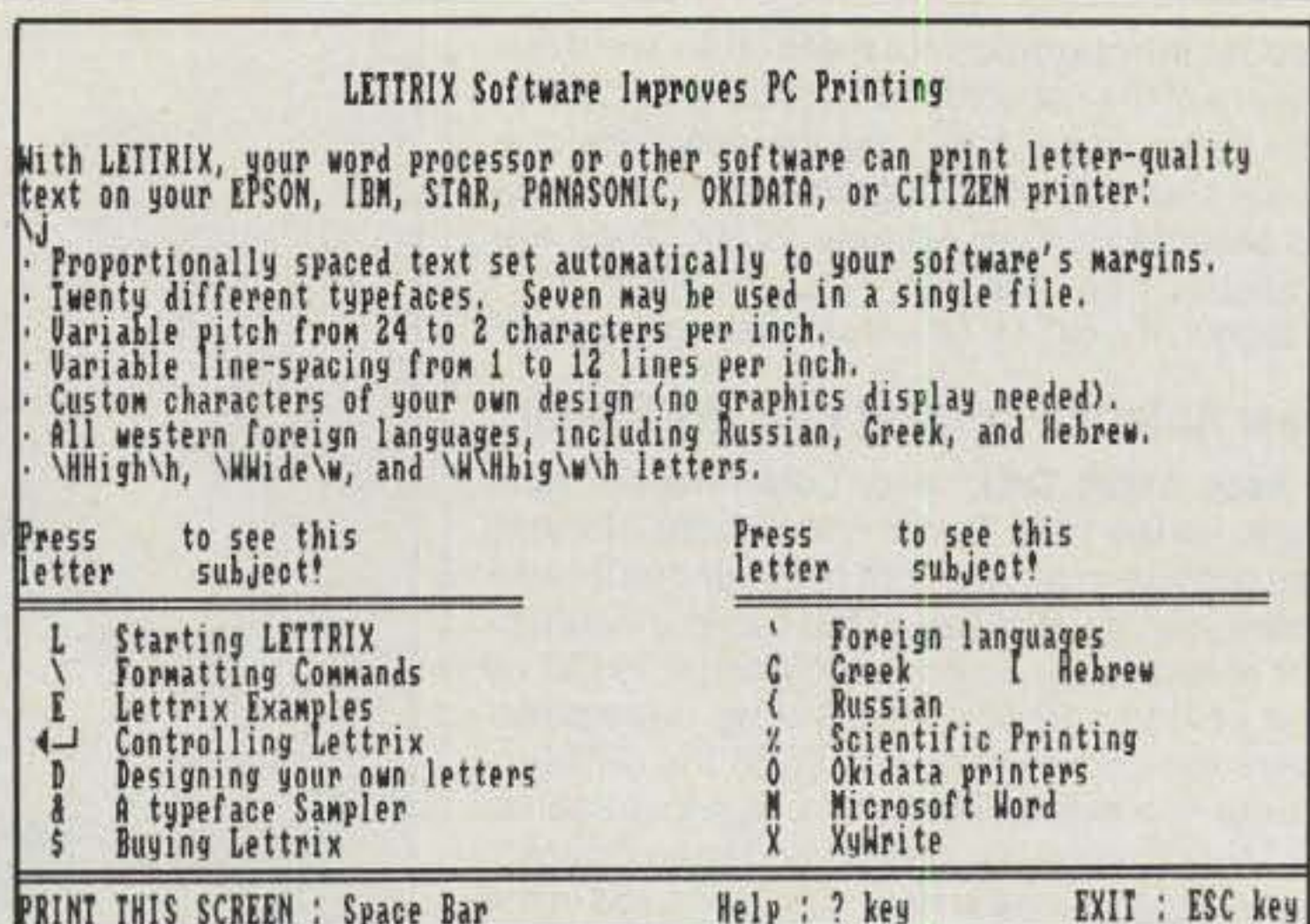


Fig. 2—Shown here is the Lettrix program's main menu. With the program, you can produce well-groomed, letter-quality text directly from your current software. Great for adding a professional touch to club newsletters! See this month's column for details.

they say, but my favorite is the **BROWSE** command which allows super-fast scanning of your log file for a specific response, using as little as a single letter. An example of using the **BROWSE** command might be to find all cities that begin with the letter "E." You can also "browse" QSLs sent with an "N" to find any QSO for which no QSL has been sent; another practical use is to periodically scan all QSOs for those which have a blank street address and need to be looked up. The program stores all the information (about 18 items) most frequently used in the average QSO. These include the station worked; date; frequency; mode; power; time on and off; report sent and received; name; address; city, state, and zip; country; county; QSL sent and received; and memo notes.

The program is available for \$39.95 from Morlan Software, PO Box 2400, East Liverpool OH 43920-0400.

**Contester III:** If you're a contester with a Commodore 64, you've probably known about the *Contester III* series of contesting software from Pete Smith, N4ZR. Pete has stuck through the boom-and-bust days of C-64 amateur radio programs and is, in fact, one of the few long-term survivors in the market. Since I first began corresponding with Pete about three years ago on his contesting programs, I've been impressed with his efforts to produce a top-quality product, his periodic program upgrades, his bug-swatting efforts, and the informative newsletter which he sends to his customers.

Pete's most recent efforts are focused on the *Contester III* for the C-64. This is a family of third-generation, "real-time" contest software which is available in integrated CW and multi-mode versions for various contests such as the CQ Worldwide DX Test, ARRL Sweepstakes, ARRL DX Contest, and CQ WPX Test. There also is an all-purpose module that you can adapt to suit a variety of contests.

The integrated CW versions add the functions of a memory keyer to the logging, duping, multiplier tracking, and statistic-keeping functions of the *Contester III*; you can use this version with most commercial interfaces, build your own from Pete's schematic, or buy one (for \$39.95) from him. The multi-mode versions

are for use on SSB or CW using a separate keyer.

The *Contester III* programs are in compiled BASIC for speed, have a capacity of up to 2200 QSOs/band (on as many as six bands) and as many as 2000 QSOs per log disk. The programs include such functions as duping, logging, calculation of running score, and multiplier tracking. At least ten different operating statistics are tracked, including overall QSOs per hour and total elapsed time. The programs feature timekeeping with an internal time-of-day clock accurate to within one minute per day.

The *Contester III* programs are priced at \$39.95 for the first contest program; additional programs in the series are discounted to \$12.95 each. For specs contact Pete Smith, N4ZR, at Winner's Edge Software, 2003 Sarazen Place, Reston VA 22091.

Postscript: While Pete has been mum recently about a possible Commodore 128 version, he's busily working on *Contester IV* and looking for ideas—possibly along the lines of more preprogrammed messages, additional log editing capability, a summary sheet generator, and changes to the user interface. Pete adds that an IBM-PC version is in the works, too, hopefully to be released within the next year.

## Antenna Potpourri

**Handy Hints and Immutable Laws:** This little collection of nine "hints and laws" for antenna builders struck my fancy. I don't know its author or origin, though it's appeared in various forms in several places including *Amateur Radio of Australia*, the *Amateur Radio News Service (ARNS)*, and *Florida Skip*, to name but a few. Here's the W8FX version:

- Never climb a tree that you can't get down from yourself if the ladder or ladder-holding helper vanishes.

- Never assume that an RF path is cold unless you have checked it — preferably using someone else's finger.

- Regardless of how much antenna wire appears to be on the spool, it's always exactly 4.5" too short for the flattop.

- No matter how many trees you have in

your yard, they're not in the right places. And, should they be in the right places, they won't be big enough to use for another 50 years.

- Anything will work as an antenna to at least some extent, but nothing works as well as it should work.

- The impedance of any new antenna you erect is always just outside the range of your antenna tuner.

- You can change ionospheric propagation paths. But, if you build a fixed V-beam or Rhombic for a favorite path, the path will move at least 25 degrees by the time you fire up.

- The breaking strain of antenna wire is easily determined: it is always five pounds less than the minimum needed to get the wire up in the air.

- By reference to the antenna handbooks, you can always prove that no useful antenna whatsoever can be made from the material you actually have on hand in your junkbox.

**Beer Can Vertical Nostalgia:** Do you remember the "beer can vertical" craze that swept the country in the 50s as amateurs struggled to find good uses for the beer cans that would otherwise litter the landscape?

From W7KG via the Yellowstone Radio Club of Billings, Montana comes the observation that beer can verticals (BCVs) go back even further than that. They first became popular when amateurs were able to return to the air at the end of World War II. The beer cans were made of steel in those days, and they could easily be soldered together for a reasonably effective and (hic!) cheap antenna that didn't require much ground space.

The first consideration in building a BCV was to determine the number of cans required to arrive at the prim and proper one-quarter wavelength at the desired resonant frequency. Resourceful amateurs wasted very little of anything when undertaking such a project. Instead of consuming the beer in the normal fashion, several Montana amateurs are said to have distilled the alcohol from the beer and used it in their torches to solder the cans together. Not only did this procedure reduce waste, but it also left the fellows with clear heads for operating!

Out of sheer curiosity, are there some genuine beer can verticals (either aluminum or

steel) still in operation out there? If so, we'd like to learn of the construction details and stories; photos would be great. By the way, you can solder aluminum cans together quite easily using Miracle ROD or Miracle FLUX. They are available from Miracle ROD, PO Box 791, Glasgow, KY 42141. One-sixty meters, anyone?

### New Antenna Products for the Shack

**Radio Shack Coax:** New Look? To be quite frank, in the past Radio Shack coaxial cable has not been well thought of by amateur radio users, mainly because of the cable's insufficient shielding. In a very candid letter to *CQ* by one of Radio Shack's marketing representatives, the company owned up to the deficiencies of its previously imported, high loss cables.

According to the company, Radio Shack's Archer brand coax is now manufactured in the U.S. in their own factory with new braid-making equipment. The new cable features low-loss polyethylene dielectric and all-copper conductors for 95% shielding. For example, the .405" O.D. RG 8/AU cable's claimed loss is 1.7 dB/100 feet at 50 MHz, rising to 6.7 dB/100 feet at 1000 MHz. The cable's primary insulation is low density polyethylene and the outer jacket is of PVC. Radio Shack also markets the popular RG 8/M, RG-58/U, RG 58/U, and RG 6/U cables in the improved Archer product line.

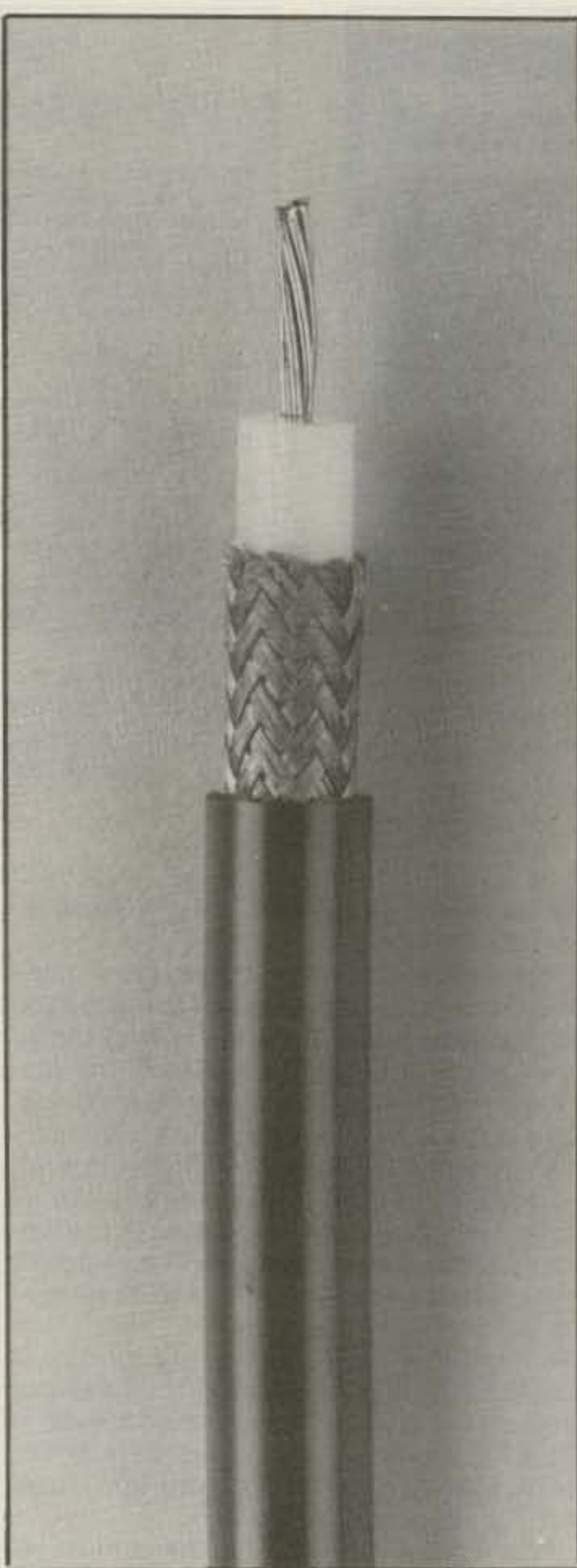
While many of us will likely continue to mail order name-brand cable for heavy duty transmitting purposes, it's nice to know that "real" coax is apparently available at the Radio Shack down the street for that "can't wait" Sunday afternoon antenna project. I'd be interested in hearing from anyone with an experience using the new-style Archer cables. The "before and after" photos show the difference between the old and new cable shielding.

**Eggbeaters and Helixes:** Val Comm, Inc. has announced a new type of two-meter mobile antenna. Designed by Mike Staal, the antenna was originally built for VHF government satellite communication networks.

The Eggbeater (whose appearance is vaguely reminiscent of the mobile "halo" popular in the 1960s) produces an omnidirectional, right-hand circularly polarized pattern. With such a pattern, the antenna is quite effective as an omnidirectional satellite antenna. When placed one-eighth wavelength over a metallic surface, such as a vehicle's roof or trunk, it has several dB gain in the higher angles, i.e. upwardly. Circularity is optimized in the 144 to 146 MHz region, though the antenna is still effective over the range 135 to 150 MHz. The antenna has a feedpoint impedance of 50 ohms, a maximum SWR of 1.5:1, and it handles up to 1 KW RF.

While the \$120 antenna isn't designed to replace a good directional beam, it should have widespread application in base station, contest, and field day use when omnidirectional communication is needed with horizontally polarized stations. You would have a theoretical polarization loss of 20 dB between a typical vertical antenna and a horizontal antenna in a line of sight path referenced to two antennas of the same linear polarization. This compares to a 3 db polarization loss going from circular to linear under the same conditions. In other words, under ideal conditions you would be 17 dB better off with the circular polarized antenna compared to an oppositely polarized linear one.

Val-Comm has also come up with 9-turn and 16-turn right hand helix antennas for 430-440



Here's the "new" Radio Shack coaxial cable. According to the company, the new cable is U.S.-made and features low-loss polyethylene dielectric with 95% shielding. (Photo courtesy Radio Shack)

MHZ satellite use. Originally designed by J. Miller, G3RUH, they are claimed to outperform the crossed Yagi which requires accurately matched phased lines to produce true circular polarization. The antenna can be end-mounted or furnished with center boom mounting holes; either version of the antenna can be stacked.

Both the 9T435 (9-turn) and 16T435 (16-turn) models are based on a 12.8 degree pitch angle with a helix circumference of about 1.08 wavelengths. The antennas have stated gain figures of 12.8 and 15.2 dB, respectively. Both are furnished with N-connectors, and they are priced at \$145.50 for the 9-turn model and \$179.50 for the 16-turn model.

Contact Val Comm, Inc., 249-B Muriel N. E., Albuquerque NM 87123 for more specs.

**When the Lights Go Out:** I, for one, don't have to be reminded of how annoying it is when an overloaded household circuit breaker trips or

a fuse burns out, causing that DX QSO to go down the drain, an hour's worth of computer data to disappear into nothingness, and several digital clocks to go berserk. Realizing how annoying this occurrence is, it's a good idea to take the time to make sure everyone in the house knows the location of the fuse box as well as the circuits which each one controls. And what's the easiest way to do this?

It's such a simple thing, but it's so useful a technique that it's worthwhile to run through the procedure, anyway. Check out "which fuse is which" at a time of day when family activities are likely to be minimized. Turn on all of the lights in the house, but since you'll be successively removing power to various circuits as you check to see which fuses or breakers control which lines, be sure not to have any sensitive amateur or computer gear turned on before proceeding. You can use small lamps, night lights, or neon testers on these lines.

Stationing yourself at the circuit breaker panel, and with family members or other helpers placed strategically at other locations in the house, shut off each circuit breaker or loosen each fuse, having someone note and write down which fuse or breaker controls which lights. If you have more than one amateur in your family and a couple of HTs, you can save yourself a lot of shouting with a little simplex activity.

After doing this, make a map or diagram showing which fuses or breakers handle the various switches and lights around the house. It's a good idea to make a photocopy of the diagram you come up with, with one attached to the fuse box and another one kept in another location (preferably near a flashlight). You may want to photostatically reduce the size of the copy for the fuse box so that it can be taped neatly to the side of the box or the door. You should make similar checks for 240-volt lines, though of course you don't want to use 120-volt light bulbs to check for "live" circuits. Naturally, the diagram you make should be simple to understand by all family members and be readily available to them when needed.

Bear in mind that there usually is a reason for a fuse or breaker to open up: it fails first so that overloads don't result in fire or serious appliance damage. The most common cause of AC overload is the use of a heavy-current appliance such as a broiler, iron, or even a linear amplifier on a circuit that is already in use. You'll want to investigate the possibility of a short circuit and consider rearranging the locations of various household appliances if your fuses or breakers repeatedly "head west."

Bear in mind the simple fact that the typical 120-volt, 15-ampere fuse or circuit breaker handles only a maximum of 1800 watts on the circuit it protects. Watch out if the lights plus the rig or heavy-duty appliances could draw more than 1800 watts on a single fused line! If so, you may want to install extra 120-volt lines or (better yet) a 240-volt circuit for the big appliances and heavy duty gear such as RF amplifiers.

Finally, take care when making any kind of AC line checks. The AC line current can be just as dangerous as the current that lurks inside your linear!

*Overheard: Love your neighbor, but don't pull down your hedge (or your antenna for that matter!).*

Next month, more Antennas & Accessories topics of current interest. See you then.

73, Karl, W8FX.

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## PRINCIPLES, PRACTICES, AND PROJECTS FOR THE VHFER

**Fishing For Grids**

The month of May brings thoughts of longer, warmer days, bright flowers, new greenery, backyard barbecues, ham-fests, and portable operations. As promised last month, I've devoted a portion of this column to a report on WB9MSV's "gridpedition" to EN56 last July. Since this kind of story is timeless, it isn't important that the operation took place nearly a year ago. Read on, and remember this isn't my story, it's Larry's.

"There are a group of operators who have added unique flavor to our home station operations, who many times go unrewarded and unacknowledged. I speak of those harty individuals who brave the elements of cold and wind or heat and mosquitoes to open up operations from rare grids. We call them Gridpeditioners.

"My XYL KA9DLP, while joining our ranks prior to our marriage over 8 years ago, still doesn't truly appreciate long contest weekends and constant monitoring of all the calling frequencies 24 hours daily from the beginning of June through the end of September each year. I promised her and the kids a vacation in the great outdoors with freshly caught Wall-eye pike frying in the pan for dinner and water so clear and cool it begs you to jump in and refresh your soul. One stipulation on her part—*no radio*.

"I did manage to keep the multimode 2 meter rig in the car and carefully camouflaged a 3-element fold-up beam in the trunk. No code key was available; I knew I could always key the mike PTT on CW should the need arise. There has always been a 2 meter "Squalo" attached to the car roof so I could mobile along on SSB. As we traveled due north, we relayed our plans on 144.200 and many folks became excited and started spreading the news of our planned operation from EN56. I was never out of contact on 2 meter SSB until we were in EN55 where the trees turned to pine and spruce, and the normally flat midwestern plains became a series of undulating hills and scenic valleys. The kids kept the XYL busy, so she had little idea of what was to come.

"We arrived at our cottage and began to unpack and relax. That was fun for a day or two, but I knew people would be



*WB9MSV/8, EN56. See the little 3-element 2 meter beam mounted to the end of an oar? With this setup and a 25 watt multimode, Larry made over 120 contacts spanning half the country last July.*

looking for me on 2 meters. I finally had the nerve to tell my wife I was taking the car to the nearest hilltop to try it out. Since it was after dinner and all the chores were finished, I guess I had her blessings.

"I had no mast to support the antenna. Necessity being the mother of invention, I borrowed an old boat oar for the job and soon had the 3-element beam at 10 feet elevation with some RG-8X attached and let out my first CQ on 144.200 MHz CW with 25 watts. Pointing south, I soon logged stations as far away as EN51 (about 300 miles). I was amazed, but solid contacts were possible with this Rube Goldberg arrangement. About 30 stations were worked via tropo to about 400 miles the first evening. I was told I was being heard better than I was hearing. The next time a preamp will tag along.

"The second and most productive evening of DX was soon at hand. Holding the mast with one hand on the roof of the car and keying the radio with the PTT line, plus trying to write, became tiring and frustrating, but there were no other options. About an hour of empty CQs and I was ready to call it an evening, but as I swung the beam through the cardinal di-

rections before packing up, I heard the familiar buzz of Aurora! Right there on 144.2 was AF9Y with an over S9 signal. We made it easily, and he graciously relinquished the calling frequency so others had a chance at EN56. My best QSO was with K2LWR in FN02. It took me about 15 minutes to get his attention with my peanut whistle station, but I finally gave John a new grid.

"Needless to say, the QSL card from K2LWR was waiting in the mail for us upon arriving at home, along with a mass of other requests. In all, with 25 watts and a 3-element beam, I made over 120 contacts, with FN02 being the farthest east and EN12 being the farthest west. Granted, we had some exciting conditions, but many contacts were made by sheer determination. My thanks to all those who patiently waited for a QSO and my apologies to those who never made it. The fault was on my end and will be rectified in 1988, as my plans include all of the upper peninsula of Michigan on 2 meters as well as 6. We now have a new van, and my XYL has realized that you can take the radio away from the OM, but you can't take the OM away from the radio!"

Great story, Larry. Your timing for the Aurora was obviously perfect. Where was Murphy? We're not always so lucky, but as you aptly pointed out, determination is a key factor in any successful operation. I'm sure we'll all be looking for you this year. Be sure to let us know the dates you plan to visit any rare grids. If you can give us 75 days' notice, your tentative schedule can be published to help make your operation even more successful.

**Updates**

Microwave Modules Ltd. has made an engineering change to their 6 meter linear transverter model MMT50/28S. Owners of early units may wish to make this simple change to improve (receive) noise figure and sensitivity, reported as initially poor on some units. According to the manufacturer, the sensitivity problem is caused by local oscillator overdrive of the receive mixer.

The action required to remedy this situation and bring the noise figure down to a respectable number is very simple; the emitter resistor of the L.O. buffer stage is increased in value from 470 ohms to 690 ohms by the addition of a 220 ohm resis-



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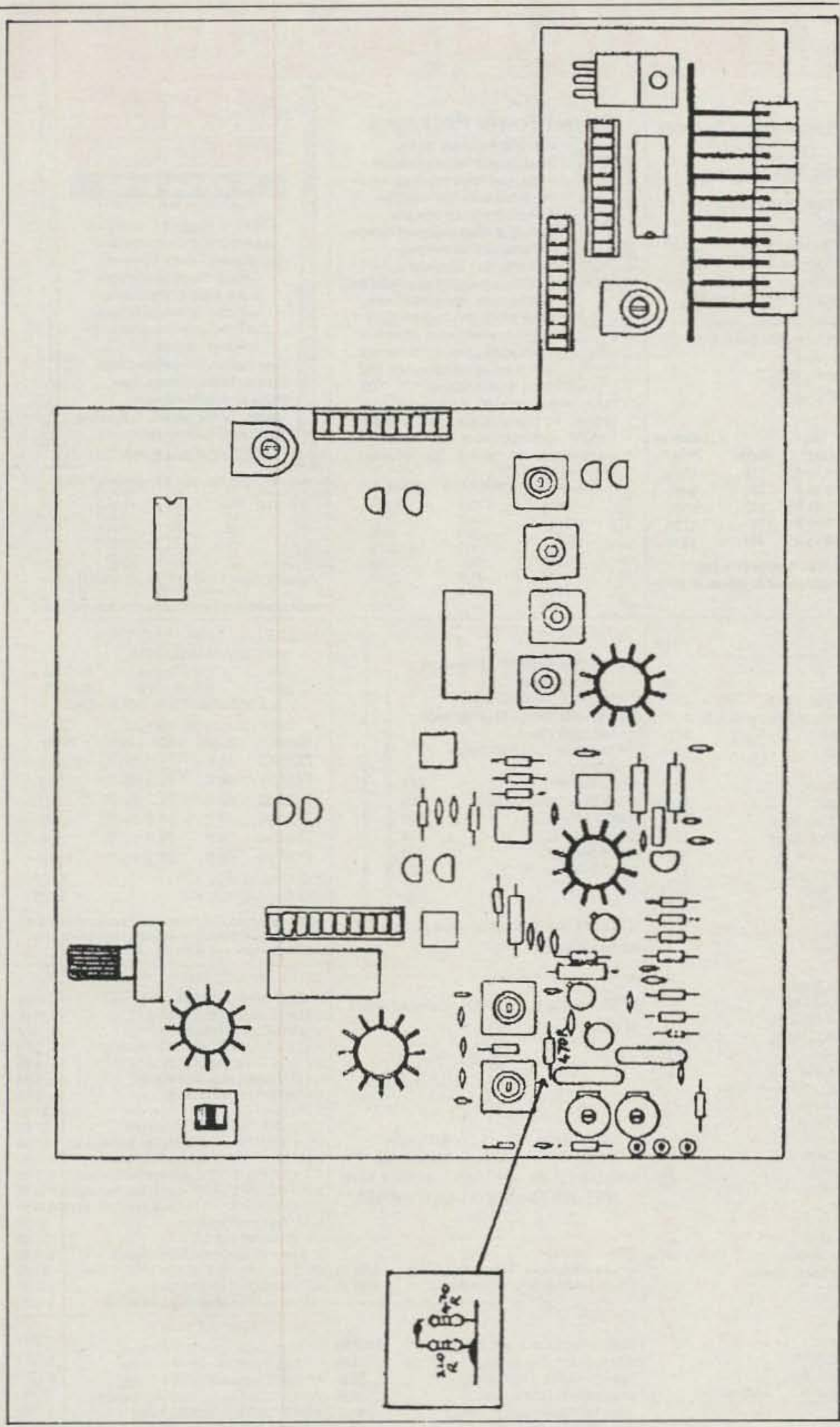
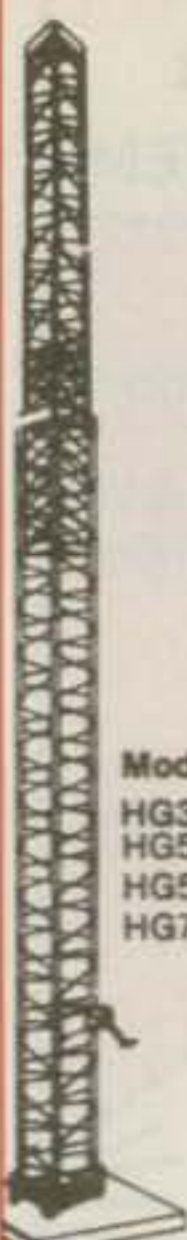


Fig. 1- MMT50/28S transverter pictorial detailing factory-recommended field modification to increase sensitivity of older units. (See text.)

tor wired in series with the original (470 ohm) component. The manufacturer's wording for this is "Uplift the grounded end of the 470 ohm resistor indicated, and bend the resistor so that it is vertical. Solder a 220 ohm (1/4 watt) resistor from the free end of the 470 ohm resistor to ground."

According to MM, "This modification has effectively increased the value of the emitter resistor in the L.O. buffer stage and therefore has reduced the L.O. drive to the receive mixer." The location of the circuit area to be modified is shown pictorially in this column. For further information on this or MM products, please con-

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HOBX48	48 ft	18 sq ft	363	\$559

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RG8X	52	.8	1.2	3.5	5.8
9086	50	.4	.64	1.7	3.1
1/2" Alum	50	.3	.5	1.2	2.2
1/2" Helix	50	.2	.4	.9	1.6
1/4" Helix	50	.1	.2	.5	.9

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**COAX CONNECTORS**

Amphenol Silver PL259	\$1.25
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**Van Gorden**

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**ALPHA DELTA**

DX-A 160-80-40 Sloper ..... \$49

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A4S 4-el Tribander Beam w/S.S. Hdwre.	\$349
A743 & A744, 30/40 mtr KIT for the A3 & A4	\$ 89
AP8 80-10 mtr Vertical	\$139
AV5 80-10mtr Vertical	\$119
D40 40mtr Dipole	\$159
40-2CD 2-el 40 mtr Beam	\$339
A50-5 5-el 6 mtr Beam	\$ 98
215 WB NEW 15-el 2 mtr Beam	\$ 89
230 WB NEW 30-el 2 mtr Beam	\$229
4218 XL 18-el 2 mtr Beam	\$129
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424B 24-el 432MHz Beam	\$ 89
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105BAS 5-el 10-mtr Beam .....  
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64BS 4-el 6-mtr Beam .....  
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28BS 8-el 2 mtr Beam .....  
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BN86 80-10 mtr KW Balun W/Coax Seal .....

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6BTV 80-10 mtr Vert	\$149	5BTV 80-10 mtr Vert	\$129		
4BTV 40-10 mtr Vert	\$99	G7-144 2-mtr Base	\$129		
G6-144B 2-mtr Base	\$89				
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FK4544	44 ft.	34.8 sq. ft.	1389.
FK4554	54 ft.	29.1 sq. ft.	1469.
FK4564	64 ft.	28.4 sq. ft.	1579.

25G Double Guy Kit	\$279.
45G Double Guy Kit	\$299.

\*Above antenna loads for 70 mph winds w/guys at hinge and  
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Prices 10% higher west of Rockies.

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RS7A	5	7	49
RS12A	9	12	69
RS20A	16	20	89
RS20M	16	20	109
RS35A	25	35	135
RS35M	25	35	149
RS50A	37	50	199
RS50M	37	50	229

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Model	Band	Pre-amp	Input	Output	Sale Price
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B23A	2M	Yes	2W	30W	\$129
B108	2M	Yes	10W	80W	\$159
B1018	2M	Yes	10W	160W	\$259
B3016	2M	Yes	30W	160W	\$229
D1010N	440	No	10W	100W	\$319

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2-417	2M	45-170W	\$299.00
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3-211	220	2-110W	\$299.00
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440 MHz Isopole	\$59.95

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ELH-260D	CALL	ALR-72T	CALL
		ALD-24T	CALL

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1224/1229 Interface	\$89.95/\$159.95
202/204 Antenna Bridges	\$59.95/\$79.95
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tact the importer, The PX Shack, Bell Mead, New Jersey.

The Saba Island 6 meter expedition discussed in last month's column has been firmly scheduled for July 7-14. The operation will use the callsign PJ0M, and two TS680 transceivers plus 3-element and 5-element beams will be pressed into 6 meter service. Let's hope for wonderful conditions and lots of 6 meter contacts with this group.

A 6 meter expedition to St. Pierre (FP8/FP0) is being planned by KA3B for the week of June 7-14, which covers the June VHF QSO Party contest weekend. The details weren't available at this writing, but Harry hoped to secure a special callsign (first choice: FP0SIX) and use an IC551D (80 watts) to a newly installed 6 meter beam. As this would represent a new country for a lot of 50 MHz operators, I sure hope Harry pulls it off. We may have more on this next month.

Encomm Inc. has announced a new series of Santec dual-meter wattmeters to cover 1.8 through 525 MHz in selected bands and power ranges. For example, model W-710 covers 1.8-60 MHz in ranges of 20/200/2000 watts; model W-720 covers 140-525 MHz in ranges of 15/60/200 watts. These products are said to be housed in sturdy metal cases and are unaffected by stray RF fields. I'll try to get hold of the W-720 for a product review. In the meantime, for further infor-



Malta Amateur Radio League beacon station 9H1SIX with operators Mark 9H1GP and Lorenz 9H1AV (left to right). The beacon runs 25 watts output to a 5-element beam on 50.085 MHz from grid JM75.

mation contact Encomm at 1506 Capital Ave., Plano, TX 75074 (phone 214-423-0024).

W5UWB wrote to advise users of Advanced Receiver Research TRS04VD sequencers that this product must have its power applied prior to powering the equipment it is intended to key. John says, "I had my equipment up and ready to run when I powered up the sequencer—surprise! All relays operate upon application of DC power for a brief interval . . . ." Unfortunately, John lost two preamps before he discovered this anomaly. It never occurred to me that anyone might switch the DC power to a sequencer (I leave all mine on 24 hours a day), and this can cause real problems, for it is true that all the relays key briefly upon initial power-up. An ounce of prevention . . .

Rudolf Klos, DK7PE, of Nieder-Olm, Federal Republic of Germany, wrote to tell of his recent visit to Malta and the 9H1SIX 50 MHz beacon. According to Klos, the beacon has been operational since September 1987 and is run by the Malta Amateur Radio League on 50.085 MHz FSK. The beacon, which runs 25 watts to a 5-element beam at 85 meters above sea level, was a donation of the British Six Metre Group. DK7PE says the beacon's antenna is rotated, according to band conditions. Reception reports are welcomed and should be submitted to 9H1ES, MARL, P.O. Box 575, Valletta, Malta.

W4FSO of Raleigh, NC wrote in response to our review of the RF Concepts 2-317 power amplifier. Alex likes his unit a great deal, "in spite of the fact that I had to return it to the factory recently for repairs. It was repaired under warranty with the notation, 'updated unit and changed C47 and C48.' The unit fits my requirements to a Tee." W4FSO says that in his case, the internal GaAsFET preamp is very helpful in pulling out the weak ones with his trusty old TR9000 transceiver. Alex is active on 50, 144, and 432 MHz from grid FM14, and was considering a THL 110 watt amp for the highest frequency band. We'll be listening for you,

Alex! Look for us from FM27 when we return to Chincoteague Island for the June contest.

## Threat To 70 cm

We received the following correspondence from SAAC, the Spectrum Allocation Advisory Committee of Toronto, Ontario:

"The decision of Canada's Department of Communications to reclassify a meteorological aid as a radiolocation device has profound implications for amateurs in the United States as well as in Canada.

"We believe that it is essential this frequency allocation be blocked in the interest of amateur radio (in both countries). We believe that a challenge to the DOC reclassification can be justified on both political and legal grounds."

This letter was accompanied by a news release dated February 9, 1988 which points out:

"The impact (of DOC reclassification which would allow meteorological aids to be operated within the 430 to 450 MHz amateur band) on amateur operations in the U.S. could be devastating. Existing and future satellite uplinks could be rendered useless, (and) ATV, weak signal, and EME operations could become impossible in many areas; and FM repeaters could be forced out of the band completely.

"The meteorological aid in question is a high power, triple beam, broad band Clair Air Doppler Radar (CADR) system. CADR systems are now operating in the U.S. on the meteorological aid frequency of 404.37 MHz where they pose no direct threat to amateur operations. These and future installations could be moved to the 70 cm amateur band, however, if CADR is reclassified.

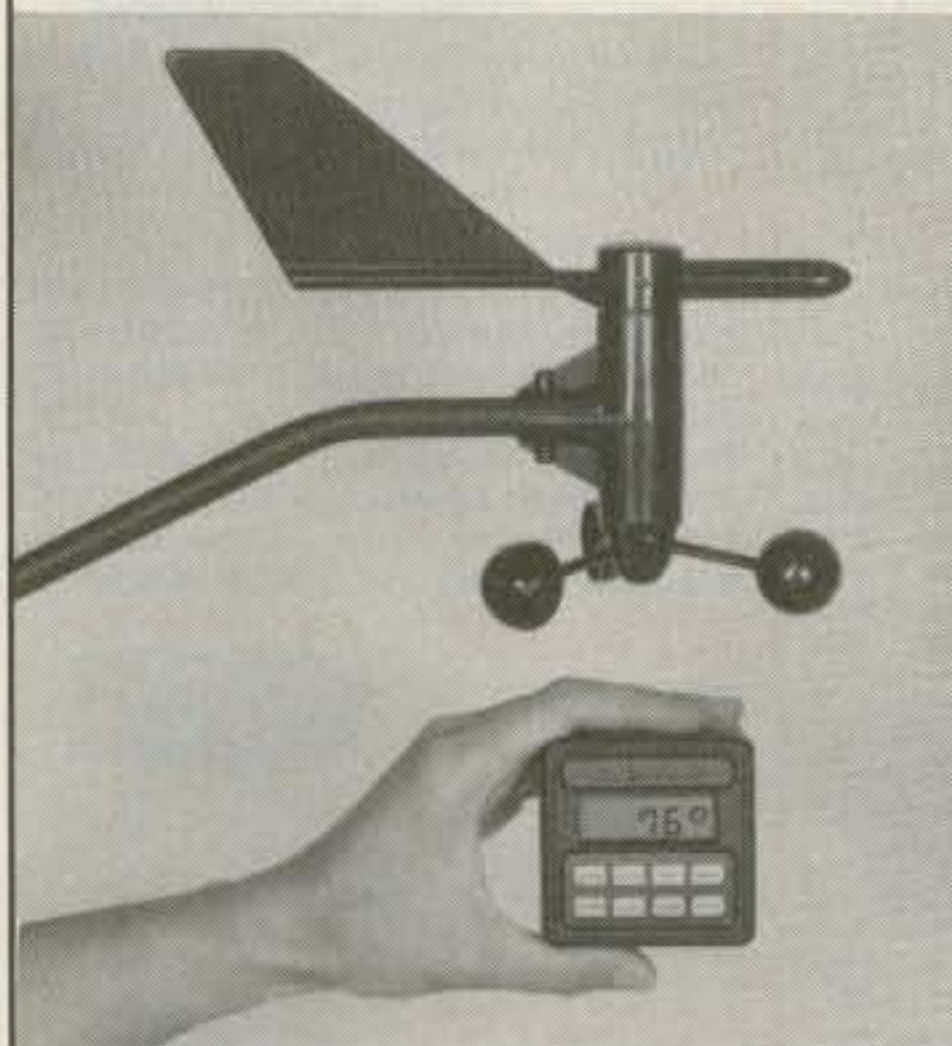
"U.S. amateurs are urged to fight this serious problem by writing their elected officials in Washington, urging them to file diplomatic protests with the Canadian government on behalf of U.S. amateurs. The fate of the 70 cm band in the United States could be at stake.

"U.S. amateurs should also write the IARU and ARRL urging these organizations to take immediate action to fight the Canadian reclassification. Canadian amateurs should write the Honorable Flora MacDonald, Minister of Communications, protesting most strongly "the allocation of a frequency within the 430 to 450 MHz band to a Clear Air Doppler Radar meteorological aid in contravention of an international treaty through the unacceptable reclassification of the aid as a radiolocation device." (Whew!)

For further information regarding this very real threat to our 70 cm band, please contact the Spectrum Allocation Advisory Committee, P.O. Box 1026, Station F, Toronto, Ontario, Canada M4Y 2T7.

73, Steve, WB2WIK

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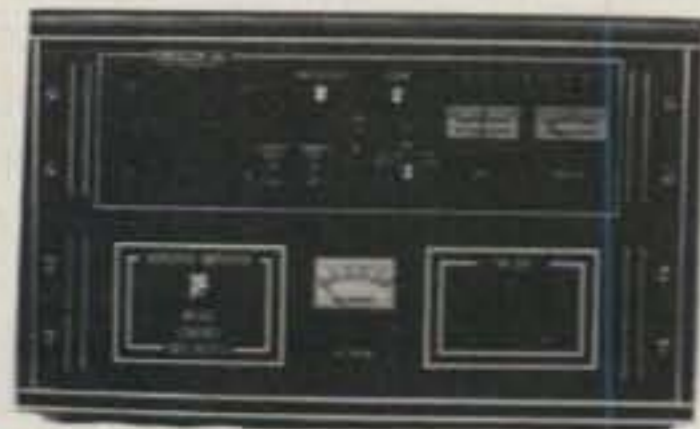
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831SP-PL259 Silverplate ..... 1.25  
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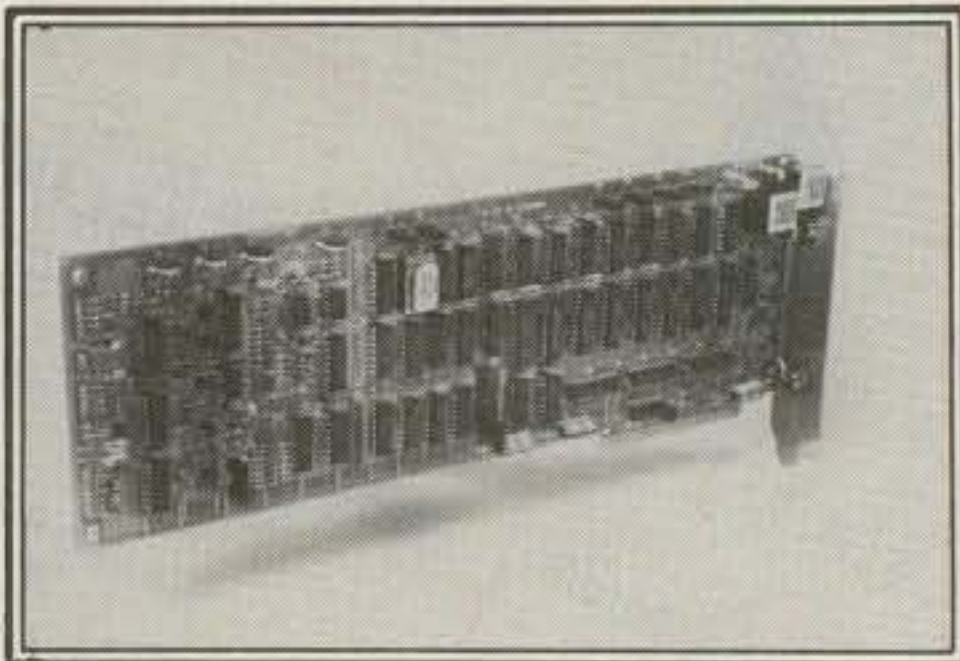


### Deluxe Repeater Controller

ACC, maker of the famous RC-850 repeater controller, has introduced the RC-96 model that brings new features and ease of hook-up to any repeater system. Remote programming lets the owner make changes to his repeater from anywhere without a trip to the site. He can change codes, autodial numbers, ID messages and more with reliable EEPROM memory.

Users will enjoy the outstanding auto-patch and autodialer, with storage for 200 telephone numbers. The talking S-meter lets them check their signal strength into the repeater. Other features include a BBS, support for pocket pagers, repeater linking, and, of course, ACC's famous high quality synthesized

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Compumax Corporation has introduced TRUFAX, a plug-in board for an IBM PC or compatible and software that enables a user to capture and transmit facsimile (FAX) over radio. Compatible with Hercules, CGA, or EGA adapters, the unit simply connects to the audio ports of the receiver/transceiver. Resolution is 3 bits per pixel or 8 gray scale levels. For more information, contact Trufax Marketing Manager, Compumax Corporation, 26 West Boylston St., West Boylston, MA 01583 or circle number 106 on the reader service card.



### Video Novice Training Course

Amateur Radio School has added a "video" Novice course to their line of code and theory courses. The course material contains two VHS video cassettes, each of which runs for two hours. The balance of the material is contained on one C90 audio cassette and in the manual. You see on your TV set dramatic demonstrations of subjects that are not easily understood from reading a book. This program is specifically designed for students who have had little exposure to amateur radio and electronics. For more information, contact Amateur Radio School, 2350 Rosalia Drive, Fullerton, CA 92635 or circle number 104 on the reader service card.

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TS-940S

HF Equipment	List	Juns
FT-747 GX New Economical Performer	\$889.95	Call \$
FT-757 GX II Gen. Cvg Xcvr	1129.95	Call \$
FT-767 4 Band New	1929.00	Call \$
FL-7000 15m-160m Solid State Amp	1995.00	Call \$
<b>Receivers</b>		
FRG-8800 150 kHz - 30 MHz	759.95	Call \$
FRG-9600 60-905 MHz	699.95	Call \$
<b>VHF</b>		
FT-212RH NEW 2m, 45w mobile	459.95	Call \$
FT-211RH FM Mobile 45w	389.95	Call \$
FT-290R All Mode Portable	599.95	Call \$
FT-23 R/TT Mini HT	344.95	Call \$
FT-209RH FM Handheld 5w	389.95	Call \$
<b>UHF</b>		
FT-712RH, 70cm, 35w mobile	499.95	Call \$
FT-711RH FM Mobile 35w	449.95	Call \$
FT-73 R/TT Mini HT	349.95	Call \$
FT-709RH FM HT 4w	389.95	Call \$
<b>VHF/UHF Full Duplex</b>		
FT-736R, New All Mode, 2m/70cm	1749.95	Call \$
FEX-736-50 6m, 10w Module	259.95	Call \$
FEX-736-220 220 MHz, 25w Module	279.95	Call \$
FEX-736-1.2 1.2 GHz, 10w Module	539.95	Call \$
FT-726R All Mode Xcvr	1095.95	Call \$
FT-690R MKII, 6m, All Mode, port.	569.95	Call \$
<b>Dual Bander</b>		
FT-727R 2m/70 cm HT	439.95	Call \$
<b>220 MHZ</b>		
FT-109 RH New HT	399.95	Call \$
<b>Repeaters</b>		
FTR-2410 2m Repeaters	1269.95	Call \$
FTR-5410 70cm Repeaters	1289.95	Call \$

HF Equipment	List	Juns
IC-781 New Deluxe HF Rig	\$5995.	Call \$
IC-761 Loaded With Extras	2699	Call \$
IC-735 Gen. Cvg Xcvr	1099.00	Call \$
IC-751A Gen. Cvg. Xcvr	1699.00	Call \$
IC-575A 10m/6m Xcvr	1399.00	Call \$
<b>Receivers</b>		
IC-R7000 25-1300 + MHz Rcvr	1199.00	Call \$
IC-R71A 100 kHz-30 MHz Rcvr	999.00	Call \$
<b>VHF</b>		
IC-275A All Mode Base w/PS	1299.00	Call \$
IC-275H All Mode Base 100w	1399.00	Call \$
IC-28A FM Mobile 25w	469.00	Call \$
IC-28H FM Mobile 45w	499.00	Call \$
IC-2AT FM HT	319.00	Call \$
IC-02AT FM HT, HP	409.00	Call \$
IC-μ2AT Micro HT	329.00	Call \$
IC-900 Six Band Mobile	639.00	Call \$
<b>UHF</b>		
IC-475A All Mode 25w	1399.00	Call \$
IC-48A FM Mobile 25w	509.00	Call \$
IC-4AT FM HT	349.00	Call \$
IC-04AT FM HT	449.00	Call \$
IC-μ4AT 440 FM HT	369.00	Call \$
IC-3200A FM 2m/70cm 25w	649.00	Call \$
<b>220 MHZ</b>		
IC-375A All-Mode, 25w, Base Sta.	1399.00	Call \$
IC-38A 25w FM Xcvr	489.00	Call \$
IC-37A FM Mobile 25w	499.00	Call \$
IC-3AT FM HT	349.00	Call \$
IC-03AT Deluxe HT	449.00	Call \$
<b>1.2 GHz</b>		
IC-1271A All Mode 10w	1269.00	Call \$
IC-1200 FM, 10w Mobile	699.00	Call \$
IC-12AT Deluxe 1w HT	473.00	Call \$

HF Equipment	List	Juns
TS-940S/AT Gen. Cvg Xcvr	\$2449.95	Call \$
TS-830S Xcvr	1199.95	Call \$
TS-440S/AT Gen. Cvg Xcvr	1379.95	Call \$
TS-140S Compact, Gen. Cvg Xcvr	929.95	Call \$
TS-680S HF Plus 6m Xcvr	1099.95	Call \$
TL-922A HF Amp	1649.95	Call \$
<b>Receivers</b>		
R-5000 100 kHz-30 MHz	999.95	Call \$
R-2000 150 kHz-30 MHz	749.95	Call \$
<b>VHF</b>		
TS-711A All Mode Base 25w	1029.95	Call \$
TR-751A All Mode Mobile 25w	649.95	Call \$
TM-221A Compact FM 45w	439.95	Call \$
TM-2530A FM Mobile 25w	479.95	Call \$
TM-2550A FM Mobile 45w	499.95	Call \$
TM-2570A FM Mobile 70w	599.95	Call \$
TH21-BT FM, HT	279.95	Call \$
TH-215A, 2m HT Has It All	379.95	Call \$
TH-25AT 5w Pocket HT NEW	349.95	Call \$
TM-721A 2m/70cm, FM, mobile	649.95	Call \$
<b>UHF</b>		
TS-811A All Mode Base 25w	1,229.95	Call \$
TR-851A 25w SSB/FM	749.95	Call \$
TM-421A Compact FM 35w	449.95	Call \$
TH-415A 2.5w 440 HT	399.95	Call \$
TH-41BT FM, HT	399.95	Call \$
TH-45AT 5w Pocket HT NEW	369.95	Call \$
TW-4100A, 2m/70cm FM	599.95	Call \$
TM-721A dual band	649.95	Call \$
TR-50 1w 1.2GHz FM	629.95	Call \$
<b>220 MHZ</b>		
TM-3530A FM 220 MHz 25w	499.95	Call \$
TH-31BT FM, 220 MHz HT	299.95	Call \$
TM-321A Compact 25w Mobile	449.95	Call \$
TH-315A Full Featured 2.5w HT	399.95	Call \$



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# Awards

a monthly feature by  
**DOROTHY JOHNSON, WB9RCY**

## NEWS OF CERTIFICATE AND AWARD COLLECTING

**T**he Story of the Month for May is:

**Ronald E. Johnson, WB0VNN  
USA-CA All Counties #545, Mixed,  
7-20-87**

"The only reason I became involved in amateur radio was so that my brother, Jerry, WA0URK, and I could have a way to communicate with each other in a quick and inexpensive manner. Jerry, who lives in the Denver area, had been a ham for a few years and convinced me that I should get a radio license. With a great deal of help from members of the Durango Amateur Radio Club, I managed to get my Novice ticket in August 1976.

"My first rig was a crystal-controlled Heath transmitter and an R-390/URR receiver, both on loan from my brother. My antenna was an inverted Vee with wires cut for 15, 40, and 80 meters, all attached to one 35 foot tall pole. The other ends were fastened to a convenient yard fence. I referred to the system as my 'spider web'!

"I was on the radio intermittently from August 1976 until January 1981. I kept my license current but was not active from 1981 through 1983. As a Christmas present in 1983, my XYL, Marilynne, with help from a friend, Cap, W0XE, gave me a new Kenwood TS-530SP transceiver. I soon became active on the bands again. One day while reading a copy of *CQ* magazine I came across an article about county hunting. I have always enjoyed a challenge, and so I decided that I would try for the USA-CA All Counties Award.

"As a Novice I had managed to work a little over 500 counties on CW. Through 1984 I continued county hunting on the Novice bands and developed quite a system for doing so. Not wanting to be involved in unnecessary rag chewing, I would listen for a station calling 'CQ,' look up his call in the book to determine the city or town, grab the atlas to find the county, and, if it was a new one, answer the call. Many times, to keep the calling station occupied while I looked through all my books, I would tap out a question mark to give me more time. Most Novice operators were sending code at 5 to 10 wpm, and I had always been able to send and receive at a rate of 15 to 20 wpm, so I did have a slight advantage over most of the stations that I was able to work.

333 South Lincoln Ave., Mundelein, IL  
60060



*Ron Johnson, WB0VNN, USA-CA All Counties #545, at his FB operating position in Colorado.*

"I very soon became aware that it would be almost impossible to work every county as a Novice. It was time to upgrade after nine years as a Novice, and in August 1985 I received my General ticket. It took a little while for me to jump into the main stream of phone operation and also, once I did, to locate the County Hunter's Net. On September 7, 1985 I worked Ken, KB7QO, in the Bronx, New York, for my first contact on the County Hunter's Net.

"Looking back on two years of participating on the net, many things come to mind—the many times I stayed up late 'riding along' with the mobiles just to get one more county, or getting out of bed on a cold winter morning at 5:00 a.m. in order not to miss a needed county. On some of those early morning occasions I would go out to my pickup truck and work a station mobile to mobile so that I would not awaken my XYL.

"I was fortunate in having another county hunter living in my county. John, KK0L, was one of my Volunteer Examiners when I took my General license examination, and he became a good friend. I relied on him for assistance whenever I had a knotty problem or a question. He always came through with a smile and a good word, even though I interrupted his work or his play occasionally.

"I am an avid bowler, and I bowled in leagues four nights a week plus one Sunday morning each month. I received much teasing on the net because of the time I spent bowling.

"I am a self-employed land surveyor, and in 1986 I received the honor of being elected the first president of the Professional Land Surveyors of Southwestern Colorado. My duties were considerable, and I often begrudged the time I was away from my rig. I did, however, manage to preside as the net control station for

over 300 hours, usually on the weekends. That position made achieving my goal of 3076 counties quicker and easier.

"Finally, on July 13, 1987 I worked my last county. With much teasing from Joe, W1WLW, the net controller, and my long suffering but loyal wife by my side, Ben, W6PXE, gave me a 5-5 report from Wise County, Texas, and my county hunting was over. Now that I have more spare time, I would like to complete my DXCC, WPX, and 5B WAS. I don't know for certain if I will attempt to work the counties all over again, but rumor has it that some fellow using the call sign of WB0VNN has recently been heard working some mobile stations!

"I have always enjoyed the times that I was able to be mobile and give contacts to others in counties that they needed. County hunting is a two-sided coin, both giving and receiving. I think the giving is more enjoyable than the receiving.

"I believe the most exciting event that occurred during my hunt for the counties was my attendance at the MARAC National Convention in Denver, Colorado in July 1987. I finally had an opportunity to meet many people whom I called friends but whom I had never met face to face.

"I do thank all the wonderful people who helped me during the past two years! It is very true that one does not achieve USA-CA All Counties without assistance from others. I sincerely hope that I will be able to return all the favors afforded me—73, Ron."

### USA-CA Special Honor Roll

Malkiel "Malik" Webman, 4X4JU  
All Counties #558, All SSB, 1-7-88

### Awards Issued

Malkiel "Malik" Webman, 4X4JU, completed the hunt and received USA-CA All Counties #558, All SSB, dated 1-7-88. This is the first USA-CA All Counties to Israel.

George Dessert, W3IJT, added another gold seal to his certificate by claiming USA-CA 3000 #588, All SSB, dated 1-30-88.

Theodore E. Palmer, WA6MUK, took two more steps toward his goal and received USA-CA 2000 #731, and USA-CA 1500 #818, Mixed, dated 1-14-88.

James T. "Jim" Clary, WB9IHH, filed his good application for USA-CA 1500 #819, and USA-CA 1000 #1001, Mixed, dated 1-23-88.



### USA-CA Honor Roll

3000		1000	
W3IJT	588	WB9IHH	1001
2000		500	
WA6MUK	731	DL1XT	2218
		DL1SN	2219
		WF7D	2220
1500			
WA6MUK	818	N4PNI	2221
WB9IHH	819	YU3BQ	2222
		G4SDJ	2223
		K8KUH	2224

The total number of counties for credit for the United States of America County Award is 3076. The basic award fee for subscribers to CQ is \$4.00. For non-subscribers, it is \$10.00. Initial application must be submitted in the USA-CA record book which may be obtained from CQ Publishing Company, 76 North Broadway, Hicksville, NY 11801, U.S.A. for \$1.25. To qualify for the special subscriber rate please send a recent CQ mailing label with your application. To be eligible for the USA-CA, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated April 2, 1985. A complete copy of the rules may be obtained by sending a SASE to the USA-CA Custodian, 333 South Lincoln Avenue, Mundelein, IL 60060, U.S.A. DX stations must include extra postage for air mail reply.

Charlie E. Jacobson, SM0CHA, updated his fine record on 1-14-88 by adding an All Mobile endorsement to his USA-CA 2500.

USA-CA 500 certificates went to:

Kurt A. Loos, DL1XT, USA-CA 500 #2218, 12-29-87, Mixed.

Eugen T. Englert, DL1SN, USA-CA 500 #2219, 12-31-87, All 2 x CW.

Terry J. Tewes, WF7D, USA-CA 500 #2220, 1-11-88, Mixed.

Franklin D. Grant, N4PNI, USA-CA 500 #2221, 1-19-88, Mixed.

Slavko Celarc, YU3BQ (ex-YU3TUX), USA-CA 500 #2222, 1-19-88, Mixed.

R.T.G. "Rod" Freeman, G4SDJ, USA-CA 500 #2223, 1-25-88, Mixed.

Warren E. Braschwitz, K8KUH, USA-CA 500 #2224, 1-27-88, Mixed.

### Awards Available

**1988 Polar Bridge Diploma.** This award is to commemorate the joint Canadian-Soviet Union Transpolar Ski Expedition from Severnaya, USSR to Ellesmere Island, NWT, Canada. This attractive, oversize bilingual (English and Russian) commemorative diploma will be awarded to amateurs and SWLs who fulfill the following requirements.

Log three different calls from NWT, Canada (usually VE8); three different calls from Asiatic RSFSR, USSR (usually UA9 or UA0); one base camp station call from either the USSR or Canada; one station call from the capital region of Ottawa, Canada; and one station from the national capital region of Moscow, USSR, making a total of nine two-way QSOs or loggings. Contacts must be made between February 15 and June 15, 1988. The expedition began about March 1, 1988 and is expected to last about 90 days.

The Department of Communications of Canada has authorized the use of the

special prefix CI8 for Northwest Territories radio amateurs to use on an optional basis between February 15 and June 15, 1988. During that same time period the special call CI8C will be used by the Ski Expedition Base Camp at Resolute Bay, NWT.

Send application, certified log data (no QSLs), and 10 IRCs or \$5.00 to CRRL National Awards Manager, Garry V. Hammond, VE3XN/VE8XN, 5 McLaren Avenue, Listowel, Ontario, Canada, N4W 3K1.

**Radio Society of Great Britain HF Awards.** Radio Society of Great Britain HF certificates and awards are featured this month. Applications and correspondence about the society's awards program should be sent to The Awards Manager, P.O. Box 20, Bridgend, Mid Glamorgan CF35, United Kingdom.

The following general rules and conditions apply to HF certificates and awards issued by the Radio Society of Great Britain and should be read in conjunction with the conditions which govern the award of the individual certificates.

#### Applicant eligibility:

1. Claimants from the UK, Channel Islands, and the Isle of Man must be members of the RSGB and, as proof of membership, should provide a recent address label from *Radio Communication*. Applicants from elsewhere need not be members of the RSGB but, where they are, they should enclose the same evidence.

2. Claimants may be either licensed radio amateurs or shortwave listeners. All certificates, but not special plaques or cups, are available on a "heard" basis to listeners.

#### Claim eligibility:

3. Each claim from within the UK, Channel Islands, and the Isle of Man must be accompanied by documentary proof in the form of QSL cards showing that two-way communication has taken place with the appropriate geographical area. Claims from elsewhere must also be accompanied by all cards in the case of those categories of award attracting a plaque or cup. In other cases a statement from the applicant's national society or a statement by two officers of a local society affiliated with the national society that the cards have been checked will be accepted, except that the HF Awards Manager reserves the right to ask to see some or all of the cards.

4. Each claim from a non-member of the RSGB must be accompanied by a fee of 3.00 pounds or 12 IRCs or \$4.00 US per certificate or class of certificate. The fee for members is 1.50 pounds or 6 IRCs or \$2.00 US. These fees will be revised from time to time. All applicants submitting cards for checking must include sufficient payment to cover their return. Cards will only be returned by air, recorded delivery (UK only), or registered mail (overseas) if adequate postage is sent with the

claim. (For registered mail add 4 IRCs.)

#### Contact eligibility:

5. All contacts must be made by the holder of the call sign on bands below 30 MHz.

6. Contacts may be made from any location in the same DXCC country.

7. Except where otherwise indicated, credit will be given for confirmed contacts made on or after 15 November 1945.

8. Contacts with land mobile stations will be accepted, provided the exact location of each station at the time of contact is clearly stated on the evidence submitted.

9. By decision of the RSGB's HF Committee, credit will not be given for contacts made on the 10, 18, and 24 MHz bands. This decision will be reviewed when the bands become freely available to licensed radio amateurs worldwide and restricted power limits are removed.

10. Credit will be given for contacts made entirely on a single mode or transmission or on a combination of modes. Certificate endorsements for single-mode transmission and/or single band may be made on the submission of cards clearly confirming the mode or frequency of transmission, but the request must be made at the time of the submission. Credit will not be given for cross-mode or cross-band contacts.

#### Disqualification:

11. Any altered or forged confirmations submitted for credit may result in disqualification of the applicant from the RSGB's award program.

12. In the case of any dispute concerning a claim, the decision of the appropriate awards manager, in consultation if necessary with the HF Committee, shall be final.

**DX Listeners' Century Award (DXLCA).** This award may be claimed by any shortwave listener eligible under the general rules who can produce evidence of having received signals from amateur radio stations located in at least 100 DXCC countries. Stickers are available for every 25 additional countries confirmed.

A 5 band endorsement is available for



*DX Listeners' Century Award offered by the Radio Society of Great Britain.*

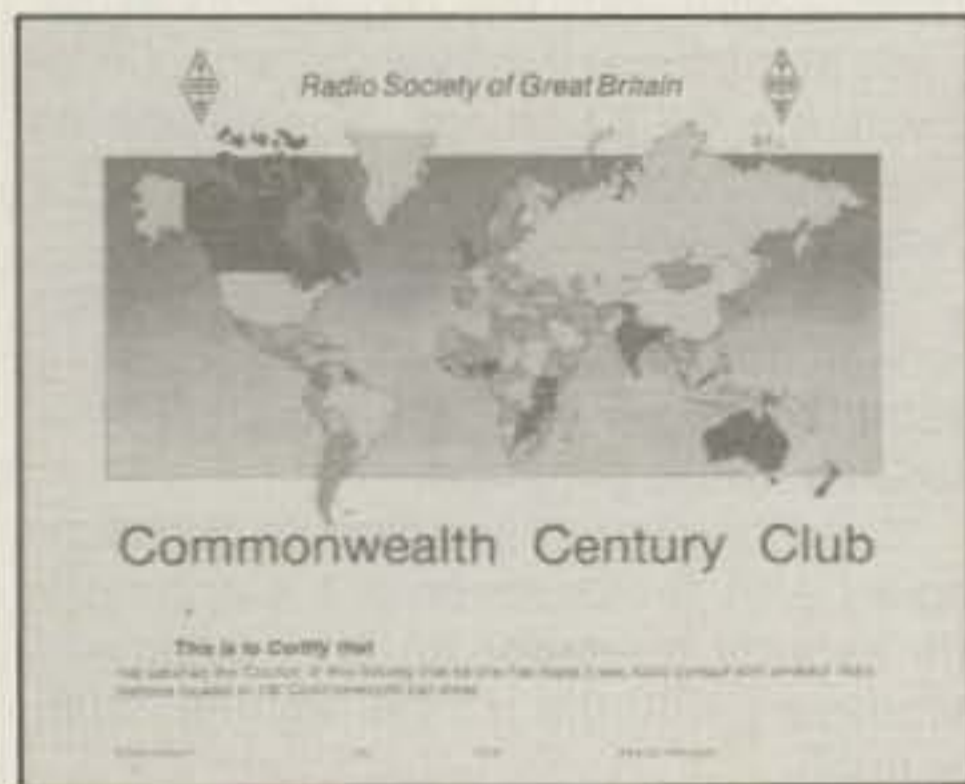
hearing 100 countries on 5 bands. The same countries do not have to be heard on each band.

**Commonwealth Century Club (CCC).** This award may be claimed by any licensed radio amateur eligible under the general rules who can produce evidence of having effected two-way communication, since 1 January 1984, with amateur radio stations in at least 100 Commonwealth call areas in the current list.

A handsome plaque with a plate detailing name, call sign, date, and number of the award will be available to all recipients on payment of a contributory charge.

Additionally, in recognition of the magnitude of the achievement, any licensed amateur providing evidence of having effected two-way communication since 1 January 1984 with all the Commonwealth call areas on the list current at the time of application will be able to claim a suitably engraved cup (charge to be determined).

Lists of Century Club members will be published regularly in *Radio Communication*, while recipients of the cup will be invited to submit shack photographs and a suitable write-up for inclusion in the journal.



*Commonwealth Century Club Award available from the HF Awards Manager, RSGB.*

**5 Band Commonwealth Century Club (5BCCC).** This award, available in five classes, may be claimed by any licensed radio amateur under the general rules who can produce evidence of having effected two-way communication since 15 November 1945 with the requisite number of amateur radio stations located in the call areas listed using all 5 bands—3.5, 7, 14, 21, and 28 MHz. Each station should be located in a different call area per band. The five classes are for contacts as follows:

5BCCC Supreme—500 stations.

5BCCC Class 1—450 stations.

5BCCC Class 2—400 stations, with a minimum of 50 on each band.

5BCCC Class 3—300 stations, with a minimum of 40 on each band.

5BCCC Class 4—200 stations, with a minimum of 30 on each band.

Certificates will be issued to winners of all classes. Additionally, as in the case of

the CCC, winners of the Class 1 award will be eligible to claim a handsome plaque suitably inscribed on payment of a contributory charge, while winners of the Supreme Award will be able to claim an engraved cup. The cost of this is 17.00 pounds, including postage and handling and VAT.

Lists of the Supreme, Class 1, and 2 winners will be published regularly in *Radio Communication* with a suitable write-up on each Supreme award winner.

**Worked ITU Zones (WITUZ).** This award may be claimed by any licensed radio amateur eligible under the general rules who can produce evidence of having effected two-way communication since 1 January 1984 with land-based amateur radio stations located in at least 70 of the 75 broadcasting zones as defined by the International Telecommunications Union (ITU).

A handsome plaque detailing name, call sign, date, and number of the award will be available to all recipients on payment of a contributory charge.

Additionally, in recognition of the magnitude of the achievement, any licensed amateur providing evidence of having effected two-way communication since 1 January 1984 with all 75 ITU zones will be able to claim a suitably engraved cup (charge to be determined).

Lists of award winners will be published regularly in *Radio Communication*, while recipients of the cup will be invited to submit shack photographs and a suitable write-up for inclusion in the journal.

**5 Band Worked ITU Zones (5BWITUZ).** This card, available in five classes, may be claimed by any licensed radio amateur under the general rules who can produce evidence of having effected two-way communication since 15 November 1945 with the requisite number of land-based amateur radio stations located in the 75 ITU broadcasting zones, using all 5 bands—3.5, 7, 14, 21, and 28 MHz. Each station should be located in a different ITU zone per band. The five classes are for contacts as follows:

5BWITUZ Supreme—350 stations.

5BWITUZ Class 1—325 stations.

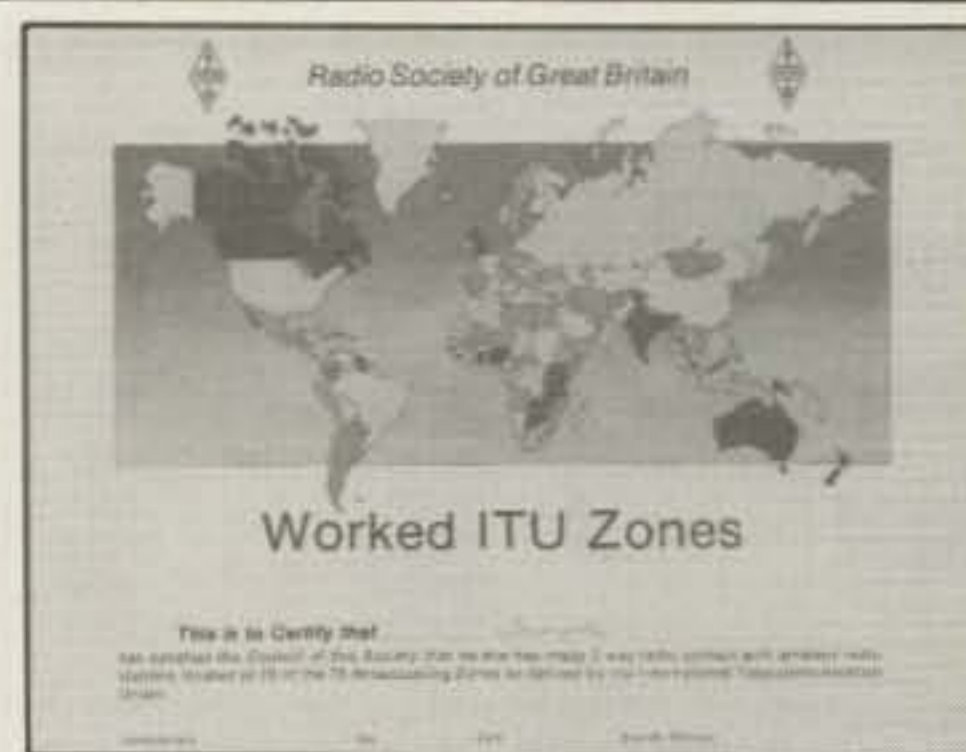
5BWITUZ Class 2—300 stations, with a minimum of 50 on each band.

5BWITUZ Class 3—250 stations, with a minimum of 40 on each band.

5BWITUZ Class 4—200 stations, with a minimum of 30 on each band.

Certificates will be issued to winners of all classes. Additionally, as in the case of the WITUZ, winners of the Class 1 award will be eligible to claim a handsome plaque suitably inscribed on payment of a contributory charge, while winners of the Supreme award will be able to claim an engraved cup (charge to be determined).

Lists of the Supreme, Class 1, and Class 2 winners will be published regularly in *Radio Communication* with a suitable write-up on each Supreme award winner.



*Worked ITU Zones Award offered by the Radio Society of Great Britain.*

*Please note:*

(a) In the case of the WITUZ and 5BWITUZ, confirmations need not bear the appropriate ITU zone number, but in order to count for credit they should give the location of the station in sufficient detail to place it clearly within one particular zone. Doubtful cases indicating possible overlap across two zones will not be given credit.

(b) The HF Awards Manager will use as his reference the Radio Amateurs Prefix Map of the World published by Radio Amateur Callbook, Inc., Lake Bluff, Illinois 60044, USA. In the case of countries which encompass two or more ITU zones—e.g., USA, USSR, and Brazil—zonal boundaries will generally follow the longitude/latitude grid lines as shown in the map. In the few instances of discrepancy between the map and the accompanying prefix/country list, the decision of the HF Awards Manager will be final.

(c) The island of Minami Torishima (JD1) lies outside the 75 broadcasting zones. As a special feature of this award program, a confirmed contact with this island will be accepted for credit for one missing zone, and in the case of 5BWITUZ for one missing zone per band.

*(Ed. note: More RSGB Award news next month.)*

### Amateur Radio Calendars

The Lockheed E.R.C. Amateur Radio Club still has some 1988 calendars available. These wall calendars are 13.5" x 19.5" and feature the words AMATEUR RADIO in very large lettering on their top half. There is adequate space in each date block to note operating events and schedules. The calendars are \$5.00 each in mailing wrappers to American, Canadian, and Mexican addresses. Send to Lockheed E.R.C. Amateur Radio Club, W6LS, 2014 Empire Ave., Burbank, CA 91504.

### Notes

After winter snows and April rains, may brings spring flowers and thoughts of summer holidays again to this part of the world. I hope all is well where you are.

73, Dorothy, WB9RCY

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The 1988 Callbook Supplement is a new idea in Callbook updates, listing the activity in both the North American and International Callbooks. Published June 1, 1988, this Supplement will include thousands of new licenses, address changes, and call sign changes for the preceding 6 months.

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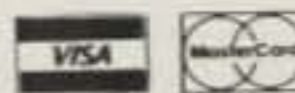
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CIRCLE 54 ON READER SERVICE CARD

May 1988 • CQ • 75

# 1987 CQ WW DX SSB Contest High-Claimed Scores

The following are SSB high-claimed scores. These are raw scores only, subject to verification.

Worldwide Single Operator All Band	
9Y4TT	10,370,962
CR9BZ	7,533,480
P40A	7,481,920
TR1G	5,758,257
T30RY	5,364,444
ZB2X	4,895,520
OH0BH	4,283,244
SU1ER	4,161,130
K4YT/DU8	3,425,408
UA9YX	3,409,436
HI3JH	3,397,884
VE6OU/3	3,115,356
9J2EZ	3,023,541
GW4BLE	2,928,000
HA0MM	2,861,108
OA4ZV	2,741,160
ZY5TT	2,393,182
OH6LK	2,156,880
RB5DX	2,127,972
ZY4OY	2,105,180
IV3PRK	1,971,935
UT4UX/RJ5J	1,905,787
JR6EZE	1,887,705
RB5MF	1,882,010
CE3BFZ	1,848,916
HK1LDG	1,837,743
5T5BC	1,806,000
JG1FVZ/5N27	1,728,540
VK2KL	1,724,602
ZY5VV	1,719,850
XX9T	1,716,780
JA1XAF	1,703,668
DJ2YA	1,636,992
DJ9ZB	1,529,973
7P8DP	1,468,794
JABRWU	1,453,347
AY9D	1,425,745
VP2E/N3JT	1,411,704
SV1JG	1,365,178
VO1MP	1,363,380
ZF2JI	1,301,890
IV3YYK	1,272,248
JF1SEK	1,269,234
YV1DWO	1,262,679
TI2MEN	1,177,188
JH0KHR	1,141,946
PP2ZDD	1,126,780
PA0AGA	1,117,208
HU1YS	1,109,200
AH6FL	1,095,120
EA5DFY	1,075,875
G3SNN	1,068,795
5T5MH	1,014,797
EA3NU	1,010,339

Single Band 1.8 MHz	
UG7GWO	255,852
LZ2CJ	94,247
WB8DIT/VP2M	40,392
SV8CS	39,294
KH6CC	37,138
LZ1KOZ	34,038
UA9SIJ	31,248
TI2CC	27,265
OK3CWO	25,655
UA9AB	22,755
CT1AOZ	22,680
YO2IS	15,704
OK1DFF	14,958
DK8NG	13,376
UA3DJG	11,776
VE7IG	10,350

3.8 MHz	
P40R	552,786
8R1RPN	231,984
UA2FGA	196,992
HA4KYN	177,154
NP4AT	148,960
CU2AK	143,336
RB5FF	138,112
OK2RZ	126,581
I4EWH	122,232
UB5IKB	117,912
EA9RM	98,650
DF8AE	81,079

7 MHz	
EABRCT	859,362
FJ5BL	654,258
EABACH	583,478

IO3MAU	430,332
VE3CDX	369,799
JA8IXM	311,360
FM4EB	304,251
JA2BAY	239,538
OF2HE	228,404
RU1DZ	227,432
RB5MR	212,736
SM5AQD	210,140
SP3RBR	193,210
YT7A	185,913
I5FCK	185,739
NP4P	185,659
DL8PC	183,446
OF1AF	179,375
F6BBJ	138,104
UB5WE	121,830
JA5CJZ	119,888
SP2ZFJ	114,125
RB5ISU	111,090
UB5IHL	101,545

14 MHz	
EA9IE	1,875,972
P40SS	1,792,056
ZZ5EG	1,647,820
YW1A	1,540,170
RF0FWW	1,474,128
LZ1KGB	1,388,628
IO1ZEU	1,224,818
YT3AA	1,073,340
VO1QU	915,275
I5MXX	914,104
4N7N	882,882
A92BE	840,392
CE0ZIJ	825,775
RG5XE	782,901
JA4FWM	774,288
CE3NR	681,526
VE2ZP	675,025
TF3CW	664,576
UP2BW	635,810
G3FXB	610,426
IK6CWO	604,800
YU7AV	591,888
YU2W	577,350
9H3DX	519,547
YT4I	510,872
DF0AT	500,634
JA0QNJ	470,840
ON7LX	458,952
LU5HNB	453,905
YU7BJ	452,928
YT1W	452,724
IK8ETA	452,295
CX8CG	424,266
VE7EIK	419,292
KH6FKG	411,700
UR2RE	404,954

21 MHz	
CW4C	3,019,940
PY5EG	2,468,529
HC1OT	1,813,395
LU2E	1,576,995
P40T	1,317,081
LU4L	1,237,956
5Z4DU	1,060,345
4N4A	942,039
KH2D	894,615
YT3L	846,360
WA4TLI/CT3	789,360
TI2LTA	779,166
ZS6BRZ	771,975
LU6DB	732,155
VE3XN	731,808
YT7NW	707,085
UG6LQ	701,454
VU2Z	689,164
OF5BM	675,032
KH0AC	668,072
N7NR/KH6	634,998
FM4DN	571,160
4N4Y	552,902
EA8LS	547,520
YC0SQT	525,162
JK1JQO	516,694
EA8AKN	502,400
KP4EQF	486,120
JR1WHW	469,062
YC3HCM	446,670
JR1CBC	438,915
GB5NN	438,900
YY1C	434,175
DF8XC	426,258
IK4GNH	423,925
HK1KXA	417,150
JH1DWM	415,940

28 MHz	
ZY5EG	1,777,508

LU1E	1,486,650
CX4HS	1,326,894
CE6EZ	1,224,492
CX7BY	1,156,159
CW2A	891,625
EA8VV	648,094
FM5CL	644,861
LU1HOO	635,252
XE1OH	610,984
K8UE/VP2M	591,442
HK3MAE	591,334
4X6MH	513,360
PY1ACV	444,780
YV6PM	416,864
UL7ACI	368,067
YC2CTW	367,731
L4H	353,865
ZS6P	353,430
CQ7NH	352,352
JH1AJT	301,116
PY1ADE	261,709
UM8MIG	258,060
EA9RY	254,410
UA6LQ	249,630
ZL1BWM	220,601
ZL1AAS	190,213
VE1BNN	189,090
ZY5GX	182,880
LU1ABT	180,744
HC1PF	171,534
JA9RPU	159,505
ZY1NEZ	159,505
AA4VK/CT3	153,648

Multi-Operator Single Transmitter	
KP2A	10,786,756
8P9HR	9,993,160
KP4BZ	9,762,546
LZ9A	7,890,048
ZC4DX	7,085,540
PJ0J	6,953,920
IJEAT	6,880,321
OK7MM	6,405,738
OK5R	6,328,330
IK4CFV	6,140,151
HG8N	5,854,884
HG7B	5,731,191
ZF1KK/9	5,605,984
HG5A	5,464,665
LU2F	5,370,008
CQ9MI	5,095,208
HG9R	5,039,307
C30W	4,599,644
UL8LYA	4,507,448
HK4R	4,334,220
LU1VZ	4,325,904
F6EXV	4,265,412
DF9ZP/VP9	4,181,514
KH2F/KH4	4,073,980
OF5NQ	4,005,122
EA7CFW	3,988,062
HG1S	3,971,376
UQ1GWW	3,908,750
HH2MC	3,721,875
GW8GT	3,710,162
UR1RWX	3,508,652
VE1DH	3,498,297
TK5UC	3,489,255
CE4TR	3,303,872
YU3AI	3,302,884
IU2HM	3,276,720
OH7AB	3,190,100
UQ1GZW	3,012,363

Multi-Operator Multi-Transmitter	
PJ1B	36,229,044
P40V	34,556,967
HC8DX	33,933,691
VP9AD	23,392,165
KH6XX	13,368,816
UP7A	10,726,404
HB0/DL8OH	7,669,416
YB0WR	7,530,844
V47Z	7,250,568
JA2YKA	6,818,350
KL7Y	4,599,912
JA3YBF	4,161,246
JA9YBA	3,433,396
JA7YFB	3,430,306
JA7YRR	3,331,776
HB0/DF1JC	3,078,350
KL7RA	3,041,121
FK/JH4RHF	2,915,822

QRP	
PJ2FR	3,180,682
VE1CBF	588,555
4M3A	562,875
LZ2QV	290,166

UG/UB4WZZ	219,744
FD1BEG	203,796
VU2N	123,849
RT4UB	95,816
OH5NHI	78,948
OK1DKS	72,618
JH4UYB	72,020
JA2JSF	64,314
JG6KZH	53,592
ZS6PT	48,544

USA Single Operator All Band	
KC1F	3,219,970
K1ZM	2,765,602
KM1H	2,661,744
K1DG	2,494,580
W3BGN	2,283,393
KM6B	2,176,510
N2LT	2,162,616
K5ZD/3	2,083,725
KS1L	1,958,956
K1YR	1,951,481
K4ISV	1,926,009
WX4G	1,772,904
N2IC/0	1,756,020
K6HNZ	1,722,918
N2MM	1,719,408
NY2L	1,679,875
K3ZJ	1,607,830
N6AR/4	1,528,904
K2DM	1,494,894
W9ZR	1,385,550
K0UK	1,365,012
W1WEF	1,284,840
WZ4F	1,271,118
NN7L	1,265,232
K1CC	1,206,900
W3UM	1,172,934
K1VR	1,169,646
W1RR	1,008,852
N6AW	1,002,592

1.8 MHz	
WB9HAD	27,181
W0ZV	12,204
W4DR	10,515
W2FCR	10,044
K7IDX	7,080
N1ACH	5,254
W1NG	4,756
K4TEA	3,552
K3UA	3,096
WB3AVN	2,976
WB5KYK	2,916
K5WXZ	2,784
AA4MM	2,336

3.8 MHz	
WB8JBM	105,492
W6RJ	100,620
WA4SVO	77,559
KC7EM	50,172
W4PZV	26,660
W2HZ	22,230
KT7G	16,356
K0KX	14,755
K0GT	14,271
W5EU	11,868
KE9U	8,964

7 MHz	
W6YA	351,422
KV0Q	102,691
N6BFM/4	64,546
K8XR	63,220
KP4AKB/B	45,144
K8PO/1	39,330
AD8C	30,970
W4OWY	28,552
KN5S	26,796
K3BSY	20,510

14 MHz	
K2VV	812,392
N2AA	707,616
K1UO	657,900
W7WA	649,250
K1RU	607,749
NB1H	566,720
KW8N	563,313
K9JF/7	522,474
K2HFX	521,976
W6QHS	496,920
W7IL	453,648
K3IPK	368,816
NG2X	359,445
KV4P	357,135
N4MO	314,457

W8TWA	210,586
W1BWS	197,280
W7FP	192,896
W5FO	178,266
W2HG	131,875
WF5E	130,320
W7TJ	121,329
KD8B	109,872
W9GIL	106,091

21 MHz	
K3RV/4	663,993
W5VX	599,238
W6PU	441,000
K4XS	425,941
KA5W	381,350
K0RF	335,575
W4XJ	276,213
KS9U	259,798
K2WK	256,685
WA2QNW	247,695
W2HPF	245,195
N4VZ	229,103
NX7K	228,060
KB5AS/6	220,968
W9RN	216,518
W6BSY	164,538
WB5UDX	153,016
N2DTL	134,664
AG9S	112,392
K7GEX	107,811
WA7PEZ	107,688
K2MFY	103,854

28 MHz	
K6SVL	176,449
KE5FI	158,256
N4EJV	149,388
WB7FDQ	117,792
WA7KLK	76,518
WA6VNR	75,348
WA2BOT	67,815
W5VGX	66,564
K6KUO	57,288
N9RD	49,677
KA6SAR	45,370
K2OLG	38,270
KB8LM	36,656
WA6FGV	34,920
W9XT	33,212
K1EFI	32,943
WB5RUS	32,825

Multi-Operator Single Transmitter	
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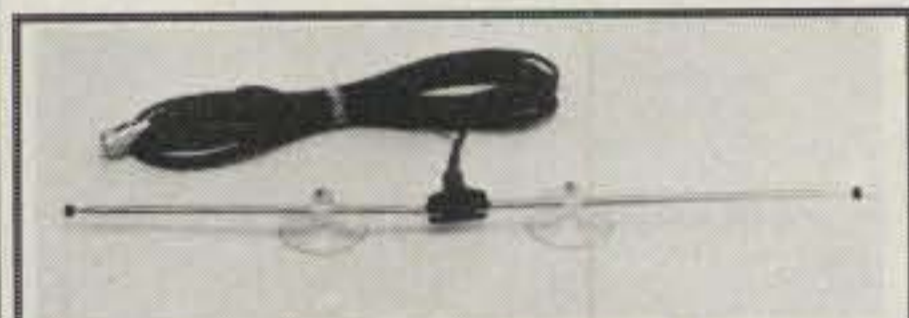
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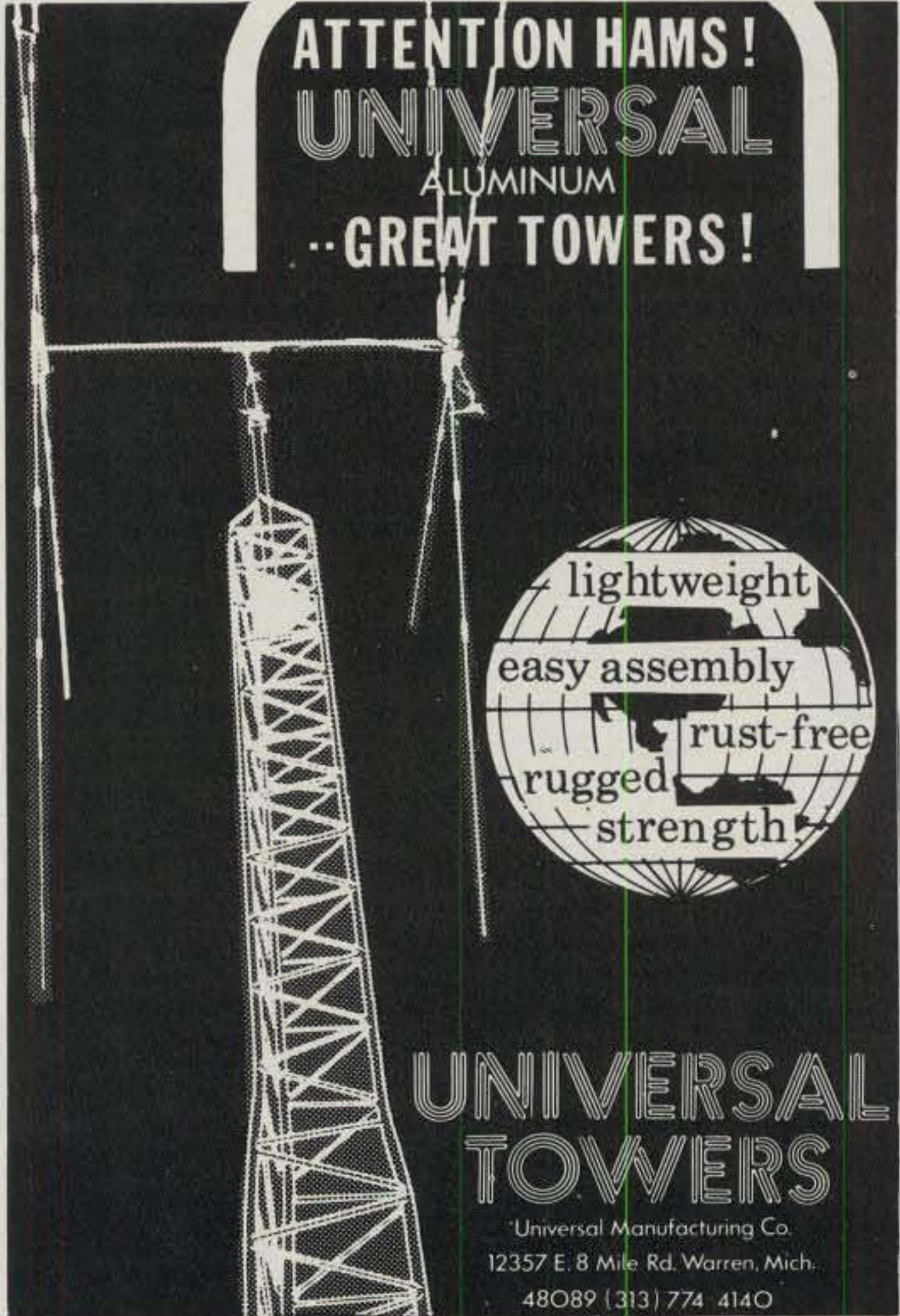


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CIRCLE 58 ON READER SERVICE CARD

# The Buck Stops Here . . .

This month we're inaugurating a new column in *CQ* entitled "The Packet User's Notebook." Obviously, one of the hottest growing modes in amateur radio has been packet radio, and we would be remiss not to offer more coverage of this fascinating topic.

The editor of The Packet Users Notebook is Glynn Rogers, Sr., K4ABT, or as he is better known, Buck Rogers. I'm sure that Buck has heard every conceivable reference to his name and the famous comic strip, so we won't go into that. By trade Buck is a Data Communications Engineer with TRW. He's had extensive experience in RF communications, designing radio and TV stations throughout the southeast. He's also done duty as a "beta test station" for packet radio equipment manufacturers. Buck has written for several amateur radio, commercial, and trade publications, so many of you are already familiar with his work.

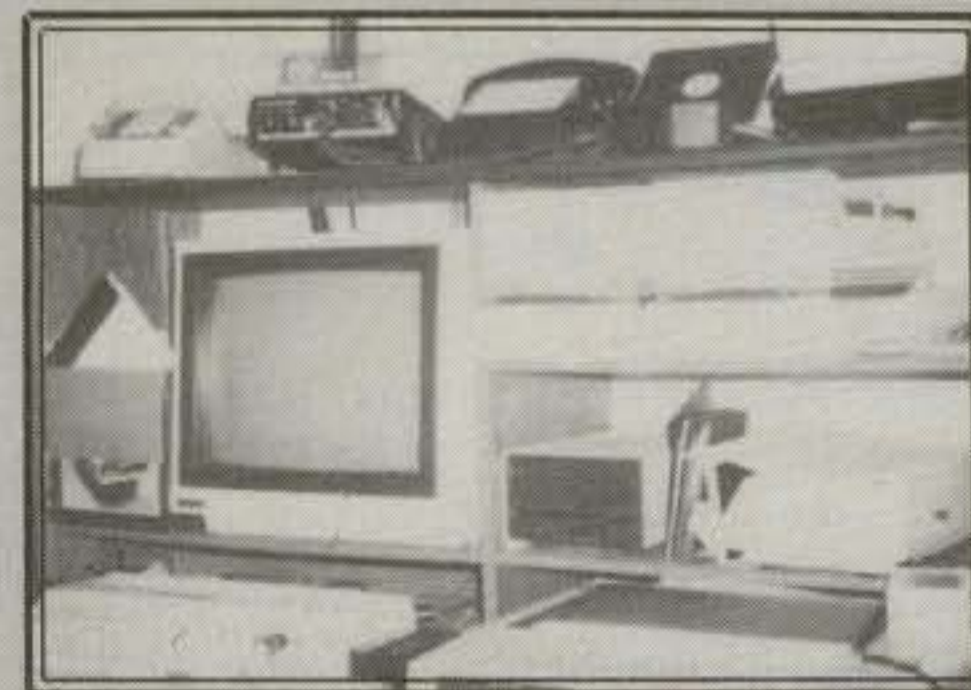
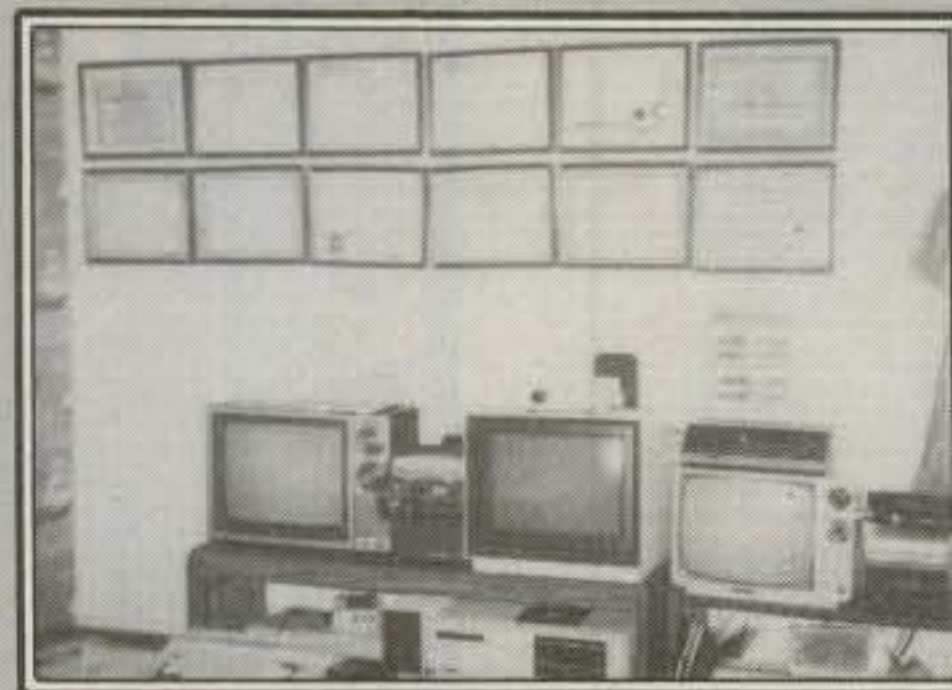
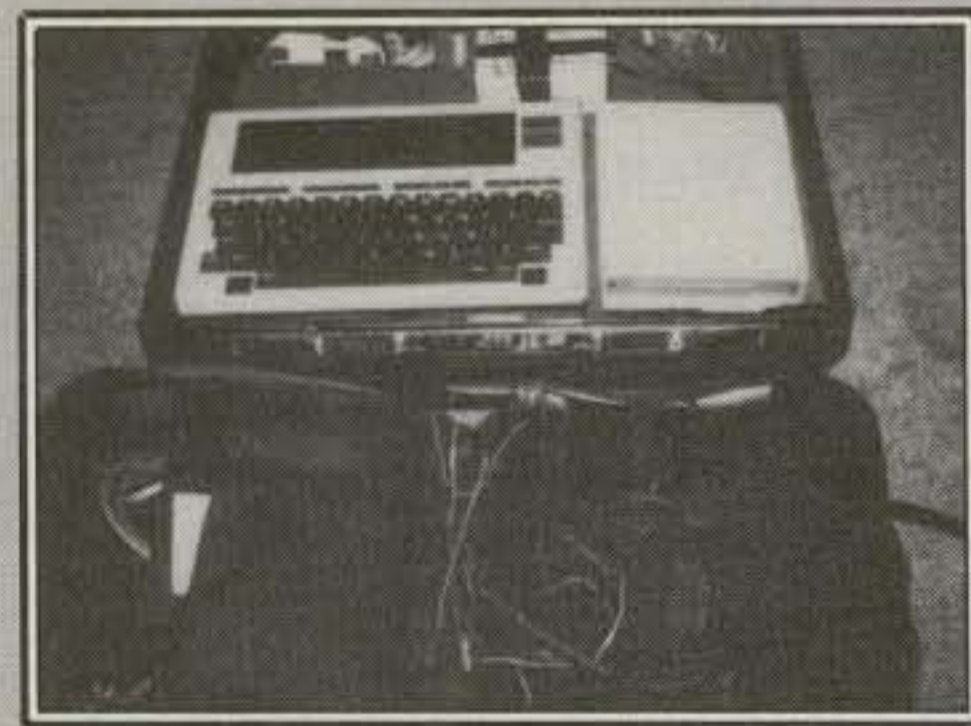
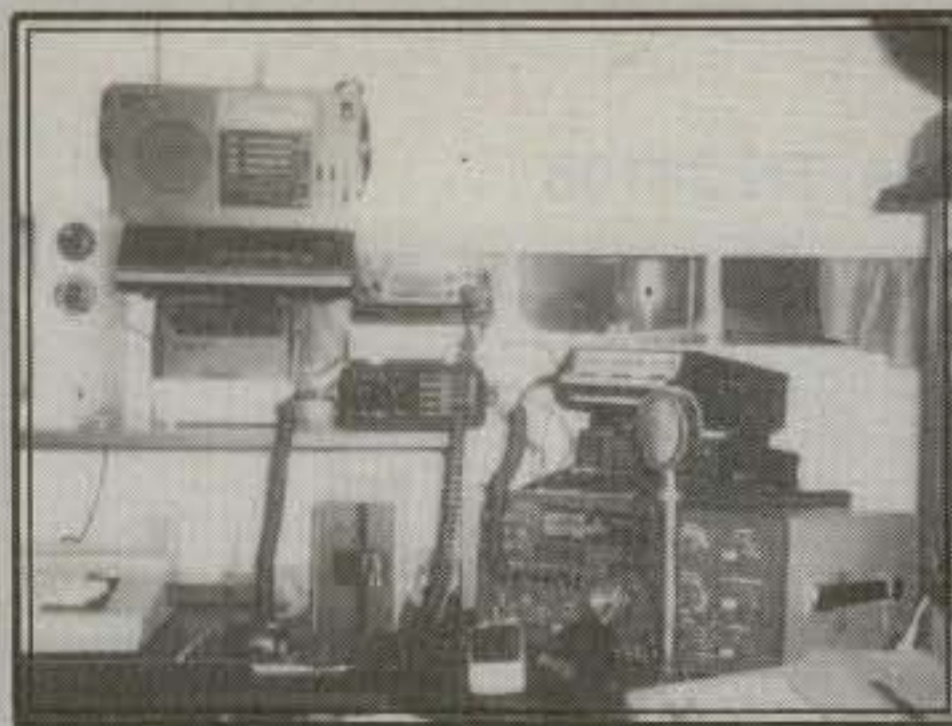
To say that Buck is dedicated to packet radio is putting it mildly. He'd rather say that his *exclusive* hobby is data communications and packet radio, from DC to microwave. If there is such a thing as a "packet pioneer," Buck certainly is one of them. In 1983 he developed a technique for passing high-resolution pictures "in artifact colors" via packet radio. The Radio Shack TRS-80 Color Computer was part of the process used in what he calls "Digital Image Transfer" (DIT). The latest process in the packet picture transfer medium is the "real-time" transfer and display of high-resolu-

tion pictures, involving the IBM PC and its clones. This new picture transfer technique is a combined effort of Bob Slomka, WD4MNT, Larry Wood, KF4JF, and Buck.

The accompanying photographs show the extent of Buck's dedication to packet radio. K4ABT boasts seven active packet stations operating in the HF, VHF, and UHF bands. The stations provide gateways to and from one band to another, as

well as the transition from one Baud rate to another (1200 bps to 2400 bps and return). Each of the seven stations support a node, a mailbox/PBBS system, 1200 or 2400 bps digipeating, and picture storage for both the Radio Shack COCO and IBM PC or clone.

At this writing Buck is completing a process which allows error-free "Digital Audio Transfer" (DAT) via packet radio.



*Can there be too much of a good thing? Not if it's your favorite hobby. Here's a look at the seven complete packet radio stations of K4ABT. There isn't enough room here to describe the whole setup and what each does, but suffice it to say, it's all operational.*

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

## An Introduction to Packet Radio, Part One

**T**o the newcomer this will be the required reading as you take the first step into the fascinating hobby of *packet radio*. The packet user who has been around for awhile, may also find many interesting points and suggestions which you may have over-looked as you entered the ranks of packet radio.

**AX.25** is the acronym applied to the **X.25** protocol. Largely developed by AT&T, for use in switching or branching communications networks, it was later found to be useful in passing data across country to and from mainframe and host computers to terminals in remote areas. The database would be located in the "mainframe" or host, while the terminal would go on-line and "time-share" the database. Meanwhile, other users awaited their turn at the database.

Through a need or better yet, a requirement, to serve more customers, an error checking flag was introduced into each field. Thus, we have the beginning of a "packet" network. As a result, more terminals could be added to the hosts network, and more subscribers could be served. The **A** was attached to the **X.25** protocol because the protocol needed a minor modification to the acknowledgement flag, in order to adapt it for "A"mateur use.

This history of packet could go on and on, however there would be more letters than I could read in a year, if I tried to explain who went the furthest in the development of packet. The answer does lie somewhere in the area between MIL standard and commercial enterprise (reasonable deduction).

Soon we will move into the world of "High-Tech Packet", but for the moment we will discuss the good things that make packet work best for you. We will learn the meanings of the "labels" like HDLC, NRZI, TCP/IP, CCITT, COSI, and the many link layer protocols which are part of the networking recommendations of the International Standards Organization (ISO). For the moment we will learn to enjoy packet for what it is without complicating your enjoyment of this wonderful facet of our hobby.

Now that we have put to rest, the chicken and egg theory, it is time to connect



Here's all it takes for a complete packet station—in fact, two stations! A copy of CQ is optional but highly recommended.

our "Packet Assembler/Disassembler" (**PAD**). The **PAD** is known to most packet users as the "Terminal Node Controller" or **TNC**. The term **TNC** is not really true. In fact we will cover "NODE Controllers" in a later issue. For the sake of keeping with the jargon you will be hearing, we will continue to call the **PAD** a **TNC**. In future issues we will cover hardware, nodes, packet switches, and protocols. We will learn more about the 7 levels of packet. We will study and compare the 3 (at present) packet modulating techniques; fre-

quency-shift keying (**FSK**), phase-shift keying (**PSK**), and minimum-shift keying (**MSK**).

Most **TNC** manufacturers provide a small wall transformer power supply with the **TNC**. If you are using a **VHF** radio which uses an external regulated 12 VDC supply and your **TNC** also uses 12 VDC, then I recommend using the regulated supply to power the **TNC**. Please observe the proper polarity. I have found most of these wall transformer supplies are just not adequate.

If at all possible, start out on packet using **VHF**. You will understand why as we make the transition to **HF** packet. Briefly, **VHF** will not require tuning the receiver around until the packets begin printing.

While preparing for packet operation, you must decide on the type and model computer (or terminal) you plan to use. Will it be a computer you can later use, as you grow into the more advanced levels of packet, like digitized color pictures and digitized voice? Another consideration is whether it will have a buffer large enough to allow you to send and receive binary or ASCII files? Will it support the "customized" packet terminal programs like, **PACPRO**, **KANTERM**, **AUTOTERM**, etc.

In my station I use several kinds of computers, and I try to use the best possible terminal program available. In any case, you should select a terminal program which will make your future packet-

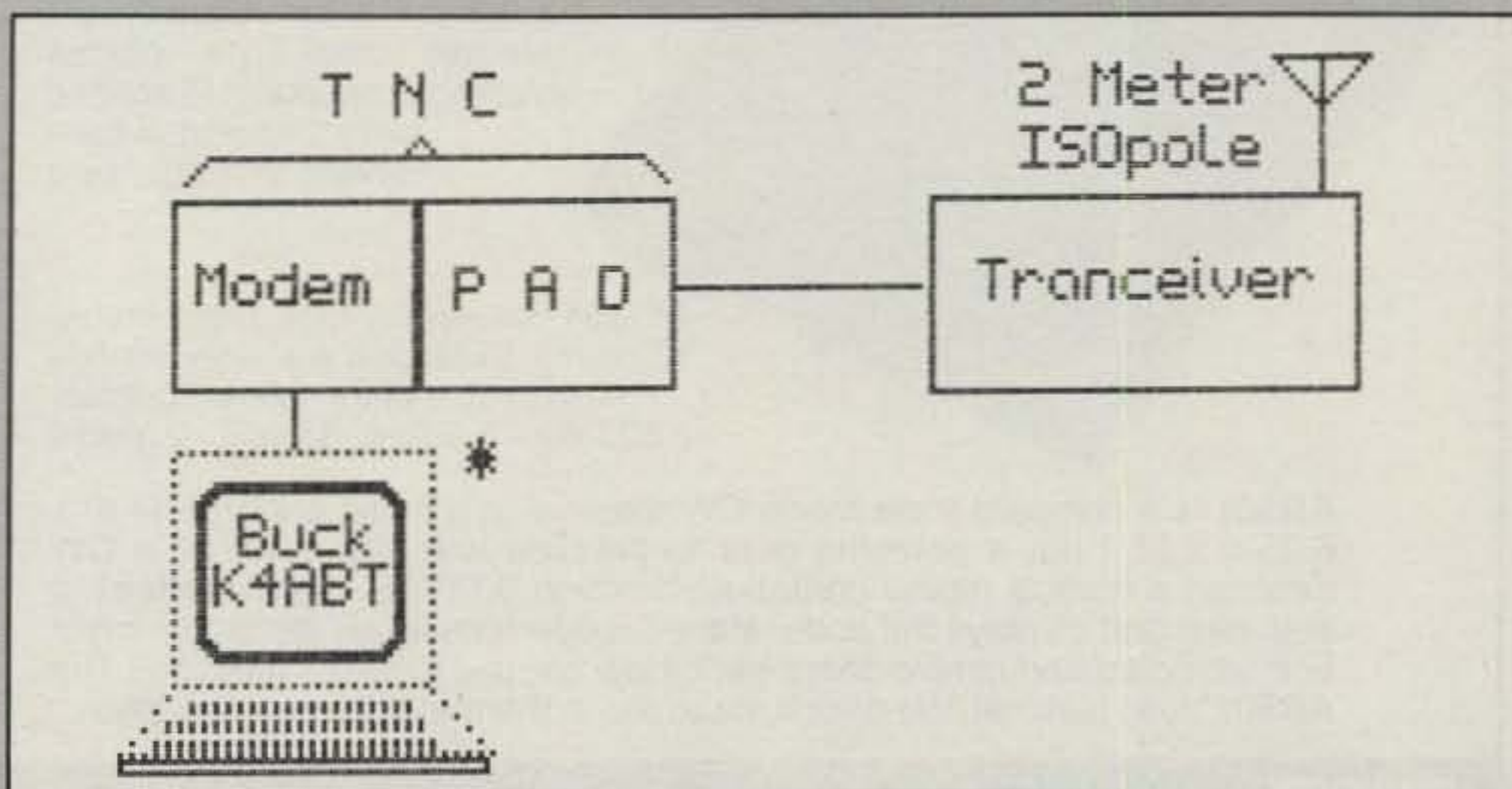


Fig. 1—Only a **TNC** and transceiver are required for "digipeater" operation. A terminal is optional.

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ing easier. Some programs are so complicated that it takes a document an inch thick to explain their use. You will find with time and experience, it is good to choose a terminal program which also allows you to change the "ABAUD" communications without having to reboot the system.

I plan to cover here, the questions I hear most, and as much in the order as they are asked. The first one is a two part

question.

**Q:** What is **Abaud**, and what is the difference between **Abaud** and **Hbaud**?

**A:** **Abaud** is the data speed of the serial I/O communications port of your computer or terminal, to your TNC. In most cases and where the terminal will permit, the **Abaud** rate should be set equal to or greater than the **Hbaud** rate. The **Hbaud** setting depends on the amateur band of operation. At present the FCC rules limit us to

300 bps **Hbaud** below 28 Mhz. Above 28 Mhz, we use 1200 to 19,200 bps **Hbaud**, and above 225 Mhz we go as high as 56 kb **Hbaud**. Most operation on 28.105 Mhz is still 300 bps, but lately I've noticed some 2400 bps phase-shift keying (PSK) **Hbaud**, zipping across the world. So, in a few words, we could say, **Abaud** is the terminal to TNC baudrate, and **Hbaud** is the station to station baudrate.

**Q:** How can I keep the incoming packet from the station I'm connected to from appearing in the middle of the current message I'm typing?

**A:** Two ways, either use a "Split-Screen" terminal program, or set the **FLOW** command to "ON."

**Q:** I am just beginning, and I don't know the correct settings to use in my TNC. What do you use?

**A:** If you are just getting into packet radio, you certainly don't want to use the same TNC configuration I use. I have built "macros" (key-stroke multipliers), which allow me to have several setups for my TNC. For the initial setup of your TNC, make as few changes as possible to the parameters. In fact, most TNCs come with everything defaulted to settings that allow communications as soon as you input your call sign. If you only want to monitor for a while, before you jump into the middle of the activity, you should set the **monitor** command to "ON."

**Q:** How can I tell which route the local stations are using to connect to the out of town stations?

**A:** set the **MRPT** command to "ON." This will allow your TNC to collect the "path" information and display it on the receiving screen for you to study. Make notes of the various paths as you become familiar with their origin and destination. You will later find these "path maps" useful in building your own routing tables.

**Q:** What is a "digipeater?"

**A:** Once you get your station on the air, you will discover a command **digipeat**, and chances are, it will be "ON." All packet stations are capable of "digipeating." A *digipeater* is a packet relay station. It is similar to a voice repeater, except it does not require expensive duplexers, or dual antennas. The digipeater is a TNC and a transceiver (see fig. 1).

**Q:** How can I find the calls of the local "digipeaters?"

**A:** Two ways; call a packeteer friend, or better yet, set the command **MBeacon** to "ON." Digipeaters sometime send out a "beacon" after it sees a disconnect command pass through. This beacon will become visible to you with the **mbeacon** command on. Again, keep a record of these "digi" (as they are called) for future use.

In the next column, we will cover the command summary and the interfacing to some of the more popular computer terminals. Good packeting, es CQ de Buck4ABT

CC

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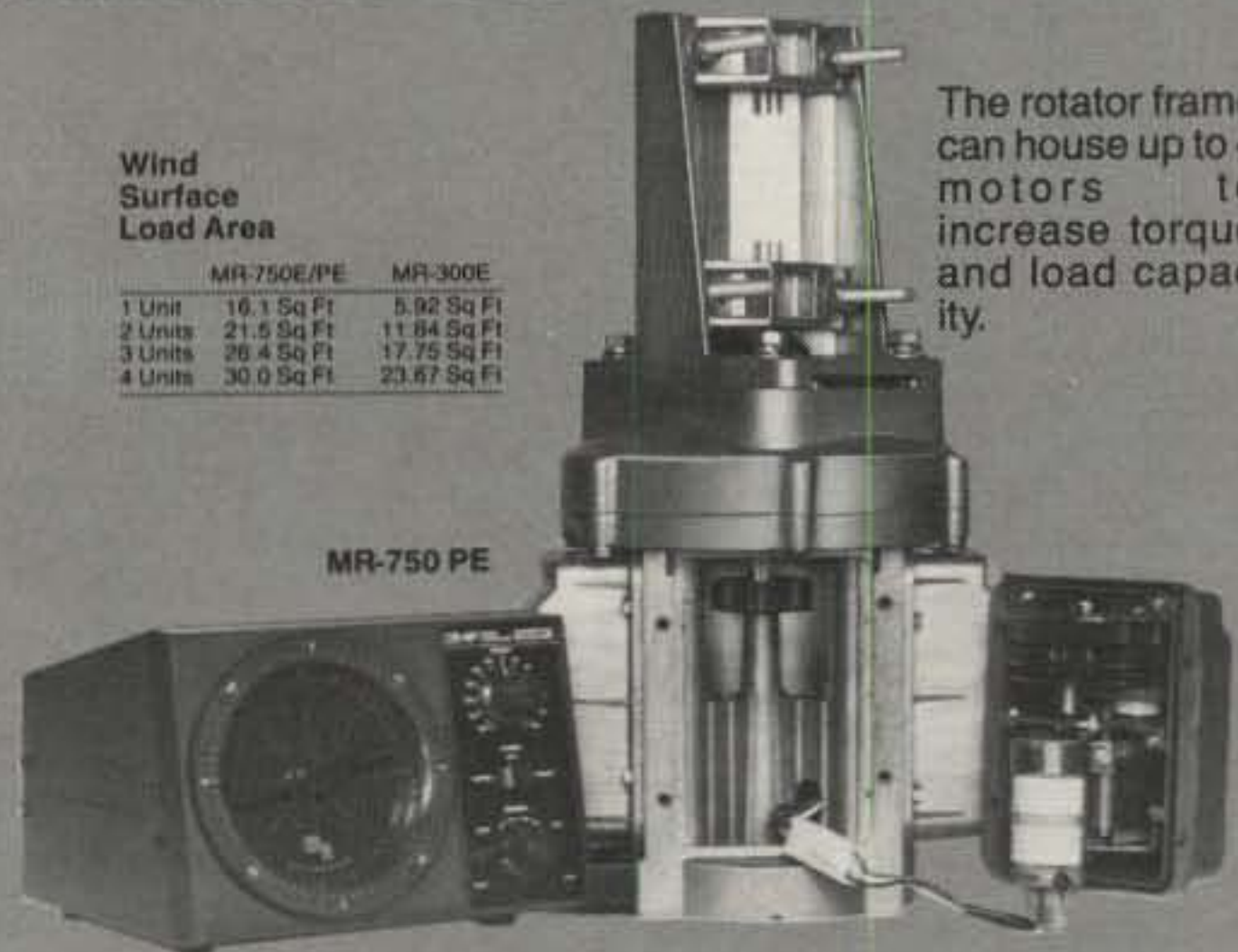
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CIRCLE 50 ON READER SERVICE CARD

## "HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

### Long-Wire Antennas—Part II

**T**his month's column completes the long-wire antennas article started in last month's issue. The first part covered introduction, advantages, disadvantages, ground, bandwidth, and installation of these antennas.

#### Length

A half-wavelength long-wire antenna is resonant, and it does not require an antenna tuner to electrically adjust it to the desired operating frequency. However, the upper ends of our bands are not usually harmonically related, and we need the antenna tuner to enable us to use all frequencies on all bands. The formula for determining the length of a long-wire antenna is:

$$l = \frac{492(N - 0.05)}{f(\text{MHz})}$$

where:  $l$  = length in feet  
 $N$  = number of half waves on antenna

To put this formula to use, let us assume we want an antenna with two half waves along its length at a frequency of 7.125 MHz:

$$\begin{aligned} l &= \frac{492(N - 0.05)}{f(\text{MHz})} \\ &= \frac{492(2 - 0.05)}{7.125} \\ &= \frac{492(1.95)}{7.125} \\ &= \frac{959.4}{7.125} \end{aligned}$$

$$= 134.65 \text{ feet. (134 ft., 8 in.)}$$

The preceding information is not intended to indicate a need for a specific length, if one is going to use the antenna with an antenna tuner. One simply needs an antenna that is at least one-quarter wave long at the lowest frequency at which it is to be used. In other words, 70 feet overall (antenna tuner to far end) enables one to operate on all bands and frequencies above 3.5 MHz.

When using a random/long-wire anten-



*Jim Washington, KA3NCL, is operating from Abidjan, Ivory Coast as TU2QJ. He is a Foreign Service officer assigned to the United States Agency for International Development in Abidjan. Jim uses a Drake TR-4 transceiver with a KLM tri-band Yagi-Uda. This picture was submitted by Jim's friend, Charles Signer, WA9INK, of the American Embassy in Cairo, Egypt. Charles is probably on the air by now operating as SU1EE. Listen for Jim and Charles on the Novice bands, particularly on 10 meter voice.*

na that is four wavelengths long at the frequency in use, radiated power is effectively doubled.

Regardless of which type of antenna is involved, it is generally true that the bigger it is, the better it can perform. This holds true with random/long-wire antennas; put up the longest one your space allows you to install. Radiation resistance increases with length, and antenna efficiency increases when radiation resistance is increased.

#### Directivity

Antenna orientation is relatively unimportant in regard to these antennas, if they are less than one-half wave long at the operating frequency. At the lowest frequency at which it can be operated, the directivity of these antennas is broadside. When operated on a higher frequency band, directivity becomes more in line with the direction in which the antenna is erected—in other words, off both ends of the antenna. This effect becomes more



*Here is 76-year-young Betty Moser, KA5TCW, of Los Alamos, New Mexico. She is a great grandmother.*



*For the first time ham radio was presented as an educational tool to teachers and administrators from across New York State at their annual middle schools convention in Rochester at the beginning of the year. Speaking on behalf of "education through communication" was Joe Fairclough, WB2JKJ. WB2JKJ is the director of the Radio Club of Junior High School 22, based in Manhattan, which funds and supports classrooms in New York State and across the nation that use amateur radio as the theme to enrich and enhance the education of young people. Here Paul George (left) noted middle-level educator from the University of Florida and Sherman Craig, President of the New York State Middle School Association, congratulate WB2JKJ on his election to the NYSMSA Board of Directors.*

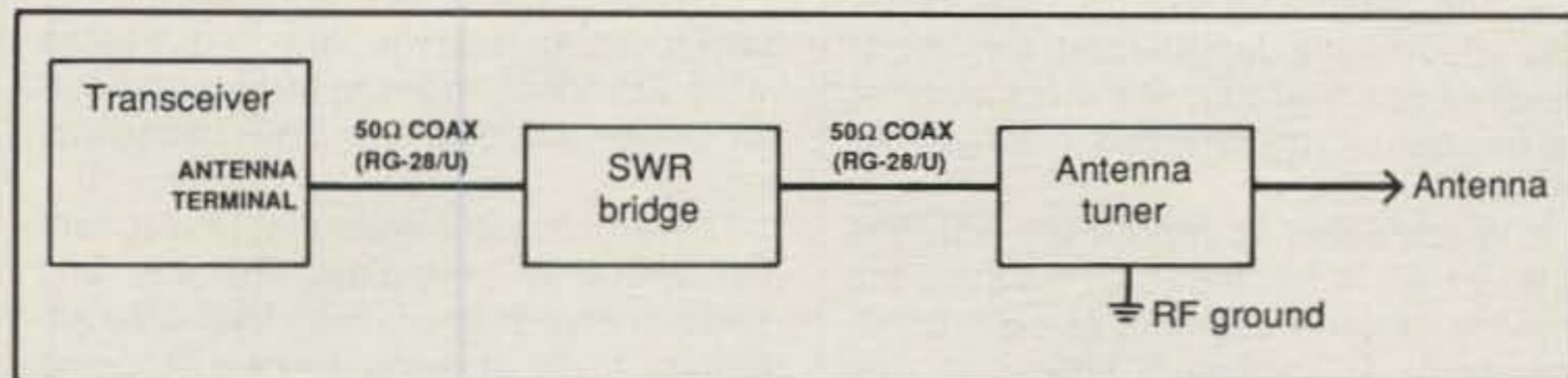


Fig. 1— Shack interconnections for typical long-wire antenna system.

pronounced at the highest frequency bands. Stated another way, a one-half wave long 80 meter resonant random/wire antenna provides optimum transmission and reception broadside (front and back) to itself. When this same antenna is operated on 20 meters, some in-line (end fire) directivity exists. When operated on 10 meters, such an antenna has a reduced broadside capability and an increased end-fire (in-line) capability. As wire is lengthened, or as the antenna is used on a higher frequency, more half-waves exist and their fields combine, intensifying the main lobe(s).

The longer the antenna, the sharper the lobes are in all planes. Several wavelengths are required to achieve this pronounced directivity. The current flowing along a wire that is several wavelengths (in regard to the frequency) produces additional directivity; due to IR (current times resistance) losses, the voltage is reduced at the far end of the antenna. When using a one-half wavelength antenna, a 54 degree down tilt produces optimum directivity in line with the down slope. The resultant radiated signals have both horizontal and vertical characteristics; this is often beneficial, since signals refracted off the ionosphere normally contain both vertical and horizontal components.

If your shack is located above the ground-floor level, your random/long-wire may slope downward to the attachment point. These antennas exhibit improved capability in the direction in which they are sloped down. Sloping improves their low angle of radiation, providing increased communication ranges (DX).

Directivity of random/single-wire antennas can be further improved by terminating them at the far end with the proper load resistance, which has to be determined by experimentation. This load resistance dissipates about half of the power supplied to the antenna via the antenna tuner; it dissipates power that would otherwise return toward the source. If you are running 100 watts output, the load resistance should be rated at 50 watts. The only time I ever used a load resistor to increase directivity, I used a 50 ohm resistor, and the results were good. Directivity can be further improved by installing a one-quarter-wave long wire

past the far end of the load resistor; it will act as a pseudo-ground.

The preceding information is not intended to imply that directivity is necessarily desired or required. You may want an omni-directional (non-directional) characteristic to provide equally useful communications capability in all azimuth headings (all directions). The preceding material is just intended to tell you about the directional characteristics of random/long-wire antennas.

### Transmit-Receive (Fire) Angle

The longer the antenna, the lower the fire angle. This does not mean a one-half wave long 80 meter antenna has a lower (better) fire angle than a one-half wave long 10 meter antenna. It means that an antenna that is several wavelengths at its resonant frequency has a lower fire angle than an antenna that is only one or two half-waves long at its resonant frequency. The relatively extreme lengths of random/long-wire antennas mandate horizontal installations. The higher one of these antennas is installed, the lower its fire angle will be.

These antennas have fire-angle characteristics that provide improved communications over the wide range of frequencies amateurs operate. An antenna that is only a few half-waves long at 80 or 40 meters has a beneficial higher fire angle on 80/40 meters, where higher fire angles are desirable. On the other hand, the same antenna is several half-waves long on 15 and 10 meters, resulting in the lower fire angles that are best for long-range (DX) communications on these higher frequencies. The radiation below horizontal encounters a mirror-like reflection off ground, resulting in an upward radiation that is in phase with the radiation that occurs above horizontal. The reflected emission combines with the direct emission, resulting in improved communication capability.

### Shack Installation

Fig. 1 shows the basic arrangement and interconnection of the transceiver, SWR meter, and antenna tuner used in conjunction with a random/long-wire antenna. The SWR meter (bridge) is built into most transceivers, but I show it exter-

nal to the transceiver for the benefit of amateurs who do not have it built into their rigs. Almost all amateur transceivers and accessories are built to accept PL-259 cable connectors. If the SWR bridge is built into your rig, you will just need two connectors and a piece of coaxial cable that is long enough to interconnect the transceiver and the antenna tuner. If the SWR meter is not an integral part of your transceiver, you will need four connectors plus two interconnecting coaxial cables. The coax does not have to be RG-213/U; the smaller RG-58C/U coax is acceptable for use in this application. Isolate the antenna tuner as much as possible from the transceiver/transmitter. If nothing else, position the power supply between these two units.

### Tuning

The function of the antenna tuner is to make the random/long-wire antenna electrically the correct length to resonate on a desired frequency. Adding inductance (L) in series with a piece of wire (or tubing) makes it electrically longer. Adding capacitance (C) in series with a conductor makes it electrically shorter. These relationships are easy to remember by thinking that L *lengthens* the antenna, whereas C acts like it *cuts* the antenna to a shorter length.

With the antenna properly installed and the shack installation completed, as previously described, the antenna is tuned to resonance as follows:

A. At the transceiver, select the desired band and an unoccupied frequency close to the one you want to use. Set mode switch to **Code/CW** and have the rig ready to be operated, but have **Drive/Carrier** control set to minimum to produce a transmitter power output that is close to zero. Turn up (clockwise) the **RF/Sensitivity** (receiver input) and **AF** (receiver output) controls to the point where background noise is heard at a low audio level.

B. Set the variable capacitance on the antenna tuner to about mid-scale and adjust (step or continuously variable) the tuner's inductor to the point where received background noise is maximum.

C. Adjust the tuner's capacitor for a possible additional increase in noise level.

D. Alternately adjust the tuner's inductor and capacitor to the point where no further increase in the noise level can be detected. This completes rough tuning of the antenna. More inductance is normally needed at the lower frequencies (longer wavelengths) and less inductance is needed at higher frequencies.

E. With preliminary antenna tuning completed, adjust the SWR meter to read forward (reference) and set its sensitivity adjustment about two-thirds of the way to the full clockwise position.

F. Key the transmitter and adjust the power output control (carrier/power) to produce a full-scale reading on the SWR

H. Key the transmitter and observe the SWR reading. If your preliminary tune-up was good, you should have the antenna close to resonance and little additional tuner adjustment should be needed.

I. Slowly adjust first the tuner's inductor and then its capacitor to reduce the SWR reading, with the key closed (low output power). Repeat these alternate adjustments until the SWR is as close as possible to perfect, as indicated by a zero reading at the SWR meter. If the station's RF ground is satisfactory, it should be possible to attain a zero (1:1) reading.

J. After the initial power-on fine tuning has been completed, set the SWR sensitivity control fully counterclockwise (minimum) and set the SWR meter to again read forward/reference.

K. Depress the key, increase transmitter output power to the desired operating level, and adjust the SWR bridge's sensitivity control to obtain a full-scale reading at the SWR meter.

L. Release the key and switch the SWR meter to read reflected/reverse.

M. Key the rig and alternately adjust the tuner's inductor and capacitor small amounts, as may be necessary to reduce the SWR meter reading to as low as possible.

N. The long/random-wire antenna is now electrically lengthened (or shortened) as required to make it resonant at the frequency you selected. It is ready to be used.

It is advisable to record the antenna tuner's L and C settings that resonate the antenna at each segment of each band. These values vary very little, enabling one to preset the tuner and just fine-tune the adjustments at full power. Very little additional adjustment should be required. Post this information where it can be read easily while adjusting the antenna tuner.

## Summary

It is hoped that this article has given you a better understanding of the simplest antenna. Even if you already have a good antenna system, you should consider improving it by adding the longest possible random/long-wire antenna that your site allows you to install.

The initial power-on fine-tuning adjustments of the antenna tuner should be performed using low power output from the rig to minimize the possibility of damaging the transceiver's RF final amplifier stage. The standing-wave ratio is the same at low power as it is at high power.

G. Release the key and switch the SWR meter to read the reflected/reverse value. Do not change the transmitter output power value or the SWR sensitivity setting.

This article just covers single-wire random/long-wire antennas. The vee and rhombic antennas are also long-wire antennas. A vee antenna is not a drooping dipole, which is often referred to as an inverted-vee antenna. The vee and rhombic antennas are basically bi-directional (in line). Rhombic antennas can be terminated (at the far end) with a 500 to 600 ohm resistor to make them unidirectional in the direction of the resistor (away from the feedline source). They are broadband, providing up to a 4:1 frequency range, plus a sharp radiation pattern. The rhombic provides 10 to 15 dB gain, as compared to a dipole. To put this power gain in terms that are easily understood, feeding a rhombic with 10 watts produces about the same received signal level as would result from supplying 40 watts to a 3-element Yagi-Uda, or feeding 320 watts to a dipole.

## Photographs Wanted

Photographs of Novices in their shacks provide introductions to a few of the newer amateurs. Photograph size is unimportant, but good definition, contrast, and subject matter are important. Color pictures can be used, but black-and-white photographs are preferred. Operating activities and achievements, plus a self-introduction, are needed with each picture. Send an SASE if a picture must be returned. A free one-year CQ subscription (or renewal) is awarded to the one amateur whose picture I select as the winner for the month. If you are a subscriber, please enclose the mailing label (or copy) from your latest CQ issue. One award is made each month, no matter how many photographs are printed. DX amateurs, who frequently work the American Novice bands, are also urged to submit photographs.

## Printed Aids

Previous Novice columns contain information that is useful to new and aspiring amateurs. Many of these items have been reprinted for distribution to students of licensing courses I instruct. For ease of use, these printed aids have been separated into six categories. These categories are introduction, code, theory, station, operating, and miscellaneous. Outdated items are continually replaced with newer material. Fifteen dollars brings a complete set of current printed aids, including shipping costs. A list of these printed aids will be sent to anyone who requests it and sends a business size (#10) self-addressed and stamped envelope to my California address.

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Because of our quality amplifiers, RF Concepts has received several excellent reviews from QST (Oct. '87, March '88) and CQ (March '88). An excerpt from the Oct. '87 QST review follows.

... I am impressed by the preamplifier in the RFC 2-317. In the past, I've found that although preamplifiers in solid-state bricks help on some contacts, for the most part they increase noise and just make the S-meter readings higher. This preamplifier, however, made a noticeable difference in readability for many QSOs, and is well worth using.

The RFC 2-317 is a well-built piece of gear that deserves consideration if you want to add some punch to your 2-meter signal. With nearly 200-W output, it's within a few decibels of 4CX250-class power amplifiers, and it takes up a lot less space. If you like to work DX, this power level is enough for aurora and meteor-scatter QSOs—and for moonbounce too, if you want to work W5UN!

RF Concepts offers a 5-year warranty on the RFC 2-317 (except for power transistors, which are warranted for 6 months). Price class: \$264.—Mark J. Wilson, AA2Z

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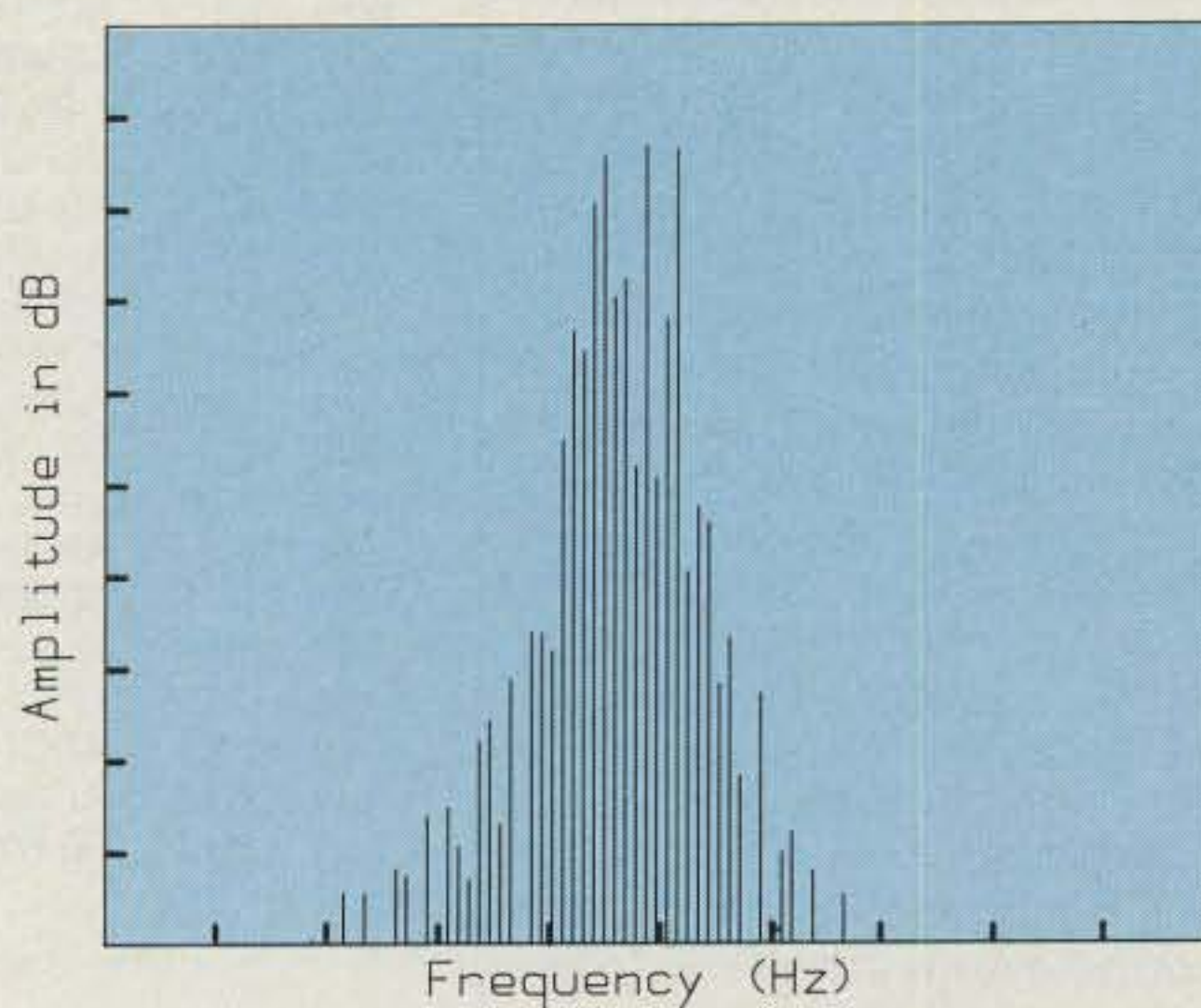
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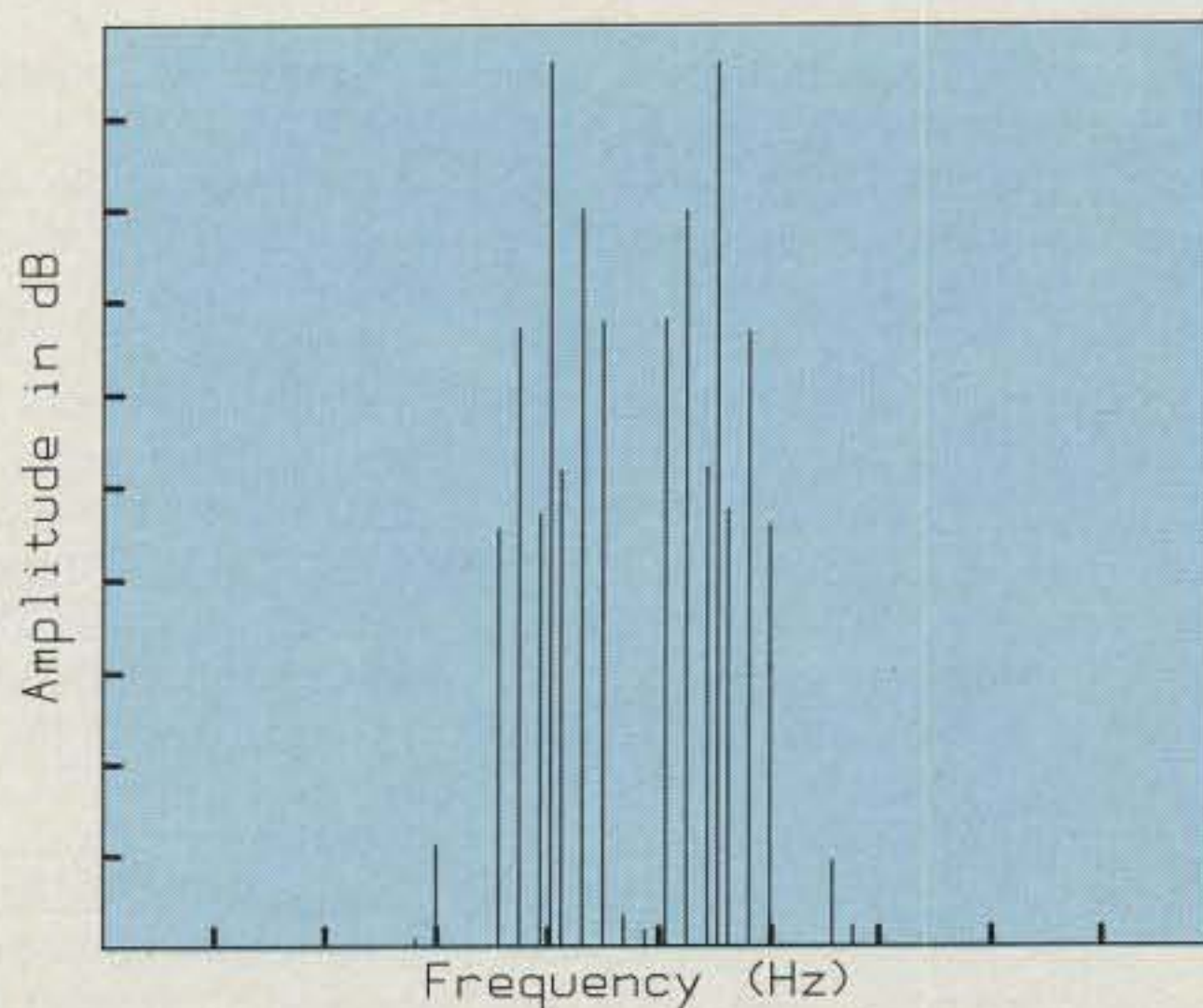
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# Contest Calendar

a monthly feature by  
FRANK ANZALONE, W1WY

## NEWS/VIEWS OF ON-THE-AIR COMPETITION

I was sorry to receive a report that the Florida QSO Party which has occupied a permanent spot in May for many years has been discontinued. *Florida Skip*, who was the backbone behind this activity, said it was due to lack of participation. You cannot have a successful QSO party if the point of origin does not generate the needed activity.

Other May casualties are the popular "Armadillo Run" and the short-lived Nevada QSO Party. At least I have not heard from them.

However, as you can see there are plenty of scheduled activities of all types in May for the contest-minded.

As an example, the ARRL has a full calendar of UHF Sprints: the 902 MHz on Friday, May 6; the 1296 MHz on Thursday, May 12; the 50 MHz on Sat./Sun. May 21/22; and the 2304 MHz on Thursday, May 26. Check *QST* for all the details.

It is my sad duty to report that Ed Hopper, W2GT, became a Silent Key on February 25th. Ed and I were co-workers at old radio WHN/WMG in New York for many years, dating back to the late '30s. After a stint in the Army in WW II, Ed came back with the rank of Major in the Army Air Force.

As for his amateur radio activities, they were well known worldwide. As a member of the prestigious North Jersey DX Association he was very active and at the top of the DXCC pre-war. Post-war he was still listed in the top group. He was a member of the original CQ WW Contest Committee in the '50s. In January 1965 he took over the CQ County Awards Program, which was in sad shape, and built it up to the worldwide popularity it now enjoys. In June 1983, eighteen years later, he gave a well-organized program to Dorothy Johnson, WB9RCY.

Rest in peace, old friend. Your mark in amateur radio will long be remembered.

The usual reminder: Get your announcements to me before the following deadlines if you expect to have them published—May 15th for the August issue, and June 15th for the September issue.

73 for this time, Frank, W1WY

### Volta RTTY DX Contest

1200Z Sat. to 1200Z Sun., May 14-15

This is the 22nd running of the Volta Contest sponsored by the ARI (Associazione Radioamatori Italiani).

14 Sherwood Road, Stamford, CT 06905

### Calendar of Events

May	6-8	Sangamon Special Event
May	14-15	ARI "Volta" RTTY Contest
May	14-15	USSR CQ-M Contest
May	14-15	MARAC County Hunters SSB
May	14-15	Utah QSO Party
May	14-16	Michigan QSO Party
May	21-22	ARI International Contest
May	21-22	World Telecomm. Contest
May	28	ARCI QRP CW Sprint
May	28-29	<b>CQ WW WPX CW Contest</b>
May	28-29	UBA SWL CW Trophy
June	4	YLRL Novice/Tech Day
June	4-5	RSGB National Field Day
June	4-6	ANARTS RTTY Contest
June	11-12	ARRL VHF QSO Party
June	18-19	All Asian Phone Contest
June	25-26	ARRL Field Day
July	1	Canada Day Contest
July	9-10	IARU HF World Championship
July	10	ARCI QRP CW Sprint
July	16-17	<b>CQ WW WPX VHF Contest</b>
Aug.	6	YLRL YL/OM SSB Sprint
Aug.	6-7	ARRL UHF Contest
Aug.	14	ARCI QRP SSB Sprint
Aug.	27-28	All Asian CW Contest
Sept.	24-25	<b>CQ WW RTTY Contest</b>

**Bands:** All bands, 3.5-28 MHz (no WARC).

**Classes:** Single operator, both single and all band. Multi-operator, single transmitter. And SWL.

**Exchange:** RST, QSO no., and CQ zone.

**Points:** Contacts with stations outside own country count for points in accordance with the Exchange Points Table (see Table I). Contacts outside own continent on 3.5 and 28 MHz count double points. The same station may be worked on each band for QSO and multiplier credit.

**Multiplier:** Each DXCC country and each US, Canadian, and Australian call area worked on each band. Any country worked on at least four different bands is worth an extra multiplier. Multipliers not found in more than four logs of those received may be disallowed. (*I don't agree on this one.*—ed.)

**Final Score:** Total Exchange Points × total multiplier × total number of QSOs.

**Awards:** A certificate of participation to all entrants, and a trophy to the top-scoring station in each class.

Use a separate page for each band and the usual summary sheet showing the scoring and other essential information and comments.

Logs must be received no later than July 16th and go to Francesco Di Mi-

chele, I2BMI, P.O. Box 55, 22063 Cantu, Italy.

(Additional information and a copy of the Exchange Point Table will be provided by Hal Blegen, WA7EGA, 12910 E. Broadway, Spokane, WA 99216. Include a large SASE with your request.)

### USSR CQ-M Contest

2100Z Sat. to 2100Z Sun., May 14-15

Keep in mind that this is a world-wide-type contest, so do not limit your operation to the USSR only. Contacts may be made on CW or SSB, 3.5 through 28 MHz. The same station may be worked on each band, but not both modes for QSO and multiplier credit. Contacts via Oscar count as an extra band if made on UHF.

**Classes:** (A) Single operator, single band. (B) Single operator, all band. (C) Multi-operator, single transmitter, all band only. (D) SWL.

**Exchange:** RS(T) plus a three-figure QSO number. USSR stations add the number of their region (oblast) to their report.

**Points:** Contacts between stations on the same continent one point; different continents three points. Own country may be worked for multiplier credit but no QSO points.

**Multiplier:** Is determined by the number of countries worked on each band. The USSR "R-150-S" list is the standard, which essentially is the same as our DXCC, plus the following oblasts: 002, 013, 014, 056, 084-5-6-7-8-9, 090-1-2-3-4-5-6-7-8, 159, and UA1 Novaya Zemlya, UA0 Kuril Is., UA0 New Siberian Is.

**Final Score:** Total QSO points from all bands times the country/oblast multiplier from each band.

The SWL's get one point for reporting one station in the exchange, and three points if both stations are reported.

**Awards:** A large selection of trophies, medals, and badges in all classes for overseas winners. Badges to all entries contacting at least 10 USSR stations.

Contest contacts may be credited for USSR awards in lieu of QSL cards if request is made with entry (R-150-S, R-100-0, W-100-U, R-15-R, R-6-K, R-10-R).

Mailing deadline is July 1st to: Krenkel Central Radio Club, CQ-M Contest Committee, P.O. Box 88, Moscow, USSR.

### MARAC County Hunters SSB

0001Z Sat. to 2400Z Sun., May 14-15

Sponsored by the Mobile Amateur Radio Awards Club (MARAC), this year's

# EXCHANGE POINTS TABLE

		CORRESPONDENT zone																																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
YOUR zone	1	2	14	10	13	16	18	22	20	25	30	36	37	39	21	22	19	20	17	11	25	29	29	22	22	16	28	25	31	39	35	14	36	25	29	34	39	40	47	44	15
	2	10	2	15	8	7	16	16	12	16	23	24	30	30	12	14	16	19	20	19	19	25	31	26	30	28	35	35	40	50	50	25	47	14	21	21	28	33	36	37	6
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	36	39	28	42	33	31	37	33	30	27	29	20	27	24	19	18	21	22	28	34	16	16	22	26	33	40	29	35	30	31	40	53	42	14	12	7	2	8	8	11	24
	37	40	33	48	40	38	44	40	38	35	38	28	33	30	21	19	21	20	24	30	15	11	15	21	25	33	21	27	22	24	33	52	38	18	12	15	8	2	7	5	28
	38	47	36	50	41	39	43	38	36	32	31	23	27	24	26	25	27	27	31	38	22	19	22	28	32	40	27	32	26	24	32	56	34	22	18	15	8	7	2	6	32
	39	44	37	52	44	42	48	44	41	38	38	29	33	30	26	24	25	23	27	33	20	15	16	22	25	33	20	26	19	20	29	51	33	23	16	19	11	5	6	2	32
	40	15	6	20	14	13	22	22	18	21	29	27	34	34	6	8	9	12	14	16	12	19	24	20	25	25	29	30	34	44	48	28	50	10	16	20	24	28	32	32	2

Table I—Exchange Points Table to be used for the Volta RTTY DX Contest, May 14–15.

contest has a few rule changes, but the object remains to work as many stations in as many US counties as possible.

**Classes:** Mobile single operator, mobile multi-operator, fixed, and DX.

**Exchange:** Signal report, county, and state (country for DX).

**Scoring:** Contacts with fixed US stations one point; US contacts with Canadian stations 3 points; US contacts with DX stations 5 points; contacts with US mobile stations 15 points.

**Multiplier:** Each US county worked during the contest.

**Final Score:** Total number of QSO points × the number of US counties worked.

**Frequencies:** 3870–3890, 7225–7250, 14

Mich. counties worked for final score (maximum of 83).

VHF scoring same as above except multipliers from each band are added together for final multiplier. Repeater contacts are not permitted.

**Frequencies:** CW—1810, 3540, 3725, 7035, 7125, 14035, 21035, 21125, 28035, 28125. SSB—1855, 3905, 7280, 14280, 21380, 28580. VHF—50.125, 145.025, 146.52.

**Awards:** Certificates to the winners in each state, country, and Mich. county (minimum of 50 QSOs). Six plaques to top Mich. winners: single operator, upper peninsula, multi-operator, VHF, mobile, and aggregate club score (minimum of 100 QSOs). And out-of-state station.

Party contacts do not count toward the Michigan Achievement Award unless one fact about Mich. is exchanged.

A summary sheet is requested with your entry showing the scoring and other pertinent information, plus a signed declaration that rules and regulations have been observed. Include a large SASE for a copy of the results.

Mailing deadline is July 1st to: Mike Shaw, K8ED, 27600 Franklin Road, Apt. 516, Southfield, MI 48034.

### Michigan Achievement Week

May 14-21, 1988

All contacts with Michigan stations made during Michigan Week, May 14-21, including the QSO Party, may be used for this award if the following requirements are fulfilled.

1. Mich. stations—Submit a log with information, name and address of station worked if possible, of 15 or more QSOs with out-of-state or DX stations with information about Michigan.

2. Out-of-state stations including Canada—Submit a log with information, name and address if possible, of at least 5 Mich. stations worked who related facts about Michigan.

3. DX stations—Work at least one Mich. station, with log information, name, and address, and relate a fact about Mich. given by the station worked.

4. Only contacts made during Michigan Week, May 16-23, are valid for this award.

Applications for certificates must be postmarked no later than July 1, 1988. Mail to Governor James Blanchard, Lansing, MI 48902.

(Facts about Michigan: State Bird, Robin; Fish, Trout; Flower, Apple Blossom; Tree, White Pine; Stone, Petoskey; or any local facts.)

### ARI International Contest

1600Z Sat. to 1600Z Sun., May 21-22

It's the world working the Italian stations in this one, including San Marino, Vatican, and SMOM.

### 1987 ARI Contest Results North America, Single Operator

USA CW/SSB		USA SSB	
N8DE	51,688	I4LEC/W4	177,548
W3ARK	33,728	NJ0C	12,160
KA1DWX	27,600	WA4QMQ	9,360
K8PYD	26,904	WK4F	8,208
W3BGN	10,976	WB4UBD	7,480
WA2UDT	9,916	W4KME	4,000
W5EIJ	2,240	N5IET	2,100
USA CW		Canada SSB	
N6JM	560	VE4RP	5,488
W4YN	320	Canada CW	
		VE3XK	15,308

**Classes:** Single operator, CW, SSB, or both modes. Multi-operator, single transmitter both modes, and SWL.

**Bands:** All six bands 1.8-28 MHz, 1830-1850 kHz on 160, and 3613-3627, 3647-3667 kHz on 80 for Italian stations. Band changes are not allowed for 10 minutes.

**Exchange:** RS(T) plus a QSO number starting with 001. Italian stations will include two letters indentifying their province.

**Scoring:** Europeans earn 2 points per QSO; others 4 points.

**Multiplier:** Each province and T7, HV, and SMOM worked on each band.

**Final Score:** Total QSO points times the sum of the multiplier from each band. A declared score exceeding more than 5% of the actual score means disqualification.

**Awards:** Certificates to the top-scoring stations in each country in each class. Special awards to the five leading stations in each class.

Use a separate log sheet for each band, and a summary sheet showing the scoring and other essential information. Include your name and address in block letters.

The Worked All Italian Provinces award is issued to stations working at least 60 different provinces. Application can be made by including a separate list of provinces worked in the contest with your log. QSL cards are not required. Include 10 IRCs to cover cost.

Mailing deadline is 40 days after end of contest to: ARI Contest Manager, via Scarlatti 31, 20124 Milano, Italy.

### World Telecomm. Contest

0000Z Sat. to 2400Z Sun., May 21-22

This world-wide activity is sponsored by the LABRE in celebration of the World Telecommunication Day, May 17th.

Phone and CW are separate contests and require separate logs. Use all six bands 10-160 meters. (No WARC bands.)

**Categories:** Single operator, all bands. Multi-operator, single transmitter, all

band. (Must remain on same band at least 10 minutes before changing to another band.)

**Exchange:** RS(T) plus ITU Zone. (See ITU Zone chart.)

**Points:** Contacts between stations on the same continent but different countries are worth 1 point on 10/15/20 meters, 2 points on 40/80/160 meters. Contacts between stations on different continents are worth 2 points on 10/15/20 meters, 4 points on 40/80/160 meters.

Contacts between stations in the same country are permitted for zone multiplier only, no QSO points.

The same station may be worked on each band for QSO and multiplier credit. The WAC and DXCC lists are the standards.

**Multiplier:** The 75 geographical ITU Zones worked on each band.

**Final Score:** Total QSO points from all bands times the sum of ITU Zones worked on each band.

**Awards:** Certificates to the first-place winners in each category in each country; second- and third-place awards will also be considered. A handsome plaque goes to the country with the highest aggregate score determined by the top 5 single operator scores plus the top multi-operator score of that country, both on phone and CW. The plaque remains in the possession of the national amateur radio association of that country affiliated with the IARU.

Use a separate sheet for each band and indicate the zone multiplier in a separate column only the first time it is worked. Logs must be checked for duplicate contacts, correct QSO points, and multipliers.

The usual disqualification rules are in effect—regulations in the country of operation and the contest, excessive duplicate contacts, and unsportsmanlike conduct.

Include a summary sheet showing the scoring, a signed declaration that all rules have been observed, and your name and address in block letters.

Mailing deadline is July 31st to: LABRE WTD Contest Committee, P.O. Box 07-0004, 70 000 - Brasilia - DF, Brazil.

### ARCI QRP CW Sprint

2000-2400 Local Time, Sat., May 28

This one is known as "The Hoot-Owl CW Sprint," and is a real shorty, only 4 hours. Rules have been modified and are easier to follow than last year's.

**Exchange:** RST and state, province, or country. ARCI members will include their membership number, non-members their power output.

**Points:** Contacts with members 5 points, non-members 2 points, 4 points if in a different continent.

**Multiplier:** States, VE provinces, and DX



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MODEL RM-35M

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MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
RM12A	9	12	5 1/4 x 19 x 8 1/4	16
RM-35A	25	35	5 1/4 x 19 x 12 1/2	38
RM-50A	37	50	5 1/4 x 19 x 12 1/2	50
• Separate Volt and Amp Meters				
RM-35 M	25	35	5 1/4 x 19 x 12 1/2	38
RM-50 M	37	50	5 1/4 x 19 x 12 1/2	50
RS-4A	3	4	3 3/4 x 6 1/2 x 9	5
RS-5A	4	5	3 1/2 x 6 1/8 x 7 1/4	7
RS-7A	5	7	3 3/4 x 6 1/2 x 9	9
RS-10A	7.5	10	4 x 7 1/2 x 10 3/4	11
RS-12A	9	12	4 1/2 x 8 x 9	13
RS-20A	16	20	5 x 9 x 10 1/2	18
RS-35A	25	35	5 x 11 x 11	27
RS-50A	37	50	6 x 13 3/4 x 11	46

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MODEL RS-7A

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MODEL RS-35M

### RS-S SERIES



MODEL RS-12S

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	@ 13.8VDC @ 10VDC @ 5VDC		@ 13.8V		
VS-20M	16	9	4	20	5 x 9 x 10 1/2
VS-35M	25	15	7	35	5 x 11 x 11
VS-50M	37	22	10	50	6 x 13 3/4 x 11
• Variable rack mount power supplies					
VRM-35M	25	15	7	35	5 1/4 x 19 x 12 1/2
VRM-50M	37	22	10	50	5 1/4 x 19 x 12 1/2

\*ICS—Intermittent Communication Service (50% Duty Cycle 5 min. on 5 min. off)

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CIRCLE 65 ON READER SERVICE CARD

countries worked on each band.

**Power Multiplier:** 4 to 5 watts output × 2, 3 to 4 watts output × 4, 2 to 3 watts output × 6, 1 to 2 watts output × 8, less than 1 watt × 10. Over 5 watts check log only.

**Power Supply Multiplier:** Battery power × 1.5, solar/natural, or battery charge by s/n × 2.

**Final Score:** Total QSO points × QTH multiplier × power multiplier × power supplier multiplier.

**Frequencies:** 1810, 3560, 3710, 7040, 7110, 14060, 21060, 21110, 28060, 28110, 50060 kHz.

**Awards:** Certificates to the top three overall scores, and to the top scorers in each state, province, and country with at least two or more entries.

Use a separate sheet for each band and a summary sheet showing the scoring and other essential information. Sample log forms are available from K5VOL. A copy of the results is also available. Include a large SASE for either one.

Mailing deadline is 30 days following the end of the contest to: Red Reynolds, K5VOL, 835 Surryse Road, Lake Zurich, IL 60047.

## UBA SWL CW Trophy

0000Z Sat. to 2400Z Sun., May 28-29

This SWL activity was purposely scheduled on the same weekend as our CQ WPX CW Contest to take advantage of the activity generated by that contest.

## 1987 European CW Contest North America Results

USA All Band		Canada	
K1EA	619,854	VO1QU	209,568
KZ2S	567,084	VO1AW	11,778
N6AR	497,276	<b>USA High Bands</b>	
K3IPK	362,880	(14, 21, 28 MHz)	
N2GUV	335,342	K2SS	125,664
KC1F	261,010	WC4E	52,800
K4YXZ	130,674	N9AG	52,416
N3BNA	122,200	K5MK	21,816
K1XM	98,371	NX7K	16,440
KA1DWX	93,576	W3ARK	12,900
K8HVT	86,618	W6BIP	12,480
KW2J	85,936	N6JV	8,976
N8BC	81,529	N4JF	8,372
K5KLA	72,072	N6EK	5,040
W5WMU	53,572	K4FW/8	3,990
W4NTI	46,512	WA2UDT	3,990
WB3JRU	44,634	K8CV	2,548
KM6B	40,656	KA3OPB	1,632
K3TX	33,048	K6NA	1,224
K4JLD/1	27,336	N6AA	1,128
K2QF	26,928	N6JM	1,008
K1CLN	23,634	N7HJM	494
K9BG	22,960	W1OPJ	462
W1IHN	21,230	<b>Canada</b>	
W4YN	18,480	VE2LJ	75,600
KE0Y	18,240	VE1ACK	198
W2DW	12,144	<b>USA Multi-Opr.</b>	
KQ1F	11,692	W3GG	385,382
N2AZS	6,490	<b>World-Wide Scores</b>	
W2KTF	6,283	<b>All Band</b>	
W5NR	5,508	K1EA was #6 and	
WB2DND	2,915	KZ2S was #9	
<b>Dom. Rep.</b>		<b>High Bands</b>	
HI8LC	27,459	K2SS was #6	
<b>Panama</b>		<i>Certificate winners</i>	
HP1AC	2,173	<i>are in boldface.</i>	
<b>Costa Rica</b>			
TIBRC	4,437		

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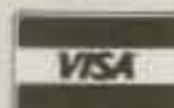
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Please send all reader inquiries directly.

Rules are the same as those used in the SSB section and were published in the March issue of this column.

Logs must be postmarked no later than June 25th and go to: Marc Domen, ONL 6945, B-2200, Antwerpen (Borgerhout), Belgium.

## CQ WW WPX CW Contest

0000Z Sat. to 2400Z Sun., May 28-29

Just a reminder, as if you needed one, that our WW WPX CW Contest is coming up the last weekend of this month. Rules and scoring are the same as for the SSB section last March and were given in detail in the January issue and briefly reviewed in the March Calendar.

Following are a few items to keep in mind:

**Par. I**—Only 30 hours out of the 40-hour contest period may be used by single operator stations. Off times must be at least 60 minutes long. Multi-operator stations can use the full 48 hours.

**Par. IV**—Multi-operator, single transmitter. Only one transmitter and one band permitted during the same time period (defined as 10 minutes). No QSYing

to another band to pick up a new multiplier.

**Par. VI**—QSO points on the three lower bands (7, 3.5, and 1.8 MHz) are worth double those for contacts on 28, 21, and 14 MHz. Own country may be worked for multiplier credit only (making U.S. contacts very attractive).

**Par. VII**—The prefix multiplier is counted once only, not once on each band. Definition of a prefix is clearly spelled out in the rules. The WPX Awards list cannot be used as a guide in the WPX Contest.

Stations operating in a call area other than that of the call sign are required to indicate the area of operation. The portable prefix is the multiplier (i.e., W8IMZ/4 counts as W4; N8BJQ/KP2 counts as KP2).

**Par. IX**—Eligibility for the many plaques remains at two years except for categories as indicated.

Mailing deadline is July 10th, but will be extended for rare isolated areas. Be sure to indicate CW on the envelope.

All logs go to: CQ Magazine, WPX Contest, 76 N. Broadway, Hicksville, NY 11801 U.S.A. Questions pertaining to the WPX Contest can be sent to: WPX Contest Director, Steve Bolia, N8BJQ, 4121 Gardenvue Dr., Beavercreek, OH 45431.

## YLRL Novice/Tech Day

1700Z to 2100Z Sat., June 4

This activity was organized a year ago by the YLRL to promote activity for the YL Novices and Technicians. Operation will be for YLs, on CW only.

**Exchange:** Station worked, RST, name, QTH, and class of license.

**Scoring:** Three points for each YL Novice/Tech worked. Two points for YL General or Advanced class, and one point for YL Extra class.

The same station may be worked on each band for credit. Score each band separately. The sum of your score on each band is your final score.

**Frequencies:** 3730, 7130, 21130, and 28130 MHz, plus or minus 10 kHz. Maximum power of 200 watts.

**Awards:** YLRL postcards to the top scoring Novice/Tech and General class or higher YL.

Submit original log only, which must be signed by the station operator. Include a summary sheet showing the scoring and other essential information, including your license class and address.

All entries must be received by July 7th and go to: Carol Shrader, 4744 Thoroughgood Dr., Virginia Beach, VA 23455.

## ANARTS RTTY Contest

0000Z Sat. to 0000Z Mon., June 4-6

The Australian National Amateur Radio Teleprinter Society is running this one.

Not more than 30 hours of operating

time is permitted for single operator stations. Off periods can be taken at any time and must be indicated in the log. Multi-operator stations can operate the full 48 hours.

**Classes:** Single operator, multi-operator single transmitter, and SWL.

**Bands:** All five bands, 3.5-28 MHz, in portions permitted for RTTY. (No WARC bands.)

**Exchange:** RST, UTC time, and zone.

**Scoring:** Points as per CARTG Zone Chart (same as the Exchange Point Table in this issue).

Multiply point total by the number of countries worked on each band. Multiply that total by number of continents worked (maximum of 6).

**Bonus:** Add 100 points to above score for each VK worked on 14 MHz; 200 points if on 21 MHz; 300 points if on 28

MHz; 400 points if on 7 MHz; and 500 points if on 3.5 MHz.

**Example:** Zone QSO points × countries × continents + bonus points for your final score.

A station may be worked on each band for QSO and multiplier credit, but continents count once only.

Country multiplier is determined by the ARRL list plus VK, ZL, JA, VE/VO, and W/K call areas.

**Awards:** Certificates to first-, second-, and third-place Muf winners on a world and country basis.

Scoring is rather complicated. Therefore, a summary sheet showing the scoring, etc., is a must.

Logs must be received by September 1st and go to: W.J. Storer, VK2EG, 55 Prince Charles Road, Frenchs Forest, N.S.W. 2086 Australia.

## MufMap

## BandAid

## Mufplot

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**BandAid:** this is probably the most comprehensive propagation forecasting program available to amateur radio operators. You can make MUF & LUF graphs and tables, grayline predictions, maintain a QSL database, find international beacon frequencies, locate any station on a world map, maintain a database containing information on over 550 targets, time zone conversions, authorized frequency listings, and have control over many of the programs defaults. Over the years, we've sold hundreds of BandAids & Mufplots. Through steady improvements, BandAid is still the best propagation program available (with the possible exception of MufMap) Now includes 8087 support. BandAid runs on IBM PCs and compatibles, requires 256K and a color/graphics card (color monitor not required). Still only \$69.

**Mufplot:** a popular propagation program for C64 and Apple II users. MUF & LUF graphs & tables, distance/bearing calculations, and more ... Hundreds in use ... Still a deal at \$30.

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1110 RG8X 95% shield (mini 8) .....17  
1130 RG213/U 95% shield mil spec NCV jkt.....39  
1140 RG214/U dbl silver shld mil spec.....1.85  
1705 RG142B/U dbl silver shld, teflon ins ..... 1.50  
1310 RG217/U 50 ohm 5000 watt dbl shld .....98  
1450 RG174/U 50 ohm .100" od mil spec .....14

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PL259AM Amphenol PL259 .....89  
PL259TS PL259 teflon ins/silver plated ..... 1.59  
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UG175/UG176 reducer for RG58/59 (specify).....22  
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CIRCLE 67 ON READER SERVICE CARD

## THE SCIENCE OF PREDICTING RADIO CONDITIONS

**S**unspot Cycle 22, off to a slow start, perked up considerably during January. The Royal Observatory of Belgium reports a monthly median of 60. This results in a smoothed sunspot number of 31 centered on July 1987. This is an increase of 3 points over the last monthly reading. A smoothed sunspot number in the upper fifties is forecast for May 1988. There was a corresponding increase in the 10.7 cm solar flux level during January, with the Algonquin Radio Observatory reporting a median reading of 109.

### May Propagation

The following is a thumb-nail picture of HF amateur band openings expected during May 1988. For specific times of DX openings refer to the DX Propagation Charts which appeared in last month's column. This month's column contains Short-Skip Propagation Charts valid for both May and June, as well as charts centered on Alaska and Hawaii. The Short-Skip Charts contain propagation forecasts for openings varying in distance between 50 and 2300 miles. For day-to-day variations expected in propagation conditions during May see the Last Minute Forecast, which appears at the beginning of this column.

**10 Meters:** Some daytime openings, mainly towards southern and tropical areas, should still be possible during May. The best time to check for DX openings should be the afternoon hours. Expect a considerable increase in short-skip openings between distances of approximately 750 and 1400 miles. Some occasional multi-hop sporadic-E openings up to 2800 miles, and sometimes beyond, may also be possible.

**15 Meters:** A seasonal decrease in DX openings on this band is normal for May, but some fairly good openings to many parts of the world still should be possible during the daylight hours. The afternoon hours are expected to be the best for DX possibilities. Numerous short-skip openings between approximately 600 and 1300 miles should be possible daily.

**20 Meters:** This should be the best all-around DX band during May. Opening shortly after sunrise, good DX conditions can be expected to one area of the world or another through most of the daylight hours, and well into the hours of darkness. The band should remain open for

### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for May 1988

Propagation Index .....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 5, 11, 15-16, 19	A	A	B	C
High Normal: 7-8, 13, 17-18, 20-21, 25-26, 31	A	B	C	C-D
Low Normal: 1, 4, 6, 12, 14, 22, 24, 28-30	B	C	D	D-E
Below Normal: 2-3, 9, 23, 27	C	C-D	D-E	E
Disturbed: 10	C-D	D	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9+, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.

D—Poor opening, with weak signals varying between S0 and S3, and with considerable fading and noise.

E—No opening expected.  
3 dB per S-Unit.

### HOW TO USE THIS FORECAST

1. Find propagation index associated with particular band opening from 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 band opening for any day of the month. For example, an opening shown in the charts with a propagation index of 3 will be good-to-fair (B-C) March 1st, fair-to-poor (D-D) on the second and third, good-to-fair (B-C) on the 4th, excellent (A) on the 5th, etc.

DX to southern and tropical regions well past midnight. Peak conditions are expected during the late afternoon and early evening, when signal levels should be exceptionally strong to most areas of the world. Expect excellent short-skip openings, often with exceptionally strong signal levels, between distances of approximately 350 and 2300 miles. Quite often, particularly during the late afternoon, optimum conditions will exist from both short and long skip, and stations a few hundred miles away will be heard at the same time as DX stations from several thousand miles away, causing considerable QRM.

**40 Meters:** Fewer DX openings are expected because of the shorter hours of darkness and the higher level of static expected during May, but some good openings to most areas of the world still should be possible during the hours of darkness and the sunset and sunrise periods. Good daytime short-skip openings can be expected over distances between approximately 150 and 750 miles, with nighttime openings extending up to the one-hop short-skip limit of 2300 miles.

**80 Meters:** Fewer hours of daylight and higher static levels are also expected to reduce DX openings on this band, but some fairly good ones are likely to many areas of the world during the hours of darkness. Excellent short-skip openings are expected during the daylight hours, ranging between 50 and 250 miles. During the hours of darkness short-skip openings should increase up to approximately 2300 miles.

**160 Meters:** Nighttime propagation conditions on this band have passed their seasonal peak and should decline until early fall. Openings up to about 1200 miles should be possible regularly during the hours of darkness this month. An occasional opening well beyond this range is likely when static levels are low. No daytime skip openings are expected on this band because of solar absorption.

### Sporadic-E Propagation

Favorable conditions for VHF ionospheric openings occur considerably more frequently during May and the summer months in the northern hemisphere, primarily as a result of a summer seasonal increase expected in sporadic-E propagation.

Clouds or patches of abnormally intense ionization, which are capable of reflecting radio waves of frequencies much higher than those reflected by the regular E or F layers, frequently form immediately beneath the normal E layer of the ionosphere.

These clouds usually cover a rather small geographical area, approximately 50 to 100 miles in diameter. They occur more or less at random, and are relatively short lived, usually dissipating within a few hours. Since this sporadic ionization generally occurs at about the same height as the regular E layer, it is called sporadic-E ionization, or E<sub>s</sub>.

As a result of an intensely ionized sporadic-E cloud, it is possible at times to communicate over relatively long distances on the 50 MHz band, and on some occasions on 144 MHz as well (see fig. 1). Further, the effects of sporadic-E are often observed on the HF bands.

The height at which sporadic-E usually occurs limits one-hop propagation to a maximum distance of approximately 1300 miles. For this reason, band openings due to E<sub>s</sub>, whether on HF or VHF, are generally referred to as "short-skip" openings. During periods of geographically widespread sporadic-E ionization, which often happens during the summer months, multi-hop propagation is some-

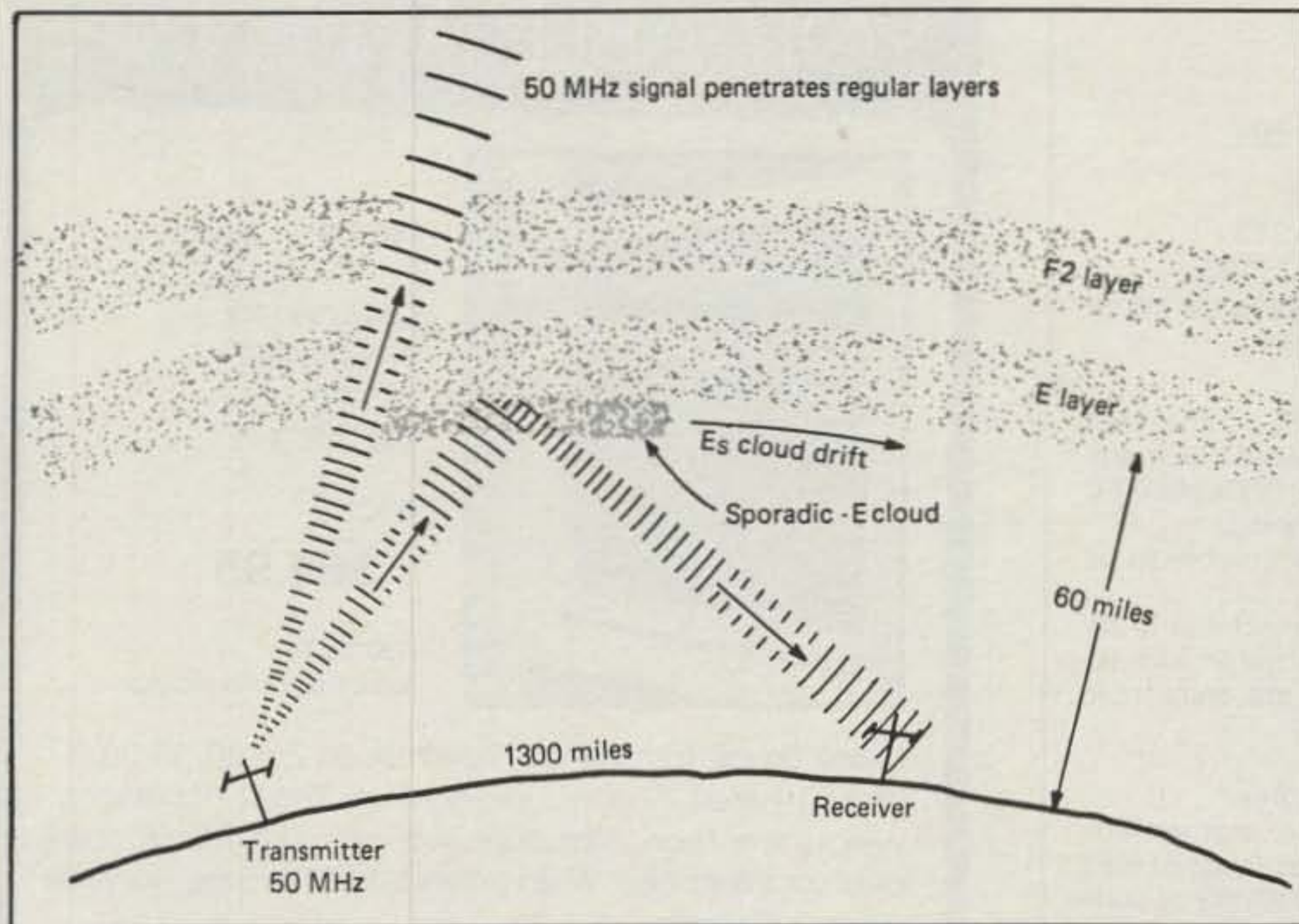


Fig. 1— 50 MHz short-skip propagation by means of sporadic-E reflection.

times possible. Trans-Atlantic sporadic-E openings on 10 and 15 meters, consisting of at least 3 hops, have been reported, as well as 50 MHz openings over 2 hop distances up to 2600 miles.

Sporadic-E ionization has long been the object of scientific investigation by amateur operators and research scientists. Studies have shown, for example, that in the mid-latitudes (United States, Europe, etc.) the diurnal variations in sporadic-E occurrence have a tendency to peak during the late morning hours and again around sunset, although  $E_s$  can occur at any time. More specifically, during the summer months peaks in sporadic-E activity are observed between 10 a.m. and noon local time and again from 6 to 8 p.m. Thus, sporadic-E propagation is primarily a daytime phenomenon during the summer months, decreasing rapidly after local sundown.

Nearly 80% of all  $E_s$  propagation observed in North America and Europe takes place from May through August, with a maximum occurring in June. In the temperate zone of the southern hemisphere, similar patterns have been observed during the months of November to February, which corresponds to the summer season in that area. A secondary maximum is evident in the month of December, with a definite minimum occurring in March.

Here is a useful tip for predicting 50 MHz short-skip  $E_s$  openings. The geometry of propagation is such that as the skip distance decreases on the 21 and 28 MHz bands, the highest frequency that will be reflected by a sporadic-E cloud increases. By observing the minimum ionospheric skip distance heard on 21 or 28

MHz during an  $E_s$  opening, and using the chart shown in fig. 2, it should be possible to tell whether 50 MHz is open, and what the skip distance might be.

To demonstrate how this technique works, consider the following example. Suppose the minimum skip distance observed on 28 MHz in a southwesterly di-

rection is 400 miles (it is the distance to the nearest skip station heard that is important). From fig. 2 the intersection between 400 miles and the 28 MHz curve corresponds to an MUF of 60 MHz. This means that 50 MHz short-skip openings in a southwesterly direction are very likely to occur. The minimum skip distance expected on 50 MHz can now be found from fig. 2 by locating the intersection between 60 MHz on the ordinate (vertical scale) and the 50 MHz curve. The resulting distance is found to be 900 miles. A useful rule of thumb to remember is that when skip stations are heard less than 500 miles away on 28 MHz, or less than 250 miles away on 21 MHz, the chances are very good that 50 MHz will open in the same general direction.

From most locations in the continental United States 1300 mile  $E_s$  openings should extend into both Canada and Mexico. From the southern third of the country, it should also be possible to work a rather large number of countries in Central America and in the West Indies during 15, 10, and 6 meter sporadic-E openings. Long-distance (DX) television reception also improves considerably during the summer months as a result of sporadic-E ionization. Signals from low-band VHF TV stations (Channels 2-5), which normally cannot be received more than 75 or 100 miles away, suddenly are propagated up to 1300 miles, often with very strong signal levels.

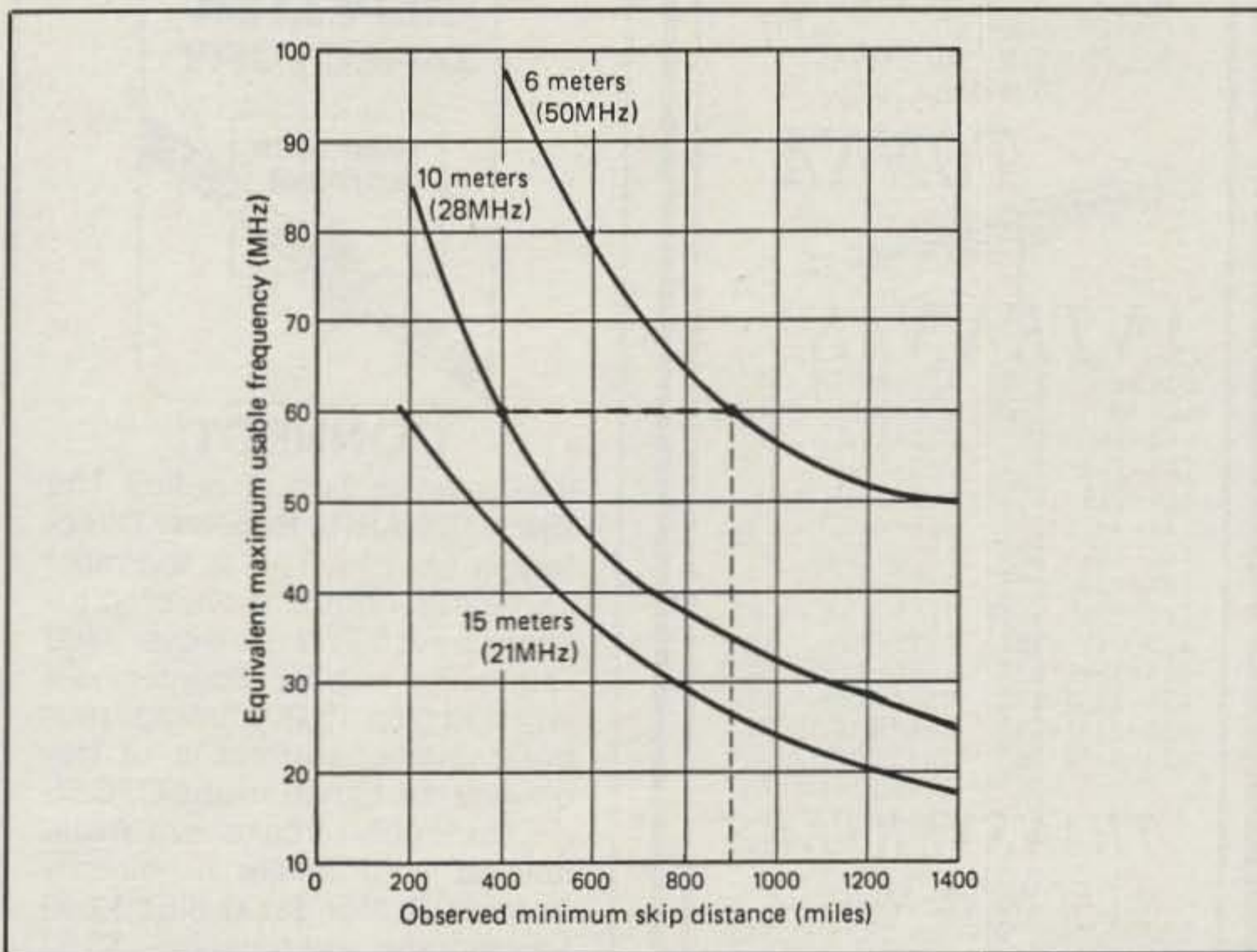


Fig. 2— Chart describing correlation between sporadic-E openings on the 10 and 15 meter amateur bands and possible 6 meter openings at the same time. The example shows a minimum skip distance of 400 miles observed on 10 meters; from the chart, 6 meters should be open with skip distance of greater than 900 miles.

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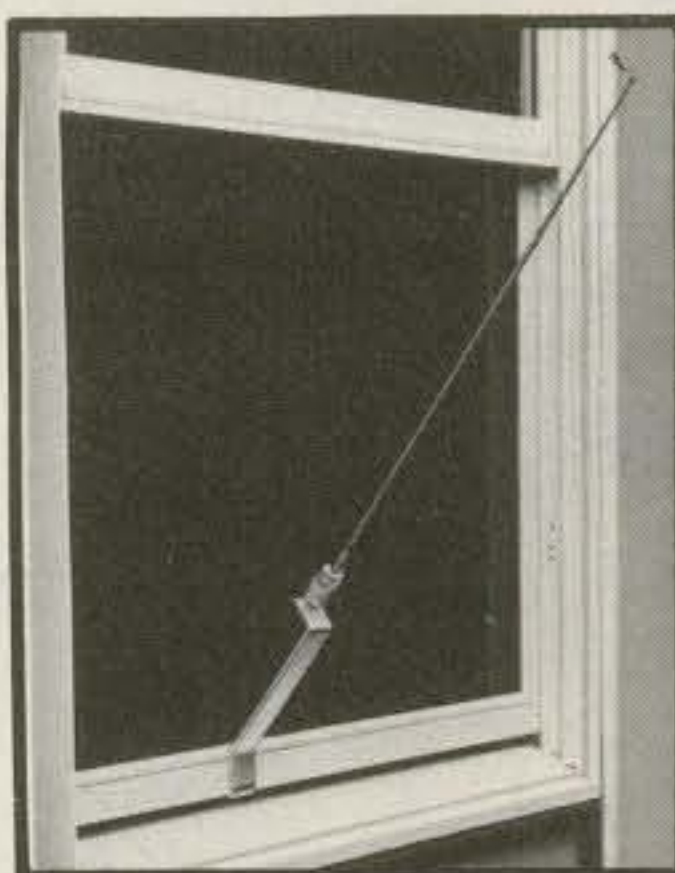
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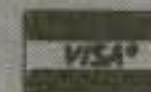


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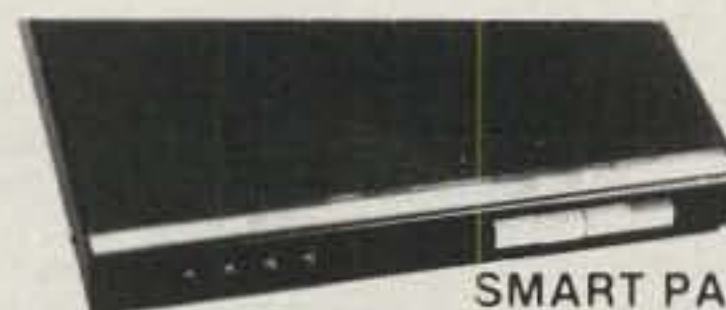
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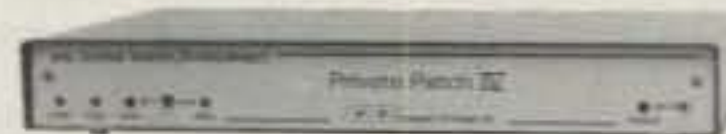
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**HOW TO USE THE SHORT-SKIP CHARTS**

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (10 through 40 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An \* indicates the best time to listen for 80 meter openings.

2. The propagation index is the number that appears in ( ) after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the Charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. On the Short-Skip Chart appropriate daylight time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EDT, on a circuit between N.Y. and Texas, the time at the midpoint would be CDT, etc. Times shown in the Hawaii Chart are in HST. To convert to daylight time in other USA time zones add 3 hours in the PDT zone; 4 hours in the MDT zone; 5 hours in the CDT zone; and 6 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 15 or 3 P.M. in Los Angeles; 18 or 6 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to daylight time in other areas of the USA subtract 7 hours in the PDT zone; 6 hours in the MDT zone; 5 hours in the CDT zone; and 4 hours in the EDT zone. For example, at 20 GMT it is 16 or 4 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts c.w. or 300 watts p.e.p. on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts c.w. or 1 kw p.e.p. on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

5. Propagation data contained in the Charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado 80302.

**CQ Short-Skip Propagation Chart  
May & June 1988  
Local Daylight Savings Time  
At Path Mid-Point**

Band (Meters)	Distance Between Stations (Miles)			
	50-250	250-750	750-1300	1300-2300
10	Nil	08-10 (0-1) 10-14 (0-2) 14-18 (0-1) 18-22 (0-2) 22-00 (0-1)	08-10 (1) 10-14 (2) 14-18 (1-2) 18-22 (2) 22-00 (1) 00-08 (0-1)	08-10 (1-0) 10-22 (2-0) 22-23 (1-0) 23-08 (1-0)
15	Nil	07-10 (0-1) 10-14 (0-2) 14-18 (0-1) 18-22 (0-2) 22-01 (0-1)	07-10 (1-2) 10-14 (2-3) 14-18 (1-3) 18-20 (2-3) 20-22 (2) 22-01 (1) 23-07 (1-0)	07-10 (2-0) 10-17 (3-1) 17-20 (3-2) 20-22 (2-1) 22-23 (1) 23-07 (1-0)
20	10-21 (0-1)	07-10 (0-2) 10-13 (1-3) 13-18 (1-4) 18-20 (1-3) 20-21 (1-2) 21-23 (0-2) 23-07 (0-1)	07-08 (2) 08-10 (2-3) 10-13 (3-4) 13-18 (4) 18-20 (3-4) 20-21 (2-4) 21-23 (2-3) 23-01 (1-2) 01-07 (1)	07-08 (2) 08-10 (3-2) 10-16 (4-3) 16-21 (4) 21-23 (3) 23-01 (2) 01-07 (1)
40	08-10 (1-2) 10-12 (2-4) 12-18 (3-4) 18-20 (2-4) 20-22 (1-3) 22-00 (0-2) 00-08 (0-1)	08-10 (2-4) 10-15 (4-2) 15-16 (4-3) 16-20 (4) 20-22 (3-4) 22-00 (2-3) 00-08 (1-2)	08-09 (4-3) 09-10 (4-2) 10-15 (2-1) 15-16 (3-1) 16-19 (4-2) 19-22 (4) 22-00 (3-4) 00-03 (2-4) 03-05 (2-3) 05-08 (2)	08-09 (3-1) 09-10 (2-1) 10-16 (1-0) 16-19 (2-1) 19-22 (4-3) 22-03 (4) 03-05 (3) 05-07 (2) 07-08 (2-1)

80	08-11 (4) 11-19 (4-3) 19-22 (4) 22-00 (3-4) 00-06 (2-3) 06-08 (3-4)	08-10 (4-1) 11-16 (3-0) 16-18 (3-1) 18-19 (3-2) 19-20 (4-2) 20-00 (4) 00-06 (3-4) 06-08 (4-3) 10-11 (4-0)	08-09 (1) 09-10 (1-0) 10-16 (0) 16-18 (1-0) 18-20 (2-1) 20-23 (4-3) 23-03 (4) 03-06 (4-3) 06-08 (3-2)	08-09 (1-0) 09-18 (0) 18-20 (1-0) 20-21 (3-1) 21-23 (3-2) 23-03 (4-3) 03-06 (3-2) 06-08 (2-1)
160	06-09 (4-1) 09-10 (2-0) 10-19 (1-0) 19-21 (3-1) 21-23 (4-2) 23-06 (4-3)	06-09 (1) 09-19 (0) 19-21 (1-0) 21-23 (2-1) 23-01 (3-2) 01-04 (3) 04-06 (3-2)	08-09 (1-0) 09-21 (0) 21-23 (1) 23-01 (2-1) 01-04 (3-2) 04-07 (2) 07-08 (1)	08-21 (0) 21-01 (1) 01-04 (2) 04-06 (2-1) 06-07 (1) 07-08 (1-0)

**ALASKA  
May & June 1988  
Openings Given in GMT #**

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	Nil	20-02 (1)	22-00 (1) 00-02 (2) 02-04 (3) 04-05 (2) 05-06 (1) 10-12 (1) 12-14 (2) 14-16 (1)	Nil
Central USA	Nil	21-04 (1)	22-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 12-13 (1) 13-15 (2) 15-16 (1)	08-12 (1)
Western USA	Nil	20-23 (1) 01-03 (1) 03-05 (2) 05-06 (1)	00-02 (2) 02-04 (3) 04-07 (4) 07-08 (3) 08-09 (2) 09-15 (1) 15-18 (2) 18-00 (1)	07-09 (1) 09-14 (2) 14-15 (1) 11-13 (1)*

**HAWAII  
May & June 1988  
Openings Given in Hawaiian  
Standard Time #**

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	Nil	12-15 (1) 15-17 (2) 17-19 (1)	13-15 (1) 15-17 (2) 17-19 (3) 19-20 (2) 20-04 (2) 04-08 (1)	19-20 (1) 20-23 (2) 23-02 (1) 21-23 (1)*
Central USA	Nil	12-15 (1) 15-18 (2) 18-20 (1)	15-16 (2) 16-17 (3) 17-19 (4) 19-20 (3) 20-22 (2) 22-04 (1) 04-05 (2) 05-07 (3) 07-09 (2) 09-15 (1)	19-20 (1) 20-21 (2) 21-01 (3) 01-02 (2) 02-04 (1) 20-21 (1)* 21-00 (2)* 00-03 (1)*
Western USA	13-17 (1)	09-12 (1) 12-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	06-08 (4) 08-16 (3) 16-19 (4) 19-20 (3) 20-22 (2) 22-05 (1) 05-06 (2)	18-19 (1) 19-20 (2) 20-22 (3) 22-02 (4) 02-04 (3) 04-05 (2) 05-07 (1) 19-20 (1)* 20-22 (2)* 22-02 (3)* 02-04 (2)* 04-05 (1)*

\* See explanation in "How To Use Short-Skip Charts" in box at the beginning of this column.

\* Indicates best time for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a propagation index of (2), or higher.

Note: The Alaska and Hawaii Propagation Charts are intended for distances greater than 1300 miles. For shorter distances, use the preceding Short-Skip Propagation Chart.

Reflection from sporadic-E clouds takes place with very little signal loss, resulting in exceptionally strong signal levels during most openings, even when very low power levels are used. Quite often it is possible to maintain communication considerably off the great-circle path between two stations by means of back and side scatter from sporadic-E clouds. For example, a station in eastern New York state may work another station in the central part of the state if both stations point their antennas toward a common E<sub>s</sub> cloud which is located, for example, over Georgia.

The ionized clouds which produce sporadic-E are erratic in their behavior and are known to drift generally in a westerly or northwesterly direction at approximately 150 to 250 miles per hour. The drift appears to be due to winds that exist in the ionosphere. Because of this drift skip zones change rapidly, and it is not uncommon for signal levels during sporadic-E openings to fade out completely from an S-9 plus level; these changes often take place in a matter of minutes.

**VHF Ionospheric Openings**

In addition to the increased sporadic-E propagation expected during May on the

VHF bands, some ionospheric propagation is also likely to occur as a result of trans-equatorial scatter, meteor ionization, and auroral activity.

Some 6 meter, and perhaps 2 meter, trans-equatorial (TE) scatter openings should be possible during May. They are most likely to occur between 9 and 11 p.m. local daylight time on long north-south paths which cross the geomagnetic equator at approximately a right angle. TE openings favor locations in the southern third of the USA, but from time to time openings further north may be possible.

The Eta Aquarids meteor shower should intersect the earth's atmosphere between May 4 and 6. This should be a major shower, reaching maximum intensity during May 5, with an average of 20 meteors an hour. Chances are good for meteor-burst short-skip openings during the three-day period of this shower.

Some auroral activity may be possible during May, resulting in short-skip auroral-scatter-type openings on VHF. Such activity is most likely to occur during periods of ionospheric storminess. Check the Last Minute Forecast at the beginning of this column for those days that are likely to be Below Normal or Disturbed during May.

73, George, W3ASK



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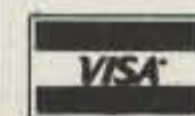
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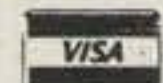
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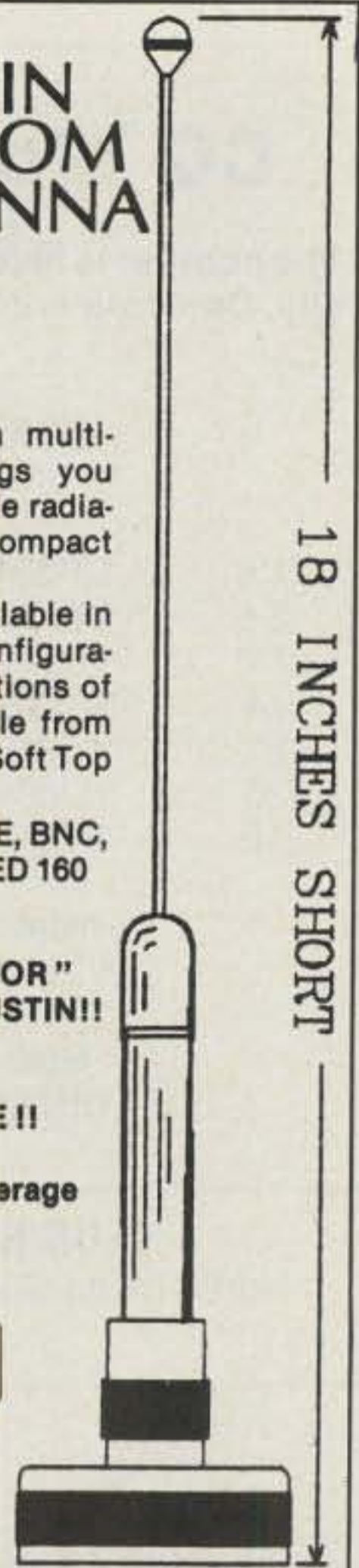


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# CQ World-Wide WPX CW Contest All-Time Records

The contest is held each year on the last full weekend of May. The All-Time Records will be updated and published annually. Data following the calls below are: year of operation, total score, and number of prefix multipliers.

## WORLD RECORD HOLDERS

### Single Operator

1.8	UP3BP/UF('85)	125,240	101
3.5	UP2NK/UF('85)	701,012	221
7.0	VP2VCW('86)	4,641,120	586
14	WC4E/KP4('86)	3,613,248	656
21	HD0E('80)	3,544,416	496
28	LU8DQ('80)	1,627,660	388
AB	5L7T('87)	8,619,225	679

### Multi-Operator Single Transmitter

V31A('87)	8,544,768	768
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### Multi-Operator Multi-Transmitter

UP7A('83)	9,920,442	823
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## U.S.A. RECORD HOLDERS

### Single Operator

1.8	K5UR('85)	13,668	102
3.5	K5NA/2('86)	197,856	216
7.0	N5RZ('85)	1,754,664	452
14	K2VV('86)	2,525,880	582
21	K6LL/7('81)	1,433,457	459
28	N4ZC('81)	136,086	222
AB	KC1F('85)	3,140,592	546

### Multi-Operator Single Transmitter

KR0Y('86)	4,516,974	693
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### Multi-Operator Multi-Transmitter

NM5M('84)	4,432,883	637
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## CLUB RECORD

North Texas Contest Club('87)	62,727,586
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## WPX (Prefix) RECORD

4N2E('87)	853
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## QRPP RECORD

4X4UH('82)	1,028,904
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## CONTINENTAL RECORD HOLDERS

### AFRICA

1.8	No Entrant		
3.5	EA8RL('84)	453,456	201
7.0	EA9GT('81)	579,824	217
14	EL2AV('82)	906,840	330
21	5Z4CS('82)	2,104,245	429
28	ZS6BUX('81)	8,850	50
AB	5L7T('87)	8,619,226	697

### ASIA

1.8	UP3BP/UF('85)	125,240	101
3.5	UP2NK/UF('85)	701,012	221
7.0	UP2NK/UF('86)	2,084,880	365
14	UZ9FWR('86)	2,570,940	540
21	4Z4NUT('86)	1,370,800	400
28	4X4UH('81)	1,081,262	338
AB	UF6FFF('86)	3,100,293	537

### EUROPE

1.8	UA2FF('87)	117,424	134
3.5	CT5AT('86)	697,248	324
7.0	DF9ZP('85)	1,998,372	482
14	YT3AA('87)	2,216,680	604
21	YU3BO('81)	1,550,390	394
28	9H1CH('81)	307,433	259
AB	YZ4GD('85)	3,554,460	651

### Multi-Operator Single Transmitter

AF	ZS6CT('84)	3,129,216	464
AS	UZ9A('80)	5,500,135	511
EU	LZ7A('86)	7,238,757	821
NA	V31A('87)	8,544,768	768
OC	KH6XX('84)	4,646,859	553
SA	AZ8DQ('86)	6,964,584	682

### NORTH AMERICA

1.8	VE3BMV('86)	43,428	77
3.5	HK3MAE/HK0('87)	456,280	187
7.0	VP2VCW('86)	4,641,120	586
14	WC4E/KP4('86)	3,613,248	656
21	KP4EQF('83)	1,816,416	476
28	KP4EQF('81)	577,500	300
AB	NP4A('87)	5,724,342	663

### OCEANIA

1.8	KG6DX('86)	1,224	12
3.5	T32AF('83)	93,480	95
7.0	T32AF('85)	1,249,176	276
14	VK4QK('80)	1,276,584	344
21	N6HR/NH6('83)	1,203,552	378
28	KG6DX('81)	1,238,806	334
AB	KG6SW('79)	2,848,320	345

### SOUTH AMERICA

1.8	YV1OB('86)	11,550	35
3.5	HK7IMB('87)	184,736	184
7.0	YX5A('87)	2,999,977	479
14	YX5A('86)	3,016,155	557
21	HD0E('80)	3,544,416	496
28	LU8DQ('80)	1,627,660	388
AB	ZZ5EG('87)	7,228,440	690

### Multi-Operator Multi-Transmitter

AF	EA9CE('84)	4,383,308	482
AS	JA2YKA('83)	5,895,628	614
EU	UP7A('87)	9,920,442	823
NA	NL7G('86)	6,791,670	690
OC	KH6XX('85)	8,551,399	647
SA	HD1A('79)	6,052,032	474

## QRPP

AF	EA8ACL('82)	139,965	155
AS	4X4UH('82)	1,028,904	344
EU	YU3BC('86)	439,624	307

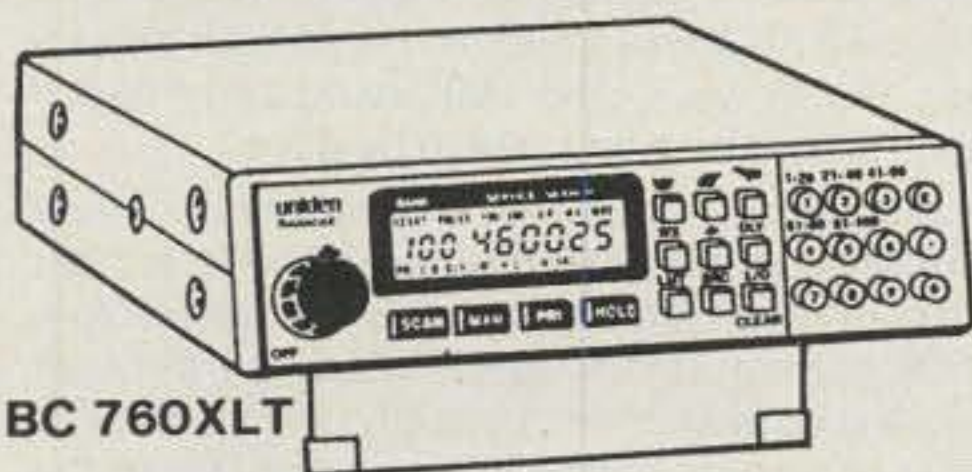
NA	WP4F('86)	594,375	317
OC	FO8JP('86)	572,131	259
SA	OA8V('81)	444,768	246

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RD500-SA Uniden visor mount radar detector ... \$79.95

## NEW! Bearcat® 200XLT-SA

New Product... Available May, 1988  
List price \$509.95/CE price \$299.95  
**12-Band, 200 Channel • 800 MHz. Handheld**  
Search • Limit • Hold • Priority • Lockout  
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz.  
Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.  
The Bearcat 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 20 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz. band and 100 channels, order the BC 100XLT-SA for only \$219.95. Includes antenna, carrying case with belt loop, ni-cad battery pack, AC adapter and earphone. Order your scanner now.

## Bearcat® 800XLT-SA

List price \$499.95/CE price \$259.95/SPECIAL  
**12-Band, 40 Channel • No-crystal scanner**  
Priority control • Search/Scan • AC/DC  
Bands: 29-54, 118-174, 406-512, 806-912 MHz.  
The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9 1/4" x 4 1/2" x 12 1/2". If you do not need the 800 MHz. band, a similar model called the BC 210XLT-SA is available for \$196.95.

## Bearcat® 145XL-SA

List price \$189.95/CE price \$98.95/SPECIAL  
**10-Band, 16 Channel • No-crystal scanner**  
Priority control • Weather search • AC/DC  
Bands: 29-54, 136-174, 406-512 MHz.  
The Bearcat 145XL is a 16 channel, programmable scanner covering ten frequency bands. The unit features a built-in delay function that adds a three second delay on all channels to prevent missed transmissions.

## Bearcat® 175XL-SA

List price \$279.95/CE price \$156.95/SPECIAL  
**11-Band, 16 Channel • Weather Search**  
Priority control • Search/Scan • AC/DC  
Bands: 29-54, 118-174, 406-512 MHz.  
The Bearcat 175XL has an automatic search feature to locate new frequencies. Priority, lock out, delay and scan speed are all included.

## Regency® Informant™ Scanners

Frequency coverage: 35-54, 136-174 406-512 MHz.  
The new Regency Informant scanners cover virtually all the standard police, fire, emergency and weather frequencies. These special scanners are preprogrammed by state in the units memory. Just pick a state and a category. The Informant does the rest. All Informant radios have a feature called Turbo Scan™ to scan up to 40 channels per second. The INF1-SA is ideal for truckers and is only \$199.95. The new INF2-SA is a deluxe model and has ham radio, a weather alert and other exciting features built in for only \$239.95. For base station use, the INF5-SA is only \$149.95 and for those who can afford the best, the INF3-SA at \$209.95, is a state-of-the-art, receiver that spells out what service you're listening to such as Military, Airphone, Paging, State Police, Coast Guard or Press.

## Regency® HX1500-SA

List price \$369.95/CE price \$179.95/SPECIAL  
**11-Band, 55 Channel • Handheld/Portable**  
Search • Lockout • Priority • Bank Select  
Sidelit liquid crystal display • EAROM Memory  
Direct Channel Access Feature • Scan delay  
Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz.  
The new handheld Regency HX1500 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 55 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Includes belt clip, flexible antenna and earphone. Operates on 8 1.2 Volt rechargeable Ni-cad batteries (not included). Be sure to order batteries and battery charger from the accessory list in this ad.

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XE300-SA Uniden Cordless Phone ... \$69.95  
XE500-SA Uniden Cordless Phone with paging... \$84.95  
XE700-SA Uniden Cordless Phone with speaker ... \$114.95

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If you purchase a scanner, CB, radar detector or cordless phone from any store in the U.S. or Canada within the last 30 days, you can get up to three years of extended warranty service from Warrantech. This service extension plan begins after the manufacturer's warranty expires. Warrantech will perform all necessary labor and will not charge for return shipping. Extended warranties are non-refundable and apply only to the original purchaser. A two year extended warranty on a mobile or base scanner is \$29.99 and three years is \$39.99. For handheld scanners, 2 years is \$59.95 and 3 years is \$79.95. For radar detectors, two years is \$29.95. For CB radios, 2 years is \$39.99. For cordless phones, 3 years is \$34.99. Order your warranty for your merchandise today.

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BC 70XLT-SA Bearcat 20 channel scanner ... \$169.95  
R1090-SA Regency 45 ch. scanner... CLOSEOUT \$119.95  
Z60-SA Regency 60 ch. scanner... CLOSEOUT \$129.95  
UC102-SA Regency VHF 2 ch. 1 Watt transceiver ... \$117.95  
BPS5-SA Regency 16 amp reg. power supply ... \$169.95  
MA549-SA Drop-in charger for HX1200 & HX1500 ... \$84.95  
MA518-SA Wall charger for HX1500 scanner ... \$14.95  
MA553-SA Carrying case for HX1500 scanner ... \$19.95  
MA257-SA Cigarette lighter cord for HX12/1500 ... \$19.95  
MA917-SA Ni-Cad battery pack for HX1000/1200 ... \$34.95  
BP205 Ni-Cad battery pack for BC200/BC100XLT... \$49.95  
B-8-SA 1.2 V AA Ni-Cad batteries (set of eight) ... \$17.95  
FB-E-SA Frequency Directory for Eastern U.S.A. ... \$14.95  
FB-W-SA Frequency Directory for Western U.S.A. ... \$14.95  
ASD-SA Air Scan Directory ... \$14.95  
SRF-SA Survival Radio Frequency Directory... \$14.95  
TSG-SA "Top Secret" Registry of U.S. Govt. Freq... \$14.95  
TIC-SA Techniques for Intercepting Comm... \$14.95  
RRF-SA Railroad frequency directory ... \$14.95  
EEC-SA Embassy & Espionage Communications ... \$14.95  
CIE-SA Covert Intelligence, Elect. Eavesdropping ... \$14.95  
MFF-SA Midwest Federal Frequency directory ... \$14.95  
A60-SA Magnet mount mobile scanner antenna... \$35.95  
A70-SA Base station scanner antenna... \$35.95  
USAMM-SA Mag mount VHF ant. w/ 12' cable... \$39.95  
USAK-SA 3/4" hole mount VHF ant. w/ 17' cable... \$35.95  
USAK450-SA 3/4" hole mount UHF ant. w/ 17' cable... \$35.95  
Add \$3.00 shipping for all accessories ordered at the same time.  
Add \$7.00 shipping per radio and \$3.00 per antenna.

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## NEWS OF COMMUNICATION AROUND THE WORLD

*The Way of DXing has no favorites.  
It is always with the Deserving  
And the big amplifier . . . .*

**Y**ears back, in another decade or so, we asked the Old Timer, "Just what is DX?" We still remember the tersely cogent answer: "DX is anything you haven't worked!" Since then we have never forgotten nor ever stopped agreeing.

Recently a letter came from Steve Muster, G4UOL, who advised us of his plans for operating during some of the CQ WW DX Tests. Steve plans to be active from GW Wales over the last weekend in May and from GD4 Isle of Man during the last weekend in November for the CQ WW CW Test. What we remembered from the letter was not that it would be from Wales and the Isle of Man, but the feeling that Steve was thinking he would not make much of a stir in the DX tests. When the Old Timer came striding down the hill one warm spring morning, we thought again of his definition of DX and showed him Steve's letter. He found it interesting. He even gave a small smile.

"DX is always DX," he commented, "and I have difficulty accepting that any DX at all might have a lesser value. Working a country for the first time is always exciting, and when you are a newcomer to DXing, working any country at all is exhilarating. But one DX happening that has always stuck in my memory is the afternoon when in a burst of wild activity I worked England, France, and Germany in one wild half hour. Three new countries in a half hour! Can you appreciate how I felt?"

Of course we could. Scratch the surface of any DXer and you will find the memory of those first DX contacts. Here we could even recall our tentative efforts in a sweepstakes contest, just after gaining a license, and working Colorado. That was real DX to us then. Later we managed a WAC and as a DXer grew a foot taller. WAC is still a coveted award, possibly the first attained by a DXer, and it marks the entry into the DX world. You have found the door; the world is waiting for your call. DX will always be a relative thing—relative to your time in grade, your rung on the DXCC ladder, and the accumulated memories of the DX years. The more you DX, the more memories you will have to enjoy. That is something else that the Old Timer told us. "When all else is gone, you will still have the memories. And they will be good to have."

"Do you think that there might be much demand for Wales or the Isle of Man in a CQ World-Wide Test?" we asked the Old Timer, putting the question to him again more to hear him expound on one of his favorite themes than for anything else. "Always!" the Old Timer always delivers. Always emphatically, always definitively.



*Where do you find DXers? Apparently in airports. Here in the Tokyo airport five DXers from three continents met a few months back. From the left are Franz Langner, DJ9ZB, one of the world's top DXers and a member of the DX Hall of Fame, then AA6PY, VU2RBI, JG3LZG, and VU2MY, S.S.R. Murthy. Those should be familiar callsigns.*

"Years back when I was active in one of the early DX associations," the Old Timer continued, "when contests were near, there often came a query from a DXer with ambition for bigger things. They asked what might be a good DXing spot for the coming contest. Telling them that any place could be a DX spot was not always a desired answer, so I pointed to places like FW8 Wallis or VK4 Lord Howe. These were mentioned as there will always be some demand for them and both had commercial air service. Actually, if you have been DXing long enough, you will easily realize how DXing and DXpeditioning really thrived when the long-distance, overwater flights became common. Trips to distant or remote spots no longer involved journeys of several weeks, not if you would fly there. Every CQ WW Test brings a lot of Caribbean action. Think of what it might be if you had to travel, say, to Trinidad by boat for the contest. It would take a lot more than tossing the gear together and getting there overnight." The Old Timer was right. We really had not thought about it, but the ease of transportation these DX days certainly has brought a much higher level of DXing. But the Old Timer wasn't finished. He was rolling.

"You know something," he continued, "I never did learn of anyone who took my advice to head out to Wallis or Lord Howe for a contest, or any of the others I suggested. I got the feeling that mostly they were looking for a big-bore effort from an easily accessible spot, maybe something that would bring a wipe-out to the lower portion of the DX band. However, if you look at any of the needed lists of DXCC countries, you will always find some well up in the list which many DXers do not consider especially rare DX. Sometimes this comes when the country has not been on the air for some years and a need for it has developed; other times it is because the country only shows intermittently. Included in these are some of the

franchised countries such as Aves, possibly Mt. Athos, and others whose access is either limited or confined to a single group.

But countries can be found on a needed country list because they are needed by someone, but sometimes, perhaps oftener than we realize, needed countries will be influenced because of the area polled. It must always be remembered that such needed-country lists are not necessarily a world-wide consensus. You yourself have noted how the European DXers are often thirsting for something in the Pacific, that JAs are frequently found looking for something in the Caribbean, and some W/Ks find the Indian Ocean and East Africa a hurdle. DX is not only relative to your need, it is also relative to location. Right?"

We had run across the same hypotheses in other guises. DX can come easily if the country is near; at a distance it is another problem. Years back when we were tied closely to a weekly DX bulletin, a JA wrote about an upcoming Navassa operation, pointing out that the then KC4 was an extremely tough one for the JAs to work. The Deserving JAs needed help. Something just had to be done.

A plan, beautiful in its simplicity, was worked out. The DXpedition agreed to appear on schedule on a frequency far removed from their normal activity spot, this to be at times when propagation was usually open to the Far East. A station with a strong signal up in the Carolinas would act as control, even going to a list operation if necessary. In Japan the frequency would be announced just prior to the operation. The whole thing was on a down-hill, sure-shot track and could not miss. It did.

The JAs could hear the W4 loud and beautiful. The W4 could hear and work the KC4 bare-foot. But when the KC4 stood by for the JAs, nothing was heard. The terrain to the west on the JA path was higher and blocked the KC4 signal to Japan. None got through.

Malpelo can be considered another example. The often-used operating site is open to the east coast and Europe. The mountainous island blocks the signals to and from the west coast. There are still W6s needing Malpelo. Things have not been good for them. Queries on possible relocation of the operating position in other years brought firm assurances that the peaks on the island were not climbable. It had to be the traditional site or none at all. Then the last time out there was an effort to find a way up the mountain. A suitable path was found, and a flat operating position atop Malpelo was mapped out. Always keep your hopes. Something good always will come to the needy DXer. Possibly even Malpelo the next time out.

Recently, OH2BH was reported as studying the need in Europe of XF4 Revillagigedo. Here in the western reaches it is well known that Jose Levy, XE1J, has supplied this one over the years. And if you quickly ask, "Who needs it?" apparently a number of Deserving in Europe might need it. Even though Clipperton has been on a number of times in the last ten years, there are still Europeans who need it, who still are waiting wistfully but hopefully for the next

77 Coleman Drive, San Rafael, CA 94901

## The WPX Program

### Mixed

1323 ..... VE7CXN 1326 ..... IN3RWH  
 1324 ..... F1HWP 1327 ..... YU2NA  
 1325 ..... JA9BEK 1328 ..... DF2PI

### SSB

1940 ..... JH1MQC 1944 ..... KA5W  
 1941 ..... KA8MVJ 1945 ..... KI6BU  
 1942 ..... KB0G 1946 ..... EA4CQT  
 1943 ..... DL7AIO 1947 ..... EA5BYP

### CW

2493 ..... JO1QUB 2495 ..... KA5W  
 2494 ..... KB0G 2496 ..... EA8UH

### WPX

232 ..... KA9VNH

### Endorsements

Mixed: 450 F1HWP, WA3LJP, IN3RWH, W3FOU, K4MEF, 500 F1HWP, WA3LJP, IN3RWH, W3FDU, KD2JC, 550 F1HWP, KQ2M, 600 F1HWP, KA5W, KQ2M, 650 F1HWP, KA5W, KQ2M, AK0G, 700 F1HWP, KA5W, KQ2M, AK0G, 750 F1HWP, KA5W, KQ2M, AK0G, 800 KA5W, KQ2M, AK0G, 850 KA5W, KQ2M, AK0G, 900 KA5W, KQ2M, AK0G, 950 KA5W, 1000 KA5W, 1050 I1ZEU, KA5W, JA6GWU, K7CU, 1100 I1ZEU, KA5W, JA6GWU, K7CU, 1150 KA5W, JA6GWU, K7CU, 1200 KA5W, K7CU, 1200 KA5W, 1300 KA5W, 1350 KA5W, 1550 KL7AF.

S.S.B.: 350 JH1MQC, WA3LJP, KB0G, KA0ZFX, KA5W, EA5BYP, EA4CQT, 400 WA3LJP, KB0G, KA5W, EA5BYP, EA4CQT, 450 WA3LJP, KB0G, KA5W, EA5BYP, EA4CQT, 550 WA3LJP, IK8GCS, KA5W, EA5BYP, EA4CQT, 600 WA3LJP, IK8GCS, KA5W, EA4CQT, 650 F1HWP, KA5W, I3ZSX, EA4CQT, 700 F1HWP, KA5W, I3ZSX, EA4CQT, 750 F1HWP, KD9OT, KA5W, KS3F, 800 KA5W, 850 KA5W, 900 KA5W, AC3T, 950 KA5W, AC3T, 1000 KA5W, 1250 W4UW.

CW: 350 KB0G, KA5W, EA8UH, 400 KB0G, KA5W, EA8UH, KQ2M, 450 AC5K, KB0G, KA5W, EA8UH, KQ2M, 500 AC5K, KB0G, KA5W, EA8UH, KQ2M, 550 AC5K, KB0G, KA5W, KQ2M, 600 AC5K, KB0G, KA5W, KQ2M, 650 AC5K, KB0G, KA5W, KGSSH, KQ2M, 700 KB0G, KA5W, G4SSH, 750 KB0G, KA5W, NF5Z, 800 KB0G, KA5W, 850 OK3PO, KB0G, KA5W, 900 OK3PO, KA5W, 950 OK3PO, KA5W, LA9XG, 1000 OK3PO, 1850 W8RSW, 1900 W8RSW, 1950, 2000 W8RSW, 2050 W8RSW, 2100 W8RSW, 2150, 2200 W8RSW, 2250 W8RSW, 2300 W8RSW, 2350 W8RSW, 2400 W8RSW, 2450 W8RSW, 2500 W8RSW, 2550 W8RSW, 2600 W8RSW, 2650 W8RSW.

10 Meters: W9IAL, KA5W

15 Meters: IT9CVE, F1HWP, KB0G, KA5W, VE1ACK, AA4LB

20 Meters: F1HWP, KB0G, IK8GCS, KA5W, AK0G, VE1ACK

40 Meters: W4ZYQ, OK3TAY, KB0G, KA5W, AK0G, KD9OT

80 Meters: KB0G, KA5W, AK0G

160 Meters: KB0G, KA5W, DL0JI, I0AMU

Asia: F1HWP, KB0G, IK8GCS, KA5W

Africa: KA5W

No. America: KB0G, KA0ZFX, KA5W, DL9JI, AK0G

So. America: KA5W, K7CU

Europe: F1HWP, KB0G, IK8GCS, KA5W, AK0G

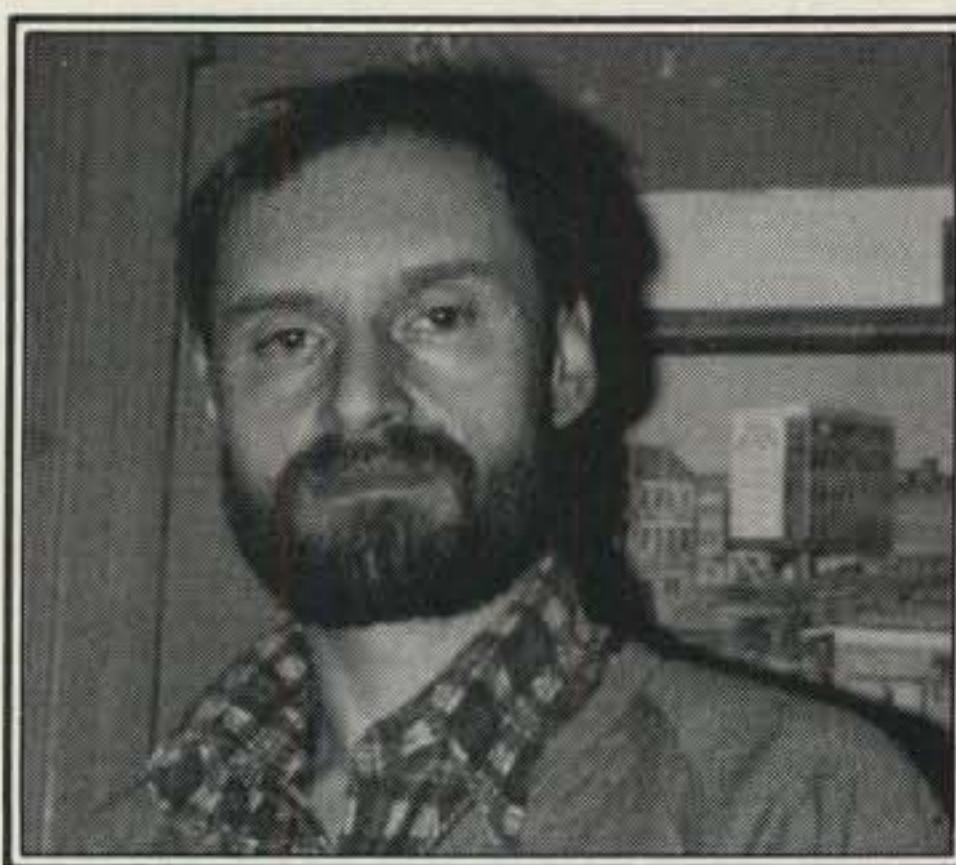
Oceania: K3UA, HA8XX, KA5W, WN4KKN

Award of Excellence Plaque: KA5W with 160M Endorsement

Award of Excellence Plaque Holders: K0JN., W4VQ, KF20, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQQ, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YLW4, NN41, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, WL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, WK9NS, DE0DXM, DK4SY, UR2\*\*, AB90, FM5WD, I2DMK, W4BQY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, HI8LC, KA5W.

Award of Excellence Plaque Holders with 160 Meter Endorsement: LA7JO, W4VQ, K6JG, W4CRW, N4MM, SM0AJU, KF20, K5UR, OK1MP, N5TV, W8CNL, W1JR, W6OUL, W4BQY, W5UR, N4NO, W8RSW, N4KE, I2UIY, W8ILC, W1BWS, NN4Q, G4BUE, LU3YLW4, I4EAT, VE7WJ, W9NUF, N4NX, VK9NS, DE0DXM, K9BG, AB90, FM5WD, SM0DJZ, DK5AD, SM6CST, I3JQJ, W3ARK, HI8LC, KA5W, UR2\*\*, VE3XN, K6XP.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to CQ WPX Awards, P.O. Box 1351, Torrance, CA 90505-0351 U.S.A.



*This is G4PEF, Professor Winston Ingram, from the London area. What is the professor's discipline? Why it's HF DXing, naturally! We are surprised you had to ask!*

one to be announced. Here every week we pass the Colvin QTH on the east shore of the bay. Often we have harbored the thought that if we just stopped and yelled, Lloyd or Iris would show on the top deck. But that does not mean they would be that easy to work when they are halfway around the world even though they try every time to cover all the needs at every stop. If we stopped and yelled it would be a local QSO, but when they were in Nepal it would be nothing but DX. DX means distance. It also means, relatively speaking, difference. Most everyone on the DXCC list needs something, and sometimes it is a surprise to learn just what is needed. One of the Locals here reminds us every time we meet that he has a Burma QSL. And this one is not even a DXer, hardly Deserving at all. And what does he say? "Just worked it one morning when tuning around," he always tells us, apparently enjoying our reactions. "Incredible," we say, and that pleases him. We ourselves would enjoy being just as pleased with a Burma QSL on the wall.

"What might we advise Steve to do?" we asked the Old Timer finally. "Do you think he will get much attention signing GW4 or GD4 in the CQ World-Wide Contests? Are there really many DXers who might need those countries?" The Old Timer actually laughed at our question. And we could not think of anything humorous that had been said.

"There will always be someone needing the Isle of Man or Wales," he was quick to answer, "and it possibly would not take a lot of effort to ensure that a GD or a GW station might get a lot of attention. When you consider operating from a DXCC country that has not yet reached the top ten of the needed countries, you should consider doing a bit of tilling in the DX vineyard. Try to figure out where the country might possibly be needed, and usually these will be countries most distant. Going to Wales Steve might consider that the JAs would be wanting to work Wales, some needing the Isle of Man. The far side of South America should be considered as well as the middle and south Pacific. Study the propagation charts and aim to operate at the times the paths are open to those distant points, maybe their twilight paths. Alert the DX clubs in those distant countries, ask them for suggested times and frequencies, and even offer to show on schedules. Do a bit of campaigning. Get the word out and let them know that Wales will be available. And this

should not apply just to Steve's operation. A bit of advanced planning is worth a lot more than some post-operation realization of oversights and errors. Tell Steve or anyone else to do the spadework. It will pay off."

"You are saying that it pays to advertise, even by a DXpedition, right?" we slipped in and found that our sagacity was hardly needed at all. "When does it not pay?" the Old Timer growled, and we had to acknowledge that he was right—again. We shifted and headed towards another quadrant.

"Steve likes CW," we quickly interjected, "high-speed CW. He does it well, being a member of the DARC High Speed Club." We were thinking that the Old Timer would consider this a plus, and he did.

"Good," the Old Timer commented. "Maybe I'll make a note to look for him myself. Good, fast CW is always a pleasure and always the mark of a good operator." We could see that the Old Timer was getting interested, a natural condition that shows every time a CQ World-Wide Test approaches. "You say his call is G4UOL," he inquired, "and he will be signing GW4UOL/A in the WPX the last weekend in

## The WAZ Program

### 10 Meter Phone

316 ..... JR4ABB

### 15 Meter Phone

252 ..... W6EUF

### 20 Meter Phone

645 ..... K2HPR 648 ..... IK4BQX  
 646 ..... JL1EDB 649 ..... JH1XYR  
 647 ..... EA5BD

### 15 Meter CW

123 ..... DK4CU 124 ..... N4KW

### 20 Meter CW

279 ..... KD7SO 281 ..... JH1XYR  
 280 ..... JR1CVU 282 ..... JJ1FSK

### 40 Meter CW

71 ..... OH3RF 72 ..... JH1XYR

### All Band WAZ

#### SSB

3167 ..... 6W1CK 3172 ..... EA4CQT  
 3168 ..... JA9BEK 3173 ..... EA5BYP  
 3169 ..... IT9CUE 3174 ..... EA5AYD  
 3170 ..... DL1FBW 3175 ..... K8WWA  
 3171 ..... KB7TQ

#### Phone/CW

6243 ..... W9ROK 6250 ..... N6AR  
 6244 ..... JA9BEK 6251 ..... ZS1WQ  
 6245 ..... GM3TRI 6252 ..... G4SSH  
 6246 ..... W7HHP 6253 ..... K0IYF  
 6247 ..... YT3AM 6254 ..... KA2HMJ  
 6248 ..... KY2O 6255 ..... WK5Q  
 6249 ..... KY2O (CW) 6256 ..... HA9RT

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (39 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Leo Haijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all C.Q. awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

## 5 Band WAZ

As of February 1, 1988 164 stations have attained the 200 zone level.

New recipients of the 5 Band WAZ with all 200 zones worked:

N6DX	N6AR	FM5WD
DJ5JH	HC5EA	OH8SR
JA3MNP		

The top 11 contenders for 5 Band WAZ are:

- |                |                |
|----------------|----------------|
| 1. N4WW, 199   | 7. W2YY, 198   |
| 2. K6YRA, 199  | 8. W7UR, 198   |
| 3. SM0BZH, 199 | 9. K9GX, 198   |
| 4. W8UVZ, 199  | 10. G4BWP, 198 |
| 5. K4CEB, 199  | 11. EA5AD, 198 |
| 6. SP6JCY, 199 |                |

448 Stations have attained the 150 Zone level.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (39 cents) size 4½ x 9½ to the WAZ Manager, Leo Huijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

May and GD4UOL/A in CQ World-Wide DX Test the last weekend in November? Both in the CW effort. Do I have it right?"

"You do," we were quick to say. "I'll be looking for him myself," the Old Timer said, and he was off striding down the hill. He also strides up the hill, this being something impressive to see. Later we thought of things, mostly DX, and how a bit of advertising never hurt any enterprising DXer.

Anyone thinking of operating during one of the CQ DX or WPX Tests at some exotic spot, maybe even mildly exotic, should acquire a list of the DX bulletins, both foreign and domestic. These will spread the word of the coming great DXpedition. It always pays to advertise *before* you go, giving the grand largesse that will be available, and *after* you return, advising of the great accomplishments, the dangers faced, and the QSO totals. Photos should always be considered necessary—not photos of the rig, as rigs have blank personalities, and once you have seen one you can say you have seen them all. Photos should show sturdy, smiling DXers, the faces dominating the photos, the background secondary but sometimes useful.

You should know the publishing schedules of all sources of information for the DXers, both bulletins and magazines. DX bulletins will always cooperate, but they like to have the information in hand early and always in time to print prior to the effort. Magazines want and need it even earlier. Most DX or amateur radio magazines want and can easily handle photos. Often DX bulletins have a limited ability to handle the pictures. Hesitate not in spreading the gospel. Always be up front in telling of your DX saga. And always study and remember the DX adage "DXers never tire of hearing or reading about DXing; DXers never tire of hearing about other DXers!" And that is a truism, absolutely. Do your own research and you will find that Aesop might have first said that. Or was it Lao Tzu, the early BY DX type? For sure it was

some DXer who said it. There's no doubt about that at all.

In DXing someone always needs something. That has always been the mainstream truism of DX. And the demand will never run dry. This is WPX season, the CW go-round at the end of May.

## DXCC Study Report

The ARRL Board of Directors in July 1986 directed that a study be made of the DXCC—what, if any, changes might be needed; what improvements might be considered; and what other areas might need study and possible changes. The DX Advisory Committee delivered a report on its findings at the January 1988 ARRL Board meeting. The major points in the report are included in the following paragraphs.

While there were many suggestions on changes as well as many declarations against changes, the net result was that DXers were generally opposed to any major restructuring but did point their fingers in various directions with suggestion for changes. Some were considered and rejected; some were adopted.

By the time you read this, the full text of the report should be available and presumably in QST. All DXers should read it to keep current and to get an understanding of any of the changes as well as the new single-band 10, 80, and 40 meter DXCC and the starting dates.

Summarizing briefly, it was found that the newer DXers favor the single-band DXCC, this being the result of the DXAC poll. Previously it was assumed that the elder statesmen of DXing would be the ones in favor. The report said that generally the rule was that the Honor Roll opposed, while the newly minted ones approved. It was noted that the country accreditation rules brought more complaints and differences than anything else in the DXCC program. The DXAC proposed changes to clarify the country list criteria, this including attention to government, separation by water, separation by another DXCC country, deletion criteria, and accreditation criteria.



Prudent Leon, FM5WD, pops a bottle of champagne, and all the DX types on Martinique hold a convention. All this was to celebrate FM5WD's getting the final card for a 5 Band WAZ. Hoisting a glass on the left is FM4EB, Dominique, over the head of FM5WG, Guy. Behind the bottle is FM4DS, Yves, and holding out his glass for more is FM5WW, Fred. Holding the bottle and the paperwork is FM5WD, Prudent. On right front is FM4DN, Lucient, and the smiling face in the center is KC7EL, bubbling with delight over his timing. He was on vacation in Martinique.

There was attention given to the proposed use of the Law of the Sea conferences and the criteria that evolved to designate sovereignty or economic zones as a basis for the DXCC country criteria. This was among the suggestions received, the committee noting that many were considered but not adopted. Some were impractical, and others were not considered in the best interest of the DXCC program.

While a majority of respondents thought that some countries should be deleted, no simple solution could be uncovered in the discussions. Dropping the long inactive countries was not thought to be in the best interests. The other reasons for deletions were considered, but it was felt that the whole country list would suffer and be decimated if all the proposals were enacted.

There was consideration given to the ever growing burden of checking QSL cards for DXCC credit. It was suggested that card counters be enabled with the title of Volunteer Verification Specialists and thus energized to take over the costly burden now done at ARRL headquarters. It was noted in making this recommendation that this would pave the way for possible future decentralization of the DXCC Awards Program.

Undoubtedly there will be some who question why their suggestions were not accepted and put into the small changes made. Others will be satisfied that things were pretty much left alone. Considering that the DXCC goes back some half-century, it is remarkable that it has endured until now with so few changes made on the original rules.

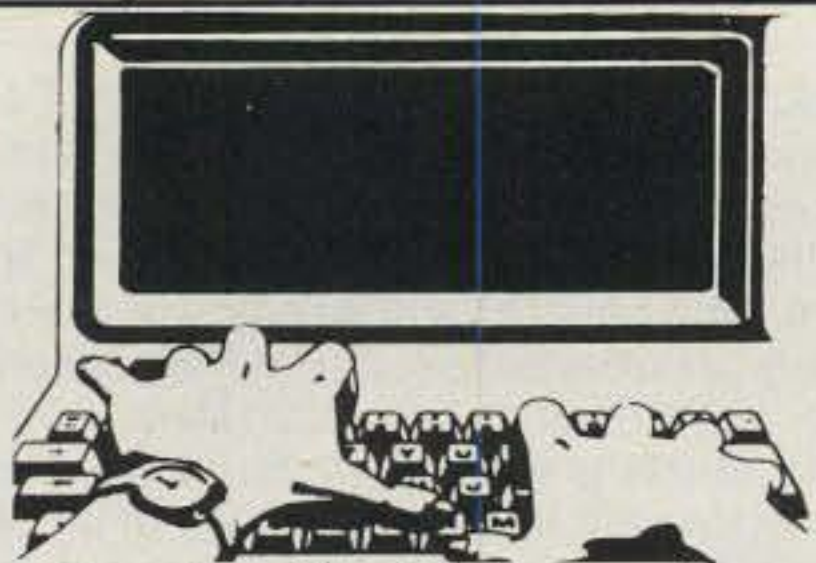
## IARU

Remember WARC 79, the International Telecommunications Union meeting in Geneva? If you remember that you have been around the track a couple of times. That meeting was memorable for a number of reasons, one being that it resulted in the 10 MHz, the 18 MHz, and the 24 MHz frequency segments for amateur use.

But that is history, and as many amateurs have been heard to say in club meetings, "Don't tell me what you did for me yesterday; tell me what you are going to do for me tomorrow!" And tomorrow for the amateurs may have a date of around 1992. It's coming!

W1RU, the president of the International Amateur Radio Union, notes that not only is the next meeting getting to be a sure thing, but also it takes a lot of preparation to ensure that such meetings will be successful. Dick Baldwin also notes that while there are specialized WARC's which may meet in between meetings of the General WARC's, there have been problems in such WARC's solving their own problems. Such solutions may deal with their specialized services, but they do not have authority to effect changes which affect other services. Thus, such problems have to be carried forward to and presented at General WARC's whose rulings can cover, and do, all of the telecommunication services. Thus, for the amateurs, the preparation must be more than the compiling of a wish list.

While a firm decision on a WARC may not be made until next year, W1RU notes that it is time to study possible changes which might and probably will be proposed and to develop the strategies needed. For example, the high-frequency broadcasters say that their allocations set at WARC 79 are not sufficient and they need more spectrum. Where? Well, the



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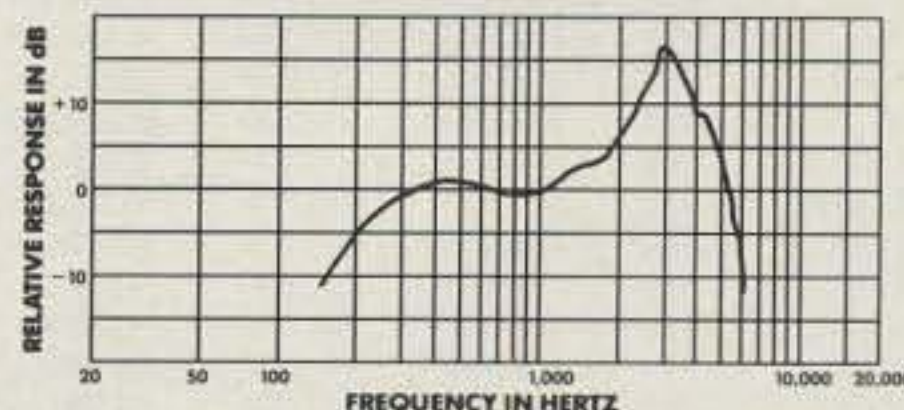
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## CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Total countries are now 317. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be made at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement. All updates must be accompanied by an SASE for confirmation. The fee for endorsement involving the issuance of a sticker is \$1.00.

### CW

W9DWQ	318	W2FXA	312	K8PYD	305	DJ7CX	297	I8WY	286
N4JF	318	DL1PM	312	N4KG	305	K8LJG	297	G2GM	282
K4CEB	317	K4XO	311	AB4H	304	WD9IIX	296	JH1VRQ	282
W6PT	316	N6AR	311	W0IZ	303	N5FW	294	K1VHS	282
ON4QX	316	DJ1XP	311	WA8DXA	302	W0HZ	293	WA4DAN	281
K9MM	316	W6ID	311	EA2IA	302	WD9IIC	292	K2OWE	281
N4PN	315	DL3RK	311	YU1HA	302	N5DX	291	N4AH	281
DL7AA	315	K9QVB	311	YU2TW	301	WA4JTI	290	W1WAI	281
N6AV	315	K1MEM	310	I3OBO	301	KQ9W	290	K7ZR	280
K6LEB	315	OK1MP	310	K3UA	301	W1WLW	289	I5XIM	280
W1NG	315	N4MM	310	IT9QDS	301	W4BV	289	W2LZX	280
W8KPL	314	AA6AA	309	W6SN	300	N8MC	289	W9NUF	280
K6JG	314	DL8CM	309	WB4RUA	300	K8NA	288	HB9AFI	279
N6CW	313	W9BW	309	W0SR	300	W9WAQ	288	DL1QT	277
K9AB	313	DL1PM	308	DL6QW	300	W6YQ	287	W9SC	277
SM6CST	313	W9RY	308	W7CNL	299	NN4Q	286	KA3R	276
K6EC	312	W4OEL	307	K3FN	298	K9BWQ	286	K4SE	275
W4BQY	312	SM3EVR	307	K9IW	298	K4CXY	286		

### SSB

K2FL	318	N6AW	314	K9IW	307	WA2MID	300	EA3KW	287
W6EUF	318	W8ILC	313	W2FGY	307	NW5K	300	AB9E	287
DJ9ZB	318	EA4LH	313	NJ2C	307	WB6GFJ	300	W5LLU	287
N4JF	318	W8PCA	313	K3UA	307	JH1VRQ	300	G3XTT	287
K6WR	317	N2SS	313	KR9O	307	WA0TKJ	299	XE1MDX	287
VE3MR	317	VE7WJ	313	W8IMZ	307	I6PLN	299	WD9GQV	287
DL9OH	317	K4XO	313	K2JLA	307	KA8T	299	N8BJQ	286
I8AA	317	K9BWQ	313	N4KE	306	DJ7CX	298	N3ARK	286
W4UG	317	OE2EGL	313	KC8EU	306	K9SM	298	N2CIC	286
W9DWQ	317	DL6KG	313	KB5FU	306	I8LEL	298	K9MNT	285
I0ZV	317	F2MO	312	K8CMO	306	JH4PRU	298	KB5RF	285
VE1YX	317	K8PYD	312	XE1OX	306	EA9IE	298	I8IGS	285
DJ1XP	317	W0SD	312	NY5L	306	XE1NI	298	KD8V	284
ZS6LW	317	K9RF	312	EA1QF	305	KC8YM	298	KD7EM	284
OZ3SK	317	K4MQG	312	NA5W	305	K5DUT	297	WB3HAZ	283
KD8VM	317	I8ACB	312	KZ8Y	305	HP1JC	297	VE3MV	283
W4NKI	317	K9HDZ	312	PY2DBU	305	YU7KV	297	IN3ANE	283
F9RM	317	LA7JO	312	K8VVF	305	XE1OW	297	ZP5JCY	283
W4EEE	316	LU3YL	312	WB4UBD	305	K2JF	297	K4JLD	283
I0AMU	316	W8JXM	312	K4RIG	305	WB3GPR	296	CX4HS	283
T12HP	316	W7FP	312	K9HOM	305	KQ9W	296	AE5B	282
KS2I	316	N6OC	312	VE7DX	305	KB3KV	296	G4GED	282
YV1KZ	316	SM4CTT	312	W6BCC	304	W4BQY	296	AI9R	282
ZL1AGO	316	W4SSU	311	WA4DAN	304	I0SGF	296	TG9EP	282
W9JT	316	K6EC	311	WB3DNA	304	W0IYR	295	N1ALR	282
VE3GMT	316	I4LCK	311	KB4HU	304	KK0C	295	KC2FC	282
4Z4DX	316	W0SR	311	XE1KS	303	W6MFC	295	F6BFI	281
W4DPS	316	K8NA	311	W2LZX	303	KA9ABC	295	K9TI	280
K6YRA	316	NJ0C	311	KB0U	303	VE3XO	295	ZL1BOQ	280
W3AZD	316	N6AHU	311	K0GT	303	W0ULU	295	G4FAM	280
ZL3NS	316	IV3YRN	310	K1MEM	302	I8ZTE	294	KU9Z	280
N4MM	316	DK2BL	310	N5FG	302	WD0BNC	294	VE6PW	280
OK1MP	316	AA6AA	310	W6FET	302	I5BDE	294	XE1XM	280
PY1APS	316	WA4JTI	310	K9HQM	302	K1VHS	294	KA3HXO	280
W0YDB	316	9H4G	310	I3OBO	302	WB3CQN	294	WB6PSY	280
VE2WY	315	AB9O	310	K9UAA	302	SM6CST	294	KB5DN	279
XE1AE	315	W7OM	310	KP4EOF	302	W4UW	294	EA6DE	279
I8YRK	315	W2CC	310	AI8M	302	KE4HX	294	JH8NYK	279
N6AR	315	WA4WTG	310	N5FW	302	K4SE	293	KX5V	279
I4ZSQ	315	G4CHP	310	I5EFO	302	KC8JH	293	K4BYK	278
I8KDB	315	WD8MGQ	310	I2MQP	302	AI5I	293	VE3IUE	278
W9BW	315	VE3MRS	310	K4CXY	302	K4LR	293	KB8O	278
K9LKA	315	K1UO	309	WD8PUG	302	W9NUF	293	KG9N	278
N4WF	315	KU9I	310	WB4NDX	301	AG9S	293	WB6OKK	278
K9MM	315	N4PN	309	WA3HUP	301	KD5ZM	293	KB7VD	278
OZ5EV	315	W6DN	309	VE3FJE	301	WA2FKF	293	WB0UFL	277
N7RO	315	ZL1BIL	309	W8LFC/QRPP	301	WA4LOF	292	W4PTT	277
W2SUA	315	WD9IIX	309	W9OKL	301	AC0A	292	KB0SY	277
OE3WWB	315	N2KW	309	YU2TW	301	VE3FEA	292	I8XTX	277
YU1AB	315	KB8DB	309	N4CRU	301	VP9CP	292	IK8BQE	277
ON5KL	315	K9QVB	309	KZ0C	301	W8LKG	292	N0AMI	276
CT1FL	315	VK4VC	308	N8BKF	301	SV1JG	292	N7ASL	276
OZ8BZ	315	YV5AIP	308	KZ2P	301	VE3DLR	292	WA6DTG	276
YV5DFI	314	N6AV	308	KE3A	301	VE3IPR	291	WA4OPW	276
K6JG	314	AI8S	308	WT4T	301	N5AWS	291	KC2RS	276
W0SFU	314	N4KG	308	NN4Q	301	W4JFE	291	WA9IVU	276
VE3XN	314	I8KCI	308	YV1AJ	301	DU9RG	291	WA9RCQ	276
YS1RRD	314	W6SN	308	K3LUE	301	XE1CI	291	K0HQW	276
K8LJG	314	I4EAT	308	K8ZZU	301	VE3CKP	290	I8INW	275
W3GG	314	NS7Z	308	K7LAY	301	KB2HK	290	WB1EAZ	275
I2LLD	314	VE4SK	307	I1POR	300	JA5PUL	289	VE7BSM	275
K9AB	314	WB1DQC	307	KB9KD	300	W9TA	289	K8NWD	275
K5OVC	314	I0MBX	307	KB3OQ	300	G4ADD	289	VE5FX	275
W9SS	314	KV2S	307	VE4AT	300	KS0Z	289	KE4VU	275
W1NG	314	KB9OC	307	WZ4I	300	AI9U	288	N9CPW	275
W1LQQ	314	VK3JF	307	WB5TED	300	OK1AWZ	288		
EA2IA	314	KZ2P	307	I2ZGC	300	KI3L	287		

thinking is that a bit more room around 7 MHz would be nice. And how about the UHF and microwave areas? W1RU notes that there is real difficulty in finding room in the existing spectrum for additional allocations. He looks for heavy pressure on the amateur allocations at 420-450 MHz and above 1200 MHz.

All of this is yet a bit in the future. Maybe something will solidify next year, but the IARU member societies are thinking that now is the time to prepare, and you should hear a lot more before long.

Times change. They always do. In other times those with long memories will remember when amateur frequencies were coveted, these generally being the HF amateur bands that were considered in peril. Check the amateur allocations of years back and you will find that amateurs have been successful in generally hanging on to what we deserve, and have, possibly more than realized, gained a bit along the way.

Forty years back 3.5-4.0 MHz was the same band as now, 40 ran from 7.0 to 7.3 MHz, but 20 was from 14.0 to 14.4 MHz. Some 50 kHz have been lost. There was no 15 meter band, but there was the 11 meter band from 27.16 to 27.43 MHz. Though this band is still active, not many DXers are found there these days. You probably recognized it as the CB arena. Then 10 meters ran from 28.5 to 29.7 MHz and it still does.

What does all this mean? In the words of the Hero of Mafeking, "Be Prepared!" The amateur allocations have not continued because they are carved in stone. They are a result of amateur effort to defend and enhance them. With another WARC starting to shape up, there will be a need to be informed and to participate where possible. Read the IARU news where available. Utilize all the frequencies available and do not let the next WARC come on you unexpected.

### The Long Look

Possibly more than one DXer has come to realize that a better understanding of the DX present is often gained by knowing more about the DX past. Dig out an amateur magazine from 40 or 50 years back and you cannot help but find something interesting, something new in DX knowledge, and perhaps even again an idea that was raised back then but still needs attention these days. Recently we were looking at QST for 1938.

There was DX back then, DXers were working hard to corner new ones, and there were even reports on DX expeditions. The word DXpeditions did not show until a couple of decades later. Back in 1938 in the March issue W8IGQ told of his experiences as the radio operator on the schooner *Yankee*, making a circumnavigation of the world starting in 1936. More travel than DXing, it was still interesting. In the June issue was the story of the Archbold expedition to New Guinea, this anthropological effort including an amateur station signing PK6XX. July had a report on the Bartlett expedition to the Arctic with W2DBS signing the expedition call W10XDA. August told of the Gatti African Expedition to the Belgian Congo and the amateur operation OQ5ZZ. The expedition was studying elephants and doing research on the Mulahu, "the mysterious and still unknown fifth anthropoid."

What was the Mulahu? We would like to tell you more, but could not find any reference to it in any encyclopedia or even the oversized dic-



## CQ DX Awards Program

### SSB

1588	JA9MQ	1591	VU2SMN
1589	KB4HU	1592	EA4CQT
1590	N2KW		

### CW

717	HA8XX	719	DJ2PJ
718	TF3SD		

### SSB Endorsements

310	W6EUF/318	300	K9HOM/305
310	DJ9ZB/318	300	KB4HU/304
310	N4JF/318	300	K7LAY/301
310	W9DWO/317	275	VE3DLR/292
310	N4MM/316	275	KSQZ/289
310	DL6KG/313	275	N2CIC/286
310	K1UO/310	275	N9CPW/275
310	G4CHP/310	275	WA9RCQ/275
300	N2KW/309	200	EA4CQT/229
300	K9QVB/309	28 MHz	VU2SMN
300	NS7Z/308	28 MHz	I2EOW

### CW Endorsements

310	W9DWO/318	275	W9WAQ/288
310	N4JF/318	275	K8NA/288
310	K9QVB/311	275	W6YQ/287
310	N4MM/310	275	I8WY/286
28 MHz	HA8XX	250	DJ2PJ/262
3.5/7 MHz	HA8XX	150	HA8XX/181
310	DL3RK/310		

Total number of active countries is 318. 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 s.a.s.e. 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 air-mail reply. Please make all checks payable to the awards manager.

tionaries. Possibly it was an early model of Big Foot, but that is only a presumption.

Back in 1938 amateurs were jumping in apprehension over a hot rumor that the FCC was going to assign spot frequencies in the amateur bands, this being done in the other parts of the spectrum but not in the amateur bands. It still isn't being done, but it raised a lot of hackles back in 1938. K.W. Warner at the ARRL was editorially noting that no recordings had been made of amateur signals in other years, he mentioning ten years back, and he was pointing out that such records would show the contrast with the present-day 1938 signals and show how tremendous strides had been made in the amateur radio technology.

In 1988 there were all of 80 calls on the DXCC roster with G6WY leading the list with 140 countries. The Honor Roll had not yet come into being then. Just making DXCC was then the ultimate honor . . . almost.

A radio magazine should never be discarded. They grow in value over the years and they bring a knowledge of past DXing that possibly cannot be found anywhere else. They cannot be equaled for giving a feel of what it was in the past. While it might be sometimes thought that history is what happened yesterday, or forty years back, it is today and you may want to recall it tomorrow, or forty years hence.

## Nepal

Though there has been a good amount of activity out of Nepal in recent months, it has long



Where do you find a familiar face? Everywhere if you are a DXer. Here in Kathmandu were JA8RUZ on the left, then Iris Colvin, 9N5QL, Lloyd Colvin, W6KG, Father Moran, 9N1MM, and JH1LKH. The photo taken by JH7WKU when the JA-UNICEF Ham Club was departing after their 9N7YDY operation.

been known to many DXers that if Father Moran had not been there to listen for the Deserving, 9N1 at times would have been among the rarer DXCC countries. It is still prime DXing, but not often one for which the DXer has to suffer to work.

But that is not the subject here. Recent months have brought another example of the international scope of DXing, and the accompanying photo will show it.

The 43rd anniversary of the birth of the King of Nepal was celebrated by the Japanese UNICEF Ham Club when they activated 9N7YDY. They opened on December 21st, operated for a week, and made 5200 QSOs from 160 to 10, working CW, SSB, and RTTY. They were able to put 160 on the air for the first time in 10 years, making 164 QSOs.

Learning that the Colvins were in the area, the JAs went to their hotel at Patan outside Kathmandu to meet them and help set up their station.

On the JA's departure, the Colvins along with Father Moran came out to the airport to see them off on their return trip. Enroute they stopped at Bangkok to visit HS0B and were invited to dinner at HS1YL's QTH. During the stop in Bangkok they were able to meet HS1DC, HS1KJ, and HS1CN, as well as HS1YL and HS1FAR. They noted that the club station HS0B would be closed at the end of the month back then, the new licensing program to start with the New Year with operating licenses issued to individuals with individual call signs.

QSLs go to JA8RUZ. Included in the UNICEF 9N7YDY effort were JA8RUZ, JN1XWO, JH7WKU, JH1LKH, JA7BOB, and JA7XBG. During their activity in Nepal they were given continuing support by 9N1MC, K.B. Khatry, the Chief Engineer at the Nepal Ministry of Communications who has been helpful to other DXers.

Minekazu Sugiyama, JH1LKH, has been active in a number of DX efforts, operating as HS0C in 1986 and JA2NQG/JD1 in 1987. His efforts always include 160 and 80 meters. He has a number of planned operations for this and next year, these including KH2/KH0/FK/YJ/FW/VK9L, and he notes that if he does not make them all, he surely will make most of them and the rest will be handled at another time.

Stop and consider how much of this would have been an enjoyable effort had DXing not

been a common bond. In Kathmandu, in Bangkok, and at a lot of other stops, DXers never come as strangers.

## Isle of Man/Wales

You might have passed it, but G4UOL will be out in the CQ DX Tests this year to check whether the Isle of Man or Wales is really DX or just a WPX counter. Steve will operate CW from May 21st to June 4th, across the CQ CW WPX Test signing GW4UOL/A. From November 19th to December 3rd he will be in the CQ WW DX Test, again the CW portion, and this time signing GD4UOL/A. Look for him from 0000Z to 1600Z each day. His CW can be high speed, and he will check you out giving his QTH, Cronk-y-Veddy. It could have been worse. Steve will want to show that Wales or the Isle of Man is still DX by the number of contacts he makes.

## Some DX Notes . . . or Something

EA3AIR notes that henceforth EA prefixes with the 0 number are reserved solely for HM The King of Spain, or for special-event stations, and only during the time the King is present in the city where the special event takes place. This decision by the Spanish authorities was effective for any EA0 calls used since September 1987. It is mandatory for foreign visitors to use their home call /EA when operating in Spain. EA call holders operating outside their own district in Spain must also use the /EA plus the number of the district in which they are operating. Without the number it is considered an illegal call.

As long as we are tossing up some WPX notes, Norm Koch, K6ZDL, notes that the 160 endorsement bar for the Award of Excellence now costs \$5.25, this being a raise by the engraver.

There has been a report that some VU-DX types are making inquiries on the possibility of putting on an operation—in Burma. They are talking. Something might happen, but it will be difficult. S0RASD has been showing on 3777 after 2200Z on some days. The DXCC Desk and its trusted colleagues have accepted S0 for credit though there are some details to be worked out. Included in the discussion is whether this is Rio de Oro, the deleted one, under a new regime or a partition problem. It is reported that fighting still continues in the northern portion of the area, and while the status of S0 may be just a bit settled, who controls what in the former Spanish territory is yet to be decided.

The amateur radio society in Finland, SRAL, will again hold its summer camp this year, this being from July 20-24th. It will be in Solvalla, some 20 miles or less from downtown Helsinki. The Radio Club of Espoo and the Radio Club of the University of Technology are the hosts, and some 1500 visitors are expected. What do they call it? HAMI 88! If you should want more details, write HAMI, Box 73, SF-02231 Espoo, Finland.

While we are covering the European beat, note that RSGB, the Radio Society of Great Britain, will celebrate its Diamond Jubilee this year, it getting started in 1913. On August 8th NRRL, the Norwegian national society, will celebrate its 60th anniversary.

What do you do when you work a special-event station? Sometimes it is nothing but worry—worry and wonder what you really did work. CT1UA notes he is worried about DX bankruptcy and the loss of IRCs after futile ef-

## 5 Band WAZ No. 60

Charles H. Emely, W1NW, has the plaque for 5BWAZ #50, and this is only one in a long string of accomplishments. Chuck was first licensed in 1957 as WN3INW, moved up quickly to W3INW, and then on to the present W1NW. He holds the Amateur Extra, commercial First Class Radiotelephone, and Second Class Radiotelegraph licenses, the latter two with Ship Radar Endorsement.

W1NW lives in Fayetteville, New York, upstate in the Syracuse area. He is an Association Executive and Management Consultant, married with two children, Chip, KA1KIN, and Wendy, ages 16 and 13, respectively. Chuck also holds a PhD degree. XYL Mary Ann is KM1F.

He also has the 5BDXCC, both SSB and CW DXCC, WAE Class 1, and other awards. He operates portable at times, working portable from the New England and Middle Atlantic states as well as Ohio and North Dakota. Overseas he has operated from the Philippines, from France, the British Virgins, Switzerland, Austria, Germany and even a stint as guest operator at 4U1ITU. Working both SSB and CW, he works phone just a bit more than the other mode.

As often noted, antennas do help. W1NW has an 8-element log periodic antenna at 90 feet covering 7.0 to 30.0 MHz, and the antenna rotates. There is also a half-wave, 5-element sloper at 110 feet for 75/80 meters, two 800 foot beverages for receiving, and a 75/80 meter horizontal dipole at 90 feet. Backing this up are the auxiliary antennas, including a Mosley TA33 at 125 feet and a 402BA at 115 feet. The equipment includes a KWM-380 and Alpha 77DX for 10 to 40 meters, and a TR7A/R7A and Alpha 76PA for 75/80 meters. There is also a 75S3C, 32S3, 30S1, KWM2A, 312B5, and a 30L1.

The 75/80 antenna uses five Snyder broadband dipoles in a switchable, directional slop-



er array, the apex at 110 feet on a tower guyed with Phillystran non-metallic guys. Chuck started out as a member of the Zanesville Ohio Radio Club, is now a member of the Salt City DX Association in Syracuse, a Life Member of the ARRL, and also belongs to the QCWA and the IDXF.

He works most of his DX straight out (does not use the nets or local DX Alert systems). Occasionally, he gets into a contest, but only when looking for specific countries. The WAZ was gained mostly on his own, but DX friends around the world did advise when needed zones were active.

Charles H. Emely, W1NW, a DXer who knows the value of a good antenna system and the winner of 5BWAZ #60.

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Charles H. Emely, W1NW, a DXer who knows the value of a good antenna system and the winner of 5BWAZ #60.

tioned as operators are K6EDV, W6OSP, ZL1AMO, DU1JMG, and DU9RG. Problems came up a few months back when some DU operators indicated any operators other than DUs would lessen the stature of the Philippine Amateur Radio Club. As transport to the islands was to be provided by the Philippine military forces, steps were taken to ensure that the fullest credit would be given to the DU operators. Jim Smith, VK9NS, is reported as having a license and looking at Sao Tome.

The ARRL Board at the January meeting allocated \$105,000 for the defense of amateur radio frequencies, endorsed continued participation in the NASA Space Program, and split the West Indies Section in two, the Puerto Rico Section and the Virgin Islands Section. They started to raise funds to renovate W1AW and elected a couple of new vice-presidents, George Wilson, W4OYI, as second vice-president and Clyde Hurlbert, W5CH as third vice-president.

ZD8CB has applied for a year's extension to his tour of duty on Ascension, this to March 1989. ZD8AE has returned from the U.K. and is being heard.

Keep in mind the INDEXA Information Net most days at 14236 kHz at 2330Z. Also re-

member the NCDXC W6TI broadcast at 0200Z on Mondays. The INDEXA has moved to supply some assistance to the Uruguay DX Group for a DXpedition to the South Shetlands next fall. 73, Cass, WA6AUD

## DX Ten Years Back

In May 1978 Jim Smith, P29JS, and Ann Koloboff, F6CYL, were headed for Cocos-Keeling. Some Brazilians were packing to go to St. Peter & Paul Rocks, and Alex Mootoo, 3B8DA, was ready to open from Rodriguez and then head for St. Brandon. Y11BDG was on the air, and QSLs were getting into the hands of the Deserving. VK2AGT was active on Lord Howe, and 4Z4MB was on the air most days trying to find a North Dakota contact. VK9ZR announced that he would be on Mellish in August and the veil was lifted on the mysterious Caribbean "new country." It was Desecheo!

Bouvet was promised as was the Neutral Zone—the 8Z4 Neutral Zone, if you have forgotten that one. The wind passeth over it in 1981, and it was deleted. Actually, the border dispute was settled and that ended a DXCC country. DC4BS was headed for a long stay in Sao Tome starting in July, and VR3AH went ashore through the surf at Christmas Island shouting, "I have returned!" Naturally, he had been there before.

Gordon was leaving Marion Island, but Dave, the new operator, was expected to keep the island available, mostly on CW. Concern was being felt about whether the weekend schedules with K2UO and K5VNJ would be continued. The first FCC release on WARC was out. Fifty kHz to be taken from the top of the 75 meter band and 60 kHz from the bottom of the 160 meter band were suggested. Also proposed by the FCC was a 50 kHz downward shift of the 40 meter band with no overall loss of spectrum, an addition of 50 kHz to the bottom of the 15 meter band, and no changes in the other bands, but three new bands at 10.1, 18.0, and 25.1 MHz were proposed. Life was exciting in the DX world in 1978.

## QSL Information

All of the following was compiled with double input from W9LNZ.

AY6D to LU1DJU  
CT3EU to G3PFS  
GD4UOL/A to G4UOL  
GW4UOL/A to G4UOL  
GB2LNM to GM4LDU  
HC5K to KT1N  
IQ9YXO to IT9YXO  
J52US to W4BJOC  
NJ7P/KP5 to NG7X  
K200YTL to K3YTL  
K200EHI to K7EHI  
KF200UM to KF4UM  
KL200KC to KL7KC  
N200RR to KN5D  
N200SV to W2SV  
TZ6FS/4S7 to DL4BC  
TI9M to TI8CBT  
TE2Y to TI2LCR  
T08KPG to FK8DD  
TR8A to TR-Buro  
VP2MU to WB4QBB  
VP8BFM to GM4ILS  
VK9ZK to G4UCB  
W200SV to W2SV  
W200MR to W7MR  
WL200K to WL7K  
W200XX to W1XX  
XE2KB to XE2ABN  
XF1G to WB6JMS  
Z21CL to Buro  
ZF2AG/ZF8 to N8AG  
ZF2KZ to OH1ZAA

ZP5LOY to LU8DPM  
3B8FF to KN2N  
5N8WRE to KA4JQ  
6W6JX to F6FNU  
8P6EM to G3VBL  
9N7YDY to J48RUZ  
8R1J to Buro  
9J2AL to WD0HHM  
AA4NC/VP2M to Will Roberts, Rt. 6, Box 64, Apex, NC 27502  
FH8CB to Elio Fontaine, B.P. 50, F97600 Dzaoudzi, Mayotte via France  
FR8EH to B.P. 386, Pierre Fonds, F-97410 via France  
TL8DW to B.P. 35, Kembra, Central African Republic  
T08KPG to S. Torope, B.P. 3040, Noumea, New Caledonia  
YN3ACZ to Box 302, Managua, Nicaragua  
SV8AC/SV9 to Mike Woolverton, Box 432, APO New York 09291  
8P9EM to Chris Pedder, 5 Royalty Lane, New Longton, Preston PR4 4JD, England  
3B8FF to Anita Keighley, 8 Meador Drive, Fayetteville, NY 13066

ports to QSO some of them. It can be a problem. We ran some through the sieve, and where routes were found, they are in parentheses. AY6D (LU1DJU), HQ1MZM (?), TE2Y (TI2LCR), TR0A (TR-QSL Bureau), 4T40 (?), 6J1HR (?). Perhaps someone else might recognize these. We sieved them through the latest K6HHD/W6GO QSL Manager List.

CT1UA suggests that special-event stations should be liberal with QSL announcements as well as advising DX publications. Not only special events, but also special prefixes. As CT1UA notes, "What good is it to work it when you don't know what you've worked?" Terrible! Even worse when it might be a new country.

ZS6XD applied for a ZS8 Marion Island license, this hopefully for a resupply trip in April. It is getting late in the fall in that part of the world, and the boat only stays for a couple of days. Marion Island has been getting scarcer, having last been heard around 1980. If it comes, there will be a lot of needy ones there declaring how deserving they are. All DXers are Deserving. Some more so.

Spratly was on a shifting schedule, one source noting March as the target period, another pointing to May as the sure thing. Men-

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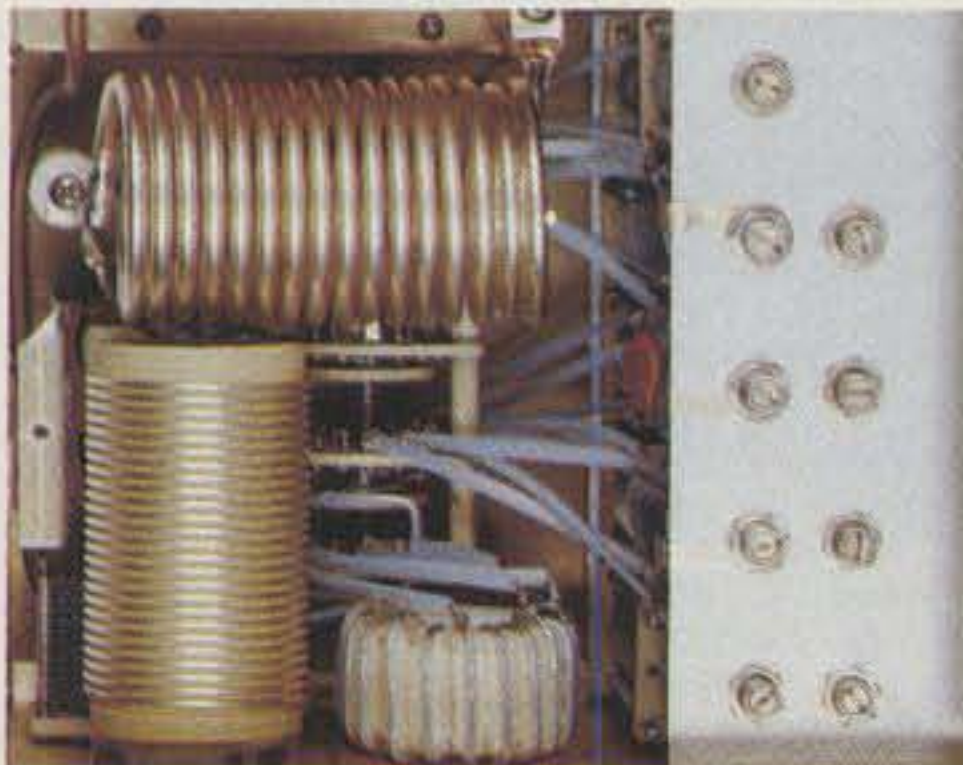
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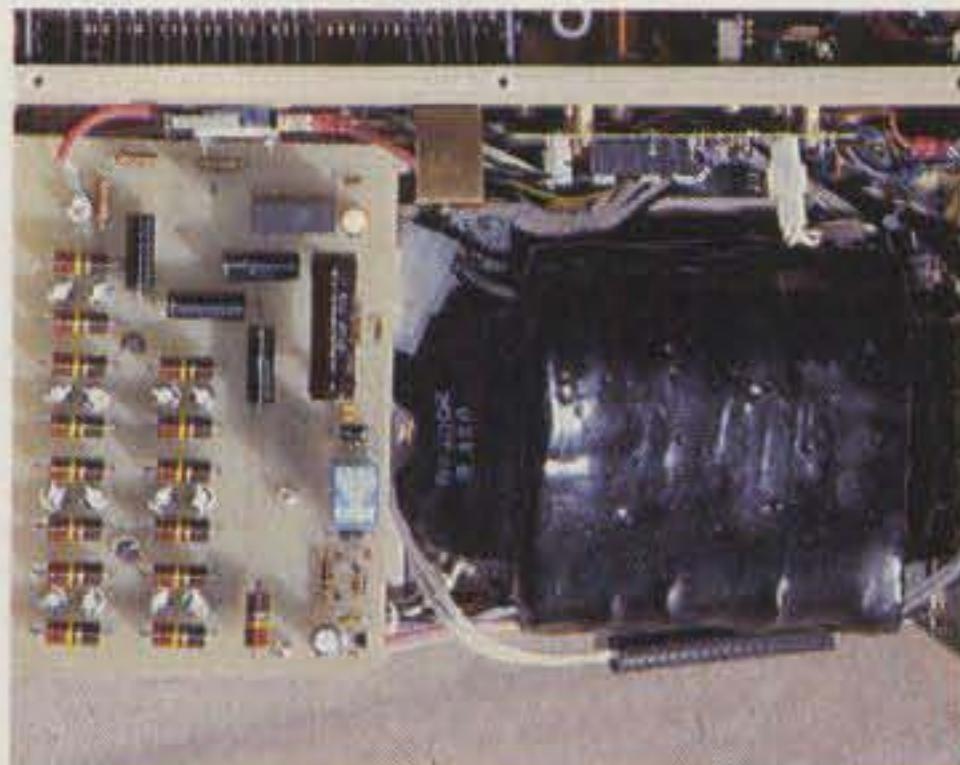
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**Announcing** (from page 6)

send SASE to NS0U, 2735 Hickory Hill, Dubuque, IA 52001.

• **Chicago, IL**— The DuPage ARC will operate from the U-505 submarine at the Chicago Museum of Science and Industry on Armed Forces Day and the day after (May 21 and 22) from 1600-2300 UTC. The call sign will be W0DUP with phone operation on: 7.25, 14.30, 28.40, and 145.25 MHz. For special QSL, send a No. 10 SASE to DARC, PO Box 71, Clarendon Hills, IL 60514.

• **Chillicothe, OH**— The Scioto Valley ARC sponsored by the Ross-Chillicothe Convention and Visitors Bureau will operate W8BAP from 1400Z to 220Z May 28 and 29 to celebrate its annual "Feast of the Flowering Moon" festival. Suggested frequencies: SSB—lower 25 kHz of the 40 and 15-meter General bands, and the 10 meter Novice band. For commemorative Certificate send QSL card and SASE to W8BAP, PO Box 73, Chillicothe, OH 45601.

• **North Freedom, WI**— The Morse Telegraph Club will operate AD9E May 28 and 29 from 1400 until 2300 UTC to commemorate the 144th anniversary of the "What hath God Wrought" message from Samuel F. B. Morse to Alfred Vail. Operation will be on 3.544, 7.044, 14.044 and 21.044 MHz. Send QSL and SASE to R. L. King, KA9GNY, 411 Lynn Ave., Baraboo, WI 53913.

• **The following hamfests, etc., are slated for May:**  
Apr. 30—May 1, **Cochise ARA Hamfest**, Sierra Vista, AZ. Contact Steve Wagner, W7CI, 602-458-6946, or CARA, P.O. Box 1855, Sierra Vista, AZ 85636.

May 1, **Kishwaukee ARC Hamfest**, Sandwich fairgrounds, Sandwich, IL. Contact Howard Newquist, Kishwaukee ARC, P.O. Box 264, Sycamore, IL 60178.

May 1, **Suffolk County Radio Club Electronic Fleamarket**,

Republic Lodge No. 1987, Melville, Long Island, NY. Contact Bill Sullivan, N2ETG, 516-689-9871 evenings.

May 6-8, **Fresno ARC Hamfest**, Airport Holiday Inn, Fresno, CA. Contact Ed Plummer, 12460 E. Heather, Clovis, CA 93612.

May 7, **Cedarburg Swapfest**, Circle B Recreation Center, Cedarburg, WI. Contact 1988 ORC Swapfest, 101 E. Clay St., Saukville, WI 53080 (SASE), or call 414-284-3271.

May 7, **Southern Tier Hamfest**, Treadway Inn, Owego, NY. Contact STARC, P.O. Box 7082, Endicott, NY 13760 (SASE).

May 7, **Arrowhead ARC Swapfest '88**, First United Methodist Church, Duluth, MN. Contact Ron Carlson, K0BR, 5128 Wyoming St., Duluth, MN 55804 (218-525-6860).

May 7, **Paul Bunyan ARC Hamfest**, Moose lodge, Bemidji, MN. Contact Paul Bunyan ARC, P.O. Box 524, Bemidji, MN 56601 (218-751-1964).

May 8, **St. Petersburg ARC Hamfest**, Lake Maggorie Park, St. Petersburg, FL. Contact Hank Briese, WA4RLV, 10804 84th Ave. N., Seminole, FL 34642.

May 8, **Medina County Hamfest**, Medina County Community Center, Medina, OH. Contact Medina Hamfest Committee, P.O. Box 452, Medina, OH 44258 (216-769-3033, from 10 a.m. to 5 p.m.).

May 14-15, **1988 Green Country Hamfest**, Tulsa State Fairgrounds Pavilion, Tulsa, OK. Contact Ron Gamel, N5WX, 918-663-0385, or write to Green Country Hamfest, P.O. Box 4283, Tulsa, OK 74159.

May 15, **Athens County ARA Hamfest**, City Recreation Center, Athens, OH. Contact Carl J. Denbow, KA8JXG, 63 Morris Ave., Athens, OH 45701.

May 15, **Tri-State ARS Hamfest**, 4-H Center, Evansville, IN. Contact C. Sartore, N9DYE, 709 E. Virginia St., Evansville, IN 47711.

May 15, **Knox County Hamfest**, Knox County Fairgrounds, Knoxville, TN. Contact Keith L. Watson, WB9KHL, 119 South Cherry St. -3, Galesburg, IL 61401-4527 (309-342-3885).

May 15, **LIMARC ARRL Long Island Hamfair**, New York Institute of Technology, Old Westbury, NY. Contact Hank Wener, WB2ALW, 516-484-4322, or Mark Nadel, NK2T, 516-796-2366.

May 15, **Chicago ARC Mini-Hamfest**, North Park Village, Chicago, IL. For more info call 545-3622.

May 15, **Warminster ARC Hamfest**, Middletown Grange Fairgrounds, Wrightstown, PA. Contact Frank Charlton, KA3FBP, 1479 Kingsley Dr., Warminster, PA 18974 (215-675-2549).

May 15, **Tioga County ARC Hamfest**, Tioga County Fairgrounds, Whitneyville, PA. Contact John Winkler, WB3GPY, RD 2, Box 267, Wellsboro, PA 16901.

May 20-22, **1988 Midwest Division ARRL Convention**, Marina Inn, So. Sioux City, NE. Contact Dick Pitner, W0FZO, 2931 Pierce St., Sioux City, IA 51104.

May 20-22, **14th Annual Eastern VHF/UHF Conference**, Rivier College, Nashua, NH. Contact David Knight, KA1DT, 15 Oakdale Ave., Nashua, NH 03062.

May 21, **1988 Radio Amateur Club of Knoxville Hamfest**, Kerbela Temple, Knoxville, TN. New date, one day only. Advance registration only. Contact Carol Whetstone, 3702 Vista Lane, Knoxville, TN 37921.

May 21, **Northwest Arkansas ARC Hamfest**, Rodeo Center, Springdale, AR. Contact Chuck Webb, KA5BML, or Mary Webb, KA5HEV, P.O. Box 338, Prairie Grove, AR 72753 (501-846-2847).

May 21, **Wexauke ARC Swap & Shop**, Cadillac Middle School, Cadillac, MI. Contact John Craddock, KX8Z, 616-797-5491, or write Wexauke ARC, P.O. Box 163, Cadillac, MI 49601.

May 22, **Quebec Provincial Hamfest**, Tracy Curling Club, Tracy, Quebec, Canada. Contact Sorel-Tracy ARC, P.O. Box 533, Sorel, Q.C., J3P 5N6 Canada.

May 27-28, **Down East Fleamarket '88**, St. Mary's University, Halifax, Nova Scotia, Canada. Contact Arnie Brown, VE1AOG, 53 Stewart Harris Dr., Dartmouth, NS B2W 3Z4 (902-435-3344).

May 27, **Skanfest Ham Radio & Computer Fest**, Allyn Arena, Skaneateles, NY. Contact Skanfest, P.O. Box 302, Skaneateles, NY 13152.

**Our Readers Say**

(from page 8)

do something rewarding like starting a Novice Day, 1985. Major General Hickey, base commander at the time, recognized the importance of ham radio after the club members gave weather updates faster than the base could receive them. Not much of a feat for hams.

So, put some fun back into ham radio. Activate your club. Put aside internal differences; and upgrade class. Work a few Novices with their new privileges, and encourage them. Maybe your club could be involved with Civil Defense in some little way. Make amateur radio something people will want to be a part of.

Steven J. Gehring, NT0J  
Comiso AS, Sicily

**Please Don't Lose Cass**

Editor, CQ:

It's difficult to find the proper words to express my enjoyment in reading Hugh Cassidy's DX section of each edition of CQ. The August 1987 rendition was especially well done. It harkens me back to those days of the "West Coast DX Bulletin." The same "picture painting" with DX phraseology which only Hugh can spin down seems to be better than ever. Please don't ever lose contact with that one, for something in a monthly dose of DX medicine we all need will be sorely missing.

Chuck Byrdges, W4WXZ  
Winston-Salem, NC

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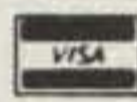
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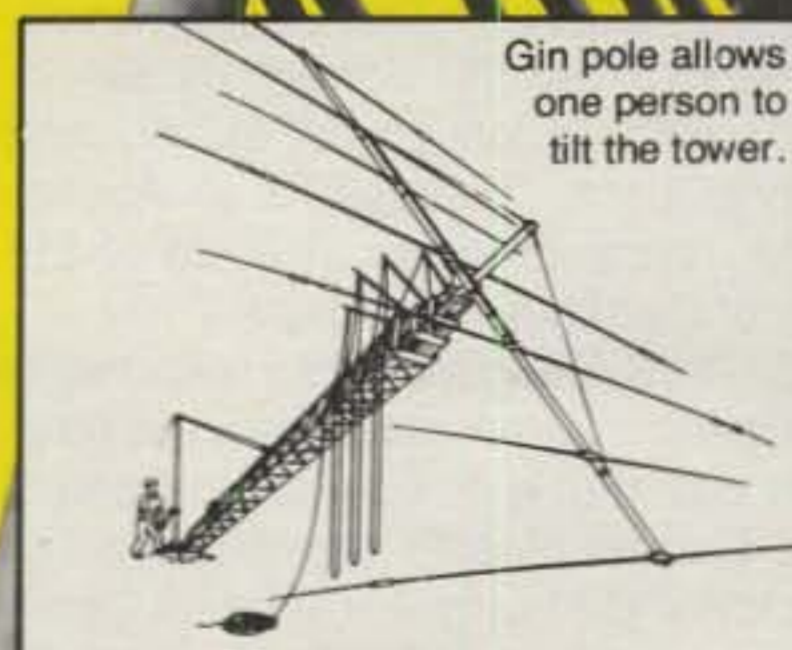
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May 1988 • CQ • 111



# Washington Readout

a monthly feature by  
FREDERICK O. MAIA, W5YI

REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

## Canada Committed To No-Code License... Is The United States Next?

The Canadian Department of Communications (DOC) has officially announced that it is committed to entry-level no-code amateur radio. The Canadian government's position was made known to the public during a combined DOC/amateur-radio industry meeting held on February 20th.

The DOC is the regulatory agency overseeing telecommunications in Canada, similar to our Federal Communications Commission (FCC). Its action is deemed important to the United States since the two nations often act in concert. Rules adopted in one nation quite frequently are adopted in the other.

While the action may have astonished American amateurs, it did not come as a surprise to Canada's two national amateur radio organizations. The Canadian Amateur Radio Federation (CARF) and Canadian Radio Relay League (CRRL) had submitted a joint position paper to the government supporting an entry-level amateur ticket without a Morse code requirement during mid-1986.

The CRRL, an offshoot of the U.S. American Radio Relay League, separated from the ARRL some time ago amid charges that the League meddled in strictly Canadian affairs. The ARRL remains strongly opposed to code-free U.S. amateur operation. The combined Canadian position, jointly signed by CARF president Ronald Welsh, VE3IDW, and CRRL president, Thomas B.J. Atkins, VE3CDM, represents the attitude of the majority of Canadian amateurs.

The CARF/CRRL comments responded to the feeling that amateur radio is basically an old-man's hobby. The Department of Communications published figures indicate that only 4.6% of all Canadian amateurs are under the age of 30 (15.1% are between 30 and 40, 20.0% between 40 and 50, 20.6% between 50 and 60, 22.2% between 60 and 70, and 17.5% are 70 years of age or over). The current average age of all Canadian amateurs is 55. Sixty percent of all Canadian amateurs are over 50 years old. These

National Volunteer Examiner Coordinator,  
P.O. Box 10101, Dallas, TX 75207

Certificate	Proposed Requirements	Proposed Privileges
"B," Basic (No Code)	40 hours of basic electronic theory and circuits, receiving/transmitting systems, antennas and propagation, station setup and operation, interference prevention, regulations.	All amateur modes above 30 MHz including 2 meters; 100 watt power limitation. Cannot be the licensee of repeater or remote base station. <i>Lifetime license.</i>
"B," Basic 7 wpm code	A 7 words-per-minute Morse code endorsement to holders of certificate "B."	Radiotelegraphy and radioteletype on amateur frequencies below 30 MHz and voice operation in the 10 meter amateur band. 250 watts input power level. <i>Lifetime license.</i>
"A" Advanced	Written test based on 20-30 hours of study of advanced electronic theory, receiver/transmitter circuitry, and antenna systems. Twelve wpm code requirement.	All amateur modes on all amateur bands using maximum legal power. <i>Lifetime license.</i>

Table I—Amateur radio restructuring as jointly proposed by CARF/CRRL.

figures are actually not much different from those of the United States. Both CARF and CRRL recognized the need for more and younger radio amateurs, and a continuing role for Morse code and experimentation although not necessarily at the entry level.

Presently Canada has three amateur radio operator classes—Amateur, Advanced, and Digital. There is no entry-level "Novice" license in Canada. The digital license, while a "no-code" amateur ticket, can't be considered entry level since it requires an *extremely* difficult written examination. It is also not very popular at all!

The two amateur organizations in Canada proposed *Amateur Restructuring* to contain three amateur license classes, or "Certificates" as they call them. They are shown in Table I.

The Department of Communications, however, proposed restructuring based on four amateur radio certificates, and added a new amateur radio wrinkle, commercially manufactured transmitting equipment, *only* for three of the four classes. (See Table II.)

While the Canadian authorities are strongly committed to the four-amateur-class structure, DOC members of the Working Group said nothing was "cast in

stone" and that many details of the proposed structure were still open for discussion. These included names of the various certificates; operating privileges; relative difficulty of the two technical examinations; requirements to use "commercial" equipment; and accommodation of holders of the present Amateur, Advanced Amateur, and Digital Amateur certificates.

Canadian amateurs will be granted the opportunity to comment on the government DOC proposal once the notice appears in the government journal, the *Canada Gazette*. Sources tell us that the new Canadian amateur radio restructuring will be implemented during mid-1989.

Will an entry-level no-code license ever come to America? It remains to be seen. The U.S. amateur association, the American Radio Relay League, is credited by the FCC as killing an earlier no-code proposal. The FCC is also on record as saying that any change in the U.S. amateur radio licensing structure would require the support of the American amateur community.

The League has now agreed to listen to an amateur radio industry proposal suggesting a "code recognition" type of entry-level amateur license. "Code recognition" would require an entry-level ama-

Certificate	Proposed Requirements	Proposed Privileges
"A" (entry level)	No code; 100 question technical exam based on 40 hours study of basic electronics, amateur radio systems, antennas and propagation, interference and suppression, regulations & operating procedures.	All modes, all amateur bands above 30 MHz, maximum 250 watts input, "commercial" transmitting equipment only.
"B" to be used in conjunction with certificate "A"	5 words-per-minute code exam.	Privileges as for certificate "A" above plus all modes, 3.5-4.0 MHz, maximum 250 watts input, "commercial" transmitting equipment only.
"C" (to be used in conjunction with certificate "A")	12 words-per-minute examination.	Privileges as for certificate "A" above plus all modes, all amateur bands below 30 MHz, maximum 250 watts input, "commercial" transmitting equipment only.
"D" (to be used in conjunction with certificate "A" or a combination of the above certificates)	50 question advanced technical examination.	Band and mode privileges as for other certificates held, plus the right to use maximum legal power and home-built transmitting equipment, and become licensees of repeater and remote base stations.

Table II—Canadian DOC proposal—restructuring of the amateur radio service.

teur candidate to be able to identify certain Morse code characters, but would not necessarily require an applicant to be able to carry on a conversation in CW.

### Status of Amateur Radio Rulemaking

- The FCC has received several requests from the amateur community to change rules applying to the 6 meter amateur band. Suggested is an expansion of the repeater subband to include 51-52 MHz and to allow auxiliary (remote control) operation in the 52-54 MHz segment.

- Several commercial radio users are interested in the top 2 MHz of the 1.25 meter amateur band now that the FCC has said that they will reallocate 220-222 MHz to narrow-band business channels. A television viewer response service and the United Parcel Service have both petitioned the FCC to use the spectrum. An FCC ruling on Docket 87-14 is expected any day now.

- New management at the FCC. Attorney Robert H. McNamara has been named Chief of the FCC's Special Services Division, which oversees the Personal Radio Services. The Amateur Radio Service is one of the Personal Radio Services, of course. McNamara, previously in charge of the FCC's Aviation and Marine Branch, replaces Ray Kowalski, who has accepted a law position in the private sector.

- A landmark RFI ruling has been handed down in Canada! Ottawa amateur Jack Ravenscroft, VE3SR, has lost his appeal to overturn a lower court decision involving the susceptibility of elec-

tronic and electrical consumer equipment to interference from amateur radio signals. Jack had previously been found guilty of being a "nuisance" when his amateur operation interfered with a neighbor's appliance operation. The Ontario Court of Appeals ruled that both Canadian amateur operators and those affected by RFI must work together to get rid of the problem. Canadian amateurs must arrange for neighborhood radio frequency interference suppression to a standard approved by the Canadian Department of Communications. Those affected by the radio frequency interference must accept the modifications, and if they do not, then they have no further recourse. The ruling, of course, only affects Canadian amateur operation.

- A possible link between cancer and electromagnetic fields has been receiving a lot of publicity in the print media lately. Washington state researcher Dr. Samuel Milham, Jr. conducted a study of all deaths of amateur radio operators in Washington and California for a five-year period ending in June 1984. He concluded that continued exposure to electric and RF fields might explain the higher incidence of certain cancers among amateur operators. The finding was published in the *American Journal of Epidemiology*.

- Selecting your own amateur radio call sign—or a call sign that has special meaning to you—is just about due for Commission action. The FCC's Private Radio Bureau proposed in PRB-3 to allow amateurs to apply to a private call-sign supplier for a *secondary call* of choice.

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The applicant would be required to pay a clerical/maintenance fee to receive the call. For airwave enforcement purposes, the FCC would be advised of the secondary call sign issued by the supplier. The FCC suggested an "on line" computer data base. It now appears that the FCC is having second thoughts about adopting such a scheme *and may not*.

• Novice Enhancement is not working as well as first thought! It now appears that the big early rush of new Novices was merely to get licensed before the FCC changed its rules and required a different, longer, and more difficult written examination. There are now *consistently* less Novices entering amateur radio

every month than a year ago.

• The January 1984 changeover from 5- to 10-year term amateur radio licenses is due to greatly affect the number of amateur radio operators. The FCC will issue no renewals for 5 years—January 1989 through December of 1993—and we won't have any "dropout" figures. During this 5-year period, no amateur will be deleted from the FCC's amateur radio operator data base. The first 10-year term amateur tickets will not come up for renewal until January 1994. We will see 5 years of substantial (artificially high) amateur radio growth beginning with January 1989—and then much slower amateur growth from 1994 on—when the first 10-

year term licenses that were issued in 1984 must be renewed.

• A joint Soviet/Canadian expedition will use amateur radio for communications as they hike on skis from one of the northernmost Soviet islands over the North Pole to Ellesmere Island in northern Canada. The skiers' position reports will be relayed to them on the 2 meter amateur band via a unique lashup of search and rescue commercial and *talking* amateur orbiting satellites. The 90-day ski trek ends in June. The skiers will keep in contact with base stations by HF amateur radio and coordinate supply drops on amateur VHF spectrum.

• The FCC is in the process of releasing newly revised §Part 97 amateur radio rules. Initially we were told that there would be some significant changes, but we now understand that existing rules will be merely reworded, reorganized, and clarified to make §Part 97 easier to work with.

### Washington Mailbag

... questions received from readers dealing with amateur radio regulations.

**§Part 97.119 forbids indecent words, language, or meaning. What is considered indecent? And how come broadcasters can air indecency and amateurs cannot?** That rule has been on the books for years and remains to this day, since no one has challenged it. The First Amendment guarantees Freedom of Speech and the only amateur we recall ever being cited for violations of this rule eventually got his amateur ticket back. The FCC does not want to be a speech censor, but is required to act in the public interest.

"Shock jocks," as some of the more offensive broadcasters are referred to, frequently are the objects of complaints to the FCC. To protect children, the Commission compromised and designated midnight as the hour after which indecent programming could be broadcast. It is doubtful that the FCC would (or legally could) act against indecent late-hour amateur speech. The fact remains, however, that amateur radio is a fun hobby for all of us and offensive remarks are certain to reduce the pleasantness.

In the interest of harmony it is better not to risk annoying or insulting anyone. Certain personal topics and arguments in general really have no business being publicly aired, but it is certainly legal if you do. Indecent speech is usually foul-mouthed, while obscenity (which is never allowed to be broadcast) appeals to the prurient (sexual) interest. Profanity is irreligious speech. What §Part 97.119 basically says is let's all be agreeable and get along with one another. Keep amateur radio friendly.

Do you have a question involving amateur radio rules? Write to us at P.O. Box 10101, Dallas, TX 75207. Questions of general interest will be answered in this column.



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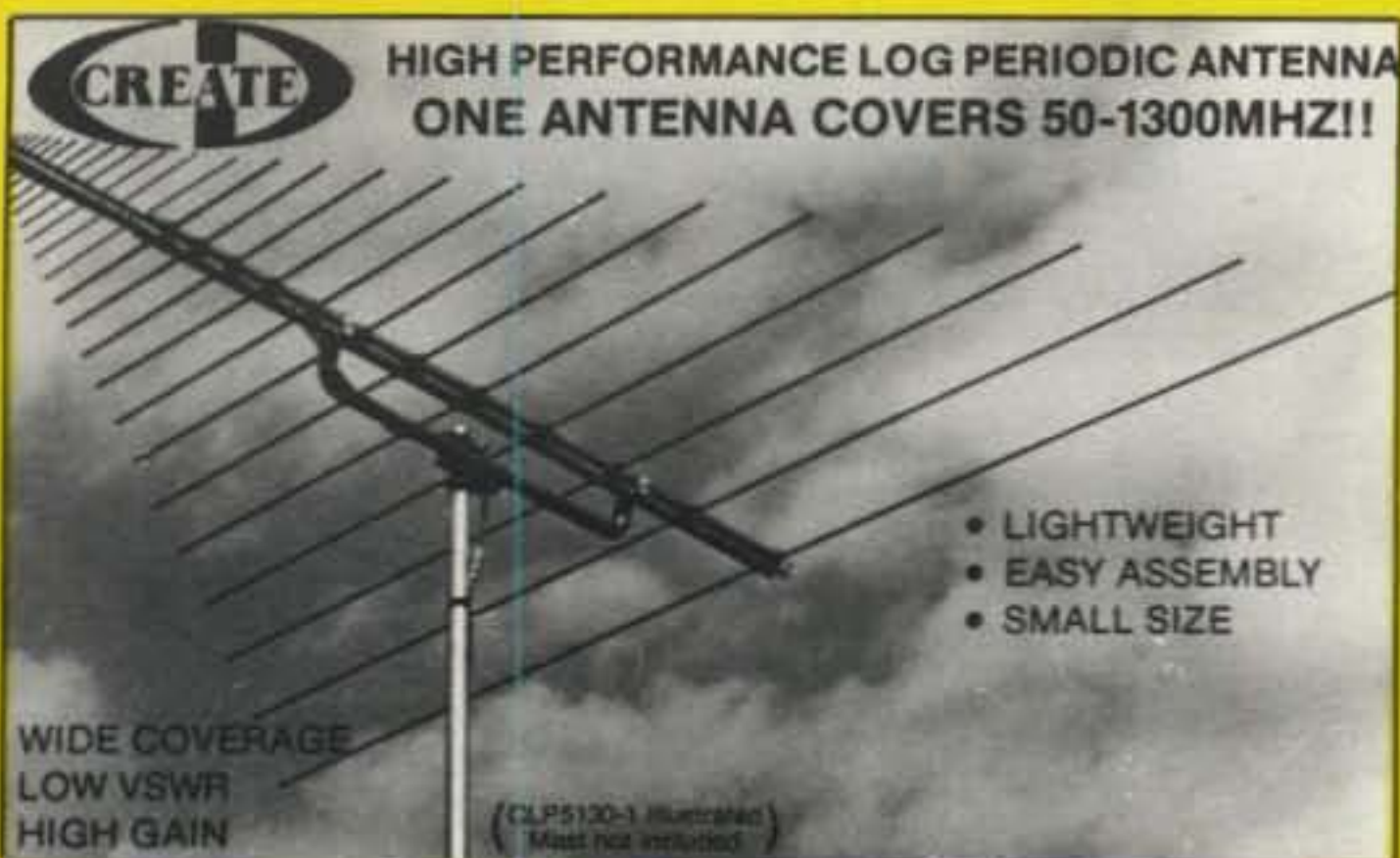
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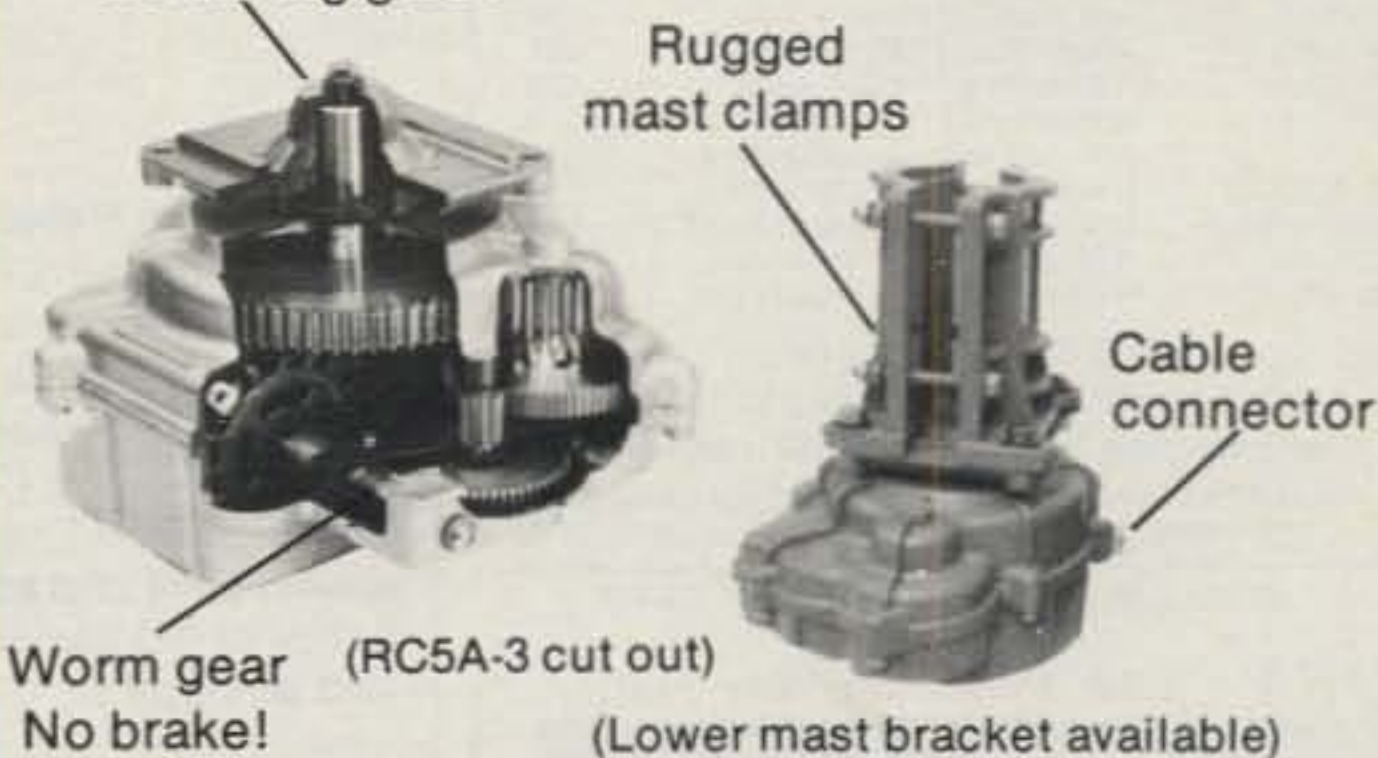
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See Lew McCoy's Review In August 1987 Issue Of CQ.



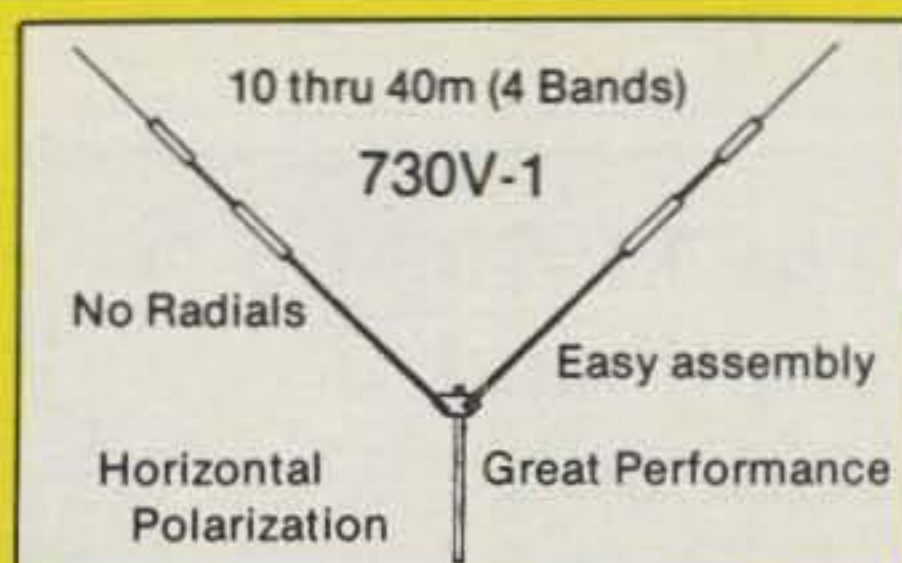
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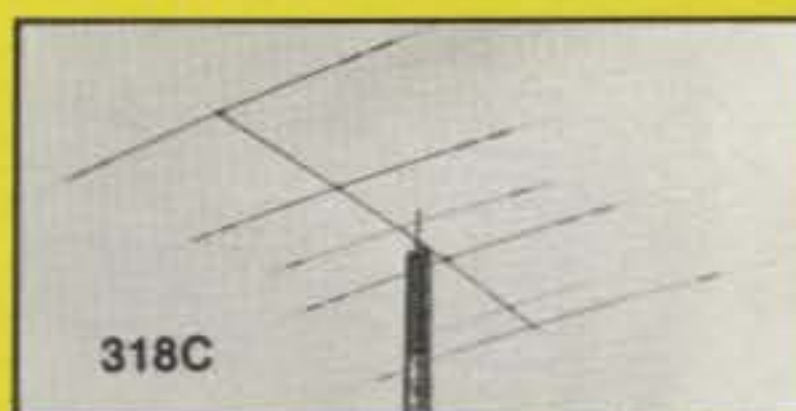
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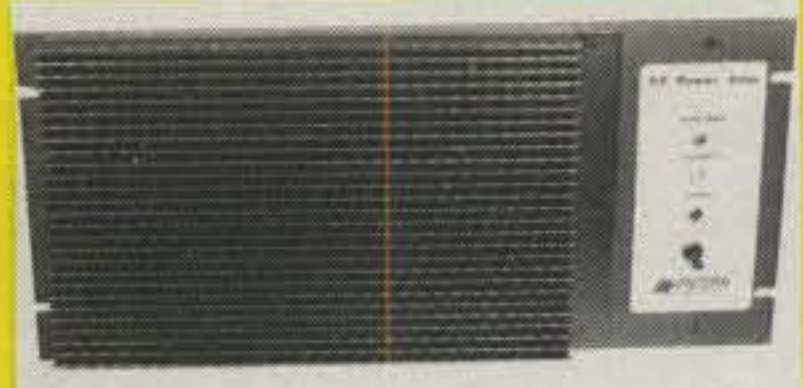


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**MINIATURE Straight Key Tie Tack** or Lapel Pin in 14 karat gold! See our display ad in CQ magazine, May 1988 issue, page 116. KD0QS, Tuttrop, 309 18th Avenue NE, Waseca, MN 56093 (1-507-835-7341).

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**WANTED:** A copy of a book and schematic for a Tempo One. Also want a Regency HR-2 transceiver in good operating condition, book and schematic for a Johnson Messenger Two CB. I will pay for copy costs. N5JVA, Tony E. Byrum, 2009 W. Fifth, Ottumwa, IA 52501-1521.

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WANTED: TS930S, FT757, FT102, 2M, 0.7M all mode. Tony Heky, 21 Louis Ave., St. Catharines, Ont., Canada L2M 2N4.

FOR SALE: Ham Radio Ten-Tec solid state, Model 540, 200 watt transceiver, AC/DC power supply. John Spencer, Fairmont, MN 56031 (507-238-1621).

WANTED: ICOM 735 and matching AH-2A automatic mobile antenna tuning system, both in good condition. Send detailed description and your best price to: Bill Jefferson, N4MXU, 67 Cedar Hills Circle, Chapel Hill, NC 27514.

WANTED: McElroy Professional hand key, British W.T. 8AMP tank key. J. White, Box 3012, Burnsville, MN 55337.

WANTED: Virbroplex Blue Racer (narrow base), foreign keys. J. White, Box 3012, Burnsville, MN 55337.

AZDEN SERVICE by former factory technician. Fast turn-around. PCS-300 NiCads \$34.95. Southern Technologies Amateur Radio, Inc., 10715 SW 190 St. #9, Miami, FL 33157 (305-238-3327).

DE K3UKW: Kenwood TS530SP 160-10 meters with WARC bands, built-in P/S, processor, NB, Dig. R/O., \$649. Also TR7730 2 meter FM XCVR, \$225. ICOM: IC745 HF XCVR, \$859. IC2KL 2 KW solid state amp, H.F., \$1249 plus shipping. Tony Musero, 1609 So. Iseminger St., Philadelphia, PA 19148 (215-271-8898).

BOY SCOUTS need your help. Donations of HF and RTTY gear needed for tax deductible receipts. Contact WA0LKE, Rt. 3, Box 565, West Plains, MO 65775, or phone Bob, 417-256-2219 weekdays. Thank you!

WANTED: Gadget category WW II surplus such as gyros, sights, mechanical computers. Also old catalogs of surplus dealers 1945 thru 1965, and manuals for above type of equipment. For historical preservation and research, not for resale or profit. Price, condition first letter to: Dave Leising, 211 North Grove Street, Lowell, MI 49331.

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ROSS' \$\$\$ USED May SPECIALS: KENWOOD TS-430S/W3, FLTRS \$749.90, SP-430 \$42.50, TM-411A \$299.90, TS-700A \$309.90. YAESU YO-901 \$379.90, FC-901 \$169.90, FR-101S/W 6M, 2M, FM, CW \$349.90; FT-One w/3, CW, FL, AM \$1295.90. SWAN 102BX \$459.90. Phone or send SASE for USED ITEMS LIST. OVER 8,777 NEW ham items in stock. MENTION AD. Prices cash, FOB Preston. We close at 2:00 Saturdays & Mondays. ROSS DISTRIBUTING COMPANY, 78 South State (P.O. Box 234), Preston, Idaho 83263 (208-852-0830).

**KENWOOD TS-940S**, factory-installed auto antenna tuner and CW filters. Asking \$1700, or without CW filters \$1600. Mods factory-installed Feb. 1988. COLLINS 75S3C R/E serial #30698, no mods, original, very clean, with manual, solid-state plug-in tube testers plus one set of tubes, with following filters—200,500,1.5,2.1—\$750, or without tube testers less \$75, or without selected filters less \$100 each. Call or write Jack M. Gutzeit, W2LZX, 75-02 168th St., Flushing, NY 11366 (718-969-8385).

**R-390A RECEIVER PARTS:** Info SASE. CPRC-26 military Manpack Radio, 6 meter FM, with antenna, crystal, handset: \$22.50, \$42.50/pair, \$97.50/six. Military-spec TS-352 Volt-ohm/Multimeter, leads, manual: \$12.50. \$4.50/piece shipping, \$9 maximum. Baytronics, P.O. Box 591, Sandusky, OH 44870.

QUALITY QSL CARDS and rubber stamps. Send 39¢ postage or SASE for samples. New stock designs or custom cards from your black ink artwork. Sandollar Press, P.O. Box 30726, Santa Barbara, CA 93130.

SELL: Used amateur, SWL, CB equipment. SASE for list. Joe Bedlovics, 241 Dover Street, Bridgeport, CT 06610.

C.P.I. PARTS and Accessories, some new, some used. Also new hardware for C.P.I. gear. Send wants to Brian Hussey, 2374 Cayuga Ct., Burlington, Ont., Canada L7P 3L5.



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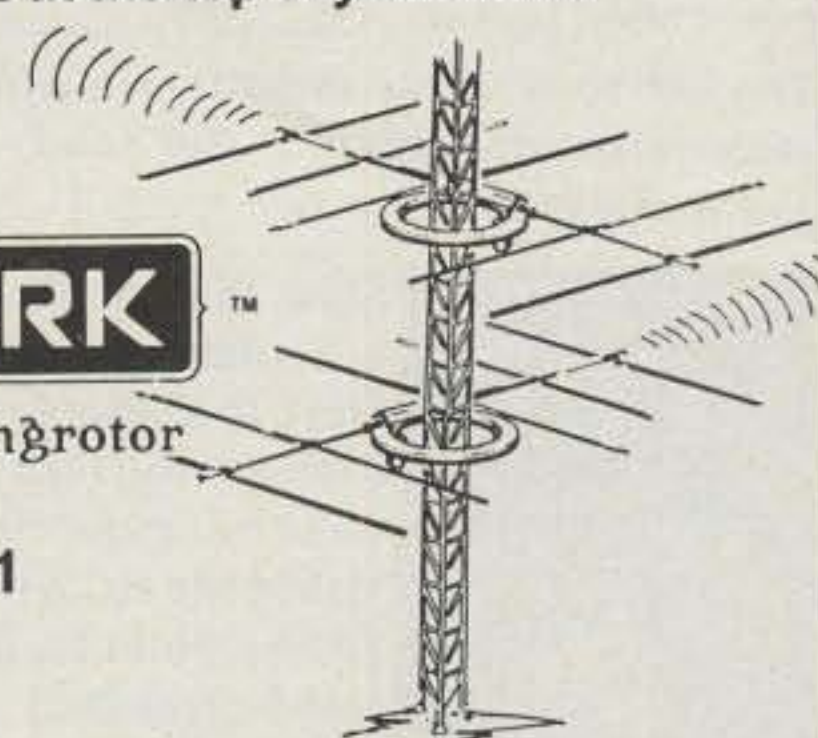
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BEAM HEADINGS, your QTH to 500 locations. In protective covers suitable for binder, \$5.00. NW2J, 1529 Sunset Road, Castleton, NY 12033.

WANTED: Knight T-50, Hammarlund HQ-145, C64/128 Ham Programs, Kelsey 3 x 5 or 5 x 8 Printing Press/Type. Don Traves, WB4CVH, 38 Elmwood Place, Goose Creek, SC 29445 (803-797-5185).

FOR TRADE OR SALE: 60 MHz solid state scope, dual channel, delayed sweep. Need HF xcvr or other eqp. WD5BJW, 1333 Pecan St., Metairie, LA 70001 (wk. 504-364-7895).

FOR SALE: Collins KWM-2 mobile mount 351D2, PM-2 DC power supply. Both with manuals. 516 E1 DC power supply, MM-1 Mobile Mike. W3CJI, 215-433-4485.

DRY CELL POWER SUPPLY for GE S/S Portamobil wanted. Jim, 121 Hilton, Elgin, IL 60120.

BUILDING Linear: Need 813 tubes, sockets, tank capacitor, and chokes. Will also buy other parts. All letters answered. NR5Q, Box 203, Springdale, AR 72765.

FOR SALE: H89 with 64K memory, 3 drives with HSDOS and CPM operating system, in perfect working condition. Call (606) 474-6260. Price \$400.

WANTED: Accessories for a TS-520S such as VFO, DF-5, DS-1 power supply, and 2m transverter. Call (718) 347-5988, WB2CUZ, Marc Roffman, 255-21 E. Williston Ave., Floral Park, NY 11001.

SELF STANDING 80 foot commercial tower, 12 foot base, \$400. You take down, Morgantown, PA. Jay, 215-582-1164.

FOR SALE: Heath SB-102 transceiver, 80-10 meters, CW and SSB, 180 watts, w/power supply, mike, and manual. In good cond. Asking \$200 or B.O. Eric May, N1ELO, P.O. Box 428, West Street, West Swanzey, NH 03469(603-352-1501).

FOR SALE: Microcraft Morse-A-Word code reader to 30 wpm, \$69. Realistic PRO-14 scanner with two ant, \$39. K4HHR (813-595-6903).

FOR SALE: ICOM 2AT Handheld with spkr/mic and charger, \$185. Perfect condx in box. WY5Q, 1020 Rue Toulouse, Slidell, LA 70458 (504-641-8785).

FOR SALE: Dentron Jr. Tuner \$40, Heath Grid Dipper \$45, Heath Transistor Checker \$50, Smithe Bantam 10-80M portable aluminum dipole \$40, shipping included. John Bojack, N0HRM, 249 Riverwoods Lane, Burnsville, MN 55337 (612-894-3926).

SELL OR TRADE National NCX-3 xcvr, 80, 40, 20 mtrs., AM, SSB, CW, with pwr. supply and mic. Knight rcvr, 500 kHz, 30 MHz. Joe Karr, N9FAU, 3800 Cheyenne Ct., Racine, WI 53404.

FOR SALE: Collins 75A2; National NC 183; Heathkit HX 10, \$50 each, plus shipping. W2RUZ, 33-45 172 Street, Flushing, NY 11358.

WANTED: Defective amateur radio equipment, price. Joe Bedlovics, 241 Dover St., Bridgeport, CT 06610.

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Please send all reader inquiries directly.

WANTED: Info for interfacing a Yaesu FRG-9600 receiver to a Commodore 64 Computer. R. DeArmond, 5631 Boot Way, Oceanside, CA 92056.

35 WATT 450 MHz Final Amp, GE Master Exec Solid State Amplifier, \$175.00. KA1YL, 262 Cook Ave., Meriden, CT 06450.

BROWNING GOLDEN EAGLE Mark III AM/SSB base, mic, manual, excellent, \$300. Wanted: 2 meter transceiver, synthesized or crystal; electronic keyer. Trades, offers! Mark, NYQE, P.O. Box 116, Mystic, IA 52574 (515-647-2839).

SELL: AEA PK-64A/HFM packet \$225, ICOM IC-271A 2m xcvr \$589, Hallicrafters SX115 RX \$300. Spectrum Communications 2M Repeater TX/RX circuit boards \$65 each, and others inquire. Floyd K5LA, 5637 Prince Edward Ave., El Paso, TX 79924 (915-751-6204).

FOR SALE: Yaesu CPU-2500R 2M with push-button mike. "Near new." Make offer. Ed McCarty, 483 West Main, Huntingdon, TN 38344 (901-986-5153).

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WANT: DRAKE VFO RV-75. Meyer Minchen, AG5G, 1753 North Blvd., Houston, TX 77098 (713-622-6161, 24 hrs).

MECH. FILTS. for R-390, 455 kHz, 16 kHz, 8 kHz, 4 kHz, and 2 kHz bandwidths. Send SASE to AA5CG, 6104 Casa Feliz N.E., Albuquerque, NM 87111.

WANTED: Diagram and parts list for a power supply Armour Electronics Corp. Model SP-010. Tom Richison, K5FRI, 905 Terrawood Place, Coweta, OK 74425.

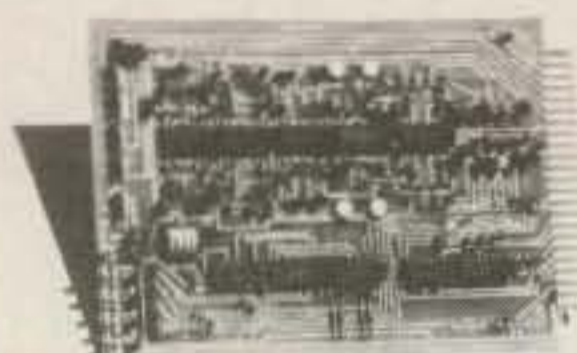
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140 WATT LINEAR AMPLIFIER, details pages 30-32 1987 Handbook, \$73 with extra MRF 454. W2QFC, 308 Parkdale Ave., East Aurora, NY 14052-1619 (716-652-4942).

WANTED: Ten-Tec #226 Calib., Heath RF probe, Vibroplex Bug, 10 or 15 meter Yagi monoband beam. KB5AYO, Rt. 1 Box 580-B, Reserve, LA 70084.

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## Aries-1 Amateur Radio Integrated Entry System

ID(Sta): IK1ABC	Name: Enrico	City: Genoa	State: Italy
Date: 83-10-88	Begin: 20:56	End QSO:	Freq: 14.095.2
Type (mode): FSK	My RST:	His RST:	Power: 95L:R
Remarks: Enjoys Sailing and Fishing on his 30' boat 'TOMAR'			
Data: 2) 10-31-87 / 17:27 to 17:48 / USB / 21.215 B / RST 55 / His 57			
Status: [I/R] [CLS] RTTY 45 Baud Normal [CLD] [Sp/F] [Qu/eX]			

Log Data  
TNC / XCVR  
Status

Input / Output  
From  
RTTY, CW  
ANTOR,  
Packet  
Controller (TNC)

```

CQ CQ CQ DE IK1ABC IK1ABC
KKK
IK1ABC DE NV2I NV2I
NV2I DE IK1ABC. TXK FER CALL OM UR RST 570 -- HV CPV? BK
IK1ABC DE NV2I
FB ENRICO UR RST ALSO 579 FROM GENOA -- I SEE FROM MY LOG THAT WE HAVE
WORKED TWICE BEFORE, THE LAST TIME ON 15 METER SSB -- HAVE YOU BEEN OUT
SAILING ON THE TOMAR LATELY? BY THE WAY I SEE THAT I HAVE RECD UR QSL
CARD. TXK -- HV IS THE PRINT?
IK1ABC DE NV2I NV2I KN
SAILING ON THE TOMAR LATELY? BY THE WAY I SEE THAT I HAVE RECD UR QSL
CARD. TXK -- HV IS THE PRINT?
IK1ABC DE NV2I NV2I KN
Hr/Red/Ext 10/Ext 2/Ext 3/Ext 4/Ext 5/Ext 6/Ext 7/Ext 8/Ext 9/Ext 10/Ext 11/Ext 12/Ext 13/Ext 14/Ext 15/Ext 16/Ext 17/Ext 18/Ext 19/Ext 20/Ext 21/Ext 22/Ext 23/Ext 24/Ext 25/Ext 26/Ext 27/Ext 28/Ext 29/Ext 30/Ext 31/Ext 32/Ext 33/Ext 34/Ext 35/Ext 36/Ext 37/Ext 38/Ext 39/Ext 40/Ext 41/Ext 42/Ext 43/Ext 44/Ext 45/Ext 46/Ext 47/Ext 48/Ext 49/Ext 50/Ext 51/Ext 52/Ext 53/Ext 54/Ext 55/Ext 56/Ext 57/Ext 58/Ext 59/Ext 60/Ext 61/Ext 62/Ext 63/Ext 64/Ext 65/Ext 66/Ext 67/Ext 68/Ext 69/Ext 70/Ext 71/Ext 72/Ext 73/Ext 74/Ext 75/Ext 76/Ext 77/Ext 78/Ext 79/Ext 80/Ext 81/Ext 82/Ext 83/Ext 84/Ext 85/Ext 86/Ext 87/Ext 88/Ext 89/Ext 90/Ext 91/Ext 92/Ext 93/Ext 94/Ext 95/Ext 96/Ext 97/Ext 98/Ext 99/Ext 100/Ext 101/Ext 102/Ext 103/Ext 104/Ext 105/Ext 106/Ext 107/Ext 108/Ext 109/Ext 110/Ext 111/Ext 112/Ext 113/Ext 114/Ext 115/Ext 116/Ext 117/Ext 118/Ext 119/Ext 120/Ext 121/Ext 122/Ext 123/Ext 124/Ext 125/Ext 126/Ext 127/Ext 128/Ext 129/Ext 130/Ext 131/Ext 132/Ext 133/Ext 134/Ext 135/Ext 136/Ext 137/Ext 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## R-X NOISE BRIDGE



### • Learn the truth about your antenna.

The Palomar R-X Noise Bridge tells you if your antenna is resonant or not and, if it is not, whether it is too long or too short. It gives resistance and reactance readings on dipoles, inverted Vees, quads, beams, multiband trap dipoles and verticals from 1 to 100 MHz.

Why work in the dark? Get the instrument that really works, the Palomar R-X Noise Bridge. Model RX-100 \$59.95 + \$4 shipping/handling in U.S. and Canada. California residents add sales tax.

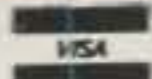
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Shows power and SWR on bright red light bars. See PEP and SWR while you talk! Automatic "hands-off" SWR reading. Power ranges 20-200-2000 watts. Works from 1-30 MHz. For 115-v AC, 220-v AC and 12-v DC models also available.

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- Tune your tuner without transmitting.
- Save those finals!
- Operate easier, faster.

**Do you use an antenna tuner?** Then you need the new Palomar Tuner-Tuner to tune up your tuner without turning on your transmitter. The Tuner-Tuner connects between your tuner and your rig.

### Here's how it works:

1. Turn on the Tuner-Tuner. You'll hear a loud S9+ noise.
2. Tune your tuner until the noise drops out completely.
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4. Start transmitting. SWR will be 1:1.

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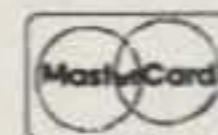
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- 45 Watts on 2 Meters
- 35 Watts on 70 cm
- 30 Memory Channels

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But the truth is, I'm working lots of DX, more than some of these blockbuster types, thanks to my Yaesu FT-747GX.

You see, my no-nonsense FT-747GX was designed with me in mind, so I can hop around the band fast to nail those DX stations. While the other guys are warming up their amplifiers, I'm working the new country!

My FT-747GX has a super receiver, with a directly-driven mixer for great overload protection. And, Yaesu included the CW filter in the purchase price

(I used the money I saved on postage for the QSL cards!).

And my FT-747GX is loaded with other features. The receiver works from 100 kHz straight through to 30 MHz, and it's a fantastic shortwave broadcast receiver. I can use all twenty memories for that alone! Plus it's got dual VFOs. A noise blanker. Split frequency operation for the pile-ups. And scanning up the band helps me check out openings as they happen.

I just put in the optional crystal oven, and next month I'm going to pick up the FM board. I can't wait to tell my buddies I worked England on a repeater!

And with the money I saved when I bought my FT-747GX, I got

a second ten-meter antenna for satellite work on the high end of the band. I use my personal computer to tell me what satellites are going by, and the computer even sets the frequencies on the radio for me.

Now my friends are getting FT-747GX rigs, too. I knew they'd figure out my secret weapon sooner or later. But now I'm setting the pace!

Thanks, Yaesu. You've made a rig that makes sense."

Yaesu USA 17210 Edwards Road, Cerritos, CA 90701  
(213) 404-2700. Repair Service: (213) 404-4884.  
Parts: (213) 404-4847. Prices and specifications subject to change without notice.

**YAESU**

CIRCLE 145 ON READER SERVICE CARD

**"They laughed when they saw my radio.  
Then they saw my logbook."**



ICOM

IC-781 HF Transceiver



# THE FUTURE OF AMATEUR COMMUNICATIONS

Once in a lifetime, a transceiver is introduced that's so extraordinary and innovative that it opens a totally new era in HF communications. ICOM's pacesetter IC-781 proudly exhibits that hallmark achievement with futuristic designs and features of true legendary proportions. Whether DX'ing, contesting, pioneering new interests or enjoying unquestionable top-of-the-line performance, the IC-781 is indeed today's standard of excellence!

**Multi-Function Five Inch CRT.** Displays frequencies, modes, memory contents, operating notes, RIT, two menu screens, plus a panoramic view of all signals in a selected range. A portion of the screen also serves as a display for data modes like RTTY, AMTOR, and PACKET.



**Unique Spectrum Scope.** Continuously indicates all signal activities and DX pileups with your operating frequency in the center. Selectable horizontal frequency spans of 50,

100, and 200KHz for each side of the frequency you're listening to. Vertical range indicates relative signal strengths. A contesteer's dream!



**Dual Width Noise Blanker** includes MCF filter plus level and width controls to eliminate pulse and woodpecker noise with minimum adjacent-signal interference.

**Incomparable Filter Flexibility.** Independent selection of wide and narrow SSB filters plus CW filters. Second and third CW IF filters are independently selectable!

**Dual Watch.** Simultaneously receives two frequencies in the same band! Balance control adjusts VFO A/B receive strength levels. You can check additional band activity, even tune in your next contact, while in QSO without missing a single word!

**DX Rated!** 150 watts of exceptionally clean RF output. Easily drives big amplifiers to maximum power.

**Twin Passband Tuning with separate controls for second and third IF stages!** Increases selectivity and narrows bandwidth, independently varies low and high frequency response, or functions as IF shift. **It's DX'ing Dynamite!**

**A Total Communications System!** Includes built-in 100% duty AC supply, high speed automatic antenna tuner, lambdaic keyer, semi-automatic or full QSK CW break-in to 60 wpm, Audio Peaking Filter (APF), RF speech processor, multiscanning, 105dB dynamic range, all-band/all-mode receiver with general coverage, and much more!

**ICOM Dependability.** The phenomenal IC-781 is built for action and backed with the most extensive warranty in the industry.

See the IC-781 at your local ICOM dealer.

CIRCLE 87 ON READER SERVICE CARD

ICOM  
First in Communications

ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004  
Customer Service Hotline (206) 454-7619  
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ICOM CANADA, A Division of ICOM America, Inc.,  
3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4  
All stated specifications subject to change without notice or obligation.  
All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 781188.