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OCTOBER 1981 \$2.00



CQ

**A Two-Chip C.W.
Transmitter With A
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1980 CQ W.W. DX Contest

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THE RADIO AMATEUR'S JOURNAL



Top-Notch.



VBT, notch, IF shift, wide dynamic range

TS-830S

Now most Amateurs can afford a high-performance SSB/CW transceiver with every conceivable operating feature built in for 160 through 10 meters (including the three new bands). The TS-830S combines a high dynamic range with variable bandwidth tuning (VBT), IF shift, and an IF notch filter, as well as very sharp filters in the 455-kHz second IF. Its optional VFO-230 remote digital VFO provides five memories.

TS-830S FEATURES:

- **160-10 meters, including three new bands**
Covers all Amateur bands from 1.8 to 29.7 MHz (LSB, USB, and CW), including the new 10, 18, and 24-MHz bands. Receives WWV on 10 MHz.
- **Wide receiver dynamic range**
Junction FETs (with optimum IMD characteristics and low noise figure) in the balanced mixer, a MOSFET RF amplifier operating at low level for improved dynamic range (high amplification level not needed because of low noise in mixer), dual resonator for each band, and advanced overall receiver design result in excellent dynamic range.

- **Variable bandwidth tuning (VBT)**
Continuously varies the IF filter passband width to reduce interference. VBT and IF shift can be controlled independently for optimum interference rejection in any condition.
- **IF notch filter**
Tunable high-Q active circuit in 455-kHz second IF, for sharp, deep notch characteristics.
- **IF shift**
Shifts IF passband toward higher or lower frequencies (away from interfering signals) while tuned receiver frequency remains unchanged.
- **6146B final with RF NFB**
Two 6146B's in the final amplifier provide 220 W PEP (SSB)/180 W DC (CW) input on all bands. RF negative feedback provides optimum IMD characteristics for high-quality transmission.
- **Built-in digital display**
Six-digit large fluorescent tube display, backed up by an analog dial. Reads actual receive and transmit frequency on all modes and all bands. Display Hold (DH) switch.
- **Adjustable noise-blanker level**
Built-in noise blanker eliminates pulse-type (such as ignition) noise. Front-panel threshold level control.

- **Various IF filter options**
Either a 500-Hz (YK-88C) or 270-Hz (YK-88CN) CW filter may be installed in the 8.83-MHz first IF, and a very sharp 500-Hz (YG-455C) or 250-Hz (YG-455CN) CW filter is available for the 455-kHz second IF.
- **More flexibility with optional digital VFO**
VFO-230 operates in 20-Hz steps and includes five memories. Also allows split-frequency operation. Built-in digital display. Covers about 100 kHz above and below each 500-kHz band.
- **Built-in RF speech processor**
For added audio punch and increased talk power in DX pileups.
- **RIT/XIT**
Receiver incremental tuning (RIT) shifts only the receiver frequency, to tune in stations slightly off frequency. Transmitter incremental tuning (XIT) shifts only the transmitter frequency.
- **SSB monitor circuit**
Monitors IF stage while transmitting, to determine audio quality and effect of speech processor.

More information on the TS-830S is available from all authorized dealers of Trio-Kenwood Communications, Inc., 1111 West Walnut Street, Compton, California 90220.

Matching accessories for fixed-station operation:

- SP-230 external speaker with selectable audio filters
- VFO-230 external digital VFO with 20-Hz steps, five memories, digital display
- AT-230 antenna tuner/SWR and power meter
- MC-50 desk microphone
- HC-10 digital world clock
- YG-455C (500-Hz) and YG-455CN (250-Hz) CW filters for 455-kHz IF
- YK-88C (500-Hz) and YK-88CN (270-Hz) CW filters for 8.83-MHz IF
- HS-5 and HS-4 headphones
- MC-30S and MC-35S noise-cancelling hand microphones

Other accessories not shown:

- TL-922A linear amplifier
- SM-220 Station Monitor
- PC-1 phone patch

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Easy tuning, digital display, professional quality

R-1000

The R-1000 is an amazingly easy-to-operate, high-performance, communications receiver, covering 200 kHz to 30 MHz in 30 bands. This PLL synthesized receiver features a digital frequency display and analog dial, plus a quartz digital clock and timer. Its easy-single-knob tuning and high sensitivity, selectivity, and stability make the R-1000 a favorite amongst Radio Amateurs, shortwave listeners, engineers, maritime communicators, and others who demand high quality in a general-coverage communications receiver.

R-1000 FEATURES:

- **Continuous frequency coverage from 200 kHz to 30 MHz**
Receives shortwave, medium-wave, and long-wave bands.
- **30 bands, each 1 MHz wide**
Easy-to-use band switch with large knob.
- **Five-digit frequency display and analog dial**
Accurate digital display with 1-kHz resolution and illuminated analog dial with precise gear dial mechanism.
- **Built-in quartz digital clock with timer**
Precise 12-hour clock with AM and PM indicators. Timer turns on radio for scheduled listening, and even controls a recorder through remote terminal.
- **Up-conversion PLL, wideband RF circuits**
Provide exceptional performance and easy operation without the need for band-spread, preselector, or antenna tuning. Excellent sensitivity, selectivity, and stability.
- **Step attenuator**
0-60 dB in 20-dB steps. Prevents overload.

- **Three IF filters for optimum AM, SSB, CW**
12-kHz and 6-kHz (adaptable to 6-kHz and 2.7-kHz) filters for AM wide and narrow, and 2.7-kHz filter for high-quality SSB (USB and LSB) and CW reception.
- **Communications-type noise blanker**
Eliminates ignition and other pulse-type noise. Superior to noise limiter.
- **Recording terminal**
For external tape recorder.
- **Tone control**
For desired audio response.
- **Built-in 4-inch speaker**
For quality sound reproduction.
- **Dimmer switch**
Controls S-meter and other panel lights and digital-display intensity.
- **Three antenna terminals**
Wire terminals for 200 kHz to 2 MHz and 2 MHz to 30 MHz. Coax (SO-239) terminal for 2 MHz to 30 MHz.
- **Selectable operating voltage**
AC voltage selector for 100, 120, 220 and 240 VAC. Also adaptable to operate on 13.8 VDC (with optional DCK-1 kit).

More information on the R-1000 is available from all authorized dealers of Trio-Kenwood Communications, Inc., 1111 West Walnut Street, Compton, California 90220.

Matching accessories:

- SP-100 external speaker
- HS-5 deluxe headphones

Other accessories not shown:

- HS-4 headphones
- DCK-1 easy-to-install modification kit for 12-VDC operation



HC-10 Digital World Clock

- **Two 24-hour displays with quartz time base**
Right display: local (or UTC) hour, minute, second, day. Left display: month, date, world time in various cities, memory time (QSO starting time), and time difference (in hours from UTC).
- **Time in 10 cities around the world**
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TS-830S



TS-130S

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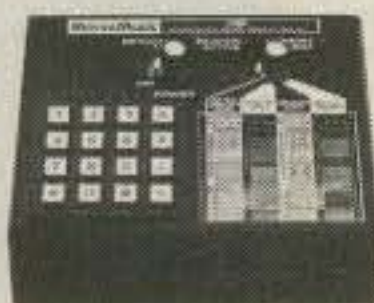
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The Radio Amateur's Journal

ON THE COVER: Larry Strain, N7DF, used this converted Collins Discage to rack up a good score on 80/160 in the c.w. contest. It's a mere \$30,000 new and somewhat less on the surplus market.



OCTOBER 1981

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Zero Bias

AN EDITORIAL

Everyone here is getting on edge anticipating the yearly onrush of logs. With the CQ WW DX Contest coming up this month, we've already begun to clear an area in which to store the thousands upon thousands of logs that will soon arrive. Our mailman wants to know what kind of car or trip the winner gets, who does he have to draw, or how many questions does he have to answer and in what category. We gave him some books, a few code tapes, and the new rules, so who knows . . . the next signal you hear from Hicksville just might be our mailman.

July started out to be a slow month with regard to traveling, but it soon filled out with three short trips. On the 12th (which was a very hot Sunday) we were out in Mt. Sinai, Long Island (near Port Jefferson) for the Radio Central ARC 3rd annual Hamfest. With virtually no shade and in blazing sun loads of folks came to talk ham radio and complain about the heat. The following weekend, the 18th, we headed out to New Jersey for Radios Unlimited's "Open House" where they were having an "ICOM Day." John Horton, W5VOV, from their Dallas office, flew up for the event, and Evelyn Garrison plus Tom Snelling, WB7ONV, came in from the Bellevue, Washington office. Randy Gutentag of Radios Unlimited had sent out a mailing to what seemed like every ham in the New Jersey and New York areas, and it seemed as if a lot of folks took him up on it. The store had a continual crowd all day, and the local repeaters were busy directing traffic to the store.

On July 25th Dick and I drove down to Baltimore at the invitation of Mayer Zimmerman, W3GXX, to attend the Baltimore Radio Amateur Television Society (BRATS) Maryland Hamfest. After a good night's sleep we got up early and headed out to Howard County Fairgrounds and set up the CQ display. It was a great day for all who attended, and there were some tremendous buys to be had at the fleamarket. Well, we're home now for about a week or so, and then Dick and I head out to Chicago for the Hamfesters event in early August.

Dallas Update

When we were in Dallas for HamCom last June, we sidetracked up to Fort Worth (or is it out to Fort Worth?) to check



See what fun you can have with a few bagels? Toasting the joyous bunch with a jar of pickles is Jack Gutzeit, W2LZX, our Advertising Manager. I'm next to Jack, and next to me is Saul Gresky of their Personnel and Training Dept. who I worked with over twenty years ago at Hudson Radio here in N.Y. Receiving the first bag of bagels is Martin Bradley Winston, WB8LBV, CQ author and new Director of Publicity for Radio Shack. Next to Marty is Hy Siegel, K9CCN/5, an old friend and Radio Shack's Assistant Advertising Copy Director. The other "Smith Brother" (as we are sometimes called) at the end is Dick Ross, K2MGA.

in at Tandy Corporation, the home of Radio Shack. Besides being a bit mercenary and trying to sell them some advertising, it's an annual excuse to visit some old friends who no longer travel north. The following is a rendition of that reunion.

In this great age of mobility it is not too unusual for people to transplant cross-country to new jobs. While uprooting the family is traumatic enough, there is often the great loss of something you've always taken for granted, but now find unobtainable or at best a very poor imitation. For some it's Chicago-style pizza, but for easterners it's two distinct items not usually found elsewhere: clams and bagels. Oh, you can get bagels in most parts of the country, but they're not the same as New York bagels. Perhaps it's the water, or a soupcon of some secret ingredient, or even a highly guarded baking technique, but whatever it is, they don't taste the same anyplace else. One

thing they surely do is travel much better than clams (and they last longer, too).

Prior to our trip to Dallas for HamCom in June, the intrepid CQ team loaded up with 20 dozen bagels of assorted varieties (including a very heady garlic bagel), a half a dozen or so jars of Kosher pickles, and a quantity of lox (smoked salmon), plus a few jars of Polish mustard to bring to some transplanted Yankees who are now working at Tandy Corporation (Radio Shack) in Fort Worth. These commonly found staples (in New York) were a cultural shock for some of the Texans.

Dick, Jack, and I (as the picture shows) deposited one large carton and several suitcases full of the comestibles at Tandy for the enjoyment of all. A volunteer (that's what we used to call them in the army) was sent out for cream cheese and a party ensued. I think that one of the highlights of this maneuver was a comment by one of the women there who had never

OMNI-C has what it takes to filter the crowds. To narrow the Amateur Radio world right down to the particular signal you want. The selectivity, sensitivity, dynamic range and operational features you need to cut any crowd down to size. **Tailored i-f response.** OMNI is equipped with the potential for **seven** response curves to handle any listening situation.

Standard filters include an excellent 8-pole 2.4 kHz crystal ladder filter and, in addition, a 150 Hz active audio cw filter with three ranges (450, 300, 150 Hz).

Optional filters include 1.8 kHz 8-pole crystal ladder ssb filter, 500 Hz 8-pole cw filter, and 250 Hz 6-pole cw filter.

Front panel switches put any optional filter in series with the standard filter for up to **16 poles of filtering** for near ultimate skirt selectivity.

Four i-f response curves for ssb and three for cw. That's response tailoring, that's crowd control.

Optimized sensitivity and dynamic range.

The OMNI sensitivity range of 0.3 μ V typical (slightly less on 160 & 80M) combines with a 90 dB dynamic range to provide an ideal balance that will handle any situation from copying a weak signal half way

'round the world to keeping the next-door kilowatt from muscling in. And a PIN diode switched 18 dB attenuator is included for extra insurance against overload.

More crowd-handling features—and all standard equipment.

Built-in notch filter.

To drop out unwanted signals or carriers. Tunable from 200 Hz to 3.5 kHz, with a 50 dB notch depth.

3-mode, 2-range offset tuning.

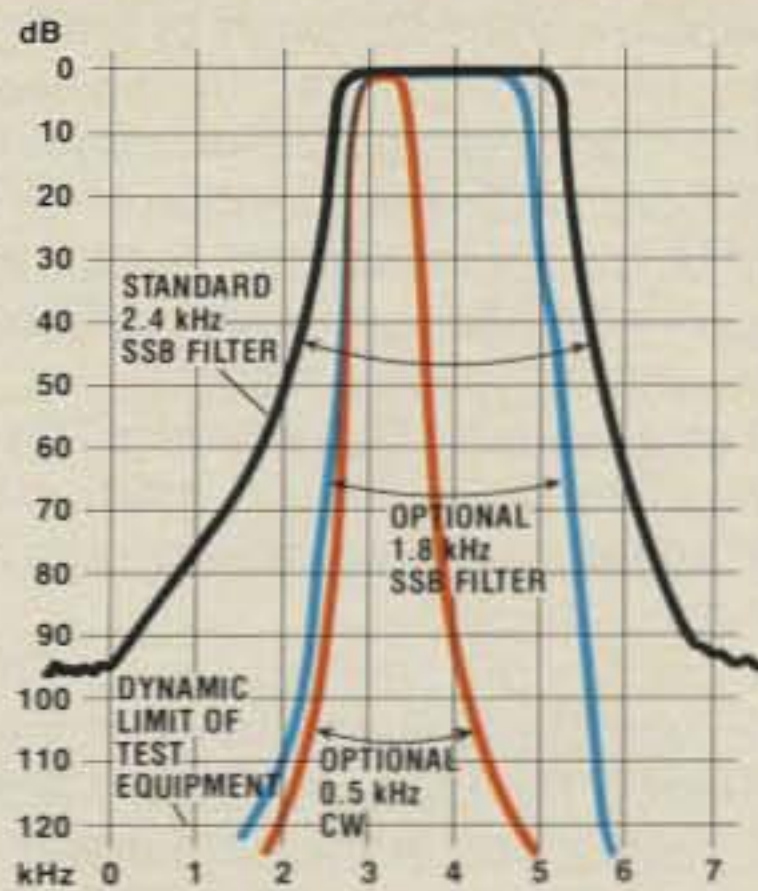
To put you where the others aren't and where the elusive DX is. Move just the OMNI receiver, or just the transmitter section, or the entire transceiver, ± 500 Hz or ± 4 kHz. For complete freedom of frequency movement to get away from the crowds.

Built-in noise blanker for those times when your noise-generating neighbor is crowding your receiver. Filtered to handle the big signals easily.

2-speed break-in. When QRM or QRN is heavy, switch to "Slow." Use "Fast" for instant, full break-in for enjoyable rag-chews or stalking DX.

OMNI-C features stand out in any crowd.

All solid-state—from the pioneer, Ten-Tec.



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Adjustable threshold ALC, optimum power for driving a linear. Provides means of working into a high SWR. **Front panel control of linear or antenna.** The rear panel bandswitch terminals control relays or circuits in step with front panel band-switch.

Automatic sideband selection plus reverse.

Low distortion audio, less than 2%; a Ten-Tec trademark.

Clean signal, exceeding FCC requirements.

High stability over wide temperature and voltage excursions.

Built-in speaker, compression-loaded; in bottom of cabinet.

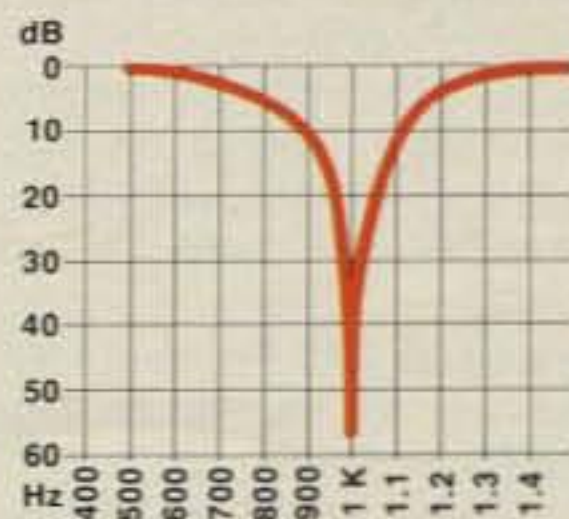
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All 9 hf bands—only crystals are needed for 18 and 24.5 MHz bands.

Broadband design for instant band change without tune-up or danger of damage to the final amplifier. Another Ten-Tec original.

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Model 280 Dual Primary AC Power Supply, \$169; Model 255 Deluxe Power Supply/Speaker Combo, \$199; Model 243 Remote VFO, \$189; Model 215 PC Microphone, \$29.50; Model 214/234 Microphone/Speech processor, \$39/\$139; Model 645 Dual Paddle Keyer, \$85; Model 670 Single Paddle Keyer, \$39; Model 227 Antenna Tuner, \$79; Filters \$55 ea.

Made in the U.S.A.

Model 546 OMNI-C transceiver \$1289

Get out of the crowds with OMNI-C. See your Ten-Tec dealer or write for details.

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Carlos V. Roberts, outgoing Chief of the Private Radio Bureau, FCC.

seen a bagel before and called it a New York doughnut.

FCC Changes

The following information comes via our Washington correspondent, Ted Cohen, N4XX. Ted has conducted extensive interviews with both Carlos and Jim for

CQ and writes our Dateline Washington column each month.

Carlos V. Roberts, Chief of the Private Radio Bureau, resigned his position effective 1 September. Carlos will join M/A-COM Corp. in the new position of Director Land Mobile Development. His job will be to apply advanced technology to land mobile communication products.

Carlos holds an MS degree in Telecommunications from the University of Colorado and is an eleven-year veteran of the Commission.

Accepting the new position of Chief of the Private Radio Bureau will be James C. McKinney. Mr. McKinney, you will recall, was interviewed in the September 1980 issue of CQ while he was Chief of the Field Operations Bureau. Mr. McKinney has been with the FCC since 1963, joining it after graduating from West Virginia Institute of Technology as an Electronics Engineer. He comes to the Private Radio Bureau with a strong background in the administration and enforcement of regulations and treaties relating to all non-government radio communications.



James C. McKinney, new Chief of the PRB, FCC.

I've had the pleasure of knowing both of these gentlemen for several years and hold both of them in high regard. I'd like to wish both of them every success in their new positions. Though neither Carlos nor Jim are hams, they both have exhibited a keen perception of amateur radio and have been active supporters of our service.

73, Alan, K2EEK

Announcing

● **KA4SJV to Operate During Space Shuttle Launch** - KA4SJV will be operating from Winston-Salem, North Carolina, during the launch of the second space shuttle flight. They will begin transmitting one hour after the shuttle achieves orbit. Frequencies will be 21.100-21.150 on 15 meters. They will be announcing the progress of the shuttle's flight.

● **Houston ComVention 81** - Houston Ham Conventions, Inc. and the Houston Area Radio Clubs will hold the Houston ComVention 81 on October 2-4 at the "Astrodomain" in Houston, Texas. Included will be amateur-radio-oriented computer exhibits and forums, flea market, Friday night equipment auction, commercial exhibits, and many more activities. Preregistration fee (by Sept. 15) is \$5; \$7 at the door. Full details are available from HHC, Inc., Box 79252, Houston, TX 77024, or call 713-481-4586.

● **ARRL South Florida Suncoast Convention** - This event will take place at the Sand Key Sheraton Hotel, in Clearwater Beach, Florida, on October 3rd and 4th. There will be a swap area, commercial exhibits, forums, luncheon, and evening banquet. Advance registration is \$4 (luncheon tickets \$6.95 complete, banquet tickets \$12.95 complete). For advance registration and more information, contact the convention committee at P.O. Box 157, Clearwater, FL 33517.

● **York County Hamfest** - The York County ARS will sponsor its 30th annual Hamfest on Sunday, October 4th at Joslin Park in Rock Hill, South Carolina. For additional information, contact YCARs, P.O. Box 4141 CRS, Rock Hill, SC 29730.

● **16th Annual Blossomland Blast** - The Blossomland ARA will hold this, southwest Michigan's largest hamfest, on October 4th from 8 a.m. to 3:30 p.m. at the Lake Michigan College Convention Center near Benton Harbor. Swap and

shop and programs. Prepaid tickets \$2; \$3 at the door. Tables \$5 each. Talk-in on 22/82 and 52 simplex. For tickets and information, send an s.a.s.e. to BARA, P.O. Box 175, St. Joseph, MI 49085.

● **Columbia ARA 5th Annual Hamfest** - This event will be held on October 11th at the Howard County Fairgrounds, just west of Baltimore, Maryland. Admission is \$3, tailgating and tables \$6. Food and prizes available. Talk-in on 147.735/135 and 146.52/52. For reservations and information, contact Dennis Parra, 6955 Spinning Seed, Columbia, MD 21045.

● **27th Annual VHF Conference** - The conference will be held on Saturday, October 17th at Kohrman Hall, Western Michigan University, Kalamazoo, Michigan. Presented will be papers of relevance to amateurs and radio engineers. For further information, contact Dr. Glade Wilcox, W9UHF, VHF Conference Chairman, Western Michigan University, Dept. of Electrical Engineering, Kalamazoo, MI 49008.

● **Irwin Area ARA Swap & Shop** - This event will be held on Saturday, October 17th at the Circleville V.F.D., Robbins Stations Road, Irwin, Pennsylvania. Flea market, vendors, prizes, and refreshments. Talk-in on 146.925/325 and 146.52. For more information, contact Bill Stash, WA3AOQ, 421 Dailey Dr., N. Huntingdon, PA 15642.

● **Big Rapids Area ARC Fox Hunt** - This hidden transmitter hunt will be held on October 17th with prizes for first, second, and third place. The event will start at 10 a.m., with registration from 8 a.m. to 10 a.m. Transmit frequency is 146.64. Refreshments available and trunk sales welcome. Registration fee is \$3.50 per carload. For more information, contact Big Rapids Area ARC, Box 1073, Big Rapids, MI 49307.

● **Hamfest Chattanooga** - Hamfest Chattanooga will be held October 24-25 at Chattanooga

State Technical Community College, Chattanooga, Tennessee. Events will include dealer exhibits, flea market, forums, contests, and ladies programs. Admission free, prize ticket donations, \$1. Flea market spaces \$2/day or \$3/both days. Talk-in on 19/79 and 3980. For more information, contact Hamfest Chattanooga, P.O. Box 3377, Chattanooga, TN 37404, or call 404-398-3358.

● **Heart of Ohio Ham Fiesta** - The Marion ARC will hold this 7th annual event on Sunday, October 25th from 0800 to 1600 at the Marion County Fairgrounds Coliseum. Door prizes, check-in prizes, refreshments. Tickets \$2 in advance, \$3 at the door. Tables \$4. Talk-in on 146.52, 147.90/30, or 223.34/224.94. For information and tickets, contact Paul Kilzer, W8GAX, 393 Pole Lane Road, Marion, OH 43302.

● **Framingham ARA Fall Flea Market** - This 6th annual event will be held on Sunday, October 25th at the Framingham, Massachusetts Police Station drill shed. Doors open at 10 a.m. (setup at 8 a.m.). Admission is \$1, sellers \$8 per table in advance (until Oct. 15), \$10 thereafter. Talk-in on 75/15 and 52. For information, contact Ron Egalka, K1YHM, 3 Driscoll Dr., Framingham, MA 01701.

● **WJRA Special Operation For Halloween** - The West Jersey Radio Amateurs will man a special operation, call sign W2JUG, from the South Jersey Pine Barrens the full 24 hours of Halloween, October 31st. Frequencies will be 15 kHz from the bottom of each general phone band, 80 through 2 meters. Novice will also be 15 kHz up. Certificates will be sent to all stations worked who send an s.a.s.e. to WJRA, P.O. Box 62, Burlington, NJ 08016.

● **Glitch Department** - In Carter Richardson's article "The Square Tower" (July 81 CQ, page 33), Dave was inadvertently listed as WB5HBJ. His call is WB5HJV.

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- 7010-S/K-7000-AC 1 1/4" H x 4 1/2" W x 5 1/4" D

MODEL	RANGE (FROM 10 Hz)	TIME BASE		AVERAGE SENSITIVITY		GATE TIMES	MAX RESOLUTION			SENSITIVITY CONTROL	EXT. CLOCK INPUT/ OUTPUT	METAL CASE
		FREQ	STABILITY-DESIGN	BELOW 500 MHz	ABOVE 500 MHz		12 MHz	60 MHz	MAX FREQ			
K-7000-AC	550 MHz	5.24288 MHz	± 1 PPM - RTXO	15 mV -24 DBM	N/A	(2) .1, 1 SEC	10 Hz	10 Hz	100 Hz	No	No	Yes
7010-S	600 MHz *1 GHz	10 MHz	± 1 PPM - TCXO * ± 0.1 PPM-OCXO	10 mV -27 DBM	20 mV -21 DBM	(3) .1, 1, 10 SEC	.1 Hz	1 Hz	10 Hz	Yes	No	Yes
8010-S	600 MHz *1 GHz	10 MHz	± 1 PPM - TCXO * ± 0.05 PPM-OCXO	10 mV -27 DBM	20 mV -21 DBM	(4) .01, .1, 1, 10 SEC	.1 Hz	1 Hz	10 Hz	Yes	Yes	Yes
8013-S	1.3 GHz	10 MHz	± 1 PPM - TCXO * ± 0.05 PPM-OCXO	10 mV -27 DBM	20 mV -21 DBM	(4) .01, .1, 1, 10 SEC	.1 Hz	1 Hz	10 Hz	Yes	Yes	Yes

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Remember those old single 6L6 transmitters that got a lot of us going? Here's a little rig that you could put together that would probably fit inside one of those 6LS's while still putting out a signal on 40 and 80.

A Two-Chip C.W. Transmitter With A 7403 In The Final

BY PHIL ANDERSON*, W0XI

You can get on 80 or 40 meters in real QRP style with just two logic chips, three coils, a crystal, and a handful of resistors and capacitors. Be the first on your block! Enjoy the thrill of working across town on 160 milliwatts. With luck and a good antenna, you might even work five or six states. And the best part of all is the price. Assuming you can round up a few crystals, the rest shouldn't cost more than a few dollars.

Crazy you say? Impossible you say? Well, I had those thoughts, too. But once I tested the two-chipper, I received 5NN reports from 2 miles down the road and his r.f. attenuator was on! Try QRP-P-P, you'll like it.

The Schematic Diagram

The transmitter consists of two TTL logic chips, three coils, four capacitors, three resistors, a crystal, and two diodes. Functionally, it contains four sections: the oscillator, the final, the full-breakin circuitry, and the keying circuit.

The oscillator consists of two NAND gates, U1-U2, with crystal feedback. U3 is added as a buffer for the oscillator from the finals. This is a standard TTL crystal oscillator, and will function to about 12 MHz. Sorry, no 20 meter operation.

The finals are 7403 open collector NAND gates. They are hooked in parallel to obtain a little more power. While bipolar transistors generally do not combine well in parallel, I found no problems with the five chips tested. Output power to the antenna measured between 160 and 200 milliwatts. The RFC, through which the d.c. power is supplied, is not critical; 100 uh should work just as well. Radio Shack

sells a 100 uh version.

The keyer circuit uses one NAND gate, U4, and one pull-up resistor. When the key is not grounded, pins 12 and 13 will be high, at 5 volts, and output of U4, pin 11, will be low, about .8 volts. With pin 11 low, pins 2 and 5 on the finals, U5-U6 will be low, holding them off. However, when the key is closed, pins 2 and 5 will be high, allowing the oscillator signal to be gated to the finals.

The full-breakin circuit consists of the two back-to-back diodes, one capacitor, and one slug-tuned coil, L. The diodes are added to make sure that a maximum of .6 volts is seen by the receiver during transmit. Since C is small and effectively shunted to ground by the diodes, the breakin circuit does little to load the output pi-network and antenna circuit. L is added to tune out the capacitive reactance of C so that the receiver matches the antenna.

*3005 W. 19th St., Lawrence, KS 66044

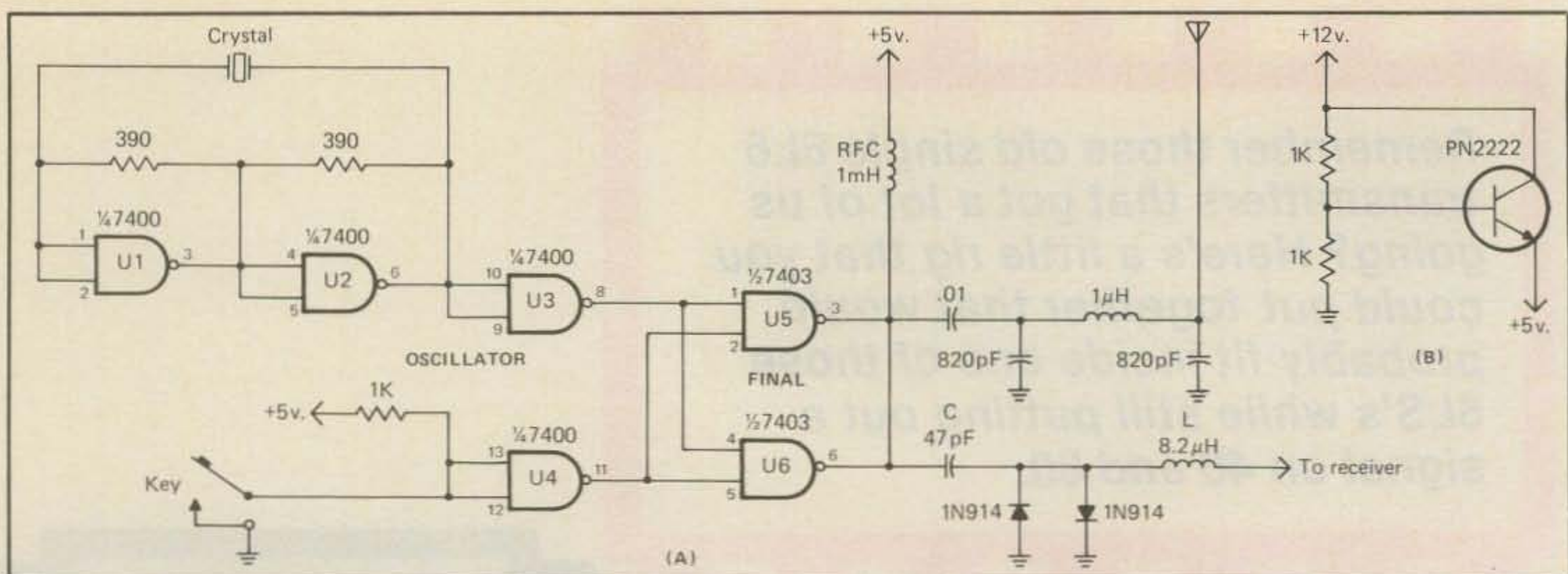


Fig. 1—Schematic diagram for the two-chip c.w. transmitter. (B) is a simple voltage divider for battery use. The transmitter is capable of delivering between 160 and 200 milliwatts.

For L and the pi-network coil I used slug-tuned Miller parts. Gowanda coils could also be used. If these coils are not available to you, you may want to use toroids and utilize variable capacitors, trimmers.

Circuit Construction

The prototype was constructed on a plugin board. The ICs were plugged in and the interconnecting wires were stripped and inserted appropriately. I soldered resistor wires on the two crystal leads

and then stuck those leads into the board. For a more permanent unit, vector board would do fine.

If you do not have a 5 volt d.c. supply, you can utilize the same divider I did, shown at the bottom of the schematic on the left. For 12 volts d.c. I used a battery adapter.

Crystals may be hard to find. One crystal that is usually in ample supply is the TV color crystal. Check your local TV repair shop. That puts you on 80 meters, 3.58 MHz. The pi-network and breakin circuit values will have to be changed. For the pi-

net use 2.2 uH for the coil and .001 uF for the caps. Leave C the same for the break-in circuit and adjust L to about 40 uH.

Testing the Transmitter

The two-chipper was tested by placing it on the air. The station antenna is a 4-band vertical and the unit was attached to its feedline and the TS-520 was in turn connected to the "receive" connection on the two-chipper board.

Without the key down, the output of the U1-U2 oscillator was easily found by tuning the TS-520 to the crystal frequency, 7.125 MHz. It was found that the note heard was not much louder when the key was down, for the receiver a.g.c. had already taken over. In addition, other signals could be heard also, so the two-chipper was not desensing the receiver.

The next step was to listen for any stations calling CQ on or near the frequency. I figured that they would have to be within 1 kHz for me to have a chance of contacting them. Since it was the middle of the afternoon on Saturday, there were several heard within minutes. I tried to answer them, but could not beat out stations with power 1000 times mine!

In order to make sure that I was getting out, I decided to call an OM up the street about two miles away, Jack Porter, KB0AO.

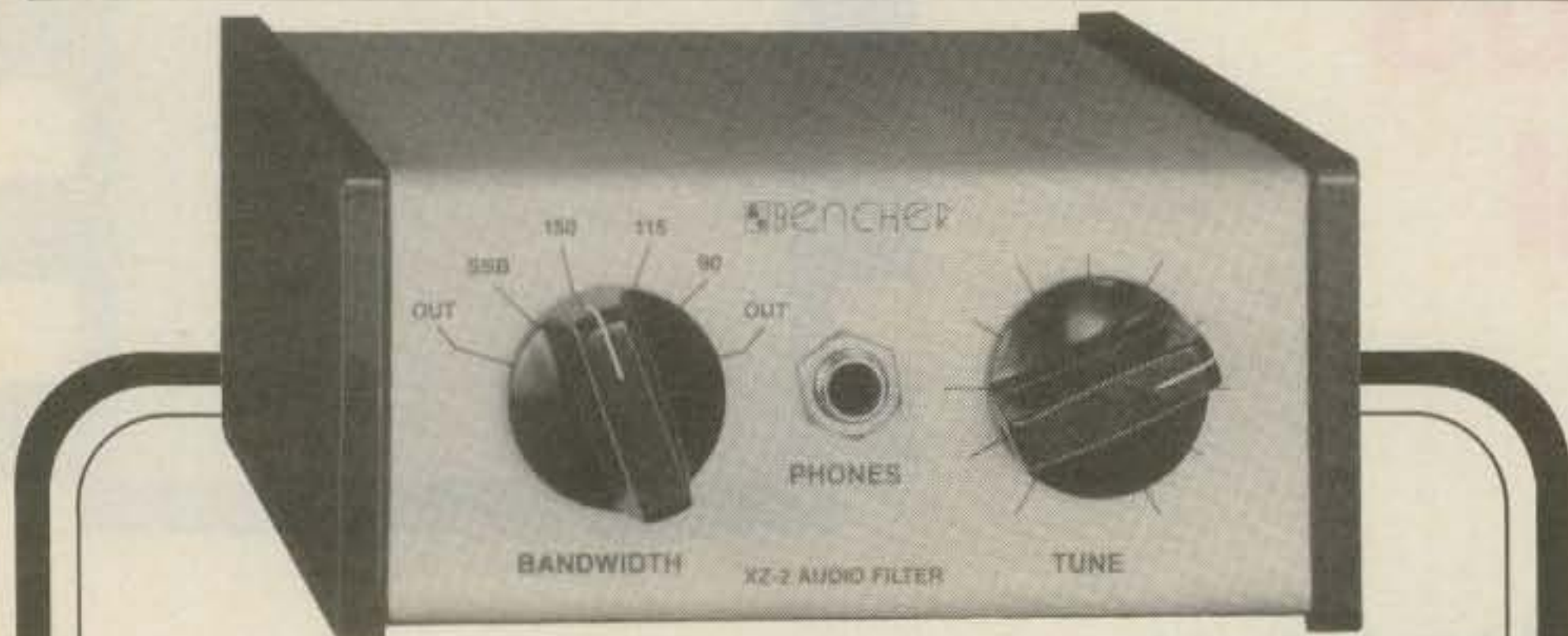
"Hey Jack," I said, "I've wired up a couple of logic chips to my 40 meter antenna, and I want to find out if I'm getting out. Will you help me?"

"You've what?"

I explained further and he said he'd be glad to. By the way, Jack, Jr. has a license too, KA0DPB. We agreed to wait five minutes for Jack's equipment to warm up and then I'd call for him at 7.125 MHz.

Well, I called and Jack came right back. Here's what he said, somewhat to my surprise, "Good sig, RST is 5NN-5NN, in fact r.f. attenuator on as sig too loud."

That's not bad for a two-mile 160 milliwatt QSO.



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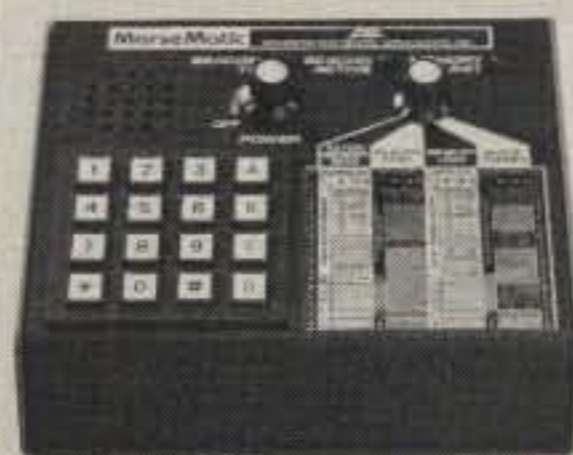


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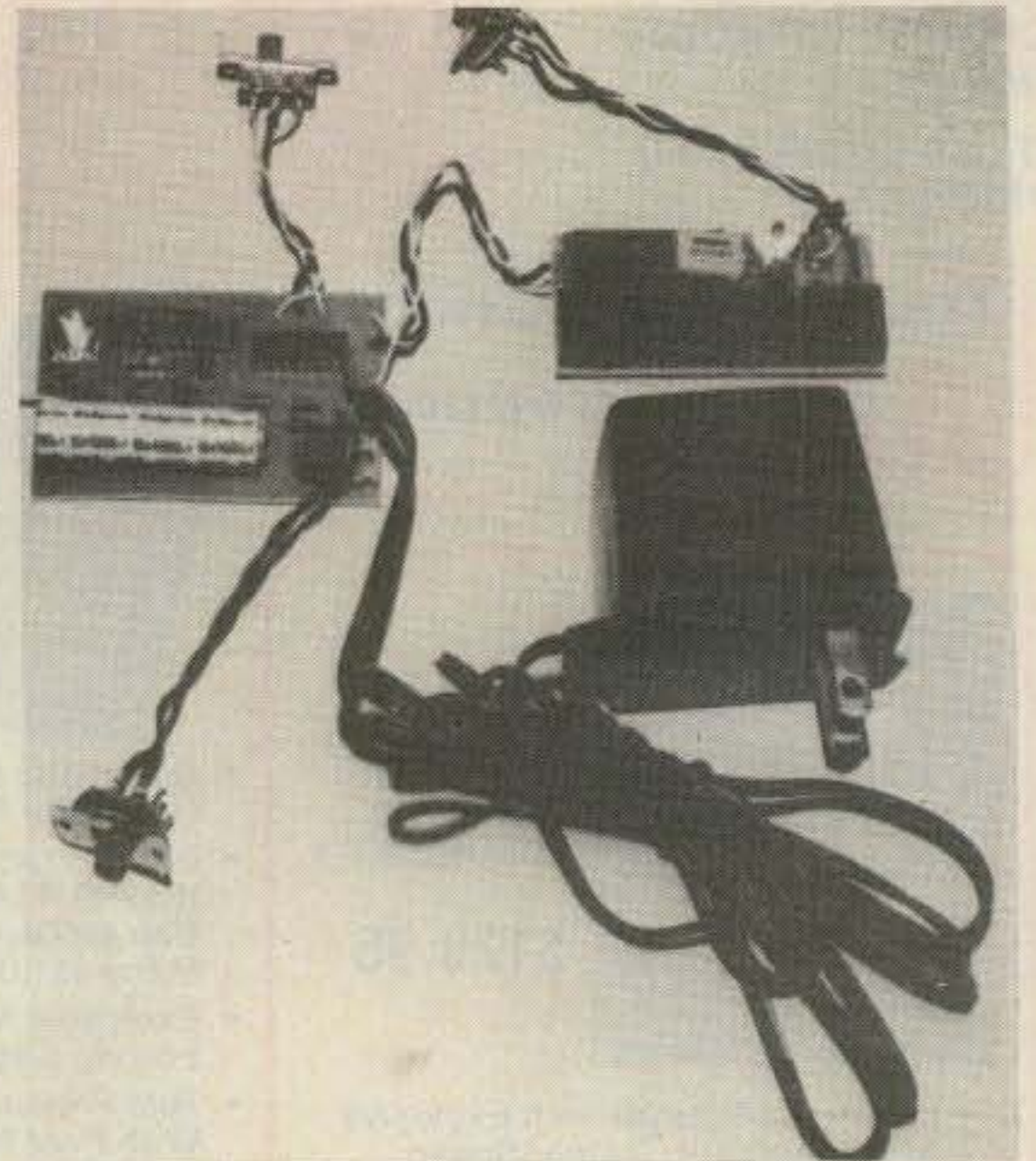
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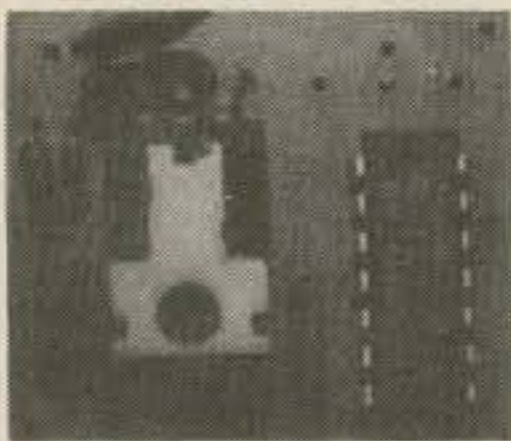
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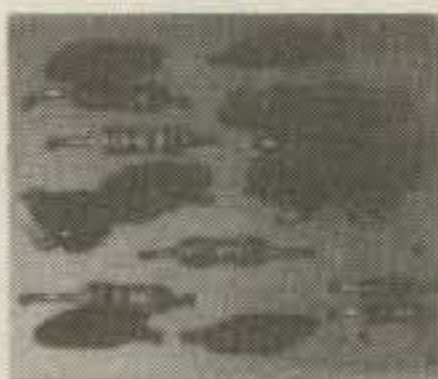
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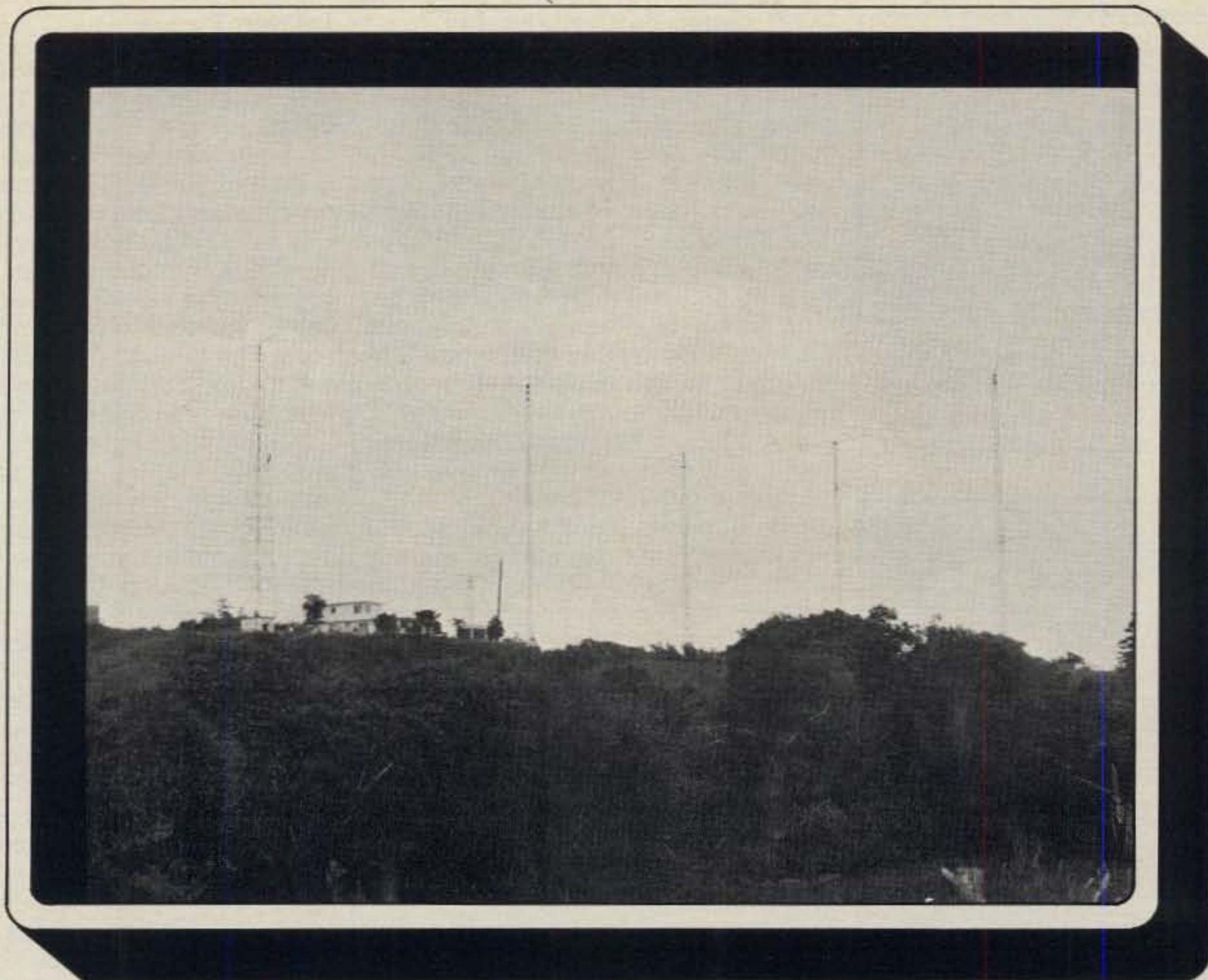
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KP4D sent us this photo of the antenna layout at NP4A 300 feet above sea level at the top of a copper mine. What a ground!

1980 CQ World Wide DX C.W. Contest Results

BY LARRY BROCKMAN, N6AR* AND BOB COX, K3EST**

The Promise of 1981

It is 2 a.m. Sunday morning. The contest has been going on now for 34 hours. But our hero, who has faithfully stuck out all 34 hours, feels that he just must keep combing those bands. As he tunes across 40M c.w., the eyebrows start getting that heavy feeling. Oh, to just have a little sleep. But no—the contest, the contest. . . . All of a sudden, the saving thought hits him. Coffee! Coffee will keep him awake during these late hours so he can snag those juicy 40M and 80M Asian multipliers. His bleary eyes shift now to the area down from the operating table where the six or seven empty coffee cups litter his dupe sheets. But then, alas, the ears ring alive with the sweet sound of Morse Code. What's this—an HS4! For-

get the coffee; never mind the sleep. The adrenalin flows freely into our hero. Now he is alert and wide awake, poised and ready to make the contact. More c.w. rings through the air. Oh, no—a false alarm. It is just an HL4, and already on the dupe sheet, too. Son of a gun! Our hero hurries back to the tuning. Like the certainty of death and taxes, the eyelids soon begin to droop again, and droop some more . . . and some more. And then, our hero is fast asleep.

The hours slip away in sweet slumber. Gone are the JA runs of early dawn; gone is the world high record our hero aspired to; gone is the glitter of a trophy; gone, even, is the certificate for regional winner. Yet, like the true contestant he is, our hero will console himself. "Wait till next year." And now, next year is just a few weeks away. And so, we make this promise to all the faithful contesters out there. A guaranteed bonanza of juicy DX packed r.f. spectra for a full 48 hours of contesting joy. Just to whet your interest, here's all the 1980 contest results to give you something to shoot for.

1980 All Band Highlights

It was another year for outstanding all time records (25 in all). Gone is the old Single Operator All Band World High record of 5.1M set by OH2BH from CT3 land in 1978. The new king of the World (and South America, too) in c.w. is Dick Norton, N6AA, from his borrowed 9Y4VT location, with a whopping 6.1M. Dick's score was more than 2M points above the fine effort of the nearest competitor, Jorge, LU8DQ, who finished at 4.0M. The difference was those low bands, where Dick really cleaned up.

Stateside, John Dorr, K1AR, has set a new Single Op/All Band USA standard at 2.8M, breaking his own last year's record by 200,000 points. He was followed closely by Eastern rivals K1KI and N2LT in a closed pack grouping that put three W's in the top 10 in the World for the second straight time.

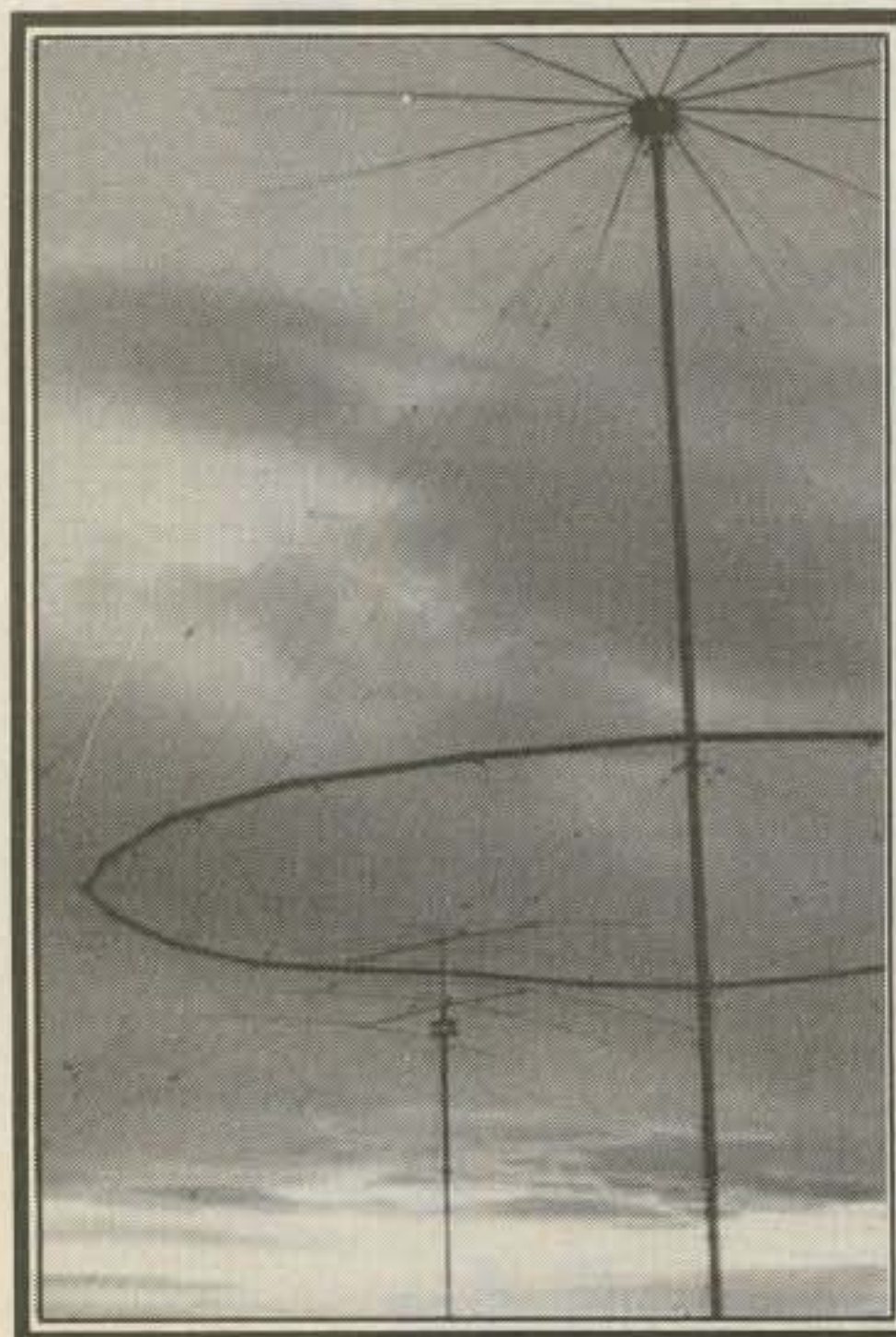
The Northern Lithuanian Contest Group sent a group down to Soviet Georgia two weeks early with an eye on the 1979 Asian Multi-Single record set by

* 7164 Rock Ridge Terrace, Canoga Park, CA 91307.

**6548 Spring Valley Drive, Alexandria, VA 22312.



The Northern Lithuania Contest Group's Multi-Single entry, RG6G, was manned by this exuberant bunch of guys. What a location, as evidenced in the background.



N7DF used this 80/160 discage to sport a fine 80/160 meter signal. The 15/20 meter beams are shown in the background.

RF6F. But, at 9.7M, the RG6 group walked away with a new World High Multi-Single mark, besting NP4A's old standard, and almost doubling the next highest score this year. Our log checker claims their log is "incredibly clean," a real credit to them. Rival UK9AAN finished second. Our thanks to Bill, EA9EO, and the rest of the EA9EU gang for their fine 5.0M third-place effort, a new African Multi-Single record.

It was N4AR again stateside in the multi-single category at 3.3M. Just 10,000 points behind was the W4NL entry from the Lamb clan.

The NP4A crew converted to multi-multi for this year's test, and managed a 1980 World High, and a new North American record of 17.6M. They were followed by 6Y5YL at 11M. Meanwhile, the guys at N2AA tightened their hold on the Stateside multi-multi plateau with a new 9.1M USA record. They were followed by K2UA at 8.1M.

1980 Single Band Highlights

The single band assault this year seems to have centered on 20 meters, where nothing short of incredible performances were achieved. VP2KAA, manned by Paul Newberry, N4PN, set a new World and North American All Time High Single Band record at 1.244M. Fellow SE DX Club member K4BAI, operating at PJ2CC, was just 35,000 points behind, as he set a new South American mark. Likewise, N7UA posted a new USA high on 20 meters at 626K, just absolutely crushing the old '78 record of W6VPH. In fact, Bob's score is almost 200K higher than any other W has ever achieved single band in the C.W. Contest.

On 10 meters KG6DX established a new Oceania record at 802K on the way to 1980 World High. He was followed by VP2KAE. W0ZV captured USA 10 meter honors with a fine 340K effort.

HD0E's fantastic 1.15M 15 meter score retires LU8DQ's old South America and World High 21 MHz records. He was trailed closely by Val, N4RJ, at VP2KAC with a 1.075M, who took over the North American 21 MHz all time high. Our congratulations to W1RM, who topped the field of W's on 15 for the second year in a row.

The ever-tough low bands were somewhat lean this year. Yet Chuck, K0RF, managed a fine 291K on 40 meters to clinch both USA and World High. Meanwhile, on 80 meters, Bob, WB2SJK, operating at WB2FZO, set a new USA 80 meter record at 139K to take both World and USA High. DJ2BW finished second at 108K, followed closely by four other Europeans clustered about 100K.

Amid the static crashes and other QRM, 160 managed to provide OK3KFF over 15K worth of credit as he grabbed World High. Perennial 160 meter Stateside fan W8LRL posted a fine 5600 points to top the field in W land.

Frank Bogataj, YU3BC, set a new all time QRP high on c.w. at 702K, followed closely by UB5CI at 670K. In W land, W0KEA managed 269K—and remember, that's with just 5 watts.

Other High Points

Other c.w. records set this year include: Single-Op, All Band, Oceania—KH6BZF (operated by K7TI); Single-Op, All Band, Europe—EA2IA; Multi-Single, Europe—UK2PCR; Multi-Multi, Europe—SK2KW; Asian 28 MHz—4X4UH; Asian 21 MHz—JH3LPT; European 21 MHz—I4IND; Oceania 14 MHz—K2LE/DU2; and Asian 1.8 MHz—4X4NJ (who beats his own '74 previous record). Congratulations to all of you on outstanding efforts. Oh, one last comment on the results. Of course it's the Frankford Radio Club once more in the club category with 141M. Congratulations, guys.

Talking Turkey

This year has been particularly taxing to those of us on the WW Contest Committee. Some of the scores were, as we have just reported, nothing short of fantastic. But, such fantastic efforts create a fantastic work load for our 12 volunteers who man the Committee. What a thankless job it is to put in so many midnight hours on the logs only to hear constant behind the scenes bickering at conventions, club meetings, 80 meter ragchews, and the like, comments about our integrity and ability to check the logs.

We feel that our past WW Contest record shows that few manage to pull the wool over our eyes. Unlike some contests, we can cite many examples where major submittals have been carefully screened, and consequently, disqualified. In fact, few top scores escape without some kind of score reduction.

What is upsetting to us, then, is that even though there are major disqualifications, some guys just refuse to clean up their act. Let us just review what the worst offenses are.

First, there are duplicate contact problems. We are weary of receiving major entries with unremoved duplicates in the logs. Our worst offenders seem to be in South and Central America, where we keep hearing "But we didn't know." Well, that excuse is wearing thin. An entrant has only one log to check. We have thousands of them, and we don't intend to dupe check thousands of contacts in thousands of entries. No one is an exception, no matter how exceptional their score.

Second, there is sloppiness. Sloppiness in copying calls, in adhering to the Multi-Single time rule, in checking the log and scoring, etc. On being disqualified, several fellows have indignantly claimed to us that they check their logs thoroughly and that's the best they can do. Yet in one disqualification we found almost 3 percent duplicates *listed twice on the cross-check sheet*.

Third, there is out and out cheating, a willful violation of the rules. This includes padding the logs, changing calls when they would otherwise show up as dupes, purposely leaving in a certain number of dupes, logging lots of stations you are not sure you worked, using the 2 meter net but claiming single-op status, and, last but not least, operating outside of your licensing provisions and acting like there is nothing at all wrong with it.

Make no mistake about it, operating outside of the terms of your license is not legal even when you are using the call and station of one who holds a higher class of license.

Our Point

We would like to make two points on the above issues. First, one of the problems we have in policing the contest is in



This year's 10 meter Single Band winner—
KG6DX.



Here's the tired crew of JA3YQD in their
club shack after the Contest.



VP2KAA, the new all-time C.W. Single
Band champion, operated by Paul, N4PN.

C.W. TROPHY WINNERS AND DONORS

SINGLE OPERATOR, ALL BAND

World

9Y4VT (Opr. Richard J. Norton, N6AA)

Donor: W2AB Memorial (Albert Kahn, K4FW)

World—QRPP

Frank Bogataj, YU3BC

Donor: Gene Walsh, N2AA

U.S.A.

Thomas W. Frenaye, K1KI

Donor: Frankford Radio Club

Canada

Reginald Brearley, VE2AYU

Donor: Canadian DX Association

Carib./C.A.

Luis P. Caamano, HI8LC

Donor: Jim Neiger, N6TJ

Europe

Inaki A. Goni, EA2IA

Donor: W3AU Operators

Africa

Steve Bauer, DJ1US/ST3

Donor: Gordon Marshall, W6RR

Asia

Bruno Bienenfeld, AA6AD/4X4

Donor: Japan CQ Magazine

Japan

Motoaki Saito, JH1EDB

Donor: Palm Garden Contest Club

Oceania

KH6BZF (Opr. Alistair Cooper, K7TI)

Donor: Maui Amateur Radio Club

SINGLE OPERATOR, SINGLE BAND

World (14 MHz)

Paul Newberry, Jr., VP2KAA

Donor: W2JT Memorial (No. Jersey DX
Assoc.)

World—3.5 MHz

WB2FZO (Opr. Robert J. Shohet, WB2SJJ)

Donor: Fred Capossela, K6SSS

U.S.A.—14 MHz

Robert P. March, N7UA

Donor: No. Illinois DX Association

Canada—21 MHz

Jim Roberts, VE3EDC

Donor: Canadian Amateur Radio Federation

Carib./C.A.—3.5 MHz

HI8JAG (Opr. HI8XPT)

Donor: DX Club of Puerto Rico

Europe—14 MHz

Karl Malmi, OH5XT

Donor: G2LB Memorial (From Friends)

South America—14 MHz

PJ2CC (Opr. John T. Laney, III, K4BAI)

Donor: Rafael Ponce de Leon, CX3BR

MULTI-OPERATOR SINGLE TRANSMITTER

World

RG6G (Oprs. UP2BAR, UP2BBC, UP2BFE,

UP2BIG, UP2PAJ, UQ2ON, UP2-038-849,

UP2-038-51

Donor: Anthony Susen, W3AOH

U.S.A.

N4AR (Oprs. N4AR, N4KG, WN4KKN,

W8KIC, N1GL)

Donor: Doug Zwiebel, WB2VYA

MULTI-OPERATOR, MULTI-TRANSMITTER

World

NP4A (Oprs. NP4A, K1UA, K1ZM, K2DM,

W2RQ, W2SQ, N2NT, K3UA, W4OO,

N4TO, KP4O, KP4EHP, K5ZD, W0UN)

Donor: Hazard Reeves, K2GL

U.S.A.

K2UA (Oprs. K2UA, KA3BKR, K2BU, N3RS,

N3AD, N3RP, WA2HGM)

Donor: Rush Drake, W7RM

CONTEST EXPEDITIONS

World—Single Operator

Jim Neiger, 8P6J

Donor: Yankee Clipper Contest Club

World—Multi-Operator

6Y5YL (Oprs. N2ME, N2MM, N2RM, K5VW,

W5XU)

Donor: Bill Schneider, K2TT

SPECIAL SINGLE OPERATOR—ALL BAND

Combined Phone/CW

Fernando M. Fernandez Martin, EA8AK

Donor: John Knight, W6YY

CLUB TROPHIES

World—Phone/CW

Frankford Radio Club, 141,011,858

Donor: CQ Magazine

Most Improved—Phone/CW

Williamette Valley DX Club, 16,219,520

Donor: Southeastern DX Club

proving that cheating occurred. We depend on your *written* complaints and evidence to act in many of these cases. No amount of letters to the NCJ, letters to friends in high places, talk in the halls of conventions, or telephone calls will do any good at all. If you have a beef, or if you know of a problem, then write to us and provide us with any backup or evidence that you can.

Our second point on cheating is this. We depend on the honor of all those who enter the contest to keep the contest enjoyable and meaningful for the rest of us. That is why we require that you sign the declaration on the summary sheet. Those who violate the rules and who falsely sign that declaration are cheapening the contest for the rest of us. Now, we call on anyone who has something on his conscience to do an honorable thing—to come forward and own up to a past mistake.

Third World Operation

Third world participation in our contest can always be improved. If you enjoy DX-ing and contesting, why not do something to help us improve that participation. Many of you are active DXers with frequent contact with hams in Africa, Asia, and South America who could really enhance the contest by their participation. Do us a favor—talk up the contest to these hams. Do one other thing—send them some log forms and information on the rules either direct or via their managers. The next time you are in the heat of the contest competition, you will be glad you did.

Our Thanks

Our thanks, as always, to all of you who entered the contest. Of course, a special thanks to our Contest Chairman, W1WY, and our CQ WW Contest Committee members. This year we are honored to announce the appointment of new members Don McClenon, N4IN, and John Dorr, K1AR. They fill slots vacated by W3ZZ and W3GRF. Our regulars include N2AA, K2SS, WB2VYA, VE3BMV, K9DX, N6VV, K6NA, N6SV, N6CW, AD6C, and W7EJ. Again, thanks for a job well done.

And now for the 1981 CQ WW Phone Test. Good luck to all!

73, Larry, N6AR, and Bob, K3EST

U.S.A. Club Scores

Frankford Radio Club	141,011,858
Yankee Clipper Contest Club	74,039,048
Potomac Valley Radio Club	66,896,290
Northern California DX Club	33,959,484
Mad River Radio Club	31,383,815
Murphy's Marauders	22,032,683
Southern California DX Club	21,057,362
Northern California Contest Club	20,492,105
San Diego DX Club	17,215,176
North Texas Contest Club	16,466,705
Willamette Valley DX Club	16,219,520
Southeastern DX Club	13,647,252
Ill-Wind Contesters	13,317,568
Southern New England DX Assn.	10,718,937
Western Washington DX Club	10,539,157
Texas DX Society	10,375,981
Central Virginia Contest Club	9,634,725
Michigan DX Association	9,235,130
North Florida DX Association	8,993,400
Northern Illinois DX Association	7,773,885
Indy DXers	7,660,966
Eastern Iowa DX Association	7,435,392
Southern California Contest Club	6,541,678
Wireless Institute of the Northeast	5,047,726
Greater Milwaukee DX Association	5,043,808
Northern Ohio DX Association	4,518,939
Long Island DX Association	4,181,152
Mississippi Valley DX & Contest Club	3,636,627
Rubber Circle Contest Club	3,544,813
Central Arizona DX Association	3,429,573
Milford Amateur Radio Club	3,054,920
Kansas City DX Club	2,951,522
Northern Ohio Amateur Radio Association	2,592,071
Fort Wayne Radio Club	2,495,116
DX Association of Connecticut	2,209,721
Rochester DX Association	2,204,208
Lynchburg Amateur Radio Club	2,105,771
Albuquerque DX Association	2,095,614

Gloucester County Amateur Radio Club	2,054,359
Neenah-Menasha Amateur Radio Club	1,935,456
Colorado Contest Conspiracy	1,791,776
Flyweight DX Group	1,570,186
Sheyboygan County DX Association	1,418,532
Alamo DX Amigos	1,339,032
Point Radio Operating Society	1,000,985
Red Stick DX Association	840,493
Vulcan DX Club	812,348
Eastern Michigan Amateur Radio Assn.	742,392
Kansas DX Association	709,413
Poughkeepsie Amateur Radio Club	390,380
Cuyahoga Falls Amateur Radio Club	217,324
Great South Bay Amateur Radio Society	132,006
San Angelo Amateur Radio Club	115,184
Overlook Mountain Amateur Radio Club	21,962

DX Club Scores

Voroshilovgrad Radio Club	26,803,274
Northern Lithuanian DX Group	20,442,741
Lithuanian Contest Group	19,367,931
Kaunas Polytechnic Institute	17,027,604
Rhein-Ruhr DX Association	15,494,779
South German DX Group	13,839,269
Ontario Contest Club	10,998,800
Chelyabinsk Radio Club	9,169,521
Fraser Valley DX Club	8,281,373
Grupo Argentina de CW	6,890,478
Alaska DX Group	5,491,424
Radio Club der DDR	5,278,232
Tallinn Radio Club	4,535,027
DX Club of Saar-Pfalz	4,172,505
The Bullmertz	2,653,589
Halifax Radio Club	1,844,607
Moscow Radio Club	373,738
Leningrad Radio Club	313,051
Minsk Radio Club	195,412

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U.S.A. QRM

Sure was an awesome signal on ten from HZ1HZ . . . W7IR. The high yagi was plagued with rain static much of the contest . . . N7UA. Operating hint to newcomers—three hours of TV football will hurt your score! . . . K8NZ. Thanks, CQ, for another great one. My vote for best operator goes to 9Y4VT . . . K8GL. Lost amp early and had to finish barefoot. Had so much fun fighting the big guns, think I'll try it again next year . . . KB8EC. Conditions were so good I accidentally worked a VP2 while loading into a piece of unterminated coax! . . . WB8JBM/WB8DQP. Early in the test I had to scale the tower to fix both the coax and the rotator . . . AI9J. Fun-fun-fun! . . . KA9CQM. Ten was simply packed with wall-to-wall signals . . . W9HPG. Snagged RG6G in the Novice band on ten . . . WD9EJE. Biggest thrill? My gear held together! . . . K9QVB. I hear too much 2-meter spotting going on by so-called single-ops . . . KB9E. Please, only repeat when requested . . . K0LUZ. My first CQ WW; what a thrill hearing so many rare ones over all the bands . . . WA2CNF/Ø. 160 meter rig blew up after working 9Y4VT . . . K2FL. Slickest operator was LU8DQ running a string . . . K2BK. Something should be done about all those needless CQ's . . . W3TV. So much for 599 as a useful signal report . . . W4VQ. Heavy participation on 20 meters by the Russians saved the contest for me . . . W4AAV. Had trouble the second nite when the band (160 meters) opened for Europe. Had such pileups calling me when I called QRZ, you would have thought I was rare DX . . . W4PZV. The new doubled up log sheets are for the birds . . . W5OSJ. Wish some of the DX stations would ID more often. It would save time and confusion . . . AD6D. Finally worked zone 23 on 40 meters after 24 years . . . WB6JMS (me too—ed.).

DX QRM

Bye bye 40 meter balun—Hello Murphy . . . VE3KKB. First try at multi-op CW. Will do better next year . . . VE3MFA. Slowed down due to Montezuma's revenge . . . TG9NX. A big snowstorm increased the s.w.r. up to 2.5:1; 20 meters was below normal conditions . . . F3TV. No troubles with the rig, only 20 man hours on repairs. Will divide it in half next year . . . OK1KRG. See you next year with a better score . . . TF3IRA. The "Other score": 540 cigarettes, 23 beers, 1/2 liter cognac, 1/2 liter whiskey, 15 liters milk, and 2 liters champagne . . . EA3AKD. Our first con-

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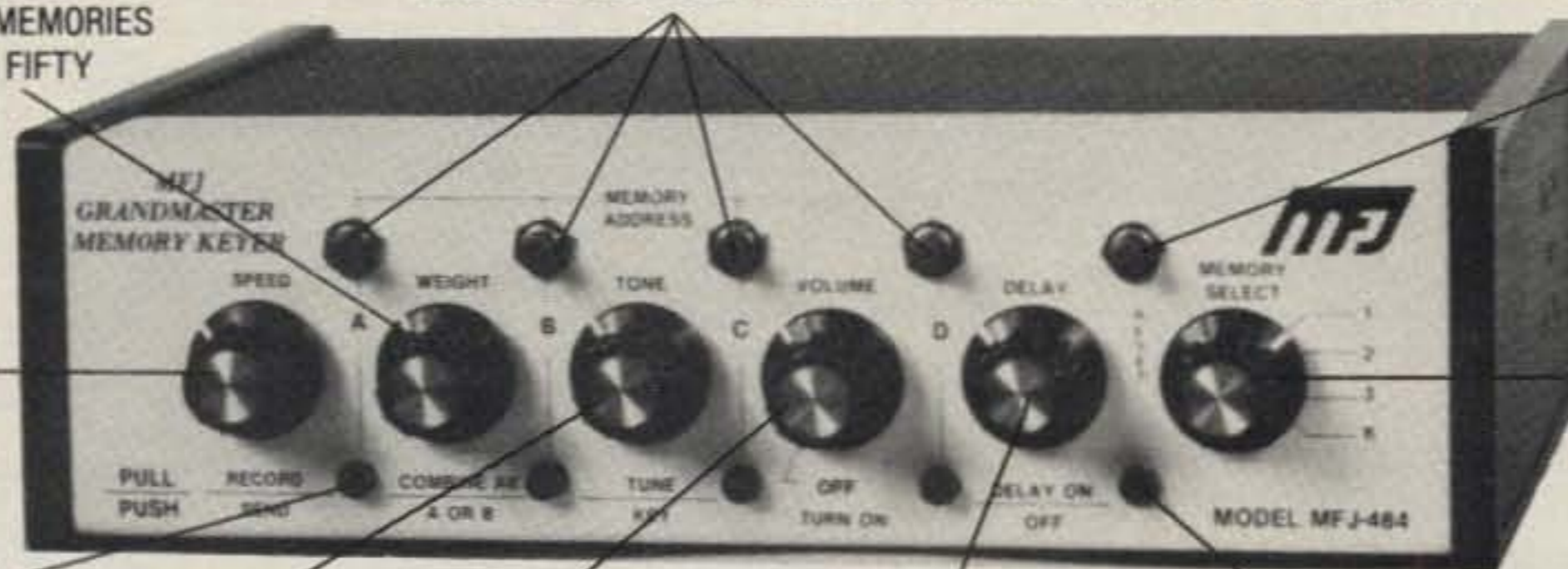
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TONE CONTROL. PULL TO TUNE.

VOLUME CONTROL. POWER ON-OFF.

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LED INDICATES DELAY REPEAT MODE.

MEMORY SELECT: POSITIONS 1, 2, 3 ARE EACH SPLIT INTO MEMORY SECTIONS A, B, C, D (UP TO TWELVE 25 CHARACTER MESSAGES). SWITCH COMBINES A AND B. **POSITION K** GIVES YOU 100, 75, 50, OR 25 CHARACTERS BY PRESSING BUTTONS A, B, C, OR D.

MFJ Grandmaster series memory keyers make sending perfect CW almost effortless.

They are so easy to use that you can probably utilize all its many features without reading the instruction manual.

Controls are logically positioned and clearly labeled. Pots are used for speed, volume, tone and weight because they are human oriented and remember your settings with power off.

Up to twelve 25 character messages plus a 100, 75, 50, or 25 character message (4096 bits total).

A switch combines 25 character messages for up to three 50 character messages.

To record, pull out the speed control, touch a message button and send. To playback, push in the speed control, select your message and touch the button. That's it!

You can repeat any message continuously and even leave a pause between repeats (up to 2 minutes). Example: Call CQ. Pause. Listen. If no answer, it repeats CQ again. To answer simply

start sending. LED indicates Delay Repeat Mode.

Instantly insert or make changes in any playing message by simply sending. Continue by touching another button.

Memory resets to beginning with button, or by tapping paddle when playing. Touching message button restarts message.

LEDs show which 25 character memory is in use and when it ends.

Built-in memory saver. Uses 9 volt battery, no drain when power is on. Saves messages in memory when power loss occurs or when transporting keyer. Ultra compact, 8x2x6 inches. All IC's in sockets.

PLUS A MFJ DELUXE FULL FEATURE KEYSER.

Iambic operation with squeeze key. Dot-dash insertion.

Dot-dash memories, self-completing dots and dashes, jamproof spacing, instant start (except when recording).

All controls are on front panel: speed, weight, tone, volume. Smooth linear speed control. 8 to

50 WPM.

Weight control lets you adjust dot-dash-space ratio; makes your signal distinctive to penetrate QRM.

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Tune function keys transmitter for tuning.

Ultra reliable solid state keying: grid block, cathode, solid state transmitter (-300 V, 10 ma. max., +300 V, 100 ma. max.). CMOS IC's, MOS memories. Use 12 to 15 VDC or 110 VAC with optional AC adapter, \$7.95. Automatically switches to external batteries when AC power is lost.

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Store four 25 character messages or a 50 and two 25 char. messages in 1024 bits of memory.

Repeat function repeats messages. Memory resets with button or paddle. Memory LED.

Memory saver saves messages when power is lost. Iambic keyer. Dot-Dash insertion.

Speed, volume controls on front. 8 to 50 WPM.

Weight control for QRM penetration. Tone control for pitch. Speaker. All ICs in sockets.

Tune function keys transmitter for tuning.

Solid state keying. 6x2x6 inches. 12 to 15 VDC or 110 VAC with optional AC adapter, \$7.95.

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MFJ-481
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Store two 50 character messages.

Repeat function lets you repeat any message continuously. LED indicates when memory is in use. Resets with button or paddle.

Tune function keys transmitter for tuning.

Linear speed control on front panel. 8 to 50 WPM. Volume control adjustable from rear panel. Inherent tone control. Speaker.

Memory saver saves messages in memory when power is lost. Uses 9 volt battery. Reliable solid state keying. 5x2x6 inches. 12 to 15 VDC or 110 VAC with optional AC adapter, \$7.95.

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The most asked question around the store is, "What HF rig do I need?" Being in the business of selling radios, I could offer a dozen answers, but the two top contenders are the Icom 720, and the Kenwood TS830S. The Icom is in stock. Kenwood, as you know from shopping, is slow delivering, but they are making a try to catch up.

You should lay your hands on the MFJ496 Keyboard. Even my code sounds good. Now if I hooked up the Field Day . . .

Kenwoods are going on special. The TR2400 is down to \$299.00. I hear the TS180S may do it too. If you have read this far, here's the payoff . . . My spy at the factories, Tang In Stead, reports the Kenwood has a TS840 out. Dual VFO's, digital synthesized, and more. Across the street at Icom, there's a new IC 7???. Before he was chased out, he discovered it goes from 1.8 MHz to, get this, 500 MHz!! T/R is done with plug-in modules. More on it as our snitches report in.

Last note . . . add an Alpha Delta Transitrapp . . . replaces conventional lightning arrestor and goes inside the shack.

OK, go read the other ads if you must. I'll stay in touch via the 'Corner', and try not to keep any secrets from you.

See you next month!

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BELDEN

RG8/u Dbl. Shield	Part Number	MHz	dbi 100 ft.	dbi 100 m.	
	9888	50	1.2	3.9	 8448 27 c/ft.
		100	1.8	5.9	
		200	2.8	8.5	
		300	3.3	10.8	
RG8/u Foam 81VF		400	3.8	12.5	 9405 45 c/ft.
	8214	50	1.2	3.9	
		100	1.8	5.9	
		200	2.8	8.5	
RG8/u Regular . 66VF		300	3.3	10.8	 No. of Cond. — 8 AWG (in mm) — 6-22, (7 x 30); 2-18, (16 x 30), (1.19)
	8237	100	2.0	6.6	
		200	3.0	9.8	
		400	4.7	15.4	
RG 213 Non-contaminating		900	7.8	25.6	 No. of Cond. — 8 AWG (in mm) — 2-16, (26 x 30) 6-18 (16 x 30), (1.17)
	8267	100	2.0	6.6	
		200	3.0	9.8	
		400	4.7	15.4	

Belden Mini RG-8 (9258)-19¢/ft.

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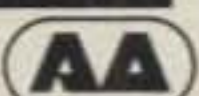
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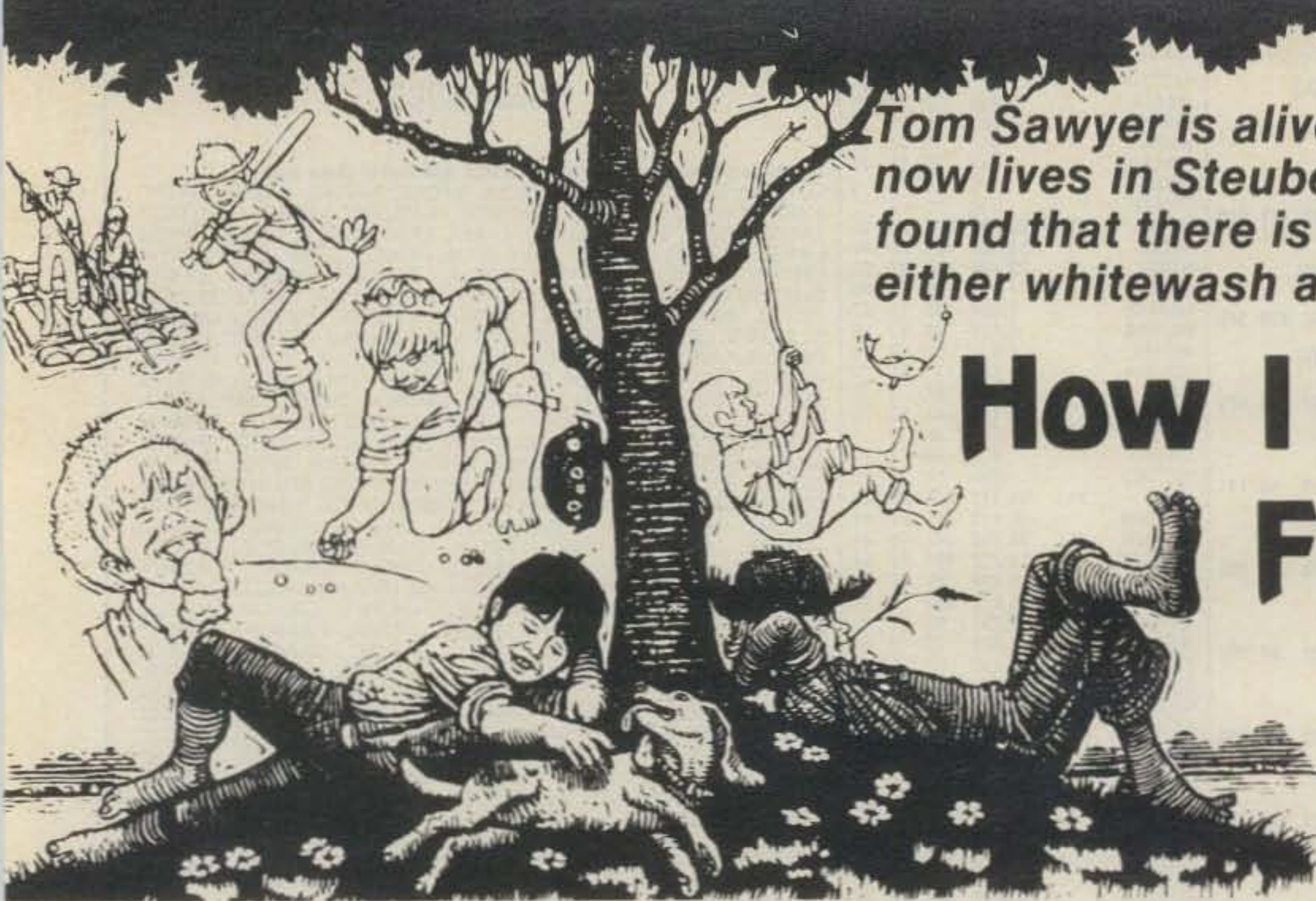
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AlphaDelta Transi-Trap Protection Systems are designed to reduce the hazards of lightning-induced surges. These devices, however, will not prevent fire or damage caused by a direct stroke to antenna or other structure.

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Tom Sawyer is alive and well and apparently now lives in Steubenville, Ohio. W8DYF has found that there is more than one way to either whitewash a fence or put up a beam.

How I Put Up My First Beam

BY JOSEPH M. PLESICH*, W8DYF

This past year I marked 25 years as a ham. During this past quarter-century I've been active and have participated in a variety of amateur radio activities, have made numerous friends, and have thoroughly enjoyed myself. *But*—I've never had a beam!

Finally, I thought, I've got a good location. (My home is perched on a 1,220-foot hill, and you can see the horizon in all directions from my roof.) Of course, this location didn't have any bearing on our decision to buy this home four years ago. I also kept telling myself that tower, antenna, and rotator prices weren't going to come down. Furthermore, I now had a couple of first-class rigs to use with a beam—a Drake "C" line and a TS-120S.

It seems as though there comes a time in every ham's life when fate intervenes. For example, one evening while visions of beams danced in my head, the phone rang.

"Hey Joe, you want to buy a tower?"

"Oh maybe," I answered, trying not to appear too interested in the bait dangling in front of my nose. However, I quickly added, "How much and where?"

The call was from Rick, WD8SAB. Rick is a young high school electronics teacher and friend of mine who seems to delight in encouraging me to spend what little money I have and in reminding me that I've been a ham longer than he's been alive. Anyway, he knew a fellow who had some tower sections for sale for \$25 a section.

"How can you go wrong?" pressed Rick.

I had to admit he was right. If you are going to have a beam, you've got to start somewhere. Since you have to put a beam someplace, a tower is a good place to start.

I don't have a truck, so I called Vince, K8LQM, who is also affectionately known locally as K8LQRM. Vince has a pick-up truck and was also looking for a tower section. I called the fellow who had the tower sections and we arranged to meet the next evening.

When we arrived, we looked at the tower sections, and we were pleased to find that they had not even been used. I took four sections; Vince took one. We parted with our green stamps, loaded them into Vince's truck, and quickly stole into the night.

With \$100 invested in my beam project, it was too late to turn back. Now, I had to acquire a beam. But what beam? The subject of beams is, of course, endless. The types and prices of beams also vary considerably.

My search began. I read many articles, ads, and sought opinions from other hams. Finally, I decided on the Cushcraft ATB-34 4-element tribander. Why? Well it satisfied me on its specs, size, cost, proven dependability, reliability, and the fact that several local hams had them and were very satisfied with the beam. I'm sure I could have been just as satisfied with many of the other fine beams on the market, but eventually one must make a choice. The Alliance HD-73 was my choice to turn the beam. Again, I studied the ads, ordered, and received my beam and rotator in less than a week after I ordered them. My investment was now up to \$400 and the real work was about to begin.

Even though my tower sections were new, Bill, WA8DRL, our club president and a painting contractor, strongly sug-

gested I paint them. I did using a product called Derusto that comes in both cans and spray. To paint the tower sections, I leaned each section against a saw horse at about a 45-degree angle. With tape and squares of plastic I plugged the ends of the tower legs. Next, I poured a little paint down inside each leg and then plugged the other ends with plastic tape. I rocked the tower section back and forth over the saw horse to coat the inside of the tower legs with paint. After this, I painted the outside of each section. The process was a bit tedious, but at least it was an attempt to give some added protection to both the inside and outside of the tower.

The next step was to get a house bracket for the tower. Rick, WD8SAB, my Design Engineer (hams work harder and for free if you give them big titles), drew a sketch of a suitable bracket. Bob, KA3EJT, another friendly, helpful, and very talented ham, made it for me.

The bracket was fastened to a 2" x 6" x 4' piece of wood which was fastened to the house with lag bolts. A plumb bob was dropped to the ground from the bracket to determine where to dig the hole for the bottom of the tower.

Since the tower was only going to be three sections high, and was to be fastened to the house, the hole was only dug about 3½ feet deep. Rick and I bolted the tower sections together. K8LQM gave me a 3-foot bottom section that we bolted to the bottom of the tower. Rick and I then enlisted the aid and muscle of Bill, my understanding neighbor, and the three of us walked the tower up and into the hole and against the house bracket. Bill and I steadied the tower while Rick fastened it to the bracket with "U" bolts. Rick and I took turns pounding an 8-foot ground rod into the ground which we fastened to one of the tower legs with a ground clamp.

The next morning I mixed and poured

*554 Lovers Lane, Steubenville, OH 43952



A close-up view of the tower mounting bracket which is bolted to the house.

five bags of cement into the hole. I had to do it all myself since I couldn't find anyone to do this glamorous chore. The cement, of course, was bought on sale. Do hams ever pay full price for anything?

Sorting the elements, bolts, and nuts of a beam can try the patience of Job, but I did it, and it took me all day. I must add that the ATB-34 is certainly constructed

with high-quality materials. I assembled it according to the instructions and for the phone portions of the bands for which the elements are marked.

WA8DRL also suggested that I coat the beam with brushing lacquer to help protect it. Three stores later I found a can of it and coated the beam twice with it. I am sure the effort will pay off with extended life for the beam in our polluted atmosphere.

Next I bought 200 feet of RG8X—100 feet for the beam and 100 feet for my Ringo Ranger, which by now I had decided to mount on the mast above the ATB-34.

It was now time to get the beam in the air and on the tower. Rick and I are both pencil-pushers. He teaches electronics and I am a high school guidance counselor. We are also alike in that we will climb as high as you want as long as we can keep one foot on the ground. With a little flattery, we recruited Greg, KA8BZM, and gave him the title of Construction Engineer. He's not only one of the few local hams who owns a climbing belt, but he also knows how to use it.

First, Greg was kind enough to make me a vertical thrust bearing for the HD-73. One evening he mounted both it and the HD-73 on the tower.

Finally all the time-consuming chores were completed. On a beautiful summer evening in Steubenville, Ohio, the following hams arrived at my home: Rick,



The rotor is shown here with the thrust bearing assembly.

WD8SAB; Greg, KA8BZM; Vince, K8LQM; Ralph, WD8OHF; John, K8ZPR; and my neighbor, Bill. Even more fellows from our club volunteered to help, but one can have too many helpers. Directions can get confused and someone may get injured.

Greg, KA8BZM, was the man on the tower and the boss! Getting the antenna

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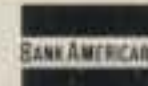
MODEL	BAND (Meters)	LENGTH (feet)
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40-20 HD/A	40/20	36
75-10 HD	75/40/20/15/10	66
75-10 HD/A	75/40/20/15/10	66
75-10 HD(SP)	75/40/20/15/10	66
75-10 HD(SP)A	75/40/20/15/10	66
75-20 HD	75/40/20	66
75-20 HD/A	75/40/20	66
75-20 HD(SP)	75/40/20	66
75-20 HD(SP)A	75/40/20	66
75-40 HD	75/40	66
75-40 HD/A	75/40	66
75-40 HD(SP)	75/40	66
75-40 HD(SP)A	75/40	66
80-10 HD	80/40/20/15/10	69
80-10 HD/A	80/40/20/15/10	69
80-10 HD(NT)	80/40/20/15/10	69
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The tower with the beam and Ringo Ranger mount to the back of the author's house.

high as they could, and we pulled it up the rest of the way to the roof. When Greg was ready, Ralph and I handed the antenna to him. After he fastened the beam to the mast and connected the coax, he came down.

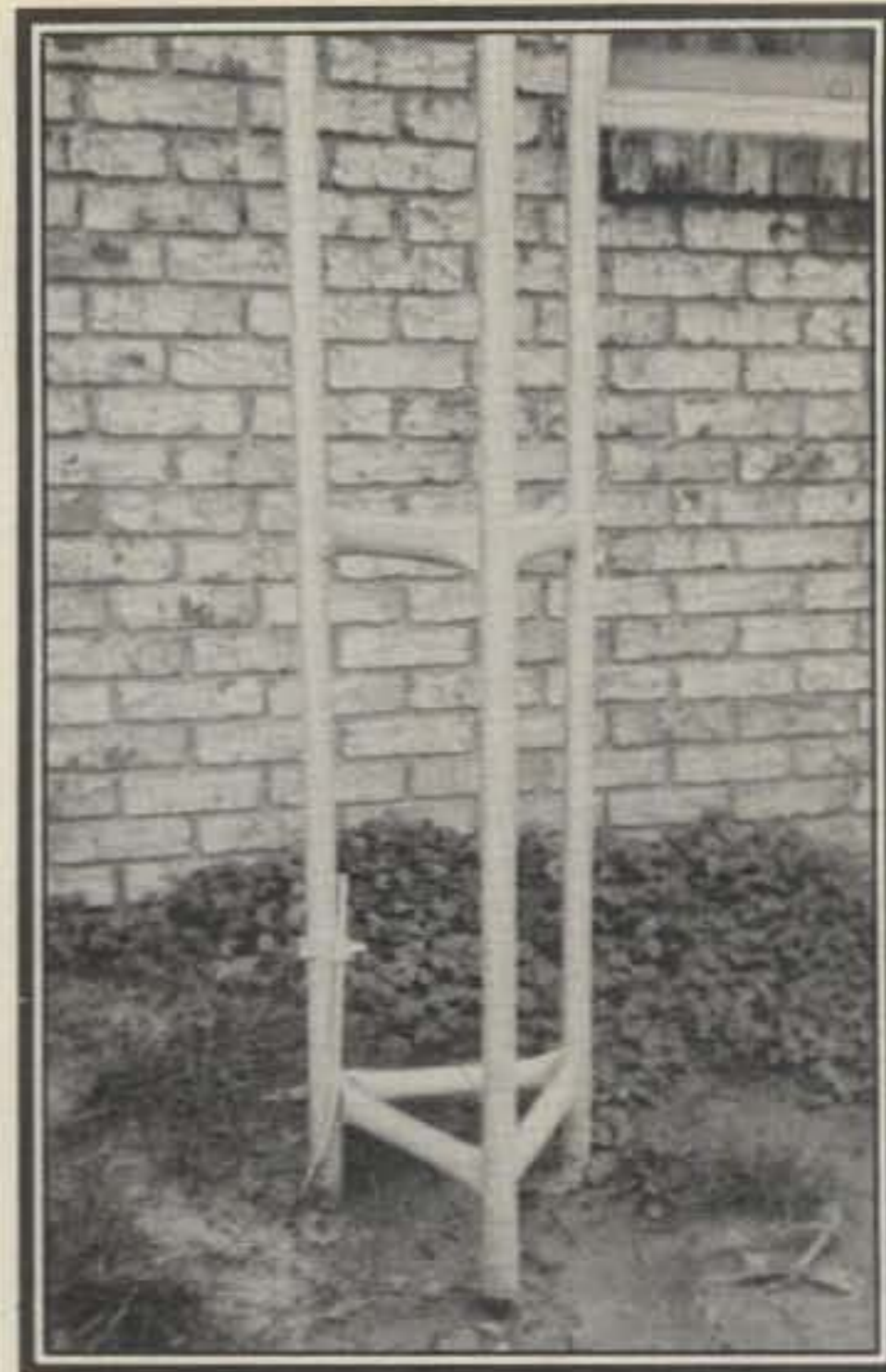
I was both anxious and apprehensive about the next step—firing up the rig to see if it worked. Greg looked over my shoulder as I dialed up the 20-meter phone band on the TS-120S. I fed just enough power into the antenna to get a full-scale forward reading on my s.w.r./watt meter. I hesitated briefly, and flipped the switch to get the reverse reading.

"Beautiful!" we exclaimed in unison as the meter read 1.2 to 1. Results were just as good on the other bands. It pays to follow the manufacturer's directions.

Greg again climbed the tower, put silicone on the coax connector, and dressed the coax and rotator cable down the inside of the tower with plastic wraps.

Does it work? Would I do it again? You bet! The first DX station I worked was a JA2 that I couldn't even hear on my dipole. Since then I've worked just about everything I could hear including a few DXpeditions.

It's an interesting and educational experience to put up a beam for the first time—and a lot of work. Just take your time, follow the directions, and make ample use of the experience and knowledge of your fellow hams, all of whom I am thanking again. Do all of this and I am



The tower base sits unobtrusively; the cement portion does not show. The ground rod can be seen strapped to one leg.

sure you will soon be having as much fun with your first beam as I am.

Addendum

The ATB-34 has been replaced in the Cushcraft line by their model A-4.

up the tower was rather simple, since the tower was alongside the house, and we weren't going very high. We tied a rope to the end of the antenna boom, and then Ralph, WD8OHF, and I got on the roof of my house. Bill and Rick lifted the beam as



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Antennas

DESIGN, CONSTRUCTION, FACT, AND EVEN SOME FICTION

Antennas For The Scanner Buff

Scanner topics on the pages of CQ? Yes, indeed. Many readers follow the action on the public service bands as well as on the amateur frequencies that are interwoven with these bands. Many more amateurs will undoubtedly tune to these interesting portions of the spectrum with the introduction of high performance scanners that rival state-of-the-art ham gear for sophistication. In this issue W8FX begins a two-part look at antennas for scanners. You won't be bored!

In the past few months we've sidetracked slightly to discuss a wider range of antenna topics than one would expect to find in an amateur-radio-oriented magazine. We have talked about antennas for the listener in some detail in recent columns, and we're going to continue for one more month "off the beaten path" with a discussion of scanner antennas. Our discussions are really not out of place, since many of us made our entry into ham radio via short-wave listening, and many more enter today via its 1981 rough equivalent—scanner monitoring.

So, if the "purists" will excuse another two months of excursion into the hinterlands, we'll dig into the subject. We will talk about "what's up there" in scanner country, discuss basic monitor receivers and scanners, point out specific base station and mobile antenna types, and reflect on the new-breed scanners and the antennas that are required to optimize their performance. We will also mention some special-interest scanner groups and publications catering to this specialized kind of hobbyist.

Scanner Country

Though a ham for some 25 years, I'm nevertheless fascinated by the "thrill" that public service band scanning offers. I find this to be increasingly so today because of the outstanding and surprising capabilities of modern frequency synthesized, microcomputer-controlled, digital-



Several firms publish public service frequency directories of interest to scanner radio enthusiasts. The Bearcat directory, the cover of which is shown here, has a special format that groups frequency listings of police, fire, ambulance, public utilities, railroads, and other services by "listening areas." This type of listing eliminates the "page hunting" common with state-wide alphabetical lists because it groups all of those services within the listening range together. The directory shown is published in two editions, one covering the Eastern USA and the other the Western USA. (Photo courtesy Electra Bearcat div. of Masco Corp. of Indiana)

readout scanning monitors that make listening-in almost too much fun to tune out.

In what I've loosely called the public service bands are a number of specialized users. These include business/industrial radio systems; marine and mobile telephone systems; military and governmental communication webs; police, fire, and municipal radio networks; the 462-467 MHz "Citizens Band" (General Mobile Radio Service); paging operations; taxicabs; air-to-ground communications; public weather alerting; and many more. Much use is made of the familiar repeater system in which you will normally hear only the base station; there is also full duplex operation, as well as one- or two-fre-

quency simplex. Direct simplex communication is the rule on some bands such as air-to-ground aviation, on which you will more than likely hear high-flying aircraft rather than base stations, unless you live near a transmitter at an airport or an FAA communications site.

The popular scanner bands include six ranges. Starting at the lower end of the spectrum, they are:

1. 30-50 MHz This range, popularly called the VHF-LO band, is somewhat older than the higher v.h.f. and u.h.f. ranges. The 30-50 MHz band is primarily used when relatively long-range, direct communications is required between base stations and mobiles. State and county police and sheriff's departments are major users of the band for reasons of extended coverage area. Channel spacing is 20 kHz and f.m. is almost universally used. There is a slow migration of users to the VHF-HI and u.h.f. bands due to "skip" interference problems and physical antenna size requirements, among other reasons.

2. 118-136 MHz There's a great deal of excitement in store for the eavesdropper on the aviation band, which sits just atop the commercial 88-108 MHz f.m. allocation. Almost completely a.m., the band is used for air-to-air and air-to-ground communications of aircraft (commercial, private, and military), air traffic controllers, control towers, and others. Only recently has the band been added to multiband scanners, so it's important that one use a scanner having both f.m. and a.m. demodulation capability if satisfactory results are to be had in receiving the 118-136 MHz band.

3. 150-174 MHz The "bread-and-butter" range, 150-174 MHz, is popular in urban and suburban areas especially and includes a wide variety of users. These include police and fire departments, railroads and rail terminals, taxicab fleets, government and military agencies, mobile telephone operations, and many others. Band characteristics are roughly comparable to the amateur 2-meter band. F.m. is normally employed, and channel spacings are typically 15 or 30 kHz.

*317 Poplar Drive, Millbrook, AL 36054

4. 450-470 MHz This band is especially popular in urban areas where solid but short-range coverage is desired. Taxicabs, mobile telephone systems, and especially police departments are rapidly expanding here where antenna size makes small hand-held units effective. F.m. is the standard, and channel spacing is 25 kHz.

5. 470-512 MHz Really an extension of the 450-470 MHz band, the "T-Band" is named for the fact that it overlaps a portion of the standard u.h.f. television band, equivalent to channels 14 through 20. The band is used in some large metropolitan areas where one or two u.h.f. TV channels may be dedicated to 2-way communications. Many, if not most, of the newer scanners include T-Band, and if you have TV channels assigned, thus at least partially precluding public service monitoring in this range, you can nevertheless punch in the TV stations' audio carriers into your scanner's memory for TV audio monitoring and possibly some u.h.f. TV DXing; for example, channel 20 audio is on 511.75 MHz. F.m. and 25 kHz spacing are usually employed.

6. 806-870 MHz Seen at present on only a few of the newest scanning monitors, this range is the newest range of interest, particularly with respect to hand-held units. Like the T-band, this segment sits inside the u.h.f. TV range, but at the high end. Long-term growth is expected as the lower ranges fill up in the metropolitan areas.

A smart marketing move on the part of the scanner manufacturers was to include the adjacent *ham bands* on many of their models, especially those on the "high end" of their lines. Many of the new Bearcat and Regency scanners include 144-148 MHz and 420-450 MHz coverage (the 2- and 3/4-meter bands) where the scanners' f.m. demodulators take to amateur-band signals like duck soup. (Note how the scanners' specs suddenly went from 146-148 MHz to 144-148 MHz coverage once the new repeater sub-band became effective.) I'm not yet aware of any standard public service scanners that cover the 6- or 1 1/4-meter bands, but undoubtedly they will appear if the market develops sufficiently.

A point for hams here is that, as police and fire departments have long since learned, conversations are not *private* between units of the communication system. Just about anyone can listen in, and can in practice make any use he desires with what he hears, rightly or wrongly. Thus, it's a good idea to watch what one says when conversing through the local 2-meter "machine." A scanner at your local electronics store or discount house may be tuned in and drawing a crowd of curious passersby!

What about range? I try to associate the key public service ranges with the adjacent ham bands to get a "fix" on the band characteristics that I can expect. In

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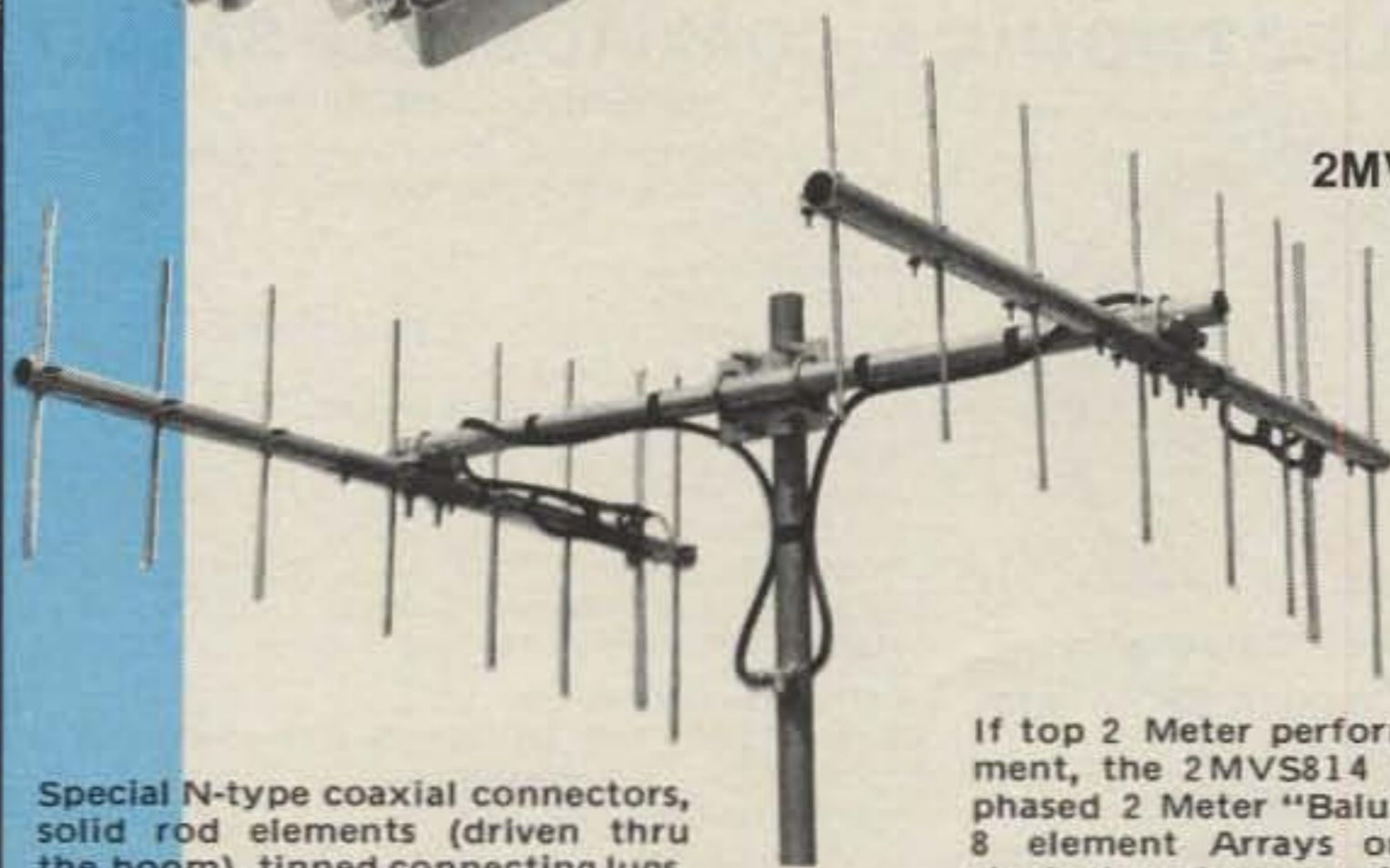
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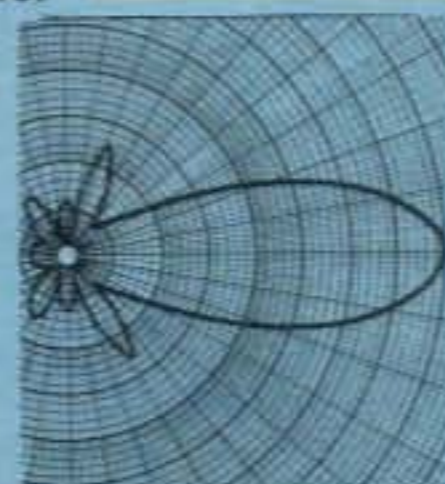


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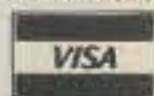


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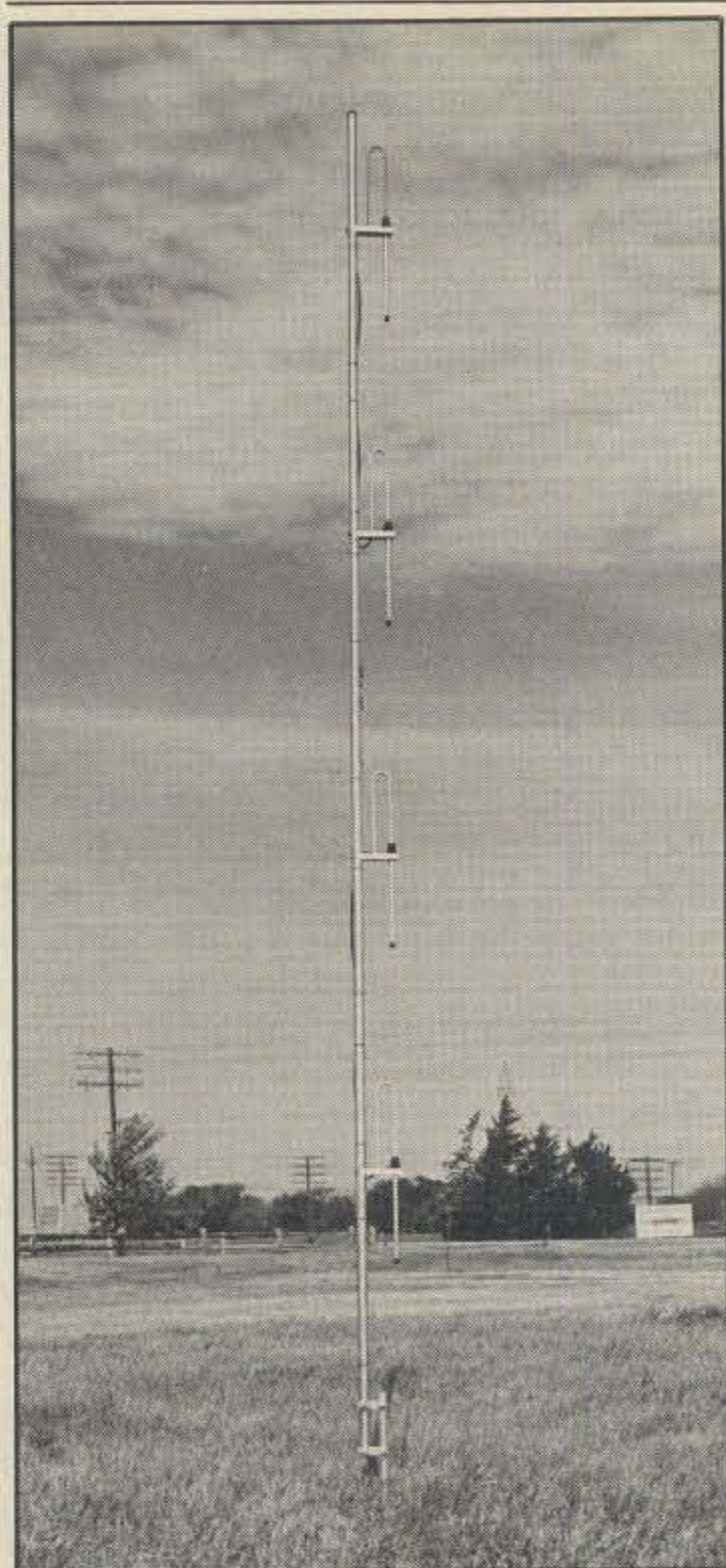
Warren - K2IXN

Bob - WA2MSH

CIRCLE 14 ON READER SERVICE CARD

general, the analogy holds true. Actual range, of course, depends upon a number of factors including antenna type and gain, location, height, and receiver sensitivity, not to mention transmitter power and antenna characteristics on the other end. Typically, with a good monitor setup you should be able to hear base stations and repeaters 30-75 miles away, but mobiles out to only 5-10 miles, depending on the band. Of course, on the 30-50 MHz band, especially toward the low end (adjacent to 10 meters), you may occasionally hear stations hundreds or even thousands of miles away. The low end obviously takes on many of the characteristics of 10, and the high end, those of 6 meters—much to the chagrin of users whose only interest is dependable short-range communications.

Legality is an interesting point that should be considered. *Is scanning legal?* Basically, on the Federal level, it is. There are no restrictions as to what one can listen to; the FCC is mainly concerned with the regulation of transmitting activities, as hams are well aware. "Secrecy of communications" nevertheless is a consideration; the law provides that one hearing information of the type that a scanner can intercept over the air (transmissions not broadcast to the general public) may not disclose the information to a third party. NOAA weather transmissions, naturally, are intended for use by the public, so obviously the secrecy-of-communications rule would not apply in this case, nor would it in the case where you might hear a MAYDAY from a plane or ship, a very real possibility with a



Most public service and related users employ vertical polarization due in no small part to the considerable base-to-mobile use that characterizes the services. Very high-gain, low angle-of-radiation antennas are typical. While the antenna shown here is a Hy-Gain model intended for amateur 2-meter use, it's nevertheless representative of the kind of antenna that's favored by public service users. The J-pole shown is a vertically polarized, broad-band, stacked 4-element model. It can be mounted so as to produce an omnidirectional, unidirectional, or bidirectional radiation pattern to favor the service area intended. Gains up to 9 dB (referenced against an isotropic source) are possible, depending on mounting configuration. (Photo courtesy Hy-Gain Electronics)

marine or aviation band scanner. Pending court decisions on unauthorized pay-TV and direct satellite TV reception could change the rules in the long run, however.

Locally, there can be legal complications. Most states don't place restrictions on *in-home* listening to the public-service bands, but several have statutes which restrict such monitoring while in a motor vehicle. If you plan to install a scanner in your car, truck, or RV, check out the law in your state, county, and municipality—especially with the police, whose job it is to enforce such laws. And if you've got one of the new scanning-type 144 or

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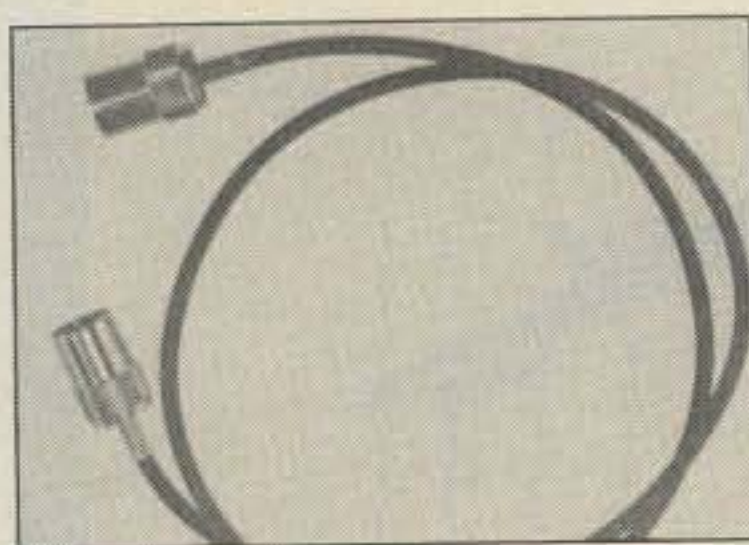
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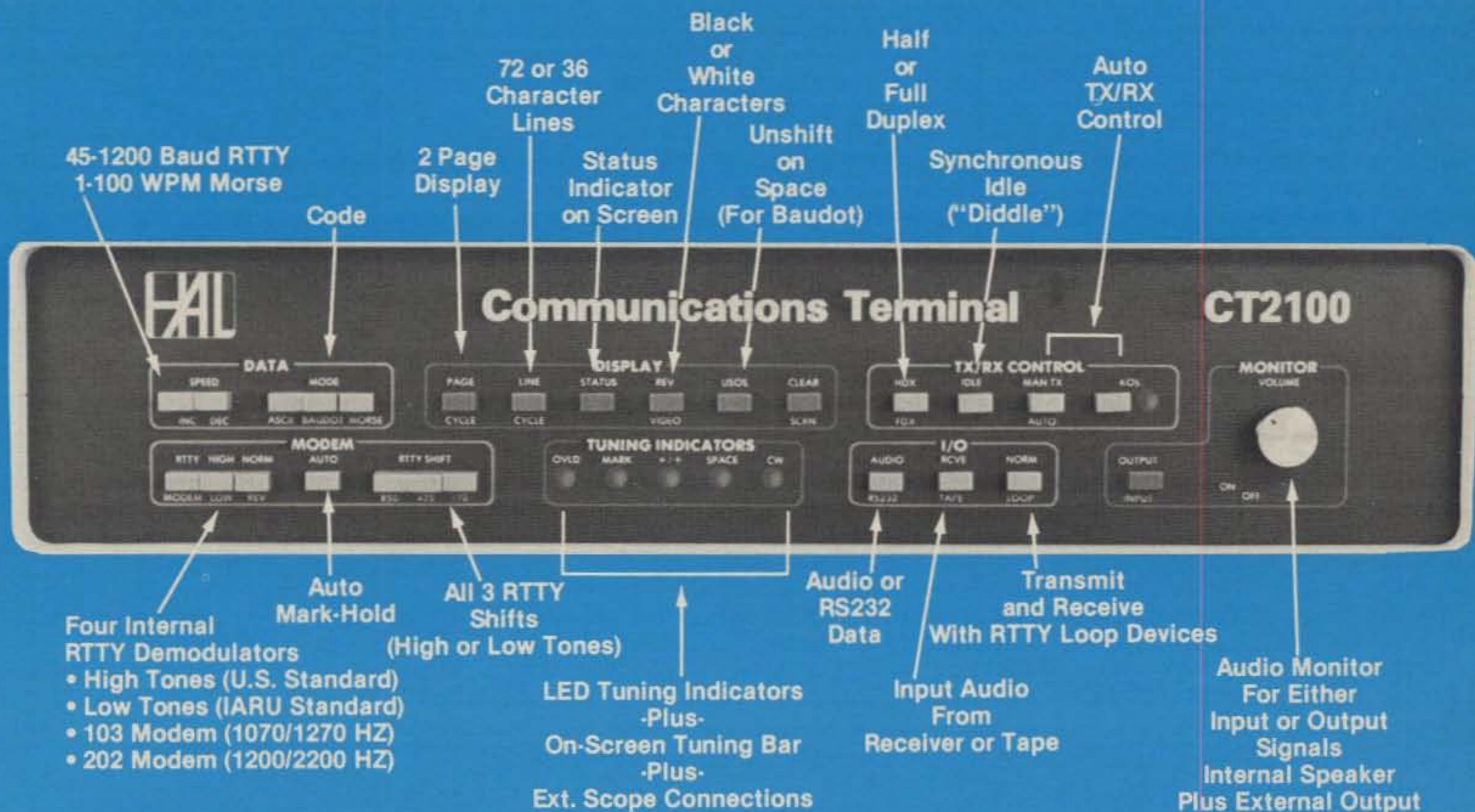
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The Scanner Radio

The scanner is a recent phenomenon. The earliest sets meant for consumer use were police and fire monitor table radios designed specifically for folks such as volunteer firemen. Most of these sets were tunable from 30-50 MHz and/or 150-174 MHz f.m., and some came in 108-136 or 118-136 MHz a.m. versions for aircraft monitoring. These tube-type radios were generally unsatisfactory by present-day standards due to their typically low sensitivity, frequency drift, and difficulty of resetting to a specific frequency.

Later came fixed-tuned monitor receivers, which employed crystal controlled local oscillator circuits to allow reception of desired channels with some degree of precision. Both single- and multiple-channel sets were produced. Some had both fixed (crystal) control and tunable capability in the same set, similar to the early CB radios that allowed crystal-controlled transmit with tunable receive function. Later-generation fixed-tuned sets were of solid-state design and included an r.f. stage, mixer, several i.f. amplifiers, and squelch control all built around a dual-conversion circuit. These receivers, specialized variations of which

are produced today, are the forerunners of the modern scanner radio.

Scanners, since their introduction about 1968, have become almost household appliances, particularly with the advent of the large-scale mass-media advertising campaigns of Bearcat and Regency. In fact, over 7% of U.S. households have one of the more than six million units produced to date. Classic scanners use crystal control of 4 to 20 channels, and can be equipped with the proper crystals to receive fire, police, mobile telephone, marine, amateur, or other services in the unit's range. The scanner rapidly searches through each of the predetermined channels at a given rate, often selectable by the user; nothing is heard until an active channel is located. Then the receiver locks onto this channel and stays with it until the signal goes off the air—or even for a second or two afterwards, to prevent missing transmissions on the same channel when there is a momentary break by having the scanner go back to search mode immediately.

Scanners can be bought for about any price. At the low end of the price range, single-band, crystal-controlled types with 4-channel capacity are common. Such units may be satisfactory for rural-area VHF-LO reception with a limited number of channels in use; using this kind of scanner on the VHF-HI or u.h.f. bands will fast run your crystal costs out of sight unless

you wish only to monitor a very few discrete frequencies (thus missing most of the "fun"). A pocket-type scanner with 4-channel capability, particularly if it is of the multi-band type, is usually satisfactory, however.

More useful are 8-16 channel capacity, 2- or 3-band scanners. These units can usually be set up to handle a mixture of channels on all the bands which the set is capable of covering. A crystal-type scanner can be adequate if it has a reasonable number of channels that can be "crystalled up," although at about \$5 a crystal, the costs mount steeply as one gets involved in the hobby. Also, crystals are sometimes not interchangeable between different manufacturers' units. Most contemporary scanners operate from house current or 12 v.d.c. and include a separate power cable for either type of power source. Much like current 2-meter gear, most scanners can be slid out of the car and moved indoors for fixed-station use in a twinkling, but have the additional advantage of an internal a.c. supply.

Many 150-174 MHz scanners, although they may not advertise 2-meter amateur coverage, can be retuned to give good performance on the band. Usually, peaking up the r.f. and mixer stages and insertion of the proper crystal is all that is required.

The programmable scanner is rapidly taking over among serious hobbyists,

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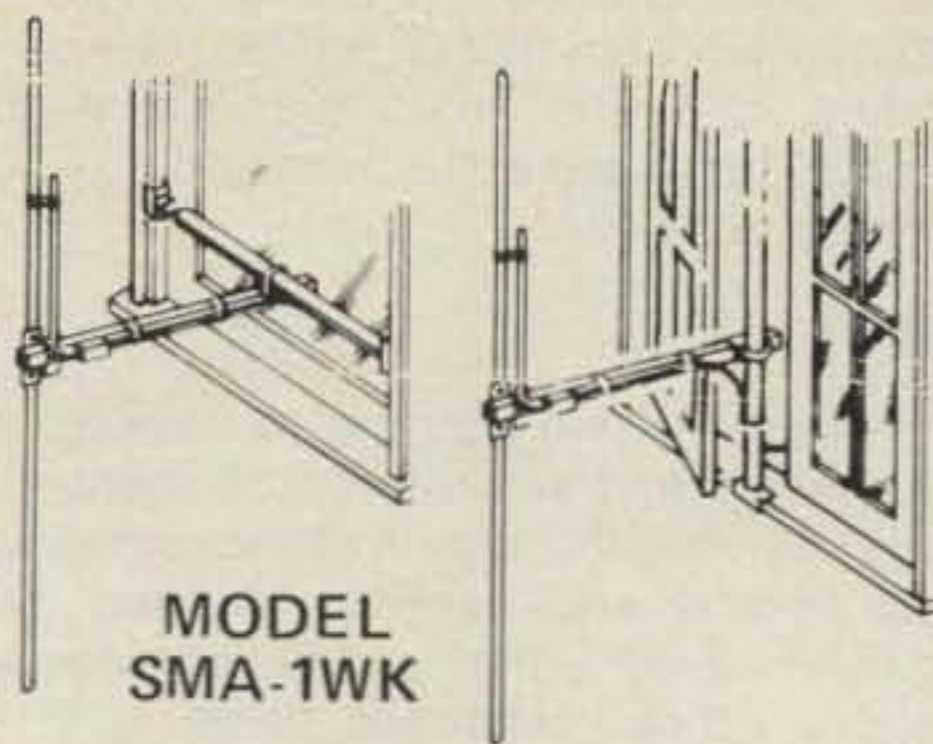
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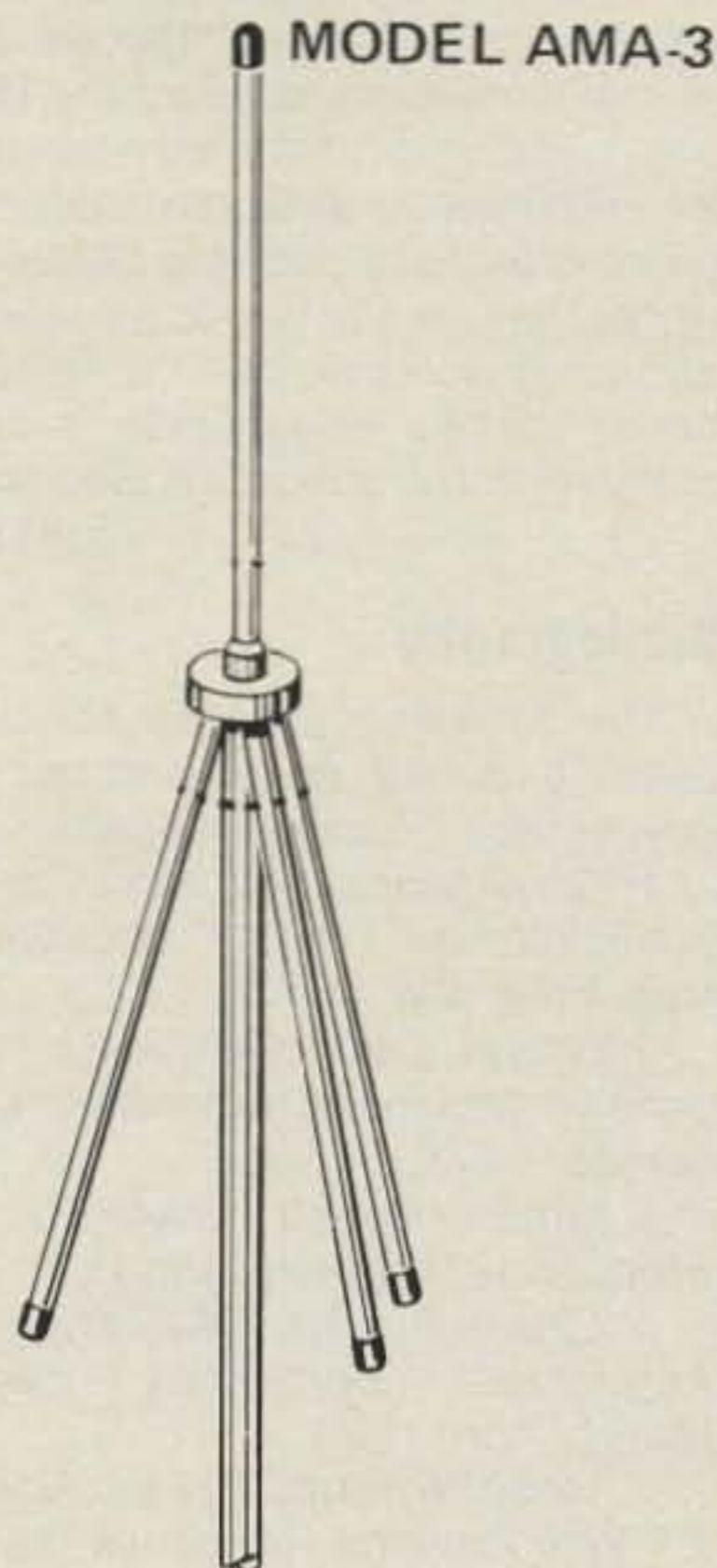


CIRCLE 131 ON READER SERVICE CARD



MODEL
SMA-1WK

AIRCRAFT MONITOR



MODEL AMA-3

Representative scanner/monitor antennas are shown by these two Finco designs. Model SMA-1WK is designed for low-, high-, or u.h.f. band use, is vertically polarized, and has special mounting hardware for apartment window mounting. The AMA-3 is designed for specialized v.h.f. aircraft monitoring in the band 118-136 MHz; the drooping ground plane radials give a good match to coaxial cable. (Photo courtesy the Finney Company)

since it has a number of distinct advantages over its crystal-controlled cousins. First, you don't have any crystals to purchase, as the scanner is ready to go on any channel within its operating range as it leaves the factory. Second, the scanner can be set for signals receivable in your area and instantly reprogrammed if you move or if you travel to other areas in your car. And, you can search for actual signals that are in use as opposed to signals listed in possibly out-of-date directories, reprogramming the scanner to receive them on the basis of activity. Most of the

latest programmables have digital read-out of the received frequency, whether in scan, manual, or search modes of operation. Most also have special track-tuning-type r.f. circuitry that allows good performance over an entire frequency band, whereas most "classic" scanners are optimized for reception over a narrow 5-6 MHz range, with sensitivity and overall performance suffering outside this range.

At the risk of touting a particular manufacturer's product, it's easiest to describe "the latest" in scanners by picking a representative "state-of-the-art" unit and running through a few features of interest. The Bearcat 300 is typical of this new kind of scanner. The BC 300, which has over 2100 active frequencies stored in its non-volatile memory, covers all of the bands described earlier, with the exception of the 806-870 MHz u.h.f. band. Its "service search" feature arranges these 2100 stored frequencies into 11 service categories, in accordance with FCC spectrum assignments, for immediate access by interest category. For example, one can depress the "HAM" service-search pushbutton and all of the popular 2-meter f.m. channels will be scanned. Depressing the "POLICE" button causes appropriate channels in either or all of the VHF-LO, VHF-HI, and u.h.f. bands to be scanned (individual bands can be locked out if desired). Frequencies are programmed into the normal scan operation by keyboard entry; 50 channels, arranged in separately selectable bands of 10, can be scanned at two different rates that are user determined. Sweeps of any segment of any band or an entire band can also be conducted using the search and limit pushbuttons to discover unlisted/unknown frequencies. Many thousands of discrete frequencies can be searched in this manner.

Other interesting features include an automatic counting function that counts the number of transmissions on a channel (to determine the most active frequencies), a built-in quartz digital clock,

priority frequency override capability, programmable channel lockout and scan delay, automatic squelch, hold/resume scanning pushbuttons, and direct channel access without stepping through all 50 channels. Sensitivity of the Bearcat unit is rated at 0.4 microvolt for 12 dB SINAD on the VHF-LO and HI bands, and slightly less on u.h.f. Aircraft band (a.m.) sensitivity is rated at 1.0 microvolt for 10 dB SINAD at 60% modulation. As is the case with most present-day scanners, a single antenna input jack is used; there are no provisions for separate antenna inputs for each band, though of course a multi-band antenna can (and should) be used for best performance on the seven bands the set covers, or an external combiner or switching device can be used if separate antennas are employed.

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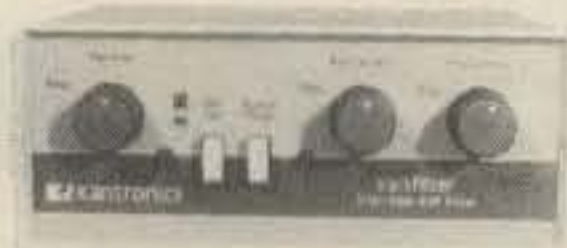
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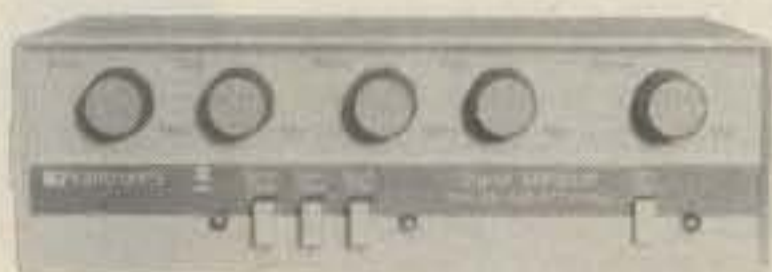
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Larsen omnidirectional fixed base antenna, shown here, is intended for transmitting applications over the range 136 to 230 MHz, but can easily be used with single-band scanners. The antenna, which provides a stated 3.6 dB gain over standard 1/4-wavelength ground plane antennas, features electrical grounding for safety and reduction of static build-up. An adjustment chart is provided to make the three adjustments required to optimize performance on any frequency within the desired range. (Photo courtesy Larsen Electronics, Inc.)

Reader Feedback

In the October and November 1980 issues we featured h.f. vertical antennas of various descriptions, including popular trap and non-trap multi-band designs. One type we did not mention specifically was the Butternut HF 5V-III, a *trapless* vertical antenna that covers 80 through 10 meters automatically. Reader Fred Bonavita, W5QJM, pointed out our lack of coverage of this very unusual antenna. Fred wrote us a lengthy letter pointing out the advantages of the Butternut antenna (he is a well-satisfied owner/user) and the unique feature that it uses no traps. He highlights the fact that the typical trap vertical functions for its whole length only on the lowest band for which it was made. Thus, by his reasoning, if you plunk down \$100 for an 80-10 trap vertical, only on 80 meters do you get full use of all that you paid for; on 40 you get a lesser amount; on 20, even less; and so on, all the way down to 10 meters where less than half of what you paid for is working for you. Fred points out that by means of a system of easily tuned, slide-adjusted *loading coils* (not traps) and a practically lossless linear decoupling stub for 15 meters only, the entire 26-foot radiator is active on 80/75, 40, 20, and 10 meters, and a full physical quarter-wavelength resonance on 15 is achieved. This design contributes to greater bandwidth relative to trapped antennas. A low s.w.r. is achieved across all bands (typically 1.5:1 or bet-

ter), although the operating range is somewhat restricted on 80/75. The interesting 12-pound antenna is shunt-fed with 50-ohm coax at the base and is at DC ground potential.

Wrap-up

This month we became so involved in the why's and wherefores of scanners and scanning that only in the accompanying photos and captions did we get around to the antenna side of things—where we're "supposed to be at." To treat the antennas properly, however, it was necessary to set the stage with some background on the scanner spectrum and the state of the art; this we did. Next month we expect to cover the details of both basic and advanced scanner monitor antennas. As we'll see, there's a good bit of crossfeed possible between what works well on the public service ranges and what works well on the familiar ham bands that lie side-by-side in the same portions of the spectrum. See you then.

73, Karl, W8FX

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THE INS AND OUTS OF WORKING DX

BY BILL KENNAMER*, K5FUV

What is rare DX anyway? In some quarters, it would be a country that hasn't appeared in years. However, most would be forced to admit that rare is anything one hasn't worked yet. The reasons for not working a particular country can vary from no activity to no propagation. Whatever the reason, it isn't in the log. Thus, most of the challenge and pleasure from the DX hobby comes from putting the new one in the log.

The adage, "You can't work 'em if you can't hear 'em" always holds true in DX-ing (except on lists, where many have been worked and not heard). However, supposing that the desired DX is active, that he is making regular appearances (thus being heard), and is staying on the air making contacts, then the problem becomes getting him into the log. With a little propagation, a full power linear, and 6 elements at 100 feet, there is no problem. However, if your station falls into a category with most of the rest of us, a tribander on a city lot, then the job becomes a little more difficult, the kind of accomplishment that operating awards were designed for in the first place. Getting the QSO through your own efforts through the pack is indeed a satisfying experience.

There is, however, more than one way to skin a cat. You can get the same satisfaction by figuring out a way to outguess the pack. This can be done either during a pileup, or even without a pileup. A little knowledge and guesswork can go a long way toward putting the new one on your wall.

To get to the point of being able to outguess the pack, let's go back a little to that great equalizer, propagation. Propagation could be considered to be one of

those things where either you have it or you don't, but there's more to it than that, because you can have it a little bit and still make things work. Unfortunately, or perhaps fortunately for you, many of the other stations that might be your competition in a pileup believe that a DX station has to be S9 before they can work him. That's good for you, because they won't be on the same band with you during the marginal propagation times of the day. Take advantage of this. Many have made some very good DX contacts by being in the "wrong" place at the right time.

Marginal propagation conditions require a bit of personal observation on the individual's part, as these conditions will vary somewhat with time of year and time of day, as well as with the sunspot cycle. As an example of some of these unusual conditions, EP stations have been worked long path on 10 meters from Colorado at 11:00 p.m. to midnight. Beam heading was in the area of 210 degrees. The best way to find out about these unusual openings is merely to take a band and stay on it as much as possible for a two to three week period. Listen all hours and in all directions. Call CQ if the band is quiet, and turn the beam a lot. If it doesn't work the first time, try another day. Here we have observed 24-hour openings on 15 meters, with 18- to 19-hour openings on 10 meters also being noted. This knowledge can then be catalogued and put to good use later.

Also, knowledge of the desired area's time of day in relation to your own is also a big advantage. For example, would you expect to find as many operators from a given country awake at 2 or 3 a.m. local time as you would at 6 to 7 a.m.? In most cases, your chances would be less likely, although that is not to say it couldn't be done, as some stay up late or get up early on weekends. Still, it is best to look for openings in an area where it is an hour or

two before work, about one to two hours after the work day, or near midnight. Most of us will find that this also conforms pretty well with our own operating schedule.

Bear in mind also that propagation patterns generally run close to the same in the Northern Hemisphere and generally reverse in the Southern Hemisphere. Thus, an afternoon opening on 10 meters would tend to be west to southwest, so a corresponding opening from Europe to the U.S.A. should take place at around the same local time in Europe as the westerly path in the U.S. An example: Texas to Hawaii, New Zealand, or Australia at 2:00 p.m. local time should indicate a Texas to European opening at 2:00 p.m. European time. Texans will check old log books for 1400Z and find that this generally holds true.

Now, armed with the knowledge that these paths do indeed exist, how does one take advantage of them? In recent time it has been noticed that the pack almost totally refuses to work a DX station that isn't S9 or better. The pack also seems to have a mass refusal to work any band that sounds noisy or dead. If you will go the band with the greatest likelihood of a marginal opening, a little time listening should reveal some positive results. Last summer some nice DX was worked on both 10 and 15 meters by going to those bands at a time when another band would have provided stronger signals. By doing so, most of these stations, though only about an S2, were easily worked on the first call with no other U.S. callers heard.

This is indeed the easy way to work DX, although it takes a little more patience. However, this knowledge can also go a long way in allowing you to work DX in a minimum amount of time when you need to.

Of course, probably the easiest way to work DX is in the DX Contest. More on that in the next column.

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CQ World-Wide DX Contest All-Time Phone Records

BY FREDERICK CAPOSSELA, K6SSS

In the records listed below, boldface listings denote world records. Number groups after calls are: year of operation, total score, contacts, zones, and countries. All-band and Multi-Operator records include a band-by-band breakdown of the world leader in each category.

Single Operator/Single Band

WORLD RECORD HOLDERS

1.8	KV4FZ('76)	37,584	380	11	37
3.5	KV4FZ('75)	275,319	1,297	23	80
7.0	KX6LA('77)	405,678	1,523	28	63
14	KV4FZ('78)	1,520,904	3,890	36	132
21	H31LR('79)	1,448,848	3,524	36	127
28	OH2MM/CT3('79)	1,827,150	4,068	37	113

AFRICA

1.8	No Entrant				
3.5	CT3BZ('79)	235,113	772	22	87
7.0	EA8CR('74)	253,528	639	31	103
14	CR6WW('74)	1,058,446	2,152	35	132
21	EA8JJ('77)	766,125	1,900	31	104
28	OH2MM/CT3('79)	1,827,150	4,068	37	113

ASIA

1.8	EZ9QAA('80)	1,520	37	3	13
3.5	VE3MR/4X('71)	197,106	742	22	69
7.0	VE3MR/4X('72)	215,840	643	27	88
14	VE3BWK/4U('78)	1,061,634	2,532	39	122
21	4X4UH('78)	738,315	1,907	33	102
28	4X0U('80) (Opr. 4X4UH)	1,187,200	2,555	37	123

EUROPE

1.8	YU3EF('80)	10,305	228	8	37
3.5	I3MAU('75)	113,535	778	18	69
7.0	SP3DOI('80)	281,970	879	34	96
14	I5NPH('80)	1,062,936	2,429	37	134
21	YU3EY('80)	1,235,675	2,817	37	124
28	I0MGM('80)	1,318,966	2,930	38	129

NORTH AMERICA

1.8	KV4FZ('76)	37,584	380	11	37
3.5	KV4FZ('75)	275,319	1,297	23	80
7.0	HR1RF('72)	399,542	1,349	28	93
14	KV4FZ('78)	1,520,904	3,890	36	132
21	H31LR('79)	1,448,848	3,524	36	127
28	KV4FZ('79)	1,482,525	4,079	39	126

OCEANIA

1.8	KH6CC('79)	2,975	63	9	8
3.5	KH6XX('77)	116,416	606	28	40
7.0	KX6LA('77)	405,678	1,523	28	63
14	VK6HD('72)	706,251	1,483	37	132
21	KG6DX('80)	1,213,940	3,588	33	82
28	KH6XX('80)	1,762,332	4,212	37	106

SOUTH AMERICA

1.8	HK4EB('76)	3,672	34	4	9
3.5	4M3AZC('80)	181,794	760	19	63
7.0	CX4CR('76)	363,110	1,125	30	80
14	FY7AK('76) (Opr. F5QQ)	1,415,329	2,950	36	127
21	CW4CR('70)	1,196,085	2,462	39	126
28	CW3BR('78)	1,662,718	4,028	35	104

Single Operator/All Band

AF	EA8AK('80)	8,996,673	5,261	133	430
AS	HS1ABD('79)	2,772,192	3,092	116	286
EU	G3FXB('79)	4,708,014	3,710	116	341
NA	KP2A('80) (Opr. N6ZZ)	5,254,080	5,651	116	300
O	KH6RS('72) (Opr. K2SIL)	5,331,072	4,739	128	256
SA	9Y4VT('78) (Opr. N6AA)	8,281,800	6,194	118	332

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	30	6	14
EA8AK	3.5	294	18	58
(1980)	7.0	374	24	66
8,996,673	14.0	1,031	33	85
	21.0	1,377	32	100
	28.0	2,155	30	107
	Total	5,651	116	300

Multi-Operator/Single Xmtr.

AF	9L1CA('78)	7,367,846	5,393	118	340
AS	R6F('79)	9,029,396	5,643	137	411
EU	I4RYC('80)	9,918,368	5,997	139	453
NA	HI8XWP('79)	9,872,267	7,603	134	417
O	KC6ZR('80)	7,605,360	6,197	137	283
SA	FY7BC('78)	8,989,695	6,125	124	371

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	-	-	-
I4RYC	3.5	73	10	51
(1980)	7.0	306	18	59
9,918,363	14.0	1,259	38	114
	21.0	1,370	38	114
	28.0	2,989	35	115
	Total	5,997	139	453

Multi-Operator/Multi-Xmtr.

AF	EA8CR('77)	21,351,898	10,290	153	544
AS	EX9A('78)	15,364,080	9,233	164	519
EU	YU3EY('79)	16,646,364	9,562	153	528
NA	VP2KC('79)	37,770,012	17,767	175	677
O	KH6XX('79)	21,990,252	10,989	184	494
SA	PJ2CC('80)	37,760,742	15,940	168	632

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	526	11	47
VP2KC	3.5	1,079	22	95
1979	7.0	1,702	28	107
37,770,012	14.0	4,208	39	153
	21.0	5,417	39	145
	28.0	4,835	36	130
	Total	17,767	175	677

Club record: Frankford Radio Club ('79) 173,821,640

CQ World-Wide DX Contest All-Time C.W. Records

Single Operator/Single Band

WORLD RECORD HOLDERS

1.8	KV4FZ('76)	42,800	390	13	37
3.5	CT3/OH1TV('77)	223,364	1,066	19	57
7.0	KP4AST('73) (Opr. WA4PXP)	447,421	1,479	32	95
14	VP2KAA('80) (Opr. N4PN)	1,244,782	3,111	37	117
21	PJ2CC('80) (Opr. K4BAI)	1,209,022	2,914	34	105
28	LU8DQ('79)	1,033,399	2,775	34	93

AFRICA

1.8	EA8CR('76)	7,696	100	8	18
3.5	CT3/OH1TV('77)	223,364	1,066	19	57
7.0	5A1TW('64)	227,814	918	22	64
14	CR6IK('74)	925,386	2,021	38	116
21	TJ1AW('70)	549,888	1,447	35	93
28	FR0MM('79)	978,012	2,590	36	90

ASIA

1.8	4X4NJ('80)	4,966	70	6	20
3.5	UI8LAG('78)	110,552	606	16	57
7.0	4X4FA('64)	174,505	781	25	60
14	UH8AA('79)	411,120	1,401	31	73
21	4Z4NUT('80)	519,831	1,500	34	83
28	4X4UH('80)	554,645	1,772	32	83

EUROPE

1.8	G3SZA('79)	21,960	283	12	33
3.5	DK3GI('77)	165,216	967	23	73
7.0	YU2CDS('79) (Opr. YU2RQX)	361,680	1,204	32	88
14	OH8OS('77) (Opr. OH2BH)	625,812	1,961	34	87
21	I4IND('80)	701,960	1,980	35	105
28	DK3GI('79)	592,848	1,584	31	101

NORTH AMERICA

1.8	KV4FZ('76)	42,800	390	13	37
3.5	KV4FZ('75)	190,082	789	24	77
7.0	KP4AST('73) (Opr. WA4PXP)	447,421	1,479	32	95
14	VP2KAA('80) (Opr. N4PN)	1,244,782	3,111	37	117
21	VP2KAC('80) (Opr. N4RJ)	1,075,407	2,955	36	105
28	KV4FZ('79)	653,072	2,384	32	87

OCEANIA

1.8	VR3AH('78)	20,310	238	12	18
3.5	VR3AH('76)	178,560	956	24	40
7.0	AH6Z('78)	387,750	1,382	30	64
14	K2LE/DU2('80)	521,031	1,377	36	93
21	KH6XX('78)	816,102	2,311	38	81
28	KG6DX('80)	801,876	2,367	35	79

SOUTH AMERICA

1.8	YV1OB('77)	14,220	192	9	21
3.5	N4JI/HC1('77)	77,748	463	21	36
7.0	CV4DL('75) (Opr. CX1BBL)	230,040	1,020	24	57
14	PJ9CC('80) (Opr. K4BAI)	1,209,022	2,914	34	105
21	HD0E('80) (Opr. K7CA)	1,146,471	2,727	36	105
28	LU8DQ('79)	1,033,399	2,775	34	93

Single Operator/All Band

AF	CT3BZ('78)	5,135,104	4,256	105	311
AS	UF6DZ('79)	3,440,172	2,540	99	255
EU	EA2IA('80)	2,931,510	3,047	116	301
NA	KP4RF('78) (Opr. N6CJ)	4,908,186	3,797	135	379
O	KH6BZF('80) (Opr. K7TI)	2,916,010	3,385	108	181
SA	9Y4VT('80) (Opr. N6AA)	6,116,945	4,505	128	329

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	91	6	9
9Y4VT	3.5	420	18	53
(1980)	7.0	846	22	62
6,116,945	14.0	1,046	28	71
	21.0	1,089	28	67
	28.0	1,013	27	67
Total		4,505	128	329

Multi-Operator/Single Xmtr.

AF	EA9EU('80)	5,077,696	3,884	116	326
AS	RG6G('80)	9,720,528	5,358	164	462
EU	UK2PCR('80)	4,256,620	3,021	145	435
NA	NP4A('79)	7,982,576	6,100	141	385
O	5W1AZ('76)	2,534,416	3,043	108	176
SA	FY7AK('75)	4,197,364	3,670	98	288

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	117	9	31
RG6G	3.5	566	22	68
(1980)	7.0	1,161	32	87
9,720,528	14.0	1,122	36	96
	21.0	1,245	35	100
	28.0	1,138	30	80
Total		5,358	164	462

Multi-Operator/Multi-Xmtr.

AF	EA8CR('78)	17,734,970	9,799	142	463
AS	EX9A('78)	8,721,019	6,882	137	384
EU	SK2KW('79)	7,101,325	6,416	146	381
NA	NP4A('80)	17,627,820	10,846	171	487
O	KS6ER('73)	1,415,650	2,136	102	123
SA	PJ2CC('79)	20,045,952	11,786	154	422

WORLD RECORD

Station	Band	Contacts	Zones	Countries
	1.8	81	6	10
PJ2CC	3.5	704	18	53
(1979)	7.0	1,768	25	76
20,045,952	14.0	3,442	33	95
	21.0	3,244	38	100
	28.0	2,447	34	88
Total		11,786	154	422

CQ World-Wide DX Contest All-Time U.S.A. Records

BY FREDERICK CAPOSSELA, K6SSS

Tabulated below are the record-high scores achieved by U.S. Contesters in the CQ World Wide DX Contest. Number groups following calls and bands are: year of operation, total score, contacts, zones, and countries.

PHONE

Single Operator/Single Band

1.8	K1PBW('76)	7,280	100	10	30
3.5	W1CF('78)	114,227	435	23	80
7.0	W3PHL('75)	110,799	337	29	88
14	W4AXE('70) (Opr. WA4PXP)	595,725	1,068	39	156
21	K1RM('79)	870,237	1,768	38	129
28	N7DD('80)	754,536	1,730	36	113

Single Operator/All Band

Station	Band	QSOs	Zones	Countries
	1.8	55	8	14
N7DD	3.5	50	15	28
(1979)	7.0	74	20	42
3,113,788	14.0	420	34	76
	21.0	794	35	86
	28.0	813	34	100
Total		2,206	147	346

Multi-Operator/Single Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	7	5	5
K5GA	3.5	39	15	37
(1978)	7.0	173	21	64
4,150,306	14.0	549	39	125
	21.0	619	35	103
	28.0	1,057	33	111
Total		2,444	148	445

Multi-Operator/Multi-Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	109	8	16
N2AA	3.5	406	24	79
(1979)	7.0	366	28	84
13,299,750	14.0	1,646	40	152
	21.0	2,198	40	144
	28.0	1,354	36	120
Total		6,079	176	595

CW

Single Operator/Single Band

1.8	K1PBW('76)	22,626	157	15	39
3.5	WB2FZO('80) (Opr. WB2SJG)	139,390	469	28	78
7.0	W5WZQ('76)	322,383	907	33	90
14	N7UA('80)	626,400	1,634	34	101
21	W1RM('79)	450,120	1,173	37	95
28	N4WW('79)	349,206	1,009	34	87

Single Operator/All Band

Station	Band	QSOs	Zones	Countries
	1.8	14	8	11
K1AR	3.5	195	20	54
(1980)	7.0	441	29	69
2,830,730	14.0	373	28	65
	21.0	464	26	77
	28.0	499	28	75
Total		1986	139	351

Multi-Operator/Single Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	10	7	9
K5RC	3.5	60	18	39
(1979)	7.0	328	30	79
4,148,781	14.0	773	38	100
	21.0	728	34	92
	28.0	658	33	85
Total		2,557	160	404

Multi-Operator/Multi-Xmtr.

Station	Band	QSOs	Zones	Countries
	1.8	39	8	15
N2AA	3.5	291	26	63
(1980)	7.0	876	32	87
9,071,199	14.0	1,289	39	123
	21.0	1,255	33	101
	28.0	972	33	97
Total		4,692	171	486

Club Record: Frankford Radio Club ('79) 173,821,640

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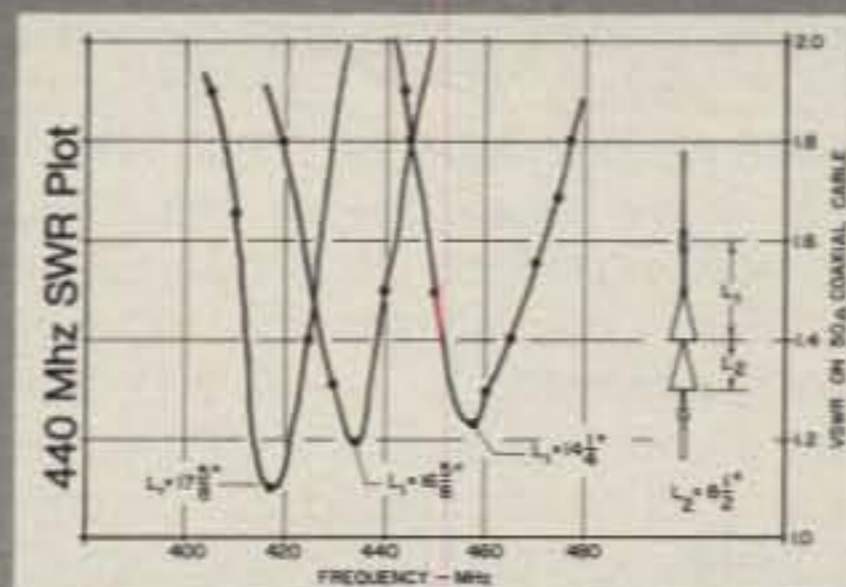
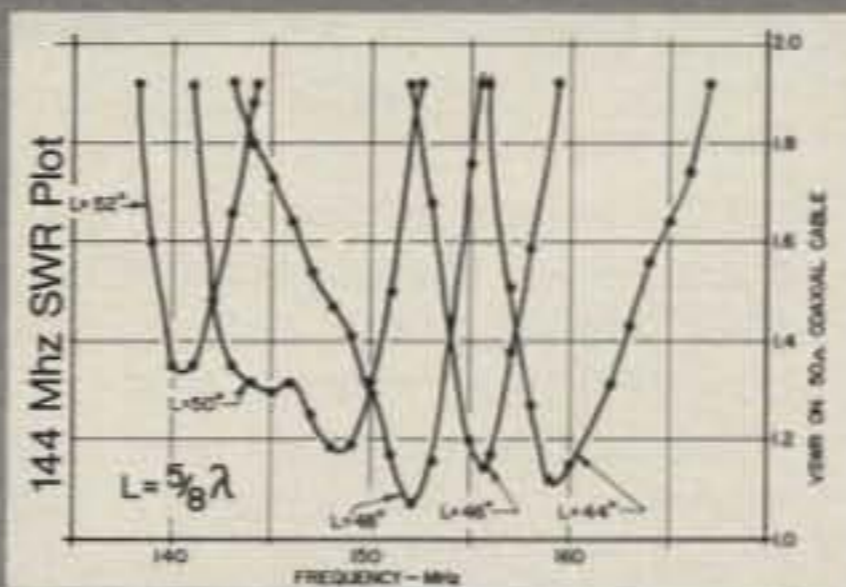
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The dust hasn't settled yet on the QRP DX scene, judging by the applications for QRP DX awards. Since our last report, VK7NRT, AB0X/WA0AGN, WB9OAR, and K2OQA have qualified for the DXCC QRPp trophy (under 5 watts output), and WA4LOF has pushed over the 200 country mark, qualifying for DXCC 200 QRPp Trophy #3. K2OQA's approach is unique inasmuch as he completed his 100 countries while operating a converted CB transceiver to a yagi on 10 meters, and his trophy will carry an endorsement indicating that special feature.

A funny thing about these applications—they seem to come in batches, sometimes separated only by a day, as in the case of WB9OAR and K2OQA. Perhaps it is a matter of QSL bureau delivery schedules. At any rate, let's back up to DXCC QRPp Trophy #13 and pick up the story with Everett "Ev" D. Willis, W6YVK, whose trophy carries the All SSB #2 endorsement. Ev writes:

"I was away for a few days, and when I returned, my QSL #100 from Tony, IS0IFA was waiting. I had worked IS0 last April (1979), but no QSL, so I was very pleased that Tony came through. I started QRP on s.s.b. on May 8, 1978, when I picked up my Argonaut at the local flea market. I had worked 25 countries by July 18, 50 by November 28, 75 by March 14, 1979, and finally 100 on September 14, 1979. My last country worked was #117 on January 7, 1980. I had received 98 QSL's by the end of January 1980, but they sure come in slowly!

"Most of my recent QRP QSO's are on 10 meters, since my antenna has been acting poorly on 15 and 20 for about a year. It is a homebrew 5-element yagi with 3 elements active on 10 and 15 meters, with just the driven element active on 20. The only traps are on the driven element and I'm sure they are the problem. Since I do not have a crank-up or tilt-over tower, it is difficult to get to the antenna to repair it. My mast is hand rotatable from in the shack and has a mechanical Great Circle indicator.

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"Early in February I located a wattmeter to my liking. With the center scale I read about 2.5 watts output on a 3-inch meter. The readings from the Argonaut read normally above 2 watts output on s.s.b. peaks. Starting this February I have been working with the Argonaut Drive control turned down so that the average voice readings are less than 1/2 watt with the intention of working s.s.b. at less than one-watt peak. In any case, in less than two weeks I had worked several states and 12 countries."

From Charlie Hoffman, K4RUG, DXCC QRPp Trophy #14, endorsed All SSB #3: "Finally after two months my QSL's were returned by the A.R.R.L. approved for DXCC but not endorsed for QRPp as I requested (*The A.R.R.L. does not provide QRP endorsements for DXCC as a matter of policy—Ed.*) Although I've operated QRPp on and off for many years, it wasn't until about two years ago that I was really hooked. A local ham, Rick Lloyd, AA4W, started me off with a friendly challenge on who could get their first WAS using our Argonauts. In just 2.5 months I had my 50th state confirmed.

"About this time I traded my old Argo in for a new 509 model which proved to be an outstanding little rig as you reported in your review article ('The TenTec Argonaut 509 S.S.B./C.W. Transceiver,' CQ, July, 1978). Anyway, just about eight months later I had worked 102 countries, but confirmations were slow in coming for some of these. Discounting Box 88 (*USSR, etc.—Ed.*), my returns were phenomenal—at least from what I've heard from other hams—98% returns! I contribute this to the fact that I sent mint stamps (*Stamps from the country to which the QSL is being sent. These are available from stamp dealers and some U.S. QSL bureaus—Ed.*), not IRC's, to most of my contacts. I did not attach the stamps to the envelopes since many overseas hams use larger than usual QSL cards. Amateurs interested in using this method (cheaper than IRC's) can get a current price list by sending an s.a.s.e. to W2AZX DX Stamp Service, 7661 Roder Parkway, Ontario, NY 14519.

"As for the contacts, I used methods advocated by you for years. I listened

99% of the time, using the 10- and 15-meter bands almost exclusively. I did not avoid pile-ups, but I did limit my time to 20 minutes on each attempt. One thing, however, I do pride myself on the fact that in no case did I ever utilize high power first in order to make an initial contact (*Good thing because such contacts do not count toward the QRP DXCC awards!—Ed.*) Also, I avoided lists or the habit of riding someone's coat-tails as is sometimes done. I am a retired Navy C.P.O. and am presently employed at the Avionics Division at the Naval Air station in Pensacola. That's about it for now—keep up the good work in your columns, reviews, etc.!"

From Richard M. Vacca, W1PWK, DXCC QRPp Trophy #15: "I had been off the air for several years, having been in a foreign country where I couldn't operate, and when I returned to the U.S.A., I bought the Argonaut in July 1976. Just figured to make a few contacts here and there around the neighboring states on 40 or 20 meters, and maybe someday to put up a nice beam antenna for 15 meters or something. For the first couple of months I worked a bunch of W/K's, VE's, and a KP4 or two. I was satisfied. I had a dipole for 40 that worked well on 15 and a 50-foot wire for 20 and things were fine! Then one day I called a European station and he came back to me! 5 watts input and a 50-foot wire and working Europe on 20 meters!

"That started it. Next thing I knew I was in there swinging, and quite well, too, I might add. 10 meters showed signs of coming to life, so up went a 10-meter dipole. One evening I worked Japan on 21 MHz using the 7 MHz dipole. I had already worked ZS2 and TU2 with it! I just needed Oceania for the WAC QRPp award. Then one day during the CQ DX Contest, there he was, KH6IJ on 10, and after a few calls, bingo, WAS QRPp. Before the smoke cleared away I had a total of 49 states and 66 countries worked with the Argonaut and the dipoles and a 50-foot wire. Alaska, Alaska, wherefore art thou Alaska?

"I finally invested in the Hybrid Mini-Quad, the HQ-1, and managed to get it up around 32 feet in the air early in the fall of

1978. Since then the results have been fantastic. After hunting for Alaska for 2 years, I worked two of them within 10 minutes with the mini-quad. Next thing I knew I had over 90 countries worked with QRP, and it suddenly dawned on me that I could possibly make the 100. After all, I now had WAC and WAS, so why not DXCC? I kept hunting and calling, but, it wasn't that easy when you have to start looking for the rarer DX and a whole group of high power boys are looking, too. Finally on 16 February, 1979, there was EA6FD on 10 c.w., and after sweating out a few high-power guys I had my 100th country worked. But now comes the hard part. To date I only had about 50 of them confirmed, and some countries are notoriously slow with QSL cards. So, I just kept plugging away on the air.

"By the end of 1979 my total had reached 116 worked but less than 90 confirmed. By the end of January 1980, the worked total was up to 118 and 97 QSL's in the bag. First mail day of February brought in two more. 99 down and one to go! For two weeks, nothing. Famine. Then, whammo! In came #100, followed closely by 101 through 104. Eureka, I had done what I thought was impossible only a couple years ago. I had confirmed over 100 countries using less than 5 watts output and a few dipole antennas plus a 50-foot wire and a mini-quad that was only 11 feet long and 3.5 feet wide! Now, don't misunderstand me. It would have been great to do this if I had been using a 4-, 5-, or 6-element yagi or quad at 75 feet or 100 feet, but with the antenna layout I had, the thrill was 100 times as great! Could I have reached the 100 with just the dipoles and 50-foot wire? Could be. I did have 66 worked, including Japan, Australia, and S. Africa with the wires. So you know what the next project is, don't you? Right. The dipoles go back up in the air in time for next year's DX season in late September. It'll be '100 with dipole or bust.' I can't get the dipole up more than 35 feet or so, but that might be enough.

"Now I'd like to comment on what is important to me in this QRP DX business. I now have a total of 120 countries worked with the Argonaut, and I did it with the little rig alone. There were no preliminary calls with a bigger rig. No buddy-buddy systems (you know—'listen for my QRP friend on the frequency' kind of thing). No lists or nets. Nothing but calling with the Argonaut and raising the stations for a contact that way. And, I've even been picked out of pile-ups on quite a few occasions.

"That latest country I've worked was only yesterday. 7X2LS was on 10 s.s.b. and he had a pile-up on him. I joined it shamelessly with the Argonaut, and I guess that I might have sent my call when part of it was in the clear. Anyway, he came back and said, 'I heard a W1. W1 station come in please.' So, with QRP timing and luck have a lot to do with it. The S7

report from Algiers gave me my country #120 with less than 5 watts out! Funny thing, when I told the 7X2 station what I was using, he even came back and gave me some advice on how to improve the Argonaut power supply so that I could get better reports from stations! I didn't have the heart to tell the Algerian station that I had worked 120 with my present power supply! I just thanked him. Well, that's the W1WPK QRP story."

DXCC QRPP Trophy #16 is a special one. William Dickerson, WA2JOC, qualified for DXCC QRPP Trophy #10 back in March of 1979, having worked the 100 on c.w. When he tried working DX with s.s.b.

and found that it could be done, he set out on a quest for a second trophy and eventually wound up with two endorsements: All SSB #4 and Both Modes #1. Bill is an outstanding DXer, needless to say. Beyond his DX activities, he has devoted much time and effort as a Board member for the QRP ARC I club, and worked shoulder-to-shoulder with Tom Davis, K8IF, club President, to bring the club around to the recognized QRP power standard of "under five watts output, ten watts input." Fine job in both areas, Bill!

DXCC QRPP Trophy #17 was awarded to an individual with whom readers of this column will be familiar because of his

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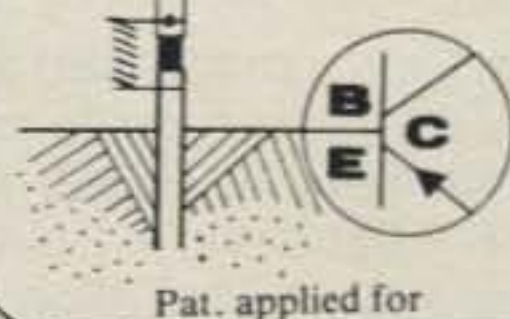
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previous reports—Dr. John Dudley, VE5JQ, who writes: "On March 17, 1980, I received my 100th QSL for my DXCC QRPp. It took about one year to work the 100 countries, but another eight months to obtain all 100 QSL's! When I started to work towards this goal, I never thought I could do it, but good conditions and lots of luck made it possible.

"I worked the first 80 countries with my vertical, and then put up my quad, a 2-element job only up 30 feet, mounted on a homebrew tower on the roof of my house. This helped, but I still feel that I could have worked the 100 countries with just the vertical although it would have taken a little longer. I would like to thank you and G4BUE for your encouragement in this task. All of the QRP gang are very enthusiastic and spur me on to do more. My next QRP goal is to work 100 countries again, but this time using all homebrew equipment, an idea inspired by your report of GM3OXX's accomplishments ('The Ultimate Achievement: DXCC Milliwatt #2—GM3OXX', CQ, March 1980). I am also experimenting with 160 meters and Oscar QRP work. At present my country total stands at 114 worked."

Lanny Rathert, N0AJZ, qualified for Trophy #18 with the All SSB #5 endorsement. He writes: "I started with my quest for the DXCC QRPp Trophy in May of 1979 with the purchase of the Argonaut. I received my 100th QSL confirmation in April of 1980. As with working for all awards, the hardest part was collecting the QSL cards. I sent the majority of my QSL's direct, but still had problems receiving all of the required QSL's. At last the 100th QSL was received. All contacts were made in the s.s.b. mode.

"There were many enjoyable QSO's with QRP. One special one was with

HK4CGH, Omar. We became good friends after the initial QSO, and now I am acting as his QSL manager. Most of my QSO's were on 10 meters, when the band was open. I now have 143 worked, with 103 confirmed. Also have the WAS QRPp from the QRP ARC I, and the 5BWAS obtained with the use of many of my QRP contacts. My station consists of the Argonaut and a Mosley TA-33 up 50 feet. This combination works well. I would like to thank all of the stations I worked for their patience with my low power signal!"

Trophy #19 went to William P. Wilson, K0CDJ, who writes: "I have been licensed since 1955, but let my license expire in 1965. I picked it up again in August 1976. I began working QRP with the HW-8 in the spring of 1977. With the HW-8 I managed to earn WAS and WAC. I worked a total of 81 countries with it. Since adding the Argonaut about a year ago (1979), I have picked up the remaining countries and have earned WAC SSB. I am presently working on 5BWAS with the Argo. All contacts used on the application were initiated and carried on with rigs running less than 5 watts output. The antenna was either a Hy-Gain Hy Tower vertical or a Mosley TA-33 at 80 feet. To date I have worked 138 countries on QRP, and I am not too far from WAZ."

Petr Doudera, OK1DKW, had almost as much trouble getting DXCC QRPp Trophy #20 as he had in working the required countries. Patience triumphed in both cases. At first Petr submitted an application without the required cards and was told to submit them to G8PG, Awards Manager for DX stations in that part of the world. Finally, Petr's application arrived with the introduction:

"Here I am again with my DXCC QRPp application. I am sorry to be so late, but

although I sent the cards to Gus, G8PG, in early April and Gus posted them immediately upon checking them—on April 30, 1980—I got the cards with the certified list today—June 5th! They have been lying at customs for about 5 weeks! Well, you asked for the story about my DX QRP work. My story was nothing special compared to OA8V or most of the W stations who made their DXCC in a few months with the help of their big beams. It took me over two years to work the 100 countries and an additional 8 months to get all the cards.

"I started to collect countries with QRP with a maximum of 5 watts input at the beginning of 1978—at first for the purpose of qualifying for the G-QRP-C Countries Award. Later, in summer 1978, G4BUE informed me about the DXCC trophies you issue. In fact, he gave me copies of the article by OA8V (CQ, April 1977) and the QRP Column from CQ of June 1977, and I thought it would be a great thing to try to achieve this award. The first 50 countries were quite easy—not so the rest!

"I entered quite a number of contests, as they help a lot with QRP. I found that sometimes it was better to wait for some exotic stations until the second day of a contest, as there were far fewer stations calling them at the end of a contest. In other cases I called a DX station or rare one for long times, sometimes hours, if my patience held out! Sometimes I was lucky and got the DX station straight away after a first buzz. Anyone who has not tried DX'ing with QRP would not know the great feeling when you get a new rare one with QRP or even a few milliwatts. I worked my 100th one in September 1979 and have been still working new ones, as I knew I would not get all the cards. That is a black page of hamming—when a rare DX station which one was pleased to contact does not send a card. I was especially disappointed when a ham or manager did not reply even after I sent several cards via the bureau, then one direct with s.a.e. and IRC's and finally direct with s.a.s.e. As of August 1980 I have worked 127 and confirmed 105 with 5 watts.

"A word about my rig. For all the contacts I have used homebrew equipment and have had several during the time I worked for DXCC. For antennas, I have a 41-meter wire, 'VS1AA' type, sloping from 17 m height that is used on all bands. Also, verticals for 14, 21, and 28 MHz, and a fixed 2-element wire beam, 'HB9CV' type, heading NW which helped me work a few new ones from N. America. But 90% of the countries have been worked with wire antennas or a vertical. I am very happy with my DXCC QRPp and want to thank you for offering it to amateurs to encourage them to operate with QRP and help spread QRP on the bands. I will always be pleased to hear a QRP station on any band."

Petr finally received his trophy January 14, 1981, after an early October mailing. With his note he provided his results at 2-3 watts output in the CQ WW DX C.W. Contest, having made 561 QSO's and having pushed his country total to 132/110. In addition, he started attempting really low power work:

"Also had some success in the micro-watt field, having worked an EA5 with 1.12 milliwatts input, PA0 with 487 microwatts for about 2.35 million miles per watt on 21 MHz. I QSO'd a G station on 14

MHz as well with an input of 358 microwatts, for over 2 million miles per watt on that band. On the other hand, I made some measurements that show that the efficiency of the PA may have been well over 100%. Hi! With no voltage supplied to the PA, the power output is roughly 200 microwatts. Of course, that is the power of the driving stage getting through the plate g1 capacity. But anyway, the QSO's were made with approximately 300-600 microwatts output. So far, no success with this power level to the U.S., although

a WB1 station heard me calling and said, 'SRI VERY WEAK UR 229 CUL SK.' But that was with 22 milliwatts input. I believe that a QSO will be possible with such a power level, but I must be patient."

Good luck, Petr! With nothing but wire antennas, it will be a real achievement!

Well gang, that's space for this month. We'll take up the stories of the QRP DXCC winners in a later column. Until then, good DX and 73.

Ade, W0RSP

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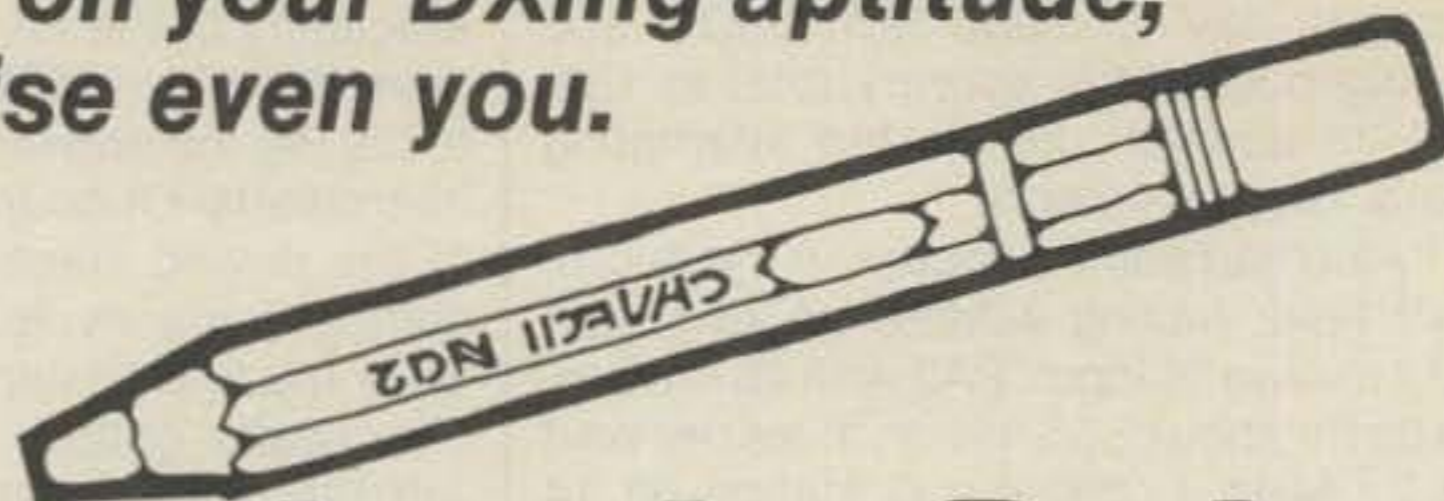
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The DXer's Aptitude Quiz

BY LARRY BROCKMAN*, N6AR

So, you think you are a DXer or you want to be one. Well, here's a quiz designed to test your aptitude at the DXer's game. There are 15 questions posed on real-life DXing situations, and 4 answers given for each. The answer you have in mind might not be among them, but pick the one you feel most comfortable with. We'll interpret the trends in your answers after the quiz.

1. You tune across a large pileup on 14.225. After a few minutes you still haven't heard the DX station. Your first reaction is to:
 - a) Jump in and ask what the list is for.
 - b) Run your receiver down to 14.195 to 14.200 and listen to see if the DX station is split.
 - c) Throw your call into the pileup.
 - d) Turn on the 2-meter spotting net to see if you can find out what the DX station's call is.
2. Your buddy is in contact with A51PN and is about to say 73. You should:
 - a) Get ready to call the A51 when he's done.
 - b) Break in on the QSO.
 - c) Ask your buddy to pass him on to you.
 - d) Ask your buddy to run a list for the A51.
3. You're a W6. The W3's and W4's are working HV3SJ on 20 s.s.b. with 59's both ways. You hear him 55. You should:
 - a) Try to get a W4 friend to ask him to listen for 6's.
 - b) Call as much as you can, hoping to get your call in between the mess or to scare off the competition.
 - c) Bide your time and throw your call in at well-placed intervals.
 - d) Wait until the propagation changes, or until he listens for 6's, and then call him.
4. VK0 Heard Island has shown up on the West Pacific DX net. The net director is taking 2 calls from each W call area for a list. You're using a tribander and 100 watts. Your best bet is to:
 - a) Try to get on the list.
 - b) Wait until another time.
 - c) Listen to the net process, and if the VK0's plans change, be prepared to act accordingly.
 - d) Call the DX station whenever you get a clear shot at him—net or no net.
5. You're trying to work ST2FF/ST0 on 14.195 split, and all of a sudden he disappears. You should:
 - a) Keep calling; your timing is probably just a little off.
 - b) Tune around on c.w. or on another band to see if he's made a change.
 - c) Listen up on 14.225 to see if he's checked into the morning net.
 - d) It's time to QRT; he's gone.
6. T3LA has just shown up 3 kHz above the morning list operation. You should:
 - a) Ask him to stop QRMing the list operation.
 - b) Work him and move him up 5 kHz.
 - c) Work him anyway; 3 kHz is enough separation.
 - d) Ask him to join the net.
7. It is 10 minutes before TN8AJ shows up for his weekly list operation, and the list is being taken by the WB9. You should:
 - a) Call in and get on the list.
 - b) Move down a little from the schedule frequency and call CQ DX, hoping to catch the TN8 before his schedule.
 - c) Listen around to see if the TN8 shows up early.
 - d) Call the TN8 blind on the net frequency.
8. You busted through a big pileup to SU1IM on s.s.b. You should now:
 - a) Ask him if you can run a list for him.
 - b) Make your call with him as short as practical so that others can have a shot at him.
 - c) Talk to him about the trip to SU you're planning for 3 years from now.
 - d) Ask him to listen for one of your buddies.
9. You've been looking for A7XD on c.w. for several months, but no dice. You're at home, it's the right time and day, and he's not on the usual frequency. You should:
 - a) Tune around and see if he's elsewhere on the band.
 - b) Write him and ask him to schedule you.
 - c) Listen on his channel and call him blind once in awhile.
 - d) Chase everyone off the channel by claiming it's busy (you need a clear channel to hear this one).
10. You hear 3Y1VC, Bouvet Island, on 14.025 c.w. listening "up." You should:
 - a) Just find a place up a few kHz and call him till you get him.
 - b) Try to determine his tuning pattern and call him only after you have a clue to it.
 - c) Always tail end on top of the guy he's working.
 - d) Always call him 1 kHz up from the guy he's working.
11. SM0AGD/S2 is 4 by 4, and you hear him come back to what you think is your call, but you're not sure. You should:
 - a) Give him a report and ask him to confirm your report once more.
 - b) Forget it; work S2BTF on the list.
 - c) Keep on calling him to get a more solid QSO.

*7164 Rock Ridge Terrace, Canoga Park, CA 91307

- d) Try again tomorrow.
12. You're working a weak one with lots of QRM in a big pileup. You've heard him come back to your call, but you haven't got his report to you. You should:
- Write down what someone else QSP's to you and let it go at that.
 - Forget it; if he came back to your call, that's all that's really needed.
 - Keep asking him to repeat your report till you get it.
 - Ask him to QSY up 3 so you can get your report.
13. You worked S8AAT last month. There he is again today, big as life. There's a big pileup on him. You should:
- Look for something else while everyone else is busy.
 - Work him again and thank him for the card.
 - Ask someone on the channel for his QSL address.
 - Work him and offer to run a list to help him with that awful pileup.
14. You hear FR7ZF call QRZ, and all bedlam breaks out calling him on his channel. After a few minutes of almost nonstop calling, you still aren't sure who he has answered. You should:
- Assume he came back to you and give him a transmission.
 - Ask everyone to quiet down so you can hear who he came back to.
 - Be patient, wait until the right instant, and then slip your call in.
 - Ask him to work by districts.
15. Someone is QRMing OJ0XX on 14.195 while he is listening in the USA band. You should:
- Go down on 14.195 and tell the turkey to shut up.
 - When you get him, ask him to QSY so others can hear him.
 - Stick it out patiently, and call him when you hear him.
 - Come down to 14.195 and ask everyone very politely to please QSY, the frequency is in use.

Scoring

Please circle the answer you selected for each question on the matrix provided in the box. Then add up the number of circles you made in each tendency column. If you scored 8 or more answers in any one column, then you subscribe pretty much to that tendency. The tendencies can be described as follows.

Mixed Answers

If you did not exceed 8 answers in any one category, then you are in the formative stage of becoming a DXer. You're not sure where you're headed, and you need a little bit more time to settle into a mold. Possibly an understanding of the four tendencies would help you, so read on.

Tendency A

You definitely are looking for the easy way out as a DXer. Actually, you are not so much interested in becoming a DXer as you are at collecting QSL cards. Also, you feel you need some extra help. In fact, you feel that you are *entitled* to that extra help. You blame your lack of success in the pileups on the "big beams" and "California kws." You feel that everyone that beats you out just simply must be using those tactics. You feel you have the right to a contact with the DX regardless of what the competition uses. So, you like to do your DXing on lists and nets where everyone has a chance. Since you're comfortable with that, it's probably too much trouble for you to learn how to improve your operating ability. Ignorance is bliss. But, just between you and the walls, the *real* DXer doesn't need the biggest antenna or the super kw linear or DX welfare (a la DX lists and nets). He thrives on operating ability—how to operate what he has optimally.

Tendency B

Overanxious, immature, hypertense, trigger happy, deaf, obnoxious, lid, closet CBer—these are all terms others might want to use to describe your style of oper-

ation. (Remember, it takes 8 answers in a category—ed.) More tactfully put, maybe you should tone it down a little. The real key to DXing is to learn how to listen and to know when to transmit. That's a lot more effective than transmitting aggressively all the time. In other words, might does not always make right. Oh, you might work the DX, but you will need the big station to do it. What a clumsy technique. It's like Sherman's march to the sea. A little more finesse and attention to manners and you'll achieve more acceptance and respect as a DXer.

Tendency C

You're learning. You're trying too. But you haven't yet grasped the definition of DX offered by CQ DX Hall of Famer Cass, WA6AUD. That definition is that "DX is." A little more attention to detail, a little more apprenticeship, a little more water under the bridge, and you're going to get there. DXers are just not born overnight. You don't just take the crash course on ham radio, pass the general, buy the latest gear, buy a big antenna, and in a couple of months launch a 0 to Honor Roll DXer career. Settle back and enjoy the process and savor the learning experience and operating pleasure.

Tendency D

You've certainly got the right idea. Congratulations. On a sample of 20 hardcore DXers who took this quiz, all 20 had over 9 answers in this category. But, as the wise old DXer you are, you also realize that there are a few more tricks and techniques to learn, new challenges to meet, new obstacles to overcome. No one is perfect and above improving their operating ability. Also, you're good at taking it in stride. You realize you don't necessarily have to be first to work the DX, as long as your finesse gets you through in the end. But, even if you miss one, you'll get it the next time. Patience, that's your virtue. Before you know it, you will be the first to get through, and you'll be right there on the Honor Roll. Truly, "DX is."

Question	Tendency A	Tendency B	Tendency C	Tendency D
1	a	c	d	b
2	d	b	c	a
3	a	b	d	c
4	a	d	b	c
5	c	a	d	b
6	d	a	b	c
7	a	d	b	c
8	a	c	d	b
9	b	d	a	c
10	a	c	d	b
11	b	c	d	a
12	a	d	b	c
13	d	b	c	a
14	d	a	b	c
15	d	a	b	c

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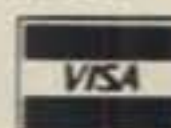
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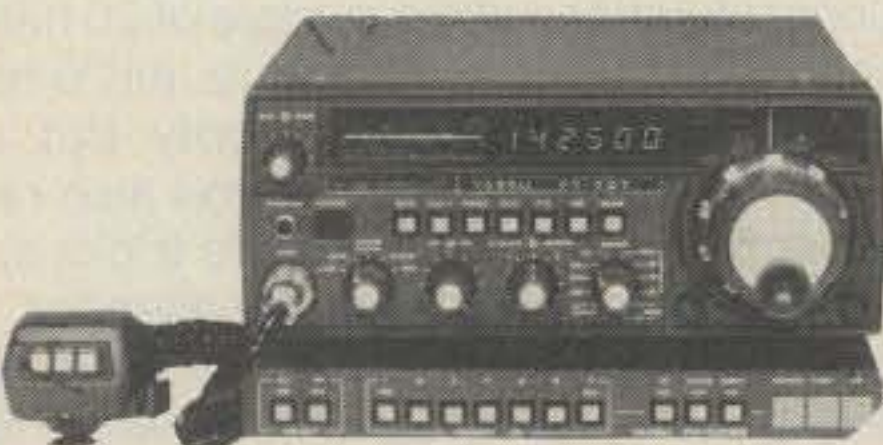
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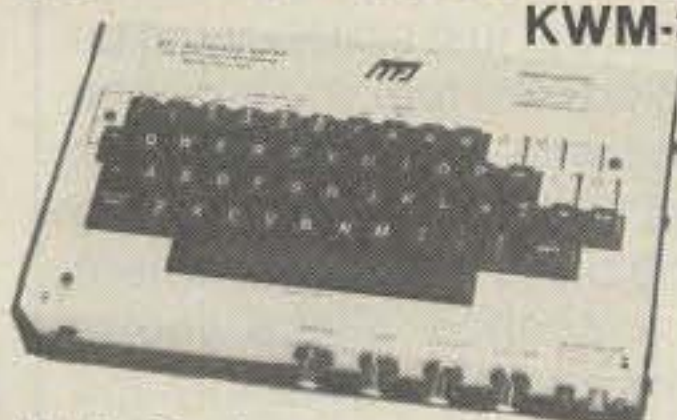


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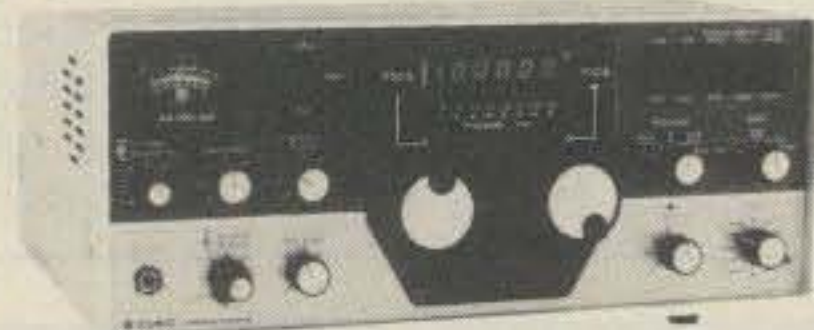
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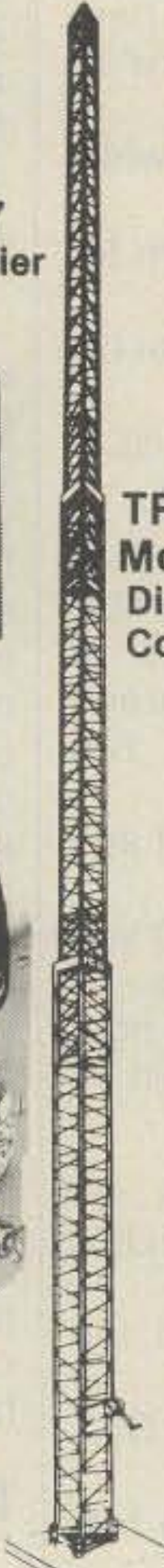
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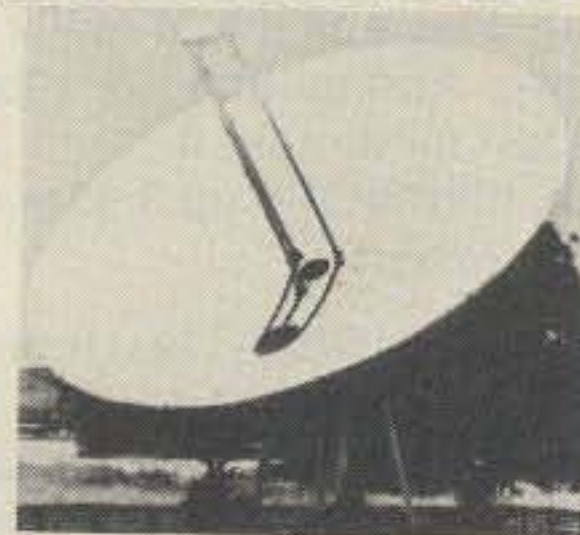
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Contest Calendar

NEWS/VIEWS OF ON-THE-AIR COMPETITION

CQ World Wide DX Contest

Phone: Oct. 24-25 C.W.: Nov. 28-29
Starts: 0000 GMT Saturday
Ends: 2400 GMT Sunday

Complete rules for our World Wide DX Contest coming up at the end of this month and next month appeared in last month's issue. Rules are the same as previous years with no changes from last year's. However, a few points have been clarified.

XI. Log Instructions. Item 3. It is no longer required that the submitted log be the original. Recopied or computerized logs are acceptable. However, the original may be requested by the Committee if additional cross-checking of the log is necessary.

XIII. Deadline. An extension of time for submitting a log will be granted upon receiving written request and if conditions justify.

There have been a few additions and deletions to the original Trophy and Plaque list including Donors.

New Phone

So. America - AB - David Novoa, KP4AM.

U.S.A. - 28 MHz - Don Thomas, N6DT.

*World - Multi-Opr. Expedition - "The Yasme Award."

New C.W.

World - 1.8 MHz - KP4ES Memorial - Chip Margelli, K7JA.

U.S.A. - Multi-Opr., Single Xmtr. - Doug Zwiebel, WB2VYA.

Deleted C.W.

Oceania - 21 MHz - Pacific R.A.T.S.
U.S.A. - Multi-Opr., Multi Xmtr. - Rush Drake, W7RM.

Awards preceded with an (*) are supplied by the donors; all others are administered by CQ. Anyone wishing to sponsor a Trophy should contact me, W1WY, for details and availability.

This year we have gone back to the original pattern of sending all logs direct to the CQ office: CQ Contest Committee,

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

Oct. 3-4	California QSO Party
Oct. 3-4	VK/ZL Phone Contest
Oct. 10-11	VK/ZL C.W. Contest
Oct. 10-11	9 Land QSO Party
Oct. 11	RSGB 21/28 MHz Phone
Oct. 18	RSGB 21 MHz CW Contest
† Oct. 17-18	WA-Y2 Contest
Oct. 17-18	Pennsylvania QSO Party
Oct. 17-18	Minnesota QSO Party
Oct. 17-18	Boy Scouts Jamboree
Oct. 17-18	CLARA AC-DC Contest
Oct. 17-18	ARCI QRP CW Contest
Oct. 21-22	YLRL Anniv. CW Party
Oct. 24-25	CQ WW DX Phone Contest
Nov. 4-5	YLRL Anniv. Phone Party
Nov. 7-8	ARRL C.W. Sweepstakes
Nov. 8	Czechoslovakian Contest
Nov. 14-15	European RTTY Contest
Nov. 21-22	ARRL Phone Sweepstakes
Nov. 28-29	CQ WW DX C.W. Contest
Dec. 4-6	ARRL 160 M. CW Contest
Dec. 12-13	ARRL 10 Meter Contest

† Not Official.

76 N. Broadway, Hicksville, NY 11801.
Be sure to indicate Phone or C.W. on your envelope, and only enclose contest material.

73 for now, Frank, W1WY

California QSO Party

Starts: 1800Z Sat., October 3
Ends: 2350Z Sun., October 4

This year's party is again being sponsored by the Northern California Contest Club.

Operating time is limited to 24 out of the 30 hour contest period for single operator stations. Multi-operator may use the full 30 hours. Off times must be clearly indicated on the log.

The same station may be worked once per band, per mode, simplex only. CA mobiles that change counties are considered new stations.

Exchange: QSO no. and QTH. County for CA stations; state, province, or DX country for others.

Scoring: Phone contacts are worth 2 QSO points, c.w. contacts 3 points.

The multiplier for CA is the number of states (50) and VE call areas (8) worked (max. of 58 possible). Out-of-state stations use CA counties for their multiplier (max. of 58).

Frequencies: C.W.—1805, 3560, 7060, 14060, 21060, 28060. S.S.B.—1815, 3895, 7230, 14280, 21365, 28560. Novice—3725, 7125, 21125, 28125. Try c.w. on the half hour and 160 at 0500Z.

Awards: Certificates to the highest scorers in each CA county, each state, VE province, and DX country. Trophies for the top single operator in CA and out-of-state station, and the highest scoring expedition to a CA county.

Indicate each new multiplier on your log as it is worked. Include a summary sheet showing the scoring and other information. A large s.a.s.e. will get you a copy of the results.

Mailing deadline is Nov. 1st to: NCCC, c/o Dennis Egan, N6QW, 811 Byerley Ave., San Jose, CA 95125.

VK/ZL DX Contest

Phone: Oct. 3-4 C.W.: Oct. 10-11
Starts: 1000 GMT Saturday
Ends: 1000 GMT Sunday

Stations in the rest of the world will be concentrating on working stations in Oceania with emphasis on VK/ZL for their multiplier.

Following rules apply to areas other than VK/ZL.

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

Scoring: Two points for VK/ZL contacts, 1 point for contacts with other Oceania areas.

Final Score: Total QSO points from all bands multiplied by the sum of VK/ZL call areas worked on each band. (Single band logs also accepted.)

Awards: Attractive colored certificates to the top all bands scorers, both phone and c.w., in each country and call areas of Japan, USA, and USSR. Additional awards if returns warrant.

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These are the attractive plaques and gavel that will be awarded in the Pennsylvania QSO Party. Last year's winners were Kurt Train, K1ITS, Drew Smith, K3PA, and the Penn Wireless Association.

Logs: Date/time in GMT, station worked, number sent/received, band, and QSO points. Underline each new VK/ZL call area worked on each band. Use a separate sheet for each band. Include a summary sheet showing the scoring, name, and address in block letters, and a signed declaration that all rules and regulations have been observed.

SWL Section: Log VK and ZL stations only, including call of station being worked, and RS(T) and serial number of VK/ZL station logged. Log and scoring same as indicated for the transmitting stations. Phone and c.w. scores are combined for final score.

Logs must be in the hands of the Committee by January 31, 1982. This year they go to: WIA VK/ZL Contest Manager, Neil Penfold, VK6NE, 388 Huntriss Road, Woodlands, 6018, West Australia.

9 Land QSO Party

Starts: 1800 UTC Sat., October 10
Ends: 2359 UTC Sun., October 11

A maximum of 24 hours of the 30 hour period may be worked.

Exchange: 9 Land stations send RST, county, and state. All others send RST, state, province, or ARRL country. The same station may be worked once per band and mode. If any station changes counties, they may be worked again.

Scoring: Each QSO is worth 2 points. Scores shall be computed as follows: 9 Land—(#QSO × (States + Provinces + ARRL countries + 9 Land Counties) × (2 points/QSO) = Total. Others—(#QSO) × (9 Land counties) × (2 points/QSO) = Total.

Suggested Frequencies: C.W.—1805, 3560, 7060, 14060, 21060, 28060, plus v.h.f. S.S.B.—1815, 3895, 7230, 14280, 21355, 28600, plus v.h.f. Novice—3725, 7125, 21125, 28125.

Awards: Certificate to top scorer in each

state, province, and ARRL country, 2nd and 3rd, if justified. Also top mobile, portable, multi-single, multi-multi, club, and Novice.

Submit summary sheet and log. Each new multiplier shall be clearly indicated. Send logs and a large s.a.s.e. to Ill Wind Contesters, c/o John W. Sikora, WB9IWN, 8747 Northcote, Munster, IN 46321 for results.

1980 VK/ZL Contest Results North America

C.W.

W1EVT	3,770
K1MEM	2,553
WB1HIH	540
W1OPJ	32
K2SX	784
WB4RUA	1,197
K5MA	5,796
W5OB	1,050
AA6EE	80
K5MM/7	10,980
N7DF	400
W7WA	320
W7QK	168
W8UVZ	6,105
A19J	13,110
K9VKY	144
W0KEA	8,274

HP1AC 315

VE3MFT 885

XE2MX 826

Phone

WA4QMQ	3,312
N4UH	468
W5OB	2,440

N6AA 8

K5MM/7 5,994

N7DF 2,926

K9MWM 30,636

A19J 10,608

W9RKP check log

AC0N 2,860

W0CDC 1,020

KD0B check log

VE3EVK 705

VE1AVX 210

VE7DXU 75

VE7BS 16

Trophy winners in this year's (March) Bermuda Contest are R. David Hawes, N3RD, R.J. Furfaro, VE3HGC, Hans Wenzlawiak, DK5EZ, and G5CMX. They will be the guests of the Radio Society of Bermuda later this month and receive their award at the Society's Annual Dinner. Top scorer for Bermuda was Edna Hall, VP9IX. Runners-up for the trip to Bermuda were K1DP, VE1AIH, DK5WN, and G3KTJ, respectively. (Better luck next year, fellows.)

RSGB 21/28 MHz SSB Contest

0700 to 1900 GMT Sunday, October 11

It's the world working the British Isles on 21 and 28 MHz in this one. There are seven countries in the British Isles: G, GD, GI, GJ, GM, GU, and GW. There is a total of 42 prefixes when the numerals are included (G2, GD3, GI4, etc.).

The same station may be worked on each band for QSO and multiplier credit. Both single and multi-operator (multi must use both bands).

Following are the rules for areas other than the British Isles.

Exchange: The RS report plus a progressive contact number starting with 001.

Scoring: Each contact with a B.I. station is worth 3 points. Multiply total QSO points from each band by the sum of prefixes worked on each band (max. of 42 per band). The GB prefix does not count for QSO or multiplier.

Unmarked duplicate contacts will be penalized 10 times the points claimed. Logs containing more than 5 unmarked duplicates will be disqualified.

There is also an s.w.l. section. Only British Isles stations are to be logged. Scoring is the same as indicated above.

Awards: There are two Trophies for the British. Overseas entries will settle for 1st, 2nd, and 3rd place certificates for world winners.

Separate logs are required for each

band. Include a summary sheet showing the scoring, a list of prefixes worked, and the usual signed declaration that rules and regulations have been observed, plus your name and address in block letters.

Logs from overseas must be received no later than December 1st, and they go to: RSGB HF Contests Committee, P.O. Box 73, Lichfield, Staffs., WS13 6UJ England.

RSGB 21 MHz CW Contest

0700 to 1900 GMT Sunday, October 18

Like the 21/28 MHz SSB Contest, activity in this one is between the British Isles and the rest of the world.

Competition is limited to single operator stations only.

There is a separate section for QRP in which power input must not exceed 10 watts.

Following rules are for areas other than the British Isles.

Exchange: RST report plus a progressive QSO number starting with 001.

Scoring: Each contact with a British Isle station is worth 3 points. Multiply total QSO points by the number of B.I. prefixes worked—G2, G3, GD3, etc., a max. of 42 possible. (GB does not count for QSO or multiplier.)

Unmarked duplicate contacts for which credit has been taken will be penal-

ized 10 times the points claimed. Logs containing more than 5 unmarked duplicates will be disqualified.

Awards: Certificates for 1st, 2nd, and 3rd place winners in each section—British, Overseas, and QRP.

Include a summary sheet with a list of prefixes worked, station description, the usual signed declaration, and your name and address in block letters.

Entries must be received no later than December 31st, and they go to: RSGB HF Contests Committee, c/o D. J. Lawley, G4BUO, 24 Glen View, Gravesend, Kent, DA12 1LP England.

The RSGB Committee is considering making this event include 28 MHz, same as the s.s.b. contest. Your comments are invited. You might also include your comments regarding awards. I feel they could be a bit more generous.

WA-Y2 DX Contest

Starts: 1500Z Sat., October 17

Ends: 1500Z Sun., October 18

This activity is usually held the third full weekend of October each year to commemorate the anniversary of the founding of the German Democratic Republic.

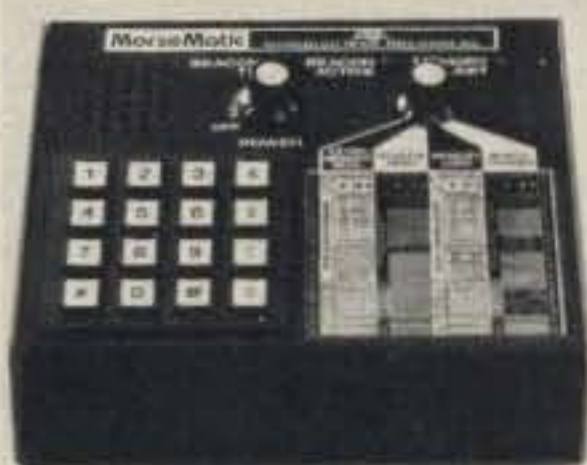
Use all bands, 3.5 through 28 MHz, both phone and c.w. However, the first 10 and last 25 kHz of all bands are to be kept free of contest operation.

The same station may be worked once

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on each band and each mode for QSO and multiplier credit.

There are three classes: single operator, multi-operator, and s.w.l.

Exchange: RS(T) plus a 3 figure QSO number starting with 001. The Y2 stations will also include 2 figures identifying their district (Kreiskenner).

Scoring: Each Y2-Y9 contacted is worth 3 points.

Multiplier: Number of different districts worked on each band (max. of 15 per band). A district is identified by the last letter in the call, A through O, not by the number in the call.

Final Score: Sum of QSO points multiplied by sum of different districts worked on each band.

S.w.l.'s get one point for each Y2-Y9 reported, including the RS(T), district, and call of station being worked. Rest of scoring same as above.

Awards: Certificates to the top scoring stations in each section of each country.

Use a separate log sheet for each band and include a summary sheet showing the scoring, a list of districts worked, the usual signed declaration that all rules and regulations were observed, and your name and address in block letters.

Entries must be postmarked no later than 30 days after the contest. They go to: Y2 Contest Bureau, RKDDR, Hosemannstr. 14, DDR 1055 Berlin, German Democratic Republic.

Pennsylvania QSO Party

1700Z-0400Z Sat./Sun. Oct. 17/18
1300Z-2200Z Sun. Oct. 18

This is the 24th annual party sponsored by the Nittany A.R.C., which in the past has been held in September.

The same station may be worked on each band and mode for QSO points. PA stations may also work other in-state stations for QSO and multiplier credit. Mobiles may be worked in each county change.

Exchange: RS(T), 3 digit QSO number, and QTH. County for PA, ARRL section for others.

Scoring: One point for s.s.b. contacts, 1.5 points for c.w., and 2 points for c.w. contacts on 80.

Penn stations multiply total by ARRL sections, + Penn. counties + 1 DX country worked.

Others use PA counties for their multiplier (max. of 67).

PA mobiles calculate their total score from each county, then add county totals for final score.

Frequencies: C.W.—40 kHz up from bottom of each c.w. band. S.S.B.—3980, 7280, 14280, 21380, 28580.

Awards: Certificates for section winners and to the top 10 PA stations (min. of 10 QSOs). Handsome plaques to the top PA and top out-of-state winners. An engraved gavel to the PA Club having the

highest aggregate score. (See photo of last year's winners.)

Include a summary sheet with your entry showing the scoring, check list of counties or sections worked, and any interesting comments. A dupe sheet is required if you make 100 or more contacts. Also include a large s.a.s.e. for a copy of the results.

Mailing deadline is November 15th to: Douglas R. Maddox, W3HDH, 1187 S. Garner Street, State College, PA 16801.

Minnesota QSO Party

Starts: 1700Z Sat., October 17
Ends: 2259Z Sun., October 18

This year's party is sponsored by a new club, The Paul Bunyan Wireless Assn. of Brainerd, MN.

Phone and c.w. are part of the same contest. The same station may be worked on each band and each mode, but no cross band or net contacts permitted.

Novices compete with Novices, Techs. with Techs.

Exchange: RS(T) and QTH. County for MN, ARRL section or country for others.

Scoring: One point for phone QSOs, two points if on c.w. MN stations multiply total QSO points by ARRL sections and DX countries worked. Others use MN counties for their multiplier (max. of 87).

Bonus: Contacts with ADØS count 10 points per band. Add 25 more points if worked on 3 or more bands.

Frequencies: C.W.—3633, 3733, 7133, 7033, 14033, 21133, 21033, 28033, 28133. Phone—3933, 7233, 14300, 21433, 28633.

Awards: There will be awards, but no details were given.

Include a large s.a.s.e. for a copy of the results and mail your entry before November 20th to: Paul Bunyan Wireless Assn., c/o Steven Scott, WDØEPE, 801 6th St. North, Staples, MN 56479.

C.L.A.R.A. AC/DC Contest

Starts: 1800Z Sat. October 17
Ends: 1800Z Sun. October 18

Sponsored by the Canadian Ladies Amateur Radio Assoc., this contest is open to both YL's and OM's.

Each station may be worked twice, once on c.w. and once on phone, or on two different bands, c.w. or phone.

Exchange: RS(T), QTH, name, and call.

Scoring: For CLARA members, 1 point per QSO, (YL or OM) 3 points for each contact with a bonus station. (YL's will identify if they are a bonus station.)

Non-members work YL stations only. Scoring same as above.

Multiply total QSO points by number of Canadian provinces/territories worked.

Frequencies: Phone—3775, 3900, 7200, 14280, 14160, 21300. C.W.—3690, 7035, 14035, 21035.

Awards: CLARA winners, first place, CLARA pin and certificate. Second and third place winners a certificate.

Non-member winners, first place, plaque and certificate. Second and third place certificates (YL or OM).

All entries are eligible for a mini prize drawing.

Mailing deadline for logs is December 31st to: Lynn Bootroyd, VE3LQL, 673 Tackaberry Dr., North Bay, Ontario, Canada P1B 8R1.

ARCI QRP C.W. Contest

Starts: 1200Z Sat., October 17
Ends: 2400Z Sun., October 18

This is the Fall edition and 20th Anniversary of the QRP Amateur Radio Club International. The contest is open to both members and non-members.

Exchange: RST and state, province, or country. Members will also include their number, non-members their power output.

Scoring: Contacts with a member count 5 points, with a non-member 2 points, with stations other than W/VE 4 points, with Novice/Techs. 3 points.

The same station may be worked on each band for QSO and multiplier credit.

There is a 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.

The following bonus multipliers are also available: × 2 is using solar or wind power, × 1.5 for battery power. Must be used for duration of contest.

Final Score: Total per band score. QSO points × (states + provinces + countries) × power multiplier × bonus multiplier if any. Add totals from each band worked for final score.

Frequencies: 1810, 3560, 7040, 14060, 21060, 28060, 50360. Novice—3710, 7110, 21110, 28110. VHF/UHF contacts must be made direct.

Awards: Certificates to the highest scoring stations in each state, province, and country, and to the top overall Novice or Tech.

Include a summary sheet showing the scoring, equipment description, and other essential information, and a large s.a.s.e. for copy of the results.

Logs must be received by November 20th and go to: William Dickerson, WA2JOC, 352 Crampton Dr., Monroe, MI 48161.

Scouts Jamboree On The Air

Starts: 0001 Local Sat., October 17
Ends: 2359 Local Sun., October 18

This is the 24th annual Jamboree sponsored by the World Scout Bureau for Scouts everywhere, including Girl Scouts and Guides. This is not a contest, but an

opportunity for Scouts or anyone interested in Scouting as well as former Scouts to get together on the air.

Amateurs can invite members of Scout units or individuals to visit their station and see how ham radio operates.

No specific exchange, no scoring, and no logs are required. However, participation certificates are available from national organizers. In the USA send your request to the USA JOTA Coordinator, W2GND. Be sure to include an s.a.s.e. with your request.

Suggested Frequencies: Phone—3740, 3940, 7090, 7290, 14290, 21360, 28990. C.W.—3590, 7030, 14070, 21140, 28190. Also Novice bands, SSTV, and RTTY. Check 6 meters.

Stateside participants should send their reports to: Harry A. Harchar, W2GND, 216 Maxwell Avenue, Hightstown, NJ 08520.

YLRL Anniversary Party

C.W.: Oct. 21-22 Phone: Nov. 4-5
1800 to 1800 GMT Wed./Thurs.

This is the 42nd annual party run by the YL Radio League, and it is open to all YL's around the world.

All bands may be used. Phone and c.w. are separate contests and require separate logs.

Exchange: QSO no., RS(T), and ARRL section. DX stations indicate country.

Scoring: One point per QSO between stations within an ARRL section and between DX stations. Two points if QSO is between a DX and ARRL section station. The same station may be worked once only regardless of the band.

Multiplier: Is derived from the number of ARRL sections and DX countries worked.

There is also a low power multiplier of 1.25 if power input is 150 watts or less on c.w., 300 watts p.e.p. on s.s.b.

Final Score: Total QSO points times ARRL sections and DX countries worked, times the power multiplier.

For each duplicate contact that is removed from the log in the course of checking, a penalty of 3 additional and equal contacts will be exacted.

Awards: 1st, 2nd, and 3rd place certificates to both c.w. and phone top scorer world wide and to the winners in each US and VE call area, and in each country.

Only YLRL members are eligible for Trophy awards. There are two gold cups, one for c.w. and one for phone, to the top scoring members in the world. There are also three special plaques: the Cocoran for the highest combined c.w./phone score in an ARRL section, the Hagar for the highest combined score for North and Central America including the Caribbean, and one for the rest of the world.

Logs must be received no later than December 19th, and this year they go to: Kay Eyman, WA0WOF, R.R.#2, Garnett, KS 66032.

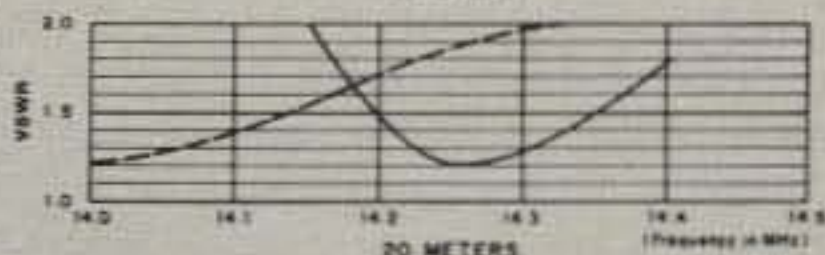
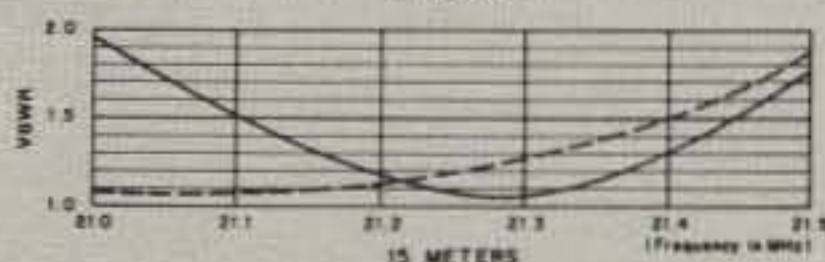
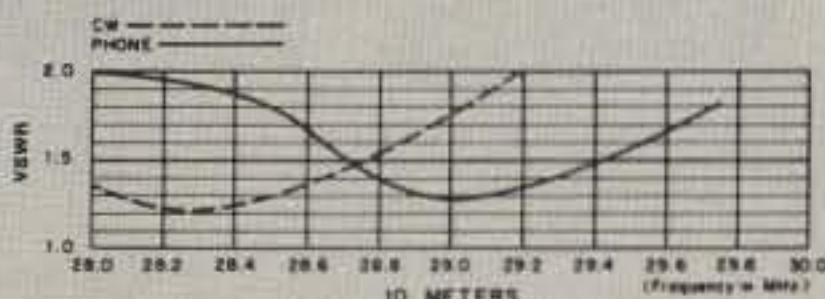
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For Serious Amateurs Only

The HQ2, a Broadband Tribander with no compromise.

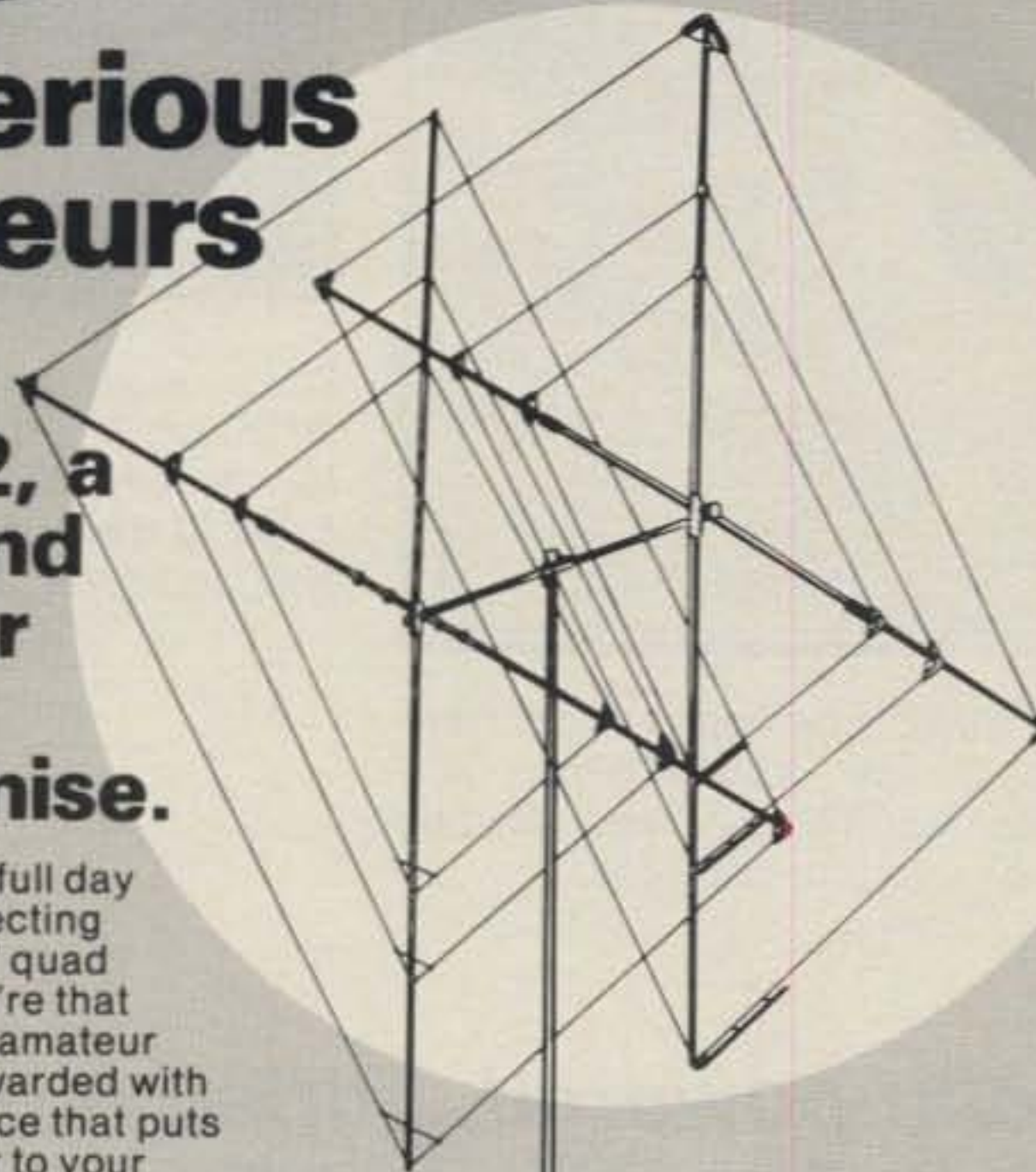
You could spend a full day assembling and erecting this "highly visible" quad antenna. But, if you're that serious about your amateur hobby, you'll be rewarded with antenna performance that puts you one step closer to your dream of an "ideal" installation.

The HQ2 is a 2-element quad antenna in a complete kit, ready to assemble -- designed and tuned by the best antenna engineers in the industry. Heavy-duty construction includes taper swaged aluminum tubing, aluminum stranded wire, die formed spreader-to-boom clamps, cyclac insulators, plus a universal tiltable boom-to-mast clamp.



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Europe: 22, rue de la Légion d'Honneur, 93200 St. Denis, France.



The HQ2 Hy-Quad features:

BROADBAND: Less than 2:1 SWR across virtually the entire 10, 15 and 20 meter bands.

DIRECTIONALITY: F/B and F/S ratios better than 3-element yagis and forward gain comparable to TH3Mk3.

SHORT BOOM: Turning radius - 13½ ft. (4.1 m).

SINGLE FEEDLINE: One feedline for all three bands.

SOLID TUNING: Less susceptible to surrounding objects and less critical of height.

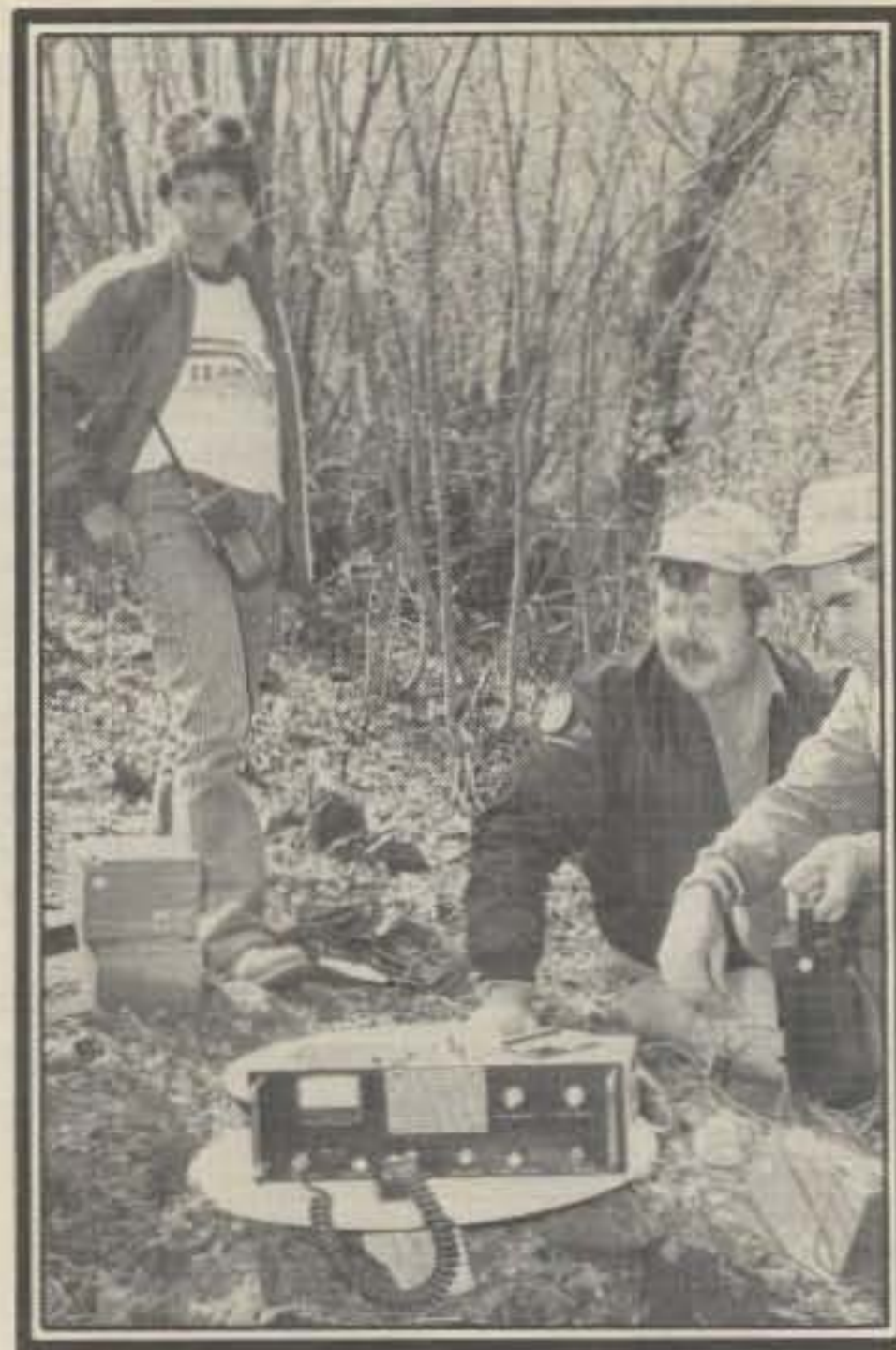
Tower shown is
**NEW Hy-Gain
HG-37SS
Self-Supporting
Crank-Up Tower**



Who says club officers don't work! Here are James Jeleski, N5DHR, Pres., and Jim Groves, N5BKW, the Veep, starting the climb to the peak.



The repeater is situated on the Continental Divide Trail as evidenced by this shot. Incidentally, the Pinos Altos (tall pines) listed at the bottom of the sign is where gold and silver were mined by the Spaniards in 1802.



"It didn't draw that much current down in town on the bench, did it?" From the left, Debbie, XYL of WA5KYV, next is Stan Gantz, WB5TGL, sec/treas, and N5DHR.

A solar-powered, buried repeater. Yes, that's right—buried. The Gila Amateur Radio Association put together a solar-powered repeater and then buried it. Interested? Then read on.

The Gila Monster

BY LEW MCCOY*, W1ICP

The Gila monster (pronounced *hee-lah*) is a lizard that resides in the southwest part of the U.S.A. Actually, it lives in crevices, under rocks, and below ground. Incidentally, you'll hear many repeaters referred to as "alligators," all mouth and no ears. Well, a Gila monster has a big mouth plus excellent hearing, as does our Gila repeater. Now that we have that interesting but probably useless information out of the way, let's get to the rest of our story. The story is told mostly with the photographs, but certain details should be added.

Any story, or in this case a repeater group, has to have a beginning, and the Gila Amateur Radio Society was formed in 1975. The guiding force in that formation was Richard Peterson, WB5NEN. At that time, the nearest repeater was some 100 miles away, so there was a really pressing need for a machine in this area. Why pressing? The Gila Wilderness area was the first wilderness area created by the Federal Government, and it is very popular with campers, back-packers, etc. Providing emergency coverage with autopatch in the Gila forest would prove to be a real benefit.

Like any repeater group, there were countless setbacks and problems getting the first installation going. The first loca-

tion was on a peak about 7000 feet above sea level. Even by New Mexico standards that is a fairly high repeater, but it failed to cover the desired area adequately. A handheld unit could hit the repeater from 30 miles (on a good day), but in country where people drive 50 miles for a milk shake (one way), that just wasn't enough!

Black Peak, which is well over 9000 feet high, was available but had no power. After much thought and planning the decision was made to go solar. Ted Handel, WB5REA, an engineer who works in Los Alamos, was one of the first amateurs in the country to go solar (which he described in 1978 in *Ham Radio* magazine). What Ted didn't talk much about in that article was the fact that his group

*200 Idaho St., Silver City, NM 88061

buried their repeater in a 55-gallon drum. In fact, as of this writing, his group has two buried repeaters, one on 2 meters and another on 220. With Ted's advice and much help the Gila Association decided to go the same route.

Once the location was approved by the Forest Service, the next problem was getting it ready. The nearest road was $\frac{3}{4}$ of a mile from the peak, and that $\frac{3}{4}$ mile was uphill on a 30 to 40 degree grade over rough terrain. When you start lugging tower, sand, cement, and equipment that far when you are at 9000 feet above sea level, you've got to know that hams are really nuts! Three wheel recreational bikes were loaded with cement and then pushed and tugged to the summit. Bear in mind that if you are going to mix cement, you'll need water—hah! Lots of water. That in turn means that when you get on a mountain peak, you have to wait for rain or go up when there is snow and then melt the snow. Take our word for it, it takes a heck of a lot of snow to mix enough cement for a tower! It took Al, WA5WYV, about 8 hours of shoveling to produce the required 40 gallons of water needed. The photos make it look easy, but digging two holes in rock, one for the tower and the other to hold the drum, is one tough job.

The drum used to house the repeater is an ordinary grease drum thoroughly cleaned up. It was waterproofed on the outside with automobile undercoating and painted inside with a good grade of metal paint. The stacking order in the drum is the duplexer on the bottom (a Tx-Rx product for which we have nothing but praise). Next are the batteries—gel type which the club obtained surplus. And on the top is the repeater, a Spectrum transmitter, and SCR-100 receiver. Again, we have nothing but praise for the Spectrum unit and highly recommend it. The quiescent current (receiver on but squelched) is 94 ma. Transmit takes 2.5 amps providing 17 watts to the duplexer.

The batteries were charged from five solar panels that would put out approximately 2.5 amps on a sunny day—and we have few cloudy days in New Mexico. It was carefully calculated that we would have a "key down" duty cycle of about 10 percent, and this proved to be the case. Actually, the five panels produced more than enough juice. We could easily run a 20-percent duty cycle, which should handle the busiest machines in the country.

The drum also contains silica gel dessicant to combat moisture. It is planned to remove and bake the gel every six months. The drum is buried to the lid, as can be seen in the photo. Rubber-covered electrical conduit runs below ground to the tower. Coax feed and power line from the panels are run through the conduit. To prevent overcharging the batteries a shunt regulator is used. When the batteries reach full charge, the excess power is dumped into a resistor load.

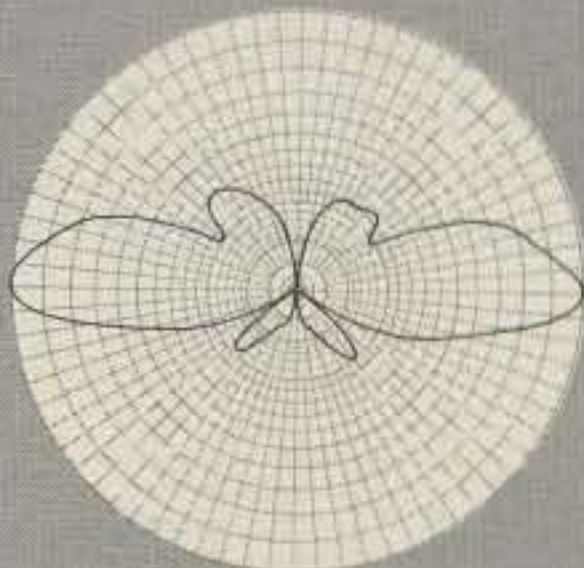
hy-gain

NEW Extended Double Zepp Antenna Design

The Hy-Gain V2 is 2-meter extended double zepp vertical consisting of two stacked 5/8 waves properly decoupled to allow no RF on the coax feedline. Coax connects to the decoupler inside the antenna for complete weatherproofing. Mechanically the V2 has no equal. It's easy to assemble and all elements are corrosion resistant 6063-T832 aluminum with rustproof hardware. The V2 is a complete antenna that's ready to mount on any mast up to 2" (50.8 mm) in diameter.

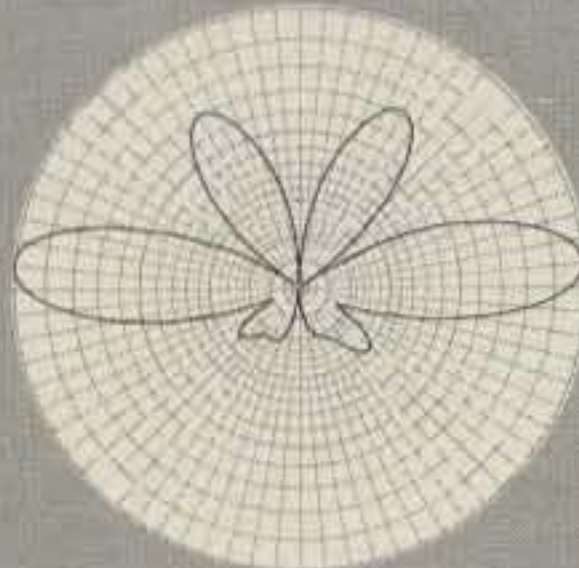
Two sets of 1/4 wave radials and a centered feedpoint put the radiation at the horizon, not the sky! The V2 and two competitors were measured for radiation efficiency on a ground-reflection-range, which was designed according to IEEE standard 149-1979, and the results shown below were conclusive.

Hy-Gain V2



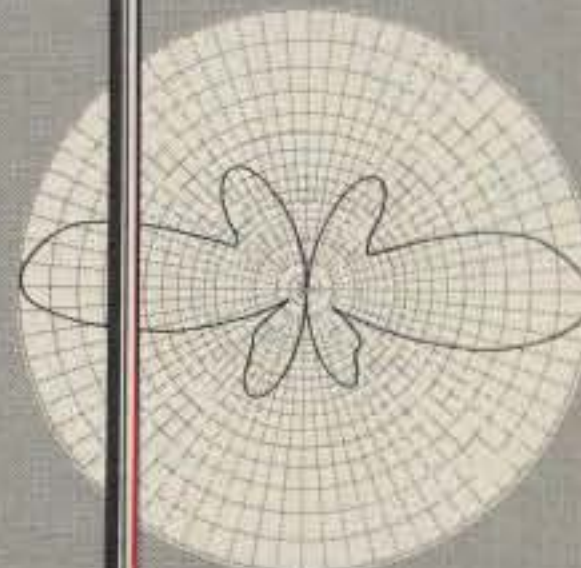
at 146.00 Mcs

Brand C ARX-2B



at 146.00 Mcs

Brand A AEA-144



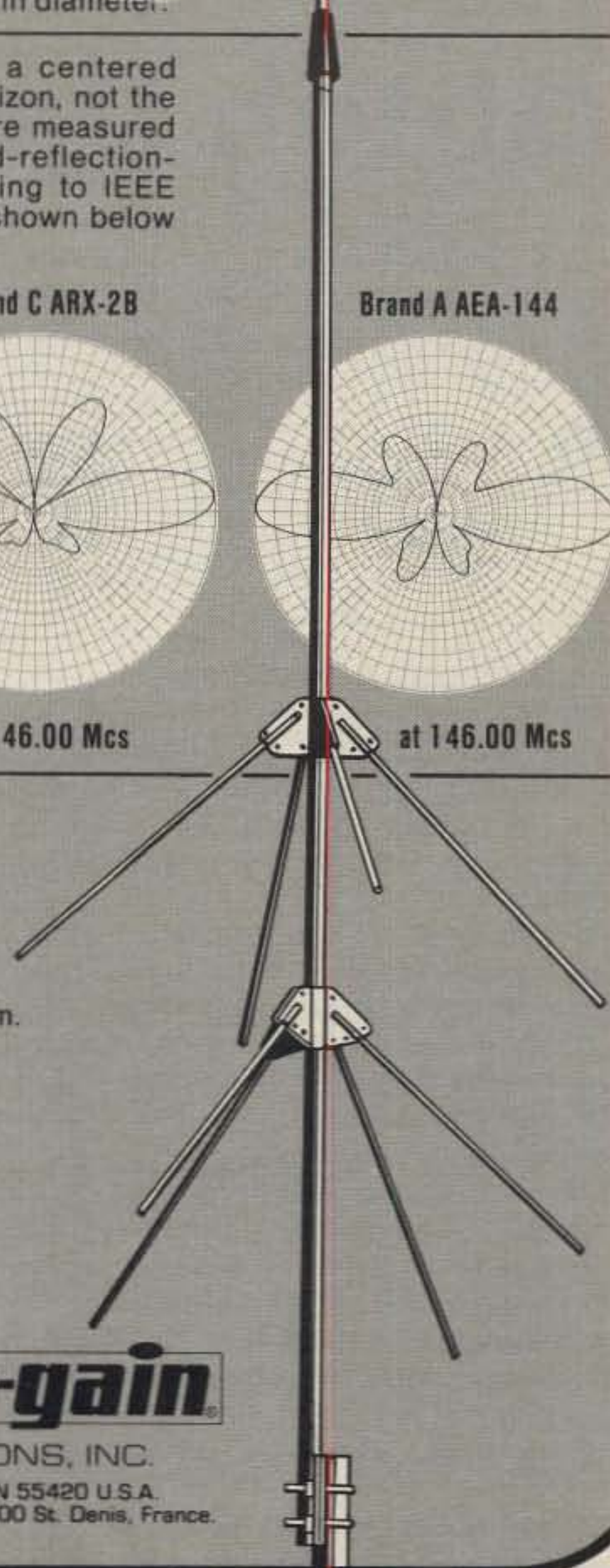
at 146.00 Mcs

Designed to operate from 138 MHz through 174 MHz, the V2 obtains a VSWR of less than 1.5:1 at resonance and has a 2:1 VSWR bandwidth of at least 7 MHz. The antenna's isolation from the support mast is 20 dB minimum.

The new V2 will equal or surpass the electrical performance of any competitive two stacked 5/8 wave antenna, regardless of gains claimed or your money back. Money-back limited to 30 days. If not satisfied, return to place of purchase.

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On the magical day that the repeater was turned on we suddenly realized what it was to have a truly wide-area coverage machine. Bear in mind that New Mexico is the fifth largest state in the Union. The Gila Monster can cover I-10, the famous cross-country interstate, from well inside Arizona clear across to Texas! And, the repeater is about 50 miles north of I-10! With one-watt handhelds, 30 miles is a cinch. The primary purpose of any repeater is to extend the range of low-power handhelds and mobiles. We know the repeater more than fulfills that requirement. The range of the repeater is now well over 200 miles for stations with good antennas.

We did have bugs, of course. A loose fitting caused several trips to the mountain. Then a self-oscillating transmitter final kept draining the batteries until that problem was corrected. But then we had a couple of months of beautiful operation with no problems until suddenly the repeater went dead. Someone had ripped off our panels! As of this writing we are off the air and trying to promote the dough for more panels, which we guarantee will be insured and protected. Our plans call for keeping real live Gila mon-



"Doggone it—it was supposed to fit when we figured it out on the ground. Who in h--I goofed?"

sters plus a dozen or so really big, mean, mad rattlesnakes around the installation, hi!! (And that "hi" was no joke!)

In addition to those people credited in the story and photos (incidentally, the photos were made by WB5NEN who just happens to be the editor of the *Silver City*



"If it keeps raining like this we'll never get the solar panel checked out! We sure could have used this water when we were mixing cement." (Famous last words!)

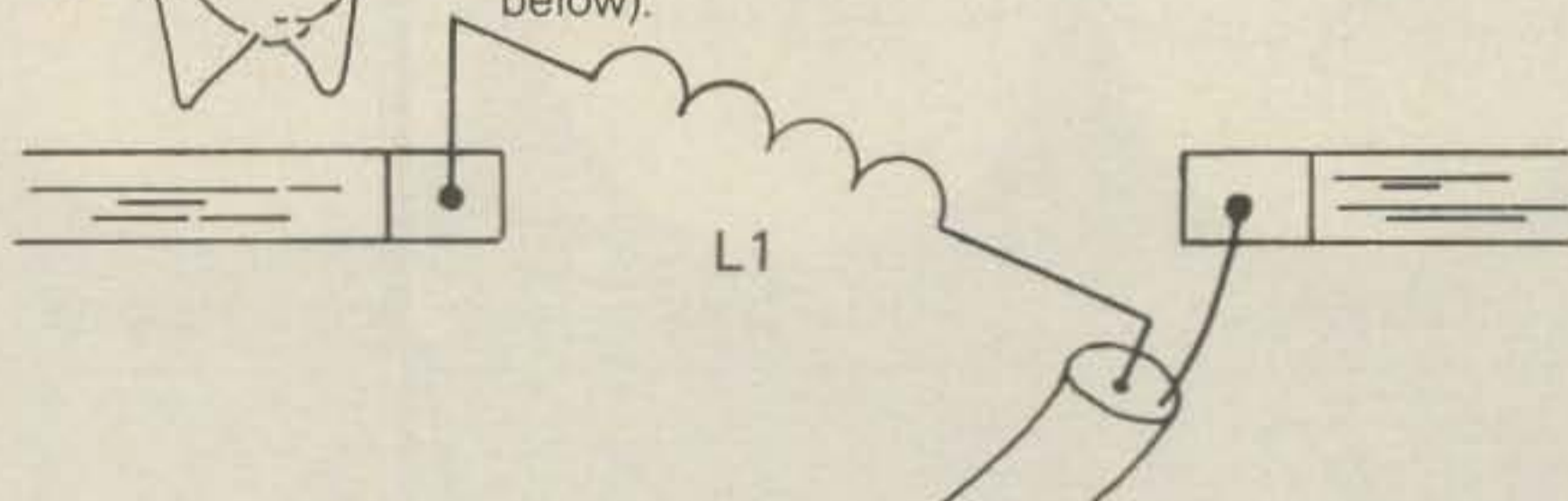


"Good grief . . . I sure hope it all fits in after all this hard work." (The small box with the perforated lid is the shunt regulator.)

Glitch Department



In Lew's first article for *CQ*, "The Frugal Fifteen," an error in figure 3 appeared. It wasn't Lew's fault (honestly); it was ours (we should have known better). The correct method of feeding this antenna is shown below. The text and photos are accurate. I would like to thank all those sharp-eyed readers who wrote and pointed out the error in a nice manner. Also I would like to thank N4EDX, who wrote Lew with the first "test report" on the antenna (see below).



Dear Lew:

Yesterday, while operating the IARU RS, I couldn't get KL7AF to hear my Swan 350 and 40 meter dipole up 15 feet. After calling him thru the pileup for 45 minutes, I got pretty disgusted, and took a copy of *CQ* that just came in the mail for a coffee break. Yep, there it was on page eight. The band was closed by the time I got the beam finished (started downtown to purchase the materials at four p.m., raised beam on a ten foot pole at eleven p.m.), so I went to bed \$27 poorer (all materials purchased new, including 25 feet of Romex; some threaded heavy duty conduit for the pole) and wondering if it would do any good.

Well, not only did I raise KL7AF on the

first call today, but I just worked JT6OUB on 21.015 (I have the extra—I didn't want to lose the DX in N4EDX) and his report was 569. I just heard 4X6AG here 579 (worked him during the contest with the beam).

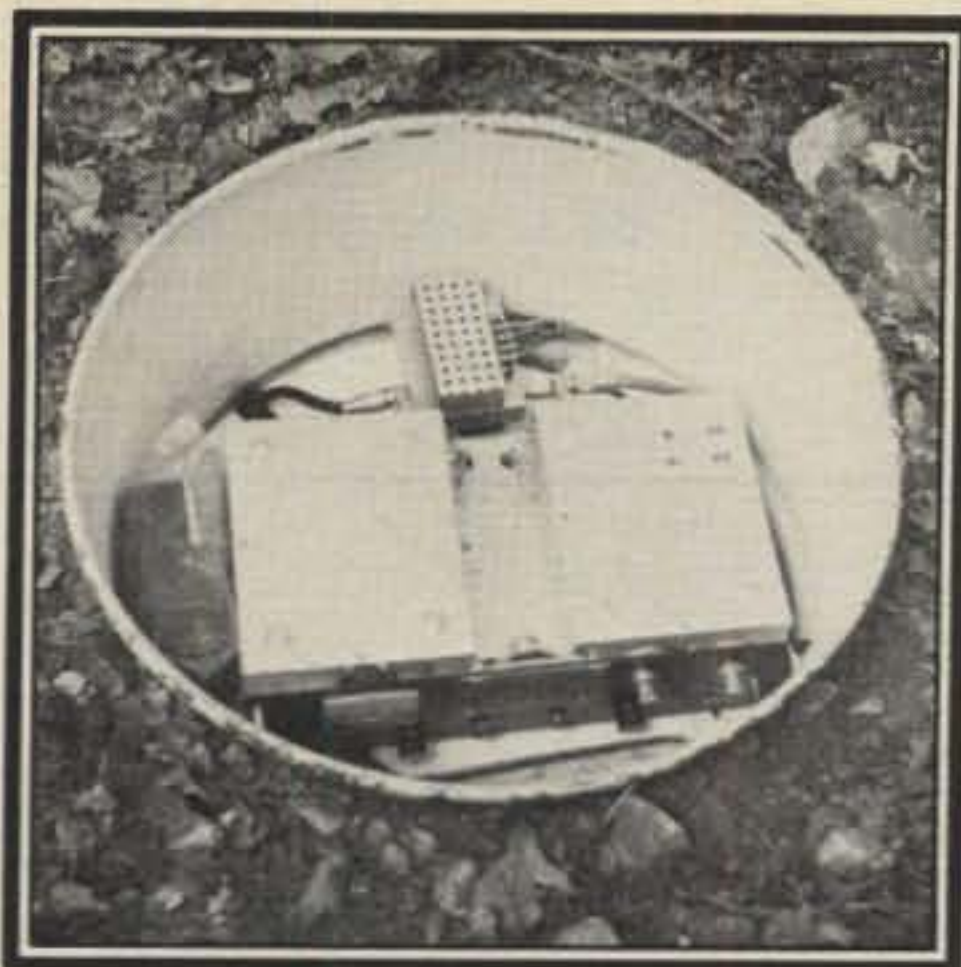
All I can say is thank you. I am trying to raise a five year old on a next to nothing salary, and have no money to spare, so I really mean thanks. I am going to talk up your beam on the air, and I hope *CQ* knows the effect of this kind of thing. I, for one, am a permanent subscriber. There will be many others.

What can I say? Just remember, if there is anything I can do from here, just let me know.

73, Dave Miller, N4EDX, ex-KP4BPH



"Be careful, you turkey, don't drop it." (The distinguished looking honcho on the left is the trustee, Richard Peterson, WB5NEN.) If the bottom of this repeater looks different than yours it is because of the Ted Handel designed microprocessor. It is an RCA 1802 COSMAC that has time out and tail timer, control link shut-down, and autopatch logic. It also sends c.w. ID (WB5NEN/RPT), shuts down unused circuits to conserve power, and eventually will do the dishes.



Almost ready to put the lid on. The package in the plastic bag at the left is a test meter plus necessary servicing tools. We highly recommend storing tools on site. It is a long way up and down when you forget!



"The first thing we've got to do is get a good antenna." (We did—A Phelps-Dodge Super Stationmaster.)

Daily Press, so he should know what he is doing), the following certainly deserve much credit for their hard work: Hal Billings, WD5FVO, Dean Battishill, W5LAJ, Dave Kittley, WB5RQC, and Charlie Wood, WA5KYV. We best add thanks to all those club members who add moral and financial support.

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The Hy-Gain Model HG-52SS is a 52 foot self-supporting crank-up tower designed for antenna loads of up to 9.0 square feet in winds up to 50 mph. This all steel constructed tower is hot dip galvanized after fabrication to ASTM specifications. Features include extra-strength diamond web bracing and an improved guide system for the telescoping sections, which provides rigid, close tolerance structural support while leaving the tube ends open for complete surface galvanizing and unrestricted moisture drainage. Rotators, including the Hy-Gain 300 and CDE Tailtwister, can be mounted inside the top section on the rotor mounting plate included with the tower. The HG-52SS is easily raised and lowered by manual or optional electric winch system. A thrust bearing is available which bolts to the top section and accommodates masts up to 2 inches in diameter. The HG-52SS is easily erected on a limited area site, and can be readily retracted to a 21 foot height for service of the antenna. Hy-Gain manufactures a complete line of Crank-Up towers from 33 to 70 feet. Write for complete details today.



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CIRCLE 117 ON READER SERVICE CARD

Novice

"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Operating Tips—Part III of IV

This article is being printed in four consecutive Novice columns. The first part covered band and frequency selection, speed, sending, keying devices, and dit-to-dah relationships. The second part covered calling and answering, plus listening. This part tells you what you should know about 2-way contacts, plus contests and DX. Each of these four parts is useful by itself, but the entire article should be read (and reread) to derive maximum benefit from it.

Two-Way Contacts

On-the-Air Conversations. It is very annoying when an amateur turns a 2-way contact into a no-way conversation. It is exasperating to ask questions or attempt to start a conversation only to have the other amateur ignore everything that was sent. Such people usually rub salt into the wound by starting each transmission with something like FB OM (fine business, old man) SOLID COPY, indicating that they copied everything that was sent. If they really did copy the entire transmission, why don't they respond to the questions or comments and make an interesting 2-way contact out of what otherwise is a series of disjointed monologues? After failing to engage in anything close to a 2-way conversation, this type of amateur usually adds insult to injury by sending an unnecessarily long and flowery signoff transmission saying how much he/she enjoyed the contact and that he/she is looking forward to future contacts. It is very much appreciated when contacts are 2-way exchanges. Almost every operator will slow down to whatever speed another amateur prefers, and the contact does not have to be long to be interesting; however, it must be a 2-way exchange, or it is of very little interest. If you just want to exchange reports and little else, that is understandable; you may just want to work a lot of amateurs in very little time. If this is your preference, it is advisable to



This is Robert L. King, KA9GNY, of Baraboo, Wisconsin. He first became interested in telegraphy in 1928 when he found a sounder in his grandfather's woodshed. He made another sounder and two keys to enable himself to practice code between the cellar and the upstairs part of the house with his brother at the other end of the circuit. In 1939 he began delivering telegrams, and the office manager helped him learn the code. He was a Western Union operator from 1940 to 1944, and became the Madison Division agent-telegrapher for Chicago and Northwestern Railroad, until he retired in June 1979. Amateurs at the Wisconsin State Police Headquarters helped his transition to the International Morse Code in 1950 and he was soon on the air as W9QOQ. He let that General license lapse in 1966. Jim Romelfanger, K9ZZ, kept badgering Bob to get back on the air and Bob finally did so in November 1980. He runs a Heath SB-102 Transceiver and is picking up where he left off in 1966; he is working states and countries at a good pace.

participate in the contests that occur every weekend. Contest exchanges are necessarily very brief, and they enable one to contact a lot of states, counties, and countries in a minimum amount of operating time. However, many amateurs are unique and interesting, and you will enjoy getting to know them on the air.

Telecons. Newer amateurs sometimes like to follow up on-the-air contacts with telephone calls to local amateurs. Some amateurs do not mind such telecons (telephone conversations), but most of us prefer exchanging information on the air.

Typical Exchange. The amateur who sends the CQ call (general call to all stations) is not calling any particular station. However, the amateur who responds to a CQ call is calling the station that called CQ. When a reply is heard, a typical initial transmission is as follows:

```
KA6EED DE W6JEP BT TNX FER UR  
CALL BT UR RST 579? 579 HR IN BUR-  
BANK? BURBANK ES NAME IS  
MARIE? MARIE BT HW? KA6EED DE  
W6JEP K
```

The preceding transmission means thanks for your call. Your RST (readability, strength, and tone report) is 579 (perfectly readable, moderately strong, pure tone) here in Burbank and name is Marie. How do you copy my transmission? Notice that both callsigns are just sent one time each at the start and end of the transmission. It is correct to keep this initial exchange very brief and to turn the contact over to the other amateur after providing just the indicated facts. The other amateur begins her/his transmission by sending the same RST (report), QTH (location), and name information, followed by initiation of the general conversation. Notice that the operator who sent the initial CQ call is not the one who starts the conversation. If you answer a CQ call, be prepared to start a discussion as soon as the basic data has been exchanged. If the other amateur is not using your correct call, tell her/him that she/he is in error and send your callsign slowly a couple of times to emphasize the correct

2814 Empire Ave., Burbank, CA 91504

callsign. It is more effective to make this correction during the conversation that it is to just repeat your callsign several times during station identification.

Recognize Firsts. When you work your first contact ever on the air, plus subsequent first contacts with new states and countries, do not keep such firsts a secret. Let the other amateur know why the QSO (contact) and QSL (written confirmation card) is very important to you. In addition to recognizing all types of first contacts on the air, add a suitable note on the card you are going to send to confirm the contact. The ARRL has a special certificate which new amateurs can send to their first contact. If you want one, request it from the American Radio Relay League, Inc., 225 Main Street, Newington, Connecticut 06111. It should help to enclose a self-addressed and stamped envelope with such a request. If you send a 9 x 12 inch (or larger) s.a.s.e., the certificate can be mailed to you unfolded; however, double postage has to be attached to oversized envelopes. Frankly, I think any amateur who is patient enough to suffer through a first contact with anyone deserves a reward. Nevertheless, I answer the weakest, slowest, and most messed up CQ calls I hear because I would rather be the first contact for some amateur than to work the rarest DX station in the world.

Guests. Since it is a fairly recent rule change that permits unlicensed guests to make code transmissions under the authority of a licensed operator, it is not well known that such operation is legal. The licensed amateur must be present at the operating point, and she/he is responsible for the transmissions. It is a real thrill for an unlicensed aspiring amateur to be allowed to actually contact someone on the air. If you have unlicensed friends who know the code, urge them to operate as your guest.

Female Amateurs. Contacts with female operators are increasingly more frequent, and I am thankful that this is so. As recently as a decade ago, it was unusual to work a female amateur. It is now normal to contact several female operators in a single day. I often hear amateurs calling a female OM (old man) because they mistakenly assume that the other operator is male. Most of the girls and women operators I know are forgiving about being called old men during the initial exchange of information; however, it is reasonable to assume that they probably do not like being called old men. Both female and male operators make the unwarranted assumption that the other amateur is male. It is true that the term OM is accepted to denote a male operator of any age, but it does not apply to females. I find it a bit paradoxical that females object to males calling them OM, since I have often heard females refer to themselves as *guys* at meetings of groups of females. I

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guess it is another case of "do as I say, not as I do."

It is wise to avoid using the term OM before you have determined that you are in contact with a male operator. This problem is increased when working DX (foreign) amateurs because strange names are not always readily apparent as being male or female. Consider the confusion of foreign amateurs who contact Americans with names such as Carol, Carole, Marian, Marion, Pat (Patricia or Patrick), etc. If you are in doubt, ask. If you have a name that could cause a DX amateur to be unsure, tell her/him that you are an OM or a YL/XYL. This identification is very important to anyone trying to qualify for various YL/XYL awards.

What Not To Do. The rules forbid telling lies and swearing on the air, which limits the conversation of our saltier amateurs. It is illegal to transmit music, which presents problems if you have a house full of people. It is normal to have music in the home as others listen to radio and TV stations, play cassette recorders or records, and play musical instruments. Music is not a problem when operating code, but it is easily picked up in the background when operating voice. This violation is compounded if the music is from an a.m., f.m., or TV station, since we are also forbidden to retransmit commercial broadcasts. Obscene jokes and stories are also banned on the amateur bands. Amateurs are not allowed to handle business-related traffic, and even buying or selling amateur gear can cause problems. When in doubt, do not do it until you have determined that it is legal.

Ending Signals. There continues to be some confusion about the proper use of telegraph work signs, including ending signals. All work signs have known published meanings, and it is poor practice to use them in other than the internationally accepted manner. The International Telegraph and Telephone Consultative Committee (CCITT) and the International Radio Consultative Committee (CCIR) operate under the auspices of the International Telecommunication Union (ITU). CCITT and CCIR decisions are published by ITU, and we usually receive such information through the International Amateur Radio Union (IARU).

Symbol indicator differences such as \overline{SK} (commercial) and \overline{VA} (military) have no real significance, since the same symbol is produced by running either pair of letters together, which is what an underscore or underline line is indicating one should do. \overline{SK} means that you are finished with a series of transmissions. When you send \overline{SK} you are letting the other operator know that you will listen to his final comments, but you do not intend to continue the conversation. When the other operator completes her/his final remarks and also signs off, it is common courtesy to send GA, GE, or GN (good afternoon,



Tom Warrenburg, KA9EKG, of Delavan, Wisconsin, credits Bill Zimmerman, WB9USG, of Alden, Illinois with getting him started as an amateur. Bill is blind, and Tom records material for 10 blind amateurs in America and 2 more in England. He has done this recording since 1977, and the Fox Tango (Yaesu) newsletters are one of the things he records regularly. Tom has been a Novice since May 1979, and he has worked all states and all continents during more than 700 contacts. His station includes a Drake TR-4 Transceiver, Tempo One Transceiver, Trac Electronic Keyer, Panasonic RF-4800 Receiver, a 40-meter inverted vee, and a 10-meter Yagi. Tom is one of several amateurs I have had the pleasure of contacting on the Novice bands.

evening, night), as appropriate, to indicate that the wrapup transmission was received. The end of message symbol is \overline{AR} , and it has no other meaning. If no message traffic was passed or no conversation took place, it is not correct to send \overline{AR} , since there can be no end to a message that does not exist. The letter K sent out of context (not part of a callsign) at the end of a transmission tells the other operator to answer. \overline{AR} does not mean answer, despite published unofficial data which indicates that it does have this meaning.

The letter N following K is also improper and superfluous. It has no internationally accepted meaning, despite common usage intended to indicate that only the station called should reply. Since the identification indicates the specific station being told to answer, there is no need to tell others not to answer. I find it humorous that some stations use KN at the conclusion of CQ calls, which amounts to restricting replies to every amateur hearing the call. Roundtable contacts are common in voice operation but they are extremely rare when using code. Furthermore, on the rare occasions when a third amateur is trying to break into an existing 2-way contact, there is usually some valid reason behind the interruption. I have never heard an amateur object to such an interruption, and I doubt that those who send KN would really refuse to include a rare DX station or a personal acquaintance in the contact. KN is not an official work sign. Avoid the childish practice of sending dits back and forth at the

end of a contact. This practice accomplishes no useful communication, and it can cause one to miss hearing another station that is calling for a contact. Tail-ending is a common and accepted practice, and such stations do not always call exactly on frequency, but good operators listen for such calls.

Emergency Operation. Real and simulated emergency traffic share the same high priority. It would be very unusual for emergency communications to be handled in a Novice band, but it is possible. If you have a station tell you that a frequency is being used to pass emergency traffic, stop operating on that frequency until those transmissions have been completed. Simply move to a frequency where your transmissions will not interfere with the emergency traffic handling. Failure to cooperate in such cases can result in license suspensions.

Contests and DX

These two are lumped together because operation is very similar in both cases.

Contests. Operating in contests is the easiest way to quickly contact the places a new amateur needs to work to qualify for various operating awards. However, one should understand that serious contesters do not like delays, so do not slow them down by telling them you need their QSL cards; just add an appropriate note in the remarks portion of each QSL you send to such contacts. There are contests in progress every weekend, plus some weekdays, and many contests include operation in the Novice bands. The contest section of this magazine provides all the information one needs to par-



Lorraine Axeman, KA8LDJ, of East Lansing, Michigan, whose Dad, Louis Axeman, N8LA, introduced her to amateur radio, was 11 years old when she was first licensed in October of 1980. Most of her operation is on 40 meters. She runs a Kenwood TS-520 Transceiver with an inverted vee dipole. Even her photograph exudes her warmth and great personality. We are fortunate to have this fine young lady in our amateur radio service.

ticipate in this activity. One does not have to be a code expert to participate in contests or to work DX (foreign amateurs). I advise you to give both a try, because I believe every amateur can enjoy a reasonable amount of both of these activities without being really addicted to either one of them. Of course, there is always a possibility that you may catch the fever and become an avid contest and/or DX operator.

DX. Although most DX contacts are brief, this is not always the case. If the DX amateur has answered your CQ call and is willing to chat, you should not hesitate to have an extended conversation. On the other hand, if many stations are waiting to work the DX station, it is good manners to keep the contact brief. The language barrier usually limits DX conversations, but even that can be partially overcome by using an amateur operator's conversation guide that provides typical phrases in several languages. *The Radio Amateur's Conversation Guide* includes 91 pages of useful phrases in English, French, German, Italian, Japanese, Portuguese, Russian, and Spanish. Supplements are also available in Finnish and Swedish. Current costs and more information about this material can be requested from Wayne Gingerich, W6EUF, 2301 Canehill Avenue, Long Beach, California 90815.

Make it very clear to each DX operator



These members of the Lockheed Employee's Recreation Club (LERC), W6LS, of Burbank, California, have each donated at least 100 pints of blood. Back row (left to right): C.S. Case, Al Jackman, Bill Slayton, and Bill Welsh. Front row (left to right): George Artzer, Jerry Friedman, John Johnson, and Ashley Scantland.

that your knowledge of her/his language is extremely limited, or you may be buried under a mass of words that have no meaning to you. If you are fluent in one or more foreign languages, you can enjoy much more enjoyable DX contacts. Many DX amateurs operate in the American Novice bands just to work beginning amateurs and to send them cards. They assume that you probably want their cards, and they will send cards via the bureau, which is cheaper and easier than mailing

cards direct. If you want to have a DX QSL mailed directly, it is usually okay to send a self-addressed envelope and a few IRC's with your QSL. It is not a good practice to hold a DX amateur a long time while giving her/him your mailing address. Most DX operators go into the Novice bands desiring to work as many amateurs as possible. Consequently, they do not want to be delayed with information about your equipment, antenna system, mail address, etc. Just give them the report (RST), plus your name and location (QTH), and let them go on to another amateur.

Part III Summary

This completes the third part of this four-part article. Part IV will cover codes and signals, unusual types of operation, special-interest organizations, operating violations, code practice, printed material, and related interest.

Stations I have worked recently are the following: Virginia, WB1AVA, Avon, CT; Alan, KA2KGD, Sewell, NJ; Carol, WN3RGP, Selbyville, DE; Dorothy, KA4HPW, Statesville, NC; Marion, WD5FTZ, Enid, OK; Michael, KA6JUM, Anaheim, CA; Roy, KA7GXX, Sandy, UT; Paul, KA8FOR, Ansonia, OH; Rita, KA9GSS, Clinton, IL; Gwen, KA0JVK, Ankeny, IA.

73, Bill, W6DDB

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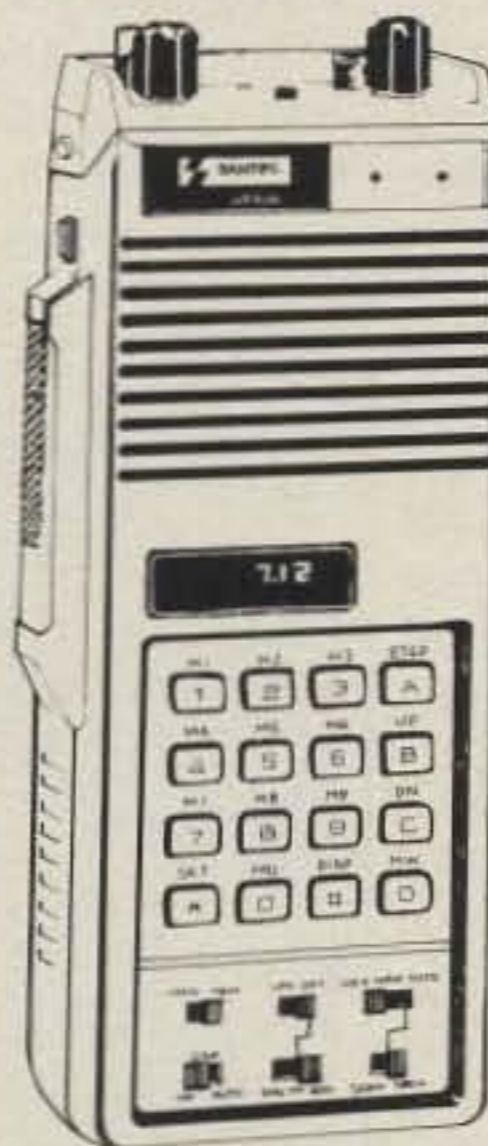


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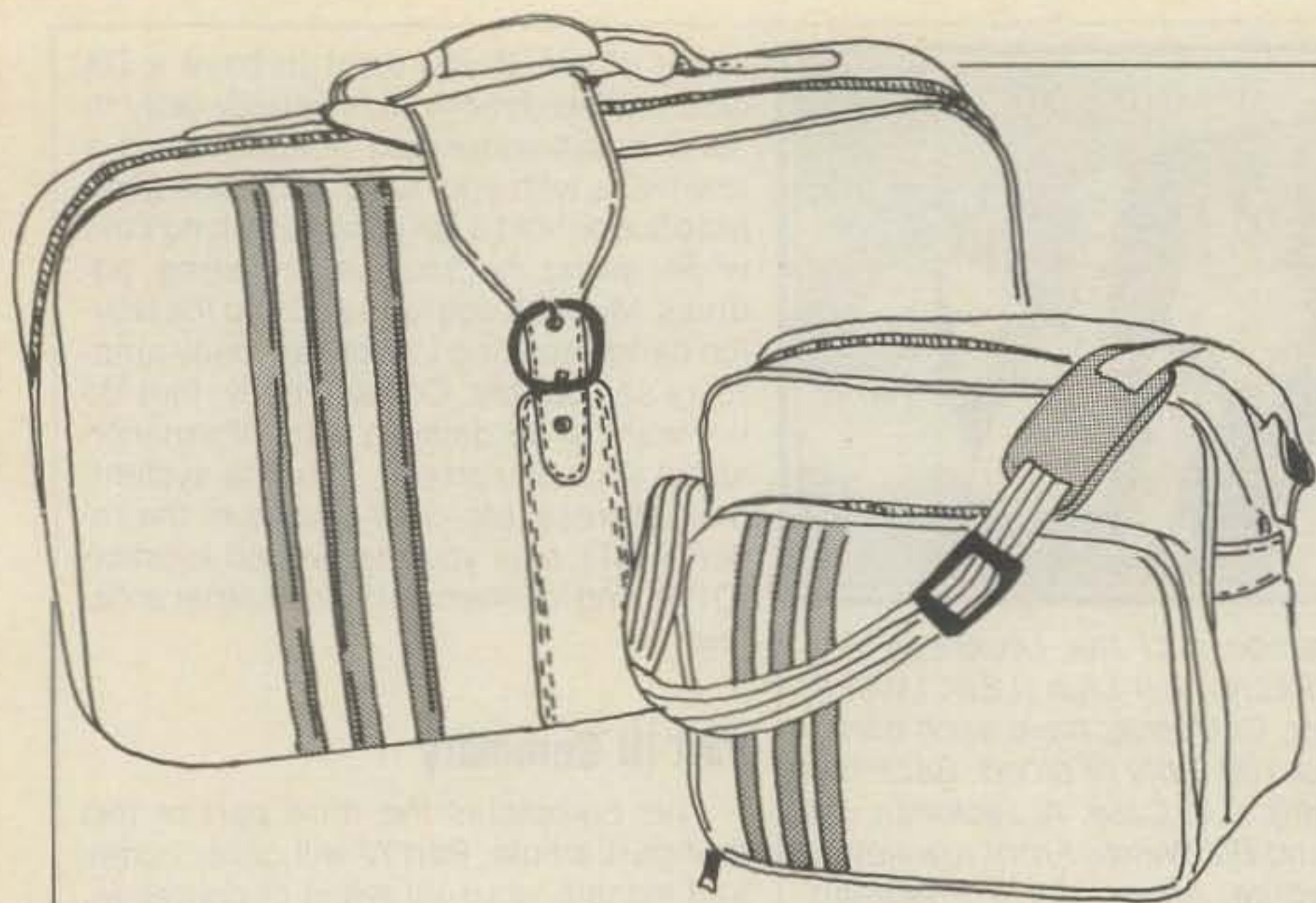
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The intrepid, hearty, DXpeditioners: Herb, K2GBH, Barbara, WA2KCL, and Dave, W4JVN.

Who says privation is character building? Nowadays you can operate a DXpedition from the comfort of a hotel room and still have plenty of time to catch all of the local color and enjoy a mini-vacation, too.

A Suitcase DXpedition To Water Island

BY HERB SWEET, K2GBH, AND BARBARA SWEET, WA2KCL*

About two years ago at the Hartford convention, the XYL, Barbara, WA2KCL, saw the Spratly slides and got the bug to go on a DXpedition. After hearing about the mortar attack on the Spratly group's sailboat, I told her that I felt something more civilized was in order—like a hotel in the Caribbean. "Why not go to the Caribbean with a small transceiver and work the ARRL DX Contest?" I asked. Being fairly close to the USA, we should be able to do reasonably well with a small operation.

So scaling it down to that level, I set her to work checking out travel and hotel arrangements, which is not the easiest thing for a ham on a DXpedition. Travel agents just aren't prepared to seek out accommodations where antennas and feed lines are of major concern. After some digging and calling around, Barbara finally came across the Limestone Reef Terraces on Water Island, a small island just off St. Thomas. Sounded interesting, but what would they think of me hanging wires all around the place? To find out I called the owner in New Jersey and told him of our dilemma. I said, "My wife and I are amateur radio operators and as part of our vacation we'd like to set up a small transmitter and antenna for a few days, but we thought we had better

check with you to see if there would be any problems." "No problem," he replied. "What bands do you plan to work on, anyway?" I didn't realize it until then, but the owner of Limestone Reef Terraces, Paul Murray, is also WA2UZA. Bingo! At this point we switched to 40-meter phone and worked out the details.

Barbara and I packed up our equipment—one transceiver, one reel dipole, some rope, a small s.w.r. meter, and a

few other small items. The rig was hand carried, and the rest of the equipment was packed along with our clothes. We had only three suitcases between the two of us. On arriving at the hotel, I realized that we had stumbled onto one of the best locations we could have hoped for. Not only was the room comfortable and inexpensive, but it also was equipped with a small kitchen—an ideal setup for the DX contest we had come down to work.



This view from the terrace is enough to make any of us envious.

*RD 2, Box 341, Covey Road, Hyde Park, NY 12538

Of course our main interest at this point was our planned antenna installation, and we were not disappointed. The hotel is located on a sharp hillside facing north. It is about 100 feet above sea level and 400 feet from the ocean. The antenna support would be one 30-foot high coconut palm tree on the north side of the building about 25 feet from our apartment. The inverted vee was erected simply by throwing a rope over the palm tree and pulling it up. Band changing was a matter of lowering the inverted vee and readjusting the tape reel length.

Well, it all looked good, but how would it work? I soon found out when a W2 answered our first CQ. We then started working not only well in stateside, but also overseas. After struggling in the pile-ups from the USA side, it was a real experience to be on the other end. Imagine if you can M1C in a pile-up calling you instead of it being the other way around!

Our contest operation turned out better than we had expected. Last year (1980), on our first try at it, Barbara and I racked up 3200 contacts and managed to keep the station on the air for 44 hours of the 48 hours allowed. However, by the time it was all over, we looked as if we had been through World War II. There had to be a better way. We really needed another operator or two.

This year (1981) our luck got even better when Dave Klimaj, W4JVN, wrote to us asking for advice on how he could set up a station in either Puerto Rico or St. Thomas during this year's ARRL DX contest. He was going to be in San Juan on business during that period and was really keen on getting on the air. After some chit-chat on 40 meters, Dave was enlisted into the K2GBH/KV4 operation and it really made a difference. This year our total rose to 4800 (raw) contacts—a rate of 100/hour overall. Our peak rate was an unbelievable 200/hour—not bad for a TS 130S and an inverted vee a few feet off the ground!

During the non-contest period of our stay, we enjoyed the beautiful beaches, sailing, dining, touring, and visiting with the local amateurs on St. Thomas. It was particularly nice to be able to keep in touch with everyone over KV4FZ's repeaters on St. Thomas and St. Croix. Through WD4OCI and KA4FNP, a couple of ex-school teachers who now spend their time just tooling around the Caribbean in a small sailboat, we met K8KKD and WB8FUI, a couple of Chief Petty Officers on the *USS Mississippi*, who were nice enough to give us a tour of the ship while it was in St. Thomas. That's the nice thing about this hobby; when you go somewhere new, you aren't left out of it. So next year we'll be back again. Oh, by the way, about 500 feet to the south of the hotel at the top of the hill is a 100-foot steel observation tower put up during World War II. Now if we can only figure how to run some hard line up there . . .

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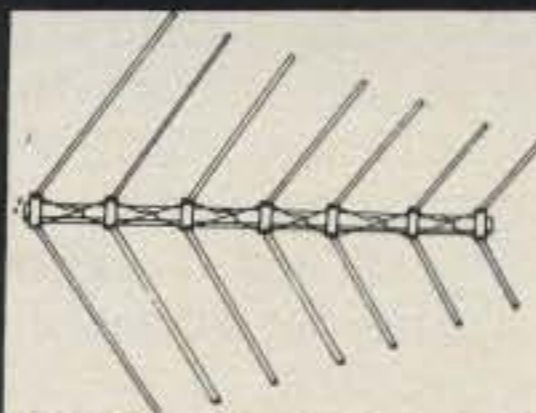
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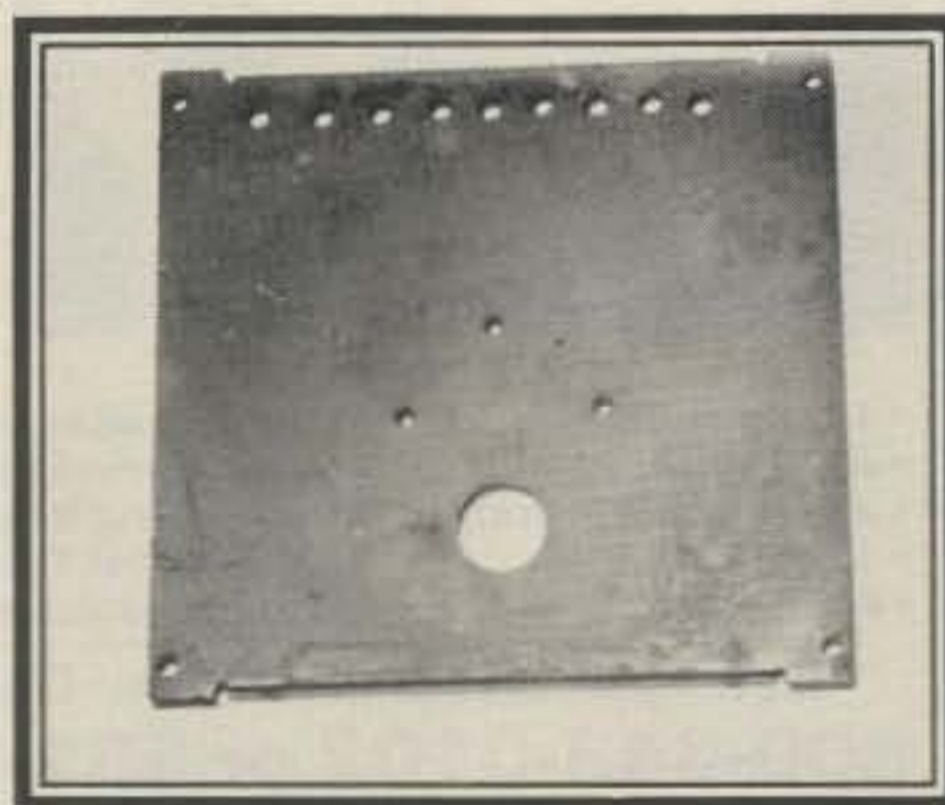
BY GEORGE M. EWING*, WA8WTE

Some years ago, with the help of some hamfest bargains and a little tinkering, I put together a mobile installation for 75, 40, and 20 meters that was a great deal of fun on long trips and worked well. However, there was a problem.¹ I was using a second-hand NCX-3 transceiver and a Heath HP-13 mobile power supply, which had been designed for rigs like the HW-100 and other green boxes that ran a bit less power. On receive, the arrangement worked fine. But on long transmissions while rag-chewing with the boys on 40 phone, the little HP-13, although struggling valiantly to keep up, gradually overheated until the case was nearly too hot to touch. Eventually, the thermal breakers provided by the gnomes of Benton Harbor in their wisdom popped, sometimes worrying other amateurs in QSO, causing them to fear that the sudden loss of signal might mean a traffic accident or worse. Clearly something had to be done.

The most straightforward approach, a new mobile rig that ran on 12 v.d.c., was deemed too expensive at present. A huskier inverter-type power supply for the existing rig to replace the HP-13 was also considered, and while not as expensive as a new solid state rig, this option was still a drain on the pocketbook, and it would require laborious changing of cables and connectors. Perhaps some sort of augmented cooling was the answer.

The first thing tried was simply to move the HP-13 from its spot under the car seat out into the open on the car floor, and to remove the cover plate. This helped lower the internal temperature of the supply quite a bit, but the combination of 800 volts of B+, no protective cover, and conductive salt slush on the floor of the car in wintertime seemed unsafe, although there were no actual accidents.

A forced cooling approach required a distinct effort on two fronts: the most practical path for the cooling air through



The new home-made cover plate of the Heath HP-13 drilled for cooling air and mounting holes.

the compact little box had to be determined, and a source of cooling air had to be provided without resorting to a separate 110 volt supply for a blower. As 12 volt blowers seemed to be hard to find at hamfests and in surplus catalogs, it was decided to first try using the car's own ventilation system as the source.

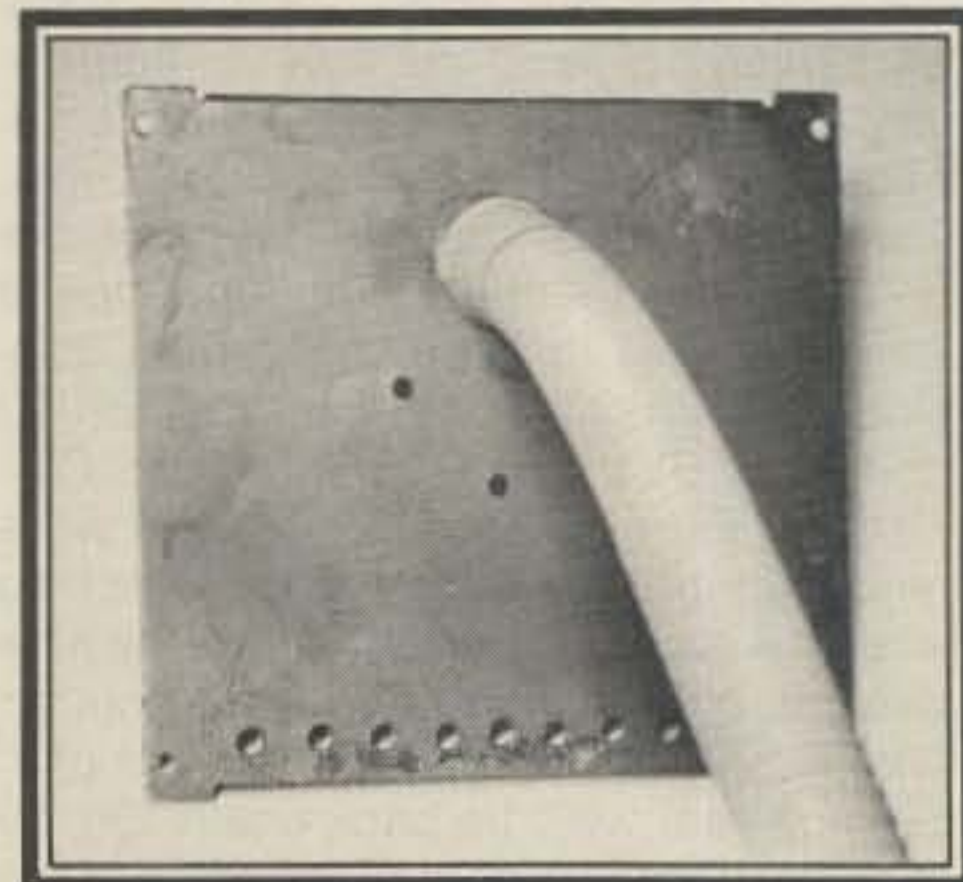
A one-inch round hole was cut in the HP-13 cover plate directly over the filter capacitors, and a row of ¼-inch holes was drilled at the other end to allow the heat to escape and to ensure an even flow over the Toroidal core, T1, and the thermal breakers. If you want to keep the bottom plate in mint condition, you can do as I did and make a new one out of do-it-yourself aluminum or other metal you may have.

To convey the air from the car's vent to the inlet on the cover plate, some sort of hose or duct was needed. A child's musical toy, called a *Bloogle*™, was the answer. This is a 24-inch length of plastic tubing about an inch in diameter and costing less than a dollar. The corrugated tube is designed to be swung around the head, which creates a partial vacuum due to the venturi principle and produces musical notes that are harmonically related to the spacing of the corrugations in the tube wall, a kind of acoustical analog

of the oscillations that can occur in a travelling wave tube.

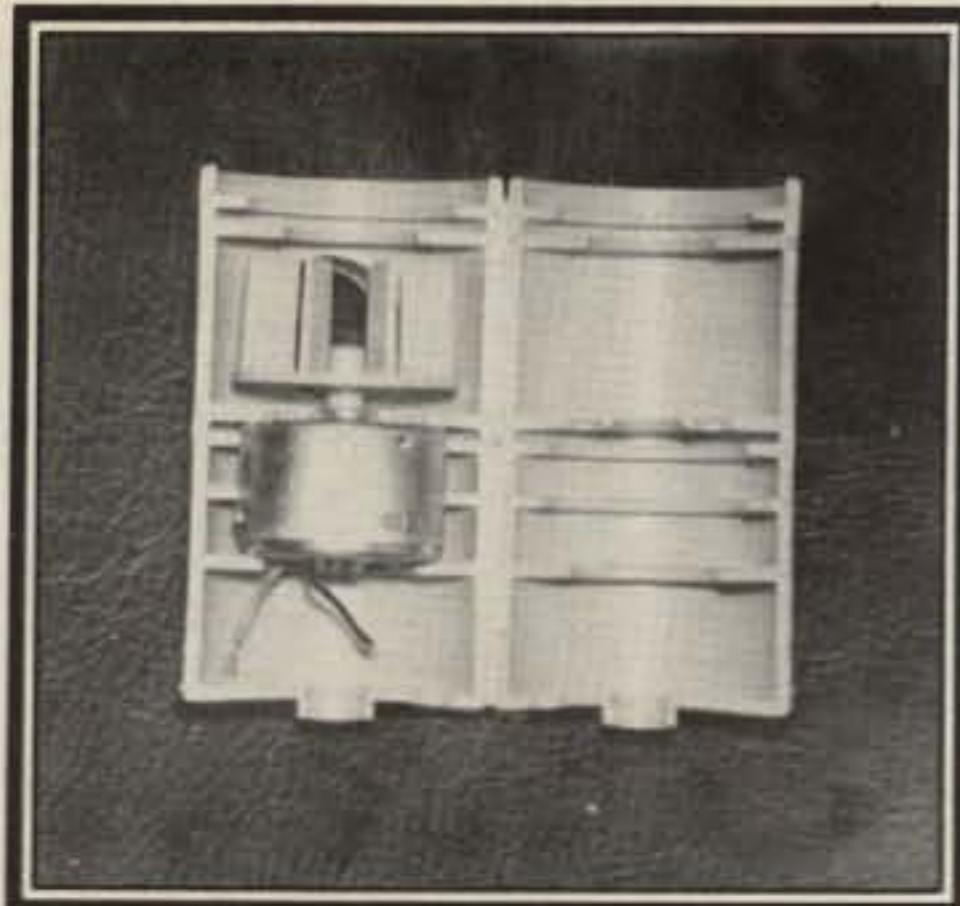
After a short time of trying to play music on the irresistible toy, the Bloogle was put to its intended use and made a first-rate air hose. The system worked pretty well in summer, although the hose got in the way, but in winter when the car's heater was in use, the supply was actually being heated, not cooled. Unheated air was available by bypassing the fan and heater core, allowing the car's forward motion to force air through the hose, but this would not help while the vehicle was parked or moving slowly in traffic. A small d.c. blower really was needed.

The ideal answer finally came with a chance to visit a Chicago area surplus store.² In one of the junk bins were some odd-looking pieces of equipment and a sign that read, "Reject Nebulizers—5 dollars." A Nebulizer™, as we all know of course, is an ultrasonic device that vaporizes water into an extremely fine mist to aid the breathing of asthma patients and the like. One of the components on the little chassis was a green plastic d.c. blower. A quick inquiry disclosed a whole barrel of identical blowers, \$2 each or 3/\$5.00. This was the exact ticket; the noz-



The cover plate with the Bloogle™ mounted to feed cooling air from the vehicle's ventilation system through the chassis.

*P.O. Box 502, Cheboygan, MI 49721



The Nebulizer™ blower with the case halves opened. Note the all-plastic construction except for the motor itself. This is an extremely quiet and reliable blower, despite low cost.

zle even fit the hole drilled for the Bloogle perfectly. It ran whisper-quiet on 12 volts, didn't draw much current, and kept the HP-13 case stone cold during long rag-chew sessions on hot summer days.

If your local hardware store is fresh out of Nebulizers, don't despair; I have since found many small d.c. fans and blowers that will do the job. Many of the mail-order houses have small blowers from time to time.³ Many of these are rated for 28 volts, but they will usually still work on 12 or even 6 volts and still deliver enough air to keep your breakers from popping. Remember, it doesn't take very much air to make a big difference. In this application, we're not trying to cool a kilowatt linear or blow 4CX-250's out of their sockets. Another possible source for small blowers is appliances like hair dryers and hot combs that use a small a.c./d.c. motor in series with part of the heating element as a dropping resistor. Many of these will work okay on 12 volts with a little tinkering, as will some of the little defroster guns sold in automotive stores for thawing frozen locks and defrosting iced windshields.

Still another approach is to find a small fan or blower that runs 400 cycle, 3 phase a.c. or some other unsuitable kind of power, remove the actual fan blades or squirrel cage, and remount them on any of the thousands of little d.c. motors that are available for other applications.⁴ Even very low voltage motors from slot cars and battery-operated toys could be used from 12 volts with a dropping resistor or some other simple voltage regulator. A resistor or light bulb for this application could be mounted in the airstream if it gets too warm.

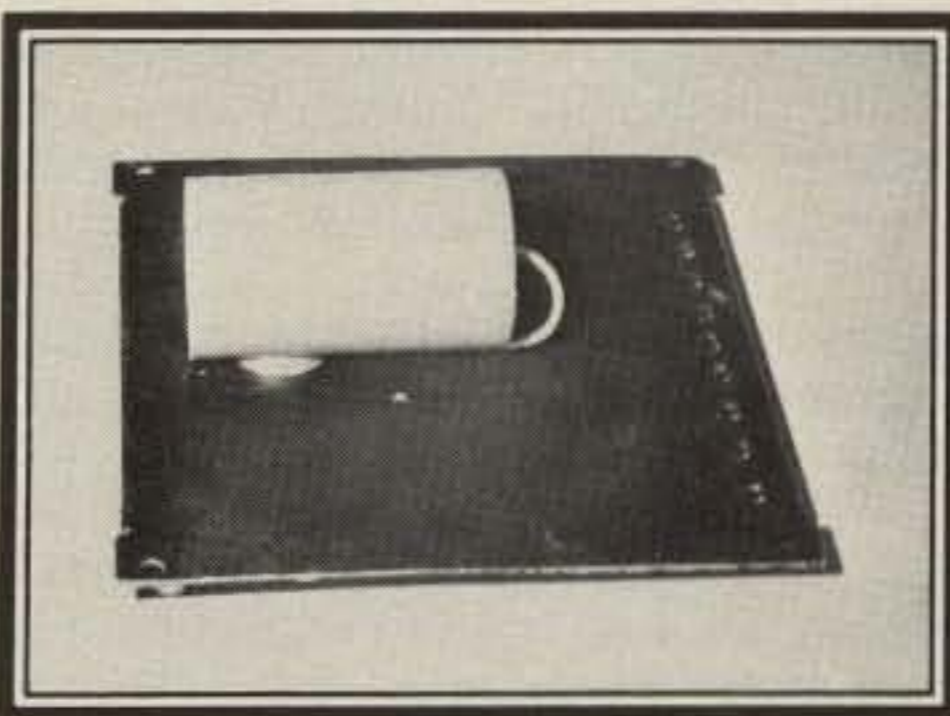
For my installation, I wired the blower between pin four on relay one in the HP-13 and ground, so that the blower would run whenever the rig was turned on. If you like, you can wire the blower to the rig's TR relay or PTT line so that it only runs on transmit. This will extend the blower lifetime and reduce noise and battery drain during long listening periods. I

haven't bothered, as the Nebulizer blower is inaudible under the T-power whine, and only draws an amp or two.

If you are fortunate enough to have a new h.f. mobile rig that doesn't require an inverter supply like the HP-13, it is hoped that some of the ideas in this article will still be helpful. There are many applications for small, d.c. cooling fans. Many of the popular "brick booster" linear or class "C" amplifiers used with mobile and hand-held v.h.f. rigs are about the same physical size and power level of the HP-13, and many of these little black boxes run fairly hot, especially if mounted inside the engine compartment to keep high-current leads to the battery short. A small blower such as the one in this article would be a great help, especially if fitted with a Bloogle or some other small tube to "snorkle" in cool outside air.

With the current boom in converted CB rigs for amateur 10 meter mobiles, I expect to see amateurs building linear amplifiers in the 50-100 watt class. This would seem a natural application for a small blower or just a Bloogle directed to the under dashboard vent, especially if the vehicle is air conditioned. Non-mobile uses in emergency and Field Day setups should be obvious.

If nothing else, if you want to rally the gang at a hamfest or picnic, detach the Bloogle from your rig and swing it sharply around your head, as if winding up a South American bolo or David-and-Goli-



The Nebulizer blower mounted on the HP-13 cover plate. The blower nozzle is a snug friction fit, and the bracket holes drilled in the plate were not needed.



The blower mounted on the plate with the Bloogle attached to the inlet to "snorkle" cool outside air. This is a good arrangement when the supply is to be mounted in a hot area, such as on the firewall in the engine compartment.

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Footnotes

¹ Ewing, George M. "Mobile Antenna Ingenuity," 73 Magazine, March, 1978, p. 42.

² American Science Center, 5700 N.W. Highway, Chicago, IL 60646. Remember, though, that this was a couple of years ago.

³ Several good bets for this kind of thing include, in no particular order:

Fair Radio Sales, 1016 E. Eureka, Box 1105, Lima, Ohio 45802.

Meshna, P.O. Box 62, E. Lynn, Mass. 01904.

Poly Paks, P.O. Box 942, South Lynnfield, Mass. 01940.

Also don't forget to check non-radio surplus places in the yachting and airplane magazines, and the bigger hamfests like Dayton and Santa Fe.

⁴ If you try this, be careful not to bend the fan blades or spoil the balance of the cage rotor; it could lead to severe vibration.

DX

NEWS OF COMMUNICATIONS AROUND THE WORLD

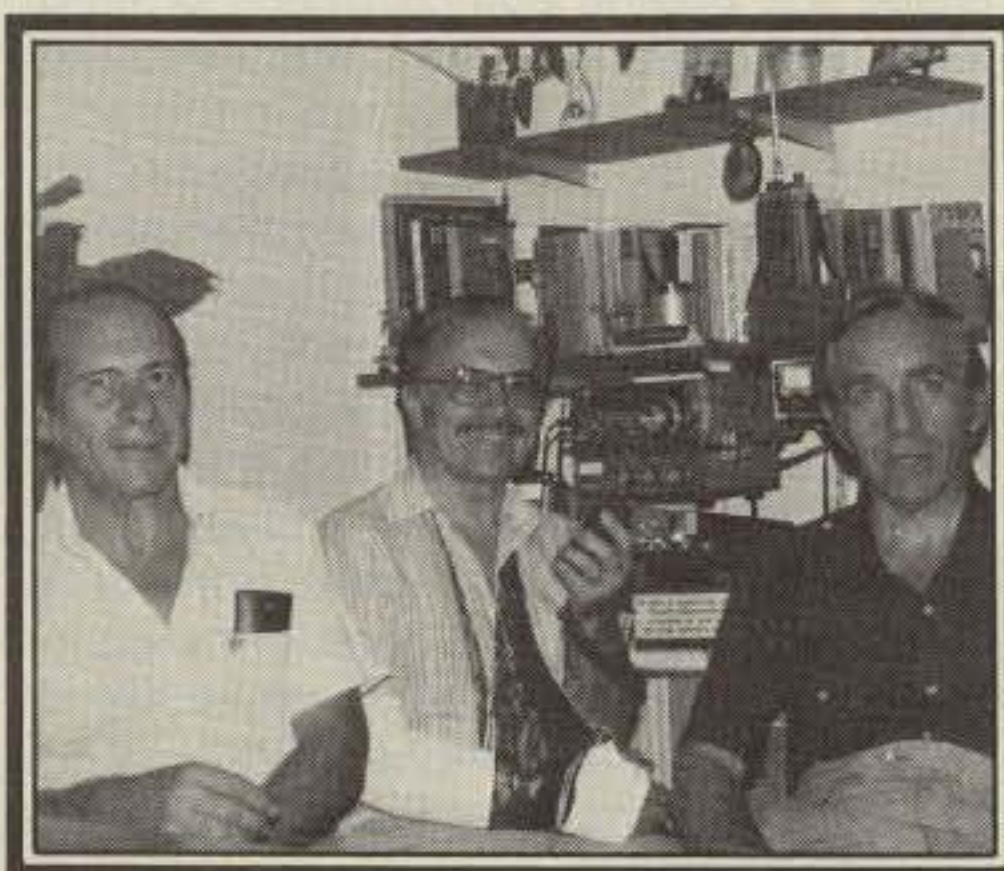
*Oh, the wasted hours of life
That have drifted by!
Oh, the good DX that might have been
I missed without a sigh!*

In these times when many DXers are resorting to computers to store needed information such as QSL routes, schedules, QSOs, and most important of all, lists, the search for information never ceases. The questions are constant and not always related to DX. Last week one of the newer DX types wandered by with a strange query. Sometimes we tend to wonder why some of these end up here.

"I was down at the green grocers," this seeker after the truth tells us, "and I was thinking of buying a watermelon. I do listen to the TV news, and there is always this little fellow deep in a carrot field telling how to pick out the good fruit. With watermelons he always says to pat and thump them and to listen to the resonance. But everytime I thump one and take it home, I find that usually I'm out of resonance.

"But this time I was watching a fellow by the watermelons, and when he touched one at one end the melon instantly split almost in half. All he did was touch it and it split open!" The questioner leaned close, the signs of puzzlement evident. "Tell me," he said, his voice troubled, "just how did he do that and what happened?"

We did not need a computer to answer this one. The problem would be to try to explain something to one who might be great in computers, but a stranger in the melon fields—one who might have scant comprehension of what we spoke. As DXers soon learn, there are things and wonders and deep understandings that are natural to DXers but a constant mystery to others. To a DXer the language may be plain, the intent obvious, and the meaning clear. To the unanointed there is eternal wonderment, often without understanding. They believe they should know and understand; after all, most of them believe that all amateurs are licensed equal-



From left to right, Lorenzo Bennati, YV5IFT, Alex Statzewich, YV5IMF, and Oscar Hendler, YV5IKI. All have Caracas QTHs and are members of the Venezuelan Radio Club. But wait!! That's not all. When these three get together you have a group that can QSO in Spanish, English, French, Russian, Italian, Portuguese, German, Polish, and Yiddish. As many a DXer has cause to learn, "Be Prepared!"

ly. The difficulty is to understand that DXers are different. DXers always have and always will be.

"You'll have to listen closely," we advised this melon lover, "for the things I will say are true but sometimes hard to understand and believe. And if there is one thing that a budding DXer must learn, it is that even though you don't understand, you must believe. Right?"

The impact from the glow in the eyes on us was almost physical. Here was the shining desire to learn and we knew that surely some day this one would be a top DXer—tall with towers, strong with power, tireless in tuning, and the first on every list. But first he had to acquire knowledge, knowledge and the understanding of the esoteric.

"You have already learned that patting a watermelon to determine its ripeness is a fallacy," we said, "but what you saw was an example in which the fellow was not only a judge of good watermelons, but probably a DXer as well. DXers are the ones who know the things that are only vaguely suspected by others and often not understood by many."

The seeker-after-truth started to say something, but we held up our hands.

"The right way to pick out a ripe watermelon is to test the blossom end with a thumbnail. A green melon is a tough melon and your nail will not penetrate. An overripe melon is soft and spongy and sometimes you may even lose a thumb into the melon. But a fine watermelon, sweet and juicy and at the peak of its ripeness will be easily recognized. Your thumbnail will penetrate the skin with a crisp snap. Once you know the experience, you'll never forget the crispness of your nail snapping through the rind. The instance you saw at the green grocers was one where the melon was at its peak, firm and vibrant with ripened tensions. That was a super melon; unfortunately there is a short period at the peak of pressures when a melon will split as you observed. But it was a superb melon, undoubtedly."

The eyes were still on us but the expected questions were slow in coming. We waited. Finally there was a flicker deep within those eyes, and he asked, "I am beginning to understand that there may be better ways to pick out a melon than by thumping it, but how does that prove the fellow was a DXer? That I don't understand."

We smiled, for this was not unexpected. "It was not cited as a fact," we said, "only a probability. But along the way you will learn that DXers are different, almost to the point of speaking a language known only to themselves. And DXers know things that are known only to other DXers. There is only one way that DXers and DXing can be judged, and that is by other DXers. That is the way it has always been; that is the way it will always be!"

We were ready for a response and quickly raised a silencing hand at the first "But . . ."

"Remember when we started to explain things that we said you may not understand but you'd have to believe? Remember?" We got a quick nod of assent to that.

"Just keep that in mind," we continued. "There are still things that only a true-blue DXer understands. And though you may not completely understand the veiled and half-hidden meanings of DXing, you are now on the road to competency in selecting watermelons. Right?"

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2248	ON5KY	2259	I4EAT
2249	JA4OGU	2260	JA2BHQ
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2251	AA6BB	2262	LA4HW

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5154	W1EWD	5167	KJ0H
5155	HB9WZ	5168	K9RHY
5156	PA3AMN	5169	JH2QAY
5157	KC0Q	5170	EA1MV
5158	DK5JI	5171	KS6O
5159	DJ4EY	5172	W1TVF
5160	DF7KG	5173	W7EDA
5161	WB4CCT	5174	WB4OSS
5162	KA9A	5175	KE5J
5163	W3GFB	5176	I8ZJZ
5164	NL7J	5177	KM5R
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Applications and reprints of the latest rules may be obtained by sending a self addressed stamped envelope (30 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.

We got a smile on that one. For though it has been said a thousand times and more, it is still the foundation of DXing that only a DXer understands another DXer, only a DXer understands DX. But the problem persists of having to convince those beyond the pale of the true knowledge that this simple truth exists.

But the way probably was not lost. The next time out this one would undoubtedly find a prime watermelon. He now has that knowledge. When he stood to leave his smile was both broad and warm.

"You know something," he said, "I believe everything you told me. DXers are different and selecting a watermelon can be an art in itself. But how about cantaloupes? How does one pick out one of those?"

We had to put a cautionary hand on his shoulder. "Careful," we said, "too much too soon can be dangerous. Learn DXing slowly and you will learn thoroughly. The

same with melons. There is always tomorrow to learn more about DXing."

San Felix

Some issues back there was mention of a possible San Felix operation by a DXer who has been to some CEO spots. If you recall the name and the call, and you read the bulletins and stuff like that, you will know that it was planned in May but may not come in November. But there are others to try, and Fred Henning, N4CNL, said that he and a crew would be on San Felix in September. If all went

well, you heard them a couple of weeks back.

Fred had a list of three complete stations, each with a linear and six operators. Some years back he used to operate the station at BV1US before that was shut down by the authorities there. San Felix has not been heard much in recent years, but the attention turned in that direction should have brought little cries of joy to the DXers who needed that one.

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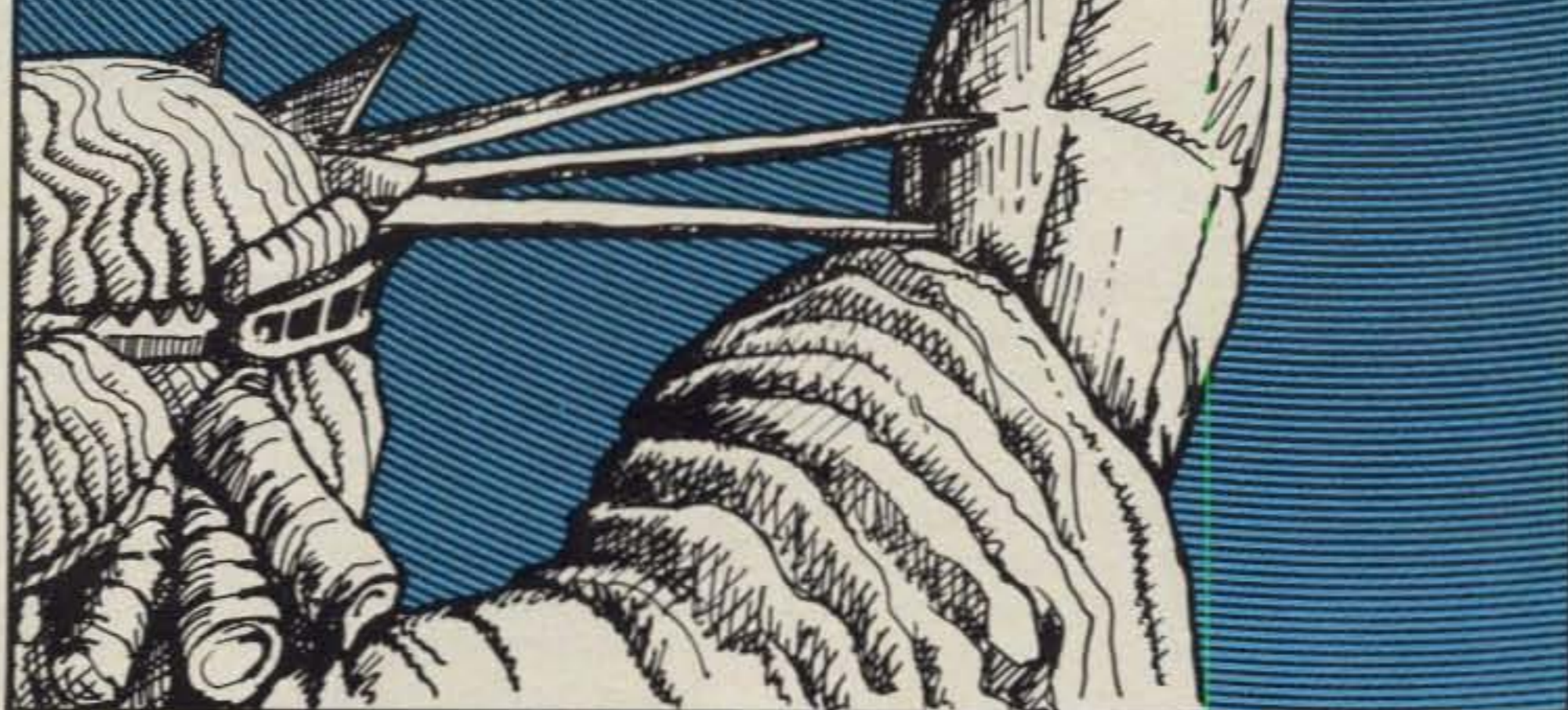
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Smiling in anticipation of the pileups, the Northern California DX Club crews for the CQ WW DX Tests prepared to depart for ZK2-Niue. From the left are Gary Cervo, WB6EXW, and Rubin Hughes, WA6AHF; They are the crew for the phone operation late this month. Next month Bruno Bienenfeld, AA6AD, and Cameron Pierce, K6RU, will pick up the c.w. action along with N6HR, Hiller Raamat, who will be the third member of the November effort, but who is not in the photo.

WA6AHF, for the phone action from October 21st, and Bruno Bienenfeld, AA6AD, Cameron Pierce, K6RU, and Hiller Raamat, N6HR, for the c.w. action starting November 25th. Though the license arrangements were completed back in July, the callsigns were not available at the time this was being written. But just take a look at the photo of the crew; one does not have to look too closely to know that these people have been working at the DX training table in preparation for this one.

QSLs will be handled by the Northern California DX Club, Box 608, Menlo Park, California 94025. S.a.s.e. or s.a.e. and IRC needed. Some of these have been heard from DX spots in other years. AA6AD was on from FO0GC a few years back, WA6AHF was on from HK0-San Andres, and N6HR has operated from overseas spots.

Pacific Maritime Nets

Earl Hinz, who writes for various yachting magazines, plus an occasional book as well, recently ran a list received from KH6CO on maritime nets active in the Pacific Ocean area. These nets are used by small boat sailors in the Pacific, plus some inter-island boats and offshore racers such as the Transpacific or the single-handed races to Hawaii or Japan. Currently there are about 400 small crafts listed in net files, and often it is interesting to check the nets. So here they are.

Seafarers Net	14313 kHz	0230Z	—
Pacific Maritime Net	14313	0530	KH6EO
Bay of Islands Net	3820	0715	ZL1BKB
Pacific Inter-Island	14313	0800	P29CC
SEA Net	14320	1200	—
Confusion Net	14305	2000	N7GYR/p
Pacific Maritime Net (Pacific & Caribbean)	21404	2300	KH6CO
SEA Maritime Mobile	14320	2400	VS6BE

your hands on the forms for the action this year. Hallowed by tradition, revered by DX contesters, loaded with trophies and wild action for participants from 160 to 10 meters, the phone uproar goes the last weekend of October, the c.w. action the last weekend in November.

Really! You can hardly afford to miss it. Send an s.a.s.e. to CQ at Hicksville for some log forms. You might even direct an s.a.s.e. in this direction as there is a supply available.

The great CQ WW DX Test will only come once this year; don't miss it. The c.w. test caps the Thanksgiving weekend.

*Then shook the hills with thunder riven
Then rushed DXers, to battle driven,
And louder than the bolts of Heaven,
"I QSL, you're five by seven!"*

There's your DX fight song. Join the joyous battle.

Needed Countries

Few DXers ever run out of needed countries. Like tomorrows, the end of need for DX countries never comes. In July *The DX Bulletin* released their most recent survey. Of the top ten, nine countries had not changed one bit in need. Bouvet moved from 12th to 10th displacing VU/Andamans which slipped to 12th. Don't ask why; it certainly was not because of Andaman activity. But comparisons are always interesting, although some say they are odious. But believing that DX is never thus, we dug out some figures from a few years back, and you may find it interesting, maybe even odious, to compare the 1981 *DX Bulletin* list with a 1978 list from the archives.

1981 DX Needed Countries	1978 Needed Ones
1. BY-China	1. BY-China
2. VS9K-Kamarans	2. 8Z-Neutral Zone
3. XZ-Burma	3. 3Y-Bouvet
4. ZA-Albania	4. XZ-Burma
5. VU-Laccadives	5. 1S-Spratly
6. VK0-Heard	6. VS9-Kamaran
7. 7O-South Yemen	7. ZA-Albania
8. XU-Cambodia	8. VK0-Heard
9. FB8W-Crozet	9. VU-Laccadives
10. 3Y-Bouvet	10. 7O-South Yemen

The 1978 list was derived from a detailed list worked out by W1AM and broken down into call areas. The ones listed are from the W8-land list and are representative of the needs although they did vary from call area to call area. There is a slow change always evident in DXing. You can easily note some that were big in 1978 but are not so now, 8Z having fallen far down the list. But Clipperton is making a comeback; in 1980 the *DX Bulletin* had it at #64, in 1981 it has jumped to #39. Clipperton will rise again!

Northern California DX Club At Niue

Five members of the Northern California DX Club will cover ZK2-Niue like a blanket during the coming CQ WW DX Tests in October and November, covering both the phone and the c.w. tests. The club teams will also operate before and after the tests, the phone activity going from October 21st to the 29th and the c.w. effort from November 25th to December 3. Ten through 160 will be the action with a lot of attention to the low bands during non-contest periods.

Those making the effort will be Gary Cervo, WB6EXW, and Rubin Hughes,

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15-4CD, 4 el. 15 mtr. Mono	\$ 96.00
15-3CD, 3 el. 15 mtr. Mono	\$ 89.00
10-4CD, 4 el. 10 mtr. Mono	\$ 82.00
10-3CD, 3 el. 10 mtr. Mono	\$ 69.00
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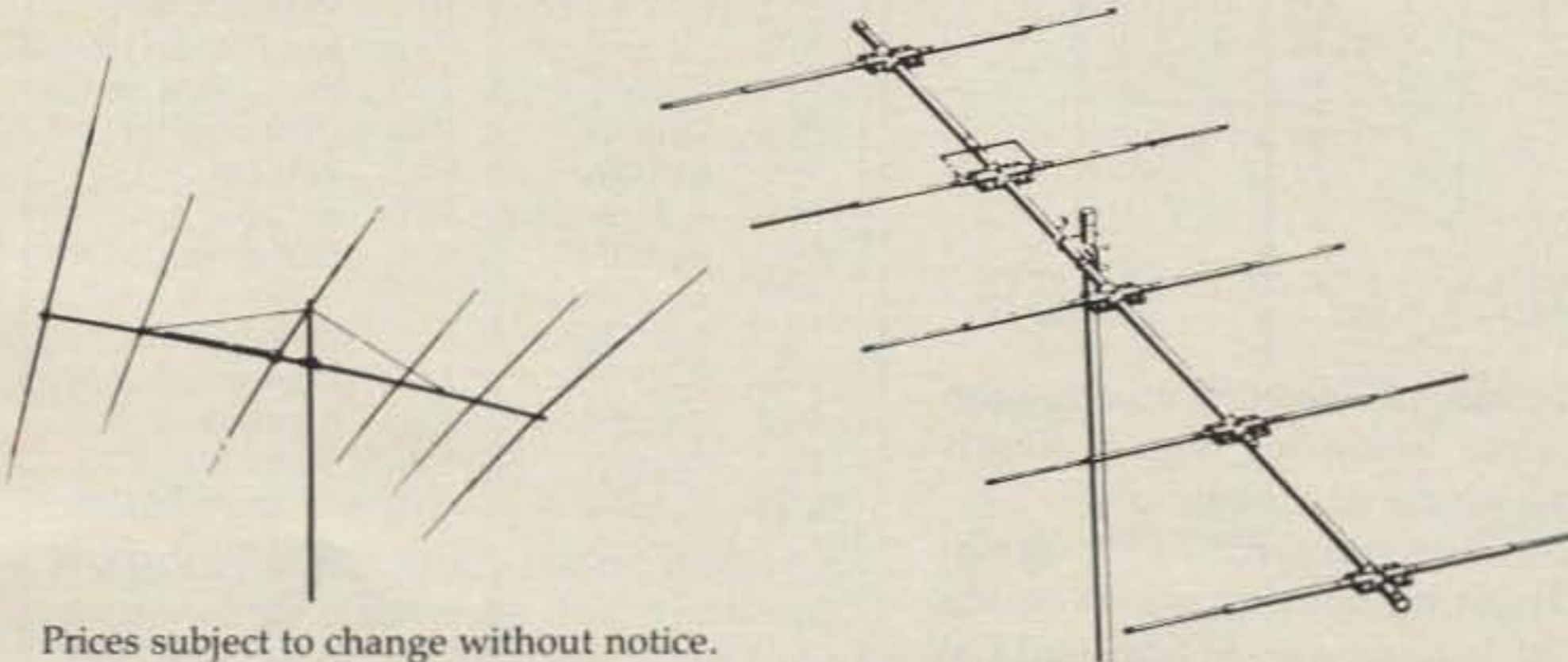
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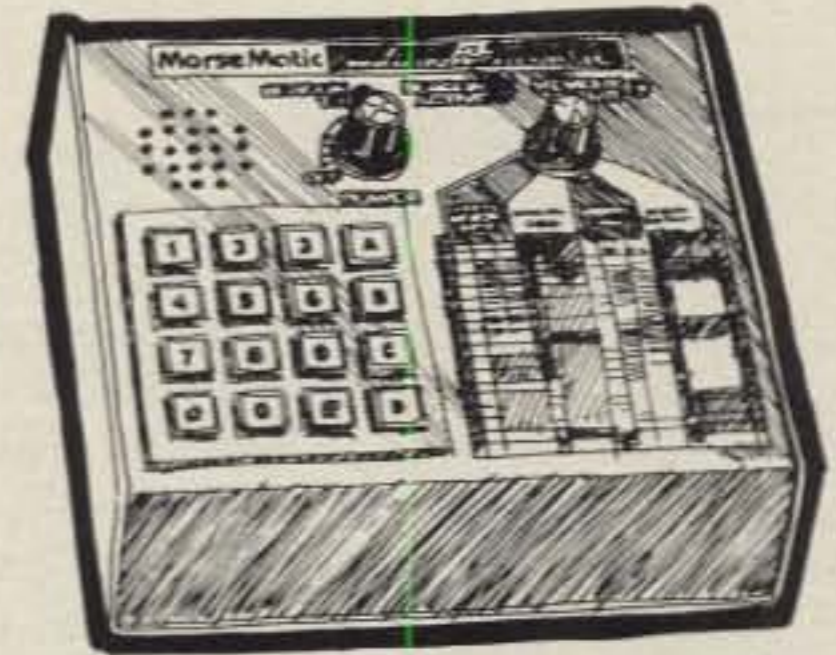
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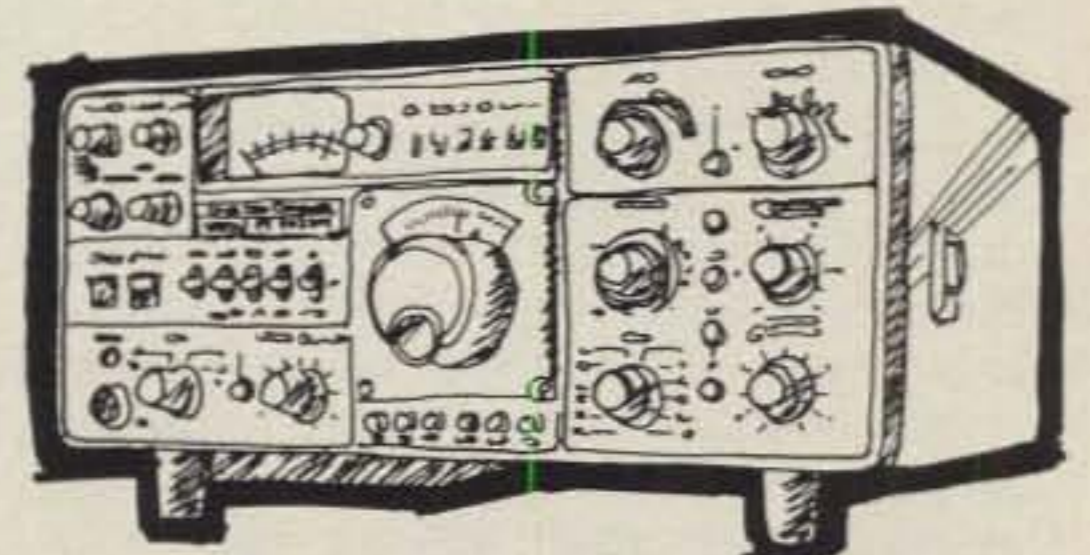


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Sometimes one might help. Sometimes one might check third-party limitations. In other years there have been problems with non-licensed operators using amateur bands, but the emphasis has been to wipe this out. Just be cautious. However, listening involves no obligation.

WPX Change Of Guard

Bob Huntington, K6XP, has handled the WPX Award chores for some six years, but will wind up his duties with next month's listing. Bob says he will be taking early retirement and wants to travel around the U.S. Norman Koch, K6ZDL, will be taking over the WPX duties. His address is P.O. Box 1351, Torrance, CA 90505.

There is always some regret when one loses a dedicated and tireless worker, and K6XP has been that for the years he handled WPX. Much of the joy in DXing would be lost if there were not the willing ones who give their time for the Awards and QSL duties and items of these kinds. Often unrecognized for their efforts, quick to be criticized if something does not go just right, these workers deserve more recognition. Here we hope that K6XP continues to enjoy DXing, as he has helped others with their enjoyment. Welcome to John Kroll, K8LJG, your new WPX master.

Bruce Blackburn, W4TA/JY9BB
Rolf Rasp, PY0RO
Norm Myers, N8MM/Bill Gilliland, N0TG
Ed Cushing, W4GW

Bob Schenck, N200/Stu Woodward, K4SMX
Pete Pederson, N5TP
JA1NRH/JA1IST

Bill Rohrer, W7IJ
Stu Woodward, K4SMX
Galen Graff, KB5FU
Enos Scherer

1979 8Z4 effort
1979 St. Peter and Paul
1978 Navassa
1962 Baja Nuevo, 1962 Serrana Bk
1962 San Felix, 1962 Juan Fernandez
1979 Spratly
1973 Spratly
1976 Okino Torishima
1979 Okino Torishima
1967 Heard Island
1977 Kingman
1980 Kingman
1969 Malpelo

Table I—A bit of "DX History."

DX History

Hugh Vandergrift, WA4WME, continues to add to his trove of DX History as embodied in his "25 Great DX-Peditions." But for those who may lean to the feeling that 25 may be just scratching the surface, WA4WME notes that a number of others have both slide and film DX shows, and he believes that these should be listed (see Table I).

This is a good start, but not the full potential. Gus Browning, W4BPD, has extensive slides of his trips. Lloyd and Iris Colvin have extensive records of their trips. Danny Weil is said to have records of his. Bob Denniston has the 1954 Clipperton effort.

WA4WME notes that he has the most

extensive file of film and slides on the 1978 Clipperton effort, he being part of the crew at FO0. He has put a lot of mileage on his "25 Great DX-Peditions" and advises that 1981 will be the end of his DX-roadshow. Darlee Magen, HC2YL, also published a book on her DX travels and adds to the permanent file of DX history.

Undoubtedly there are more. Perhaps some day a bit further down the pike an effort will be made to gather the various bits of DX history into a single library. It does appear to be a worthwhile effort.

Some Quick Notes

FO0FB, Ross Forbes, was back in Paapeete in mid-summer. This was his fourth visit to Polynesia, and he was aiming for a lot of activity, among other things. Ross notes that in that area you will hear the FO1 prefix, that being a license for v.h.f. activity. Elsewhere you should note the photo of FO8DF, Jean Parker, usually one of the stations being heard out of Pirae on the island of Tahiti.

There is another note on the Brazilian prefixes, this being an update coming from PT2TF, Therezinha Felix Cardoso, who has been operating portable in the Bethesda, Maryland area. For those keeping track of the Brazilian prefixes, Therezinha says they are as follows:

PP1 Esp. Santo	PY1 Rio de Janeiro
PP2 Goiaz	PY2 Sao Paulo
PP5 S. Catarina	PY3 Rio Grande de Sul
PP6 Sergipe	PY4 Minas-Gerais
PP7 Alagoas	PY5 Parana
PP8 Amazonas	PY6 Bahia
PR7 Paraiba	PY7 Pernambuco
PR8 Maranhao	PY8 Para
PS7 Rio Grande N.	PY9 Mato Grosso
PS8 Piaui	PU8 Amapa
PT2 Brasilia	PV8 Roraima
PT7 Coara	PW8 Rondonia
PT8 Acre	PY0 Offshore islands

KS6O, KR6Q, SM0CCM, and K6TMB were on from the Aland Islands during the July Radiosport Contest signing K6TMB/OH0. Before the test you might have caught them with their own calls portable OH0. Anyhow, QSL to their home QTHs in the late CBs, except KS6O used to be KB6YU and you will find him under that listing. The group used OH2BH's setup in the island group.

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128 120ma \$ 49.00 C4410
128 250ma \$ 45.00 C4411
174 300ma \$150.00 C4445

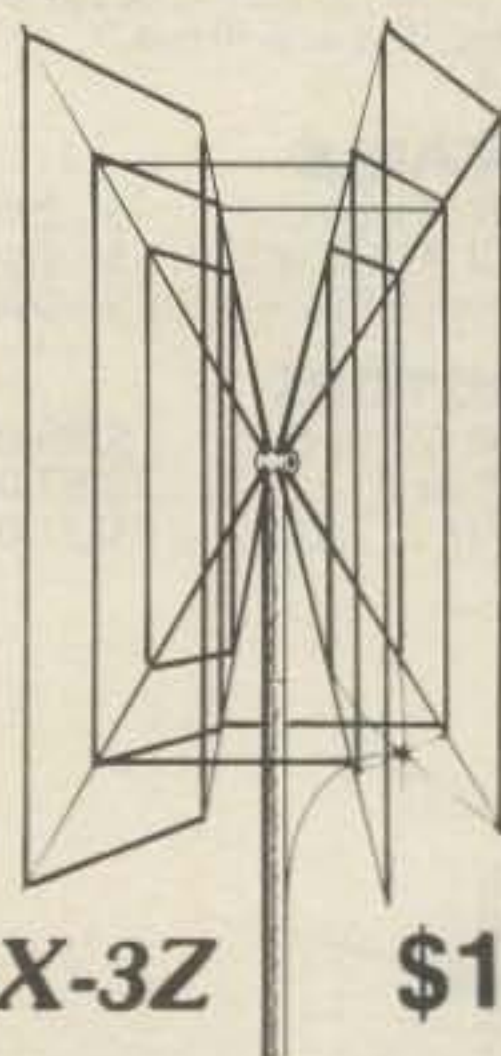
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934	WB4CCT	937	YU1FD
935	VE3FEA	938	JA2HMF
936	YU2QK		

S.S.B.

1411	K4KZZ	1415	WA4OET
1412	K9TI	1416	E18AU
1413	KP4AE	1417	I2JSB
1414	K9VIQ	1418	DF7XY

C. W.

2088	OZ1DKG	2091	JA7BVA
2089	OZ2JZ	2092	W0CON
2090	HB9BOW	2093	JA2GAL

Endorsements

Mixed: 450 WB4CCT, 500 KO4M, W9JR, JA2HMF, 550 VE3FEA, 600 KB8EC, 650 I1ZQD, YU2QK, YU1FD, 700 WA3GNW, IT9QDS, 750 DJ5VQ, 800 I5AFC, 850 DA2DC, AB4D, 1200 K5DB, IN3ANE, N4UH, 1750 N4MM, 2150 YU2DX.

S.S.B.: 300 K9TI, KP4AE, K9VIQ, WA4OET, E18AU, 400 KA3A, WA2JAS, 450 KB9UG, 500 K9UAA, SM2AHP, JH5FQO, 550 DK5WQ, 600 K4KZZ, VK3NDY, IBINW, K9HDZ, 700 IV3YRN, 750 KL7AF, 800 ZL1AGO, I2JSB, 850 CT1UA, 1400 VE3WJ, 1450 ZL3NS, 1500 N4MM, IBKDB.

C.W.: 300 OZ1DKG, HB9BOW, W0CON, JE2GAL, 350 OZ2JZ, 400 WA4NEU, WD4RAF, DJ0BC, KA7T, JA7BVA, 450 JA3ARM, 500 AG4A, DJ5VQ, VE2BP, 600 KA3A, 800 OK1DKR, 900 JA1KRU, 1200 N4MM.

10 meters: WA4NEU, VK3NDY, VE3FEA, NN4Q, WA2IFS.

15 meters: WA4NEU, VE3FEA, JA2KVD, VK3NDY, JA7BVA.

20 meters: K7CU, WA4NEU, I3MLD.

40 meters: WA4NEU, AB4D.

80 meters: WA4NEU, KA3A, AC2J.

Asia: DA2DC, I3MLD, DJ5VQ.

Europe: WA4NEU, VK3NDY, WA4YCI, VE3FEA, JH5FQO, DA2DC, IBINW, HB9BOW.

No. America: WA4NEU, VE3FEA, DA2DC, K7CU, JA2KVD, NN4Q, K9VIQ, KA7T, WA2IFS.

Oceania: VK3NDY, JA3ARM, K2VV.

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, 5014 Mindora Dr., Torrance, Calif. 90505 U.S.A.

5BWAZ

Stig A. Lindblom, LA7JO, is the eighth station in the world to gain 5BWAZ, working all of CQ's 40 zones on 5 bands. Stig was first licensed in 1971, getting his first introduction to amateur radio through Boy Scout activity in Norway when he was twelve years old.

He lives in Trondheim, is a member of the Trondheim DX Club, and his XYL is Grethe, LA9IV. Stig is 26 years old, and there are two harmonics in the family. A member of the CQDX Honor Roll and a holder of the CQDX WPX Award, Stig also holds the U.S. County Award and the 5BDXCC Award. Usually active in contests, Stig operates from three different QTHs about Trondheim using a Yaesu 901DM line at the home apartment and weekend locations. At his office he uses a Drake TR-7. He uses monobanders on 10/15/20 meters at the weekend location and the office. These are supplemented by inverted Vees and verticals for 40/80 meters at each spot.

Stig works in sales at an electronic factory, which may explain some things if you are wondering. He reports that the Trondheim DX Club, often heard in DX action, has but fourteen members.

He notes that as he gets deeper and deeper into DXing, he finds that he is

DXers
Contesters
5 Band DXers

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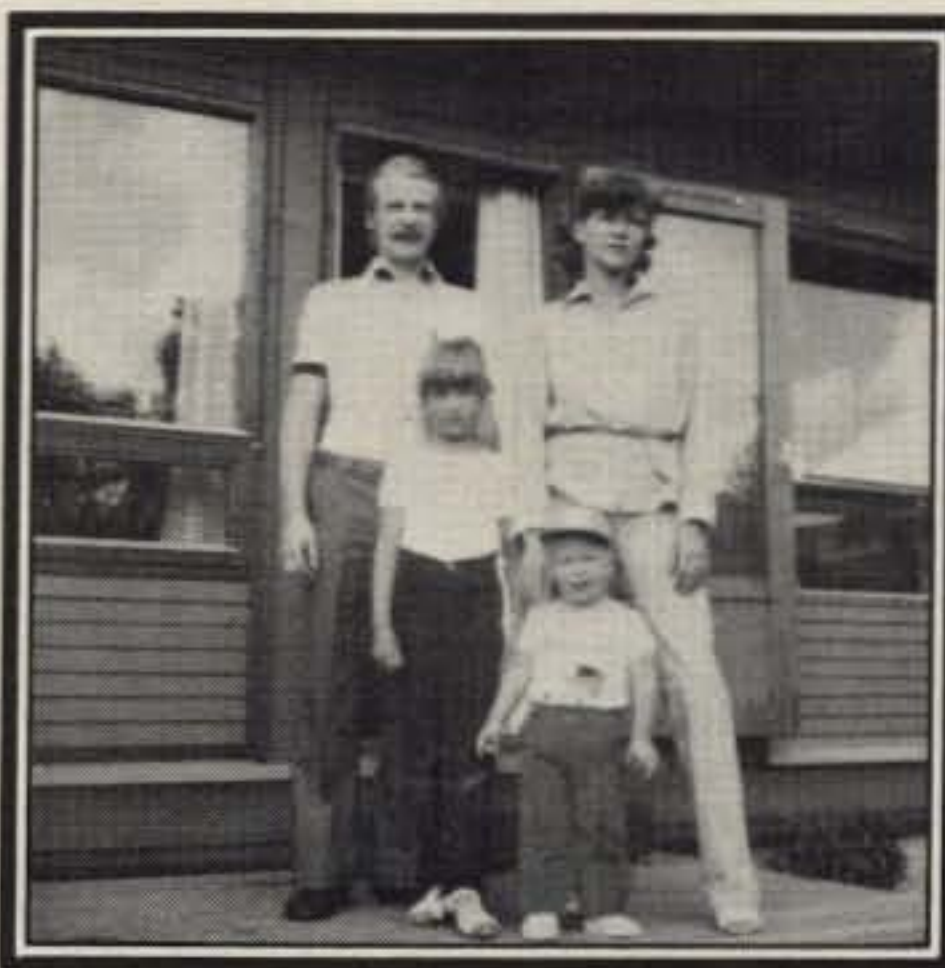
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CIRCLE 36 ON READER SERVICE CARD



Stig A. Lindblom, LA7JO, shown here with his XYL, Grethe, LA9IV, is the eighth to win the 5BWAZ Award. A member of the Trondheim DX Club, Stig keeps monobanders for 10/15/20 meters flying over his office, one of his three operating QTHs.



Hannu Nieminen, OH1XX, shown here with his XYL, Kaarina, is the tenth DXer to achieve 5BWAZ since the award was created. Previously achieving 80 meter WAZ, Hannu is surrounded by a family of amateurs, OH1QP, OH1BN, and OH2BAD, brother, nephew, and brother-in-law, respectively.

spending more time on c.w., although he still works a lot of s.s.b. He likes to experiment with antenna arrays, jump into the contests, and visit with friends. His current DXCC total worked is 309. He is looking for a couple more.

Hannu Nieminen, OH1XX, is the tenth DXer to achieve 5BWAZ, this being added to the 80 meter WAZ Award on phone.

An electrician, Hannu uses a Kenwood TS-820 with an outboard VFO and a home-brew linear. He uses a 3-element quad tribander up 100 feet for 10/15/20 meters, a 4-element sloper on 40, and ground-plane and dipole on 80. All of these he made himself.

5 Band WAZ

Standings as of July 1, 1981

All 200 zones worked:

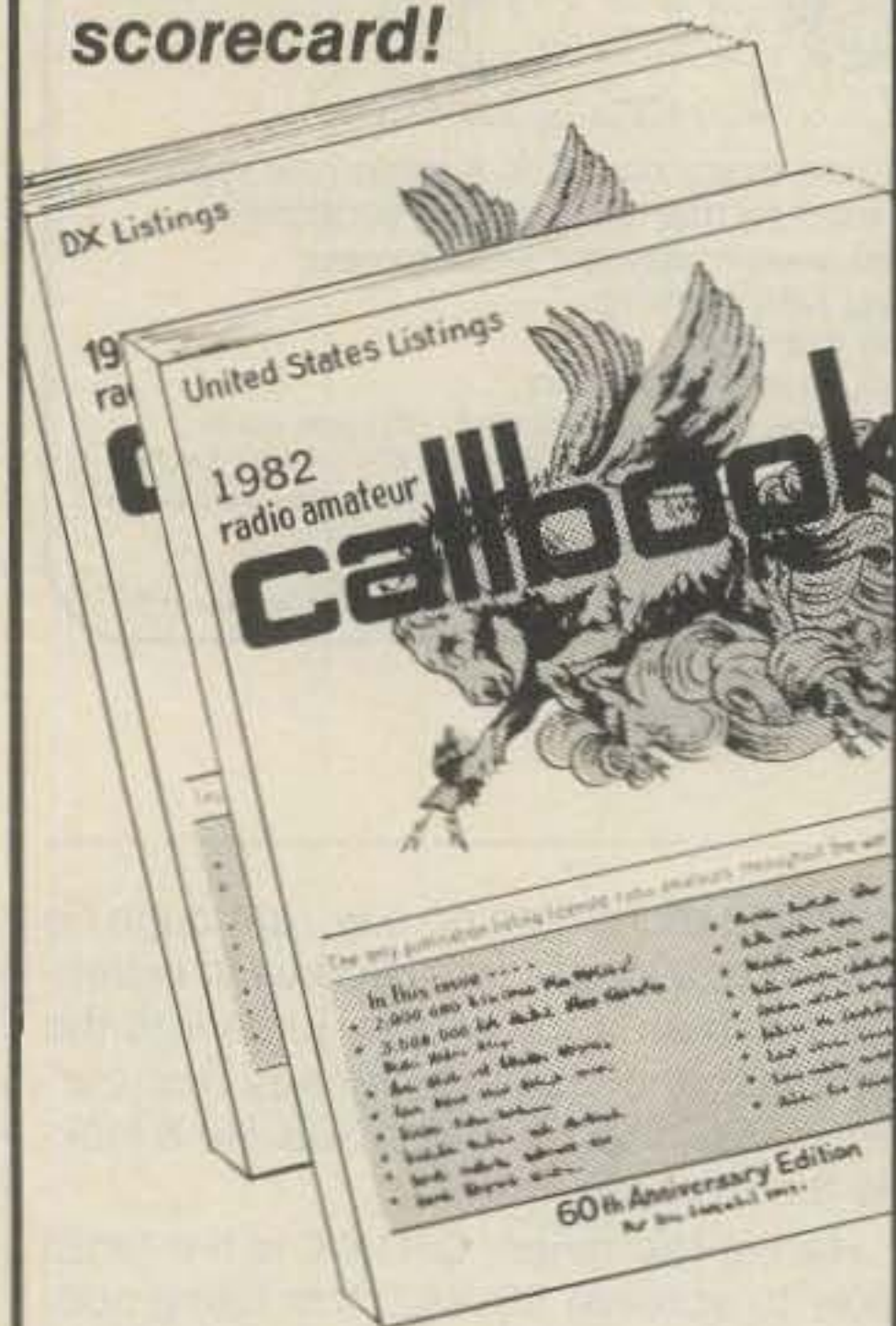
1. ON4UN, John Devoldere (Belgium)
2. K4MQG, Gary Dixon (U.S.A.)
3. SM4CAN, Kent Svensson (Sweden)
4. AA6AA, Steve Orland (U.S.A.)
5. W8AH, Albert Hix (U.S.A.)
6. W6KUT, E. A. Andress (U.S.A.)
7. EA8AK, Fernando Fernande (Spain)
8. LA7JO, Stig Lindblom (Norway)
9. EA3SF, Fernando Blenert (Spain)
10. OH1XX, Hannu Nieminen (Finland)
11. EA8OZ, Julio Rosello (Spain)
12. W0SD, Edward Gray (U.S.A.)

The top 10 contenders for 5 Band WAZ:

1. K5UR, 199
2. W8GT, 195
3. LA9GV, 191
4. N6DX, 191
5. DL3RK, 190
6. WA4JTI, 190
7. W8UVZ, 190
8. OK1AWZ, 190
9. W1NG, 190
10. ZL1BIL, 190

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The WPX HONOR ROLL

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MIXED

2154	F9RM	1575	W2NUT	1309	SM7TV	1108	KF2O	836	LA7JO
2151	YU2DX	1550	N6CW	1245	PA2TMS	1019	PY4OD	800	K7AGJ
1975	K6XP	1538	PA0SNG	1238	K5DB	1018	SM3EVR	793	DK2BL
1942	K6JG	1525	DJ7CX	1236	YU1AG	1017	W7CB	775	WB8YQX
1863	VE3GCO	1467	N6JV	1205	DL1MD	1001	YU3APR	775	K7AGJ
1850	K2VV	1445	N2AC	1190	N6FX	1000	K8LJG	764	N4IB
1841	W2NC	1434	YU2RTW	1186	K6ZDL	920	W0IUB	756	WB8ZRL
1738	N4MM	1411	N4NO	1181	W0SFJ	914	N6JM	753	N3RL
1713	N4UU	1403	N9AF	1175	IN3ANE	903	KL7AF	750	KA3A
1693	W3PVZ	1368	YU1ODS	1168	I6SF	902	K6DT	700	W6YMH
1647	W7LLC	1360	AA4A	1155	W8CNL	865	DA2DC	700	NN4Q
1639	W4BOY	1350	KE4I	1151	UK3AAO	859	UA3FT	661	K2OF
1610	K5UR	1332	W9FD	1148	JH1VRO	853	I2MQP	644	DK7XX
1577	YU7BCD	1325	N6AV	1114	WA1JMP	851	K8CH	623	W0JIE

S.S.B.

2066	F9RM	1364	K5UR	1070	W0YDB	893	YU1AG	702	KL7AF
1833	I0ZV	1300	PA0SNG	1035	W2CC	892	W2NC	657	I5AFC
1764	I0AMU	1268	YU7BCD	1023	WA4QMO	867	I6ZJC	654	WB8ZRL
1742	K6XP	1262	N4UU	1010	N4NO	853	I2MQP	650	AC2J
1682	K2POA	1250	I0MBX	1001	W4BOY	852	CT1UA	633	N3RL
1672	K6JG	1181	OZ5EV	1001	WD8MGQ	850	ZP5RS	629	YU3APR
1543	N4MM	1163	AA4A	996	JH1VRO	830	N2AC	619	VK3NDY
1528	K2VV	1150	N2SS	989	OE2EGL	810	I6NOA	606	VK6YL
1500	I8YRK	1127	YU7ODS	967	PA2TMS	802	I4LCK		
1484	I8KDB	1121	DJ6VM	938	N6FX	770	WA2FKF		
1475	ZL3NS	1105	WB2NYM	932	W6MYV	743	WB8YQX		
1408	I4ZSQ	1072	DL1MD	909	PY3BXW	716	EA3KW		

C.W.

1640	W8KPL	1333	K2VV	1218	N4MM	928	I6SF	750	N4YB
1614	W2NC	1307	G2GM	1127	W1WLW	900	VE7CNE	735	DL1MD
1550	ON4QX	1288	YU7BCD	1126	VO1AW	854	PY4OD	703	KF2O
1491	WA2HZR	1286	N2AC	1108	VK4SS	851	KH6HC	700	K8LJG
1471	K6JG	1261	W4BOY	1066	YU7ODS	827	JE1JKL	679	I1YRL
1467	DL1QT	1248	K5UR	1031	K6ZDL	813	YU3APR	662	AA4A
1434	K6XP	1235	W3ARK	1002	YU1AG	808	I5IZ	615	KA3A
1428	N6JV	1234	W9FD	989	LZ1XL	802	DJ3LR		
1415	N4UU	1220	N4NO	964	N6FX	750	JH1VRO		



One of the signals often heard from Czechoslovakia, this is Jiri Bruchanov, OK2PDE, a well-known DX-type and a WPXer.

Hannu says that the low bands give him the most problems. On the 80 meter WAZ zones 1, 6, and 31 were the difficult ones. Hannu's older brother, Jori, is OH1QP. His nephew is OH1BN. OH2BAD, Mikka, is married to Hannu's sister, Raili. At the family gatherings there is always Topic "A," also known as "DX."

Hannu's XYL is Kaarina. He is a member of Salon Radiokerhory, the club call OH1AD. Hannu with this 5BWAZ joins the few who have been able to gain what is probably the most difficult award in DX-ing.

QSL Information

WD8NKT advises that he no longer handles QSLs for XE1RL. Ramon sold off his equipment, and if you hear an XE1RL on the air, it may be something else. WB4RRK has bowed out on VP5BD and VP5DM, no logs having been received.

F00FB to WB6GFJ
PZ2AC to WB4RRK
VP5EE to WB4RRK
XE1LCH to WD8NKT
XE1DX to WD8NKT
XE1MDX to WD8NKT
4Z4XX to WB6EGD
8P6JB to WB4RRK
8P6JC to WB4RRK
8P6JG to WB4RRK
8P6KV to WB4RRK
8P6KX to K2QIE
8P6KV to WB4RRK
8P6LB to WB4RRK
8P6MH to K2QIE
9Y4LL to K2QIE
9Y4JW to K2QIE
PP2ZDD to W4BAA (not W2BAK)

Kevin Wells, KA3GGP, is looking for some QSL Managerial duties. Kevin says that it doesn't matter whether it is contest or DX work, he is eager to help. You can reach him at 541 Sunnyfield Drive, Monroeville, PA 15146. That is in the Pittsburgh area.

For those seeking QSL Manager duties, it does pay to advertise. That is why the list of volunteers is run in this column. However, it is also helpful to lurk in wait on the bands and possibly pick up a needy DX type who might need a manager. Watch for those whose QSLing is be-

CQ DX Awards Program

S.S.B.

1035	IN3VZE	1038	KP4AE
1036	WA4UYB	1039	VE3IUE
1037	15VSW		

C.W.

501	LA1ND	503	WA4NEU
502	KE9U	504	WA7NXL

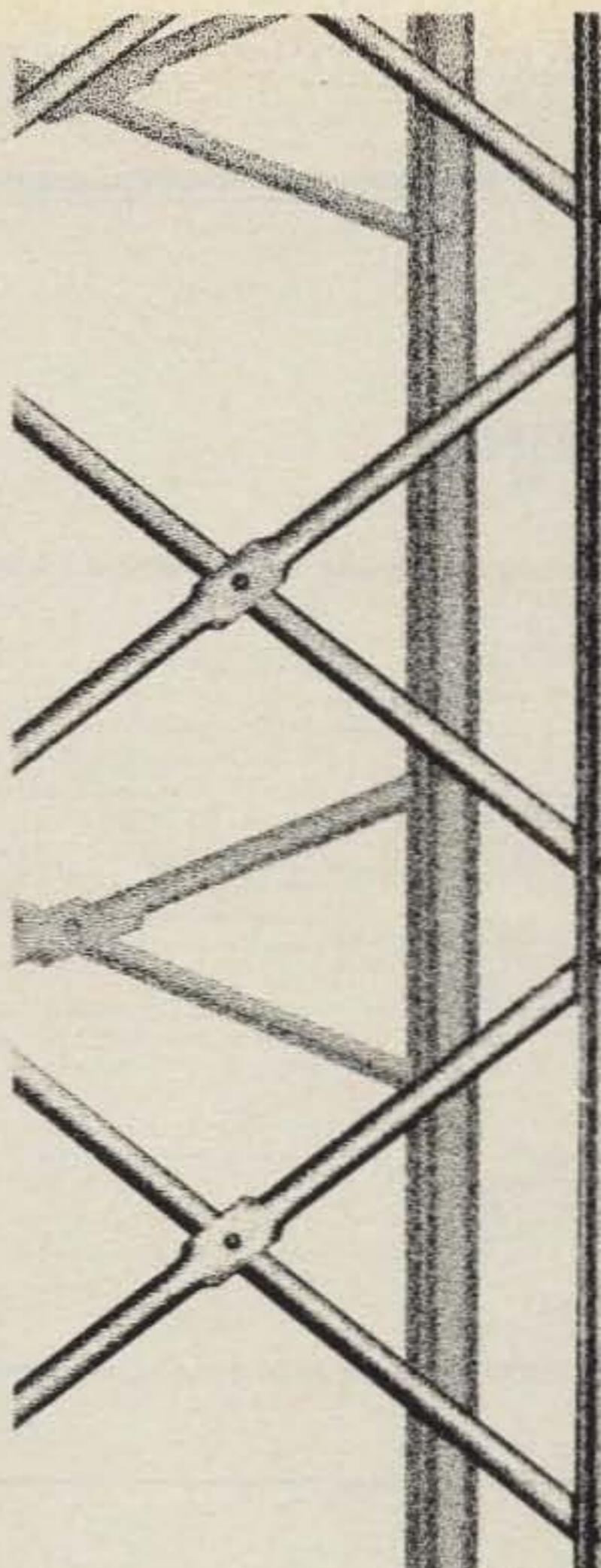
S.S.B. Endorsements

310	W0SD/313	275	VE4AT/275
310	ZL1AGO/312	275	K0GT/275
310	13LLD/310	250	18KCI/266
310	K8LJG/310	250	ZL1BOQ/254
300	XE1J/306	250	JH4PRU/251
300	DJ7CX/300	200	N7ASL/235
300	K1UO/300	200	KB0C/208
300	YV5DFI/308	200	JA9DDM/217
275	JA5PUL/292	200	WB3IGR/201
275	W6DN/297	150	GI3YDH/180
275	W7FP/279	150	K9BQL/150
275	K8CMO/296	28 MHz	WD4GSG
275	VE3IUE/280	28 MHz	WA2YEX
275	XE1OX/275	28 MHz	K9BQL

C.W. Endorsements

300	K3FN/301	200	K9TI/202
275	DJ7CX/287	200	WD9IC/204
200	IT9QDS/214		

The 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.



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CIRCLE 31 ON READER SERVICE CARD

ing done direct. Some do this because they like to handle the cards. But there are some who would welcome some help. You might ask over the air, but it would be far better to write a letter. Just make sure that the arrangements, such as getting the logs, are understood beforehand. Sometimes this is a problem.

Some Faroes Notes

Leon Tallman, W1JTI, was being heard a month or so back signing /OY and should be signing OH1KH by now. QSLs for Leon go via the OY-Bureau. OY3H handles the WAQY Award. Non-European stations need only 10 points for WAQY I, 15 points for WAQY II, and 25 points for WAQY III. OY6FRA and 6NRA are club stations and count double. Other FRA members count 1 point on 10/15/20 meters, two points on 40/80. Certified list and 10 IRCs brings the award from Heri Olsen, OY3H. You can get more information on the award from Heri. Should you want some information on amateur activity in the Faroes, drop a line to Martin Haasen, OY7ML.

73, Hugh, WA6AUD

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Receiver Kits and \$1.50, Power Supply add \$2.00, Antenna add \$5.00, Option 1/2 add \$3.00, For complete system add \$7.50.

HOWARD/COLEMAN TVRO CIRCUIT BOARDS

DUAL CONVERSION BOARD

This board provides conversion from the 3.7-4.2 band first to 900 MHz where gain and bandpass filtering are provided and, second, to 70 MHz. The board contains both local oscillators, one fixed and the other variable, and the second mixer. Construction is greatly simplified by the use of Hybrid IC amplifiers for the gain stages. Bare boards cost \$25 and it is estimated that parts for construction will cost \$270. (Note: The two Avantek VTO's account for \$225 of this cost.)

47 pF CHIP CAPACITORS

For use with dual conversion board. Consists of 6-47 pF.

70 MHz IF BOARD

This circuit provides about 43 dB gain with 50 ohm input and output impedance. It is designed to drive the HOWARD/COLEMAN TVRO Demodulator. The on-board band pass filter can be tuned for bandwidths between 20 and 35 MHz with a passband ripple of less than 1/2 dB. Hybrid ICs are used for the gain stages. Bare boards cost \$25. It is estimated that parts for construction will cost less than \$40.

.01 pF CHIP CAPACITORS

For use with 70 MHz IF Board. Consists of 7-.01 pF.

DEMODULATOR BOARD

This circuit takes the 70 MHz center frequency satellite TV signals in the 10 to 200 millivolt range, detects them using a phase locked loop, deemphasizes and filters the result and amplifies the result to produce standard NTSC video. Other outputs include the audio subcarrier, a DC voltage proportional to the strength of the 70 MHz signal, and AFC voltage centered at about 2 volts DC. The bare board cost \$40 and total parts cost less than \$30.

SINGLE AUDIO

This circuit recovers the audio signals from the 6.8 MHz frequency. The Miller 9051 coils are tuned to pass the 6.8 MHz subcarrier and the Miller 9052 coil tunes for recovery of the audio.

DUAL AUDIO

Duplicate of the single audio but also covers the 6.2 range.

DC CONTROL

This circuit controls the VTO's, AFC and the S Meter.

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11C05DC	1 GHz Counter Divide by 4	50.00
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Frequency response	40 MHz to 300 MHz	
Gain:	300 MHz 16 dB Min., 17.5 dB Max.	
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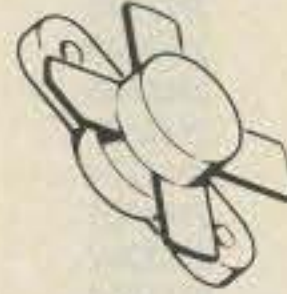
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Efficiency = 50%



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- Common Collector Characterization



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PRD

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109J,I	Fixed Attenuators	25.00
WEINSCHEL ENG.	2692 Variable Attenuator +30 to 60dB	100.00

COMPUTER I.C. SPECIALS

MEMORY	DESCRIPTION	PRICE
2708	1K x 8 EPROM	\$ 5.00
2716/2516	2K x 8 EPROM 5Volt Single Supply	15.00
2114/9114	1K x 4 Static RAM 450ns	6.99
2114L2	1K x 4 Static RAM 250ns	8.99
2114L3	1K x 4 Static RAM 350ns	7.99
4027	4K x 1 Dynamic RAM	2.99
10 For \$20.00		
100 For \$100.00		
4060/2107	4K x 1 Dynamic RAM	3.99
4050/9050	4K x 1 Dynamic RAM	3.99
2111A-2/8111	256 x 4 Static RAM	3.99
2112A-2	256 x 4 Static RAM	3.99
2115AL-2	1K x 1 Static RAM 55ns	4.99
6104-3/4104	4K x 1 Static RAM 320ns	14.99
7141-2	4K x 1 Static RAM 200ns	14.99
MCM6641L20	4K x 2 Static RAM 200ns	14.99
9131	1K x 1 Static RAM 300ns	10.99

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MC6800L	Microprocessor	13.80
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MC6821P	PIA	8.99
MC68821P	PIA	9.99
MCM6830L7	Mikbug	14.99
MC6840P	PTM	8.99
MC6845P	CRT Controller	29.50
MC6845L	CRT Controller	33.00
MC6850L	ACIA	10.99
MC6852P	SSDA	5.99
MC6852L	SSDA	11.99
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MC6860CJCS	0-600 BPS Modem	29.00
MC6862L	2400 BPS Modem	14.99
MK3850N-3	F8 Microprocessor	9.99
MK3852P	F8 Memory Interface	16.99
MK3852N	F8 Memory Interface	9.99
MK3854N	F8 Direct Memory Access	9.99
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6530	Support For 6500 series	15.99
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TMS6011NC	UART	9.99
MC14411	Bit Rate Generator	11.99
AY5-4007D	Four Digit Counter/Display Drivers	8.99
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8251	Communication Interface	9.99
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MC14412	Low Speed Modem	14.99
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MC14409	Binary to Phone Pulse Converter	12.99
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MC1489L	RS232 Receiver	1.00
MC1405L	A/D Converter Subsystem	9.00
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MC1408/6/7/8	8 Bit D/A Converter	4.50
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MC1349/50	Video IF Amplifier	1.17
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LM562	Phase Lock Loop	10.00
LM565	Phase Lock Loop	2.50
LM567	Phase Lock Loop	2.50

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In the July issue WB8LBV had us whistle for our car and this month he adds another helpful gadget for the mobile that's just as simple to build and use.

How To Build And Install An Ignition Keyhole Light

BY MARTIN BRADLEY WEINSTEIN*, WB8LBV

Some cars have it, some don't. I'm talking about that handy little light that illuminates the ignition keyway for a moment whenever you enter the car. This is one heck of a lot more dignified than groping around the steering column with your hands trying to find where Detroit or Osaka put the blasted thing.

My car doesn't have one. But it does have lots of little courtesy lights everywhere, and a map light in the dashboard cowl very close to the ignition keyway. Aha! If your car doesn't have a map light,


chances are it has an overhead light that can accomplish the same purpose.

My mobile is a Dodge, so one side of the courtesy lights is wired hot and the door switches close the path to ground. This circuit uses that ground connection to turn on a general-purpose PNP switching transistor (I_C of 150 mA), which charges the capacitor.

The second transistor is a VMOS power FET (n-channel), like a VN40AF or VN66AF. The capacitor charge holds its gate on; in fact, gate leakage is the only discharge path, and gate leakage on these devices is so low you may want to substitute a smaller-value capacitor.

The 1N4001 diode assures that only one light is affected by the VMOS switch, not the whole kaboodle of courtesy lights.

The whole circuit can usually fit behind the light housing, tapping right into the connecting wires already there. If your car keeps the lamps grounded and switches the hot side, you have two choices. The first, and more difficult at this writing, is to find a p-channel VMOS FET and flop the circuit. The other alternative is to use a relay with the second circuit shown.

As the masthead on Scripps-Howard newspapers says, "Give the people light and they will find their own way." 

*c/o CQ Magazine

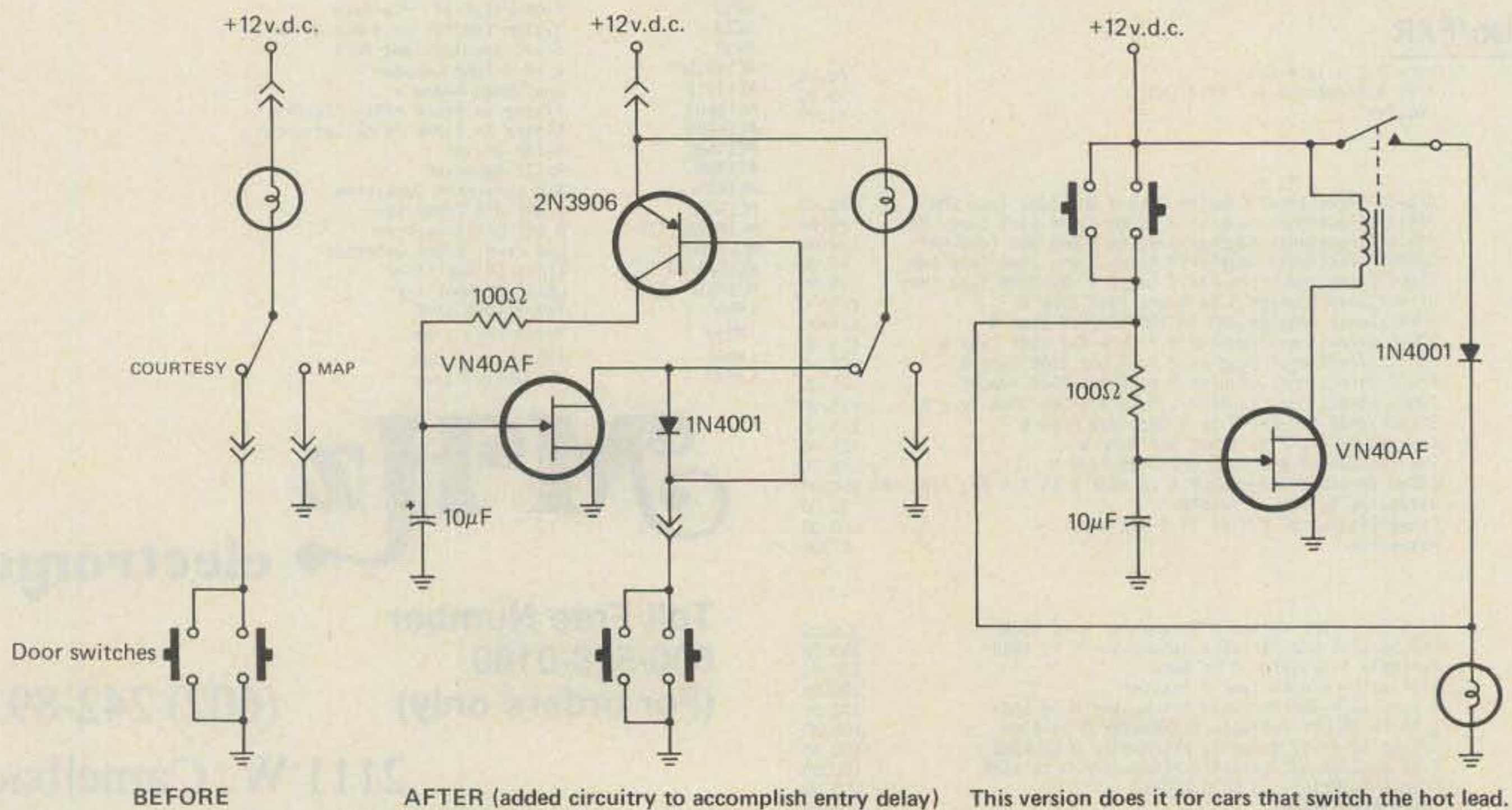
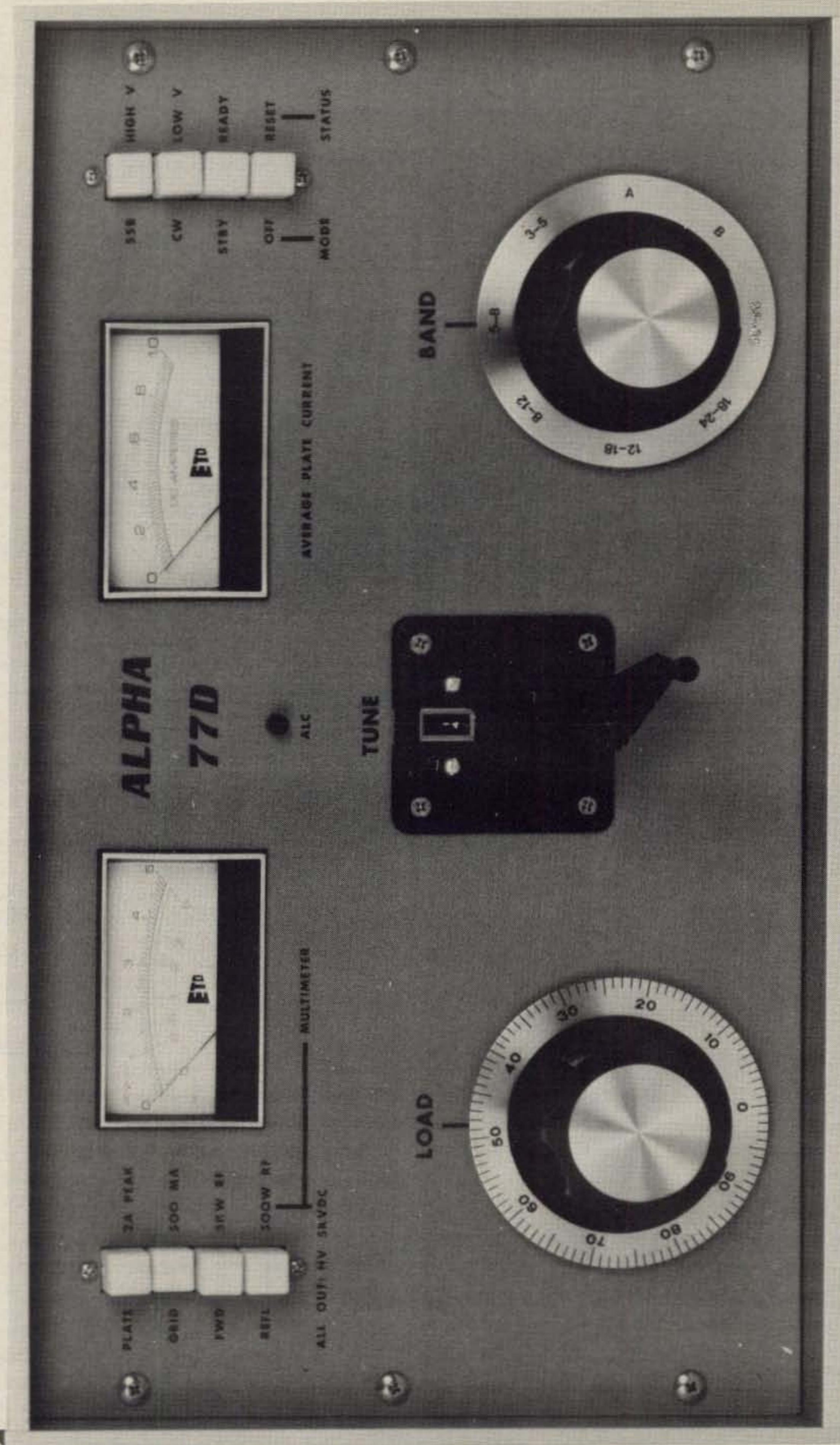


Fig. 1—Simple before and after circuitry for adding an ignition keyhole light to your mobile. Positive and negative ground versions are shown.

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CIRCLE 76 ON READER SERVICE CARD

Awards

NEWS OF CERTIFICATE AND AWARD COLLECTING

The October "Story of The Month" as told by Paul is:

Paul Schuett, WA6CPP All Counties #299, 8-25-80

"What can I say about myself? I'm not particularly interesting (but that is not true!—Ed., W2GT).

"I teach high school—business communications, accounting, and typing. I have been licensed since 1969, started as a technician and went to advanced.

"Stumbled across the county hunters' net and thought it was a lot of fun. Operating times dictated by school schedule, so did most of it during summers and on Sundays except for a sabbatical leave I had in 1977.

"All Counties took about 11 years. Gene, N4ANV, got my last 3 in North Carolina, the last being Lenoir. It sure takes a lot of work to do this, and without a lot of people helping me, it would have taken a lot longer.

"My XYL is WA6CNC who talks only to me, thinking this whole thing is a bit idiotic. We are proud of our three children, ages 13, 18, 19. I am 45.

"Formerly in the radio-TV business, I keep my 1st class radiotelephone license renewed, but don't do too much there anymore.

"Originally from Illinois, I moved to Washington after graduating from college, and moved to California 5 years later.

"Am former VP of the Stockton Amateur Radio Club, former director of WCARS, currently active in RACES. I enjoy collecting certificates and awards, applying for those I see for which I qualify. Some of the more difficult ones are 5BWAS #75, DXCC with over 250 countries, WPX, WAZ, Commonwealth DX, BCRTA (the first one I got was the Wheat City Certificate making the contacts on the net). Contests won include the SS, ARRL-DX, California QSO, each VHF, VE-W. All operation on s.s.b. or f.m. on 2 meters.

P.O. Box 73, Rochelle Park, NJ 07662



Paul Schuett, WA6CPP, at his operating position.



Greg, Andrea, and Stan Schuett.



Carlotta and Paul Schuett, WA6CNC and WA6CPP.

"Lately I've been on the v.h.f. traffic net and working with RTTY. Maybe I can get a few thousand counties on that mode."

Awards Issued

Although no new applications were received for All Counties, Bill Winnegar, N6UW (ex-W6CLM), did upgrade endorsements for his USA-CA-500 through All Counties #120 of February 1975 from Mixed to All S.S.B., All Mobiles, All 14.3.

Ted Long, K0UQV, added to his collection USA-CA-1500 and 2000 endorsed Mixed.

Herb Morgan, WD9GBH, obtained USA-CA-500 through USA-CA-2000 endorsed All S.S.B., All Mobiles, All 20.

Dave Popkin, W2CC, picked up USA-CA-1500 endorsed Mixed.

Fred Van Aalst, WD4RAF, collected USA-CA-1000 endorsed All A-1 Novice bands.

USA-CA-500 Certificates, endorsed Mixed, went to:

William Murray, GM2AWW.

Emanuel Travares Filho, PY1NEW.

Stig Lindblom, LA7JO.

Michio Ogawa, JA1MIN.

Yuusaku Harada, JA7DY.

Roger Tavella, K1BHY, won USA-CA-500 endorsed All 50 MHz, A-3. #9 so endorsed.

Len De Klerk, S83T, requested USA-CA-500 endorsed All S.S.B. #1 to S8.

USA-CA-500 Certificates, endorsed All A-1, claimed by:

Delros Byrne, KA8EBG, also All Novice Bands.

Michael "Joe" Chusid, AK9Z.

Awards

The Philippine UN-DU Award: This Award was described and pictured on page 65 of CQ February 1981. Due to increased cost of printing and air mail rates, as of 31 July 1981 the cost has increased to \$12 U.S. instead of \$6. This Award is issued by The Philippine Amateur Radio Association, Inc., 17th Floor, Philippine Communication Center Building, Ortigas Avenue, Pasig, Metro Manila, Philippines.

Oriental DX Club Awards: This relatively newly organized DX club with members in Japan and the Philippines offer these two new Awards:

Worked All DU Award (WADU): Available to all licensed amateurs throughout the world who can show proof

USA-CA Honor Roll

2000		500	
KQ UQV	478	GM2AWW	1622
WD9GBH	479	K1BHY	1623
		PY1NEW	1624
1500		LA7JO	1625
KQ UQV	535	JA1MIN	1626
WD9GBH	536	JA7DY	1627
W2CC	537	WD9GBH	1628
		S83T	1629
1000		KA8EBG	1630
WD9GBH	677	AK9Z	1631
WD4RAF	678		

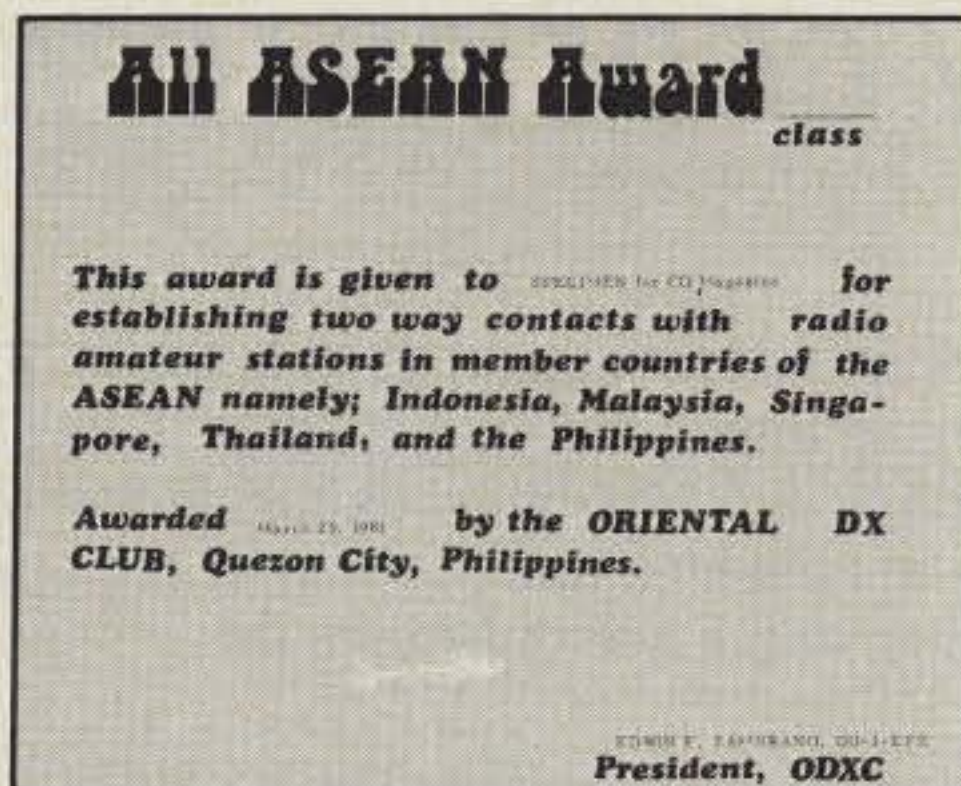
of two-way contacts with at least one station from each of the call areas (DU1 to DU9 except DU5). Contacts may be made in any of the amateur bands or modes. Special endorsements are available for All S.S.B., All C.W., Single Band, Multi-Band.

Worked All Asian Award (WAAA): Also available to all licensed amateurs throughout the world. To qualify, the applicant must show proof of two-way contacts with amateur radio operators in the member countries of the Association of Southeast Asian Nations as follows: Philippines 5 contacts; Malaysia 1 contact; Indonesia 2 contacts; Thailand 1 contact; Singapore 1 contact. Special endorsements available for: s.s.b., c.w., Single Band, Five Band WAAA.

For both Awards, only contacts from January 1, 1970 are okay. To apply, a self-prepared list of contacts showing the callsign, name of operator, address, time in GMT, date, band, and mode of opera-

tion should be submitted. This self-prepared list must be verified and certified by two officers of the applicant's local club or association on all pages. Also the applicant must supply the following information with his application: full name and callsign, mailing address, and endorsements desired.

For each of the aforementioned Awards, the fee is \$4.00 U.S. (no IRCs please). Apply to: Edwin F. Zambrano, DU1EFZ, P.O. Box AC-166, Quezon City 3001, Philippines.



Worked All Asean Award.

Worked Broward County Cities Award (WBCC): This Award was described and shown on page 39 of CQ October 1980, but here are the new rules:

1. Residents of Broward, Colliers,

Dade, Hendry, Monroe, and Palm Beach Counties need confirmed QSOs with 10 of the 29 cities. A Gold Seal will be awarded for working all 29 cities.

2. All other amateurs need confirmed QSOs with 5 cities. A Gold Seal will be awarded for working 15 of the 29 cities.

3. Contacts must be made from the home QTH of the applicant, but QSOs with mobile or portable stations in Broward are valid. All legal amateur bands and modes may be used, but repeater contacts will not be accepted.

4. Applications to list date, time, band, mode, and the call and QTH of the Broward station. Certification by two licenses amateurs is needed, also certification by the applicant that he does have the QSLs. Send application with fee of \$1.00 and 35¢ in stamps for postage (DX applicants U.S. \$1.00 plus 3 IRCs) to: WD4RAF, Awards Manager, 1921 NW 41st Street, Oakland Park, Florida 33309 USA. Gold Seals will be supplied free; only an s.a.s.e. is needed.

Bylard Award: Sponsored by the British YL Amateur Radio Association. Required 10 contacts with Bylara YL amateurs including at least 6 British YLs. All contacts must be after 29 April 1979. Each YL counts just once, regardless of bands or modes. Cost is 12 IRCs or \$4.00. Apply to Bylard Award, c/o Diana Hughes, G4EXI, 3 Primley Park Crescent, Leeds LS17 7HY, England. (Thanks to Bill Welsh, W6DDB, for this data.)



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LEARNING YOUR NEW LANGUAGE: The Morse Code — why every ham knows it; how to learn it the right way.

UNDERSTANDING BASIC THEORY: Easy-to-learn explanation of electronic theory and what you need to know to qualify for a Novice license.

SETTING UP YOUR STATION: Choosing a location; how to select your equipment; what antenna to use; glossary.

OVER THE AIRWAVES PAINLESSLY: How to operate; tuning up; safety; identifying stations in foreign countries; awards; clubs; The ARRL and QST.

The booklet consists of 134 pages of text and an additional 26 pages of equipment and publication advertising. The C-60 cassette provides 60-minutes of code practice instruction. The entire package is available for \$8.50 (in U.S. funds) at your favorite dealer or order below:

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The Camel Corps Award.

The Camel Corps Award: The Camel Corps (the unorganized Ham Radio operators of Newaygo County, Michigan) are pleased to announce the availability of the "WAC" (Worked All Camels) Certificate. To qualify you have to work 10 "Camels." In requesting a certificate, please list the call sign and date of each qualifying contact. Send your request to a member of the Award Committee: Clair Rowe, WA8ZMS; Press Jones, N8UG; or "Chick" Childs, KA8FIO.



Worked Albany Radio Members Award.

Worked Albany Radio Members Award: Sponsored by the Albany Amateur Radio Association (AARA), Albany, N.Y. The Award is available to all licensed amateurs, no date limitations, do not send QSLs, just full log data. No fee, enclose name, call mailing address, and return postage (2 first-class stamps for USA, 2 IRCs for all others). Club roster and list of most Albanians available, send 2 IRCs.

Note: A point consists of one two-way contact on any amateur band, any mode, with any amateur radio station located in an "Albany," or with any member of the AARA, wherever located. No repeater contacts. Satellite contacts okay. Endorsements available. An "Albany" is any city, town, village, county, or other community anywhere in the world with "Albany" in its place name.

The President's Endorsement: Fulfill basic requirements, 4 points of which are contacts with different and unrelated "Albanys" (other than Albany, N.Y., U.S.A.).

Requirements:

1. For AARA members and/or amateurs whose locations are in Albany,

Rensselaer, or Schenectady Counties; 15 points, of which at least 5 must be AARA members.

2. For stations whose locations are New York State (except #1) 10 points, of which at least 5 must be AARA members.

3. For stations in the "lower 48" states (except #1 and #2) 7 points, of which at least 1 must be an AARA member.

4. For stations in all other locations, 5 points, of which at least 1 must be an AARA member.

Send applications to: Harry Hovey, KB2FC, 15 Sylvan Lane, Troy, N.Y. 12180 USA. (Thanks to Wm., W2OOJ for this data.)

Notes

Sorry to report the loss of more friends/County Hunters:

Don Brickey, W7OK (ex-W7DDB, W7AKE), All Counties #82, 8-2-72. His "Story" and photo were on page 70 of CQ January 1974. Many will remember the nice booklet he prepared, "County Hunting History," for the Annual ICHN Convention in Peoria, Illinois in 1972. Our condolences to his wife, Milly, W7CDH.

Bob Schmarder, WA2AEA, who had the "QSL Clearing House," 4 Pinewood Circle, Corning, N.Y. 14830. (Send no more QSLs.) Bob had received USA-CA-3000 #225.

"Bing" Miller, W0GV, All Counties #140, 1-14-76. Voted The County Hunter of the year 1980. Many will remember he printed a monthly newsletter for the County Hunters before MARAC took over. "Bing" will be greatly missed by all. (Thanks to his son, Al, W0EWH, and Dorothy, WB9RCY, for this sad news.)

Thanks to Art, W0BK, he did come through with the requested data on the Confederate States of America Centennial Award, but it apparently was issued only during the Civil War Centennial Celebration, 1961-1965. Art received #226 dated July 28, 1962, and it was signed by James P. Hamilton, Pres., Engineers' Radio Association of Duke University.

The International Directory of Awards is new and being put out by Vance LePierre, W5IJU, 2618 McGregor, Fernandina Beach, Florida 32034. Cost is \$8.00. It covers nearly 1000 awards, has 100 pages, much information, and 8 sections covering nearly 300 U.S. Awards and other North American, Central American, South American, European, African, Oceanian, and Asian Awards.

I'm always looking for data on new Awards/Certificates and will use the material as soon as space permits.

73, Ed, W2GT

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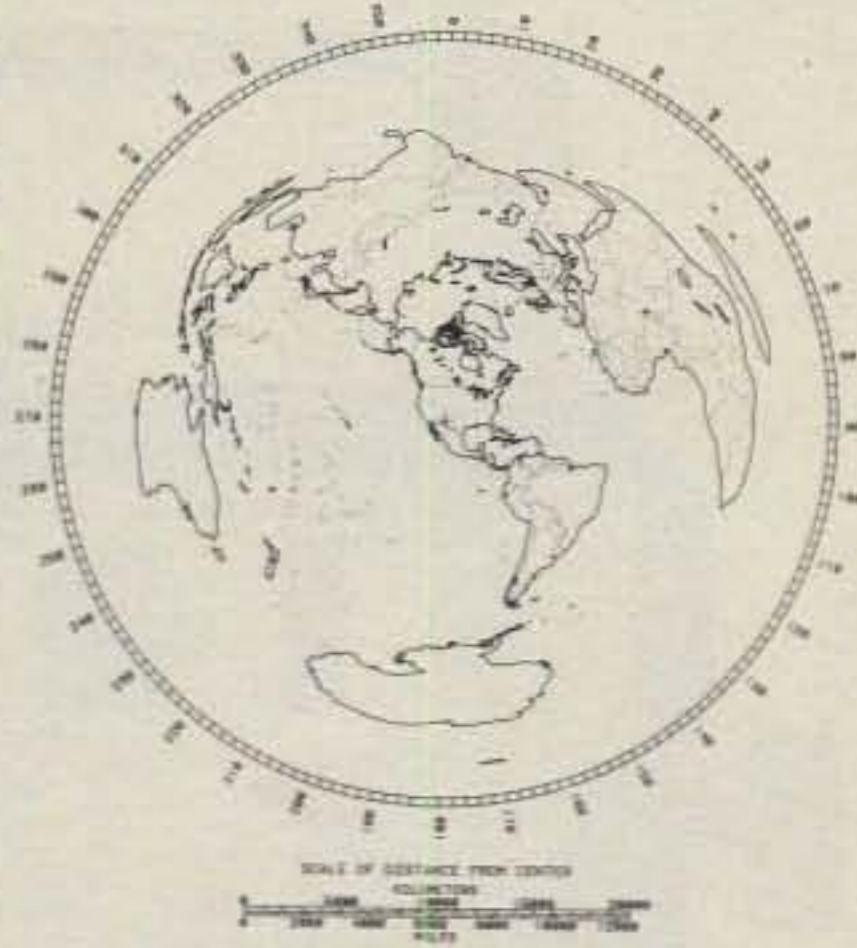
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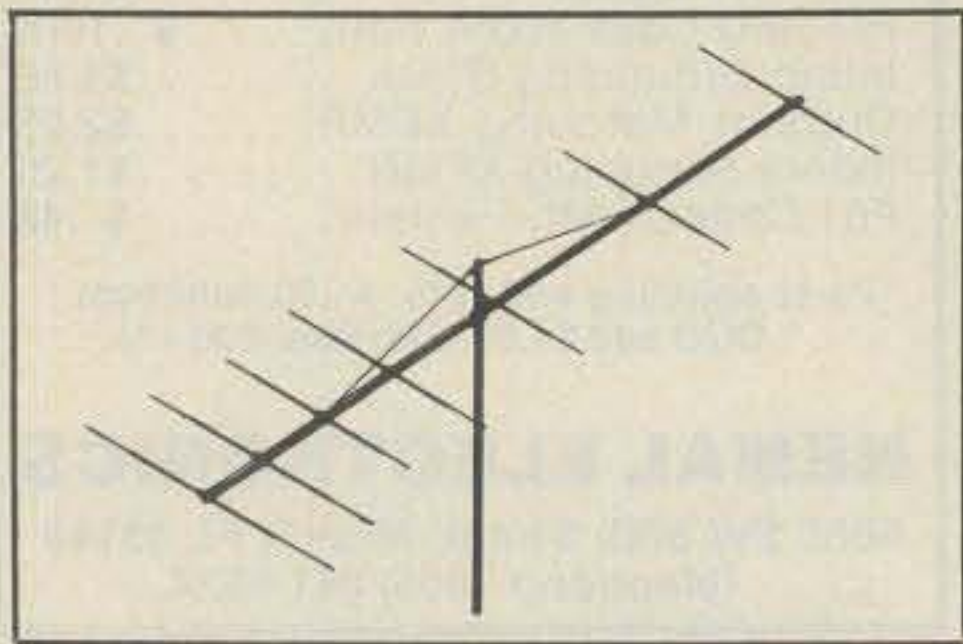
CIRCLE 150 ON READER SERVICE CARD

CQ SHOWCASE

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KLM now offers a high performance "Long Boomer" for 6 meters. The 50-51-7LB is optimized for the most active section of the band, 50-51 MHz, and is designed for 6 meter enthusiasts. The 7LB produces 13 dB gain over a dipole at better than 1.2:1 v.s.w.r. Usable bandwidth extends to 52 MHz.

The 7LB uses a 2-inch boom and 1/2-inch elements of 6063-T832 aluminum al-



loy. Additional boom support comes from an overhead guy system of super strong nonconductive Aramid cable. All hardware (except U-bolts) is stainless steel. KLM's 4:1 4 kw p.e.p. ferrite balun is included. For more information, contact KLM, P.O. Box 816, Morgan Hill, CA 95037, or circle number 103 on the reader service card.

MFJ VHF SWR/Wattmeter/ Fieldstrength Meter

The MFJ-812 is a v.h.f. s.w.r./wattmeter/fieldstrength meter combination, which will keep you informed about your antenna and feedline as well as your rig's output. It reads s.w.r. at lower power levels from 14 to 170 MHz. Forward and reflected power can be read from 144 to 148 MHz on two scales (30 and 300 watts). Binding posts are provided on the back panel for fieldstrength antenna con-



nection. The MFJ-812 reads field strength levels from 1 through 170 MHz.

The unit measures 4 1/4 "W x 2 1/4 "H x 2 3/4 "D. The all aluminum cabinet has an eggshell front panel with black top and sides. It is available for \$29.95 plus \$4 shipping and handling. There is a 30-day money-back trial period. For more information, contact MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762, or circle number 101 on the reader service card.

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Kawasaki

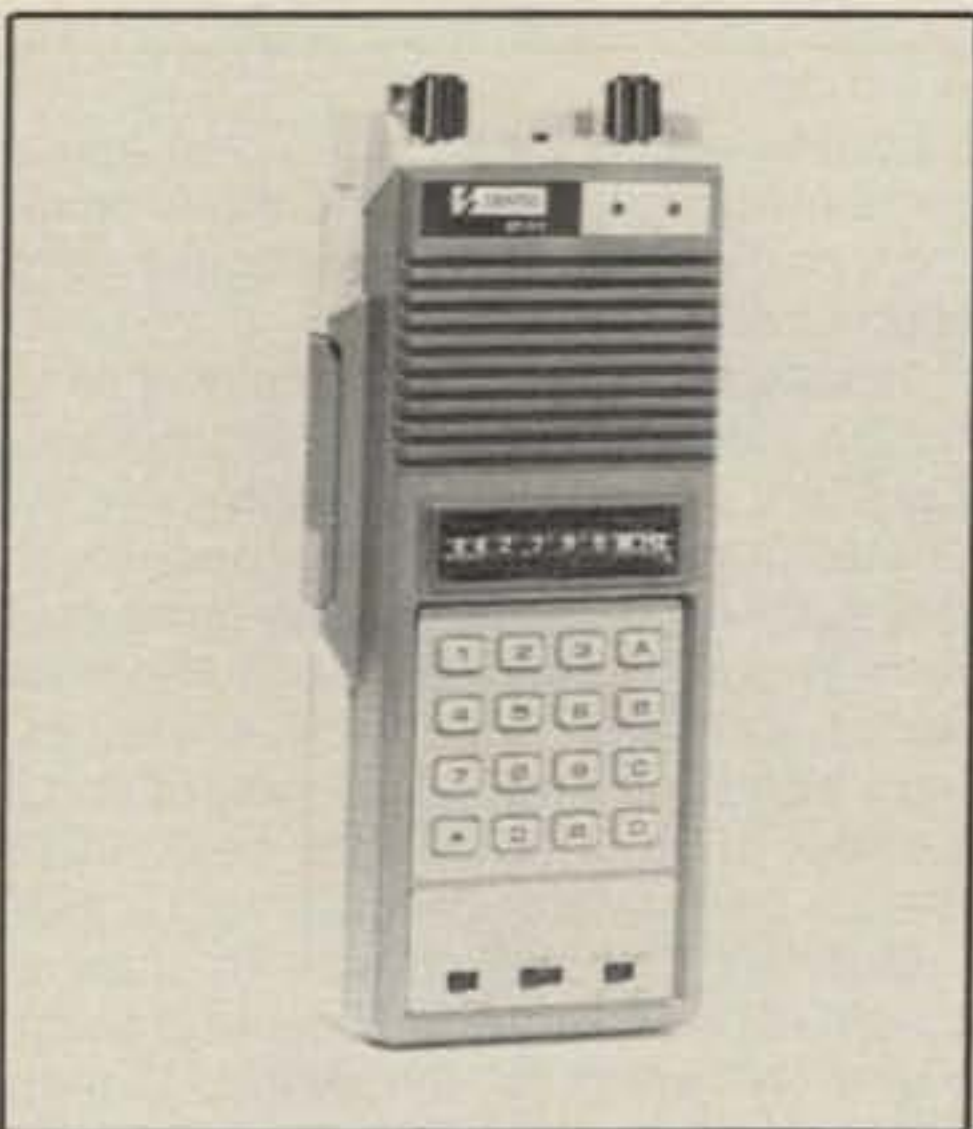
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CIRCLE 7 ON READER SERVICE CARD

Encomm 440 MHz Handheld Transceiver

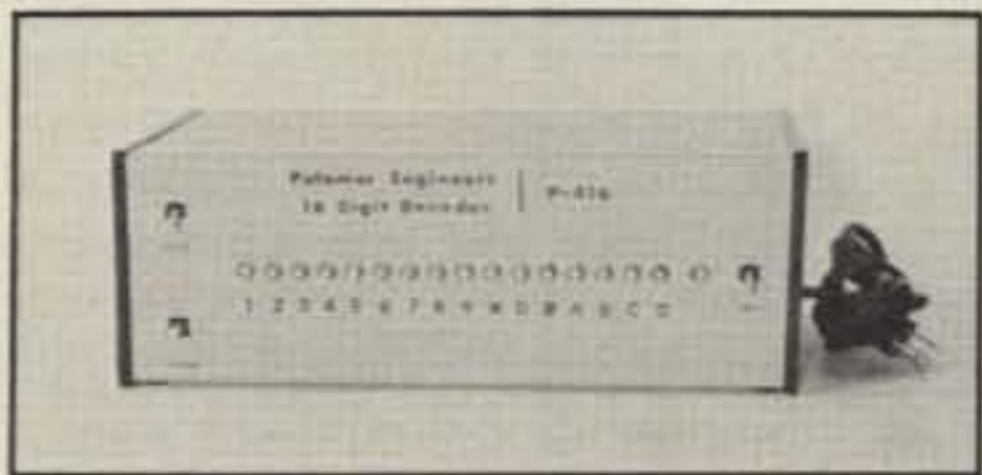
The ST-7/T 440 MHz synthesized handheld transceiver is for use in the 440-449.995 MHz amateur band. This compact u.h.f. package has 3 watts output from the transmitter and incorporates all 16-tone DTMF tones and an optional synthesized CTCSS encoder capability. The high power level is backed up by the capability to switch to either one watt or as low as 50 milliwatts for battery saving applications.



Offset of the transmitter from the dialled receiver frequency is accomplished at the flick of a three-position switch. Another switch feature is the immediate access to the national calling frequency of 446 MHz by a slide switch. The antenna is a 1/4-wave flex antenna that mounts on the BNC connector. This addition to the Santec line of handheld radios is available from Encomm, Inc., 2000 Avenue G, Suite 800, Plano, TX 75074, or for more information, circle number 107 on the reader service card.

Palomar Engineers 16 Digit DTMF Decoder

The Model P-416 decoder converts incoming Touch-Tone signals to dc outputs on 16 lines. Indicator lamps show which digit is being received. Outputs will drive power relays directly and are either momentary or latched as selected by a panel switch.



Decoding is by digital logic with quartz crystal frequency control for long term stability and operation over wide temperature variation. It operates on 115-volt ac power. Price is \$385. For more informa-

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tion, contact Palomar Engineers, 1520-G Industrial Ave., Escondido, CA 92025, or circle number 104 on the reader service card.

Benjamin Michael Military Clock

Benjamin Michael Industries has introduced the Model 173DM military time clock. The 173DM features dual, independent digital clock movements housed in a solid walnut case. Military time is displayed on the left clock face, while the more standard 12-hour format with a.m./p.m. indicators is displayed on the right. Each clock is independently set, allowing each to display a different time zone if desired.



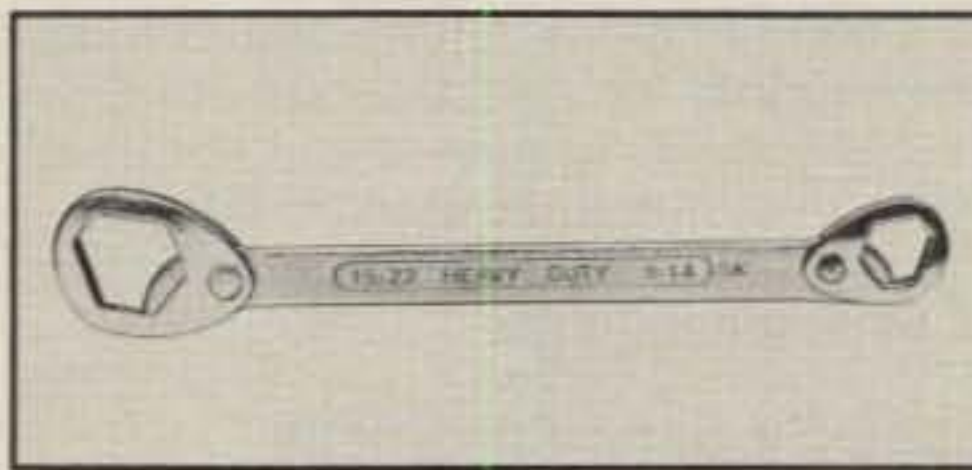
Both large displays are LCD. The unit features quartz crystals and over one year of operation on a single battery. Price is \$69.95. For more information, contact Benjamin Michael Industries,

Inc., 65 E. Palatine Road, Suite 105, Prospect Heights, IL 60070, or circle number 105 on the reader service card.

Radio Shack Multi-Wrench

The versatile Multi-Wrench with a self-adjusting jaw automatically sizes itself to fit any nut or bolt between 3/8 inch and 7/8 inch from flat to flat. Inch and metric sizes are automatically accommodated, and the wrench is designed to grip at least three surfaces at all times.

Tightening or loosening action may be selected by simply turning the wrench upside-down, reversing the gripping characteristics of the head. The Multi-Wrench is available for \$3.99 from Radio Shack



Stores. For more information, contact Radio Shack, Div. Tandy Corp., 1800 One Tandy Center, Fort Worth, TX 76102, or circle number 102 on the reader service card.

Propagation

THE SCIENCE OF PREDICTING RADIO CONDITIONS

DX Contest Special

The 1981 CQ World Wide DX Contest will be held on the following dates:

Phone Section: 0000 GMT Saturday, October 24 to 2400 GMT Sunday, October 25.

C.W. Section: 0000 GMT Saturday, November 28 to 2400 GMT Sunday, November 29.

For the 31st successive year, this month's Propagation column contains a special forecast for use during both Contest sections, Phone and C.W.

Another Great Contest Period Expected!

Despite a declining sunspot cycle, solar activity is expected to continue in the high range during the 1981 Contest period. Unless nature plays a trick in the form of a radio storm, h.f. propagation conditions during this year's Contest period, while perhaps not as outstanding as those during the 1979 and 1980 Contests, are expected to be exceptionally good.

The Royal Observatory of Belgium, the official keeper of sunspot records, reports a monthly mean sunspot number of 89.8 for June 1981. This is the lowest monthly level recorded in almost four years. It results in a smoothed sunspot number of 143 centered on December 1981, a drop of 5 points from the November value.

A smoothed sunspot number on the order of 120 is forecast for October 1981 and for the Contest period. While this is considerably lower than the levels of 158 and 150 observed during corresponding periods in 1979 and 1980, respectively, it is higher than during any other Contest period since 1959.

While conditions during the 1981 Contest may not be as outstanding as those observed during the previous two Contest periods, it may be difficult to detect much of a difference. Barring the development of a radio storm, I'm calling for another great Contest.

Band-By-Band Conditions

The following is a band-by-band summary of DX propagation conditions ex-

11307 Clara St., Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for October 1981

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 4, 7, 26, 31	A	A	B	C
High Normal: 3, 5-6, 8, 20, 25, 30	A	B	C	C-D
Low Normal: 1-2, 9-12, 15-16, 19, 23-24, 27-29	A-B	B-C	C-D	D-E
Below Normal: 13-14, 17-18, 21-22	B-C	C-D	D-E	E
Disturbed: None	C-E	D-E	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9 + 30 dB.

B—Good opening, moderately strong signals varying between S9 and S9 + 30 dB, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S9, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S3, and with considerable fading and noise.

E—No opening expected.

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 fair (C) on Oct. 1st and 2nd, good (B) on the 3rd, excellent (A) on the 4th, etc. Conditions look fair-to-good for the Contest period Oct. 24-25.

For updated information, subscribe to bi-weekly MAIL-A-PROP, David D. Meisel, Editor, 54 Westview Crescent, Geneseo, NY 14454.

pected from mid-October through mid-December, and centered on the 1981 Phone and C.W. Contest periods.

10 meters: Good, solid openings should be possible to almost every section of the world sometime during the daylight hours, with the band remaining open to southern and tropical areas into the early evening. The band should open just after sunrise towards Europe, Africa, and the east, as well as in a southerly direction towards the Caribbean and Central and South America. Signals should peak towards Europe and the east an hour or so before Noon, towards Africa about an hour or so after Noon, and towards the south during the late afternoon. Optimum conditions towards the Far East, Australasia, Southeast Asia, etc., should occur during the late afternoon and early eve-

ning. Exceptionally strong signal levels can be expected on many 10 meter openings, particularly when conditions rise to High or Above Normal.

15 meters: This should be the best band for DX during most of the daylight hours. Excellent propagation conditions are expected from shortly after sunrise through the early evening hours. The band may remain open to as late as Midnight towards southern and tropical areas. Expect signals to peak on 15 meters about an hour or so later than the peak on 10 meters from similar geographical areas.

20 meters: This should be an around-the-clock DX band, with good openings possible to all areas of the world. Signals should peak from all directions for about an hour or two after sunrise and again during the early evening. Excellent openings should be possible to many areas of the world during most of the daylight hours and throughout most of the hours of darkness as well. Expect long-path openings on this band for about an hour or so after sunrise and again for an hour or so before local sunset. Exceptionally strong signal levels should be noted during peak propagation periods. If you plan to operate on a single band during the Contest, this should be the one to produce the longest period of DX, the strongest signals, and openings to more areas of the world than any other single band.

40 meters: Good DX conditions are expected to most areas of the world on this band from the late afternoon, through the hours of darkness, and until shortly after sunrise. The band should open first for DX towards Europe and the east during the late afternoon. Signals should improve steadily as darkness approaches. During the hours of darkness expect good DX openings to most parts of the world. Signals should peak from an easterly direction about Midnight and from a westerly direction just after sunrise. Excellent openings in a southerly direction should be possible throughout the night.

80 meters: While not quite as good a nighttime DX band as 40 meters, expect relatively good DX openings on this band to many areas of the world during the hours of darkness and into the sunrise period. The band should peak towards Europe and the east around Midnight and

towards the west just *prior to sunrise*. Expect good openings towards the south throughout *most of the night*.

160 meters: Some DX openings should be possible during the hours of *darkness* and the *sunrise period*. The band will be noisier than 40 and 80 meters, and signals considerably weaker, but look for some relatively good openings towards Europe and towards the south from the eastern half of the country and towards the south, the Far East, Australasia, and the South Pacific from the western half of the country.

DX openings to other areas of the world may also be possible. A good propagation aid for determining DX openings on this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is *local sunrise* at the *eastern-most* end of a path.

For a more detailed circuit-by-circuit forecast refer to the *DX Propagation Charts* appearing on the following pages. Instruction for the proper use of these charts is given elsewhere in this column.

Contest Work Charts

The *DX Propagation Charts* on the following pages show the times when each amateur band from 6 through 160 meters is expected to open from each time zone area in the continental USA to the major DX areas of the world. The information contained in the charts, while useful during the Contest period in their present format, can easily be reorganized into more convenient formats to meet specific operational work plans or schedules. Experience gained during previous Contests has shown that specifically tailored schedules derived from the charts can be extremely useful in piling up contacts and points with a minimum amount of wasted time.

Table I is an example of one of several types of operational plans that can be devised. It is a *single band* operational work schedule for 20 meters, which shows the times when propagation conditions are expected to be optimum to various areas of the world (with a propagation index of 3 or 4) for each 3-hour period throughout the day. A Pacific time zone QTH has been chosen for this example, but similar plans can be devised for other time zones, for other bands, and for other operational schedules.

Radio Storm

If a radio storm should develop during the Contest periods, expect conditions to decline considerably, depending upon the storm's severity. During periods of radio storminess expect considerably fewer openings on 10, 15, and 20 meters, with weaker signals, increased fading, and higher noise levels. Paths passing through the polar regions and the upper

Time PST

Areas To Which Conditions Are Expected To Be Optimum

00-03	S. E. Asia, Far East, South Pacific, New Zealand, Australasia, Antarctica, Caribbean, Central America, and Northern Countries of South America.
03-06	South Pacific, New Zealand, Australasia, Caribbean, Central America, and Northern Countries of South America.
06-09	Central and South Asia, S. E. Asia, Far East, South Pacific, New Zealand, Australasia, Caribbean, Central America, Northern Countries of South America, Europe.
09-12	Far East, Caribbean, Central America, and Northern Countries of South America.
12-15	Western and Southern Europe, North Africa.
15-18	Europe, Africa, Caribbean, Central America, South America.
18-21	Africa, Central and South Asia, South Pacific, New Zealand, Caribbean, Central America, and South America.
21-00	Far East, South Pacific, New Zealand, Australasia, Caribbean, Central America, South America, Antarctica.

Table I—Sample 20-meter work plan for western USA QTH.

latitudes are often more adversely affected than signals in mid-and-lower latitudes. Conditions on 40, 80, and 160 meters should become erratic as well. During certain types of storms, conditions may actually improve at times for openings on all bands towards southern and tropical areas, and on 40, 80, and 160 meters during the hours of darkness.

If a radio storm should develop, concentrate on working trans-polar paths on 10, 15, and 20 meters during the daylight hours. Check the 40, 80, and 160 meter bands for possible openings to some areas of the world during the hours of darkness.

A "Last Minute Forecast" for the Phone section of the Contest, made at press time, appears at the beginning of this column. A similar forecast for the C.W. section will appear in next month's column. For updated geomagnetic and solar data during the Contest period, check the National Bureau of Standards Radio Station WWV broadcasts at 18 minutes past each hour. These broadcasts—transmitted simultaneously on 2.5, 5.0, 10.0, 15.0, and 20.0 MHz—contain the latest available geomagnetic K-figure and the level of 10.7 cm solar flux. They also contain a short-term forecast of geomagnetic and solar conditions given in subjective terms. Fig. 1 can be used to convert the geomagnetic and solar data given on the WWV broadcasts into expected h.f. ionospheric conditions.

The hourly forecasts broadcast on WWV, along with the latest solar flux and geomagnetic indices, also may be obtained by telephoning Area Code 303-497-3235 at any time. This is *not* a toll-free number, but there is no other charge for this service. Detailed solar-geomagnetic data can also be obtained at any time from the *NASA Solar Flare Hotline*. The toll telephone number for this service is Area Code 301-344-8129.

Updated day-to-day forecasts for the h.f. bands can also be obtained through the MAIL-A-PROP subscriber service. For further information and subscription fees contact MAIL-A-PROP Editor Dr. David D. Meisel, 54 Westview Crescent, Geneseo, NY 14454.

V.H.F. Ionospheric Propagation

While conditions for 6 meter DX openings this winter are not expected to be as good as during the previous two winters of considerably higher solar activity,

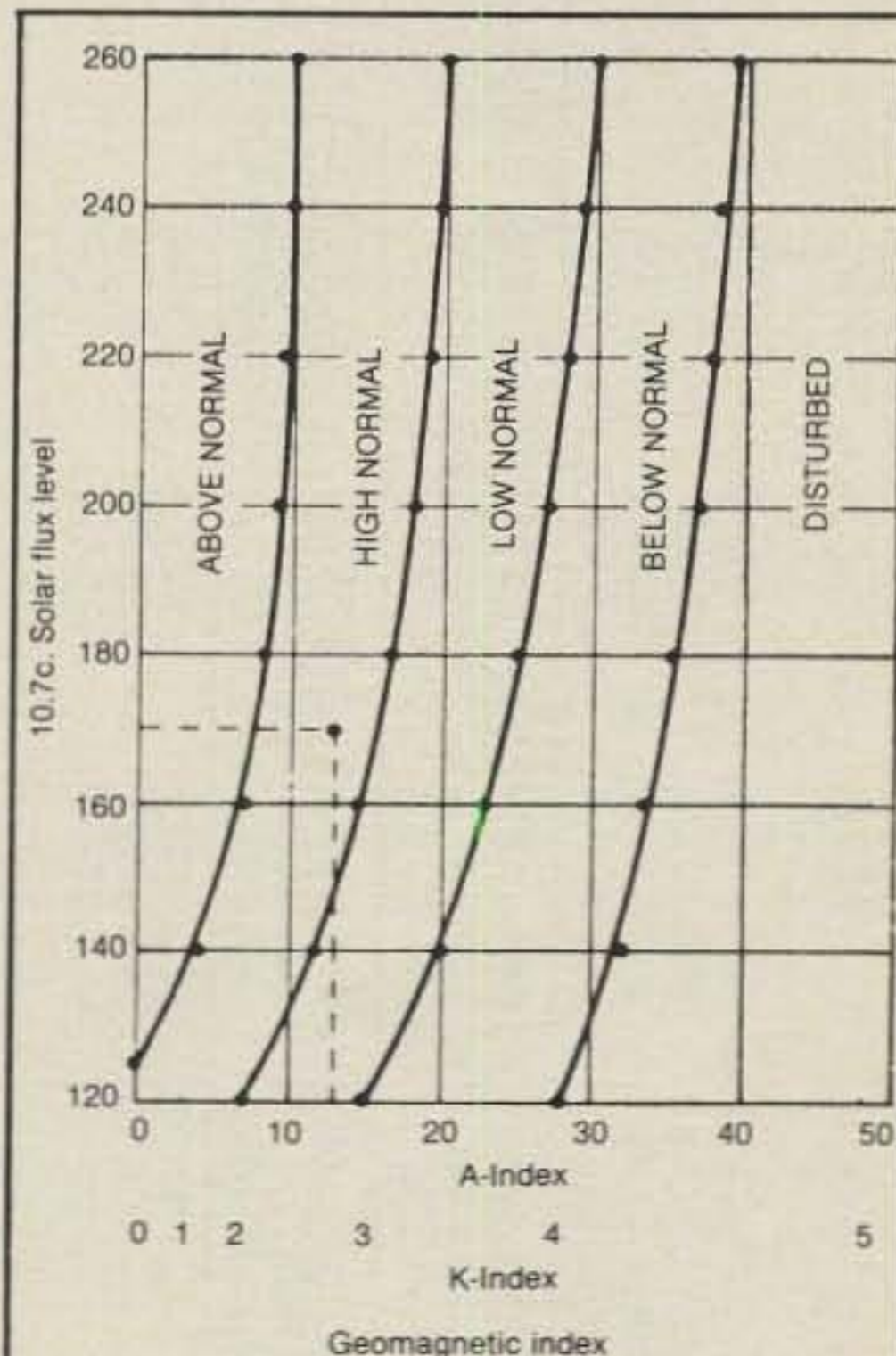


Fig. 1—Intersection of given values of solar flux and geomagnetic activity determine expected h.f. ionospheric propagation conditions. (Example: Solar flux is 170 and A-index is 13; expect High Normal conditions.)

Eastern Mediterranean & Middle East	07-08 (1) 08-10 (2)† 10-11 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-11 (2) 11-12 (1)	06-07 (1) 07-10 (2) 10-14 (1) 14-16 (2) 16-18 (1) 18-20 (2) 20-22 (1) 00-02 (1)	18-22 (1) 06-08 (1)
Western Africa	06-07 (1) 07-08 (2) 08-11 (3)† 11-13 (4) 13-15 (3) 15-16 (2) 16-17 (1)	05-06 (1) 06-07 (2) 07-13 (3) 13-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	05-10 (1) 10-14 (2) 14-15 (3) 15-20 (4) 20-22 (3) 22-02 (2) 02-03 (1)	18-19 (1) 19-21 (2) 21-22 (1) 19-21 (1)*
Eastern & Central Africa	07-08 (1) 08-10 (2)† 10-14 (3) 14-15 (2) 15-16 (1)	06-08 (1) 08-12 (2) 12-16 (3) 16-17 (2) 17-19 (1)	06-14 (1) 14-16 (2) 16-22 (3) 22-23 (2) 23-00 (1)	18-21 (1) 06-08 (1)
Southern Africa	07-08 (1) 08-10 (3)† 10-14 (4) 14-15 (3) 15-16 (2) 16-17 (1)	06-10 (1) 10-12 (2) 12-13 (3) 13-16 (4) 16-17 (3) 17-19 (2) 19-21 (1)	06-12 (1) 12-14 (2) 14-16 (3) 16-19 (4) 19-22 (3) 22-01 (2) 01-03 (1)	17-19 (1) 19-20 (2) 20-21 (1) 06-08 (1) 18-19 (1)*
Central & South Asia	16-17 (1) 17-19 (3)† 19-20 (1) 07-09 (1)	16-17 (1) 17-19 (3) 19-20 (2) 20-21 (1) 07-09 (1)	06-07 (1) 07-09 (3) 09-10 (2) 10-11 (1) 16-17 (1) 17-19 (3) 19-21 (2) 21-22 (1)	17-19 (1) 04-09 (1)
Southeast Asia	08-09 (1) 09-10 (2) 10-11 (3) 11-12 (2) 12-14 (1) 14-15 (2) 15-17 (3)† 17-19 (2) 19-20 (1)	07-08 (1) 08-11 (3) 11-12 (2) 12-15 (1) 15-17 (3) 17-19 (2) 19-21 (3) 21-22 (2) 22-23 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-11 (2) 11-12 (1) 19-22 (1) 22-01 (2) 01-03 (3) 03-06 (2)	02-03 (1) 03-06 (2) 06-08 (1) 03-06 (1)*
Far East	13-14 (1) 14-15 (3) 15-19 (4)† 19-20 (2) 20-21 (1)	07-08 (1) 08-09 (2) 09-11 (3) 11-13 (2) 13-15 (3) 15-17 (2) 17-19 (4) 19-20 (3) 20-21 (2) 21-22 (1)	06-07 (1) 07-08 (2) 08-10 (4) 10-12 (3) 12-14 (2) 14-18 (1) 18-20 (2) 20-21 (3) 21-23 (4) 23-02 (3) 02-06 (2)	23-01 (1) 01-05 (2) 05-07 (3) 07-08 (1) 01-05 (1)* 05-06 (2)* 06-07 (1)*
South Pacific & New Zealand	08-09 (1) 09-10 (2) 10-19 (4)† 19-21 (3) 21-23 (2) 23-00 (1)	07-08 (1) 08-11 (4) 11-18 (3) 18-00 (4) 00-02 (3) 02-03 (2) 03-04 (1)	11-18 (1) 18-19 (2) 19-21 (3) 21-04 (4) 04-07 (3) 07-09 (4) 09-10 (3) 10-11 (2)	21-22 (1) 22-00 (2) 00-07 (3) 07-08 (2) 08-09 (1) 22-00 (1)* 00-06 (2)* 06-07 (1)*
Australasia	09-11 (1) 11-12 (2) 12-14 (4) 14-18 (3)† 18-20 (4) 20-21 (3) 21-22 (2) 22-23 (1)	07-08 (1) 08-12 (3) 12-14 (2) 14-18 (1) 18-20 (2) 20-21 (3) 21-00 (4) 00-01 (3) 01-02 (2) 02-03 (1)	18-20 (1) 20-22 (2) 22-00 (3) 00-04 (4) 04-07 (3) 07-09 (4) 09-10 (3) 10-12 (2) 01-02 (2) 12-14 (1)	02-03 (1) 03-04 (2) 04-07 (3) 07-08 (1) 03-04 (1)* 04-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	06-07 (1) 07-08 (3) 08-10 (4)† 10-15 (3) 15-17 (4) 17-18 (2) 18-19 (1)	05-06 (1) 06-07 (2) 07-10 (4) 10-14 (3) 14-19 (4) 19-20 (3) 20-21 (2) 21-22 (1)	06-08 (4) 08-10 (3) 10-14 (2) 14-16 (3) 16-00 (4) 00-02 (3) 02-04 (2) 04-06 (3)	18-19 (1) 19-21 (3) 21-02 (4) 02-05 (2) 05-06 (1) 19-21 (1)* 21-02 (2)* 02-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	06-07 (1) 07-13 (3)† 13-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	06-07 (2) 07-09 (3) 09-14 (2) 14-16 (3) 16-21 (4) 21-23 (3) 23-02 (2) 02-06 (1)	12-14 (1) 14-16 (2) 16-18 (3) 18-00 (4) 00-01 (3) 01-03 (2) 03-05 (1) 05-07 (2) 07-09 (1)	20-22 (1) 22-04 (2) 04-05 (1) 22-04 (1)*
McMurdo Sound, Antarctica	07-08 (1) 08-09 (2) 09-10 (1) 19-20 (1) 20-22 (2) 22-23 (1)	06-07 (1) 07-09 (2) 09-12 (1) 14-17 (1) 17-20 (2) 20-23 (3) 23-01 (2) 01-02 (1)	16-18 (1) 18-20 (2) 20-04 (3) 04-05 (2) 05-06 (1) 06-08 (2) 08-10 (1)	00-05 (1)

*Indicates best time to listen for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a Propagation Index of (2), or higher.
†Indicates best times to check for 6 Meter F-2 layer DX openings. While such openings will not occur frequently, some may be possible when day-to-day conditions are HIGH NORMAL or better.

some good openings should be possible this October. Expected seasonal increases in daytime maximum usable frequencies, coupled with a continuing level of relatively high solar activity, should make possible DX openings to many areas of the world on 6 meters. The best times for such openings are shown in the DX Propagation Charts on the following pages with a †. Generally speaking, check for openings from the eastern half of the USA towards Europe, Africa, and the east *before Noon*. The best chance for 6 meter DX openings towards the Caribbean and Central and South America from all areas of the USA should be from an hour or two *after sunrise* through the *early afternoon*. Look for openings towards the Far East, the South Pacific area, New Zealand, and Australasia during the *late afternoon* hours. These openings will favor stations located in the western half of the USA, but some openings may extend considerably to the east.

Trans-continental and 6 meter openings over shorter distances are also expected during October and the fall and winter months. Conditions for such openings are expected to peak during the early afternoon hours.

The Orionids meteor shower should take place between October 20-23, with conditions peaking on the 21st. Since an hourly meteor count of approximately 25

is expected during peak periods of this shower, check the v.h.f. bands for meteor-reflection-type ionospheric short-skip openings during the course of the shower.

Also check the v.h.f. bands for unusual ionospheric short-skip openings during periods that are expected to be Below Normal or Disturbed on the h.f. bands. This information is contained in the "Last Minute Forecast" which appears at the beginning of this column.

C.W. Contest Forecast

The *DX Propagation Charts* contained in this month's column are valid for both the Phone and C.W. sections of the 1981 Contest. *Be sure to keep them handy for use during next month's C.W. section as well.* Short-skip propagation forecasts for October appeared in last month's column.

As a check against present forecast methods and for possibly improving future forecasts, the Editor would appreciate any comparisons or comments concerning actual vs. forecast conditions during the 1981 Contest. These can be mailed directly to W3ASK, P.O. Box 1714, Silver Spring, MD 20902.

Good luck in the 1981 Contest. It looks like it will be another exceptionally good one!

73, George, W3ASK

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THE INS AND OUTS OF THE WASHINGTON SCENE

NBC To Air Special On R.F.I.

According to sources in Washington, NBC (New York) is in the process of taping a one-hour special on interference to communications (or so-called "radio frequency interference" [r.f.i.]). The show, which could be shown this fall, will probably include portions of the FCC's meetings on Sen. Goldwater's r.f.i. bill (S. 929) and on the interference experienced just before the Columbia space shuttle landing. It has also been learned that an NBC crew has been sent to Lynchburg, VA, where television viewers of Channel 6 in Richmond, VA, are experiencing t.v.i. as a result of the operations of an f.m. station in the lower portion of the f.m. band. The latter problem, according to James McKinney, Chief, Field Operations Bureau, FCC, is found throughout the US, with particularly severe cases to be found in Florida and Oregon. It is not known whether or not amateurs will be interviewed on cases of alleged r.f.i., but such material would surely make a significant contribution to NBC's special.

FCC To Issue NOI/NPRM On Spread Spectrum Modulation Techniques

According to Dr. Michael Marcus and Mr. Michael Kennedy, Office of Science and Technology, FCC, the Commission has adopted a Notice of Inquiry/Notice of Proposed Rule Making (NOI/NPRM) which would permit amateur Extra and Advanced class licensees to use spread spectrum modulation techniques in the 51, 144, and 220 MHz bands. Among other things, the NOI/NPRM will propose that certain restrictions be placed on the types of shift registers which can be used. The purpose of such restrictions will be to ensure that problems related to secrecy of communications are minimized.

8603 Conover Place, Alexandria, VA 22308



Some of the more than 140 guests from industry, government, and the military who enjoyed the amateur radio luncheon as part of the Armed Forces Communication and Electronics Association (AFCEA) annual convention and exposition.

AMRAD Continues Spread Spectrum Experiments

Hal Feinstein, WB2KDU, coordinator of spread spectrum (SS) activities for the Amateur Research and Development Corporation (AMRAD), recently announced that his organization's SS activities are continuing on a successful note. To date frequency hopping experiments have been carried out by Paul Rinaldo, W4RI (president of AMRAD), Dick Kessler, K2SZE, and Olaf Rask, WA3ZXW. These amateurs used commercial/military frequency hopping systems in the 80-, 40-, and 20-meter bands, with the hopping rate set at 5 hops/second; hopping was done in a nonlinear manner. At this hop rate the frequency hopping technique was found to be effective against c.w. interference, but not against s.s.b. signals. The use of higher hopping rates, however, may improve the "anti-jam" capability of the spread spectrum systems tested, and rates of 25 hops/second are now being investigated.

Also being investigated is the use of modified CB transceivers for spread spectrum applications. Allan Kaplan, W1AEL, is working on this idea using surplus Hy-Gain PC boards, while Feinstein is looking into the possibility of using s.s.b. CB transceivers which have been modified for transmission and reception on 200 channels. In all cases the modifi-

ed CB transceivers would be used for frequency hopping experiments in the 10-meter band.

Because of the interest generated by the AMRAD spread spectrum experiments, thought is now being given to restarting the AMRAD 20-meter phone net for spread spectrum discussions. Readers who desire more information on AMRAD SS activities at this time, however, are encouraged to write to Mr. Hal Feinstein, WB3KDU, AMRAD Spread Spectrum Coordinator, 1410 Rhodes St. North, Arlington, VA 22209.

CCIR Study Group 8 To Consider Paper On Bandwidth Compression

CCIR Study Group 8 (SG-8; Amateur [Terrestrial]) now has under consideration a Canadian paper which addresses bandwidth compression and selective filtering techniques. The paper describes the narrow-band voice modulation (NBVM) technique developed by Harris and Cleveland in which the second and third formants of speech (which do not occur simultaneously with vowel sounds) are inverted by down-conversion at the transmitter and are restored at the receiver. This technique can reduce the bandwidth to about 1500 Hz, although investigations with bandwidths of 1200 and 1000 Hz are also being conducted.

With respect to selective filtering tech-

niques, the paper reviews five interference-rejecting filters which can be installed in the audio section of the receiver:

1. The stereocode filter
2. The wideband-narrowband filter
3. The coherent audio filter
4. The variable bandwidth filter
5. The frequency-agile filter

The CCIR (the International Consultative Committee on Radio) is the technical arm of the International Telecommunication Union (ITU). Papers approved by the CCIR study groups are used as the bases for the ITU's deliberations on matters pertaining to frequency allocations.

Commissioner Robert E. Lee Retires From FCC

Commissioner Robert E. Lee closed out 28 years of government service earlier this year when he retired from the FCC. Lee, a highly respected official, recently served as the acting chairman of the Commission, while the current chairman, Mark Fowler, was the subject of confirmation hearings by the Senate. Mr. Lee's successor is Mary Ann Weyforth Dawson, who won Senate confirmation in early June.

AFCEA Amateur Radio Luncheon A Success

More than 140 amateurs, their spouses, and friends recently attended the Armed Forces Communication and Electronics Association (AFCEA) Amateur Radio Operators' Luncheon. Held annually as part of AFCEA's annual convention and exposition, the luncheon provides an informal atmosphere in which amateurs from all walks of life can meet and exchange views on matters of current interest to the amateur service and the Military Affiliate Radio Service (MARS).

While formal presentations are discouraged, luncheon guests were pleased to welcome Commission representatives and to encourage them to comment on issues of interest. To this end, Carlos Roberts, Chief of the Private Radio Bureau (PRB), encouraged amateurs to make their views known on the "plain language rules" for the amateur service (the commission had just extended the period for comments by two months). Roberts also noted that the Commission, in general, and the PRB, in particular, encouraged experimentation by amateurs into such areas as satellite communications, spread spectrum modulation techniques, packet radio, error-correcting codes, and slow- and medium-scan television.

James McKinney, Chief of the FOB, commented on interference problems. Specifically, he expressed concern for the rising number of amateur-to-amateur complaints, noting, as an example, the 469 complaints filed with the Commis-

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sion in the second quarter of FY81. McKinney also reviewed the strong Commission actions taken as a result of the interference Gerard J. Morin, W1GM, and Leonard K. Boucher, K4MME, caused to the Maritime Mobile (MM) Net (both operators face revocation proceedings in Washington, D.C.).

Finally, Michael Kennedy, Office of Science and Technology, noted that the Commission was investigating applications of spread spectrum technology in the amateur service, and that an NOI/NPRM would shortly be issued in this matter (see above). Kennedy, too, called attention to the fact that experimentation by amateurs was encouraged at all levels within the FCC.

Luncheon festivities were concluded with a drawing for door prizes. Lucky winners walked off with items such as a Bird wattmeter and a pair of gold-plated EIMAC 8874 tubes.

Halligan Receives 65th Year Award From QCWA

The Quarter Century Wireless Association (QCWA) recently awarded William (Bill) J. Halligan, W4AK/W9AC, his 65th Year Award in amateur radio. Readers will recall that Halligan founded and operated the Hallicrafters company prior to and after WW II, and among things, served as one of AFCEA's early presidents.

F. J. Elser, KH6CZ, Wins Doctorate In American Studies

Col. (ret.) Fred J. Elser, KH6CZ, has been awarded a PhD in American Studies

by the University of Hawaii, Manoa. According to Katashi Nose, KH6IJ, (writing in the Honolulu Star-Bulletin) Col. Elser's dissertation was entitled: "Amateur Radio—An American Phenomenon." This is only the second research paper prepared on amateur radio for a doctoral degree, the first having been prepared by V. Bowers (a non-ham) in 1934. Col. Elser is no newcomer to amateur radio, having started his amateur activities in the Philippine Islands shortly after WW I.

Portions of this month's column were generously provided by Charles (Check) Dorian, W3JPT, Lee Wical, KH6BZF, and David Talley, W2PF. Your editor and the staff at CQ congratulate Mr. Talley on completing 64 years in the amateur service.

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In My Opinion: BY BYRON H. KRETZMAN*, W2JTP

This month we kick off what I hope to be a regular feature in CQ, namely "In My Opinion." This segment will cover material which does not normally coincide with what is considered an article. It will be expository in some cases and perhaps wishful thinking in others, but all in all it should be an open forum for ideas. I've got a few lined up already for future months and will gladly accept more. Try to keep it to three or four typewritten pages. Please, no name calling, mud slinging, or unsupported contention.

We lead off this section with Byron Kretzman, W2JTP. Byron has long been an advocate of a.m. and has written on the subject previously in CQ. Go to it Byron. —K2EEK

A.M. Is Not Dead, Stop Trying To Bury It!

Since I first got back on 75 a.m. phone four years ago, after an absence of about 35 years¹, I have witnessed a resurgence of amplitude modulated phone operation that is a little short of amazing, considering the seemingly never-ending efforts to bury it. The "party line" is that a.m. is not "state-of-the-art," a.m. is not economical of spectrum space, our ham bands are too crowded, etc., etc., to all of which I say, "Not so!"

Let's briefly compare phone in 1939 to phone in 1981, remembering that there were only about 50,000 hams in 1939. Remember, too, that we had no 40-meter phone, no 15-meter phone, and the phone segments on both 75 and 20 were a lot less than they are now. In 1939 I used a 100 watt transmitter, a doublet antenna about 50 feet high, and an SX-16 receiver, complete with crystal filter. Seventy-five in 1939 was a mass of unyielding heterodynes from the many kilowatt rigs. I couldn't hack it with only 100 watts. Seventy-five in 1981 is a far different story. Occupancy is way down; there is plenty of room for both a.m. and s.s.b. In fact, there are seldom any heterodynes between the a.m. stations, and few present-day a.m. stations use more than 100 watts.

As for the claim, "not state-of-the-art," what the heck is a.m. broadcasting? And why are all those foreign countries fighting for more shortwave (a.m.) broadcast frequencies? They don't use s.s.b. for propaganda. There are many new "state-of-the-art" techniques in a.m. broadcasting today, like solid-state transmitters up to 500 watts output, and noise-reduction techniques, like Dolby, in the program and recording circuits. We never see anything in the literature on this "state-of-the-art."

A.M. is Not Dead on 160

All of the long-existing nets or round-tables are still in operation, most with low power (20 to 50 watts) and now above 1835 in the 1800 to 1850 kHz segment to avoid the s.s.b. stations. All a.m. stations keep out of the "DX Window," 1825-1835, as the s.s.b. stations do not. I've noticed some harassment of a.m. stations by s.s.b. stations. And, there is one 8th call area group that has parked right on W1AW's code practice and bulletin frequency.

*431 Woodbury Road, Huntington, NY 11743

¹B. H. Kretzman, "No Harry, AM is Not Dead!" CQ, March 1977, page 56.

²W. Pasternak, "Looking West," 73, January 1981, page 149.

A.M. is Not Dead on 75

There has been a great increase in a.m. activity on 75-meter phone the past four years. Operation is still confined to 3850 to 3900 kHz for the most part, although some a.m. operation on 3810 has been observed, and there is the "Old Buzzards" net on 3945 every morning here in the northeast. Low power is the norm. I've worked stations using 10 and 20 watts. The DX-60 is a popular inexpensive rig, and there are some DX-100 rigs on the air. All are using the old "communication" receivers, like the HQ-129, the SX-28, and the BC-348, available in the flea markets for peanuts. A recent 75-meter "Jamboree" produced contacts with more than 125 different a.m. stations in the two-day weekend.

A.M. is Not Dead on 40

Forty-meter a.m. operation is generally around 7295 kHz, between two foreign shortwave broadcast stations, which makes life miserable for us in the afternoons and evenings. Daytime a.m. activity can also be found around 7160 kHz. It is interesting to note that those heard on 40 are also on 75 in the evenings. Like 75, much low power is evident.

In the southeast, a.m. is actively operated by members of SPAM, a society founded by W4CJL for the promotion of a.m. Membership has spread westward to Texas and northward as far as New Jersey.

A.M. is Not Dead on 10

Ten meters is probably the band where a.m. activity has increased the most, perhaps because the band has been good enough lately to permit solid-signal contacts all across the country. This a.m. operation on 10 is centered around 29 MHz, usually just above 29 MHz. Strangely, this narrow segment of this relatively wide band seems to attract many s.s.b. stations although there is plenty of room for them below 29 MHz. (Whatever happened to the "gentlemen's agreement" whereby the s.s.b. stations would stay below 29 MHz?)

However, a.m. stations on 10 are gradually increasing power, and many are building huge beams, like W5PYT and his Sterba curtain. One result of this evolution of station equipment is the increase in back-scatter operation, where contacts over 250 to 500 miles become commonplace—WA1HLR in Maine to W2JTP on Long Island, for example, 320 miles.

A.M. is Not Dead on 6

Thanks to the publicity generated by WA6ITF², old Gonsets, Heathkits, and Cleggs are being dug out of basements and attics and are being put back on 6-meter a.m. The use of this low power and the proliferation of Cable TV has helped to reduce the bugaboo of t.v.i.

And, in addition, quite a few of us are rediscovering the tremendous satisfaction of building converters and even a.m. transmitters, easy to do on 6, especially for low power.

Six-meter a.m. stations use vertical antennas, further reducing the possibility of t.v.i. Localized operation in the Philadelphia, Pennsylvania and Camden, New Jersey area is on or about 50.6 MHz. This is the "Coffee Pot" net on about 9 a.m. mornings. In northern New Jersey another group is on or about 50.22 MHz and gets on about 11:40 p.m. On Long Island interest on 50.6 MHz is picking up. W2JTP has just converted an old Eldico (2E26 final) 2-meter a.m. transmitter to 6.

A.M. is Not Dead on 2

When the repeater segment was expanded, 145.350 MHz, the home of the "Happy Hour" group (Long Island and Connecticut), had to be abandoned. It was moved to 144.350 MHz. Antennas are horizontal and rag-chewing is the order of the day. The rigs are still old Gonsets, Cleggs, and Com-crafts. "Repeaters, who needs 'em?" is the feeling of most 2-meter a.m. operators. The "Happy Hour" starts at 6 p.m.

A.M. and the S.W.L.

As we said back in 1977, a.m. is what the shortwave listener listens to—not s.s.b. Those on a.m. are still getting letters and phone calls from shortwave listeners. This is *their* introduction to ham radio. They hear *us* having fun, which many times leads to them becoming hams.

A.M. and the Press Exchange

Since January of 1980 a.m. has had its own voice in the form of the monthly *Press Exchange*, a small but timely bulletin devoted to a.m. It contains not just activity reports, but also technical information on a.m. *PE* is published by W2NRM of Ramsey, New Jersey, and its ever increasing circulation is now stretching all over the country. *PE* is particularly important to a.m.'ers because it does not suffer the two to three months time delay in reporting ARRL and FCC regulatory actions, common with all amateur radio magazines. For example, RM-3665, which proposed to eliminate a.m. from all amateur bands, could not even be mentioned, except in *PE*, before the filing deadline for comments. (A request for extension was denied.) It is *PE*, too, which sponsors the frequent band-by-band "AM Jamboree," like the 10-meter Jamboree held in late January of 1981 and the 75-meter Jamboree previously mentioned.

Now, a.m. is a *fun* operation. "Old Buzzard" QSO's are frequent, and young fellows are enjoying this old-time kind of hamming, where we *do* and where we talk about what we *do*. Come on, jump (back) into a.m.; the water is fine! ☐

CQ BOOK SHOP

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Charles T. Allen, W5DV, and James M. Allen, W6GOC, eds.

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The 10 Meter FM Handbook

by Bob Heil, K9EID

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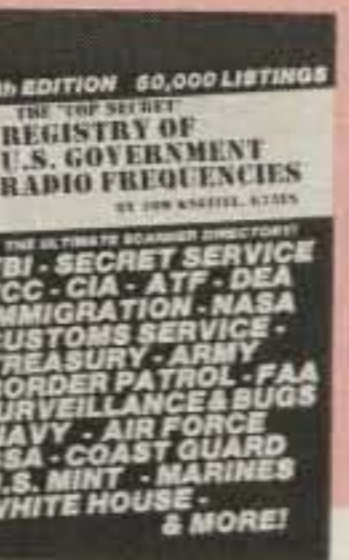
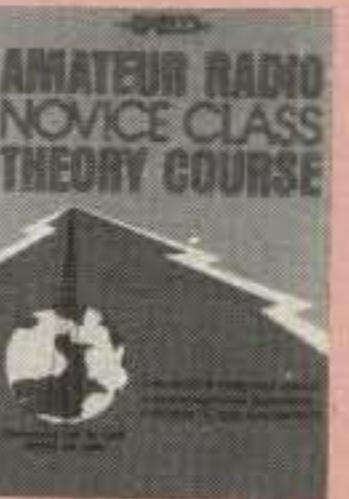
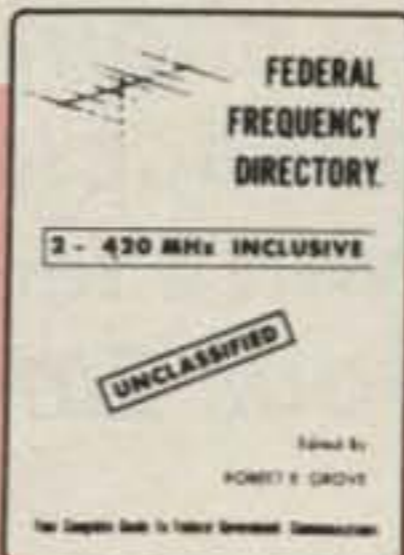
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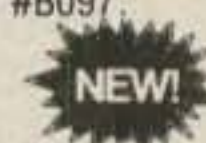
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How To Get On 6 Meters (Almost)

BY MARTIN BRADLEY WINSTON*, WB8LBV

How many 6-meter a.m. rigs have you seen around lately? Here's one that will never win any DX awards (unless CQ starts a WAR—Worked All Rooms), but it's handy for hamfests, short-range crowd-control activities, antenna raising parties and . . . you tell us!

The starting point is Radio Shack's venerable Archer Space Patrol® walkie-talkie, catalog 60-4001, with a U.S. catalog price of \$9.95. When you get yours, play it smart and pick up a battery-a-month card and the 9-square you'll need to power it.

Pay close attention. What we'll describe here is a no-sweat modification to put this pocketful onto 6 meters.

Fifty Giant Milliwatts

QRP rigs are leviathans compared to the output you'll get from this rig. Take a look at the schematic (it's the whole thing—honest—not just a section). There are three powerful NPN transistors busy pumping electrons here. What more can you ask for?

The receiver is (can you guess?) a super-regenerative (what else!) with unremarkable selectivity or sensitivity. You can talk to an unmodified 49.680 MHz rig from almost anywhere on 6 meters, but it can't talk back. Since the transmitter

configuration is a fairly straightforward crystal oscillator and amplitude modulator, the logical conclusion was that a simple change of crystal would accomplish all. But, of course, there's no such thing as a simple change of crystal. We'll give you the full particulars in a second, but first here's the rest of the specs on this tiny powerhouse.

R.f. input power is a whopping 50 milliwatts. Battery drain is 35 ma when transmitting and 20 ma when receiving. (The super-regen, by the way, is a pretty fair noise transmitter in its own right.) A 5-inch 8 ohm speaker doubles as mike. Overall dimensions are 5¼H × 2¼W × 1⅞D inches, and the unit weighs 0.39 pounds. The whip is built in and telescopes down until only the orange end button is showing. The PTT switch has a lock-on notch. And there's an audio oscillator code key (big square orange push-button on the front) that lets the beast beep-diddy-beep either over the air (with the PTT in) or right there for code practice. The Morse code is molded onto the front panel for those of us with poor memories of way back when when we got our tickets to let us work 2-meter f.m.

All in all, as my XYL puts it, "It's cute."

Crystal, Crystal, Who's Got The Crystal?

When was the last time you trotted down to the corner store to buy a just-right crystal for *anything* other than a CB

rig or a scanner? I invite you to spend the time I spent unwinding the schematic into separate transmit and receive configurations, because there just isn't any such thing as a name for the oscillator they use here, at least not according to any of the dozen or so handbooks in my half-vast library. So I did what any clear-thinking ham would do. I took my problem to someone else. (It's gratifying to know that *they* did, too.)

The someone else in this case is Rolin Distributors (P.O. Box 436, Dunellen, NJ 08812), who, as any of the readers of the ads on these pages are well aware, do a bang-up job of making available all kinds of ham crystals. I sent them the schematic of the Archer walkie-talkie, which should be enough for any competent crystal palace, right? Of course! That's why I also sent them a pair of the walkie-talkies—just in case.

Alas, the simpler the circuit, the more aggravating a fudge becomes. The folks at Rolin applied all the expertise they could muster to matching a crystal type to this circuit. Then, at the end of their ropes, they did what any clear-thinking crystal palace would do—they forwarded the whole kit and caboodle to Bomar Crystal Corporation, the manufacturer of most of the crystals they sell.

Think this is the end of the saga? You're wrong: It is! Bomar did a bang-up job of finding the perfect crystal for this circuit and even added a few installation/replacement tips. And the best news is

*c/o CQ Magazine

that these crystals, cut for whatever 6-meter frequency you specify, are available for only \$8.50 each through Rolin. (Clubs interested in buying 20 or more are invited to contact Rolin directly for quantity discount information.)

Do It To It!

First step in the changeover process is to send away for your crystal. I chose 50.180 MHz, but you can make your own selection. The next step is to get the case of the walkie-talkie open—a less Herculean task than you might imagine.

Take the battery cover off and the battery out and collapse the whip antenna. Remove the small Phillips-head screw from the middle of the back of the case. The back of the case now unsnaps from the front, but a little *carefully* applied prying force along the seam will help (I used a frisket knife razor-like blade).

Now there are all of two screws left. The one at the base of the antenna lets you remove the connector lug, which makes for a lot less tail-wagging-the-dog rattling of the case at the end of the lead as you try to work on the printed circuit board. The PC board itself is fastened by the remaining screw (in the upper right corner) and by a couple of pieces of plastic. Push these plastic pieces out of the way gently, without breaking them, and the PCB will lift right out.

From here, I'll quote from the people at Bomar:

"Steps needed to remove the original crystal are:

"1. Cut the 'flexible cement' between the crystal and the PTT switch housing with a razor blade.

"2. Remove solder from the crystal leads on the foil side of the PC board using a 'solder sucker' or solder wick.

"3. The original crystal leads were inserted into the PC board and then bent over at 90°; the leads must be straightened before removing the crystal to avoid damaging the solder pads.

"Properly correlated crystals final plated to 50.180 MHz (or your choice) are then

installed. The can was not cemented to the PTT switch housing [though it could be]. Retuning of the output was not attempted, nor did it seem necessary.

"Performance of these transceivers after modification seemed comparable to original performance, although no measurements were made."

The Quasi-Official CQ Test Report

No expense was spared (or spent) in our rigorous examination of the pair of walkie-talkies we modified. Initial testing was done in Hicksville, Long Island and Branford, Connecticut. No, not between Hicksville and Branford—the little devils couldn't work that far on a long-distance phone call.

The first test was done in the executive offices of CQ with Publisher Dick Ross, K2MGA, on one unit and Editor Alan Dorchoffer, K2EEK, on the other. Solid copy was reported on a continued QSO between their offices.

The second test was performed by the author, WB8LBV, in his at-home laboratory, equipped with a typewriter, an empty fire extinguisher, and some once-borrowed-never-returned test equipment, plus, of course, a stack of dubious ham gear. My imported synthesized 6-meter a.m. rig successfully picked up both the super-regenerative receiver noise rush and the modulated (both by voice and the code key) transmitted carrier. And it was *dead on-channel!* Boy, those folks in the crystal business sure can count their kiloHertz!

A more rigorous test with the a.m. rig and the two walkie-talkies showed excellent performance in a variety of tests, but no test for range was made. (An earlier test with unmodified rigs showed reliable communications possible out to 50-100 feet, with regression beyond that.)

Listen, nobody promised you DX with these rigs. Besides, would you pay \$400/watt for a DX rig? But they're handy, they're fun, and they're perfect for those purely walkie-talkie things we all like to do now and again.

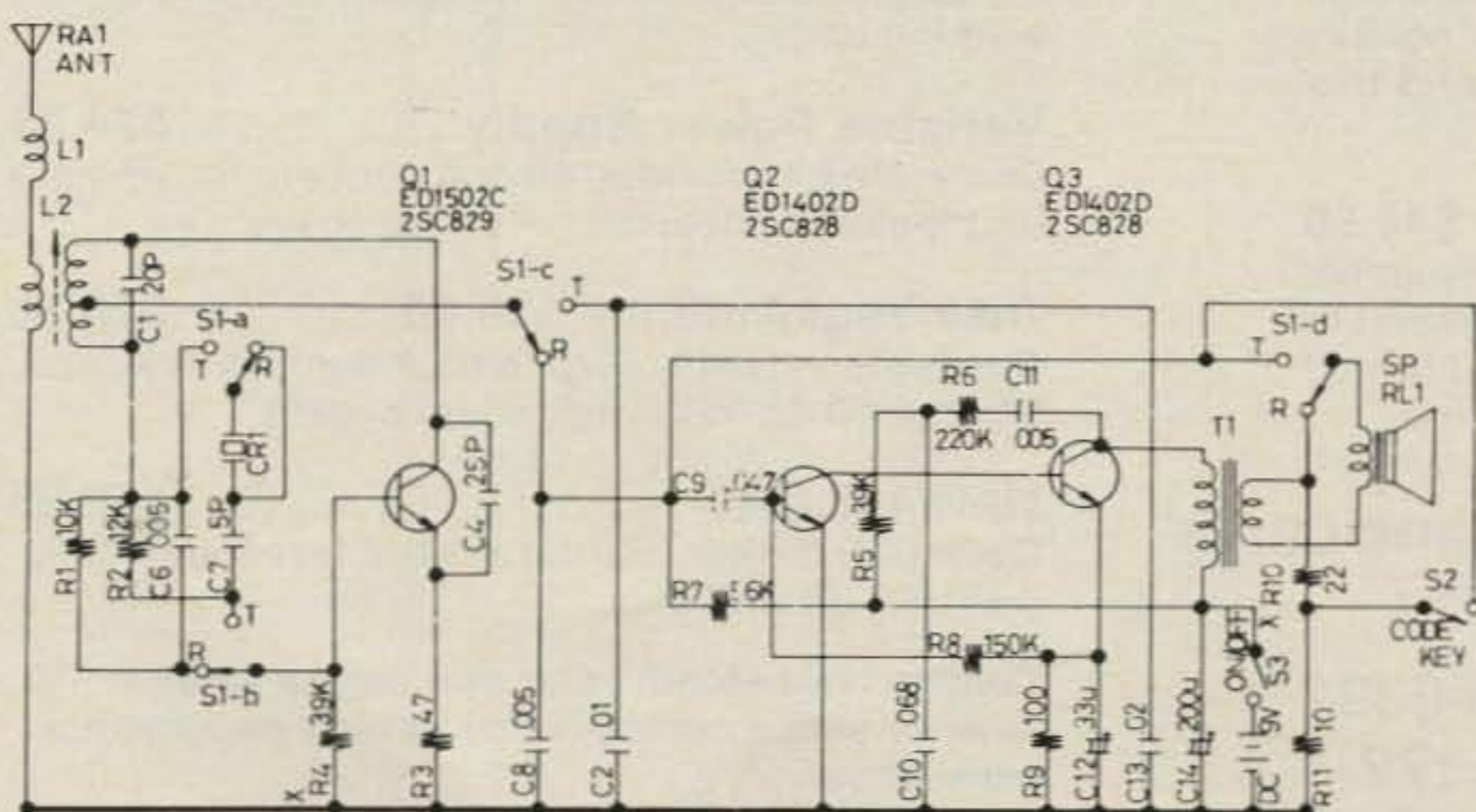


Fig. 1—The complete schematic for the Archer walkie-talkie.

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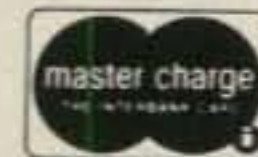
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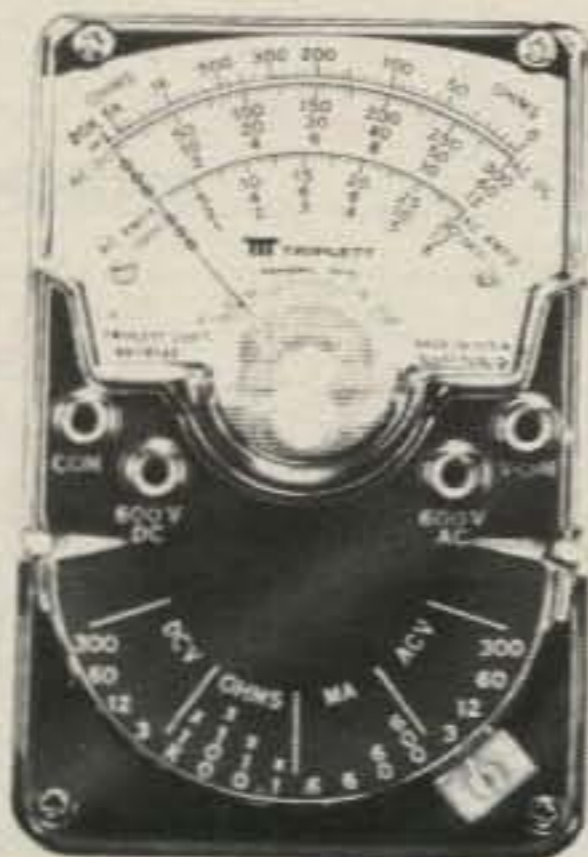
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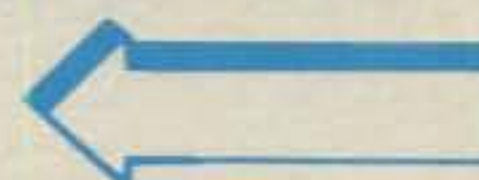
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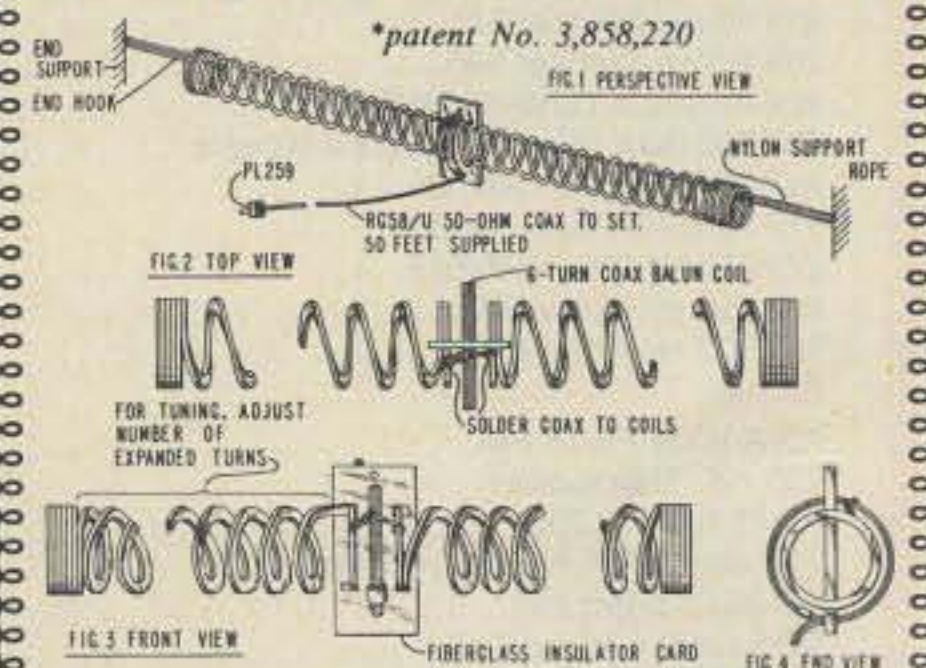
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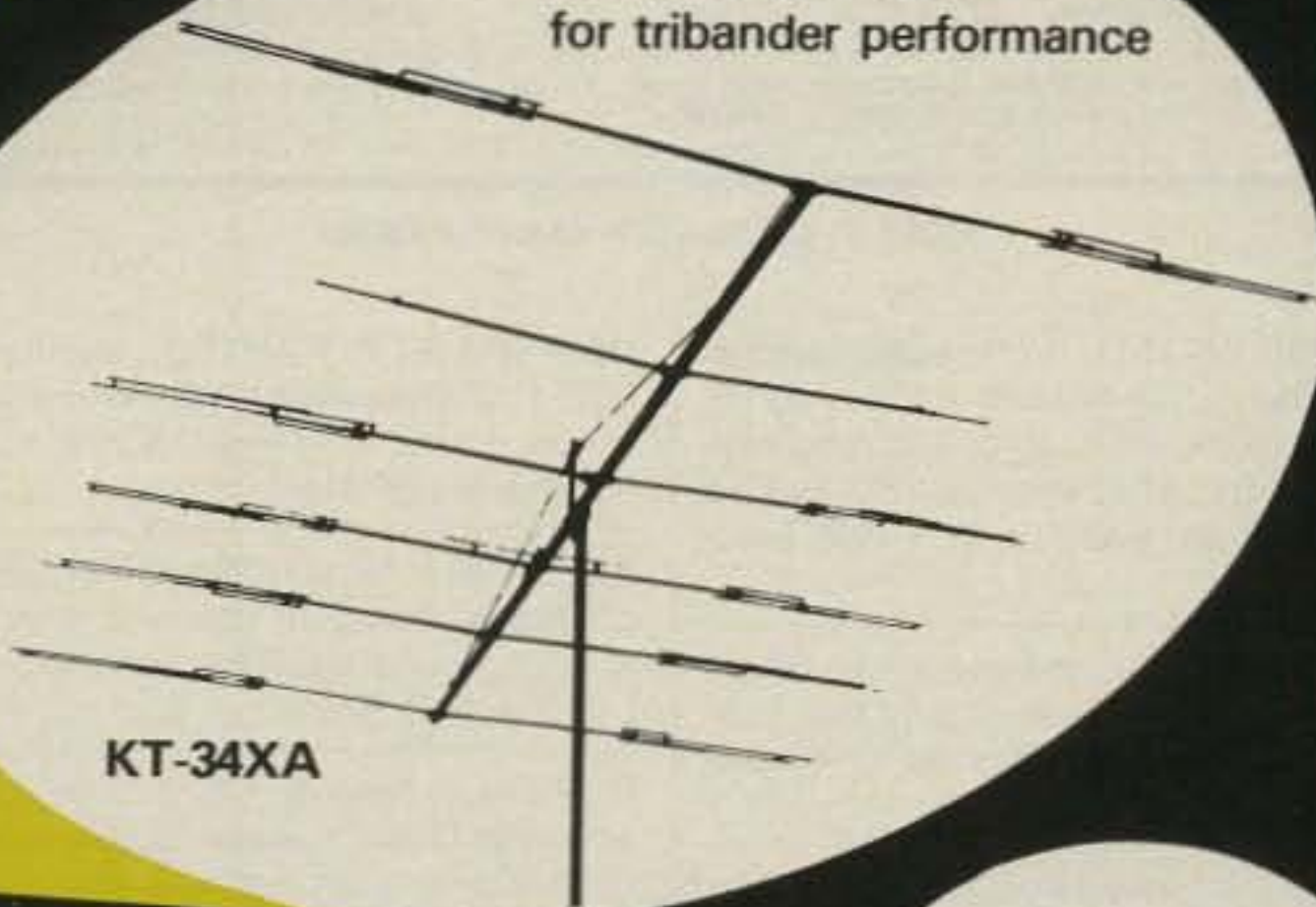
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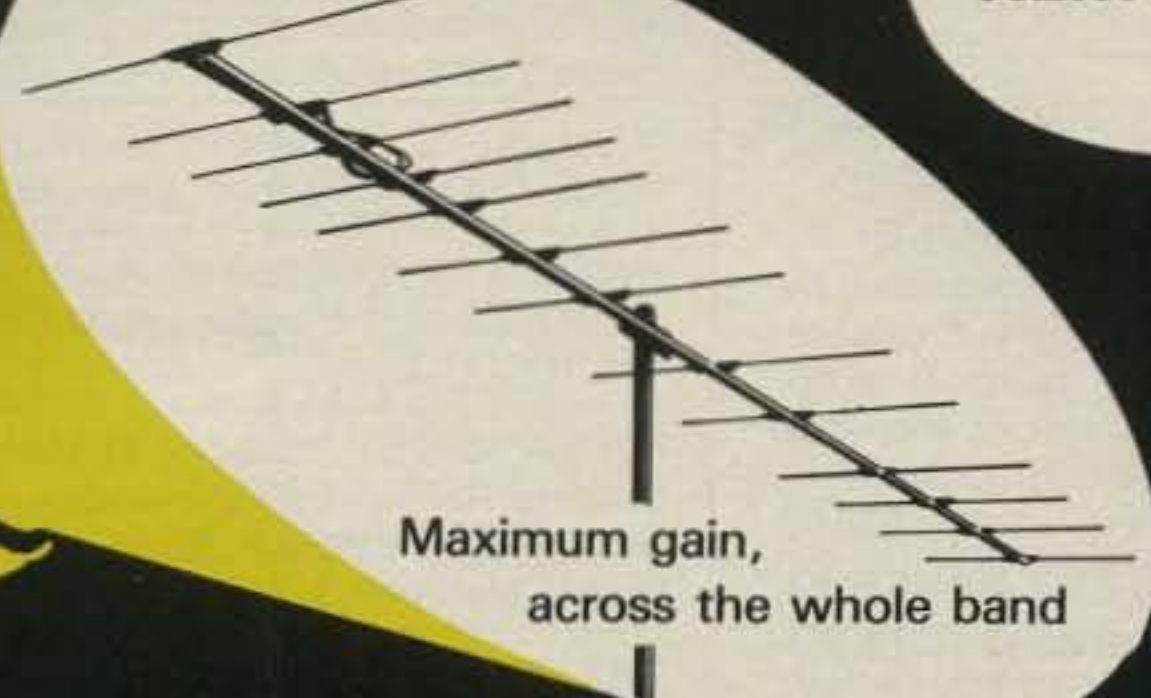
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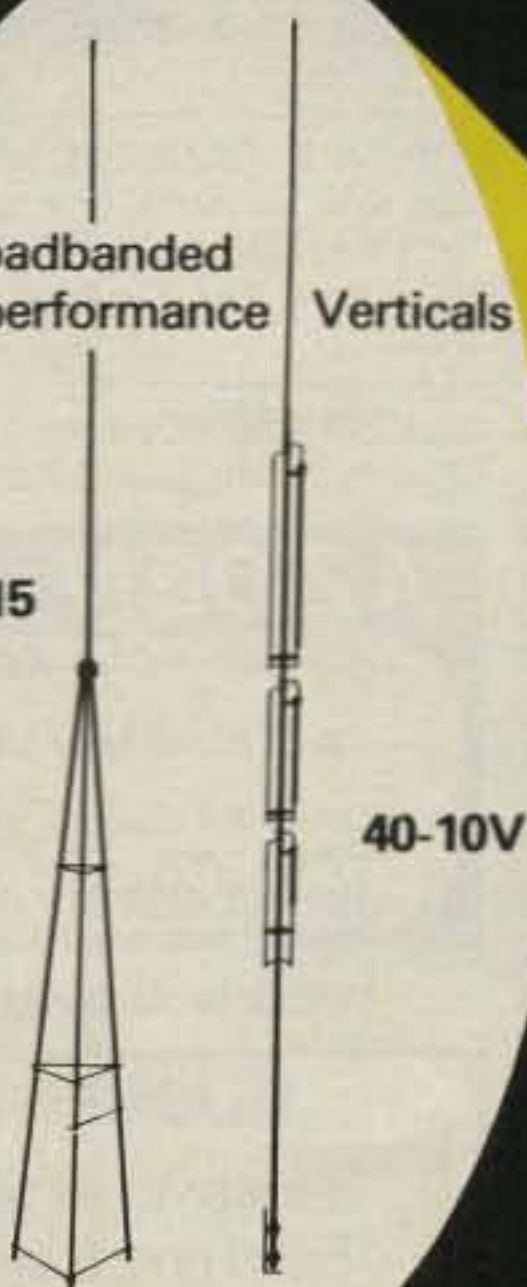
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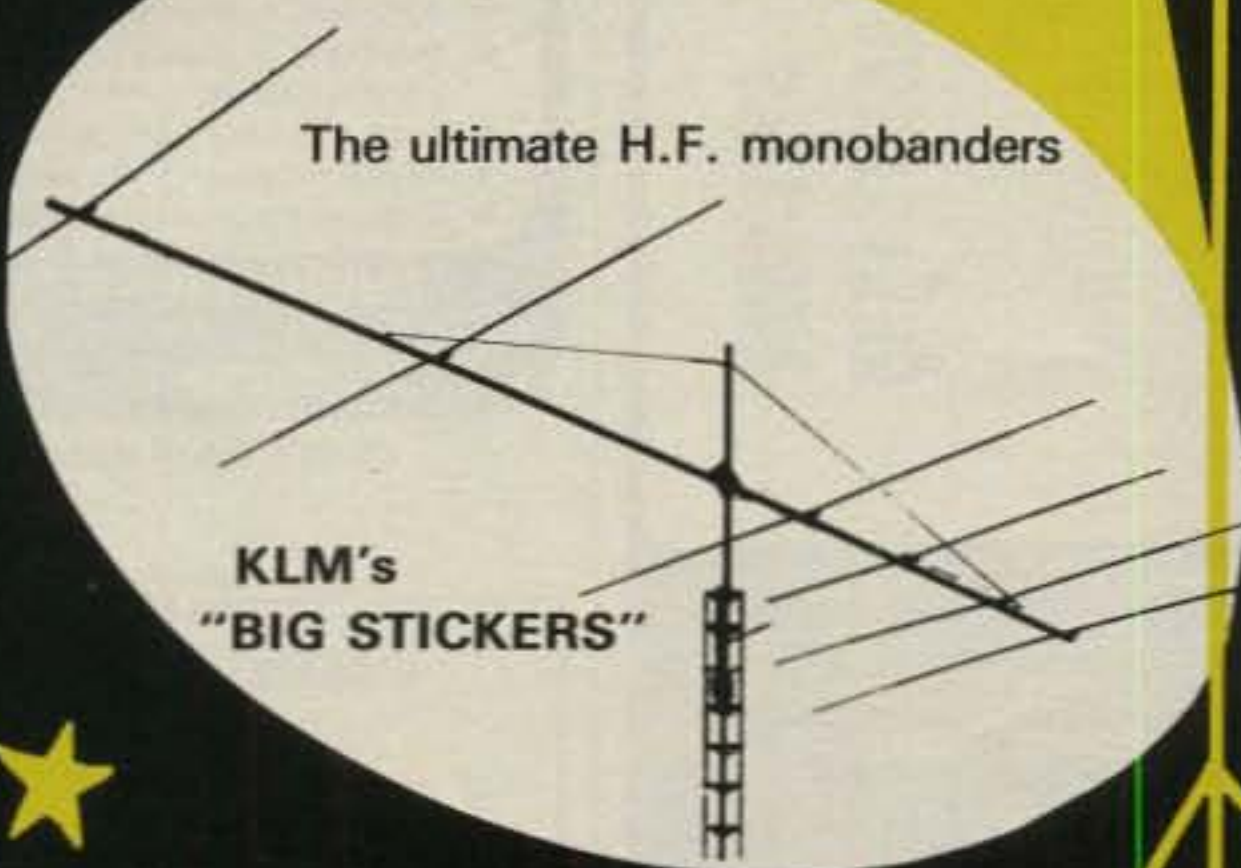
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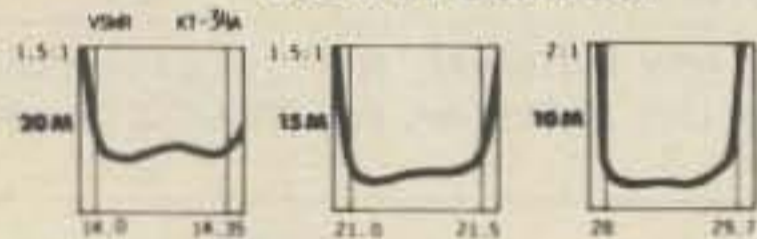
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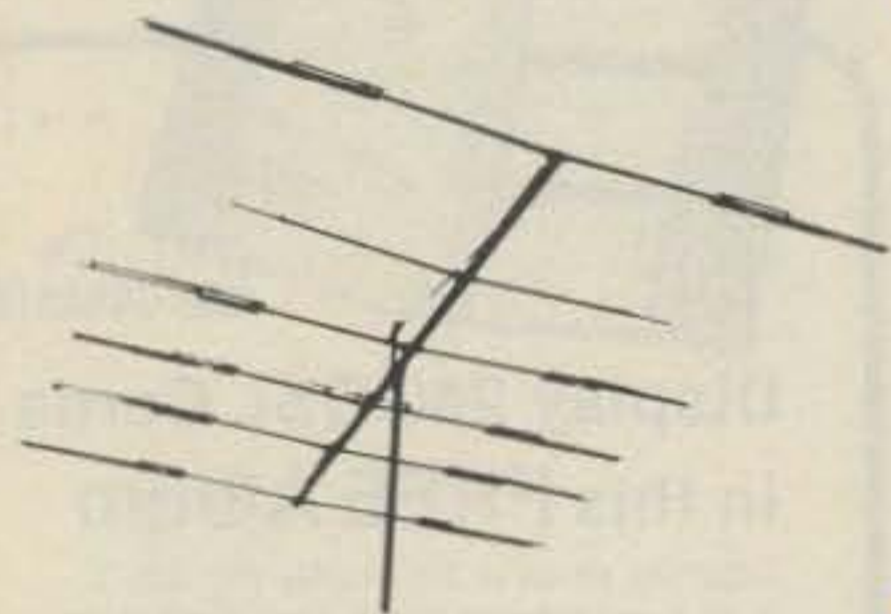


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