

ICD 08241

# Amateur Radio

SERVING AMATEUR RADIO SINCE 1945

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# CQ

## Sable Island DXpedition

... page 13

Also ...

### CQ Reviews:

- The Omni V by Ten-Tec
- The New Grand Master Keyer by MFJ
- The PFC-4500 Counter by Digitrex



THE RADIO AMATEUR'S JOURNAL



# KENWOOD

...pacesetter in Amateur Radio

All-mode  
tri-bander!

## Warp Drive!



## TS-790A Satellite Transceiver

The new Kenwood TS-790A VHF/UHF all-mode tri-band transceiver is designed for the VHF/UHF and satellite "power user." The new TS-790A is an all-mode 144/450/1200 MHz transceiver with many special enhancements such as automatic uplink/downlink tracking. Other features include dual receive, automatic mode selection, automatic repeater offset selection for FM repeater use, VFO or quick step channel tuning, direct keyboard frequency entry, 59 memory channels (10 channels for separate receive and transmit frequency storage), multiple scanning and multiple scan stop modes. The Automatic Lock Tuning (ALT) on 1200 MHz eliminates frequency drift. Power output is 45 watts on 144 MHz, 40 watts on 450 MHz, and 10 watts on 1200 MHz. (The 1200 MHz section is an optional module.)

- **High stability VFO.** The dual digital VFOs feature rock-stable TCXO (temperature compensated crystal oscillator) circuitry, with frequency stability of  $\pm 3$  ppm.
- **Operates on 13.8 VDC.** Perfect for mountain-top DXpeditions!
- **The mode switches confirm USB, LSB, CW, or FM selection with Morse Code.**
- **Dual Watch allows reception of two bands at the same time.**
- **Automatic mode and automatic repeater offset selection.**
- **Direct keyboard frequency entry.**
- **59 multi-function memory channels.** Store frequency, mode, tone information, offset, and quick step function. Ten memory channels for "odd split."
- **CTCSS encoder built-in.** Optional TSU-5 enables sub-tone decode.
- **Memory scroll function.** This feature allows you to check memory contents without changing the VFO frequency.

- **Multiple scanning functions.** Memory channel lock-out is also provided.
- **ALT—Automatic Lock Tuning—on 1200 MHz eliminates drift!**
- **500 Hz CW filter built-in.**
- **Packet radio connector.**
- **Interference reduction controls:** 10 dB RF attenuator on 2m, noise blanker, IF shift, selectable AGC, all mode squelch.
- **Other useful controls:** RF power output control, speech processor, dual muting, frequency lock switch, RIT.
- **Voice synthesizer option.**
- **Computer control option.**

### Optional Accessories:

- **PS-31** Power supply • **SP-31** External speaker
- **UT-10** 1200 MHz module • **VS-2** Voice synthesizer unit
- **TSU-5** Programmable CTCSS decoder
- **IF-232C** Computer interface • **MC-60A/MC-80/MC-85** Desk mics • **HS-5/HS-6** Headphones
- **MC-43S** Hand mic • **PG-2S** Extra DC cable

## KENWOOD

KENWOOD U.S.A. CORPORATION  
COMMUNICATIONS & TEST EQUIPMENT GROUP  
P.O. BOX 22745, 2201 E. Dominguez Street  
Long Beach, CA 90801-5745  
KENWOOD ELECTRONICS CANADA INC.  
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Mississauga, Ontario, Canada L4T 4C2



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



# KENWOOD



## TS-950SD

"DX-clusive" HF Transceiver

The new TS-950SD is the first Amateur Radio transceiver to utilize Digital Signal Processing (DSP), a high voltage final amplifier, dual fluorescent tube digital display and digital meter with a peak-hold function.

- **Dual Frequency Receive Function.** The TS-950SD can receive two frequencies simultaneously. The sub-receiver has independent controls for frequency step size, noise blanker, and AF gain and its own digital display!
- **New! Digital AF filter.** Synchronized with SSB IF slope tuning, the digital AF filter provides sharp characteristics for optimum filter response.
- **New high voltage final amplifier.** 50 V power transistors in the 150-watt final section, results in minimum distortion and higher efficiency. Full-power key-down time exceeds one hour.
- **New! Built-in microprocessor controlled automatic antenna tuner.** The new antenna tuner is faster and you can store the settings in memory! (Manual override is also possible.)
- **Outstanding general coverage receiver performance and sensitivity.** Kenwood's Dyna-Mix™ high sensitivity direct mixing system provides from 100 kHz to 30 MHz. The Intermodulation dynamic range is 105 dB.

## The Ultimate Signal.



Digital Signal Processing



• **Digital Signal Processor.** DSP is a state-of-the-art technique that maximizes your transmitted RF energy. Your signal stands out because it is much more pure than your competition! You can even tailor your transmitted CW or voice signal waveshape!

• **High performance IF filters built-in.** Select various filter combinations from the front panel. For CW: 250 and 500 Hz, 2.4 kHz for SSB, and 6 kHz for AM. Filter selections can be stored in memory!

- **Multi-Drive Band Pass Filter (BPF) circuitry.** Fifteen band pass filters are available in the front end to enhance performance.
- **Famous Kenwood interference reduction circuits.** SSB Slope Tuning, CW VBT (Variable Bandwidth Tuning), CW AF tune, IF notch filter, dual-mode noise blanker with level control, 4-step RF attenuator (10, 20, or 30 dB), switchable AGC circuit, and all-mode squelch.
- **Built-in TCXO for highest stability.**
- **Built-in electronic keyer circuit.**
- **100 memory channels.** Store independent transmit and receive frequencies, mode, filter data, auto-tuner data and CTCSS frequency.
- **Digital bar meter.**

**Additional Features:** • Built-in interface for computer control • Programmable tone encoder • Optional VS-2 voice synthesizer • Built-in heavy duty AC power supply and speaker • Adjustable VFO tuning torque • Multiple scanning functions • MC-43S hand microphone supplied

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KENWOOD  
...pacesetter in Amateur Radio

- Optional Accessories**
- VS-2 Voice synthesizer
  - SP-950 External speaker w/AF filter
  - SM-230 Station monitor w/pan display
  - SW-2100 SWR/power meter
  - TL-922A Linear amplifier (not for QSK)



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



# KENWOOD

...pacesetter in Amateur Radio

Good  
for Satellite  
Digital QSOs

## Matching Pair

### TS-711A/811A VHF/UHF all-mode base stations

Look for  
FUJI  
and  
PHASE III-C

The TS-711A 2 meter and the TS-811A 70 centimeter all mode transceivers are the perfect rigs for your VHF and UHF operations. Both rigs feature Kenwood's new Digital Code Squelch (DCS) signaling system. Together, they form the perfect "matching pair" for satellite operation.

#### • Highly stable dual digital VFOs.

The 10 Hz step, dual digital VFOs offer excellent stability through the use of a TCXO (Temperature Compensated Crystal Oscillator).

#### • Large fluorescent multi-function display.

Shows frequency, RIT shift, VFO A/B, SPLIT, ALERT, repeater offset, digital code, and memory channel.

#### • 40 multi-function memories.

Stores frequency, mode, repeater offset, and CTCSS tone. Memories are backed up with a built-in lithium battery.



#### • Versatile scanning functions.

Programmable band and memory scan (with channel lock-out). "Center-stop" tuning on FM. An "alert" function lets you listen for activity on your priority channel while listening on another frequency. **A Kenwood exclusive!**

#### • RF power output control.

Continuously adjustable from 2 to 25 watts.

#### • Automatic mode selection.

You may select the mode manually using the front panel mode keys. Manual mode selection is verified in International Morse Code.

#### • All-mode squelch.

#### • High performance noise blanker.

#### • Speech processor.

For maximum efficiency on SSB and FM.

#### • IF shift.

#### • "Quick-Step" tuning.

Vary the tuning characteristics from "conventional VFO feel" to a stepping action.

#### • Built-in AC power supply.

Operation on 12 volts DC is also possible.

#### • Semi break-in CW, with side tone.

#### • VS-1 voice synthesizer (optional)

More TS-711A/811A information is available from authorized Kenwood dealers.



#### Optional accessories.

- IF-10A computer interface
- IF-232C level translator
- CD-10 call sign display
- SP-430 external speaker
- VS-1 voice synthesizer
- TU-5 CTCSS tone unit
- MB-430 mobile mount
- MC-60A, MC-80, MC-85 deluxe desk top microphones
- MC-48B 16-key DTMF, MC-43S UP/DOWN mobile hand microphones
- SWT-1 2-m antenna tuner
- SWT-2 70-cm antenna tuner
- PG-2U DC power cable

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

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**ON THE COVER:** DXer and contester Bob Ferrero, W6RJ at the rig in his Danville, CA QTH. (Photo by Larry Mulvehill, WB2ZPI.)



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# ZERO BIAS

## EDITORIAL

**T**he other morning dawn cracked on a crummy day. The local news was already reporting on large scale auto accidents and other bad news, so I decided to see what the real world had to offer and fired up the rig on 10. Ten meters at dawn from the east coast can be quite interesting, especially during the winter.

Well, real life that morning had most of the European countries coming through, a dozen or so Oblasts represented, plus an Algerian station and one from the United Arab Emirates. There was also a young lady on from Lebanon and one or two Japanese stations, long path. If you didn't want to get in the fray, you could have turned the beam the other way and worked counties galore across the country while picking up states. You could have worked scores of new prefixes or earned points and credit towards any number of awards. That was real life that morning, and it wasn't too different from many other mornings.

That morning stands out in my mind not because of the signals I heard, or the DX that got away, but because of a conversation I tuned into between two big guns. They were at the high end of the Novice/Tech portion and oblivious to the cacophony of signals around them or even under them. They were rag-chewing in the midst of a feeding frenzy of DXers. One of the amateurs offered that the amateur radio magazines and manufacturers were hyping the sunspot cycle to their own ends and that propagation really wasn't what it should be and was certainly not nearly as good as it was in 1958. They went on to say that this particular morning didn't offer much and that it was better a year ago at this time. So the irony of the situation is that here we have two long-time amateurs who were being drowned in a typhoon of signals and DX, and who were so blase as to have no one to talk to except each other, just as if the band were dead.

Well, maybe these folks wake up each morning expecting that this will be the day when the elusive ZAs will once again be heard. Maybe this thought is the only excitement left for them in amateur radio. Is there life after working them all? Most of us have a ways to go before we have to face that question. However, recent events in Europe may increase the odds of working a ZA. If the pendulum doesn't swing the other way, there should be all sorts of opportunities for agreements between East and West. So, at some point it looks like our big guns will work that ZA, receive the QSL, and really have to hunt far and wide to get that same adrenalin rush you get when you work a new one.

That feeling, that exhilaration, is what amateur radio is all about. No, you can't quantify it or dissect it, but it's there for all of us at some time or another. Most of us ride peaks and valleys of interest in amateur radio, but very few give it up entirely. You can give up the hobby

physically but not emotionally, as many amateurs still consider themselves amateurs even though they haven't made a contact in years and have equipment lying dormant in the basement. Sooner or later the bug bites again and the cycle starts, just like the sunspots.

No matter what area of amateur radio you prefer, or no matter how vertical your interests are, there is that hurdle or achievement or something that once passed or accomplished will give you the same rush as the big gun adding a ZA to his total. That is the sizzle, the addictive quality of our hobby that has us doing something which in turn is fun and most important of all makes us feel extremely good about ourselves.

Our traditional cultures are full of taboos on such activities. First, there is no apparent purpose to some of this behavior nor resultant public good or personal enrichment (this means getting a better job) resulting from most of what goes on in amateur radio. Don't get me wrong. When a disaster or emergency arises there are countless altruistic acts and an outpouring of support from amateur radio. These noble acts and selfless deeds are done by a minority of us, though we all bask in their radiance. This is not designed to whip up a frenzy of public service. Although that would be nice, it's a little unrealistic to expect.

Rather than continually harping on what we should all be doing and what the "service" is all about in terms of technical adequacy (or inadequacy), we should take a real hard look at what it is in real-life terms. For if we are ever to sell and market our hobby to new (young or old) people, then we are forced to tell the truth. What is the truth? We are all having a great time and a lot of fun, and most of us are utilizing our hobby for things the rest of the world would not consider serious or meaningful. However, we enjoy it, it's fun, and it makes us feel good.

Now there's a bunch of us who are quite serious and who can rationalize in technocratic terms the purpose and "mission" of amateur radio and amateur radio operators. They have solutions to worldwide problems and envision a cadre of amateur radio operators and stations standing by 24 hours a day to handle emergencies, while at the same time being fulfilled by mastering electronic esoterica and conversational Morse. Upward and onward. Tomorrow's amateur should be better prepared technically than today's amateur.

Some will cite the "instant gratification" generation or YUPPYdom for causing the state that we're in. We're not in any particular state. It's just that the world has changed dramatically since that 1958 ten meter sunspot-cycle-high our big-gun DXer pined for, and most of us have changed along with it. We can't keep this little oasis of amateur radio the very same way it was in 1958 or even return it to that era. People (young or old) are prone to

ask, "Why would I want to do that?" when told about amateur radio. We offer the reasons of obligation, duty to one's country, and training opportunities, and maybe towards the end the word *fun* is slurred and spoken softly as a reward for the previous reasons.

Well, if it happens to be a nice day, and you happen to go to the park, chances are you'll see some people playing ball. I don't think at that moment they are concerned about Abner Doubleday, statistics, or weighing their chances of getting in the Baseball Hall of Fame. They're playing ball and having a good time and it feels good. You can always say that they are improving their cardio-vascular condition or opting for a form of organized exercise. If you told them that, the odds are they would go home and forget the game.

Without the benefit of enormous amounts of research or the sage advice of experts and consultants, one could take a giant leap and presume that people (of all ages) pursue an avocation because they believe it will be fun, enjoyable, and an escape from real-life tensions. The fact that the very same person will also eventually spend time reading about, studying, and actively learning more about that particular avocation is really secondary to the primary motive of enjoyment.

Maybe there is life after you eventually work them all, and you don't want to advertise the fact. Maybe deep down we are all afraid that if the masses found out about amateur radio more people would want to get involved. Not too many people are captivated by the anticipation of studying license manuals and mastering Morse code, so we can always push that aspect to keep the numbers down. Who knows what could happen if the whole world found out about what we've been secretly enjoying for these many years.

I know the very serious among you are not really having a good time or enjoying yourself, but are merely stewards of the bands, hefting the weight of responsibility and preparing yourself for the next technological hurdle. In fact, some of you, if given the choice between another amateur moving next door and having next to you a group home for psychopathic child-molesting animal killers, could probably see the sociological need for such a home even in your backyard. The greater need, and the need of the service, both served.

Well, there is life after you work them all, and it is fun, and you do come away with a good feeling. That's the message, plain and simple. If you really want to sell the hobby, those are the points everyone understands. Don't get bogged down in technological gibberish, buzz words, or the necessary evils in order to get a license. What's wrong with telling someone that you really enjoy your hobby and you think they would, too?

73, Alan, K2EEK



# AEA'S NEW PK-232MBX

## With PakMail™

Now AEA's popular PK-232 multi-mode data controller has new features you've been asking for...PakMail™ Mailbox with selectable third-party traffic, seven-character AMTOR (CCIR R.625) call identity, TDM (Time Division Multiplex) receiving for SWL's, and Prioritized Acknowledgement (ACK) protocol for improved packet performance. Compatible with almost every computer or asynchronous data terminal, you can enjoy the full spectrum of amateur digital communications with AEA's new PK-232MBX.

**All Operating Modes.** The PK-232MBX includes all authorized amateur digital modes available today...Morse, Baudot, ASCII, AMTOR/SITOR 476 and 625, Packet, WEFAX receive and transmit, as well as commercial standard NAVTEX automated marine information services.

**Superior Modem.** An eight-pole Chebyshev bandpass filter limiter-discriminator modem improves the signal-to-noise ratio at the detector and virtually eliminates interference from adjacent signals. System performance has been proven superior to that of PLL modems designed for telephone line services.

**PakMail™** PakMail™ mailbox with selective control of third-party traffic is now a standard feature. Your friends can now leave you messages around the clock. Your local full-service BBS can automatically forward your messages directly to your PK-232MBX.

**WEFAX Transmission and Reception.** AEA brought you the first multi-mode controller to send and receive WEFAX (weather facsimile) charts. The PK-232MBX directly supports the widest range of printers on the market using the optional RS-232/printer cable.

**Host Mode.** Only AEA provides the type of full-featured Host Mode preferred by many professional programmers for efficient control of the PK-232MBX. AEA's Host Mode programs include PC-Pakratt with FAX for the IBM PC's and compatible MS-DOS computers, COM-Pakratt with FAX for the Commodore C-64 and C-128, and now MacRATT with FAX for the Apple Mac-Intosh.

**Two Radio Ports.** Independent radio connection ports allow convenient, interchangeable all-mode operation regardless of port selection. You can connect two VHF/UHF radios, an HF and a VHF/UHF radio, or two HF radios, selectable by a front-panel switch.

**Signal Analysis.** The PK-232MBX's internal software features AEA's exclusive SIAM (Signal Identification and Acquisition Mode). The PK-232MBX automatically identifies Baudot, ASCII, AMTOR/SITOR and TDM signals, then measures signal speed and polarity. A simple "OK" command automatically switches the PK-232MBX to the recognized mode and starts the data display.

**PakMail™ Upgrade Kit.** The easily-installed PakMail™ upgrade kit includes a plug-in board and new software EPROMs, and is fully compatible with all existing PK-232's. Please contact factory for details.

**You Deserve The Original.** AEA produced the first multi-mode data controller. The PK-232 continues to be the standard against which all other multi-mode controllers are judged; the choice of critical amateurs, commercial services and government agencies. Don't settle for less than the best.

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## Tower of Strength

Rugged, all steel Hy-Gain antenna crank-up towers are galvanized after welding. Precision welding fixtures assure straight and true alignment of tower sections for close tolerance crank-up guide systems. Diamond web bracing, 2.5 times the strength of ordinary "W" bracing, adds strength where tower sections meet. Open-end tubular steel legs are galvanized inside and out and permit unrestricted moisture drainage. It all adds up to long lasting, massive tower strength for antenna loads of up to 16 sq. ft. at 60 mph.

	Height Extended	Height Retracted	Antenna Square Foot Windload Limit
HG-37SS	37 ft.	20.5 ft.	9.5 @ 50 mph
HG-52SS	52 ft.	21 ft.	9.5 @ 50 mph
HG-54HD	54 ft.	21.5 ft.	16 @ 60 mph
HG-70HD	70 ft.	21.5 ft.	16 @ 60 mph

Towers come complete with hinged base, installation steelwork, predrilled rotator plate and a manual winch.

Hy-Gain crank-up towers require no guying and conform to EIA, to the Uniform Building Code, and are approved by Los Angeles (license 1095). UBC documents for building permits are available on request (specify tower model) before you buy the tower.

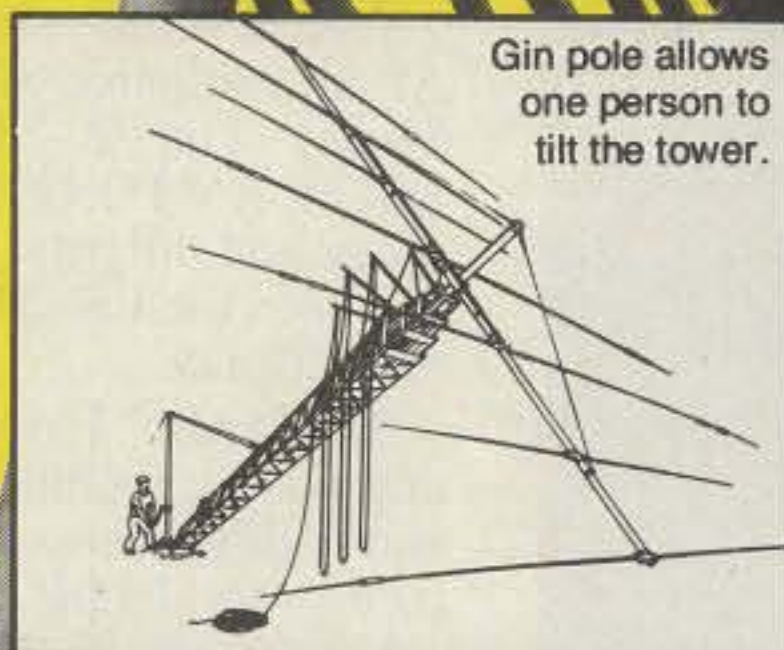
### OPTIONAL TOWER ACCESSORIES

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# TELEX<sup>®</sup>

# hy-gain<sup>®</sup>

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9600 Aldrich Avenue South  
 Minneapolis, Minnesota 55420

## ANNOUNCEMENTS

• **Dayton Amateur Radio Assn. Scholarship Applications Being Accepted** - The Dayton ARA will accept applications for the 1990 scholarship program after January 1, 1990. Licensed amateurs graduating in 1990 are eligible. There are no restrictions in license class or course of study. Five \$1500 scholarships will be awarded. For more information and an application, write to DARA Scholarships, 317 Ernst Ave., Dayton, OH 45405.

• **Pitcairn Island** - At 0001Z January 1 the radio amateurs of Pitcairn Island will begin their year-long bicentennial celebration. During January all VR6 stations will use their call VR200PI/ and the last two letters of their suffix. Operation will be in the 10 meter SSB Novice portion, and the 15 and 20 meter SSB general portion of the bands. All VR200PI QSLs are direct only and should be sent to the award manager, Dr. G. O'Toole, KB6ISL, 9605 San Gabriel Ave., So. Gate, CA 90280-4725 with #10 SASE for confirmation.

• **N3KZ from University of Pennsylvania** - The University of Pennsylvania ARC will operate on 14.250 MHz from 1600-2000Z on January 17 in celebration of Benjamin Franklin's birthday and the 250th year of the university. For commemorative QSL send #10 SASE to W3KRB, 1207 Waverly Road, Gladwyne, PA 19035.

• **W8YY from Houghton, Michigan** - Michigan Technological University ARA will operate W8YY from January 31 to February 4 to celebrate their Winter Carnival. Suggested frequencies: CW—1.805, 3.550, 7.050, 14.050, 21.050; phone 1.850, 3.875, 7.250, 14.250, 21.375, 28.450; packet 145.01. Alumni are encouraged to call. For certificate send QSL and large SASE to W8YY Amateur Radio Club, Wadsworth Hall, Houghton, MI 49931.

• **The following hamfests, etc. are slated for January:**

Jan. 13, **West Allis Radio Amateur Club 18th Annual Midwinter Swapfest**, Waukesha Co. Expo Center Forum, Waukesha, Wisconsin. Contact WARAC Swapfest, P.O. Box 1072, Milwaukee, WI 53201 (SASE).

Jan. 13, **Fox Cities ARC Winter Banquet**, Roosevelt Junior High School, Appleton, Wisconsin. Contact Don Baker, NB9J, 621 W. Seventh St., Kaukauna, WI 54130 (414-766-3886).

Jan. 20, **Sky High ARC Tenth Annual Citrus County Hamfest**, National Guard Armory, Crystal River, Florida. Contact Del Slocum, 904-726-0725, or write to SHARC Hamfest, 3101 E. Oakton, Hernando, FL 32642.

Jan. 21, **Metro 70cm Network Electronics Fair and Fleamarket**, Lincoln High School, Yonkers, New York. Contact Otto Supliski, WB2SLQ, 53 Hayward St., Yonkers, NY 10704 (914-969-1053).

Jan. 21, **Southfield High School ARC 24th Annual Swap & Shop**, Southfield High School, Southfield, Michigan. Contact Robert Younker, Southfield Senior High School, 24675 Lahser Road, Southfield, MI 48034 (313-746-8675).

Jan. 27, **The Winterfest**, Stratford House, St. Louis, Missouri. Contact Jim Berger, WA0FQK, 314-351-7732.

Jan. 28, **Wheaton Hamfest '90**, The Odeum, Villa Park, Illinois. Call 312-629-8006 for more information.



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DR-570T



The **ALINCO Model DR-570T** is a dual band transceiver offering big value in a small package. The independent main band and sub-band operation permits full duplex operation. The front panel is easy to read and understand. The LCD display lets the operator know at a glance which functions are in operation. The built-in duplexer has a single antenna output for a dual band antenna. **ALINCO** has listened to the consumer and in response has created the versatile **DR-570T** which is truly user-friendly with minimal effort.

- **ULTRA-COMPACT BODY**

5 7/8" (W) x 2" (H) x 8 1/2" (D)

- **HIGH POWER**

45 watts on 2M and 35 watts on 70 cm. Approximately 5 watts low power.

- **EXTENDED RECEIVER RANGE**

(130-169.995 MHz) on 2M, 144-147.995 MHz transmit. 440-449.995 MHz on 70 cm. (transmit and receive)

(Specifications guaranteed on amateur bands only. Modifiable for MARS/CAP permits required)

- **SIMULTANEOUS**

Receiving on both bands at the same time  
Scanning: intermix scan modes on both bands at the same time

- **INDEPENDENT**

The volume, squelch and control dial are independently adjustable on both bands. You can store the following information on both bands at the same time. Priority function, choice of 37 encoding/decoding sub-tone frequencies, call channel, scan function (program, memory channel, VFO or unique open channel scan), memory skip, bell function, + or - repeater shift.

### FULL FEATURES

- **FULL DUPLEX CROSS BAND OPERATION**

Transmit on one band while receiving on the other band -- telephone style.

- **AUTOMATIC BAND EXCHANGE (A.B.X.)**

When in the ABX function is active, an incoming signal on the sub-band will activate an automatic exchange between the main band and the sub-band.

- **PRIORITY**

The VFO frequency is monitored for 5 seconds and then shifts for one second to the selected priority channel (In both bands at the same time).

- **DUAL SPLIT SHIFT OPERATION**

Operates odd offset operation

- **BELL FUNCTION**

- **REPEATER REVERSE FUNCTION**

- **CALL CHANNEL FUNCTION**

- **BEEP FUNCTION**

- **20 MEMORIES (10 FOR EACH BAND)**

Each memory channel can store frequency, repeater offset, encode/decode frequency.

- **4 SCANNING MODES**

Program scan, memory scan, band scan and unique open channel scan (opposite to normal busy scan). Scan stops on a busy (or open channel) channel and then resumes approximately 5 seconds after stopping even if the signal is still present.

- **REPEATER OPERATION**

The DR-570T can be used as a cross band repeater.

### EASY TO OPERATE FUNCTION

- **LARGE AMBER MULTI-FUNCTION LCD DISPLAY**

Visible in all conditions, it indicates main and sub-band frequencies, frequency step, "on air", "call", "CTCSS", "PRI", "REV", "-", "+", "\*", "T" (tone), tone frequency, "MUTE", "LOCK", "ABX", "BUSY", "F", "S/RF meter", "REV"

- **MHz FUNCTION FOR BOTH BANDS**

One MHz is increased or decreased per touch

- **SELECTABLE DUAL AND SINGLE BAND OPERATIONS**

One touch selection with pressing of twin key

- **SELECTABLE BAND MODE (MAIN/SUB)**

One touch selection with pressing of band key

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# OUR READERS SAY

## Keep It Legal and Courteous

Editor, CQ:

I often note that editors of amateur radio magazines deplore the fact that our total numbers are decreasing and they urge that we try to recruit new amateurs. However, after doing some serious listening on our bands, I have reached the conclusion that *we don't need more amateurs, but we need a better quality of amateur.*

Since moving here to the southeastern states, I have done a lot of listening on 75 meter phone, and what I hear disgusts me. I hear some very asinine conversations with no operational or technical purpose at all. I hear stations with transmitters BFO running with the microphone open, occupying a valuable slice of the spectrum, broadcasting every sound from the household to the world of listeners. I hear profanity on the air, parents yelling at their kids, profanity between husband and wife, profanity directed towards other amateurs. Long-time listening shows that many such stations are in the Southeastern states. As a technically minded amateur I can only call these people "yokels"—know-nothings who don't know the value of the spectrum they are using for their drivel. In all my years as an amateur in the Washington, D.C. area, northern New York, or in California, I have never before heard such operations nor misuse by operators who should know better. It is absolutely disgusting . . . .

Let's have some courtesy on our ham bands, fellows! We don't need more numbers in our ranks, we need a better class of operator—*more courtesy and consideration. And a code-free license won't bring it on—either.* Remember this: *your microphone is broadcasting to the whole world.* The impression that you give of amateur radio is a lasting impression. Make sure it is a good one, free from criticism and poor operations.

We use spectrum space which other services need and want and they can and will use our own operations against us to gain their own ends. Believe me, they will try to degrade amateur operations if we let them. We have fought a long and hard battle to get and keep our reserved frequencies. Let's keep them free from the kind of operations I have described here . . . . Keep it *legal and courteous and useful.*

Capt. Paul H. Lee, USN (Ret.), N6PL  
Rockledge, FL

## He's Hooked!

Editor, CQ:

October 27, 6:00 PM, I had a schedule with my Dad, K0SWA, on 10 meters. The band was open and our prearranged frequency was clear, so I poured a cup of coffee and got ready for a nice QSO when the entire world started calling. So began my first contest experience.

After about an hour I figured out what was going on. I found the September issue of CQ and read the rules for the CQ World-Wide DX Contest. I was a contester! I should explain I've only been licensed about six months and really didn't think I would enjoy this activity. I was wrong and I was hooked.

As a Technician I operated only 10 meters. But I was able to make 127 contacts for 37 countries. Not bad for 100 watts and a vertical.

Thanks for a fun contest. Next year I should have my General, and I suppose I will have to go without sleep all weekend. The other bands don't sleep at night as 10 does.

Bruce Walters, N7MVX  
Helena, MT

## Okay To Send To UK BBSes

Editor, CQ:

Can you publish a short note in a future issue with regard to stations in North America sending packet radio messages to U.K. stations at our BBSes? There is no question of your violating third-party traffic regulations, as all U.K. calls will have messages sent via GB7\*\*\* BBSes (the GB7 prefix signifies our legal third-party traffic station). This appears to be causing mail being stopped by Sysops, concerned with violating the license regulations.

Phil Godbold, G4UDU  
Sussex, England

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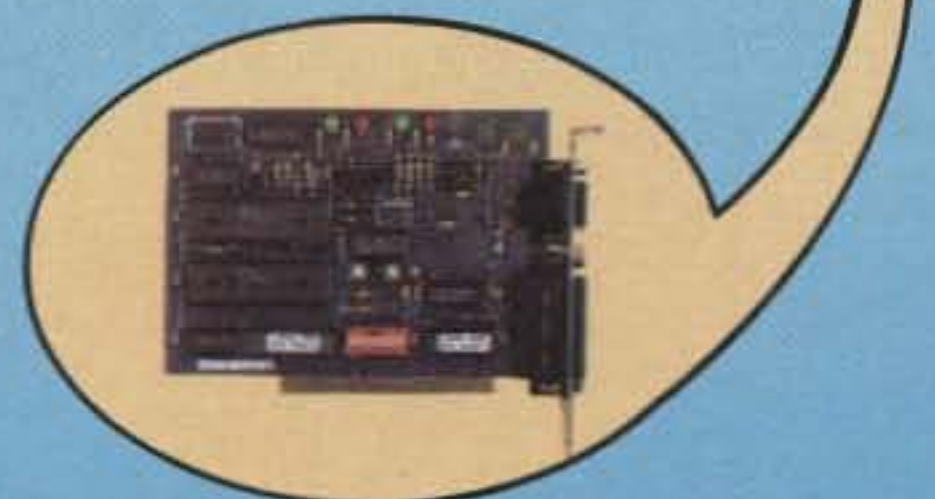
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And the FT-1000 options such as **digital voice-recording system (DVS-2)** for storing and playback "CQ Contest" messages. On RX the DVS-2 has a 16-second running memory for playing back garbled calls. There's also a **CW spot control**, so you can align your frequency to that of an incoming signal without having to transmit; Plus **direct keyboard frequency entry**; **Front panel RX antenna selector**; **Built-in cascaded filters**;

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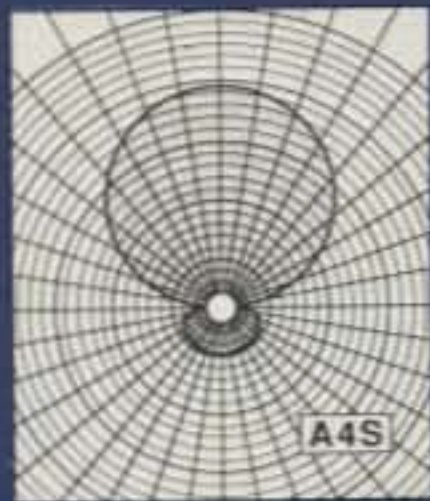
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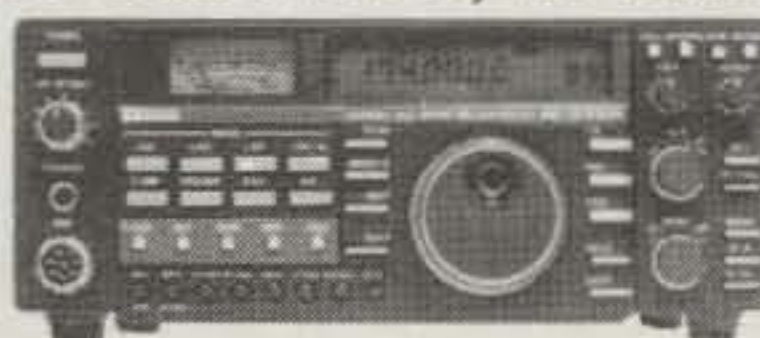


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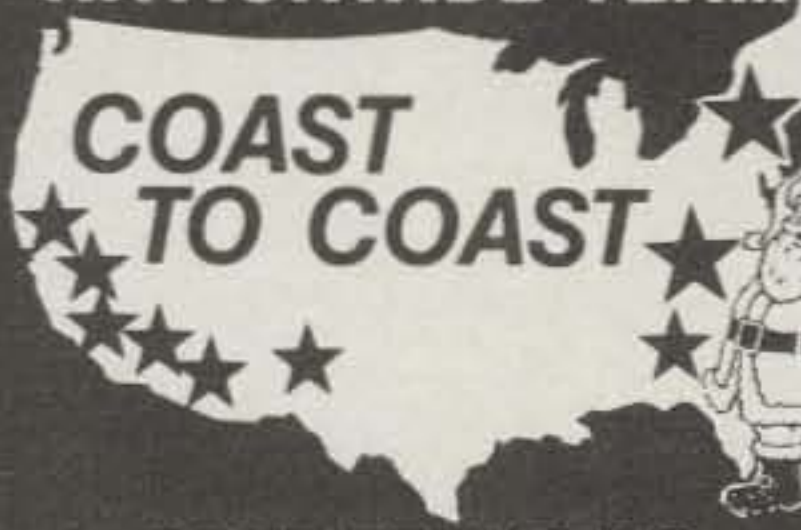
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**What do Hurricane Dean, 300 ponies, 5 DXpeditioners, and the supersonic Concorde have in common? The 1989 DXpedition of CY0DXX to Sable Island.**

## DXpedition to Sable Island, CY0DXX

BY JACK COLUMBUS\*, VE1XT

**A**ctivating a rare DXCC country stirs the blood of any DXer. Throw in a difficult to reach, mystery-shrouded island in the Atlantic and you have the stuff of winter-time story telling for years to come.

Sable Island is a 23 mile long crescent-shaped sandspit 125 miles east of Nova Scotia in the foggy north Atlantic. Over the years Sable has been the final resting spot of some 500 ships of all shapes and sizes. They met their end on the island's sandy shore, giving Sable the nickname "Graveyard of the Atlantic." Her treacherous sandbar stretches some 50 miles beneath the ocean's surface, and her constantly changing face has led to the destruction of ships and men through the centuries. Tales of incredible bravery and savage storms highlight Sable Island's fascinating history.

For amateurs Sable took on even greater attraction in 1975 when the island became a separate DXCC country. Now in addition to the historical interest she engendered, amateurs had an even better reason to cast covetous glances in her direction.

The Island is highly sensitive in environmental terms. In recent years extensive efforts have been made to protect the vast sand dunes from constant erosion by wind and water. As a result, public access to the island is severely restricted. Applications to visit must be approved by a multi-departmental committee of the Canadian Government.

There are other hurdles to cross before one can get to Sable Island. Permission to visit is granted only when accommodations have been arranged. Camping or tenting is not permitted. Arrangements for a place to stay must therefore be made with one of the permanent groups on the island.

\*75 Parkwood Drive, Sydney River, N.S., B1S 1H6 Canada



*A break in the action for a group shot. Left to right are Don, VE1AOE; Robert, VE1BHR; Alan, VE1AL; Bob, W5KNE; and Jack, VE1XT.*

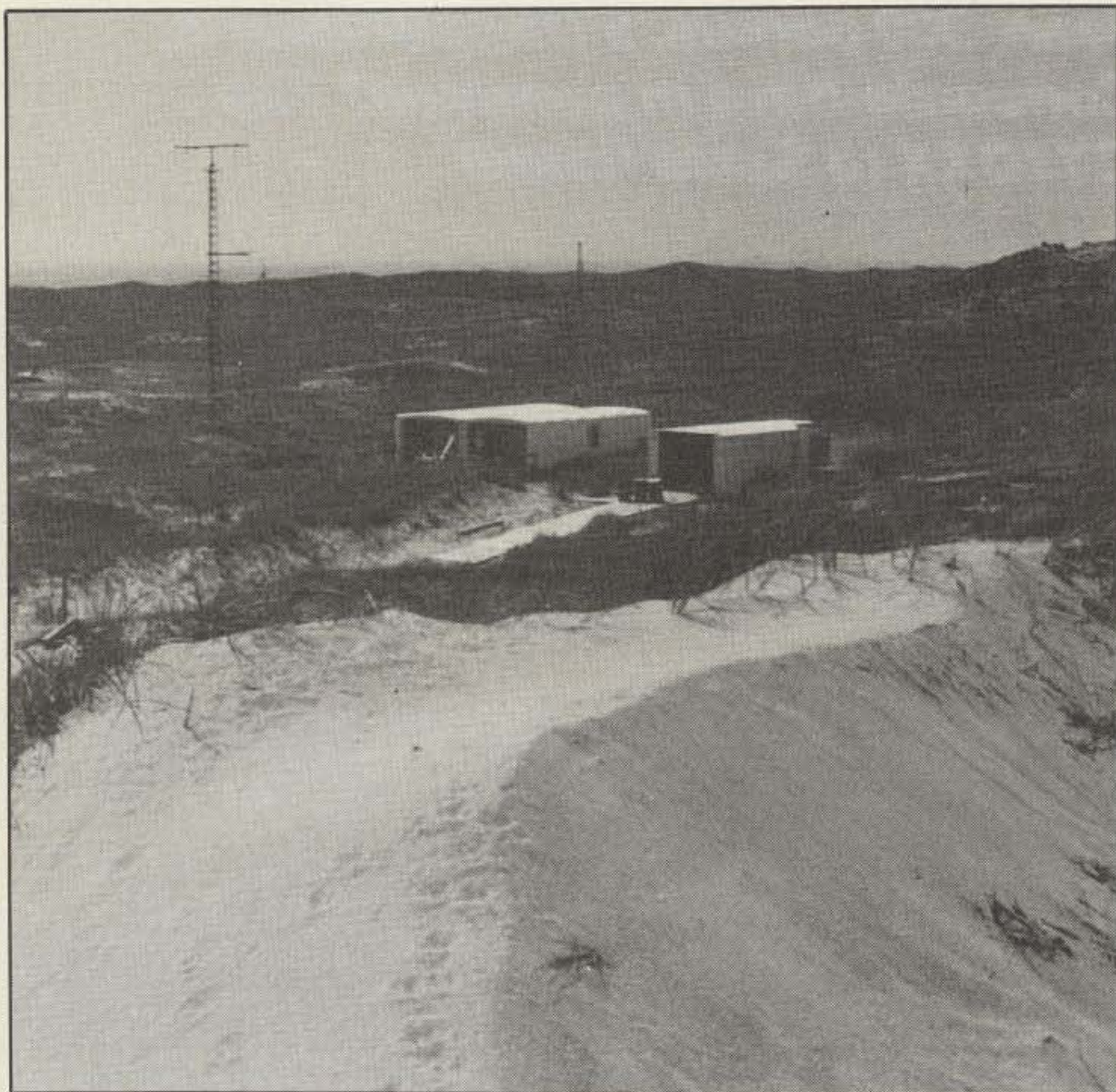
The Breton DX Group had conducted a successful DXpedition in August 1988 to St. Paul Island using the callsign CY9DXX. The experience gained in making arrangements for that operation proved invaluable in our plans to activate Sable Island. First, the callsign. Communications Canada quickly approved our request for a special call, CY0DXX. Canadian amateurs are permitted to use the allocated callsign for Sable Island CY0SAB, but in light of the St. Paul operation, our group felt strongly about the recognition factor of the "DXX" suffix and the distinctiveness of the call.

With callsign in hand, our next step was acquiring permission to go to the island. Canada's Ministry of Transport Coast Guard division is responsible for both Sable and St. Paul Islands. Having

laid the groundwork in 1988 on St. Paul, our request for permission to operate from Sable Island in 1989 was approved on the condition that we were able to find a site for the DXpedition. Initially we had planned to operate from quarters occupied by the Bedford Institute of Oceanography, a world-renowned scientific institute based in Nova Scotia. Tentative approval was received from B.I.O., but permission was later withdrawn when their busy schedule had solidly booked the Sable house.

The search was on again for a home for CY0DXX. It came to our attention that the Nova Scotia Department of Mines and Energy had a mobile-home-type setup on Sable Island. In the 1970s Sable was a hotbed of exploration for offshore oil and gas. In recent years the level of activity





The operating site of CYØDXX amid the grassy dunes of Sable Island.

has diminished substantially, and the department's island office is vacant most of the time. Department officials took a keen interest in our venture and granted permission to use their facilities. Things were beginning to gel nicely.

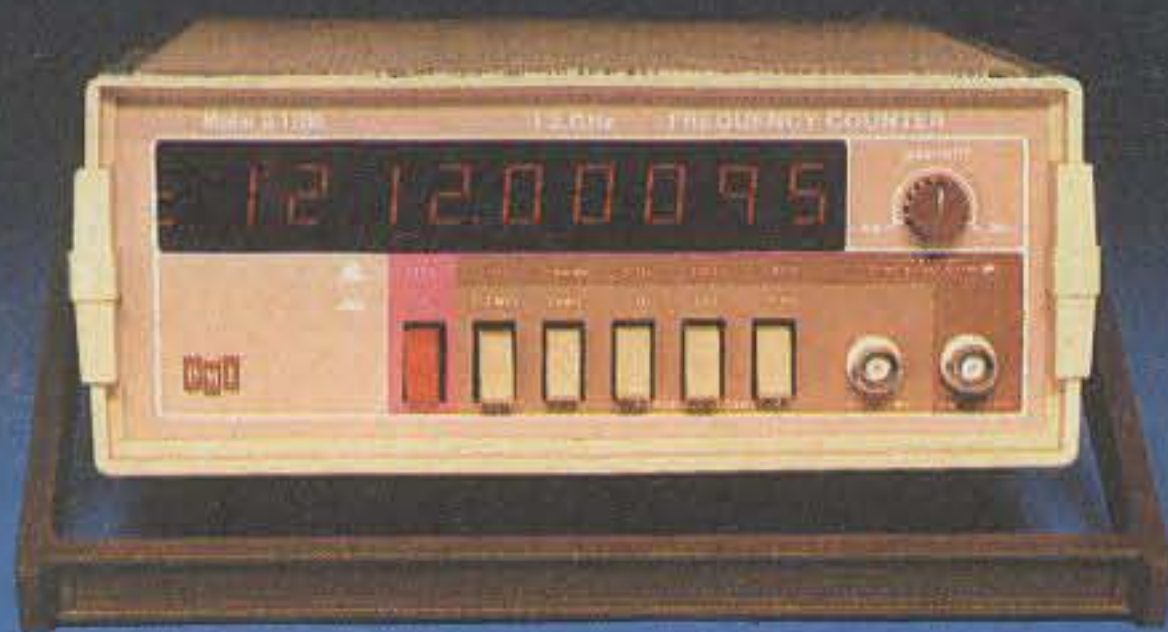
Sable Island is known for many things, among them its almost constant companion—fog. Conditions appear to be best in late summer, so the Breton DX Group decided on mid-August for the operation. It would last a week and concentrate on the HF bands which were reaching their peak as solar Cycle 22 neared its maximum. Attempts would also be made for contacts on 6 and 2 meters from an elusive island and even rarer grid square FN93.

The Sable DXpeditioners would be Alan, VE1AL; Robert, VE1BHR; Don, VE1AOE; Bob, W5KNE; and Jack, VE1XT. All except Don operated in 1988 from St. Paul. Don is an enthusiastic VHF and UHF operator and readily agreed to bring along gear to cover the higher frequencies.

For the HF bands, we decided to go with state-of-the-art. ICOM America provided equipment for the St. Paul 1988 operation and didn't hesitate to take part in our Sable venture with two top-of-the-line IC-781's. In addition, an IC-745 and IC-701 owned by group members were taken, giving us four-station capability on HF.

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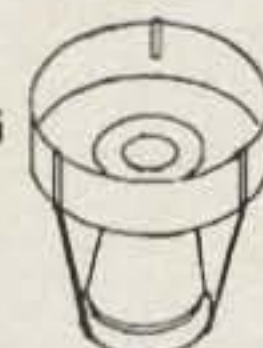
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*HW2P shown actual size.*

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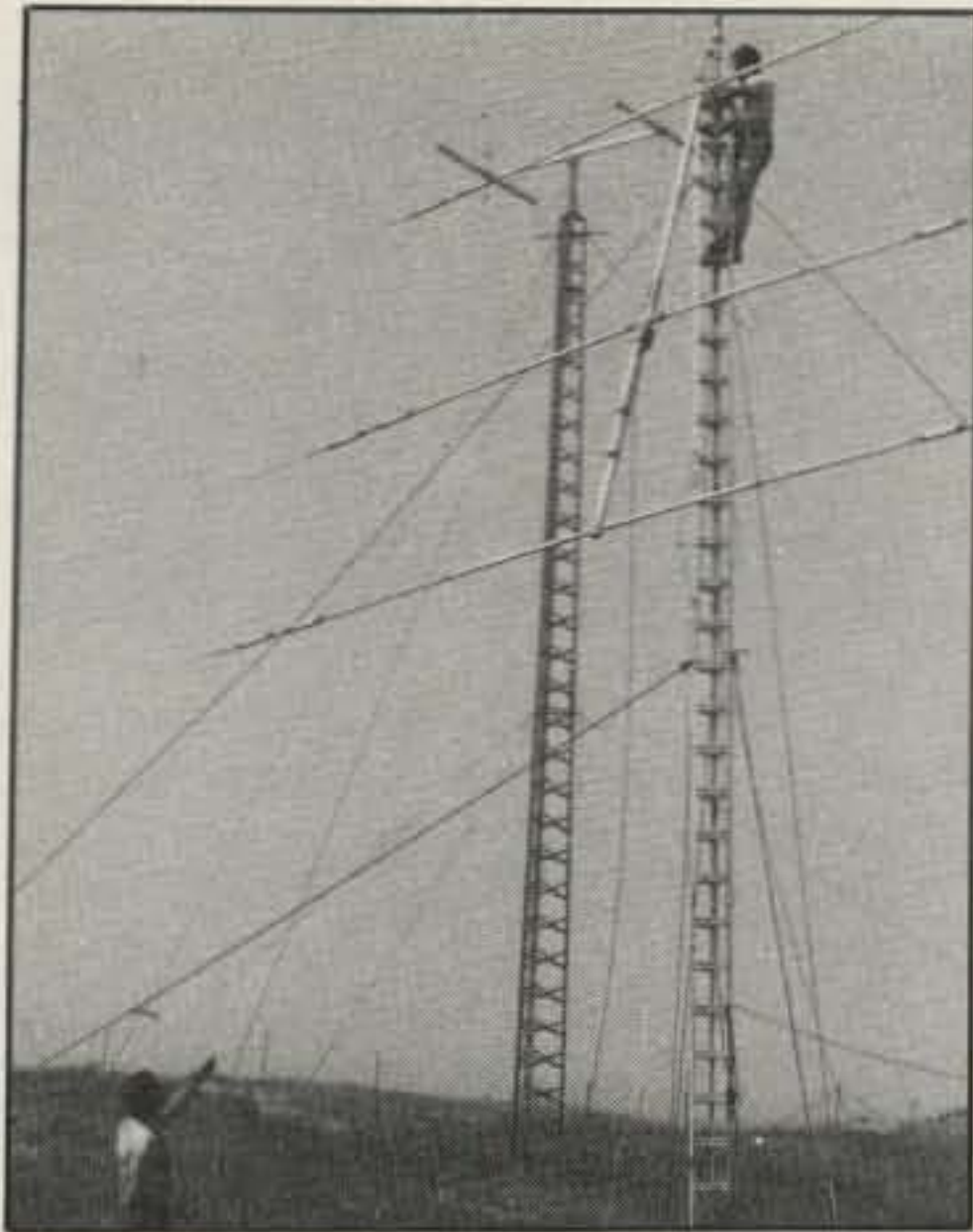


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Robert, VE1BHR, on the tower maneuvers a tribander in place while Jack, VE1XT, assists from the ground.



Alan, VE1AL, enjoying the pile-up on 20 meter CW from CY0DXX.

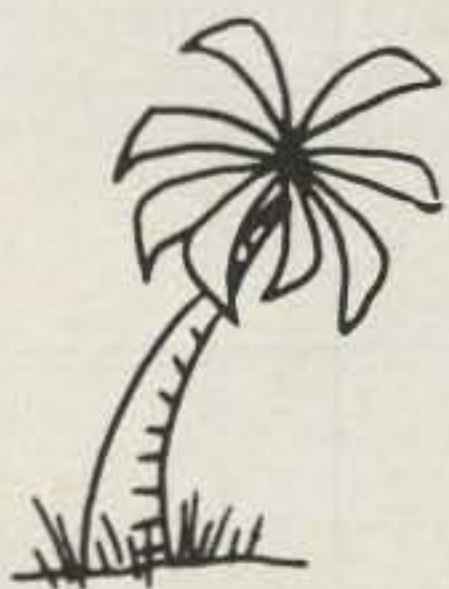
and 10 meters were used in addition to dipoles for 160, 80, and 40. A 5-band vertical for 20 through 10 meters, a Ringo Ranger for 6 meters, and an 11-element Yagi for 2 meters completed the antenna requirements.

The Department of Mines site has its own 6½ kilowatt generator, and arrange-

ments were made to transport two 200 litre drums of gasoline for use during the DXpedition.

There are two ways to get to Sable Island—air and sea. The method of choice is air transport. Eastern Flying Services of Halifax offers a charter service using a British Norman Islander, a twin engine,

high wing short takeoff, and landing aircraft. The Islander has limited carrying capacity. Its total payload is just 1300 pounds. The operators alone added up to nearly 900 pounds. This meant we had to get some of our gear to Sable in advance. We packed up 400 pounds of rigs, power supplies, antennas, and cables ten days



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*Jack, VE1XT, marvels at the giant whale rib at the entrance to the CY0DXX site.*

before scheduled departure and brought them to the airport. They were delivered to the island the following week.

We chartered the *Islander* to take us to Sable on Saturday, August 5th, returning on Sunday the 13th. All was in readiness and the countdown was on. However, the best laid plans often go awry, and Murphy made his presence felt. The night before departure the charter service called to advise weather conditions were deteriorating and the forecast predicted no improvement until the following Monday at the earliest. The trip was off, at least for the time being.

On Sunday evening things still didn't look promising. But our pilot agreed we would try to make the trip the next day. We departed Sydney at 0330 on Monday morning for the 4-hour drive to the Halifax International Airport. Murphy appeared to be traveling with us. The weather conditions on either side of the airport were excellent, but the airport itself was socked in by a blanket of thick fog. Our only option was to wait it out, hoping for a break later in the day. Finally at 1615 the break came. The skies cleared and the aircraft was prepared for takeoff. With the plane's fuel tanks filled and our fingers crossed, the Breton DX Group was on its way.

As we lifted off the runway, our pilot, Tom Copeland, banked the *Islander* to the left and headed out over the Atlantic towards our ultimate goal, Sable Island. For the next hour and a quarter our thoughts turned to the unknown. What would the site be like? Would the generator work? Did we forget anything? Did we have enough food?

At 1715 Sable Island came into view. Whitecaps seemed to bracket the island like a lace scarf. Wide sandy beaches spread as far as the eye could see. Our flight path took us over the main compound where a half dozen weather technicians live year round.

We gradually descended and glided to an unbelievably smooth landing on a beach that was at least 300 meters wide. Jerry Forbes, the officer in charge of the Sable Island Upper Air Station, was on hand to greet us. After introductions our gear was removed from the hold of the *Islander*, placed in Jerry's wide-tire pickup, and we were on our way to the "mines camp," our home for the next week.

"Are you ready for a long stay?" Jerry inquired.

"Hurricane Dean is tracking right this way, and things could get hairy."

Just what we wanted to hear. We thought Murphy was surely in our group!

The 4-mile ride down the beach gave us our first close-up look at this island that had been the subject of countless yarns of adventure and daring.

In case we were not quite convinced that this really was Sable Island, the first look at the entrance to the camp wiped away any uncertainty. There, marking the start of the driveway, was a rib from a giant whale curving to a height of at least nine feet.

Once at the camp, unloading was completed in minutes, and Jerry showed us the intricacies of operating the gasoline-powered generator. A 40 meter dipole was quickly strung up, a transceiver unpacked, and the first contact was made. Alan, VE1AL, worked SP9CV at 2225 on

August 7 on 21 MHz. CY0DXX was on the air.

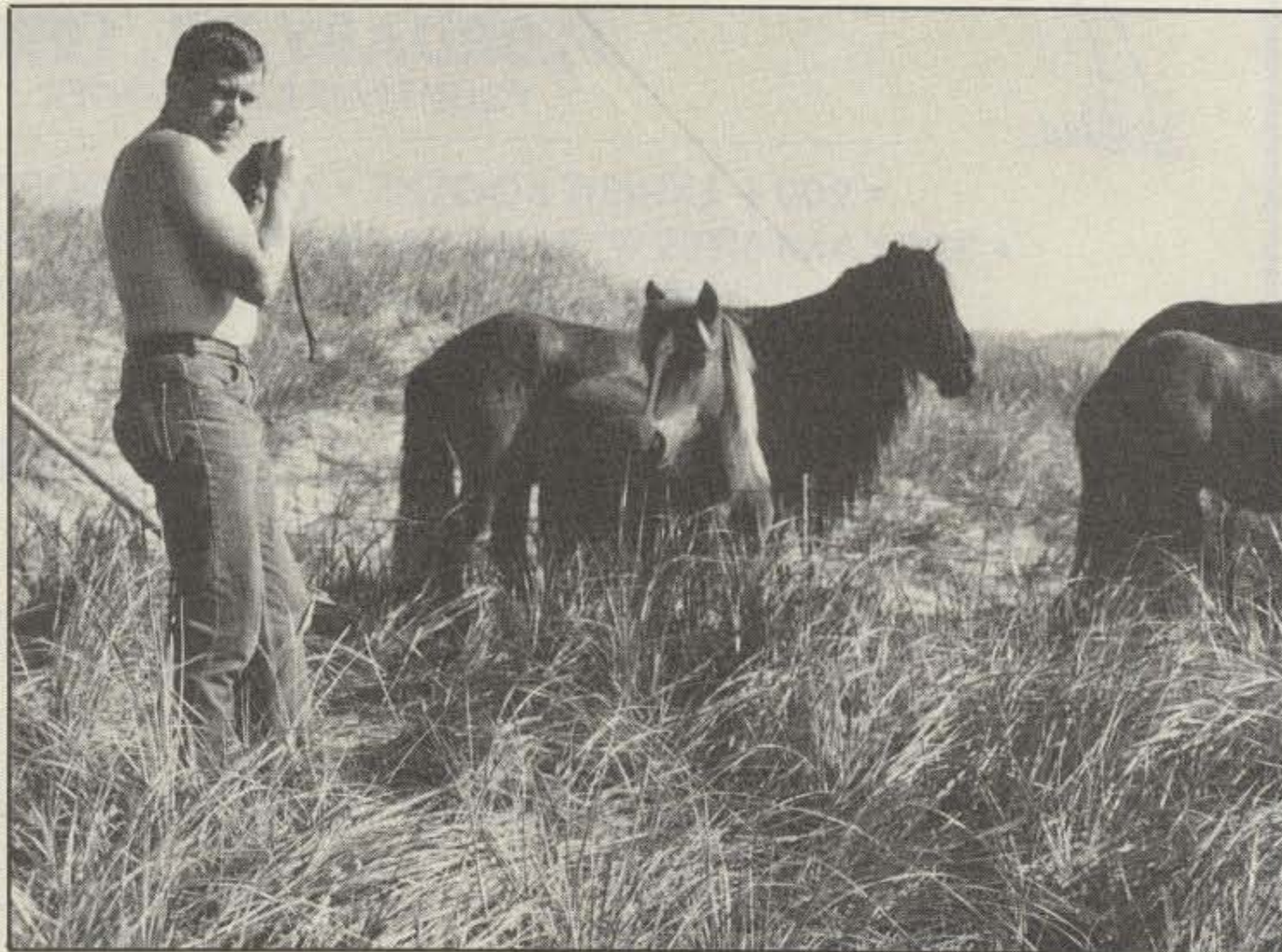
While Alan generated a pile-up, other group members began to unpack. Two of us accompanied Jerry to the main compound to pick up our two drums of gasoline that were to carry us through to the end of the DXpedition.

With the weather forecast looking ominous as Hurricane Dean approached, it was decided to delay putting up any of the Yagi antennas.

Operations continued until near midnight when the exertion of the day caught up with us and it was time for some well-earned rest. The winds were picking up in strength as the storm neared. It hit its peak in the early morning hours, but we suffered no damage and in fact slept through the worst of it. The next day we learned peak winds were clocked at more than 90 miles an hour. The remaining island population of a dozen or so spent the night huddled in one of the buildings in the main compound. There were no injuries, and the only damage reported was a roof blown off a nearby shed.

The next morning was spent putting up the two Yagis and the rest of the wire dipoles. Conditions were excellent with good openings into JA on 15 and 20 meters. We had hoped to work many Japanese amateurs who needed Sable on any band and mode for a new country. It's a difficult path for them, and as a result Sable is near the top of their most-wanted list.

The mines camp turned out to be ideal for an amateur radio DXpedition. Not only was it several miles from the main compound, reducing the possibility of R.F.I.,



*Robert, VE1BHR, gets a shot of the famous Sable Island ponies.*



but the site came complete with two standing towers and lots of other tower sections lying around which could be drafted into service.

Meanwhile, Don was preparing the VHF station, assembling the Ringo Ranger and the 11-element Yagi. We operated SSB on 50.110 and 144.200 MHz. There was some interaction from the other rigs, and at times we moved our 2 meter frequency to 144.220 MHz. This was the time of year for the *Perseid* meteor showers, and many stations had set up skeds for contacts up and down the eastern seaboard. The results were not as good as we had hoped. However, 50 stations were worked on VHF, 25 on 6 meters, and 25 on 2 meters.

During the erection of the antennas two loud booms were heard about 20 minutes apart. The same phenomenon was noticed in the afternoon and each day during our stay. The weather technicians assured us there were no armed hostilities underway in the vicinity. We were hearing the sonic boom of the Concorde, whose flight path over the North Atlantic took it directly above Sable Island.

The breaking of the sound barrier may have startled us, but it didn't bother any of the famous Sable Island ponies. They are really fair-size horses, descendants of farm animals brought to the island by the French a century and a half ago. They're a hardy breed surviving on marram grass and fresh water which lies just a few feet beneath the surface. Their numbers vary from year to year depending on the sever-

ity of the winter. There were over 400 counted in 1979 and the most recent census puts the figures at about 330. They are quite mild-mannered, allowing us to approach to within a few feet for close-up pictures. In earlier years some of the horses were rounded up and taken to the mainland for sale. But the practice ceased this century, and the horses are allowed to go about their business with no interference from man.

Sable Island is also home to thousands of gray and hooded seals. They spend their days sunning themselves on the beach or frolicking just offshore. They are extremely curious and will follow humans walking along the beach. But they are very wary and scamper away in a hurry if one approaches too closely.

We decided to extend the original ending date of the operation because of our delayed arrival. Our pilot was advised to pick us up on Monday, August 14th at noon. However, Murphy was still with us. Monday dawned bright and clear, but a line of thunderstorms between us and the mainland prevented the aircraft from flying. Tuesday and Wednesday were extremely foggy, and again no chance of a flight.

Then Murphy relented a little. On Tuesday, August 15th the Canadian Coast Guard Ship *Sir William Alexander* anchored offshore. She was carrying winter fuel supplies for the permanent residents of Sable. The off-loading was scheduled to take two days. The *Alexander* also carried two men to the island who had come



*A few of the famous Sable Island ponies grazing near the CY0DXX site.*



*A Canadian Coast Guard helicopter moves into position to airlift gear from CY0DXX to the Coast Guard Ship Sir William Alexander waiting offshore.*

to close our camp. Thankfully, they brought enough food to feed an army. By this time our supplies were running low. Had Murphy finally gone?

The Coast Guard offered to take us back to the mainland if our flight arrangements didn't work out. And they didn't. Murphy had returned.

The *Alexander* was completing its discharge of fuel on Thursday morning. We had been packed and ready to go for three days. The Yagis had been taken down in anticipation of our scheduled departure on Monday. When that hadn't materialized, we unpacked one of the IC-781's and strung up a G5RV to pass traffic to our families on 80 meters and to make a few contacts on the other bands.

On Thursday the rig was packed up again and the antenna taken down. The Coast Guard helicopter from the *Alexander* arrived at the site late in the morning, and our gear was put into a large net and air-lifted by chopper to the waiting ship. The Yagis went in a separate load slung by rope beneath the Bell 206.

Next it was our turn to board the helicopter for the 5 minute flight to the *Alexander*. We lifted anchor at 1500, and after a 12 hour voyage docked the following morning at Coast Guard headquarters at Dartmouth, Nova Scotia.

CY0DXX had made 16,000 contacts on 160 through 2 meters, providing a new country to many amateurs and providing more than a few moments of excitement to the members of the Breton DX Group.



# CQ REVIEWS:

## Ten-Tec's Model 562, Omni V HF Transceiver

BY JOHN J. SCHULTZ\*, W4FA/SV0DX

**T**en-Tec certainly achieved an American "first" with their Paragon transceiver. Ten-Tec will continue to produce that transceiver, and certainly I highly recommend it to any amateur who desires an all-around, excellent quality HF transceiver incorporating general-coverage receive. The Omni V, on the other hand, can be regarded as an exclusive edition of the Paragon for those who desire optimized amateur-band-only performance from a transceiver in the \$2,000 price range.

The optimized performance of the Omni V revolves around a unique idea that the engineers at Ten-Tec developed which combines the best features of frequency synthesizer technology with the features of what might be called analog frequency mixing. The former, in conjunction with microprocessor-based control, allows the bells-and-whistles features like frequency memories and dual VFOs, while the latter feature recreates the clean receive signal performance of a bygone era before transceivers went digital.

Although I dubbed the Omni V an exclusive edition of the Paragon transceiver, it is not simply a Paragon with a few internal circuitry changes. Various features are significantly different between the two series of transceivers both internally and externally. Many operators will probably more than welcome the exceptional receive performance of the Omni V as a trade-off for some reduced convenience features as compared to the Paragon.

### Specifications

Table I presents the detailed specifications for the Omni V as given by Ten-Tec. The general specifications note that the unit covers all amateur bands from 160 through 10 meters with an over-shoot at each band end suitable for most MARS operation. The frequency readout is down to 10 Hz. The almost all aluminum construction of the Omni V, like the Paragon, produces an almost unbelievably lightweight transceiver for its power class. It really is hard to imagine that a 16 pound package could enclose such a full-featured transceiver. If you have ever lugged around some of the larger steel box transceivers for portable operation, you'll appreciate what I mean by this.

The transmitter specifications are very much state-of-the-art. The carrier and sideband suppression figures are excellent, as is the spurious output specification. The key-down, 200 watt input specification for up to 20

minutes is achieved without any cooling fan being used. A small external cooling fan can be used if you want to operate key-down forever (e.g., beacon operation). And, if I may jump a bit ahead with my story, the fact that the Omni V has no cooling fan that might periodically cycle on and off (even during receive periods as is the case with some other transceivers) plus its extremely electrically quiet operation on receive make it one of the most fatigue-free transceivers I have ever operated while trying to copy weak signals.

The receiver specifications are also very

much state-of-the-art. The dynamic range and third-order intercept figures are excellent (more about those later). There is a full range of anti-QRM controls from the IF passband tuning to audio bandpass tuning to an audio notch filter and even a tone control. Both the standard and optional IF filter specifications are given. Unfortunately, the optional filter specifications do not indicate a special feature of the Omni V in that a further optional filter (for CW, SSB, or FSK) may be installed in the 9 MHz IF which will work in series with the optional filters shown in the table for the 6 MHz IF. The to-

#### General

Frequency Range	Transmit and receive on all ham bands from 160 through 10 meters in their entirety. Twelve 500 kHz segments plus 30 kHz over-shoot at each band end.
Frequency Control	Microprocessor-controlled digital PLL synthesizer with crystal mixed oscillator. 10 Hz resolution.
Frequency Readout	7 digit 10 Hz vacuum fluorescent readout.
Frequency Stability	Worst case, 1 PPM per degree C at 29.999 MHz.
Frequency Accuracy	± 100 Hz at 25° C.
Antenna Impedance	50Ω unbalanced.
Power Required	Receive = approx. 1.5 A Transmit = approx. 20 A at 13.8 VDC.
Construction	Rigid aluminum chassis. Extruded aluminum front panel. Textured top and bottom, snap up stainless steel bail. Printed circuit boards G-10 epoxy glass.
Dimensions	HWD 5¼" × 14¾" × 17" (14.6 × 37.4 × 43.2 cm).
Net Weight	16 lbs. (7.25 kg).

#### Transmitter

Modes	USB, LSB, CW, RTTY (FSK or AFSK), (FM optional).
DC Power Input	Maximum 200 watts at 14 VDC CW, SSB, (FM). 100% duty cycle for up to 20 minutes. Continuous with auxiliary air cooling of Omni V amplifier heatsink.
RF Power Output	25 to 100 watts adjustable with front-panel RF PWR control.
Microphone Input	Low impedance. Four-pin front-panel connector accepts microphones with 5 mV (-62 dB) output. Polarizing voltage is provided for electrets.
T/R Switching	VOX or PTT on SSB. Switchable FAST or SLOW QSK on CW.
CW Sidetone	Internally generated, adjustable tone and volume independent of AF GAIN control.
SSB Generation	9 MHz, 8-pole crystal ladder filter. Balanced modulator.
Carrier Suppression	60 dB typical.
Unwanted Sideband Suppression	60 dB typical at 1.5 kHz tone.
Spurious Output	More than 45 dB below peak power output.
Meter	Switchable forward power, SWR, collector current, audio processing level.
CW Offset	600 Hz automatic.
FSK Shift	170 Hz.
SSB Monitor	External monitor jack output.

\*c/o CQ magazine

Table I—Specifications of the Ten-Tec Omni V HF Transceiver.





The front-panel layout of the Omni V is very well balanced with an easy-on-the-eyes frequency display, the analog controls on the left, and the large keypad around the main tuning control.

tal result is that you could end up with an outstanding 24 poles of filtering for one mode, depending upon which optional filters are installed!

As impressive as the specification table for the Omni V is, now that I have used the trans-

ceiver for a reasonable period, I rather feel that the table does not do justice to the rig. It makes no mention of the fact that 25 tunable memories are available, computer control interface is standard, fast QSK turn-around is less than 30 ms, etc.

**Receiver**  
Modes  
Sensitivity

USB, LSB, CW, FSK/AFSK, (FM optional)

FREQUENCY MODE	FREQUENCY MHz	1.8 - 29.999	
SSB, CW, RTTY		.15 $\mu$ V	10 db S/N @ 2.4 kHz
(FM)		.30 $\mu$ V	12 db SINAD @ 15 kHz

Selectivity

SELECTIVITY FILTER	SELECTIVITY	
	-6 dB	-60 dB
STANDARD	2.40 kHz	3.36 kHz
OPTIONAL	1.80 kHz	2.90 kHz
OPTIONAL	.50 kHz	1.40 kHz
OPTIONAL	.25 kHz	.85 kHz
(FM)	15 kHz	30 kHz

Attenuator	Approx. - 20 dB for 1.8 to 29.999 MHz.
IF Frequencies	1st = 9.0 MHz, 2nd = 6.3 MHz, (FM 2nd = 455 kHz).
RX Antenna Input	Switchable 50 $\Omega$ phono jack.
Image Rejection	> 60 dB.
IF Rejection	> 60 dB.
Noise Blanker	Switchable on/off with adjustable width.
S Meter	Automatically switched on during receive. Calibrated to 50 $\mu$ V at S9.
Dynamic Range	97 dB typical.
3rd Order ICP	+ 12 dBm.
Squelch Sensitivity	FM, CW, SSB, FSK (1.8-29.999 MHz) = Less than .6 $\mu$ V.
Passband Tuning	$\pm$ 1.2 kHz.
Audio Output	1.5 watts at 8 $\Omega$ with less than 2% distortion.
Notch Filter	250 to 2.2 kHz, 50 dB notch typical.
Audio Bandpass Filter	4 pole, variable center frequency 220 to 1.7 kHz, 35% bandwidth at - 6 dB. Variable fader control selects filtered or flat audio response.
Tone Control	Variable 15 dB rolloff at 5 kHz.

## Displays and Controls

The most obvious display feature is the large frequency readout. It's a green fluorescent type with about  $\frac{1}{8}$  inch high numerals. It's very comfortable to work with over extended operating periods. The display is permanently set to display down to 10 Hz. The display is also used to call up either the current time (hours and minutes) or a calendar feature (month and day) derived from a built-in clock/calendar. To the left of the display there are three annunciators for VFO A, VFO B, or SPLIT.

All the rest of the displays and controls, except those associated with the keypad around the main tuning knob, are the same as in the Paragon transceiver. It's what I call the analog side of the front panel. These controls were all described in detail in Part II of my Paragon review (CQ, May 1988), so I won't go into them in detail here but will just highlight a few features.

1. The metering is quite complete for all functions including power output, SWR, collector current, and speech processing level.

2. The microphone gain control has an LED associated with it for monitoring the ALC level, which is very convenient when the processor is used, since the meter can be dedicated to check the processing level.

3. The RF power output level is continuously variable from about 20 to 100 watts.

4. A separate RF gain control is provided and there is all-mode squelch.

5. The AF gain control is associated with a tone control to roll-off the higher frequencies.

6. There is an audio bandpass filter with variable bandwidth. One control sets the center frequency of the filter (200 to 1700 Hz) while another concentric control pulls in the skirts of the filter (around the center frequency) from an essentially flat response to a fairly sharp response (35% bandwidth).

7. The passband tuning control is essentially a variable bandwidth control operating over  $\pm$  1.2 kHz.

8. A notch filter operates over the 250 to 2200 Hz range and provides a fixed notch depth of 40-50 dBm.

9. The rest of the pushbuttons are for the usual functions such as receive input attenuator, AGC on/off, VOX or PTT operation, QSK fast or slow, etc. The noise-blanker switch is associated with a variable width control.

The keypad around the main tuning knob has a few features similar to those on the Paragon, but many features are different. There are the usual keys for mode except that an FSK key replaces the AM key on the Paragon. The very useful TUNE key is still present above the mode keys. The filter selection keys are above the tuning knob and are marked 2.4 1.8, 0.5, .25, and NAR. There is no 6.0 key since the Omni V does not have an AM mode. The 1.8, 0.5, and .25 keys select any of the optional filters installed in the 6 MHz IF. The NAR key selects the optional filter installed in the 9 MHz IF which can be either a 1.8, 0.5, or .25 kHz type.

The keys to the immediate right center of the tuning knob control the selection of VFO A or B, equalizing the frequency in them and setting them up for split-frequency operation. There is also a REV key which temporarily reverses the VFOs when in split operation so you can listen on your transmitting frequency.

A FAST key below the VFO keys changes the tuning rate by a factor of 5 (from 10 Hz to 50 Hz steps except in the FM mode where it





A closer look at the keypad. Except for two keys, each key has a single dedicated function to avoid confusion in operation. It's a very user-friendly arrangement.

changes from 100 Hz to 500 Hz steps). Immediately to the right of the FAST key are "down" and "up" arrow keys. These keys change the frequency in 10 kHz steps, or if the FAST key is activated, in 30 kHz steps.

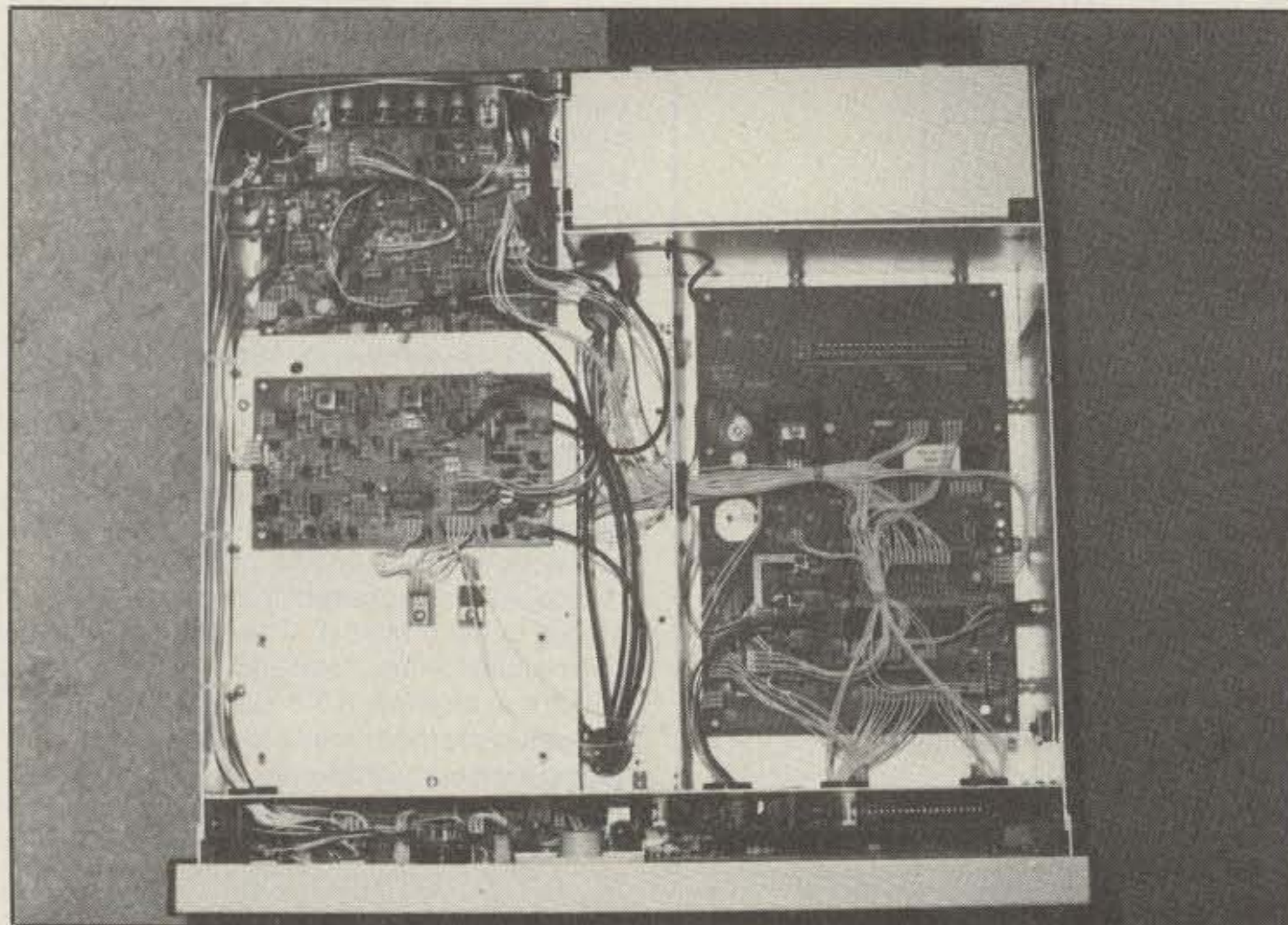
Although the keyboard so far has resembled that of the Paragon in general terms, the rest of the keyboard in the Omni V is completely different. The center right grouping of keys consists of 12 keys which are band-switching keys. There is one key for each band, except that 10 meters has four keys for four 500 kHz band segments. You can QSY immediately between any band in a very clear, unambiguous man-

ner. When going from one band to the other, the operating frequency will automatically be located at the same position relative to each band edge. For instance, if you are on 7020 kHz and go to 20 meters, the 20 meter frequency will appear as 14020 kHz. Even though 10 meters is divided into four 500 kHz segments, all of the band can be tuned without pressing any of the band-segment keys once you start tuning in any desired band segment. There is no numeric frequency entry keypad, so to get to a specific operating frequency within a band you have to choose that band and then tune a VFO to the desired frequency or have

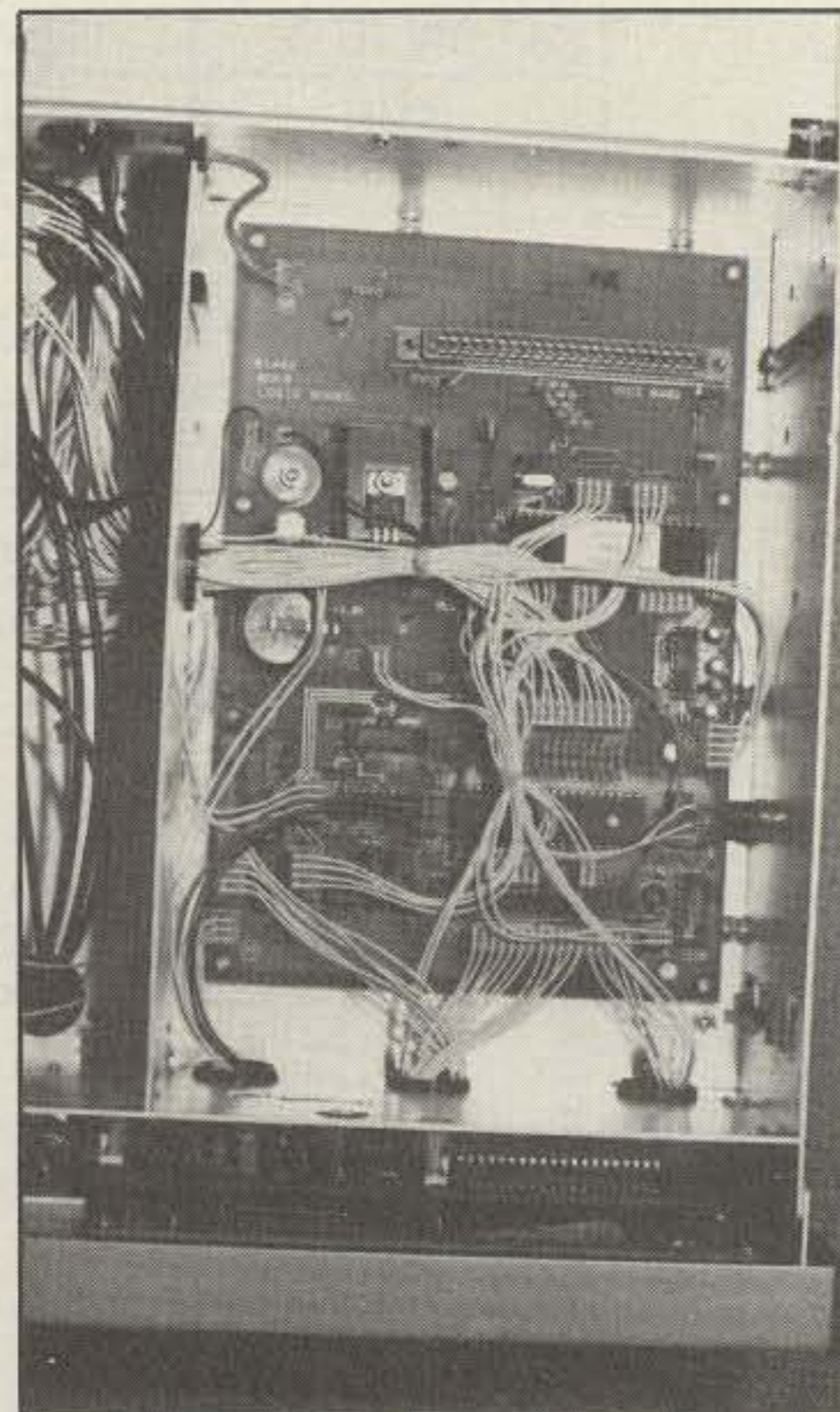
the specific frequency stored in a memory.

The frequency memory system is controlled by just three keys on the upper right of the keypad. They are the MT (memory tune), VFO-M (VFO to memory), and M-VFO (memory to VFO) keys. If you're operating on a frequency you would like stored, you depress the VFO-M key twice. You do not have to choose a memory location. That is done automatically unless all 25 memory locations are filled. In such a case, a decimal point in the frequency display will turn on, and you have to go through a simple procedure to clear out one of the memory locations. Each memory stores band, frequency, mode, and filter selected data. To see what frequencies are stored in memory, depress the MT key, and then as you rotate the main tuning knob, you will scroll through and have displayed on the frequency display the frequency stored in each memory slot. During this process, the operating frequency you were using before depressing the MT key will not change. Therefore, you can continue to operate while scrolling through the frequencies in memory. If you find a memory position on which you would like to operate, the M-VFO key is used, and the transceiver will switch to that frequency along with the stored mode and filter information. Once such a stored frequency is transferred to a VFO, you can, of course, tune the frequency as desired and change mode or filter selection as desired.

A scratch-pad memory is available by pressing the VFO-M key only once, instead of twice as just mentioned. In this case the current band, frequency, mode, and filter setting will be stored, but the information will not go into one of the regular 25 memory slots. The scratch-pad memory is recalled by pressing



Taking off the top cover, I was immediately impressed by the very neat construction and the spaciousness of the layout. The oscillator circuitry of the 12-band mixer is located in a shielded compartment on the left. The logic board is to the right.



A closer look at the logic board. The round disc to the center left is the lithium memory back-up battery which will last about two years. It is easily user-replaceable. The connector to the top of the board is for an optional voice frequency readout board.



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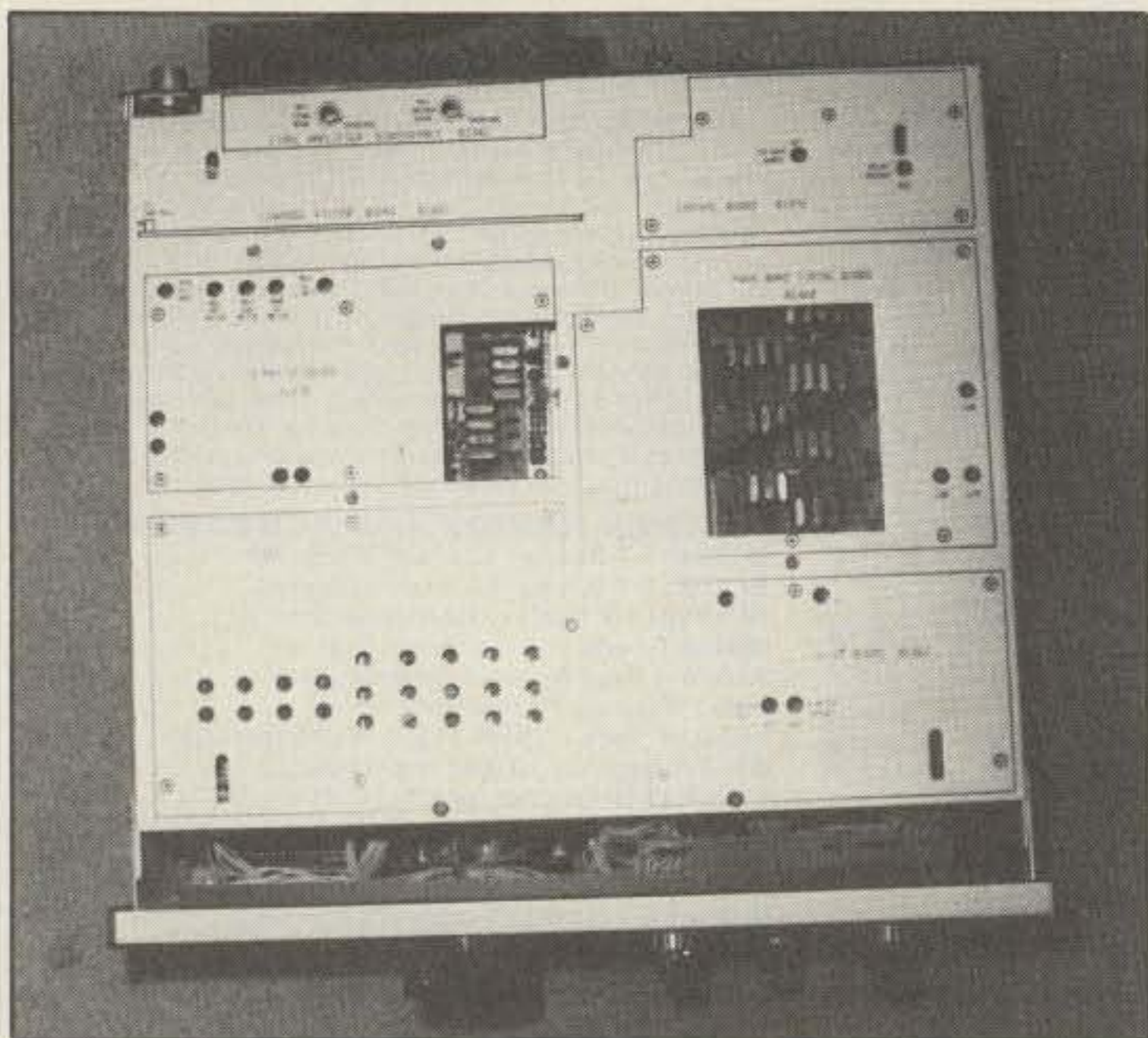
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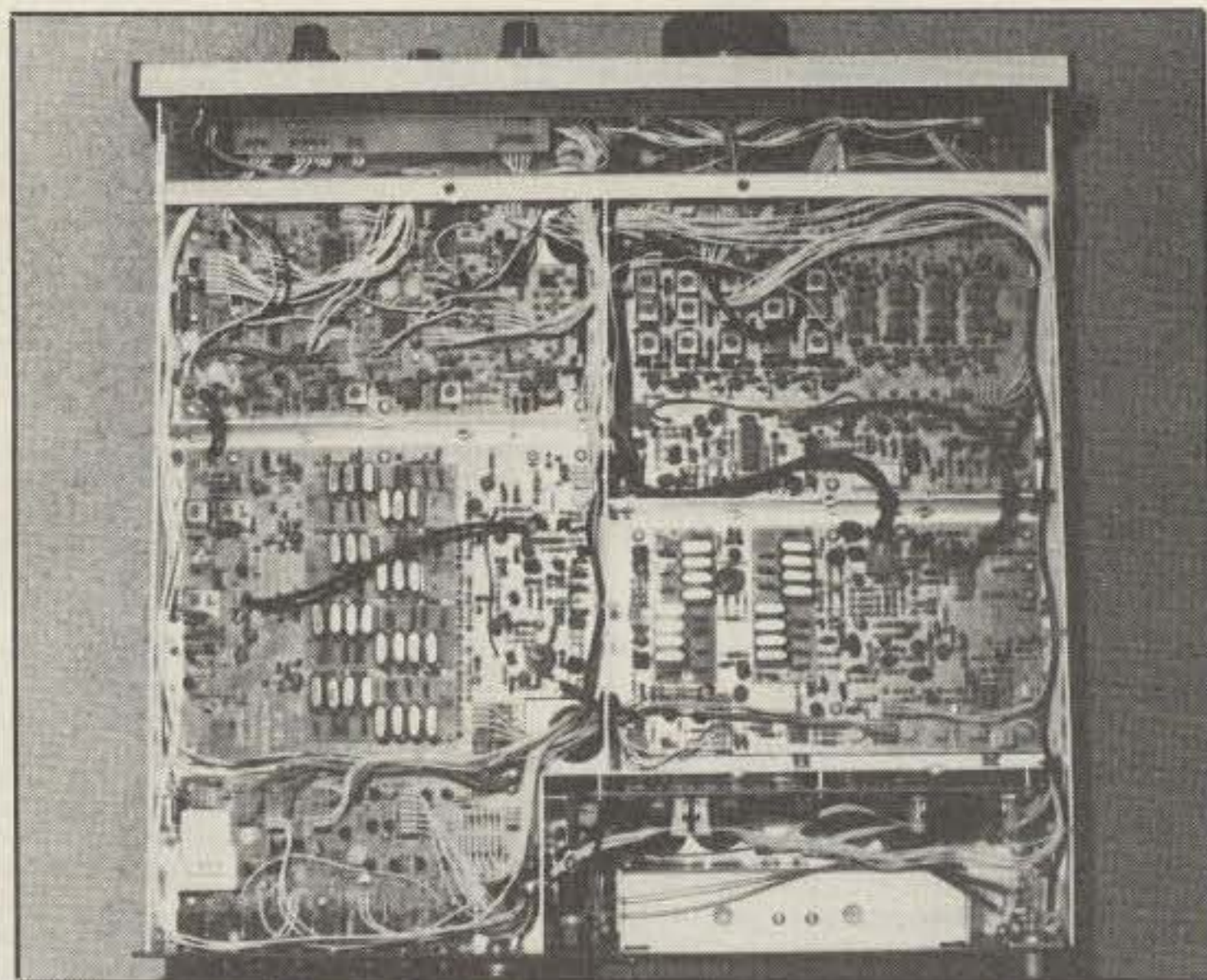
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Taking off the bottom cover, you encounter a large internal shield. It has cutouts so you can easily exchange or add various IF filters. Also, there are access holes so you can adjust things such as S-meter calibration, CW keying waveshape, ALC range, carrier balance, etc. Neat!



Taking off the internal bottom shield, quite a formidable array of neatly arranged, mostly double-sided PC boards are visible. The IF filter board is to the center left, the mixer board to the upper right, and below it is the passband tuning board. Below the latter is part of the final amplifier, which is housed in its own completely shielded enclosure. There is no built-in fan for the amplifier. None is necessary unless you operate key-down modes for very extended periods or do quite heavy contest operating in any mode.

the M-VFO key. If you don't wish at the moment to operate on the scratch-pad recalled frequency (e.g., an impossible pileup), you can again enter the frequency into the scratch-pad memory and tune around that band or another band.

There are no keys for receive or transmit frequency offset tuning. Such operations have to be accomplished by using the split-operation feature of the two VFOs (more on that later).

Overall, the keypad on the Omni V is very clearly laid out. Basically, all of the keys have a clearly defined single function.

## Construction

As usual, I couldn't resist taking all of the covers off the Omni-V to see how things looked inside. The photographs tell most of the story. The PC boards are well balanced with regard to the amount of circuitry on each one, and each board is fully serviced by multiple connectors so any individual board can easily be removed for possible servicing. The almost total aluminum frame construction should make the transceiver essentially immune to environmental factors just about anywhere in the world. In spite of the transceiver's sophisticated circuitry features, its overall size is quite in line with that of HF transceivers in the 100 watt output class. However, the feature that amazes me is the amount of free space that is still available within the unit. For instance, when you take off the top cover, only about half of the exposed volume is filled by circuitry.

## External Connections

The external connections are almost exactly the same as those used on the Paragon. The front panel has connectors for a headphone and microphone. The rear panel of the transceiver contains a whole range of connectors to

provide interface with a linear amplifier, FSK equipment, phonepatch, transverter, separate receive antenna, PTT footswitch, etc. Just about every contingency has been provided for in addition to the standard antenna and power-supply connectors.

The Omni V does, however, have as standard a DB-25 connector on the rear panel for computer control, since RS-232 interface is built into the transceiver.

The rear panel also contains various controls that normally would be infrequently adjusted, such as those for VOX, CW sidetone level and pitch, SSB/FM phone sidetone level, and beep tone level.

## Bench Checks

Since the Paragon transceiver was previously quite thoroughly checked out, and since most of the RF path circuitry is the same for both the Paragon and Omni V, only a few spot checks were made to confirm that the Omni V has at least the same excellent characteristics as the Paragon. I thought it a bit more useful to spend more time checking out actual on-the-air operation of the Omni V. Besides, that's more fun.

Let me at least indicate that spot checks on the Omni V proved that it does indeed have outstanding characteristics. There is no question that its published minimum specifications are quite conservative. On the transmit side, the Omni V has just about one of the cleanest signals possible with third-order IMD (14.2 MHz, 100 watts PEP) down almost -40 dB. The power output is almost exactly 100 watts across each band. Rise and fall times for CW keying are about 4 ms and turn-around times less than 20 ms, well below that required for any digital mode of operation. With key-down periods of 20 minutes, the final heatsink does get warm, but it must be far, far away from exceeding its total key-down capability (without using any

external cooling). Overall spurious emissions (harmonics, etc.) are down 50 to 55 dB with higher harmonics (3 to 5x) going down to about 70 dB.

On the receive side, the Omni V does indeed have the "quiet" edge. The minimum discernible signal on 10 meters was an outstanding -140 to 142 dBm. That doesn't mean that the transceiver has an overload-proof front-end, since the measurement is made using a single signal source. It does, however, indicate that internal noise is very low indeed. The third-order intercept point (14.2 MHz, 20 kHz signal spacing) plotted out to a very good +18 dBm. All of the IF filters measured out as good as or better than specified with regard to shape factor. The standard 2.4 kHz SSB filter with a shape factor of 1:1.4 would have been considered an expensive option in many transceivers only a few years ago. The various optional filters all checked out exactly as specified, and I would heartily recommend the optional 1.8 kHz filter to an SSB enthusiast or one of the optional CW filters for a CW buff.

How about phase-noise? The topic of phase-noise as it affects the receive performance of a transceiver has received a lot of publicity lately. What is phase-noise? Allow me to present the idea to you in a simple manner, and I'll suggest some references if you really want to explore the subject.

Fig. 1(A) shows a mixer (there could be several in series) fed by a local oscillator which produces either an almost pure sine wave (e.g., crystal oscillator) or some form of distorted waveform approaching a square wave. If the sine wave feeds the mixer, the signal coming out of the mixer will ideally look like those in fig. 1(B)—that is, a signal with clean flanks or, as seen on a spectrum analyzer, just a single carrier frequency. If the local oscillator produces a distorted waveform, the output from the mixer starts to look as in fig. 1(C). The basic signal has fuzzy flanks, and if observed



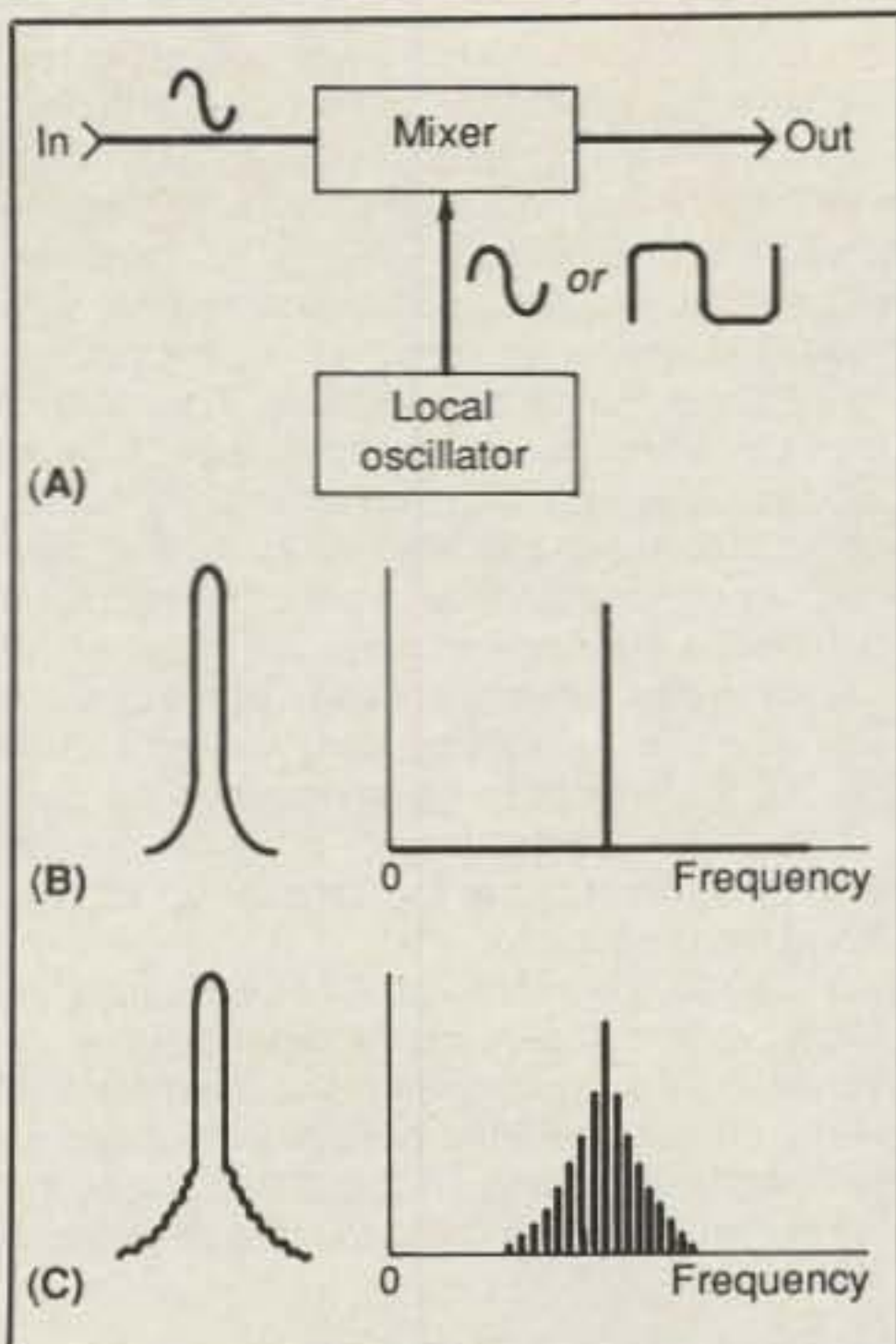


Fig. 1— Depending upon whether a local oscillator injects a sinewave or distorted wave-shape into a mixer stage (A), the output of the mixer will be a basically "clean" signal (B) or one with "fuzzy" skirts representing noise (C). (B) and (C) show a close-up of an output signal and a representation of how the signals might look on a spectrum analyzer. The noise on either side of the signal at (C) can be measured in terms of noise density.

on a spectrum analyzer, there is the carrier signal plus a hazy cluster of spurious signals around the carrier signal. The latter signals are noise. If several "noisy" mixers are used in a row, the noise buildup is cumulative and noise will mask weak signals. There is more to it than that, of course, especially if the same mixer stage or stages are used to process the received as well as the transmitted signal, as is

the case in most transceivers. The March/April 1988 edition of *QST* discusses the subject in detail.

Unfortunately, there is no simple way, as yet, to quantify phase noise. You can compare spectrum analyzer pictures of the phase noise in various transceivers or produce a table or graph of noise density as you go out in frequency from a carrier frequency, but that's about it. I did look at the IF signal of the Omni V on a spectrum analyzer using an HP-8640B signal generator as a signal source. The IF signal looked very clean, but I have no "numbers" to present. The exceptional minimum discernable signal level of the Omni V, as previously noted, at least hints at the fact that self-generated noise within the unit must be extremely low.

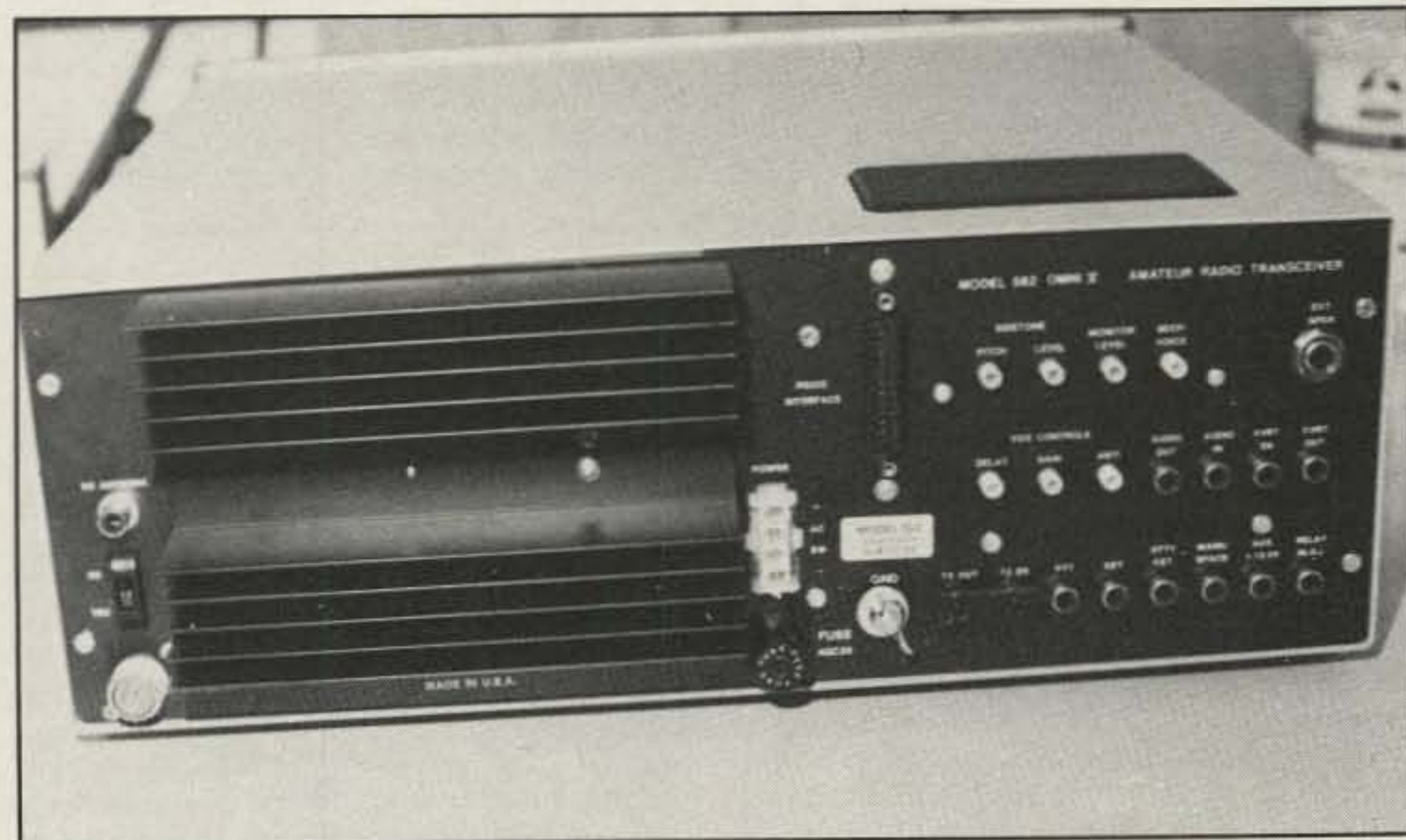
### Memory Retention

No, you don't have to keep the power supply turned on to retain memory information in the Omni V. The memories are nonvolatile RAM and retained until changed. The status registers (and clock) are backed with a standard 3 volt lithium battery. The battery is easily user replaceable, and the manual for the Omni V describes a simple procedure as to how it can be done without losing the information in the memories. Normally a battery lasts at least two years, and a soft battery is first indicated when the clock no longer keeps correct time.

### Operating Results

Simply stated, the Omni V is a thoroughly enjoyable radio to operate. I won't go so far as to state that every feature is perfect, or I'll be out of the business of writing product reviews, but the Omni V comes pretty close.

First of all, it is a comfortable radio to operate. The large frequency display is extremely pleasant to view, and its operation is perfectly smooth both visually and electrically. There are no clicks or pops as you tune through any portion of any amateur band. The tuning "feel" is very good—firm but not soft. Ten-Tec sup-



The back panel has enough in/out connectors for any type of accessory equipment. The panel also contains the VOX controls and the CW/phone monitor level controls. The RS232 interface connector is standard.



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plies an Allen wrench with the radio if you would like to reposition the tuning knob on its shaft for a different "feel."

The filter selection keys above the main tuning knob allow you to choose any desired filter (in any mode, by the way, except FM) with a finger without taking the same hand off of the tuning knob—very convenient. And, I'll reverse myself as to some comments I made in a previous article on the Paragon about preferring some of the "analog" controls to be located on the right side of the front panel. I found the controls on the Omni V extremely well arranged. It is quite convenient to be able to adjust the main tuning with your right hand while various level or selectivity controls can be adjusted with your left hand. This impression may be a mental adjustment to the fact that the frequency display on the Omni V is shifted to the right of the tuning knob as compared to being centered above the knob on the Paragon.

Of course, the real beauty in using the Omni V on receive is its superb quiet. No radio can eliminate atmospheric noise or totally eliminate QRN, but when those noises are not a factor, the Omni V really shines. It becomes fun to work quite weak stations and still be able to have an intelligible QSO. I had some nice experiences by being able to work weak South American stations from SV0DX when apparently other European stations could not copy them well enough for a QSO. Of course, propagation always plays a role in such situations.

I found the keypad on the Omni V very easy to learn to use basically because each key, with two minor exceptions, has a single dedicated function. There is a separate key for each band so that is the "bandswitch."

I did become annoyed after some time that the starting frequency on each band shifted according to how a VFO had been set on the last previously used band. The solution was to put my desired band start frequencies in some of the memory locations.

Surprise department: At first glance there would seem to be no receiver or offset tuning possibilities. In reality, those features exist although Ten-Tec decided to implement them in a slightly different, and perhaps better, way. Basically, the operations are achieved by using the dual VFOs in the split mode. This can be done in various ways. You could, for instance, without being in a split mode, use VFO A only to tune about a band and find a clear spot to call CQ. Then if a station came back to your call but was slightly off frequency, you would press the A = B key, the A/B key, and the SPLIT key (they are all arranged vertically on the keypad in that order). The transmit frequency is then fixed to VFO A while VFO B is tunable on receive. That procedure is workable but awkward. A better idea is to always operate in the split mode. Then you only have to press one key, A = B, to have one VFO control the transmit frequency and the other VFO control the receive frequency. Since either VFO is fully tunable, any receive or transmit offset is possible. The reverse key (REV) allows you to temporarily exchange the VFO frequencies so when operating split you can quickly receive the frequency on which you are set up to transmit. Obviously, when a DX station is operating split and "tuning 5 to 15 kHz up," you can check that you are not transmitting on a pileup frequency, or if you are agile enough, you can track the transmitting frequency of the last station to which the DX station came back and get ready to transmit on that frequency.

I admit that it took me a few operating sessions to get used to offset tuning "a la Ten-Tec," but then I rather got to like it. If you set up in the split mode to start with, you only have to press the A = B key when calling CQ or answering a station to have complete flexibility with regard to receive or transmit frequency movement about the initial frequency. The more or less traditional use of having dual VFOs (storing the frequency of a station in QSO, tuning about a band with the other VFO, and then periodically switching VFOs to check if the QSO is finished) is not negated because of the extra "scratch pad" memory feature of the Omni V. Using Ten-Tec's offset system I worked XT2CW on the first try after he announced his split mode on 10. I'm sure many other Europeans were still trying to get the split set up as I finished the contact.

I used the Omni V primarily on SSB and CW. Many very complimentary reports were received on the audio quality and clean keying. Many friendly inquiries were also received as to what the radio was all about. Judging by the latter, the Omni V is going to have an interesting future.

## Options and Accessories

The Omni V I used had all of the optional 6 MHz IF filters installed and the optional 1.8 kHz 9 MHz IF filter. All of the filters are highly recommended, especially if you wish to optimize performance on any given mode. However, the standard 2.4 kHz SSB filter in conjunction with the use of passband tuning and the audio selectivity features will provide more than satisfactory operation for the casual operator on any mode. The voice readout and FM options are available for those who desire those features. I understand that an optional remote optical encoder is in the works. This is basically a box that brings the main tuning to wherever you want it. You can have the radio on a slightly elevated shelf while tuning it in a comfortable manner as you spend hours searching for a "new one."

Ten-Tec has available a complete line of accessory items for the Omni V ranging from microphones to power supplies to linear amplifiers. I have not tested them as part of this review, but I have presented many of them in previous reviews. They certainly should all mate perfectly with the Omni V, especially QSK with amplifiers such as the Hercules II or Titan.

## Summary

The Omni V is a delightfully exciting radio. Is it worth the price? Sure. Why does it cost as much as the Paragon, which seems to have more features, such as general-coverage receive? The answer to the latter is that the cost of incorporating a 12-band crystal mixer local oscillator board in the Omni V plus the cost of the nonvolatile RAM memory system plus the cost of the standard RS-232 interface all add up.

The receive performance of the Omni V is a definite cut above any other transceiver in its price class. I think that factor alone will make the Omni V extremely popular, especially with serious DX and contest operators and also with all-around operators who simply want every edge they can get in an amateur-band-only transceiver.





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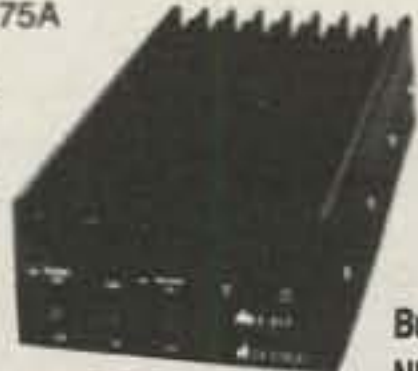


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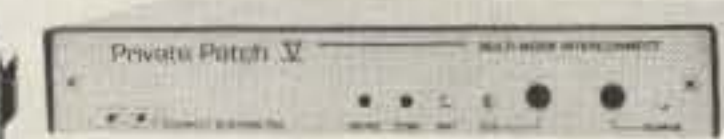
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***In this last installment we get the transmitter working and start to make contacts. With any luck, you've kept up with Parts I and II, and you can finish the rig. You've had the fun of building your own rig, and now you can have the fun of operating it.***

# The 30 Meter Fun Machine

## A Superhet 30 Meter QRP Transceiver

### Part III—Conclusion

BY PAUL D. CARR\*, N4PC

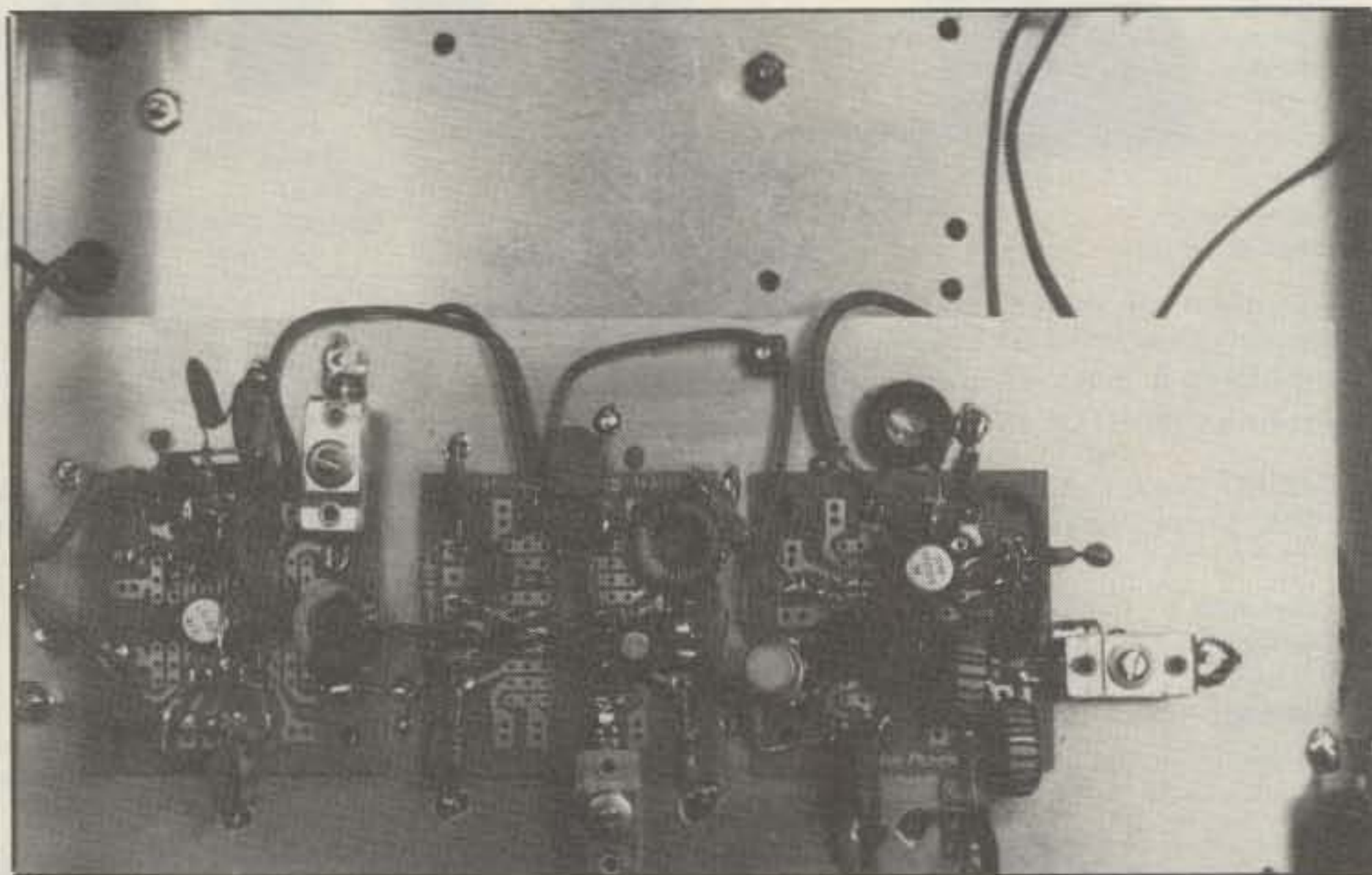
I hope you are having fun listening to those great signals on the 30 meter band. At the end of this article you will have the companion transmitter, and you can talk to those guys.

Since a transmitter is the reverse of a receiver, my philosophy for building a transmitter is reversed also. Start with the frequency generator and end at the antenna. In either case, you end at the antenna—your connection to the world whether the signal is coming in or going out.

Your frequency generators (the VFO and heterodyne oscillator) have already been built. To get a signal on 10.1 MHz we need the first stage of our transmitter—the transmit mixer.

A mixer may be defined as an electronic device having two inputs and one output. The output is mathematically dependent on the two input signals. In this case, we add the output from the VFO (4.1 MHz) and the heterodyne oscillator (6.0 MHz) to produce the desired output (10.1 MHz).

The transmit mixer is built on one-half of a Radio Shack dual circuit board. I used an MC1496G integrated circuit as a mixer. This IC is packaged in a TO-5, 10-pin format. Bend the leads so that 5 pins will terminate on one side of the board, and the remaining 5 pins will terminate on the other side of the board. The body should be about 1/4 inch above the board when the leads are properly formed. Trim the ex-



*The bottom view of the completed transmitter section. From left to right: Transmit Mixer, Buffer/Driver, Keying Transistor, and the Final.*

cess lead length and solder the leads to the board. The remaining components can now be placed in a fashion similar to what we have been doing. Watch out for excessive lead lengths, as long leads are a potential source of trouble.

When wiring is complete, check for wiring errors and mount the circuit board on a piece of copper-clad printed-circuit-board material large enough for all the transmitter circuit (I used a piece about 4" x 8"). Connect the output from the VFO to pin 1 and the output from the het-

erodyne oscillator to pin 8. One word of caution: Use only enough injection voltage to produce the desired output. A further increase in injection will not produce additional output, only undesirable by-products of the mixing process. Experiment with the 10 pF capacitor to be sure you have the right value for your particular mixer IC.

Next place a 47–56 ohm resistor across the secondary of the output coil; connect + 12 volts and adjust the output capacitor for maximum signal as indicated by a

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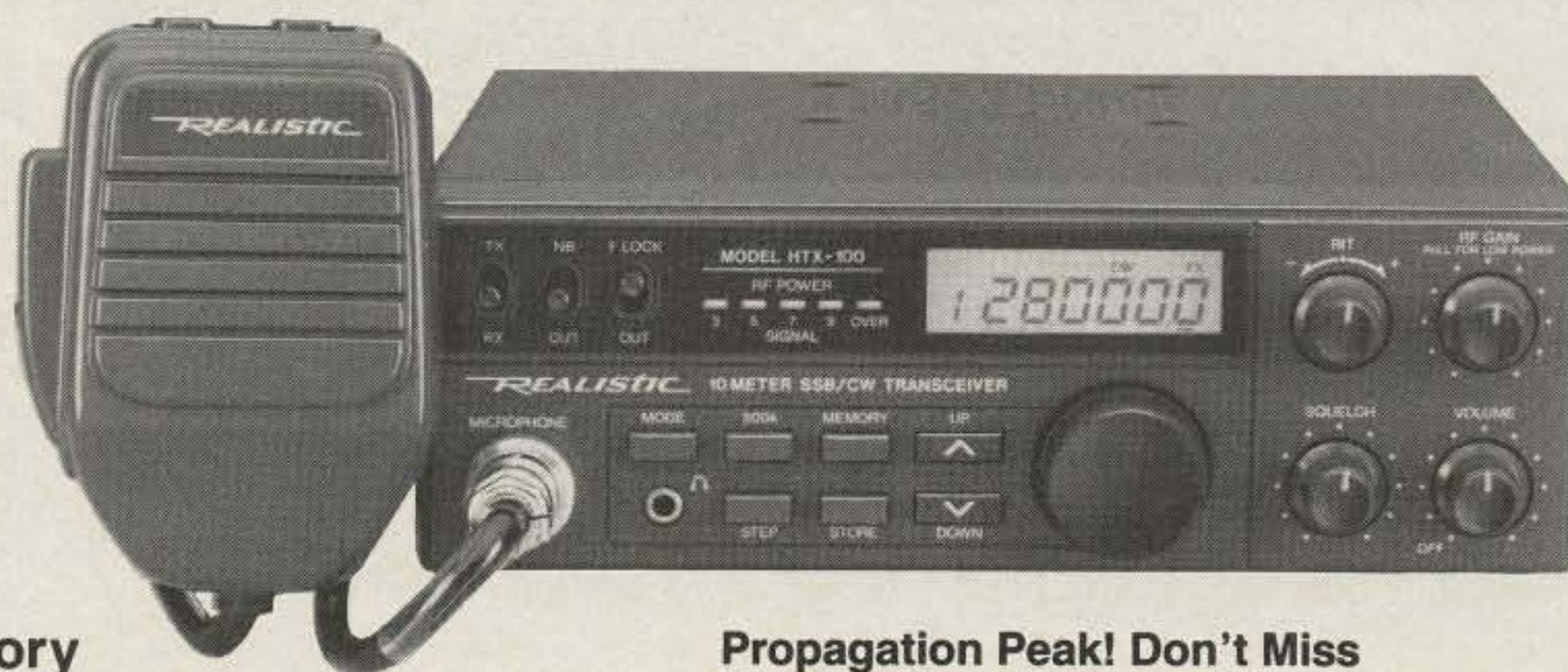
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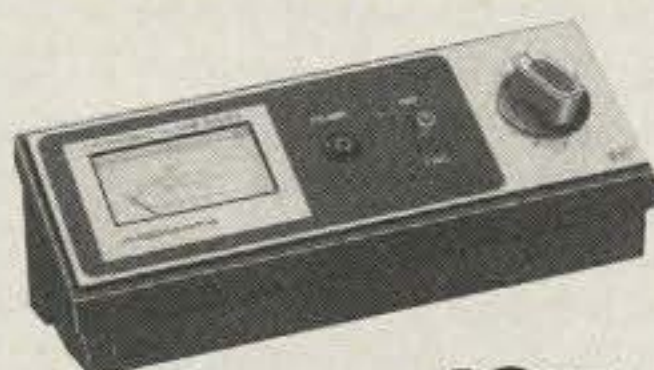
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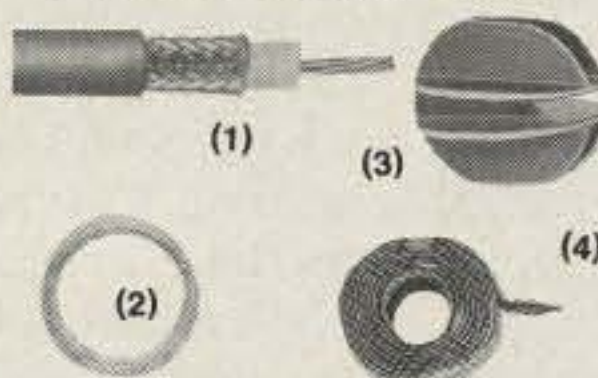
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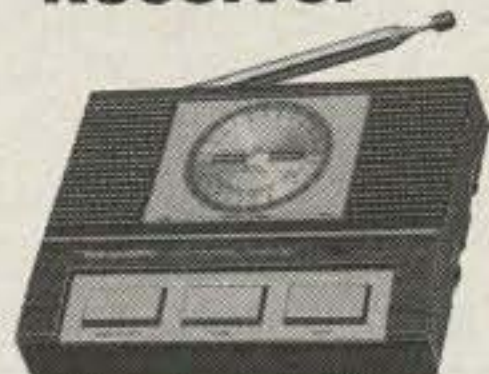
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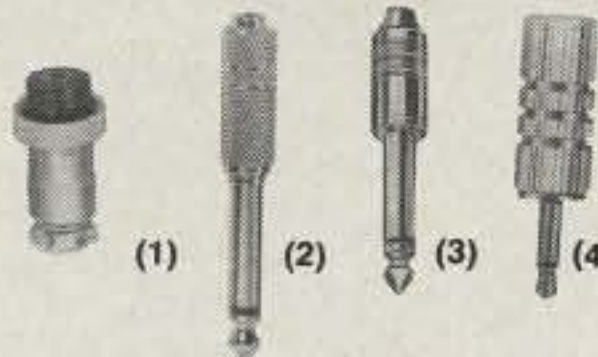
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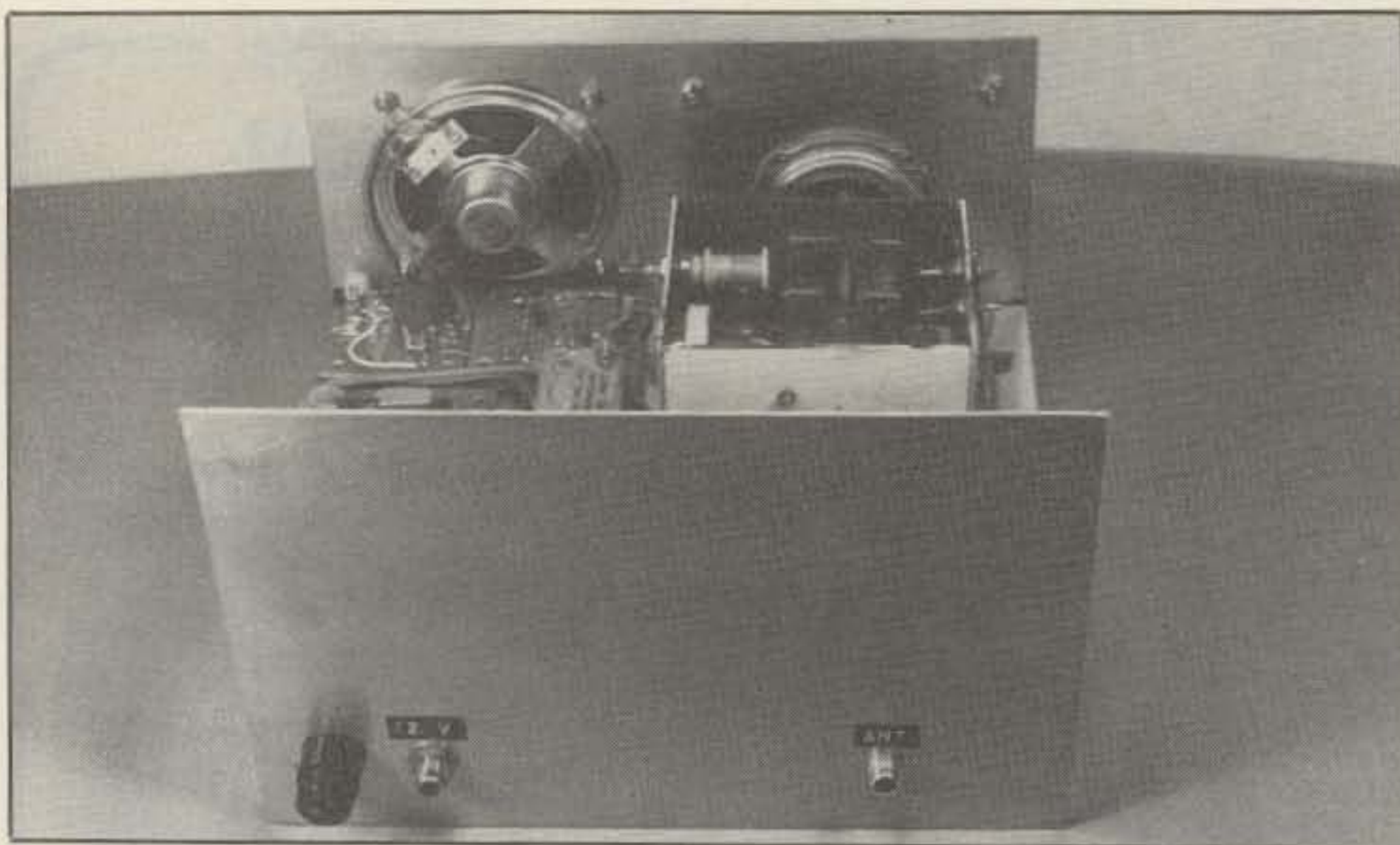
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The rear view of the 30 meter transceiver. There are only three fittings to be seen. From left to right are the fuse holder, 12 VDC input, and the antenna connector.

detection device (an oscilloscope, VTVM with RF probe, or the station receiver). The signal should be clean and crisp if heard on the station receiver. If you do not get these results, stop to find out why.

The next sections in the transmitter chain are the buffer and driver circuits. Both of these circuits are built on one-half of a Radio Shack dual circuit board. Prepare the board in the same way as the previous boards and build the circuits according to the schematic. After construction is complete, check for wiring errors and correct any that have occurred. Place the circuits on the transmitter foundation and connect the mixer transformer secondary to the base of the 2N3904 buffer. Connect the driver output transformer secondary to a 47 ohm resistor. Apply +12 volts and adjust capacitor C2

for maximum output from the driver stage. Remember, if you are taking voltage readings, the magnitude of the voltage is dependent on the impedance across which it was taken. There should be about 70 mw of power available at this point.

The last stage consists of the final transistor and the Pi network. Again, it is built on one-half of a Radio Shack dual circuit board. Do not omit the zener diode on the collector, as it is a transistor saver. It protects against excessively high collector voltages if the circuit should happen to be keyed without a proper load at the antenna terminal. The keying circuit is also built on this circuit board. Components for the Pi network are mounted on the circuit board used as a base for the entire transmitter unit. The coils are supported

by the leads of the capacitor used in the circuit. The series network for coupling the antenna to the receiver is also part of this assembly.

After this last circuit is built and checked, wire the output of the driver to the base of the final amplifier and the output of the Pi network to a 50 ohm dummy load. A 47-56 ohm 2 watt resistor is satisfactory. Apply +12 volts; key the unit and adjust the Pi network for maximum output. You should have 1.25 to 1.75 watts output with 12 volts applied. The transmitter section is now complete.

## Bits and Pieces

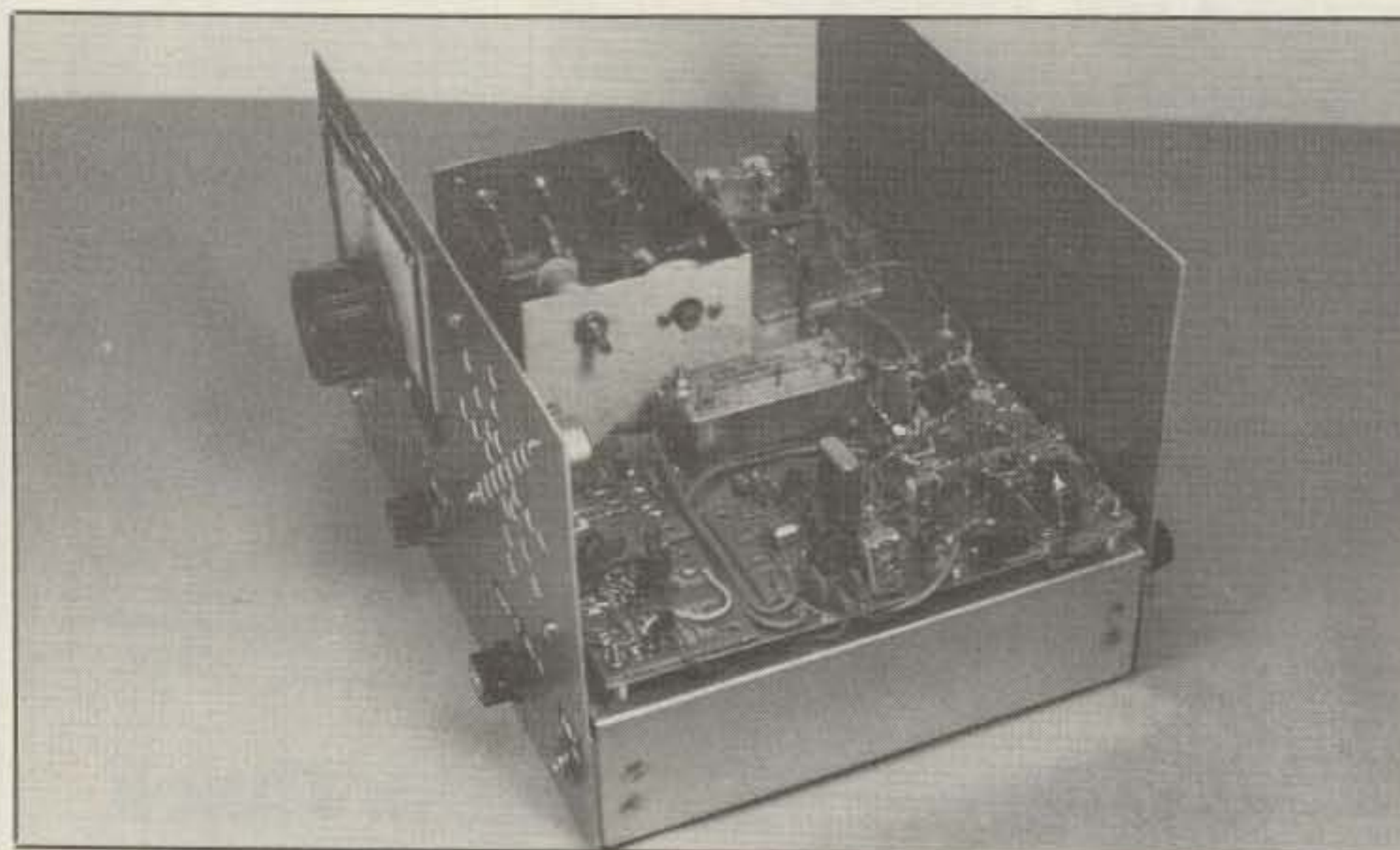
A word about component values: Good quality transistors should be used. I chose a 2N3904 and 2N2222 for the buffer and driver, although many other equivalent types will work equally well. I have used a 2N4427 for an output transistor with the same output.

Package for your circuits is your own choice. In my case, I used a 7" x 9" x 2" chassis left over from an earlier project. The front and rear panels are made from double-clad-copper circuit-board material. A cabinet was fashioned from 1/4 inch plywood and stained walnut. The entire cabinet was then sprayed with satin-finish polyurethane for protection.

I have not discussed the frequency offset circuit in the BFO/heterodyne oscillator. When the transmitter is keyed, a 12 volt potential is placed across the 1N914 switching diode effectively grounding the inductor and lowering the output frequency. Here is a neat way to customize the amount of offset to suit *your* ears. With a clip lead, temporarily place 12 volts to the current limiting resistor. Next zero beat an increasing signal. Remove the clip-lead. What you now hear is the *exact* offset of your transmit signal. If the pitch is too low to suit your ears, increase the number of turns on the inductor, which will increase the transmit offset. Removing turns from the inductor will decrease the amount of offset. Thus, you can customize the offset to suit you. That is not available in commercial rigs. When you operate, tune the incoming signal until you get the desired pitch, and you are zero beat.

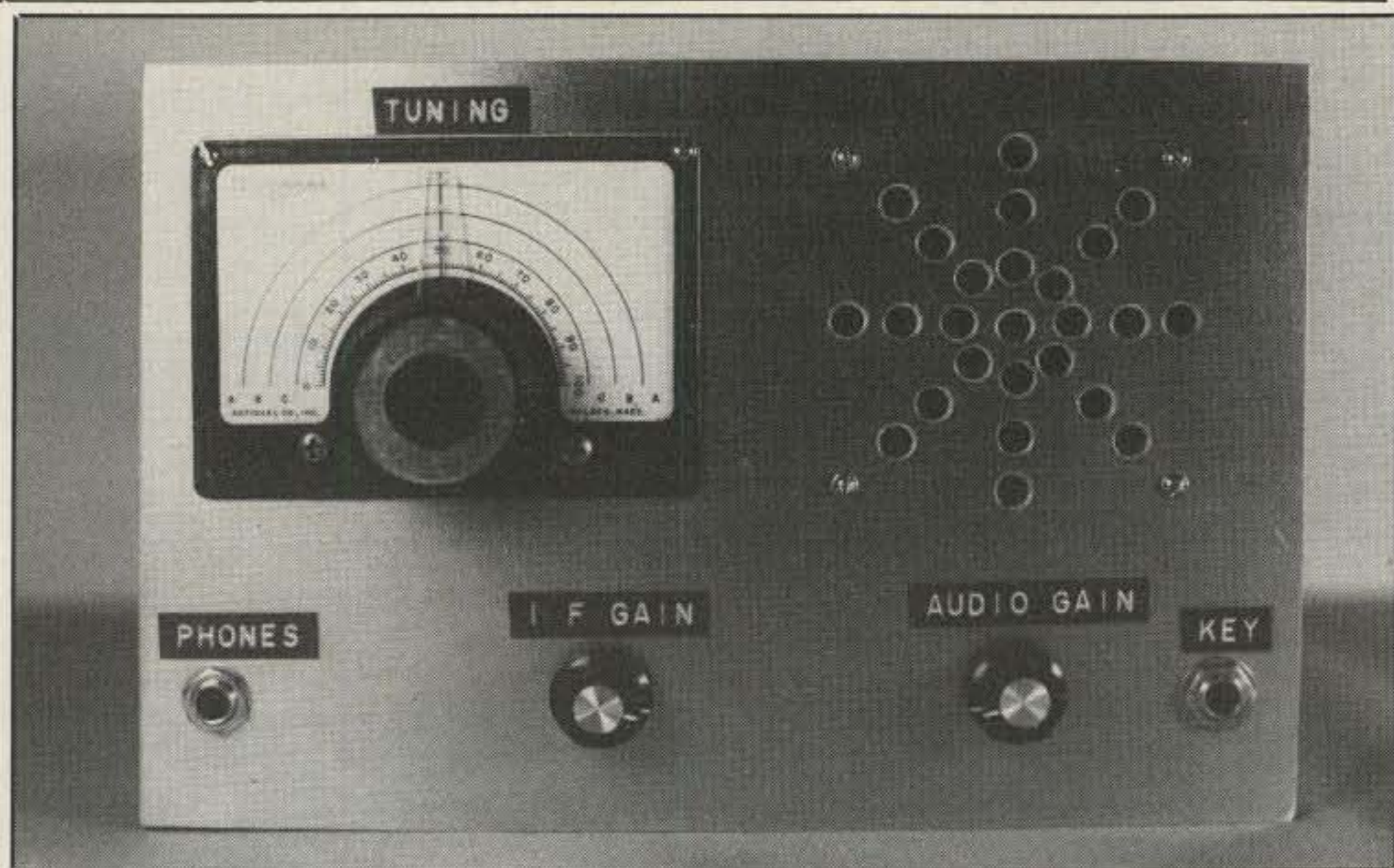
## Results

The rig has performed very well. Many stations in the "lower 48" have been worked, and the rig has drawn unsolicited comments about its nice keying characteristics. I am also working on WAC—Africa, Europe, and Australia so far. I must tell you about a contact I had with VK7FJ in Hobart, Tasmania. After initial exchanges (he gave me a 539) I told him how much power I was running. He immediately questioned me about the pow-



This top oblique view shows the completed transceiver. While it may look a bit complicated to some, the logical step-by-step construction technique makes this a fun and practical project.






Front view of the completed QRP transceiver.

er I was running, and when I convinced him I was running QRP he replied, "It's amazing what you can do with a really good QRP rig, mate." After the QSO I leaned back in my chair and remarked to myself, "Boy, was that fun!"

Many people have been very helpful in keeping me pointed in the right direction on this article. My XYL—the best in the world; Lew McCoy, W1ICP, and Harold Hughes, W4ZS—thanks, fellows, you

taught me how; my daughter Laura for typing; Richard Armstrong, KB4APX, for proofreading; and Chuck Edgeworth (not a ham yet, but I'm working on it) for providing the photographs. Thanks, folks.

To the extent time permits, I will try to answer all questions (SASE please). So heat up the soldering iron and get started. Building is almost as much fun as rare DX with a rig that you have built. Well, I will let you provide the adjective. 

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***KC3YB came up with this clever idea to ease him into a pretty neat mobile installation. The same idea might help you out.***

# How To Build A Mobile Equipment Gimbal Mount

BY JOHN R. SOMERS\*, KC3YB

**A**lthough the mounting brackets used with amateur radio mobile equipment are undeniably better than those which come with CB equipment, and are much more versatile, you may have found that they will not always work in your particular installation. How many times have you struggled in confined space, upside down as likely as not, only to find that when you slid your rig into the bracket, you couldn't reach the controls? Or, more likely in today's smaller automobiles, that you couldn't see the front panel? Or the passenger had no room for his feet?

## The Problem

Recently while I was installing a 2 meter rig in my pickup truck, I found that I had no room left under the dash to mount another radio. I was on the verge of fabricating a couple of L-brackets to mount the rig to the floor when I realized that I couldn't reach the controls without bending way over. It would be a downright dangerous chore to try to drive while groping around for the rig at the same time.

Giving some thought to the matter, I decided that I needed to elevate the rig and move it forward for easy access. But this would require the passenger in the middle of the seat to straddle the radio. Therefore, I had another requirement, namely, that the bracket be mounted near the firewall and project forward.

Visions of the Rube Goldberg type contraption almost caused me to give up the project and leave well enough alone.

## An Idea

Mulling it over in my mind one last time, the idea of a gimbal mount came to me. This would give me control over a full range of movements, forward and back as well as side to side. I would be able to position the bracket out of the way while moving the rig to within convenient reach.

Once I had decided what I wanted to



*As installed in my pickup, the gimbal mount holds the rig in a convenient position and out of the way at the same time.*

do, how to do it posed no problem. I have always felt that whatever I wanted to do, I could find the needed parts at my local hardware store. Somewhere within that hundred-year-old structure had to be just what I needed. All I had to do was find it. Sure enough, there it was among the plumbing supplies—galvanized pipe and pipe clamps. Why didn't I think of it sooner?

As soon as my eye fell on the bin of pipe clamps, I knew I had solved part of my problem. Test fitting one around a scrap of half-inch pipe, I noticed that the fit, although snug, would allow the pipe to turn within the clamp. However, should the clamp be bolted tightly to something (like a transceiver mounting bracket), the pipe would not budge. The same rationale applied to the clamp's being tightened to the

floor of an automobile. Now for something to hold them together, yet allow them to be positioned as needed.

A threaded bolt rod seemed to fill the bill for the vertical support. I would merely drill and tap one hole in the center of each of two short pieces of pipe and screw the assembly together. Picking up a handful of half-inch nuts, I hurried home to start the project.

## The Nuts and Bolts

As the piece of pipe I had picked out of the trash bin was 7 inches long, I decided to cut it in half and make both the upper and lower portions of the bracket the same size. I was careful to remove the sharp burrs around the inside and outside of each piece, so someone wouldn't cut himself. Then, clamping the pipe in my

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Two large meters give you a complete

picture of the operating condition of your AL-80A. They let you know right away if there is a problem.

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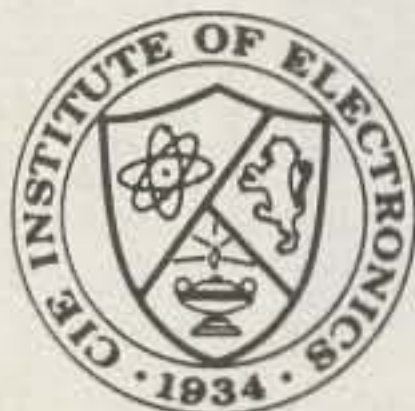
wise, I drilled a succession of increasingly larger pilot holes in the middle of each pipe, the last being  $\frac{27}{64}$  inch, the size required for the half-inch tap I chose to use. After threading each piece, I went out to the truck to test fit the assembly.

After a little rough positioning to see where I wanted to put the bracket, I cut a section of bolt rod, allowing an inch extra for adjusting the bracket when it was installed. Threading four nuts onto the rod, I then threaded the pipe sections. When they were positioned as desired, I tightened two nuts in place, one on each end. Then I tightened the second two nuts tightly against the first two to hold them in place. The bracket was secured in the floor of the vehicle by means of four lag screws,  $\frac{1}{4}$  inch in diameter by  $\frac{3}{4}$  inch long.

When I had determined where I wanted the bracket located, I made the holes in the floor with an awl. This does a better job than drilling, as the floor covering is not ripped or pulled into the hole as with a drill bit. Although the holes through the floor are effectively plugged by the screws, I sprayed the underside of the floor with automotive undercoating. That way I am sure no exhaust fumes will find their way into the cab. Additionally, the rubbery material provides rust protection for the ends of the screws and the sheet metal where it was displaced by the process.

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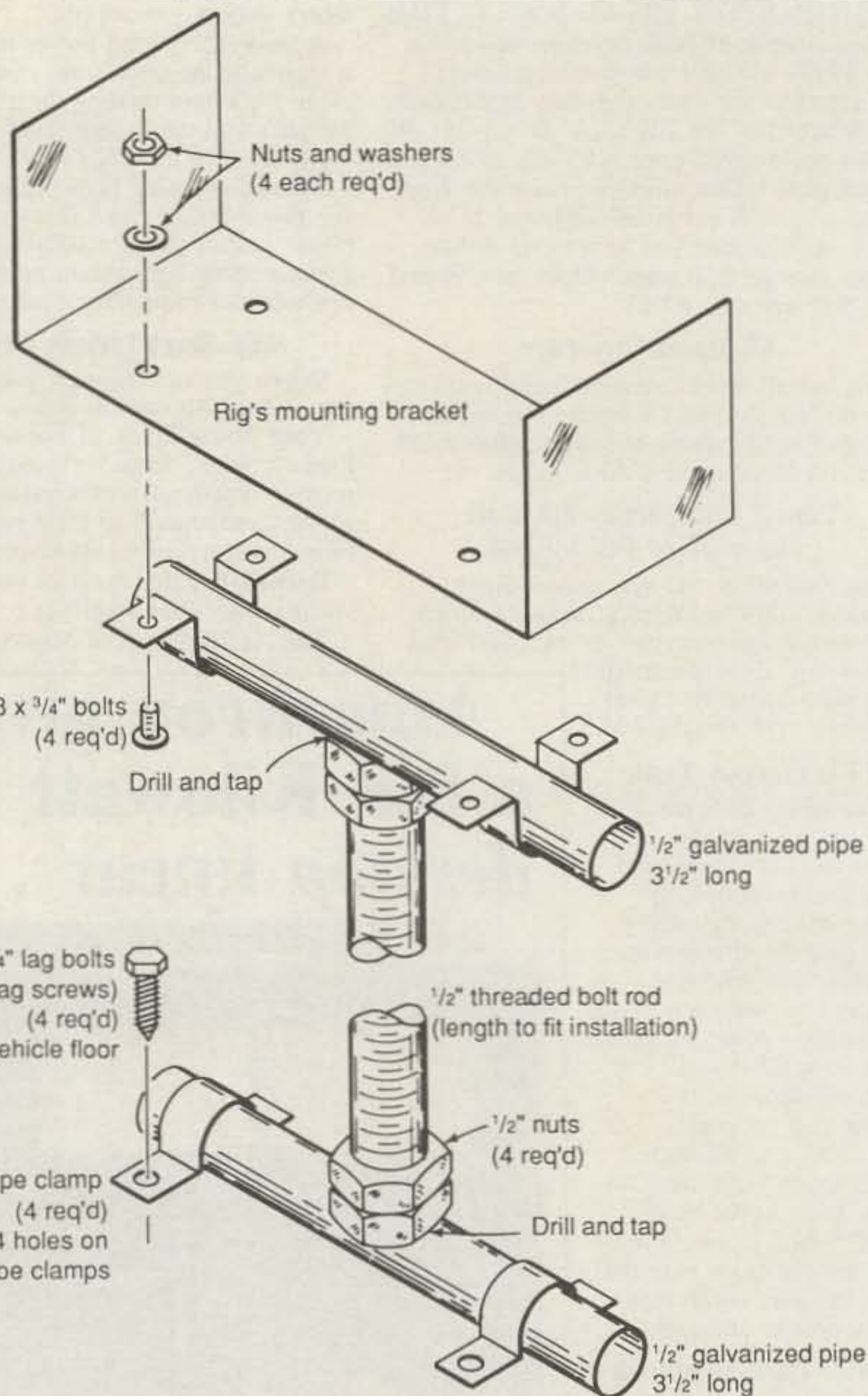
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### Parts List

2 pcs.  $\frac{1}{2}$ " galvanized pipe,  $3\frac{1}{2}$ " long  
1 pc. threaded bold rod 8" long  
4 ea.  $\frac{1}{2}$ " nuts, same thread as bolt rod

4 pcs.  $\frac{1}{2}$ " pipe clamps (sometimes called pipe straps)  
4 ea.  $\frac{1}{4}$ " lag screws,  $\frac{3}{4}$ " long  
4 ea. #8 bolts,  $\frac{3}{4}$ " long, w/nuts and washers

Fig. 1 - The gimbal-mount bracket, constructed of scrap half-inch pipe and clamps, a handful of nuts, and a section of threaded rod, will allow a mobile rig to be positioned so that it is easily visible and in reach of the driver. The dimensions listed in the parts list are as used in my installation. In other situations size requirements may vary.

### Fine Tuning

Once the rig's mounting bracket was attached to the gimbal and the transceiver inserted, I was pleased to find that I was able to position the rig so it was easily accessible and out of the way at the same time. In order to keep the rig in place and to keep the nuts from loosening from the jouncing it was bound to receive in my truck, I applied some Loc-tite® to the threads and tightened up everything. I have had good success with this procedure; everything stays right where I put it.

In some cases, due to installation differences and variations in the sizes of the hardware involved, it might be a good idea to wrap a small piece of abrasive mesh around each end of the pipe before tightening the clamps. This will make the assembly less easily moved due to bouncing or being jarred.

I have been very pleased with the gimbal mount. I find that it enables me to utilize my rig safely and in a more convenient fashion than if I had tried to make my needs fit my installation instead of the other way around.





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# CQ REVIEWS:

## The Digitrex PFC-4500 Frequency Counter

BY DAVE INGRAM\*, K4TWJ

**D**o you remember when VHF/FM activities were young, repeaters were strange new items, and crystallized rigs were state-of-the-art? We all set our rigs on channel using a club or group's frequency counter that was so large two men and a boy were necessary to move it from place to place. Today you can hold that comparable package of electronics right in the palm of your hand. My how technology has expanded!

The Digitrex Model PFC-4500 frequency counter featured in this review is an authentic example of that statement. This compact multi-purpose unit measures only 2.6"H x 1.6"W x 1.2"D with its internal 9 volt battery. It covers 1000 kHz to 500 MHz, or 10 MHz to 1300 MHz with an included two capacitor mod. It also has quite a sensitive "front end" for measuring weak signals, and it has accurate resolution down to 1 kHz. The Digitrex PFC-4500 is a cinch to use anywhere. Just snap a pull-up antenna or 'scope RF probe on its top-mounted BNC socket, press its on/off pushbutton, and read the frequency. It's that easy!

The PFC-4500 is enclosed in a small plastic case, with its four-digit LED display at the bottom and a small front switch for selecting 1 kHz or 100 kHz display resolution. If you set it to the 100 kHz position and hold it within several feet of a talkie transmitting on 146.760 MHz, it will read 1467. When you switch to the 1 kHz position, the display will show 6760. That same resolution, incidentally, is maintained throughout the frequency counter's range.

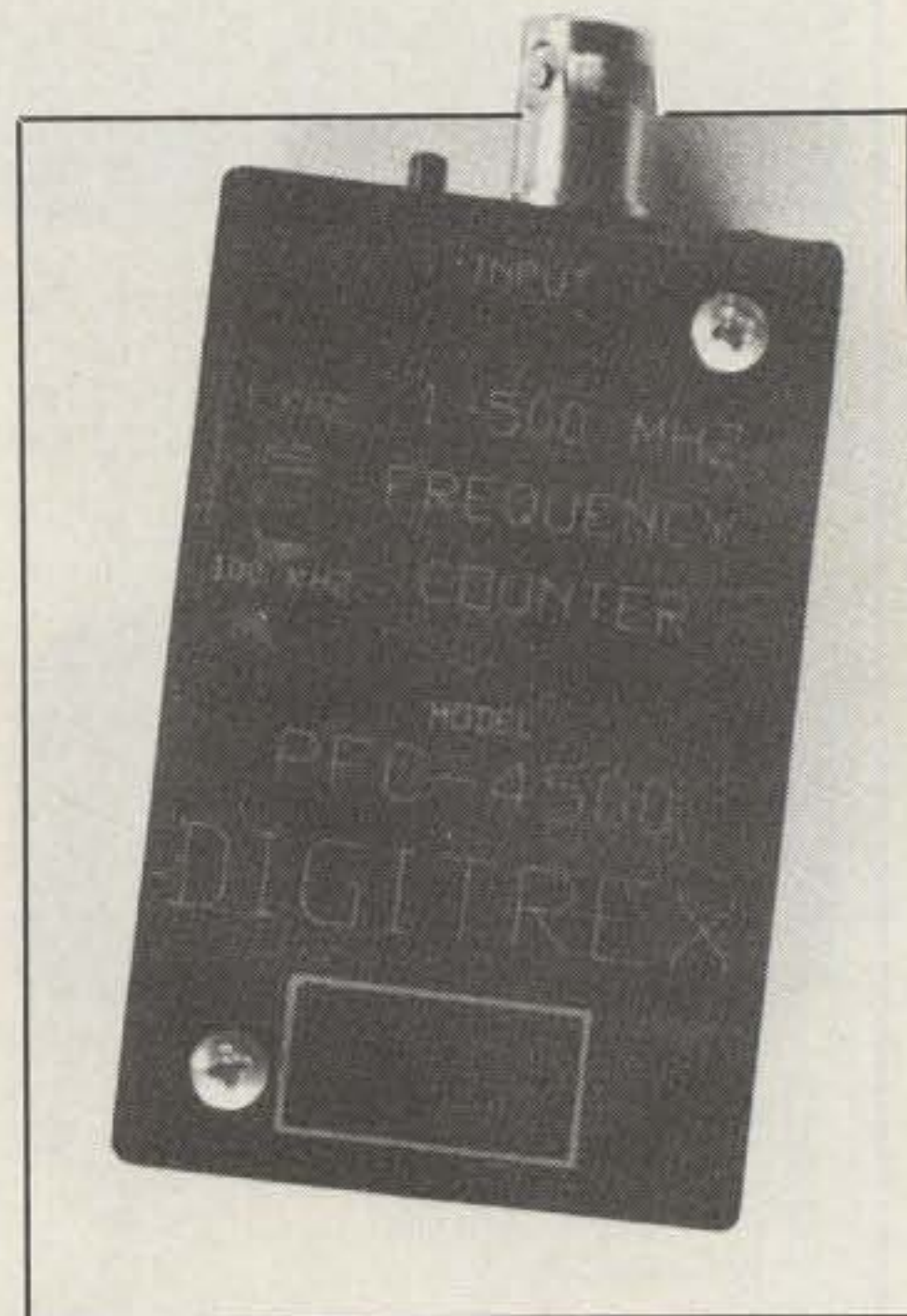
Checking VHF/UHF rigs is only one of the PFC-4500's many applications. This little gem is also great for tweaking and troubleshooting homebrewed oscillators, converters, QRP rigs, classic regenerative receivers, and quick-evaluating used transmitters at hamfests. You can

switch on your super-deluxe home transceiver for some of the previous HF functions, true, but it is more logical and convenient to use a small and inexpensive aid like the PFC-4500.

Assuming you built a little QRP rig and needed to check its operation, just hold the PFC-4500 near that circuit while holding the rig's key down. A correct (crystal) frequency reading from a couple of feet away indicates production of RF. Move the PFC-4500 farther away until it barely picks up enough RF for correct display, and then disconnect the QRP rig's "final" (leaving only its oscillator with voltage). The PFC-4500's display should then "babble" until it is moved closer to the QRP rig, indicating proper RF stage amplification. Similar tricks work well for converters and transverters.

The PFC-4500 makes a terrific "growler" or zero-beat indicator for modern-day operation with old-time regenerative receivers and self-excited oscillator transmitters. In fact, I will add more notes along this line in a future "World of Ideas" column featuring classic rigs. Basically, the concept works as follows. You wind a coil for your two-tube 1930-style receiver, plug it in, adjust the receiver for earphone-howling regeneration, then read its operating frequency and/or tuning range on the PFC-4500. You can then tweak coil turns, vary capacitor values, etc., until a desired frequency coverage is obtained. Let's next assume you are using that receiver on a good nostalgia and QRP-favoring band like 30 meters. You receive a station calling CQ, press the PFC-4500's button, and read 10.108. You then key your Hartley transmitter, its signal overrides the receiver's radiated regeneration, and you carefully zero it for a 10.108 reading on the PFC-4500. Yes, indeed, old-time radio with a high-tech twist works DX in style!

Do you occasionally wonder if those hamfest bargain rigs are working or are total "dead ducks"? A small amount of proper frequency RF output usually indi-



*The Digitrex PFC-4500 digital frequency counter. Compact unit covers both HF and VHF/UHF ranges, and it is surprisingly sensitive.*

cates it can be refurbished, but how can you quick-check it? Snap out your PFC-4500! Assuming its measured frequencies are half-right, any necessary repairs may be confined to RF stages. Remember, too, the previous idea is applicable to HF and VHF/UHF gear alike.

Another neat application for the PFC-4500 is using it "scanner style" to detect "bugs" or to determine exact public utility frequencies. Simply get as close as convenient to a police, fire, etc., system's antenna, read their frequency on the PFC-4500, then program your VHF/UHF receiver accordingly. DO NOT climb their towers, however! I use a 3 dB mobile antenna, drive up near a curious tower, and read the transmitted frequency right in my car.


A brief look inside the PFC-4500 and glance at its schematic diagram reveals a relatively simple yet quite effective de-

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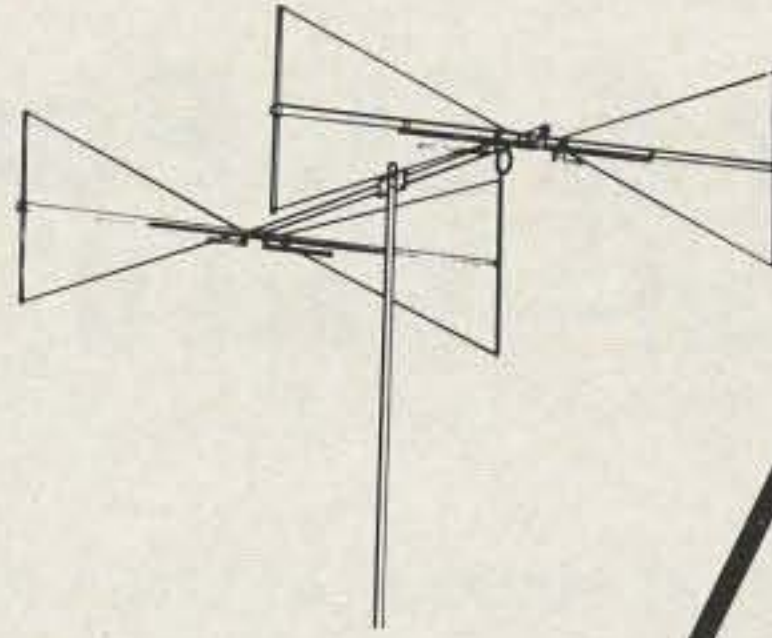


sign concept. Five ICs comprise the counter itself, another IC is used for input amplification, and two more ICs are used in the display. All circuitry is contained on one PC board. The design is both neat and effective.

In conclusion, I found the Digitrex Frequency Counter to be one of the most useful "extras" and unique pieces of test equipment added to my shack in many moons. It is really handy for upper-band and microwave experimenters, but I particularly like it for working with old-time gear. Vacuum-tube circuits of the '30s are naturally cantankerous, especially the receivers, and knowing their main frequency of operation is a tremendous help when setting them up for use on today's bands. The Digitrex's 4500 sensitivity of 20 millivolts in its mid-range and 200 millivolts at the outer band edges is great for working with very low power rigs. I also like the ability to walk by those mysterious towers on our southern beaches, read their frequency of transmission on the PFC-4500, and tune in that action at night on a general-coverage transceiver.

Whether you are a casual constructor or a serious experimenter, I think you too will find the Digitrex 4500 most attractive. It is priced at \$59.95. For more information, contact Digitrex Electronics, 1005 Bloomer Rd., Rochester, MN 48063. 

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**Even though they encountered a few problems, these members of the Natal DX Group made 6325 contacts and worked 111 countries. Here's how.**

## St. Peter & St. Paul Rocks A DXpedition—Part II, Conclusion

BY KARL MESQUITA LEITE\*, PS7KM

On Sunday, May 14 at about 1035 UTC at low tide, we began the landing using the inflatable boat from the *Shanty* and a little aluminum boat from the *Do Rio Negro*. Karl, PS7KM, and Captain Peter stayed on the boat organizing and passing along the various items. Tino, PT7AA, and Alexandre in the inflatable boat with Leo, PS7JS, and a seaman from the *Do Rio Negro* in the aluminum boat made the first trip. Their objective was about 70 meters off, and they carried canvases, wood, antennas, water, food, a radio, and a battery. The sea was calm, permitting an easy landing. Leo, PS7JS, was the first to set foot on the Rocks. We unloaded the supplies, setting them on top of the stones. A strong wave surprised us, soaking the Yamaha 1400 watt generator, parts of the baggage, food, camera, flash, two 2 meter rigs, and the coaxial cables.

We began carrying the material up higher near the remains of the old lighthouse, free from the waves. We set up the tent and erected two antennas, a vertical for 10, 15, 20, and 40 meters and a beam for 10, 15, and 20 meters. We also installed the radios and generators. A high SWR was evident with both antennas; after a change of coaxial cable, it appeared that the vertical would give better results, and this turned out to be the case.

At 1848 UTC on 28 MHz SSB ZY0SS made the first contact of the expedition with Leon, K2EWB. Soon after we contacted the first Brazilian station, PT2BW. We continued operating, although we were very tired. The propagation was excellent on all bands. At 2115 UTC on 28 MHz CW ZY0SW called CQ and made the first contact with Jacintho, PY2PA, ex-PY0SJ. The next QSO was with WP4ACE. Unfortunately, ZY0SW had to use a hand-key, as the electronic key had been left on the vessel.

On Tuesday we were awakened by strong gusts of wind and rain which hit



ZY0SS, ZY0SW, and ZY0SY (left to right) left their mark on the DX world.



Karl, ZY0SS (PS7KM), in SSB operation. In all they made 3502 SSB contacts.

\*Box 385, 59000 Natal, Brazil



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The original tent was set up high near the remains of an old lighthouse.



After a storm knocked over the tent and antenna, the setup was moved to a more protected location.

with enormous force. We managed to keep the tent upright. At 1305 UTC the wind and rain returned and this time succeeded in knocking over the tent and antenna. After the storm subsided, we moved the tent to a better protected location on an incline. The canvas remained still quite low, giving us more safety. After a few hours we returned to the radio on SSB, a great pileup, and we used split up to 25 kHz. At noon the temperature reached 45°C. At 2109 UTC we begin operating CW again.

On Thursday the operation ran normally, and at night RTTY operations began. After connecting the equipment, Leo, ZY0SY, made the first contact on 14 MHz with F2BS at 2225 UTC. This was followed by a QSO with PT2BW. The equipment began to have problems. We made the last contact on May 18 at 0016 with JA1ACB, and soon afterwards the computer and interface stopped working. We worked 37 stations. The Commodore 64 computer and MID-1000 interface were damaged by the overcharge of power. This

finished the RTTY operation. Nevertheless, we were pioneers in this regard!

The next day the operation ran smoothly with no problems on SSB and CW. Each operator handled three hours. At around 1400 UTC the Yaesu FT-707 stopped working in the receive mode, but transmit was still okay. We put the Kenwood TS-130 on the air.

On Friday we continued operating, making more than 5000 contacts. Propagation was very good for VK, ZL, JA, and 3D2 from 10 to 40 meters. USA and Eu-

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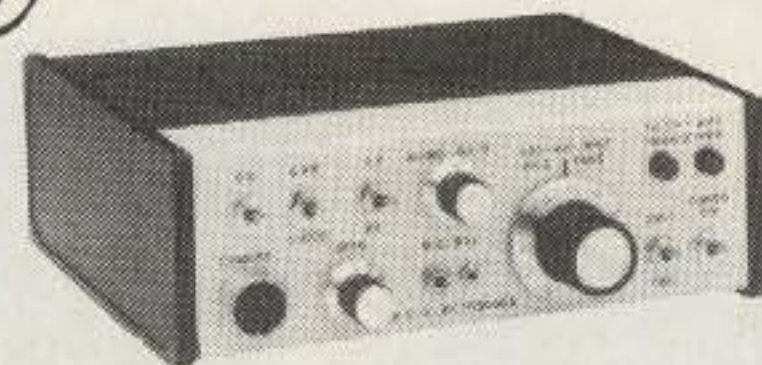
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Tino, ZY0SW (PT7AA), in CW operation. On CW 2786 contacts were made.

rope came through with no problems, but there was an incredible pile-up. In the afternoon we had a visit from Sr. Manoel and a part of his crew who came to eat lunch with us. They brought fish and some lobsters, and we opened a bottle of champagne to celebrate the success of the operation. At night, after a CW contact with PY1BVY, the electronic key quit, but operation continued on SSB.

The last day of operating was Saturday, May 20. Part of the equipment was already on the ship as we started to dismantle and pack the rest. Meanwhile, Karl, ZY0SS, continued operating and made the last contact at 0932 UTC on 40 meters with JA2BAY, thus bringing to a successful conclusion the DXpedition to Saint Peter & Saint Paul Rocks by the Natal DX Group.

With a full moon and low tide, the sea quite choppy, we began to carry the remainder of the equipment and materials onto the ship. Leo, ZY0SY, was the last to leave the Rocks. At 1315 UTC aboard the *Shanty* we started the return trip, heading to Fernando de Noronha with a strong wind.

We continued the trip to PY0F. We were completely exhausted. We spotted the island at 1000 UTC on Wednesday, May 24. With a torn mainsail we couldn't approach the island, and wind and current were against us. We made radio contact once more with Andre, PY0FF, who helped us out by sending two small fishing boats to tow us into port. At 1700 UTC we succeeded in landing. That evening Andre presents us with a marvelous dinner at his house.

At 1800 UTC the following day we again started the trip to Natal. On Sunday, May 28, we were 22 days into the trip, but still a long way from home. At

2100 UTC we spotted the continent. In spite of Captain Peter's efforts, the current was carrying us toward the Ponta do Calcanhar, 65 km off and to the north of Natal. We passed the day trying to overcome the current, the wind against us, and each hour farther away from the coastline.

At 1000 UTC on Monday the wind suddenly started to improve, and little by little the land drew nearer. Still early in the morning, by radio we were informed that PT7BR and PT7SY were in Natal to welcome us. At 1800 UTC we caught sight of the highest buildings of Natal. At last we entered the Rio Potengi and anchored at the Yacht Club of Natal at 2320 UTC. The DXpedition to St. Peter and St. Paul Rocks had been successfully completed.

Awaiting us were PT7BR, PT7SY, PS7RN, PS7CW, PS7BY, and PU7ILP, as well as our family members. Tired but happy, we felt ourselves to be truly radio amateurs. It was a great adventure and an achievement of international renown to put on the air one of the most difficult locations in the world—PY0S. And after a magnificent dinner with friends and families, still tired, we slept soundly without the rolling of the sea.

We certainly had our shortcomings. The lack of a better knowledge of the location led to some mistakes. These will surely not be repeated, for we want to reactivate the Rocks in May 1991.

However, in spite of all the problems, we successfully accomplished our goals. We made 6325 contacts overall and worked 111 countries. On SSB there were 3502 contacts, on CW 2786, and on RTTY 37.

We must express our most sincere thanks to all those who helped us, and they are too numerous to mention here.

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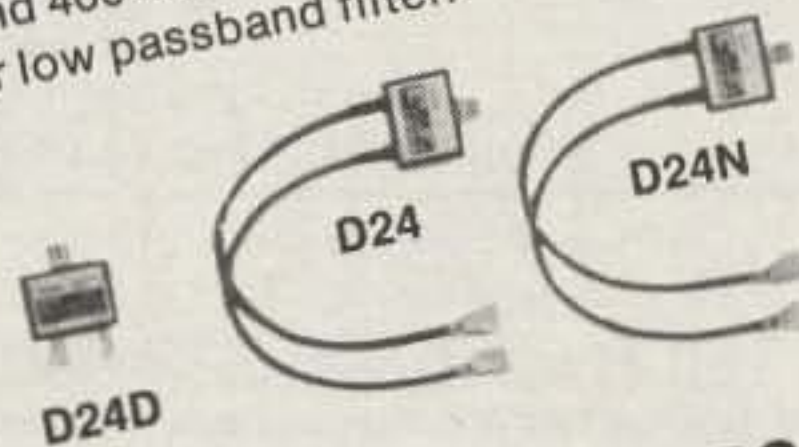
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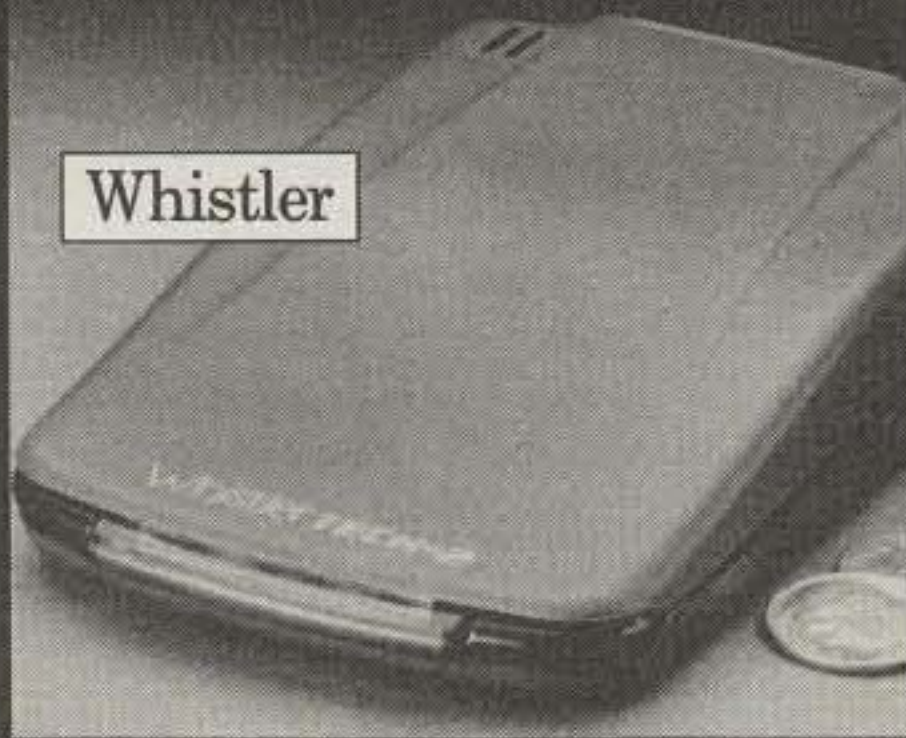
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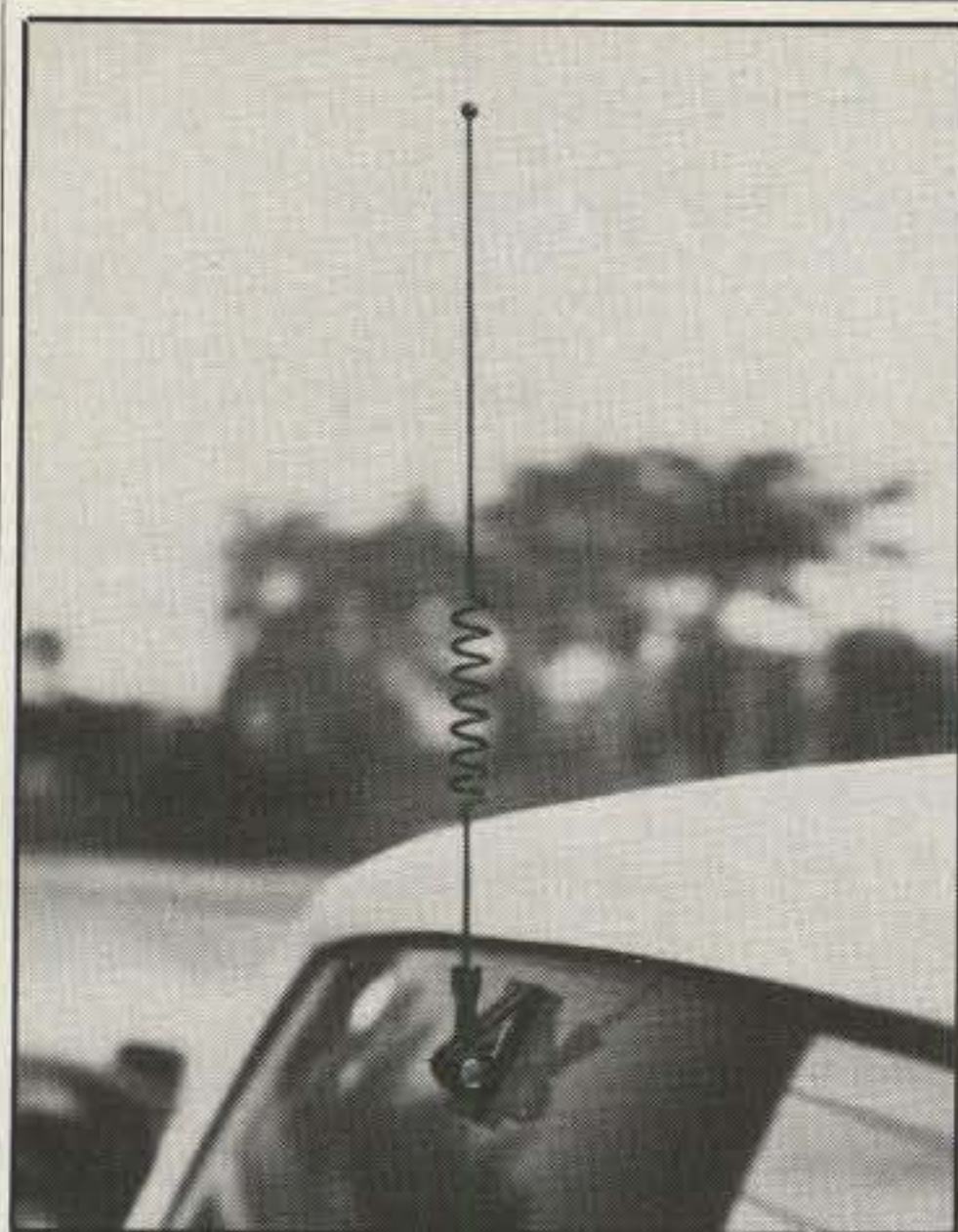


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The 4410A contains an amplifier employing an inherently self-balancing measurement technique. Its bridge circuit allows optimum reading accuracies, with a 5000-to-1 dynamic element range. Elements for the 4410A plug into the element socket and rotate for forward or reflected measurements. The seven overlapping power levels provided by each element cover 0.002-10 watts, 0.02-100 watts, 0.2-1000 watts, or 2-10,000 watts. The desired range is instantly selectable by turning a rotary switch. A battery test position is located on the switch. For more information, contact Bird Electronic Corp., 30303 Aurora Rd., Cleveland (Solon), OH 44139, or circle number 104 on the reader service card.





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Model AP-453 will accept 100 watts continuous power (150 watts intermittent) with a VSWR of less than 1.5:1. Nominal impedance is 50 ohms. The antenna is DC grounded, with a shunt-fed coupling unit, and is furnished with 15½ ft. of RG-58/U cable, including a UHF male (PL-259) connector. Other antennas in Antenna Specialists' complete line of ON-GLASS® cellular "look-alikes" are Model AP-143 (138-150 MHz), Model AP-153 (150-174 MHz), and M-906 for CB frequencies. For further information, contact The Antenna Specialists Co., 30500 Bruce Industrial Pkwy., Cleveland, OH 44139-3996, or circle number 105 on the reader service card.

### PAYL Software's DX Tracking Program

DXLOG is a computer program for IBM PC compatibles that automatically tracks DX QSOs and award status. DXLOG prints a checklist of worked and confirmed DXCC countries by band and mode. DXLOG can automatically determine eligibility for all HF DXCC awards and endorsements and print the required forms. DXLOG also can generate "QSL needed" lists, QSL data labels, and more. The user can update the included DXCC country list. CQ Zone information is automatically determined. Professional documentation is supplied.

DXLOG is an easy-to-use program (not in BASIC) and is not copy protected. For more information, contact PAYL Software, P.O. Box 926, Levittown, PA 19058-0926, or circle number 108 on the reader service card.



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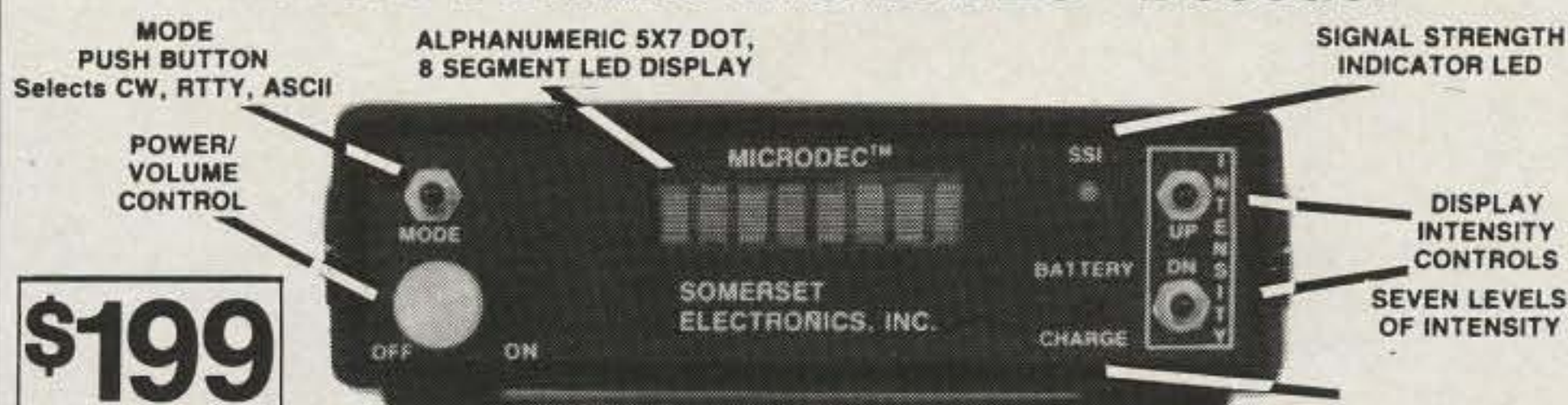
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## **Build Your Own Low-Cost Boom Mike**

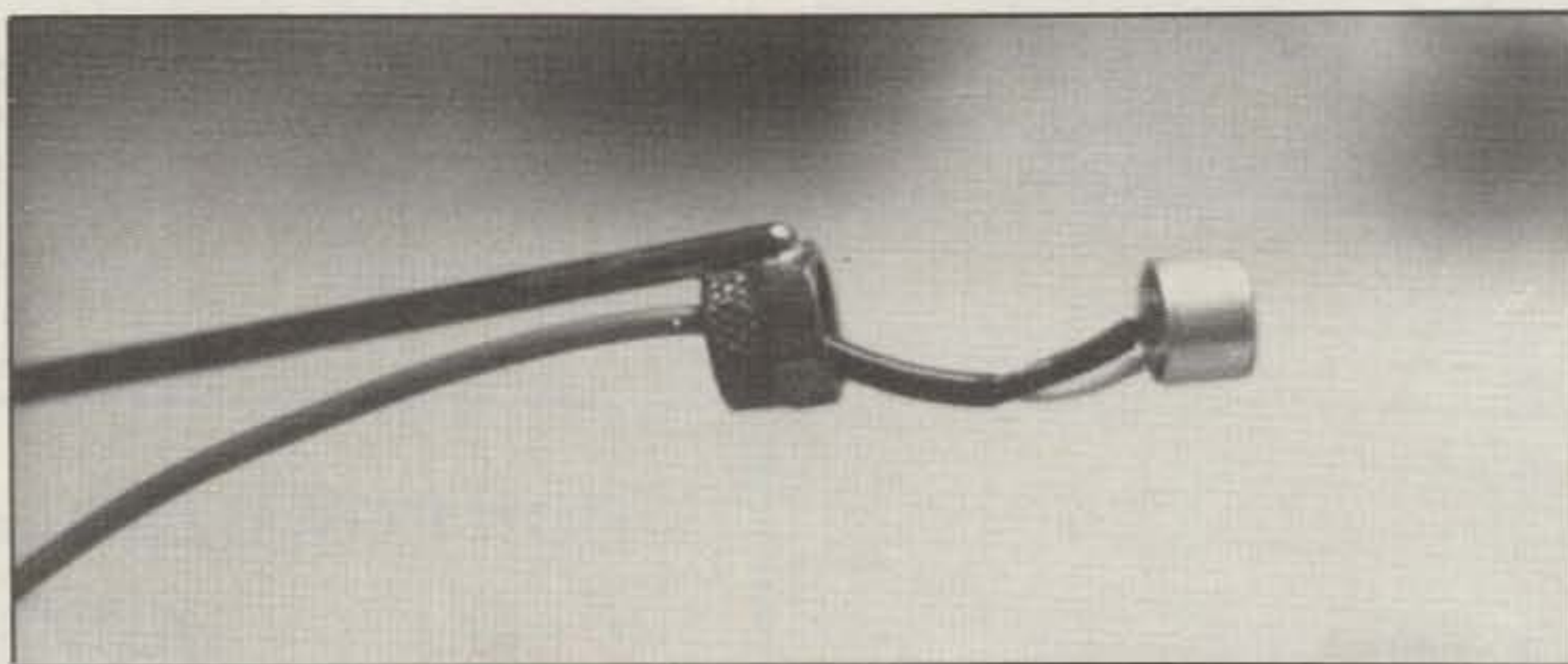
BY STEVE EXAS\*, N3FZL

**W**ere you ever contesting, thinking how nice it would be to have a boom mike hanging from your headphones? A microphone directly in front of your face at a fixed position is easy to adjust for VOX operation, and follows you while you are logging or just moving about the shack. Here is a cheap and easy way to add a boom mike to any inexpensive set of headphones.

As we all know, almost all stereo headphones are perfectly acceptable for communications use using a stereo to mono adapter or by just simply combining the right and left channels in the plug. A cheap pair of headphones can be found at yard sales, second-hand stores, or flea markets. Maybe you have some in your junk pile! You can even purchase new ones for less than \$20.

The project centers on the use of an inexpensive electret microphone element (Radio Shack #270-090). There are really only three active components in the whole system, including the element itself. A 1K resistor is used to bias the mike element, and a 2.2 uF capacitor is used to couple its output to your transceiver or transmitter. The boom is a piece of  $\frac{1}{8}$  inch (.125) diameter clothes-hanger wire. The wire is formed to suit, and the element housing is a small brass fitting soldered to one end. Mounting the boom to the headphones can be done in almost any way you can think of. I used a small "black box" I had in my junk pile. I call it a black box because I still am not sure what it was (probably a potted relay or filter of some sort).

Anyway, I drilled it through to allow the hanger wire to slip in and out, and drilled and tapped a #5-40 hole at right angles for the boom adjustment lock screw. I then epoxied the mount to the right-hand ear cup, checking first, of course, to position it at the most comfortable and convenient angle for the boom to be on. The

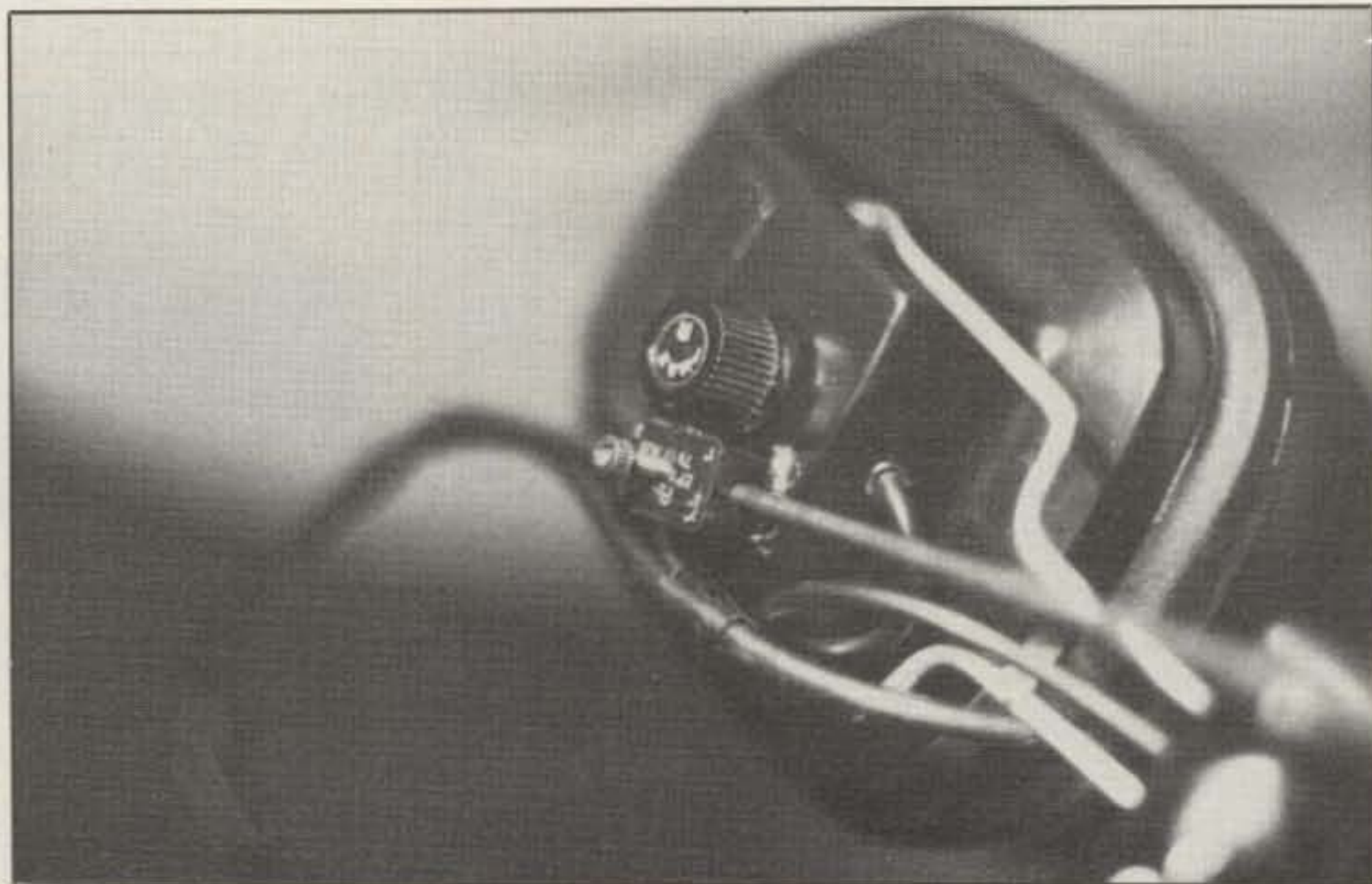


*The electret element fits snugly into the brass fitting, which was soldered to the wire.*

angle doesn't have to be perfect, for you can bend the boom to suit once you have the mount fixed to the phones. In fabricating the boom, just cut the long, straight portion out of a sturdy  $\frac{1}{8}$  inch diameter clothes hanger, and clean the lacquer or other coating from one end, approxi-

mately  $\frac{1}{4}$  inch from the end. This can be done with sandpaper or a wire wheel.

A small brass fitting will be needed to house the element, and any fitting having an I.D. capable of accepting the element will do. I used a  $\frac{1}{4}$  inch "polyflow" compression nut, used for plastic tubing



*The author's mysterious little black box, which is only used to support the wire boom. A small set screw is used to provide tension on the wire boom.*

\*603 Lenox Ave., Reading, PA 19606



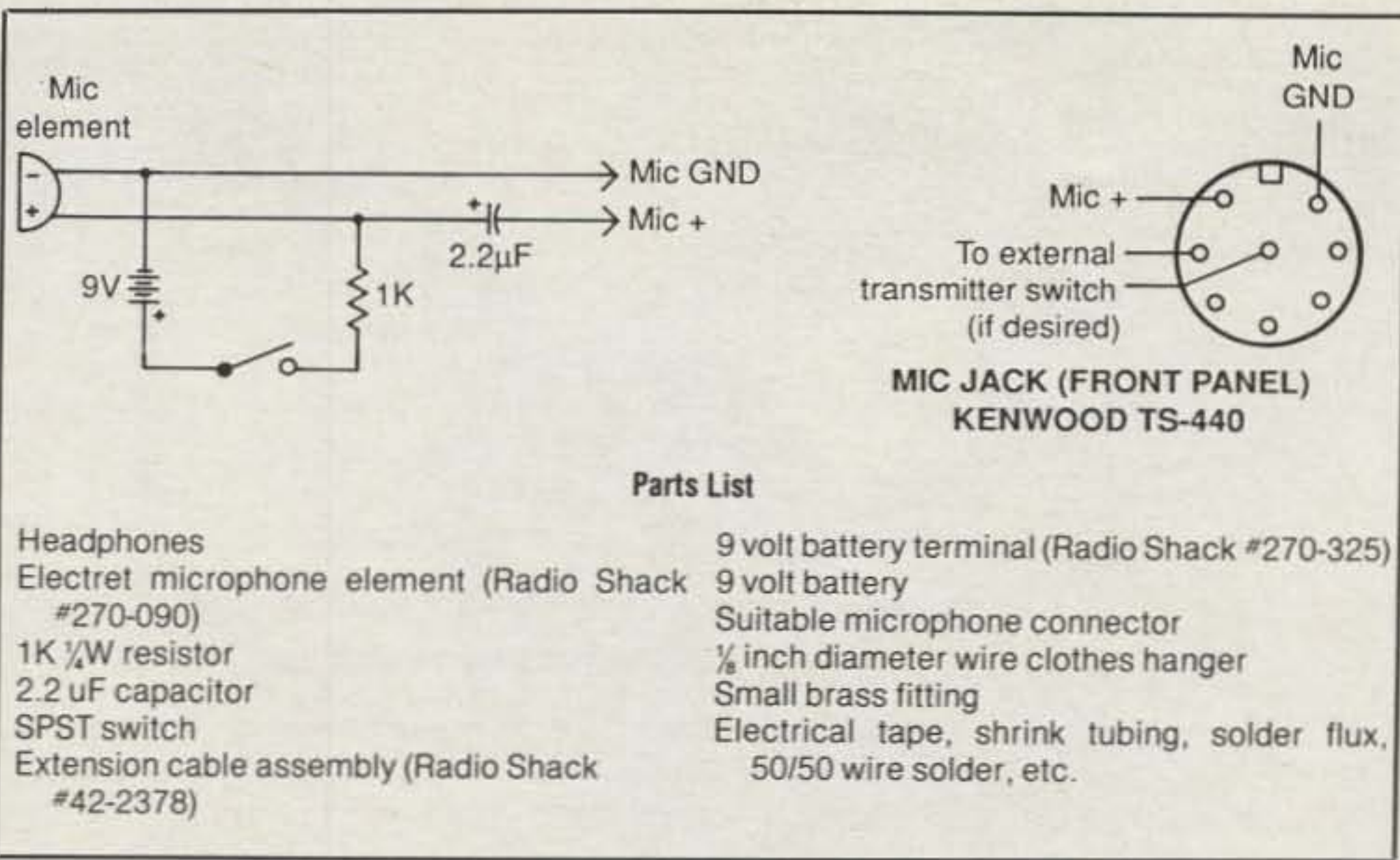
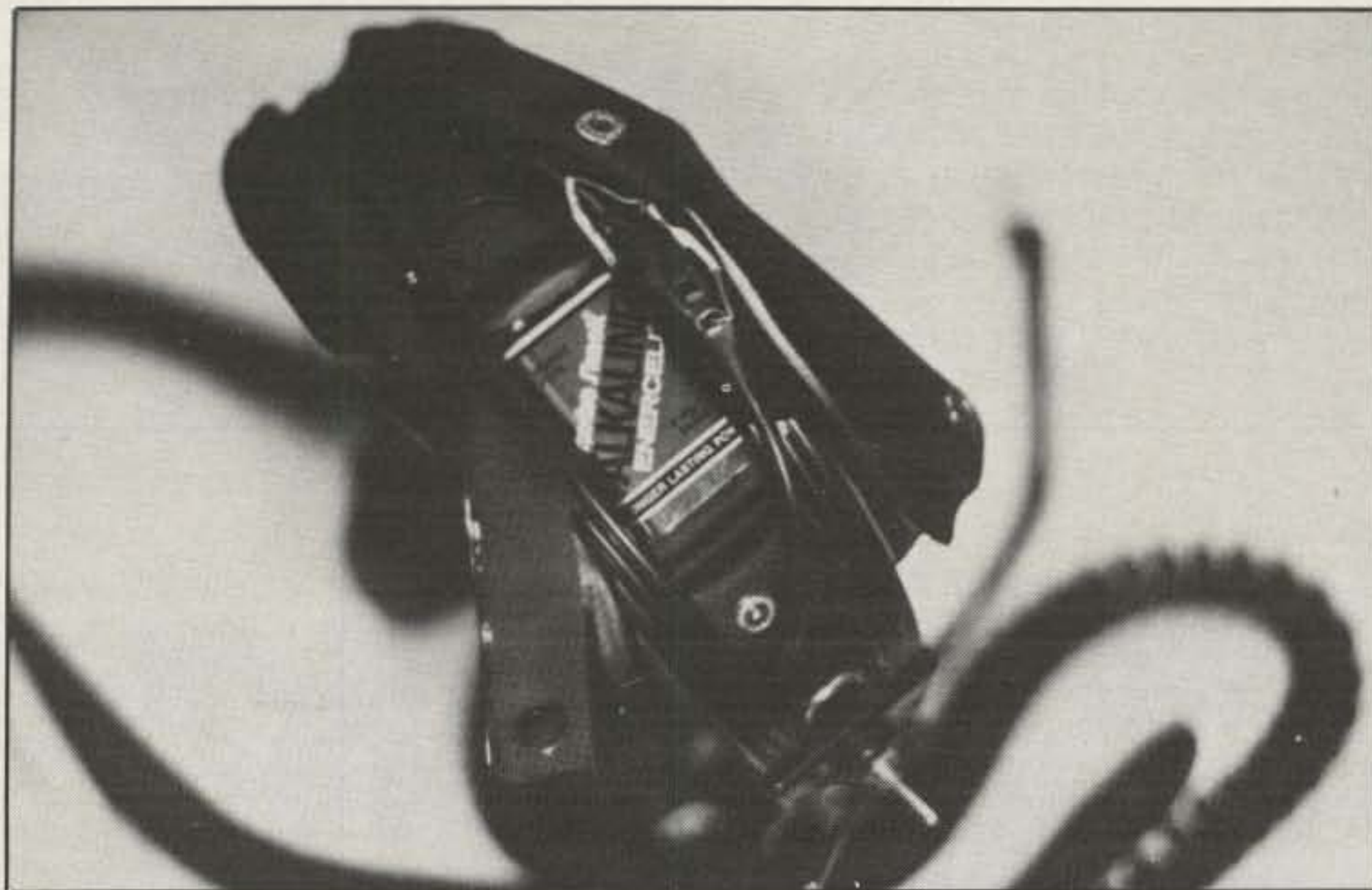


Fig. 1—The simple microphone circuit.



The battery and its on-off switch fit within the padded headband.

mostly for industrial applications. I had to open the I.D. of the fitting, but this was okay because I was able to slowly work it open to get just the fit I wanted. The I.D. should be large enough to allow the mike element to enter the fitting, once a wrap of electrical tape or shrink tube is applied so as to insulate it from the fitting.

Once the fitting is done, it is soldered to the end of the wire. You can't use your 25W pencil iron for this one, so you will need a much hotter iron or gun. (I used a propane torch.) Be sure both the wire end and the brass fitting are clean, and use paste flux and 50/50 solid wire solder. It will help to file a small, flat area on the hanger (wire) end to allow better contact and positioning of the wire on the fitting. Carefully position the fitting in a clamp or vise on a non-flammable surface, and lay

the wire onto the fitting. Use something heavy to hold the wire in place while soldering. Once soldered, the boom is complete!

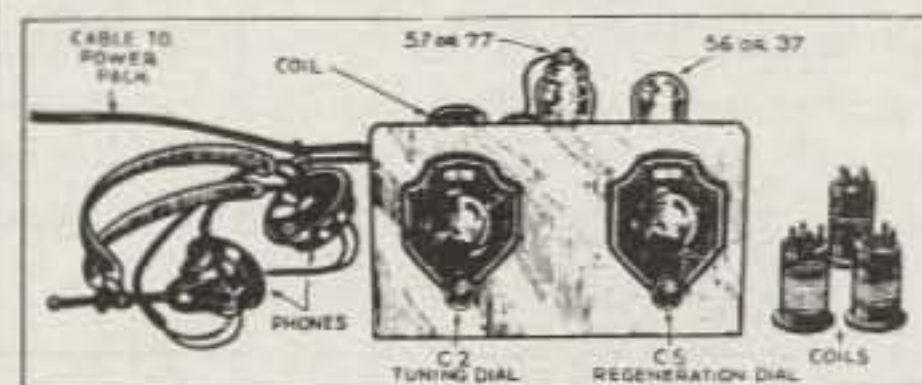
Prepare the element for insertion by first soldering the cable wires to the element. Be sure to note correct polarity, and connect the cable braided conductor to the mike element minus (-) terminal, and the insulated center wire to the plus (+) terminal. Be sure to use shrink tubing on both leads to prevent them from shorting or grounding against the fitting or boom. Make sure you have enough cable to follow the boom and make it to the top of the headphones with a few inches to spare. Next insert the element into the fitting, and if the fit is loose, you can use RTV silicone to glue it in place on the terminal end. Run the cable for connection

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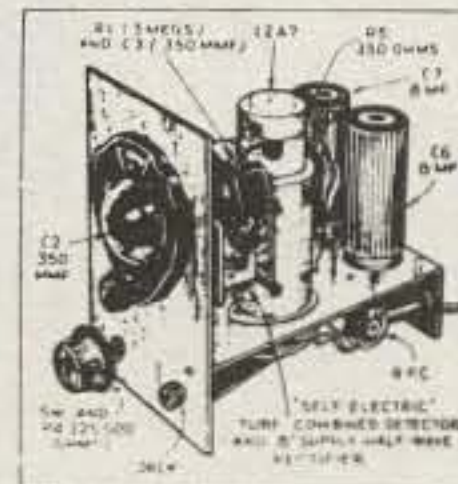


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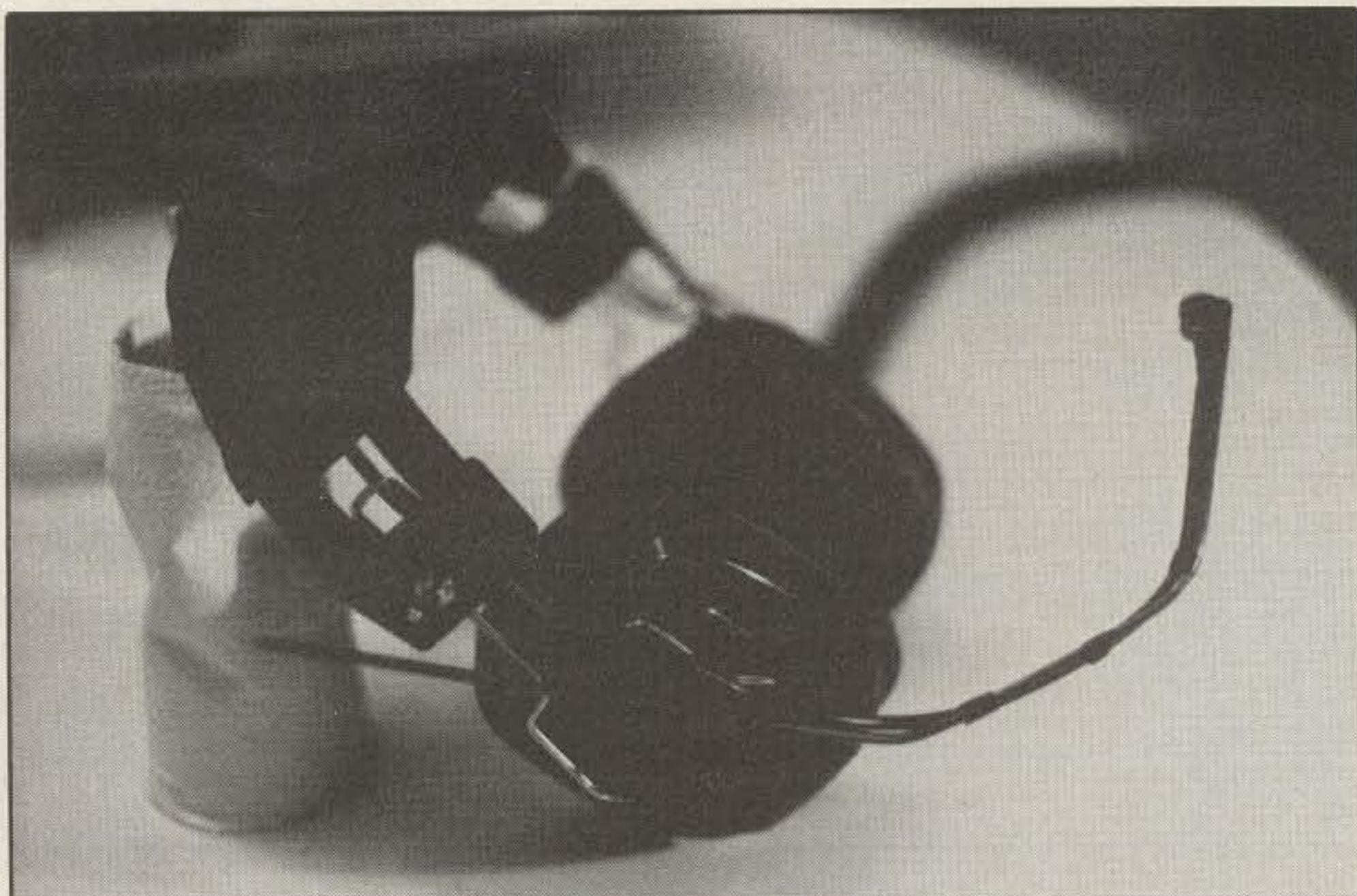
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to your rig, either through the coiled headphone cord or alongside. The cable can be fixed to the headphones any convenient way, using wire ties or electrical tape. Tape or shrink tubing can be used to secure the cable to the boom, having it neatly dressed.

Once both cable ends are dressed to the top of headphones, wire up the simple circuit shown using care and good insulation practices. The entire circuit, including the 9 volt battery, is contained on top of the headset. The SPST switch can be located at any convenient place and must be used to break the battery circuit when not in use.

My headphones happened to have a snap-on cushion, which nicely conceals the battery and components. I am sure such a cushion could easily be made using a little foam rubber, some fabric, and Velcro. In terminating the microphone to your rig, you may wire it directly to a mating microphone connector. I fabricated an adaptor to allow use of the 1/4 inch phone plug for the mike input/output. I also wired another 1/4 inch female inline jack into my mike connector to allow use of my CW key for keying the transmitter in my Kenwood TS-440S for non-VOX operation. The Radio Shack extension cable assembly lends itself nicely to the project. I cut the 1/4 inch female molded end




*The completed boom mike ready for duty in the next contest.*

off about one foot from the end, and used this to wire to my mike connector. I cut another 16 inches off the cable to use to wire the mike element. The remaining 9 1/2 feet with the male plug was used as the mike output.

I have included the microphone con-

nection diagram for the Kenwood TS-440S for the benefit of other 440 owners. Others should consult their operating manuals for correct wiring.

So there you have it. A boom mike that works like a champ for around \$5.00 and a few hours of tinkering. 

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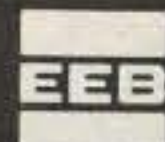
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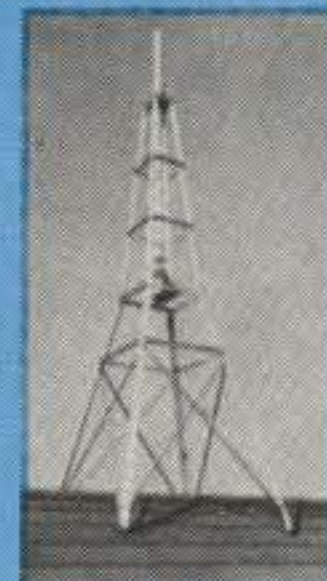
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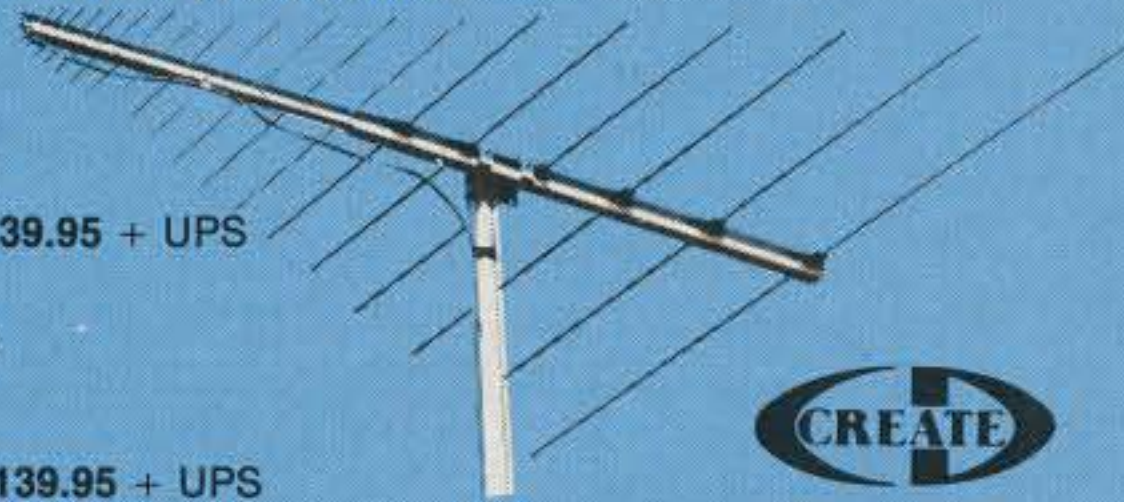
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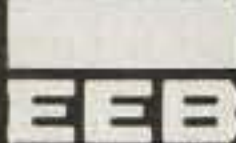
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***“Tune in the world,” “Talk to the world,” and “Have the world come into your bedroom” are phrases that persuaded most of us to get into amateur radio. KC6AXB dreamed the same dream, and while the world didn’t quite make his bedroom, it did find a place in his new basement.***

## The World From My Bedroom

BY MICHAEL C. MacDONALD\*, KC6AXB

It all started at the bottom of a dusty box at the local drive-in movie fleamarket on a bright Sunday morning. There it was, a 10-year-old copy of *Tune in the World* just lying there waiting for me as if predestined by fate. Fate had also predestined the price at 25 cents, which to my thrifty eye was too good to pass up. That fact and a long held curiosity about amateur radio made me forego the usual haggling over the price. Unbeknownst to me this small book was to lead to my downfall, as it were, into the complex world of Novice licensing while being an apartment-based city dweller with a non-radio-oriented wife, a very limited budget, and a Schnauzer puppy that has a taste for electrical insulation. Impossible you say? Not so! One just has to be careful and a little sneaky.

Well, I took my bargain book home and read it from cover to cover. “This is for me,” I thought. “Worldwide communication from my bedroom.” It was full of the stuff Novices like to hear such as “Work the world with two watts,” and “Make a great 80 meter beam from barnyard trash,” and testimonials on how little Jimmy so and so got his Extra class license in four weeks. “This is great!” I thought. “A little time, a few bucks, some old wire and tin cans, and bingo! I’m fighting off the pileups and snatching that rare DX!” My imagination went wild.

This first book just whetted my appetite, however, and I bought more, eager for knowledge. When small stacks of radio-related library books started appearing on corner tables, nightstands, and bathroom shelves, my sweetie took notice and inquired politely, “What is all this stuff you’ve brought home?” How could I answer her without raising suspicion that our sweet abode was about to become DX central? “Uh, it’s for work,” I stated. “You’re a geologist and these are radio books,” she said. “Hmmm,” I thought. “She’s not buying it. Clever, these females.”

I thought a moment and decided that I would have to get technical to throw her off the track. “Well, you see, my dear, the resistivity of highly metamorphosed polycrystalline granite is proportional to the inverse sine function of 3.14 megahertz emanations from a semiburied dipole directional radiator, and because of this . . .” I rambled for a few more seconds, sticking together every long, technical geologic phrase I knew with those I had picked up from the radio books. I sounded like a college professor, which bored her rather than impressed her, and she left the room stating that no matter how important these books were to the advancement of science, from now on they would reside in the closet. Well, I’d squeaked by that one.

The next day I visited our local amateur radio store to check out things and see what a rig really looks like. While I was there, the salesman came over and inquired if he could be of service. I said no, but immediately began to ask all sorts of questions about radios and antennas and “Could I really talk to people around the world from my bedroom?” He was extremely helpful and spent a lot of time explaining various things to me.

Finally he took me over to the demonstration rigs and plopped me down in front of one of those gigantic modern jobbies with all the hundreds of knobs and glowing LEDs and said, “Here. Just play with it a while.” I took a slow, deep breath, my heart racing. “But what if somebody calls? What will I say?” I asked in a panic of unwanted responsibility. “Don’t worry,” he said. “I’ve told them to hold all our calls. Just tune around the dial and listen for people talking or sending code.” He smiled strangely and walked away, happy at finding an electronic baby sitter for me.

With fascination I turned the knobs, pressed the buttons, flipped the switches, and had a wonderfully enjoyable time for about 20 minutes until the salesman came back and moved the antenna switch to “online,” which caused the radio to emit a loud CW QSO rather than the white noise that I had been listening to previously.

“This might help a bit,” he said. I felt like a real knucklehead and averted my gaze to the spec sheet, studying it with intense embarrassment. He soon left me again, and I began to tune around the dial a bit and came across some extremely rapid code. I was amazed at its speed and syncopation and listened intently. Another customer came by and noticing my look of extreme concentration watched me for a minute and then said, “You know, I can’t read any faster than 7 WPM, and you read that stuff without a notepad. That’s great!” He then walked off leaving me rather puzzled.

After I had thoroughly explored the functioning of every knob on the rig and decided that most of them must be unconnected spares, I left the store and vowed to learn the code and pass the test so I too could experience the thrill of worldwide communication.

I studied the written questions and had little problem with them and decided that I would be ready for the exam in a few days. Then I picked up the code tape and plugged it into the tape player. “Good heavens!” I bleated. “How can anyone be expected to translate that? It’s just too fast . . . not humanly possible . . . must be the wrong speed . . . maybe the batteries are too strong.” Well, the speed was correct, a “rushing” 5 WPM, and so I “bit the bullet” and listened to the tape at every opportunity. Doing this undetected at home was no simple task. I found that the best way to do it was to put the tape player in my

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You have counted on OPTOELECTRONICS Hand Held Frequency Counters to be the best quality, to be affordable and reliable. We have been there for you with Frequency Counters that are compact and ultra sensitive.

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### Hand Held Series Frequency Counters and Instruments

MODEL	2210	1300H/A	2400H	CCA	CCB
RANGE: FROM TO	10 Hz 2.2 GHz	1 MHz 1.3 GHz	10 MHz 2.4 GHz	10 MHz 550 MHz	10 MHz 1.8 GHz
APPLICATIONS	General Purpose Audio-Microwave	RF	Microwave	Security	Security
PRICE	\$219	\$169	\$189	\$299	\$99
SENSITIVITY					
1 KHz	< 5 mv	NA	NA	NA	NA
100 MHz	< 3 mv	< 1 mv	< 3 mv	< .5 mv	< 5 mv
450 MHz	< 3 mv	< 5 mv	< 3 mv	< 1 mv	< 5 mv
850 MHz	< 3 mv	< 20 mv	< 5 mv	NA	< 5 mv
1.3 GHz	< 7 mv	< 100 mv	< 7 mv	NA	< 10 mv
2.2 GHz	< 30 mv	NA	< 30 mv	NA	< 30 mv

ACCURACY ALL HAVE +/- 1 PPM TCXO TIME BASE.

All counters have 8 digit red .28" LED displays. Aluminum cabinet is 3.9" H x 3.5" x 1". Internal Ni-Cad batteries provide 2-5 hour portable operation with continuous operation from AC line charger/power supply supplied. Model CCB uses a 9 volt alkaline battery. One year parts and labor guarantee. A full line of probes, antennas, and accessories is available. Orders to U.S. and Canada add 5% to total (\$2 min, \$10 max). Florida residents, add 6% sales tax. COD fee \$3. Foreign orders add 15%. MasterCard and VISA accepted.

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### OPTOELECTRONICS INC.

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*"Yuuki," the insulation-eating Schnauzer who gave away the whole secret amateur radio plot. (Photo by Patricia Davenport)*

pocket while watching the latest rerun of "Gilligan's Island," slip one earphone into the ear that was not facing my wife, and then watch the TV with apparent undivided attention. This undivided attention spanned commercials and even late-night test patterns. I soon drifted into a catatonic stare as I concentrated on the dits and dahs. I had to keep on my toes, however, when the news was on, because my dearest would ask questions about parts that she had missed while going to the kitchen for snacks. I then would have to make up some fictional news tidbit about the royal family or a drought somewhere. Finally I got to where I was reading 70% of the code at 5 WPM, even through beer commercials. I thought this was good enough. "Who ever uses numbers anyway? And all that punctuation. Bah!" I thought.

There was a testing session being given that very weekend at the monthly electronics fleamarket and so I went, ready to achieve greatness. I passed the written test with flying colors, but the code test stopped me cold. The letters seemed to meld together, flashing by my "mind's eye" with incredible speed, while my "mind's CW translator" plugged along for six letters and then got permanently stuck on a rather vicious piece of punctuation. I had failed and felt miserable. I was pierced through by these cruelest of words—"Code test 5 WPM failed." I slumped in my chair, earphones dangling like a vanquished gladiator. One of the old timers saw my dejection and came over to offer consolation. "It's not so bad. Not everyone passed on his first try. Hey, do you have a tape player in your car?" he asked. I muttered the affirmative, and he suggested that I listen to the tape while riding to and from work. "You'll be ready for those numbers and punctuation marks real soon if you do that!" he said. "There is still hope!" I thought, and immediately rushed to the car to drive home and test this new process.

Well, trying to read the code and driving a stick shift in traffic required an equal amount of mental faculty, plus a little bit more. I soon learned that I had none to spare. The freeways were okay just cruising along translating the dits and dahs, but I found that stoplights and punctuation do not mix. I ran several red lights when my mind went into vapor lock decoding a question mark while down-shifting.

For my safety I had to go back to the TV method. The XYL finally caught on to this one night when I fell asleep watching TV and practicing code. She came over to kiss me goodnight, saw the earphone, found the tapeplayer, and yanked the earphone out of my ear. I awoke to a tremendous "KA-WHOP!" sound, followed by rapid and pointed interrogation. I quickly explained my new hobby, and she said it was okay with her to do whatever I wanted with my spare time as long as no radio stations were set up in the apartment. Well, it was a start, and I could work around that "no radio station" business.

Three months later I felt I was ready to face the test again. I marched to the fleamarket testing session and sat at the table, headphones plugged in. "Go ahead and make my day!" I muttered as the minute of practice code started up. The test portion began, and I was reading most of it, totally missing one letter after each number, of course, but life is full of tradeoffs. When the multiple-choice questions were handed out I found that I could answer them all. "Success is sweet! Piece of cake!" I commented to the sweating first-timer who sat next to me.

I swaggered out of the exam building and into the crowds at the fleamarket and wandered up and down the aisles feeling part of the whole affair, a veteran. A vendor noticed the Novice study guide I was carrying and began barking, ostensibly to the masses, "Getcha Novice rig here! Cheap! It works good! Perfect starter rig for the new radio amateur! Get on the air right away!" I paused, intrigued but wary of the bait and fearful of the XYL's "no radio decree." Sensing my interest, he played me. "CW capabilities on three important Novice bands. This rig won't let you break the law and transmit on unallowed frequencies!" I lingered in indecision, and then he set the hook, "Talk to the world from your bedroom!" I scurried over lest someone else snatch the bargain.

There it was, a 20-year-old kit-built Heath HW-16 Novice CW rig. "Wow," I crooned, and asked the eternal fleamarket question: "Does it work?" The vendor replied honestly, "Yes, but it has a slight 60 Hz hum. But for starters it's a great rig. I used it for five years, then I bought a new rig. You know, the kind with all the dials." "Yeah, I've used those before. Pretty good rigs, I guess," I casually commented, trying to drip with radio expertise as best I could. "How much for this little baby?" I said, now moving into my practiced fleamarket negotiating posture. "Seventy-five bucks," he replied. "Cowabunga!" I thought. "Talk to the world from my bedroom for only 75 bucks!" I tried to be cool. Maybe I could cut the price a little and get it low enough so the wife wouldn't detect the monetary effect in the checking account.

"Well, it's pretty old . . . and that hum . . . I just don't know . . . hmmm," I mused. The vendor sensed my indecision and said, "I tell ya what. How about 65 bucks and I'll take it back if the hum is too bad for you. I live just up the street." "Fantastic!" I thought. "A money-back guarantee!" But the effect on the checking account had to be small enough to hide, so I offered \$55 hoping to get it for \$60. He said, "You look like a nice fellow. Okay, 55's a deal." The words "sold," "deal" came out of my mouth so quickly as to be near simultaneous and sounded like "dold" but he understood and I left with my treasure.

He was honest. The rig worked real well, and the hum was hardly noticeable. But I had some trouble hiding it from the vigilant eyes of my better half. It resided under my desk for a few weeks, appearing only on Sunday afternoons when she was working at the library. Only then could I rig a wire antenna and listen to all those guys sending CW much too fast for me to read. Transmitting was out of the question, for I had no real an-



tenna and I feared TVI-spawned retaliation from thick-necked neighbors watching sports events.

While the desk shielded the rig from detection by the prying eyes of my "sweetheart," it could not conceal it from the energetic nose of our Schnauzer puppy, also a new acquisition. The first to go was the power plug. This seemed to offer a substantial mouth-sized chew toy for the little rat-chaser. Thank heaven it wasn't plugged in at the time. But he still got quite a shock when I found him blissfully gnawing at my treasure. I bellowed, he scurried, I yipped, he barked, I lunged, he evaded. We both fell in exhaustion.

This was too much work, so I covered the rig with a blanket to conceal it better. The next day I found that he preferred the heat-shrink tubing on the cord to the VFO much better than the rather bland gray cord that he had sampled previously. More of a bouquet and less aftertaste, I guess. The chase scene was repeated, except this time with my wife chasing him also. She had not seen his indiscretion, but asked me why I so vigorously pursued him. I said that he had chewed her \$90 Italian leather pumps and deserved a good talking to. So he was duly captured and incarcerated in the bathroom for the afternoon. The crisis was over for the moment.

Later in the week the cuddly little bum got revenge, though. We were watching TV, and he came romping playfully into the living room as puppies are apt to do, dragging some bit or piece that he had found and bringing it to us for approval and loving embraces. I froze, for clenched in his mouth was the 8-pin connector to the VFO power cord. Still connected to that was the VFO itself, which was quietly scraping its way down the hall under one puppy power. It was an utterly unmistakable component of a radio and once observed would mean exposure of my whole plan.

I started up to head him off before he dragged the VFO into plain view of the missus, but she looked up and unresisting of his cuteness called him over for an affectionate cuddling and petting. The dog and the VFO bounded across the room, and he

rocketed into her arms with the VFO coming to rest at the foot of the chair. "What's this in your mouth my cute little doggie doodles?" she crooned. She examined the 8-pin connector and followed it to the box on the floor. "Oh, what's this? Varia . . . Variable Frequency Osc . . . Hey! Is this a ham radio?" she accused, looking me in the eye.

"No, it is not," I answered truthfully, because technically it is only a part of a radio. "Your ears are red. Look at me and tell me the truth," she demanded. I evaded for a while and sounded like Ollie North, but I soon folded under interrogation, spilling my guts. "Well, keep it away from the puppy!" she said. "I don't want any vet bills to remove electronic parts from inside the dog!" "We just need more room if we are going to set up radios and stuff. We've been looking for a house for five months. When we get a house you can get a ham shack and fill it with all the radio stuff you want. I'll even decorate it for you," she said.

As an interim solution before buying a house, I coated the cords to the radio with a dilute solution of cayenne pepper and little fido kept away. The next week we miraculously (heh, heh) found a house that was in our price range and just big enough for us. I kept asking the real estate agent, "You're sure that there are not any neighborhood regulations on tall, funny-looking TV antennas?" She said that she didn't think so, so I bought the place. All my amateur friends said I bought it only because I needed something to attach my antenna to. Pretty expensive mount, I'd say.

Now the dog stays upstairs, and I do my tinkering in a spacious cave-like basement, and the XYL bangs on the floor when I should come up for air. I haven't got an antenna up yet, so the world will just have to wait a little bit longer to talk to me.

Seems that I might have a conflict with a planned landscaped backyard and deck, but I can work around any old "no antennas" proclamations. It will just take a little finesse in design and concealment. As far as talking to the world from my bedroom, the XYL thinks all of that should be kept in the basement, and she'll provide all the QSOs in the bedroom. CO



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Here is the finest 3 KW Tuner money can buy with roller inductor, dummy load, new peak reading meter, antenna switch, balun plus more ... \$349.95

The MFJ-989C is not for everyone. However, if you do make the investment you get the finest 3 KW PEP tuner money can buy - one that will give you a lifetime of use, one that takes the fear out of high power operation and one that lets you get your SWR down to absolute minimum.

The MFJ-989C is a compact 3 KW PEP roller inductor tuner with a new peak reading Cross-Needle SWR/Wattmeter. The roller inductor lets you get your SWR down to absolute minimum.

With three continuously variable components - two massive 6 KV capacitors and a high inductance roller inductor - you get precise control over



MFJ-989C \$349.95

SWR and the widest matching range possible from 1.8-30 MHz.

You get a new lighted peak and average reading Cross-Needle SWR/Wattmeter with a new more accurate directional coupler.

You get a giant two core balun wound with teflon wire for balanced lines and a 6-position antenna switch with extra heavy switch contacts.

Its compact 10<sup>3</sup>/<sub>4</sub>x4<sup>1</sup>/<sub>2</sub>x15 inch cabinet fits right into your station.

You get a 50 ohm 300 watt dummy load for tuning your exciter, a tilt stand for easy viewing and a 3-digit turns counter plus a spinner knob for exact inductance control. Add \$10 s/h.

## 2-knob Differential-T™ Tuner



**MFJ-986** The new MFJ-986 Differential-T™ 2-knob Tuner uses a differential capacitor to make tuning foolproof and easier than ever. It ends constant re-tuning with broadband coverage and gives you minimum SWR at only one best setting. Covers 1.8-30 MHz.

The roller inductor lets you tune your SWR down to absolute minimum. 3-digits turns counter lets you quickly return to your favorite frequency.

You get MFJ's new peak and average reading Cross-Needle SWR/Wattmeter with a new directional coupler for more accurate readings over a wider frequency range. It reads forward/reflected power in 200/50 and 2000/500 watt ranges. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312, \$12.95.

A new current balun for balanced lines reduces feedline radiation and forces equal currents into antenna halves that are not perfectly balanced for a more concentrated, stronger signal. Add \$10 s/h.

## MFJ's Fastest Selling Tuner



**MFJ-941D** The MFJ-941D is MFJ's fastest selling 300 watt PEP antenna tuner. Why? \$109.95 Because it has more features than tuners costing much more and it matches everything continuously from 1.8-30 MHz.

It matches dipoles, vees, verticals, mobile whips, random wires, balanced and coax lines.

SWR/Wattmeter reads forward/reflected power in 30 and 300 watt ranges. Antenna switch selects 2 coax lines, direct or through tuner, random wire, balanced line or tuner bypass. Efficient airwound inductor gives lower losses and more watts out. Has 4:1 balun. 1000 V capacitors. 10x3x7 inches.

## MFJ's Random Wire Tuner

**MFJ-16010** \$39.95



You can operate all bands anywhere with any transceiver when you let the MFJ-16010 turn any random wire into a transmitting antenna. Great for apartment, motel, camping operation. Install a wire anywhere! Tunes 1.8-30 MHz. 200 watts PEP. Ultra small 2x3x4 in.

## MFJ's Deluxe 300 Watt Tuner



**MFJ-949D** The MFJ-949D gives you lower SWR than any tuner that uses two tapped inductors. Why? Because \$149.95 you get two continuously variable capacitors that give you infinitely more positions than the limited number on switched coils.

This gives you the precise control you need to get your SWR down to a minimum. After all, isn't that why you need a tuner? Covers 1.8-30 MHz.

You get MFJ's new lighted 2-color peak and average reading Cross-Needle SWR/Wattmeter, dummy load, antenna switch, and 4:1 balun - all in a compact 10x3x7 inch cabinet. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312, \$12.95.

With MFJ's deluxe 300 watt PEP tuner you get an MFJ tuner that has earned a reputation for being able to match just about anything - one that is highly perfected and has years of proven reliability.

## MFJ's Mobile Tuner MFJ-945C \$89.95



Don't leave home without this mobile

tuner! Have an uninterrupted trip as the MFJ-945C extends your antenna bandwidth and eliminates the need to stop, go out and adjust your mobile whip.

You can operate anywhere in a band and get low SWR. You'll get maximum power out of your solid state or tube rig and it'll run cooler and last longer.

Small 8x2x6 inches uses little room. SWR/Wattmeter and convenient placement of controls make tuning fast and easy while in motion. 300 watts PEP output, efficient airwound inductor, 1000 volt capacitors. Mobile mount, MFJ-20, \$3.00.

## 144/220 MHz VHF Tuners

**MFJ-921** \$69.95

MFJ's new VHF tuners cover both 2 Meters and the 220 MHz bands. They handle 300 watts PEP and match a wide range of impedances for coax fed antennas. SWR/Wattmeter. 8x2<sup>1</sup>/<sub>2</sub>x3 in. MFJ-920, \$49.95. No meter. 4<sup>1</sup>/<sub>2</sub>x2<sup>1</sup>/<sub>2</sub>x3 inches.



## MFJ's Artificial RF Ground

**\$79.95 MFJ-931**

You can create an artificial RF ground and eliminate RF "bites",

feedback, TVI and RFI when you let the MFJ-931 resonate a random length of wire and turn it into a tuned counterpoise. The MFJ-931 also lets you electrically place a far away RF ground directly at your rig -- no matter how far away it is -- by tuning out the reactance of your ground connection wire.

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**MFJ-962C** For a few extra dollars, the MFJ-962C lets you use your barefoot rig now and have the capacity to add a 1.5 KW PEP linear amplifier later. Covers 1.8-30 MHz

You get two husky continuously variable capacitors for maximum power and minimum SWR. And lots of inductance gives you a wide matching range.

You get MFJ's new peak and average reading Cross-Needle SWR/Wattmeter with a new directional coupler for more accurate readings over a wider frequency range. It reads forward/reflected power in 200/50 and 2000/500 watt ranges. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312, \$12.95.

Has 6-position antenna switch and a teflon wound balun with ceramic feedthru insulators for balanced lines. 10<sup>3</sup>/<sub>4</sub>x4<sup>1</sup>/<sub>2</sub>x14 7/8 inches. Add \$10.00 s/h.

## MFJ's smallest Versa Tuner

**MFJ-901B** \$59.95

The MFJ-901B is our smallest -- 5x2x6 inches -- (and most affordable) 200 watt PEP tuner -- when both space and your budget is limited. Good for matching solid state rigs to linears.

It matches whips, dipoles, vees, random wires, verticals, beams, balanced and coax lines from 1.8-30 MHz. Efficient airwound inductor. 4:1 balun.

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## Only MFJ gives you *all 9* modes

Count 'em -- you get 9 fun modes -- Packet, AMTOR, RTTY, ASCII, CW, FAX, SSTV, Navtex and full featured Contest Memory Keyer.

You can't get all 9 modes in *any* other multi-mode at *any* price. Nobody gives you modes the MFJ-1278 doesn't have.

## The best modem you can get

Extensive test in *Packet Radio Magazine* prove the modem used in the MFJ-1278 copies HF packet more accurately than all other modems tested.

The MFJ-1278 is the *only* multi-mode with a *true* DCD circuit for HF. This dramatically reduces sensitivity to noise and dramatically increases completed QSOs.

## Exclusive Built in Printer Port

Only the MFJ-1278 has a dedicated printer port that lets you plug in your Epson or IBM compatible printer.

You don't need to buy an optional \$40 cable just to plug your printer into your MFJ multi-mode.

## New Easy Mail™ Personal Mailbox

You get MFJ's new Easy Mail™ Personal Mailbox with soft-partitioned memory so you and your ham buddies can leave messages 24 hours a day.

## 20 LED Precision Tuning Indicator

MFJ's unequalled tuning indicator

makes it really easy to work HF packet.

And unlike others, you use it exactly the same for all modes -- not differently for each mode.

Just tune your radio to center a single LED and you're *precisely tuned in to within 10 Hz* -- and it shows you which way to tune!

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You'll see tomorrow's news today when you copy outstanding FAX news photos with crisp, clear details.

MFJ-1278 is the *only* multi-mode with a built-in multi-gray level modem. It lets you transmit *and* receive high resolution multi-gray level FAX/SSTV pictures with an appropriate terminal program.

## Only MFJ can transmit FAX . . .

Most packet stations can *receive* FAX.

But only the MFJ-1278 lets you *transmit* FAX without internal modifications that disable other modes.

So now you can send your own pictures, maps and diagrams by FAX to stations throughout the world.

Too bad they can't send theirs to you . . . *unless* they disable other modes.

## One FREE Upgrade!

When you buy your MFJ-1278 *today*, you don't have to worry about missing new modes and features that come out *tomorrow*.

Why? Because your MFJ-1278 comes with a coupon good for one *free* eprom upgrade exchange that'll add new features.

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Plus you get . . . 32K RAM (not 16K), *free* AC power supply, Host mode that lets MFJ-1278 serve as a KISS interface

or dumb modem, fast throughput anti-collision technology, independent transmit level for each radio port, random code generator, lithium battery backup, RS-232 and TTL serial ports, *standard* 850 Hz RTTY shift, socketed ICs, tune up command, peripheral I/O port, automatic serial numbering, programmable message memories, dual radio ports (*each* HF or VHF), CW key paddle jack, speaker jack that lets you monitor CW sidetone, transmit and receive audio and packet connect bell, *new* fully intergrated instruction manual with *Fast Start*™ instructions and more in a 9½ x 9½ x 1½ inch cabinet.

## Get on the air instantly

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All you need is an MFJ-1278, your rig, any computer and a terminal program.

With an MFJ Starter Pack, \$24.95, you just plug it all in, wire up your mic connector and you're on the air.

Order MFJ-1284 for IBM compatibles (includes Picture Passing); MFJ-1287 for Macintosh; MFJ-1282 (disk) for C-64/128; MFJ-1283 (tape) for VIC-20.

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That means we will repair or replace your MFJ multi-mode (at our option) *no matter what* happens to it for a year.

Others give you a *limited* warranty. What do you do when *they* say, "Sorry, your *limited* warranty doesn't cover *that*?"

## Get 9 new ways of having fun

Don't settle for 3 year old technology.

Choose the only multi-mode that gives you the latest advances and all 9 modes.

Get 9 new ways of having fun *today*!

# What the ham magazines say about the MFJ-1278:

**QST Magazine:** "I was especially impressed by the new '1278s DCD (data carrier detect) circuit performance. This function, vital to HF packet-radio operation, performs admirable . . . Refinements such as this go a long way toward improving the viability of HF packet-radio operation with a multimode!"

"FAX reception is so good that it is irresistible to tune around for interesting FAX transmissions. The current '1278 provides good copy on all seven supported FAX formats . . . I most enjoyed copying news-photo transmissions. Some of these were outstanding, with crisp, clean reproduction and a surprising amount of detail." September, 1989.

**CQ Magazine:** "I found the '1278 did an excellent job (copying CW), even with bad operators. I've checked lot of CW 'copiers' in

my time, and certainly this unit was as good or better than most."

"I switched the terminal mode to HF packet . . . I was very impressed, because with the tuning indicator I immediately received (good) packet copy . . . I (tried) a connect with an east coast station. Before I knew it I had a QSO going and even handled break-in stations anxious to log New Mexico." May, 1989.

**73 Magazine:** "If you think I enjoyed using (the MFJ-1278) you are right. It was easy and fun to use . . . Overall, I found the MFJ-1278 to be . . . a good multi-mode controller at a reasonable price. You won't be disappointed." April, 1989.

**Worldradio Magazine:** "Bottom line: Excellent value for the money. Solid performer. Easy to use. Easiest of the top three to get on line . . . ." September, 1989.

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**Sometimes a QSO extends beyond signal reports and the weather. Sometimes the bonds of friendship are formed and amateur radio does indeed make the world a smaller, more familiar place.**

## A Russian Chat

BY DONALD PECK\*, W3CRG

**A** "conversation between two talkative people" is the way Alec, UA6LHB, describes our chats. I have been chatting with Alec on a schedule to learn more about the Soviet Union and the Russian language. This is the opportune time to talk with the Soviet Union. Ten years ago it was difficult to get more than a signal report and possibly what the operator did for a living. Now with the new openness of glasnost, it is possible to learn more about the Soviet Union.

Usually when I get an idea for a new project, I talk to other people and round up some material. "Don's grandiose idea" is how Alec describes this project. On a number of occasions other amateurs have called me after my conversations with Alec and have shown great interest in learning more about Russia. The Russians, in many cases, are multi-lingual, and a surprising number have learned at least some English by listening on the radio with little training in school.

Alec and I first met quite by accident on the 15 meter band. He introduced me to a group of international amateurs, two of whom live right here in my area. At first I needed help from the group to translate American English into British English so that Alec could better understand me. Now I'm able to talk with Alec without trouble because I speak slowly and carefully in short phrases. Simple sentences with just the subject, verb, and object, if possible, are best. It also helps to repeat and use short transmissions with frequent breaks to be sure he understands. Sometimes Alec runs out of English much as an automobile runs out of gasoline. Even with his limited vocabulary, he comes up with some fantastic words and phrases.

As you can tell, language is our main problem. Take, for example, the word "da svedanya." My dictionary defines the word "goodbye" as "da svedanya" spelled



*Don, W3CRG, at his operating position.*

out in the strange Russian Cyrillic alphabet (developed in the ninth century by St. Cyril, who combined the Greek and Roman alphabets). To make the Russian alphabet understandable, it can be Romanized or transliterated into "do swidanya" and changed again into the phonetic form which is "da svedanya," depending on the system used by the translator. When Alec and I have trouble understanding each other, we get some help from our dictionaries. Recently, when trying to translate the words "nativity scene" for Christmas, the best I could do was "rozhdstvenski," which means "Christmas time." The problem is that Alec's Russian edition does not contain the words "nativity scene."

In the future, help with translation may be automated using a computer. There is more development needed on computers that translate sounds and not letters. For example, "The spirit is willing, but the

flesh is weak" allegedly came out in Russian as "The vodka is good, but the meat is rotten" according to a recent article in the *Washington Post* newspaper.

The Russians have been teaching me colloquial Russian, and I have been teaching them English idioms. Victor, UA6LA, has taught me to use the word "poka" for "goodbye," which is a friendly, short word for "da svedanya." I have been teaching them the English phrase "from the horse's mouth," which is a difficult job. They confused it with the phrase "Don't look a gift horse in the mouth," which is in their Russian-English phrase book.

Speaking with Alec is like talking with an extended family. We talk about our families, jobs, and other interests. Alec built his own SSB transceiver, 200 watt linear, antenna, and rotor. He has some trouble with QRM because he does not have a good SSB filter.

\*4809 Guilford Rd., College Park, MD 20740





Alec, UA6LHB, uses all homemade equipment.

Alec and his XYL had a prize-winning dog that he taught to respond to Russian and English. I also have a little dog who responds to a few English words, but not to Russian. We also have a common interest in books. Alec asked me if I knew of Jack London, who is a very popular author in the Soviet Union. Many of his books have been translated into Russian. Alec is also a great fan of Agatha Christie's mysteries which he is able to read in English because the sentence structure is easy to read. He doesn't like A. Conan Doyle, however, because the sentence structure is more complex. We talked about *The Hound of the Baskervilles*, which he calls *The Dog of the Baskervilles*.

Alec spends most of his time working on SSB and learning English with little time left over for CW. Some Russian operators use CW because of their limited knowledge of English, but of course there are also fluent English CW operators. In general, they are fast, skilled operators who use International Morse Code for the English language. When they send in the Russian language, they use the corresponding Roman alphabet except for those letters in the Russian alphabet which do not exist in the Roman alphabet. For example, Alec gave me the sound of "shah," which looks like a Roman III and is "dah-dah-dah-dah" in CW. If the operator is copying on a Roman alphabet typewriter, the upper-case number keys are used for the additional Russian letters. There are typewriters with a Russian keyboard, but most of us do not have one.

While chatting with Alec, his friends sometimes break in. After one of our contacts a British amateur called me and said that she and her OM had been talking and corresponding with Alec for almost

seven years. They have been sending him mystery novels. They are studying the Russian language using tapes, but it is a little difficult because they live in an isolated QTH. We are corresponding and helping each other with the study of Russian. Here in College Park I have access to book stores that have many books on Russian, and I can study Russian at the University of Maryland, which has a very good Slavic language department.

Some Russians have limited knowledge of English but are fluent in other languages. Toly, UV6LF, is fluent in German, and Hank, PA3BQZ, translates my comments into German and relays for me. Whenever Toly and I speak without help from a translator, we use a strange combination of English, German, and Russian. I find it interesting but difficult to speak parts of three languages. Toly has taught me a new Russian word, "druzba," which means friendship. He sums up his feelings in one word—friendship. I also enjoy talking with Michael, UA6LU, who is very good with English, but he is only on the air on the weekends.

It is quite surprising to hear a Russian operator speaking perfect English only to find out that he has memorized just a few English words. This points to the need to speak carefully and have a dictionary handy. After speaking with one Russian operator, I had an amateur from Texas call me and tell me that he couldn't understand the Russian at all, but thought I did a great job. I find myself speaking like a Russian sometimes since I have developed an "ear" for the language. Using a heavy Russian accent I like to say to Alec "da svedanya, my Russian is good, no?" Alec returns with his British English and says, "Don, your Russian is excellent!"

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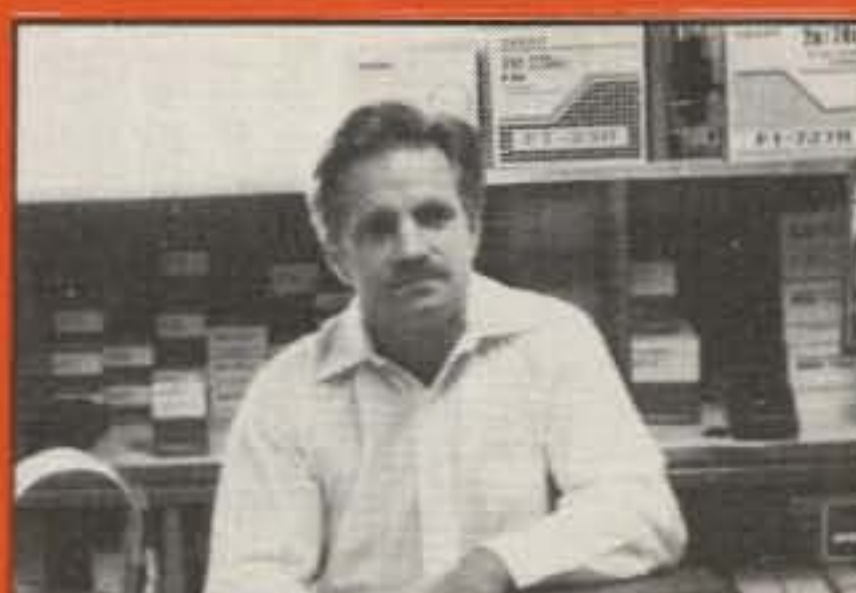
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# CQ REVIEWS:

## The MFJ-422 Keyer/Paddle and The MFJ-486 Super Grand Master Memory Keyer

BY JOHN J. SCHULTZ\*, W4FA/SV0DX

Over the years MFJ Enterprises has produced some very popular and very useful accessory items for the CW enthusiast. Their line of CW accessory items at the moment ranges from an inexpensive but complete code practice oscillator (MFJ-557) to a microprocessor-based memory keyer (MFJ-486) that is absolutely state-of-the-art. It would have been nice to review each of the CW accessory items in the MFJ line, but I think the purpose will be served well enough by taking a detailed look at the MFJ-422B/MFJ-422BX Keyer/Bencher paddle combo and the new and fascinating MFJ-486 microprocessor-based memory keyer. The MFJ-422B/BX products incorporate circuitry used in some other lower priced MFJ keyer products and the MFJ-486 is, of course, unique in itself.

### The MFJ-422B/MFJ-422BX

The basic MFJ-422 has been around for a number of years. In fact, I've had one in

c/o CQ magazine

use at my station for quite a while. My unit has been "used and abused" quite a bit in the shack and on field days, but it still functions. Still, I was very glad to acquire the new MFJ-422B/BX with its improved features.

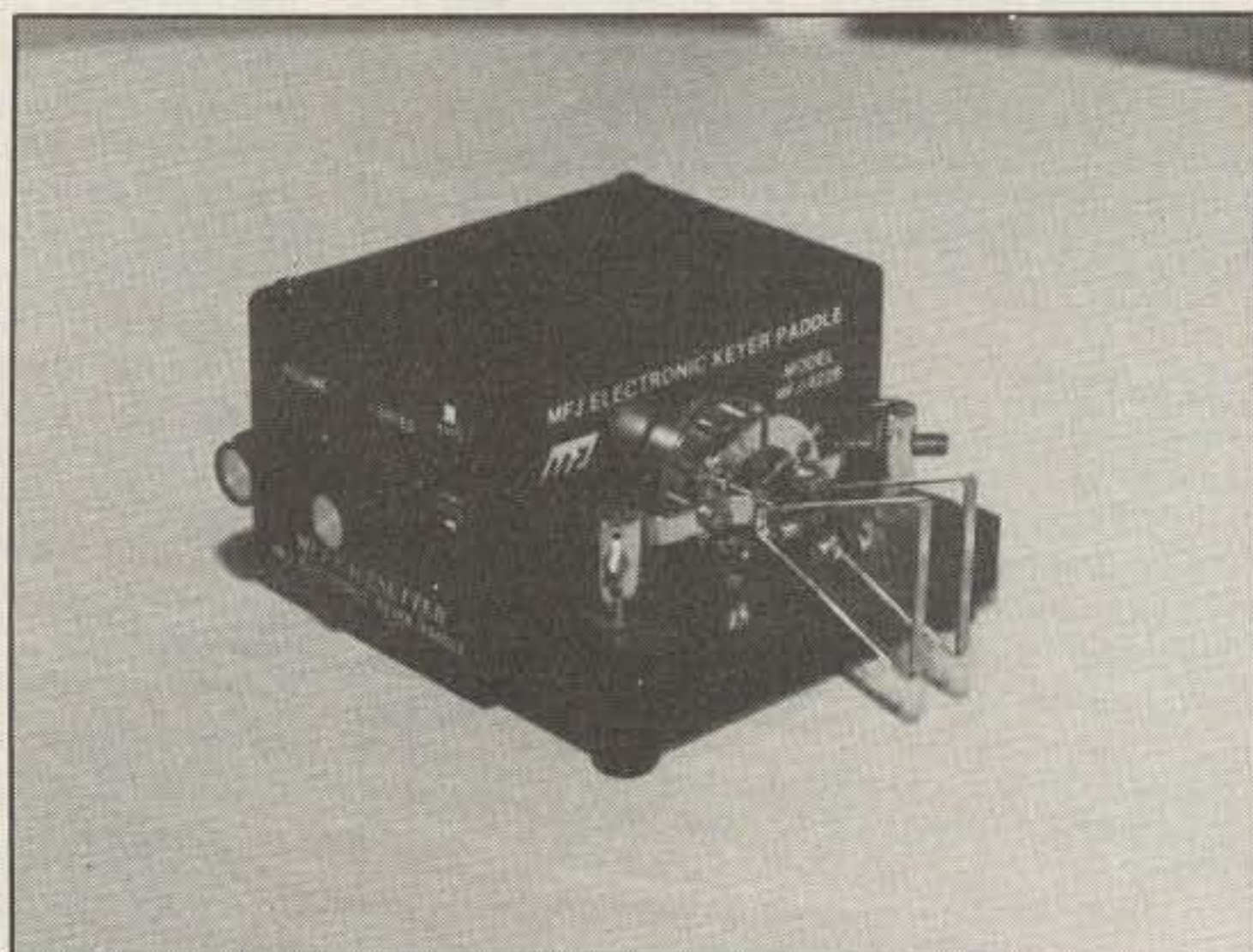
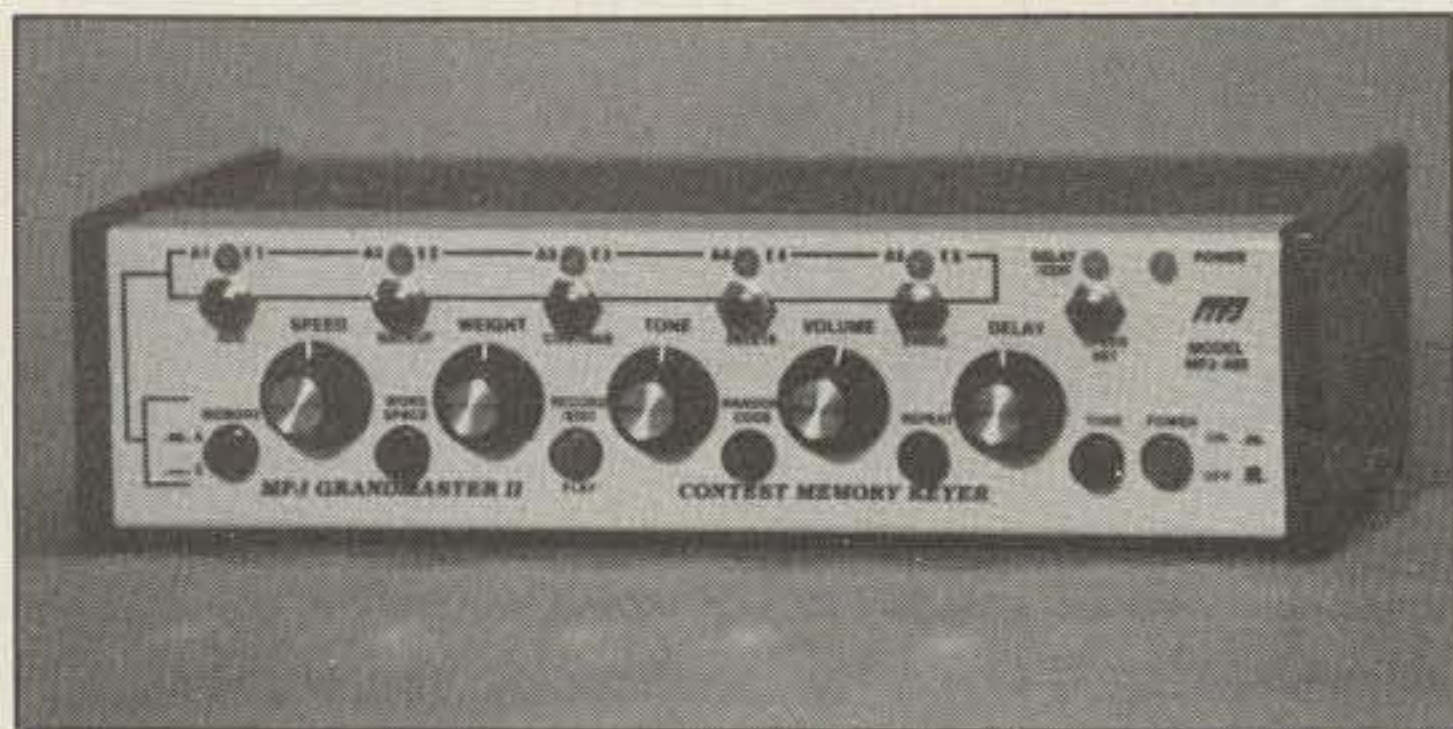
For those not acquainted with the MFJ-422 line, let me back up a moment. The MFJ-422 keyers are based upon the Curtis 8044 series of keyer chips and are housed in an enclosure that slips over a Bencher keyer paddle. The MFJ-422B is the complete package of the MFJ keyer with the latest version of a Bencher paddle. The MFJ-422BX is just the MFJ keyer which is designed to fit on any previous or current version of the Bencher paddle. The integrated assembly forms a quite compact and extremely functional keyer. The integrated keyer has all of the advantages offered by the Curtis keyer IC—namely, iambic "squeeze" keying or regular keying, dot and dash memories, sidetone with adjustable tone and volume, interface with any transceiver's keying requirements, and adjustable weight. The MFJ-422BX has a built-in speaker and a switch for semi-automatic or automatic

modes. In the automatic mode, dots and dashes are automatically generated. In the semi-automatic mode, dots and dashes are automatically generated. In the semi-automatic mode, dashes only are manually made. In effect, the semi-automatic mode can be used for tuning purposes since the dash mode represents a continuous key-down condition if desired. The speed range is about 8 to 50 WPM. The MFJ-422BX uses one of the latest Curtis keyer chips—namely, the 8044 ABM.

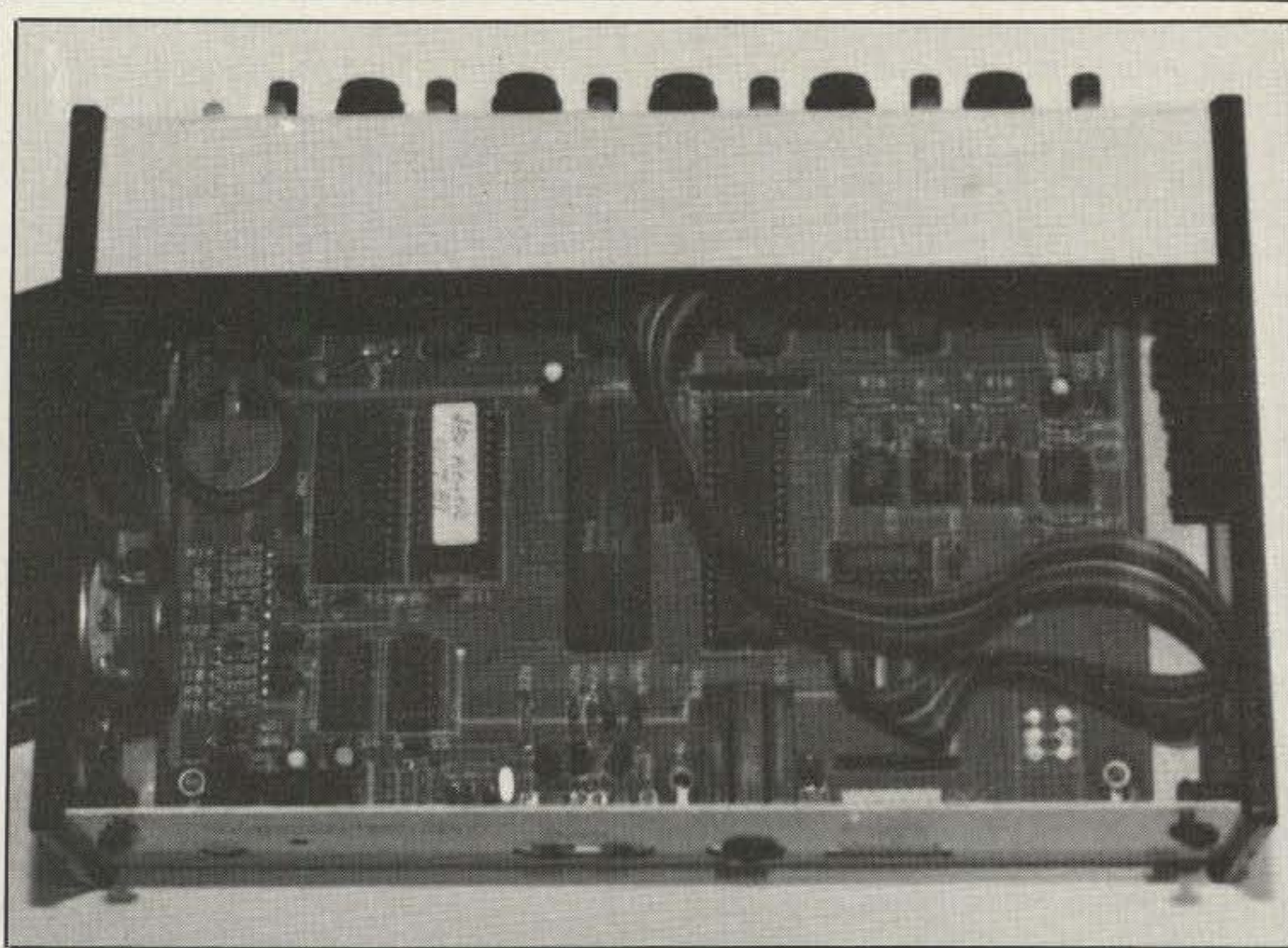
Looking over the MFJ-422BX both inside and outside, I was quite pleased to see that a number of improvements were made. The PC board for the Curtis IC has been upgraded and a separate rear-panel on/off switch has been installed rather than having the on/off switch incorporated with the sidetone volume control. The operating voltage range of the MFJ-422BX is specified as being from 5 to 9 VDC. I found that it would operate over a wider range (3 to 12 VDC) quite satisfactorily. If the keyer is battery powered by a 9V transistor radio battery, the battery will last at least a few days. That situation

*The MFJ-422B is a smartly styled, compact combination of a standard black-base Bencher paddle with keyer electronics from MFJ.*

*The MFJ-486 keyer really has all of its controls "up front." However, it is a relatively easy unit to use.*







Looking inside the MFJ-486 a very neatly constructed unit can be seen. All of the ICs are socketed. Rear-panel jacks provide for power connection, paddle connection, transmitter keying (grid block, cathode, or solid state), and the connection of an optional memory remote control.

might be tolerable for short-term portable operation, but not for extended home station operation.

For home station operation, I would highly recommend that the MFJ-1305 AC adapter be used with the keyer. The AC adapter supplies 9 VDC at 200 ma and will "loaf along" with the keyer even if the keyer's sidetone volume is turned up quite loud such that the keyer's current drain will rise to about 50 ma at 9 VDC. Of course, I think it deserves to be emphasized that the MFJ-422BX is very versatile as regards operating voltages. It can be easily powered for extended periods of portable operation by a series connected chain of three to four "D" cells or permanently powered using the AC adapter just mentioned.

The MFJ-422B, as previously mentioned, is the integrated assembly of the MFJ keyer with the latest edition of the Bencher paddle. Since I reviewed the Bencher paddle for CQ shortly after it was introduced, I was quite curious to see how the current production run of the Bencher paddle shaped up. I was pleased to see that the paddle has more than maintained its quality.

The basic mechanism is the same as years ago, but the plating on a number of parts has been improved. The lucite paddles are now firmly held in place by rivets. Gold-plated contacts are still used, and a full range of adjustments are still possible for dot/dash paddle tension and the travel of the dot/dash contacts. MFJ has added a nice touch to the paddle in that a hex wrench, which is needed for adjustment

of the contact travel on the paddle, is supplied and secured to a clip on the base of the MFJ-422B. Therefore, it's readily available whenever you might wish to change the paddle adjustments. Overall, the Bencher paddle retains its extremely smooth feel and it can be operated for hours without fatigue.

The MFJ-422B represents the almost perfect combination of an extremely smooth operating paddle with modern keyer electronics for those operators who want an electronic keyer without any added "bells and whistles."

### The MFJ-486 Super Grandmaster Memory Keyer

For those CW buffs who do want some "bells and whistles" specifically tailored to their needs, the MFJ-486 opens some new worlds. First of all, it is a keyer with built-in sidetone. You do have to supply a paddle, but every possible modern keyer feature is provided. There are front-panel controls for keyer speed and weight and sidetone volume and tone. There is a separate push button for "key-down" tuning. The dot and dash weights are *separately* adjustable!

Looking a bit beyond the keyer functions provided by the MFJ-486, one has to appreciate that the MFJ-486 is a micro-processor-based memory keyer with some extremely versatile, powerful, and useful functions. The versatility of the MFJ-486 is, in fact, so great that I'm afraid some CW buffs will shy away from it because of the assortment of knobs and

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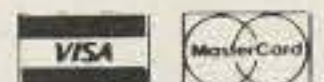
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pushbuttons on its front panel. Resist that temptation! The MFJ-486 is, in fact, fun and simple to use. You can use or ignore whatever features it provides and then later on get to know and appreciate the sophisticated features.

The keyer has two memory banks with five addresses on each bank. The first four addresses on each bank are for general use, while the fifth address on each bank is reserved for a four-digit contest number. The total memory capacity is 8,000 characters, which is really quite enormous. One can use the general-purpose addresses in any desired manner, ranging perhaps from having a short CQ call recorded in the first address on the first bank to having your life's history recorded on the fourth address on the second bank.

Recording to any address is a simple matter of manipulating a few pushbuttons and then using a keyer paddle to enter a message. Various LEDs indicate which address is being recorded and that any previously recorded message in a given address has been erased. A rather sophisticated feature is that various

pushbuttons can be used to add or delete words in any stored message without having to go through the entire procedure of re-recording the entire message. You can even insert one stored message inside another stored message.

Playing back any given recorded message involves a simple usage of the address pushbuttons. While playing back a message, a keyer paddle can be used to stop the transmission of the recorded message, insert any information from the paddle, and then resume the rest of the recorded message. Obviously, that feature is quite a convenience if you are going through a "routine" QSO and just want to personalize a transmission by inserting the name of the other operator now and then. There is also a repeat function whereby any recorded message, once called up, will be repeated continuously with a pause between repeats determined by a front-panel "delay control"—an obvious bonanza for contesters!

Speaking of contesters, we should mention that the fifth address in each memory bank provides for a contest number feature. The fifth address in one bank

will always send the number you store in that location. The fifth address in the second bank will send an automatically incremented number (e.g., 01, 02, 03, etc.) starting with the number you initially store in the address. To respond to a contest QSO, therefore, you could send a recorded reply from one address and then send an automatically incremented number from the fifth address in the second memory bank.

If the foregoing weren't really enough, the MFJ-486 also includes a random code generator. It has two modes—character sets and actual English-language messages. I found the latter to be quite unique and interesting. If you are not actually using the unit for on-the-air operation, the code-practice features are quite helpful. A speaker is built-in. Also, you can select normal or Farnsworth spacing for code practice, and the character spacing is also variable. The speed control has a unique feature in that it is associated with a "set" switch which calibrates the speed control to 20 WPM. If the control is set fully CCW and the set switch pressed, the speed range is 20 WPM up to 100 WPM. If the control is set fully CW and the set switch pressed, the speed range is 20 WPM down to 4 WPM. The feature is operative in all modes, not just by code practice.

The MFJ-486 unit is housed in a very sturdy Ten-Tec enclosure measuring about 9¼" x 6½" x 2¾". Looking inside the unit, a very sophisticated electronics package can be seen. Almost all of the electronics is contained on a single double-sided PC board. The electronics is absolutely state-of-the-art with a master microprocessor IC, crystal time-base, etc. All of the 11 ICs in the unit are socketed. The construction of the unit appears to be A-1 in quality. The unit should last for years and years of performance.

The unit does require a good DC supply which provides at least 8.5 VDC at 300 ma. Battery operation is possible, of course, but normal base-station operation with a plug-type power supply (e.g., MFJ-1312) would be the norm. A lithium battery in the unit provides memory backup for all of the stored messages and should be good for at least several years. The battery, by the way, is very accessible and easy to replace.

The "bag of tricks" contained in the MFJ-486 is enormous, and unfortunately, I think I have only "scratched the surface." Regardless of all that, if you are a serious, casual, or contest CW operator, the MFJ-486 deserves your attention and inspection. It's an outstanding device that truly qualifies as a CW "dream machine." For those who really get into using the keyer, the option is available. It's the MFJ-77, which is a wired remote-control box so you can control of all of the message memories directly at a key paddle.

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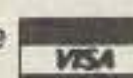
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BP-7 13.2 v @ 500 MAH \$61.95

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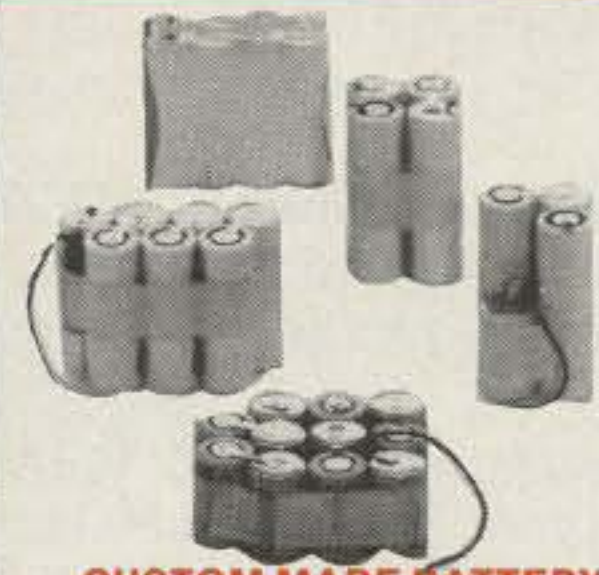
BP-8 8.4 v @ 800 MAH \$61.95

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Replacement Battery  
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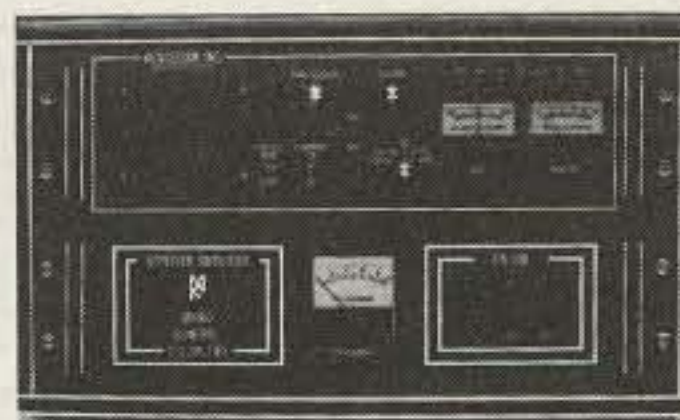
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## NEWS OF CERTIFICATE AND AWARD COLLECTING

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

**Michael Mardit, WA2VQW  
USA-CA All Counties #591,  
Mixed, 11-7-88**

"I was born on June 6, 1947, and by the time I was three, my interest in electronics had already been kindled. I credit my dad with that, for it was fascinating for a three-year-old to watch Dad experiment with devices and to see him construct electronic projects, some of his own design. I recall sitting at the kitchen table with him and handing him tools, which by the time I was four I knew by name. As he would crimp a connection or cut a wire, I would 'help' him.

"As the story was told to me, one evening when I was five, my mom presented my dad with my first creation upon his return home from work. It consisted of three octal sockets (remember them?) strung together with hook-up wire and string—my first 'radio.' This was to be the beginning of a super hobby which would become my most favorite pastime, and lead me into engineering.

"I learned Morse code at the age of seven, again through the efforts of my dad, who intrigued and excited me by his '30's depression stories of his work as a museum photographer accompanying the museum radio operator, his best friend at the time, on an expedition to Brazil. CW was the only 'lightweight' and reliable mode of communication with civilization outside the jungle. He made learning the code fun for me. It wasn't long before I was an SWL, and started tinkering on my own.

"I had so much fun SWLing and working on projects that it was not until age 14 that I was given the final push into becoming a Novice ham, pushed by the very same friends whom I had tutored in code and theory. You see, we had shared much the same interests, and as they got their Novice tickets one by one, I began to feel left out, so I decided to put my soldering iron down for a little while and join them on 15 meters.

"My first rig was a homebrew 6L6 driven by 6AU8. It was crystal controlled and would run almost 30 watts input if I pushed it, and I *pushed* it. My Novice receiver was a Heath AR-3. I sincerely believe that if you lived in Brooklyn, New



*Michael Mardit, WA2VQW, with Bryan and Daniel, hams-to-be, no doubt, at his largely homebrew station.*



*One of Michael's homebrew antennas, a far cry from the bent random wires of apartment-dwelling days.*

York during 1961-62, and you were on 15 meter Novice CW, you worked me! I had only a 15 meter dipole camouflaged on the roof of a four-story apartment building, and New Jersey was DX!

"My first contact out of the second call area took me four months, but I will never forget it. Fifteen opened up to the mid-west one late January evening and I was able to exchange info with another young Novice in W0 land (Minnesota). My face was so flushed from the excitement that my mom thought my transmitter had surely malfunctioned and that I had radiation burns.

"My General class license came in March of '62 and then things changed. I found a used Eico 720/730 that a teenage student could afford with allowance money and some financial encouragement from the folks. A Lafayette KT320, Knight V44 VFO (kits I had built), dipoles, wires, and other random homebrew creations completed my shack. Over the next

few years I worked over 60 countries with that combo, running 90 watts CW and 65 watts AM phone.

"I graduated from high school in 1965 and went on to technical school to earn a degree in electronics technology. After tech school I was fortunate enough to land a job with General Precision Labs in Pleasantville, New York, and I spent the next several years working on Doppler radar receiver/transmitters for the FB111 and A7D aircraft, to be followed at a later date with computer-controlled radar displays at Loral Electronics Systems in the Bronx, where I am currently employed.

"In early 1968 I discovered the CHC-FHC service net on 75 meters and the county hunters. That introduction, coupled with a brand new Swan 500, allowed me to become initiated and involved in county hunting. Let me tell you, though, good 75 meter indoor antennas are not easy to come by, and I tried loading up anything and everything metallic I could find that would take power on 80 and down—window screen and even angle-iron bed frames, to name a couple. I found I could do marvelous things with random bent wires and window screens from my new sixth floor apartment if I hung a 1/4-wave ground line down from the outside of the window. (A homebrew tuner certainly helped.)

"As the years passed I continued to homebrew antennas and collect counties. Having acquired a better understanding of circuitry and design skills in school, I spent most of my spare time on circuit design and homebrewing. I spent more time experimenting than on the air.

"About the time age 30 rolled around, I became an executive officer of a singles organization of which I was a member, and after six months I became president. I met my wife Michelle there, and in 1980 we were married. The poor girl had no idea what she was getting into. In 1982 we moved out of the city for literally greener pastures, and a place to put up real antennas! We're currently living in Yorktown Heights, where our family has grown to include three lovely children, Bryan Howard, Daniel Joshua, and Mel-yssa Irene. In case you're wondering, that's why my county total was frozen at 3070 for five years.

"I realized back in September '88 that with two hours of commuting time every day I might be able to finish All Counties by keeping a watchful eye—mobile. (Somewhat risky, for the area in which I work is not conducive to holding on to mobile equipment.) The idea proved to be a

333 South Lincoln Ave., Mundelein, IL 60060



good one, however. I put my old Argonaut 509 to work driving a homebrew 6146 with inverter power supply, a homebrew continuously loaded whip, and a homebrew audio filter as a receiving adjunct. I made two of my last five while I was driving home, thanks to KB4QI, who went out of his way to sit on the county line of Perquimans and Chowan in North Carolina. Third and second from last were in New Mexico and California and were worked through the respective special efforts of K5VYT and K0GEN. My last county for the whole country was Randolph, Arkansas; and my special thanks must go to Jim, WB6SRK, for his special effort in getting it for me and in sending me a photo of the county line sign.

"The acquisition of USA-CA All Counties #591 was a continuing challenge that spanned nearly 21 years and accompanied me through many life experiences. So many net controls—like WB9RCY, N7BKW, and N9AUZ, to recall a few—extended their patience to accomplish the many relays and repeats I needed to get my marginal signal out of the apartments to work the weak ones—and there were plenty of them. To qualify for All Counties really requires a team effort. It requires steadfastness, assertiveness, patience, and cooperation on the part of many individuals, including family members. This, if nothing else, I have certainly learned.

"Arnie, K9DCJ, took the time to sit down and generate a listing of all the possibilities for my last five, and was there to cheer me on, as he has done for many others. This is a fine example of personal time spent in an unselfish and dedicated manner. For this he has earned the title 'Honorary Godfather.'

"Anyway, this brings me up to date. Thanks to all of you who helped make this possible. And now, with a better antenna system, it is my turn to help. 73 and CU on 336—Mike, WA2VQW."

### USA-CA Special Honor Roll

Betty Pearl Cruz, WPE6YL  
USA-CA All Counties #635, Mixed, 9-2-89

### Awards Issued

Betty Pearl Cruz, WPE6YL, kept her SWL gear on line and fulfilled the requirements for USA-CA All Counties #635, and USA-CA 3000 #665, Mixed, dated 9-2-89.

David B. Kustra, N7LYR, filed his good application and received USA-CA 2500 #738, USA-CA 2000 #807, USA-CA 1500 #893, USA-CA 1000 #1083, and USA-CA 500 #2360, All SSB, dated 9-29-89.

Randy L. Hatt, WB8NVD, added two gold seals to his USA-CA certificate by claiming USA-CA 2000 #806 and USA-CA

### USA-CA Honor Roll

3000		1000	
WPE6YL	665	KC2YW	1082
		N7LYR	1083
2500		500	
N7LYR	738	JA2NDQ	2357
		WB4QZD	2358
2000		OK3IF	2359
WB8NVD	806	N7LYR	2360
N7LYR	807		
1500			
WB8NVD	892		
N7LYR	893		

The total number of counties for credit for the United States of America County Award is 3076. The basic award fee for subscribers to CQ is \$4.00. For nonsubscribers it is \$10.00. Initial application must be submitted in the USA-CA Record Book, which may be obtained from CQ Communications, 76 North Broadway, Hicksville, NY 11801, USA for \$1.25. To qualify for the special subscriber rate please send a recent CQ mailing label with your application. To be eligible for the USA-CA, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and program dated April 2, 1985. A complete copy of the rules may be obtained by sending an SASE to Dorothy Johnson, WB9RCY, USA-CA Custodian, 333 South Lincoln Avenue, Mundelein, IL 60060, USA. DX stations must include extra postage for airmail reply.

1500 #892, Mixed, dated 9-27-89.

Douglas Cropper, KC2YW, took another step in his quest for All Counties and received USA-CA 1000 #1082, All SSB, dated 9-25-89.

USA-CA 500 certificates went to:

Hiroshi Shiraishi, JA2NDQ, USA-CA 500 #2357, All CW, 9-6-89.

J. Archie Hampton, WB4QZD, USA-CA 500 #2358, Mixed, 9-8-89.

Ivan Frastacky, OK3IF, USA-CA 500 #2359, All CW, 9-9-89.

David B. Kustra, N7LYR, USA-CA 500 #2360, All SSB, 9-29-89.

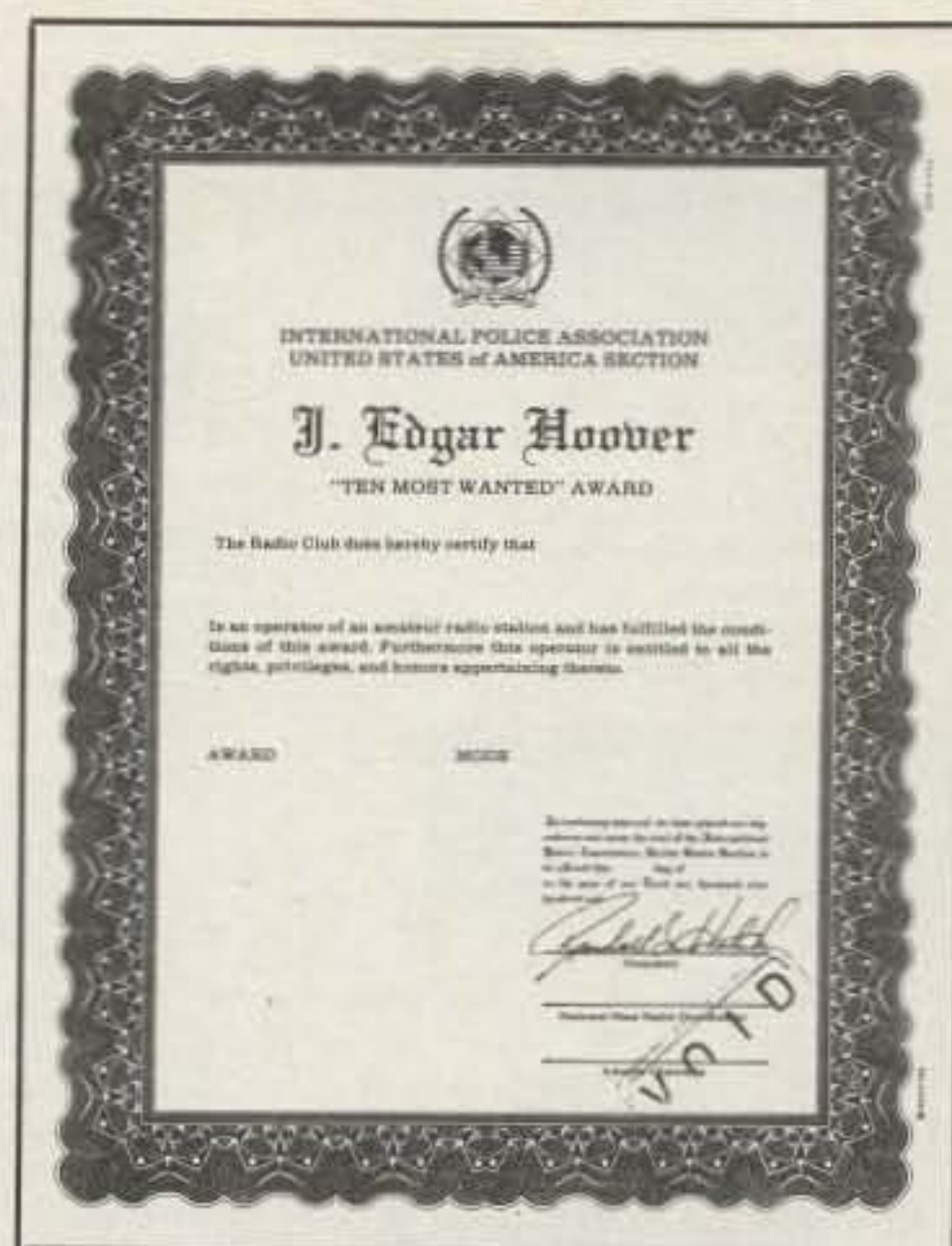
### Awards Available

**J. Edgar Hoover Award.** The J. Edgar Hoover (Ten Most Wanted) Award is sponsored by the United States Section of the International Police Association Radio Club. It is designed to enhance the spirit of friendship among radio amateurs throughout the world according to the motto of the IPA—*Servo Per Amikeco* (Esperanto, meaning service through friendship).

The J. Edgar Hoover Award is open to all radio amateurs and SWL stations throughout the world. Award hunters must work IPA/RC members. A list of IPA/RC member stations is available from N6EIK, WA8VDC, or DK5JA for an SASE (US) or 2 IRCs.

The object of the award is to work an IPA/RC member in each of the ten radio call districts in the United States of America. Awards may be earned for CW only, SSB only, or mixed CW/SSB.

The QTH of the station at the time it is worked will determine the district worked, not just the callsign of the station.



The J. Edgar Hoover Award offered by the USA Section of the International Police Association.

**Example:** If N6EIK is worked with a QTH of Nevada, then the contact counts for area 7 and not area 6. Contacts with stations in Alaska KL7 count as area 7 and in Hawaii KH6 count as area 6.

Awards are issued only for contacts after 1 November 1985. There are no band or mode restrictions. Send completed verified application/log sheet and IRCs or U.S. postage (amounts not specified) to IPA/RC Award Manager, N6EIK, Edward A. Roach, 1209 Tulip Drive, Antioch, CA 94509, USA.

**Windmill Award.** The Windmill Award was established to stimulate radio contact between radio amateurs all over the world and the Dutch International Police Association Radio Club members. To obtain this beautiful award, the licensed radio amateur has to make contacts as follows.

HF: 3 different Dutch IPA-RC members  
VHF: 3 different Dutch IPA-RC members  
UHF-SHF: 3 different Dutch IPA-RC members

For applicants in the Netherlands the requirements are as follows.

HF: 3 different Dutch IPA-RC members  
VHF: 5 different Dutch IPA-RC members  
UHF-SHF: 3 different Dutch IPA-RC members

Send application with 5 HFL plus postage to the Windmill Award Manager, Jan. J.v.d. Mey, PA0MEY, Gr. Jul. v. Stolberglaan 560, NL-2263 VX Leidschendam, The Netherlands.

**Sherlock Holmes Award and Trophy.** The Sherlock Holmes Award and Trophy is sponsored by the International Police Association Radio Club—German Section. It is designed to enhance the spirit of friendship among radio amateurs in keeping with the motto of the IPA.



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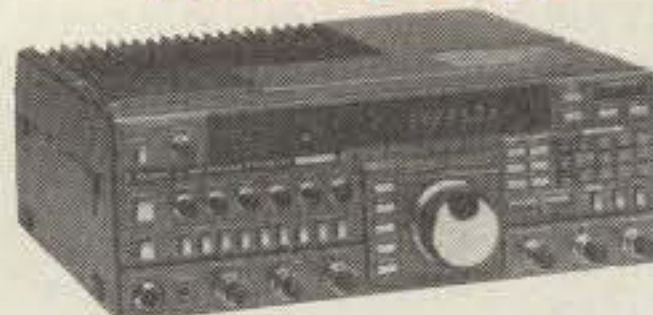
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RS35M	25	35	179
RS50A	37	50	229
RS50M	37	50	249

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HDX572	23'	72'	30 sq ft	3559

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\*Note-towers rated at 50 mph to EIA specifications

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

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Cable Type	UHF FML	UHF MALE	N FML	N MALE
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3/4" Helix®	\$55	\$55	\$55	\$55

Amphenol Silver PL259.....	\$1.50
UG21B N Male.....	\$3.50
9086/9913 N Male Connector.....	\$4.95

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G5RV all band antenna.....	\$49.95		

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

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- A4S 4-el Tribander Beam w/S.S. Hdwre.....
- A743 & A744, 30/40 mtr KIT for the A3 & A4.....
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- AP8 80-10 mtr Vertical.....
- AV5 80-10 mtr Vertical.....
- D40 40 mtr Dipole.....
- 40-2CD 2-el 40 mtr Beam.....
- A50-5 5-el 6 mtr Beam.....
- 215 WB NEW 15-el 2 mtr Beam.....
- 230 WB NEW 30-el 2 mtr Beam.....
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- 3219 19-el 2 mtr Beam.....
- 424B 24-el 432 MHz Beam.....
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- QK710 30/40 mtr. Add-On-Kit.....
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- TH5MK2S Broad Band 5-el Triband Beam.....
- TH7DXS 7-el Triband Beam.....
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- 205BAS 5-el 20-mtr Beam.....
- 155BAS 5-el 15-mtr Beam.....
- 105BAS 5-el 10-mtr Beam.....
- 204BAS 4-el 20-mtr Beam.....
- 64BS 4-el 6-mtr Beam.....
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- 14 AVQ 40-10 mtr vertical.....
- 18 AVT/WB 80-10mtr Vertical.....
- 18HTS 80-10 mtr Hy-Tower Vertical.....
- 23BS 3-el 2 mtr Beam.....
- 25BS 5-el 2 mtr Beam.....
- 28BS 8-el 2 mtr Beam.....
- 214BS 14-el 2-mtr Beam.....
- 2BDQ 80/40 mtr Trap Dipole.....
- 5BDQ 80-10 mtr Trap Dipole.....
- BN86 80-10 mtr KW Balun W/Coax Seal.....

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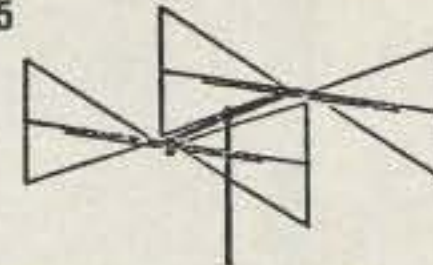
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FK2568	68 ft.	11.7 sq. ft.	
FK4544	44 ft.	34.8 sq. ft.	
FK4554	54 ft.	29.1 sq. ft.	
FK4564	64 ft.	28.4 sq. ft.	

- 25G Double Guy Kit..... \$299.
- 45G Double Guy Kit..... \$319.

\*Above antenna loads for 70 mph winds w/guys at hinge and apex. All foldover towers shipped freight prepaid in 48 states. Prices 10% higher west of Rockies.

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- 9902LD Cable End (for 6700 cable)..... \$11.95
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(Antenna/tower product prices do not include shipping unless noted otherwise)



Any amateur radio, or SWL, station may apply for the Sherlock Holmes Award and Trophy. Award hunters must work IPA Radio Club Members. A member station may be worked once on each amateur band. A list of IPA-RC members is available from the award manager, DK5JA, for 2 IRCs from DX stations, or one IRC from others.

Awards and trophies are issued only for contacts made after 1 March 1976. There are three classes and two trophies.

Sherlock Holmes Award 50—50 points  
Sherlock Holmes Award 100—100 points

Sherlock Holmes Award 200—200 points

Sherlock Holmes Trophy, Silver—750 points and 10 different IPA countries

Sherlock Holmes Trophy, Gold—1250 points and 20 different IPA countries

Sherlock Holmes Trophy, Silver, VHF—300 points and 3 different IPA countries

Sherlock Holmes Trophy, Gold, VHF—400 points and 5 different IPA countries

There are no band or mode restrictions.

Contacts count for points as follows on each amateur band.

IPA Radio Club Member in hunter's country—2 points

IPA Radio Club Member in DXCC country in hunter's continent—5 points

IPA Radio Club Member in DXCC country in all other continents—10 points

IPA Radio Club Special and Club stations—points  $\times 2$

Send completed verified application with GCR list and 8 IRCs (or DM 6,—) to IPA Radio Club Award Manager, Anton



The Sherlock Holmes Award sponsored by the International Police Association, German Section.

Kohten, DK5JA-DK0 IPA, P.O. Box 40 01 63, D-4152 Kempen 1, West Germany.

For the trophy in silver or gold, send GCR list and 35 IRCs (or DM 40,—).

(Ed. note: More information on IPA awards in February CQ.)

**Radio Club Uruguayo Awards. C19D** —Comunicados 19 Departamentos: Work the 19 Uruguayan departments. There are no mode or band restrictions, but the award can be endorsed for mode and band. Contacts after July 1949 are valid.

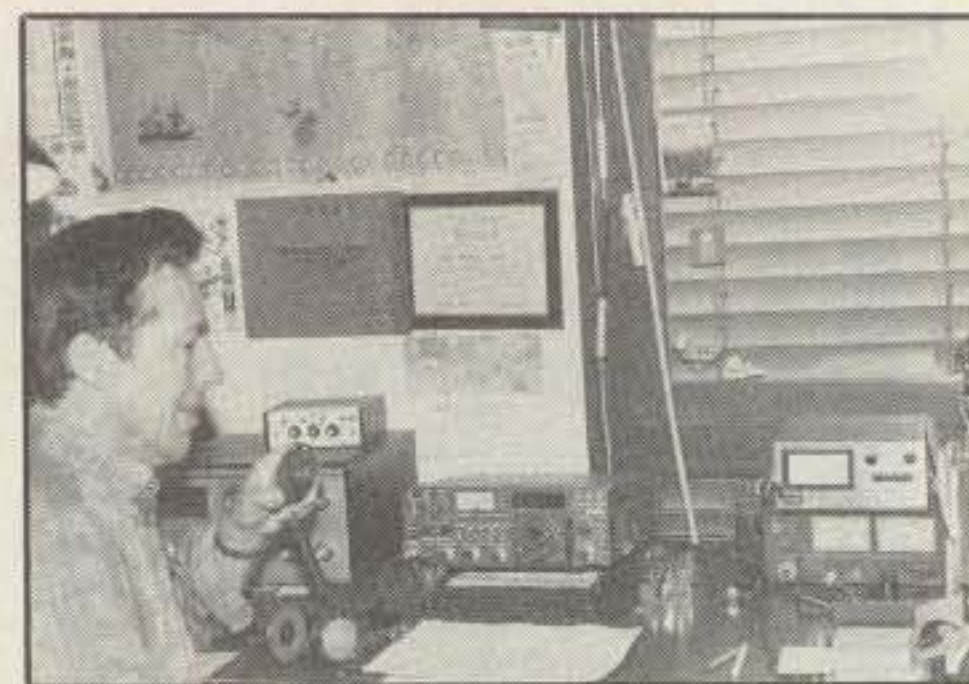
**33 Orientales:** Work 33 different stations from the same location outside Uruguay. There are no mode or band restrictions. The award is endorsable for mode or band. Contacts after January 1, 1953 are valid.



Certificates of Radio Club Uruguayo.

**All CXs:** Work 9 CX stations with numbers 1 through 9 in their call. For CX hams the 9 stations must be on at least three bands. At least 24 hours must separate QSOs. Contacts after 23 August 1983 are valid.

**General Conditions:** Send list certified by your National Awards Manager or recognized IARU associate. For each of the awards, include 10 IRCs for postage and handling. If no certification is possible, send QSL cards, list of all the contacts, and enough IRCs for return postage on the cards. All applications for these certificates, as well as inquiries or other information, must be sent to Radio Club Uruguayo, Awards Committee, P.O. Box 37, Montevideo, Uruguay.



Kurt Wetter, HB9AFI, USA-CA All Countries #634, number one to HB-land. Kurt's award is dated 8-24-89.

**ZD8 Awards.** The following was received from R.W. O'Hara, ZD8BOB.

"Notice of three new awards was made in June (1989), but we have since been able to revise the prices of these awards and they are now considerably reduced. Details are shown below..."

**The South Atlantic Award.** This award is available to stations who have worked at least one station on each of the South Atlantic dependencies, viz, Ascension, St. Helena, and The Falklands, on any band and in any mode.

**The Ascension Island Award.** This award is available to stations who have worked at least three stations on Ascension Island on any band and in any mode.

**The Air Bridge Award.** This award is available to stations who have worked one station in the British Isles, one station on Ascension Island, and one station on the Falklands on any band and in any mode.

To qualify for these awards, applicants must list the relevant log entries and certify that the QSOs have taken place. There are no date limitations on any of the awards. Applications for each award must be accompanied by 10 IRCs, \$5 U.S., or 2.50 pounds sterling and be forwarded directly to Awards Manager, P.O. Box 2, Ascension Island, South Atlantic.

## DXNS USSR Oblast Guide

This guide is published by Geoff Watts and is available from the International Listeners Association. It contains outline maps of all 184 oblasts; lists of oblasts in numerical and prefix order; oblasts of one, two, and three letter suffixes; oblasts of active pre-1970 calls; pre-1970 club station oblast list; "Victory 40" stations and oblasts; R-100-O worked 100 oblasts award; deleted oblasts that still count; future new USSR prefixes; USSR "CQ-M" annual contest rules; R-150-S USSR countries list; CQ and ITU zone list. Price: One pound sterling or \$3 US, including postage. Available from the International Listeners Association, 1 Jersey St., Haford, Swansea, SA1 2HF, U.K.

Happy New Year, everyone.

73, Dorothy, WB9RCY



The Windmill Award available from the Dutch International Police Association Radio Club.



Control up to eight digital radios simultaneously from your MS-DOS microcomputer! We offer a series of software/hardware packages that interface with most current synthesized rigs.

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**KENWOOD:** TS-940, 440, 140, R-5000, 680, 711, 811  
**YAESU:** FT-767, 757 GXII, 757 GX, 747, 9600, 736, 212, 712  
**JRC:** NRD 525  
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Knowledge of MS-DOS is not necessary - the installation program does it all! Datacom allows complete control of your rig from the keyboard. Move your cursor to the desired frequency and the radio will be set automatically.

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- Full featured logging utility allows searching for previous entries by call sign. Separate log for each service.
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- Optional radio direction finder allows bearing information to be logged automatically.

CURRENT MENU MEM 394 K STACK 1 K DATE: 10-24-1989 SELECT FUNCTION MODE= USB

VERSION 9.1 LOCAL : 16:54:00 U.T.C.: 20:54:00

1. READ MEMORY CHANNELS	7. MEMORY CHANNEL DIAL
2. INPUT DESIRED FREQUENCY	8. WRITE MEMORY TO VFO VFO A
3. 500 KHZ. UP	9. UTILITY MENU
4. 500 KHZ DOWN	ALT-P. CHANGE MENU PAGE
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6. SWEEP BETWEEN 2 LIMITS	ALT-Q. END

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PORT= COM2 BAUD= 9600 CURRENT PARAMETERS RDLY= 0.138  
 UPPER - BAND LIMIT - LOWER FREQUENCY MODE FILTER SQ. ACTIV. ADDR

30.000 MHZ	0.100 MHZ	17.44300 MHZ	USB	WIDE		38
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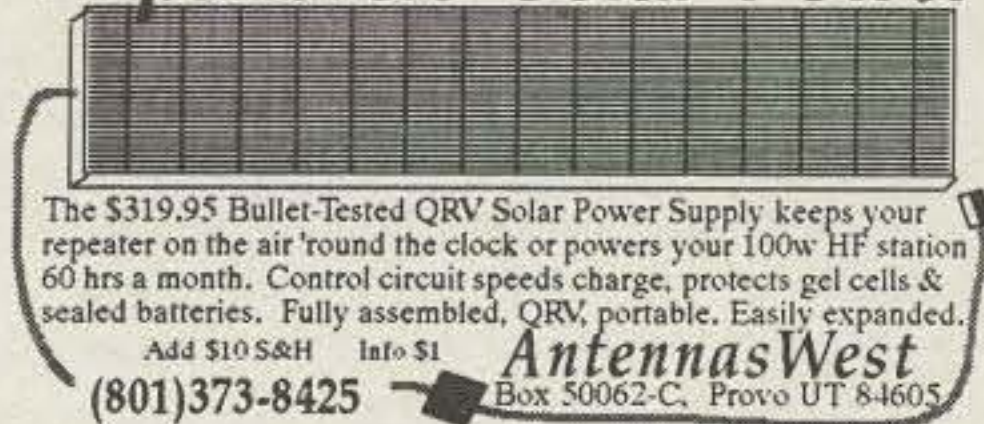
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## REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

### The Stage is Set for Change

Every year about this time we pause to reflect on the major amateur radio happenings of the past twelve months. Technology, like time, never stands still and neither does the amateur radio hobby. It is always in a state of change.

#### Ham Radio Growth

The government operates on a fiscal year basis—from October to the end of September. Thus, the 1989 fiscal year ended September 30th. The FCC keeps strict records on the amateur service.

The statistics are in for fiscal 1989. At best it was a mediocre year in terms of amateur radio growth! The Novice Enhancement proceeding of 1987 was designed to encourage newcomers, especially youngsters, to enter the Amateur Service. Hopefully, they would be aimed toward a high-technology career later on in life. There were 21,956 first-time amateurs in fiscal year 1986, the last year prior to the enhanced Novice Class. In FY 1989 it was 23,065. Hardly what you would call good progress. (See Table I.) It is interesting to note that 39 amateurs

entered amateur radio at the Extra class level!

Table II shows that the total number of existing amateurs upgrading their ticket during the 1989 fiscal year has pretty much leveled off. Novices, however, are upgrading to the Technician level in unprecedented fashion. There can be no doubt that it is Technician and not Novice privileges they are after! Novice Enhancement, and the separation of the 50-question Element 3 into 3A and 3B, has had a far greater impact on the Technician than the Novice class.

Five years ago the General class was by far the most widely held ticket. There are now less General class amateurs than there were in 1985. Soon we'll have more Techs than Generals. (See Table III.) We now have 30,000 more Technicians and 12,000 more Extra class than we did in 1985.

By the way, the 1989 figures in Table III are somewhat distorted. This is caused by the activation of the ten-year term license in 1984. Prior to that amateur licenses were issued for five years; thus there will be no renewals during the period 1989 through 1994. This has had the effect of artificially adding thousands of amateurs to the amateur ranks. Not all would have renewed, but nonetheless they will have been carried on the rolls as

"active" for another five years. The figures for 1989 are really not comparable with prior years.

California continues to have the most amateurs—more than double the nearest state (Florida). Did you know substantially more than half of all U.S. licensed amateurs reside in just ten states? Table IV lists the states having the most amateur operators (also the ones with the least—those which make Working All States such a hardship!).

There are two volunteer examining programs in the Amateur Service. The Novice program is separate from the VEC System, which examines applicants for upgraded licenses only. While no one is quite sure of the number of Novice-level VEs, there appears to be around 20,000 examiners in the VEC System. While two examiners may conduct a Novice exam, it takes three to hold an upgrade test.

The VEC System was born in 1984 and only a few test sessions were conducted that year. The figure mushroomed to 2644 test sessions in fiscal '85 (which ended September 30). The VEC System has been expanding dramatically ever since. In fiscal 1989, 55,863 persons were administered 93,744 VEC System examinations at 5342 examination sessions! Statistically, about ten persons attend the average test session and six of

National Volunteer Examiner Coordinator,  
P.O. Box 565101, Dallas, TX 75356-5101

(Fiscal Year)	FY	FY	FY
First Licenses to:	1987	1988	1989
Novice	22,319	18,550	20,047
Technician	1,452	2,117	2,498
General	411	307	355
Advanced	119	82	126
Extra Class	37	24	39
<b>Total New Licenses</b>	<b>24,338</b>	<b>21,080</b>	<b>23,065</b>

Table I—Amateurs entering the service for the first time. "New blood" entering the Amateur Service is really the only true measure of amateur radio growth. The number of newcomers has pretty much stagnated as evidenced by these figures. "Novice Enhancement" has not helped increase the Amateur ranks.

Table II—Existing amateurs upgrading their licenses. The trend here is clear. Ascending to the Technician class is by far the most popular upgrade. There is little growth in upgrading to the senior level (Advanced and Extra) classes. Most newcomers appear satisfied to operate on the VHF/UHF bands.

(Fiscal Year)	FY	FY	FY
Amateurs Upgrading:	1987	1988	1989
Novice to:			
Technician	11,168	13,050	14,024
General	2,035	1,317	1,054
Advanced	133	132	106
Extra Class	29	26	14
<b>Subtotal:</b>	<b>13,365</b>	<b>14,525</b>	<b>15,198</b>
Technician to:			
General	2,926	3,780	4,070
Advanced	730	938	921
Extra Class	31	62	26
<b>Subtotal:</b>	<b>3,687</b>	<b>4,780</b>	<b>5,017</b>
General to:			
Advanced	3,777	3,750	3,640
Extra Class	230	269	195
<b>Subtotal:</b>	<b>4,007</b>	<b>4,019</b>	<b>3,835</b>
Advanced to:			
Extra Class	2,755	3,018	2,739
<b>Total Upgrades:</b>	<b>23,814</b>	<b>26,342</b>	<b>26,789</b>



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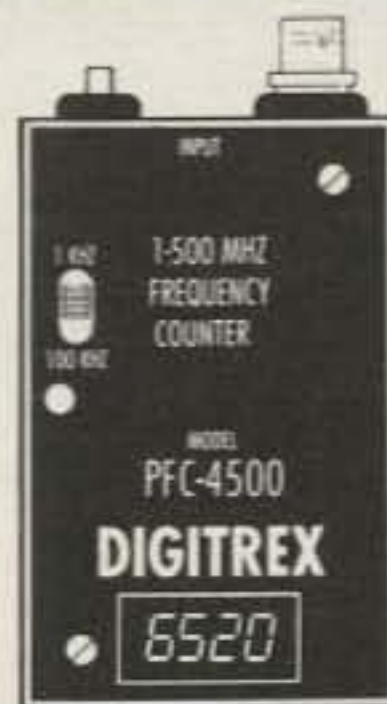
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%/Total	9.2%	23.7%	28.5%	20.1%	18.5%	100.0%
FY1986	40,768	98,195	116,864	86,148	79,107	421,082
%/Total	9.7%	23.3%	27.8%	20.4%	18.8%	100.0%
FY1987	43,214	98,147	114,428	91,633	82,779	430,201
%/Total	10.1%	22.8%	26.6%	21.3%	19.2%	100.0%
FY1988	46,152	98,354	112,989	99,603	79,667	436,828
%/Total	10.5%	22.5%	25.9%	22.8%	18.3%	100.0%
FY1989	49,545	101,514	116,496	112,631	84,614	464,800
%/Total	10.7%	21.8%	25.1%	24.2%	18.2%	100.0%

Table III - Amateurs by license class—five-year period. The Extra class, and especially the Technician class, shows the greatest increase. All other classes are declining in their portion of total amateur population. The figures for 1989 are somewhat distorted due to implementation of the ten-year term license in 1984. There are 35% more Technician class amateurs than just five years ago! 1990 will see the Technician class overtake the General class as the most widely held amateur ticket.

those successfully improve their license status.

Table V lists the growth of the VEC System over the last five years. If you add 20,000 new Novices to the total, some 75,000 persons were administered amateur radio operator examinations by volunteer examiners in FY 1989. VE testing continues as one of the real success stories in amateur radio today.

### Amateur Radio Expansion

The number one story of 1988 carried on into 1989, that being the reallocation of 220-222 MHz to business interests. The 220-225 MHz band was previously a shared band, the Amateur Service being one of those allowed access. The FCC decided that 222-225 MHz should become the exclusive property of the amateur with the bottom 2 MHz (220-222) going to the Land Mobile Service for narrow-band communications. The FCC reassigned

the spectrum saying it was little used by amateurs. Congress held hearings on the reallocation and stopped short of condemning the Commission on their handling of the matter. The FCC refused to reconsider the reallocation in June. Although the ARRL appealed to the courts, it appears certain that the reallocation will stand.

The reassignment prodded amateurs into thinking seriously about Amateur Service restructuring. It became evident that we need more amateurs using our frequencies. Amateur satellite and packet organizations went on record as publicly supporting abolishing the code requirement for VHF and higher frequency operation.

The ARRL convened a blue-ribbon panel consisting of League, industry, and individual amateurs whose job it was to look into the possibility of removing the Morse code prerequisite. They reported back to the League in April.

(Fiscal Year)	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989
California	59,960	58,400	59,944	61,432	66,130
Florida	24,518	25,476	26,242	27,094	28,856
Texas	24,408	24,930	25,495	25,992	27,750
New York	25,833	26,030	26,001	25,505	26,878
Ohio	20,276	20,370	20,783	21,010	22,179
Pennsylvania	17,153	17,309	17,525	17,531	18,439
Illinois	17,384	17,446	17,548	17,509	18,286
Michigan	14,212	14,158	14,258	14,258	15,052
Washington	12,600	12,997	13,436	14,016	15,034
New Jersey	12,824	12,910	12,932	12,823	13,482

Table IV - Ham census—ten most populated states. Observation: California, Florida, and Texas continue to post significant gains, while other heavily populated states show basically no growth. Amateur radio is a prime hobby of retirees, and one explanation may be the influence of their migration to warmer climates. The ten states with the fewest amateurs are Wyoming 1019, Delaware 1097, South Dakota 1165, North Dakota 1149, Vermont 1269, Montana 1764, Rhode Island 1833, Alaska 2091, Idaho 2205, and Nevada 2300.

Their recommendations ended up with ARRL directors agreeing to propose a code-free VHF/UHF Communicator class license to the FCC. About a dozen other petitions were filed along the same line, and the Commission is now in the process of developing a Notice of Proposed Rulemaking on the matter.

### Other Major Stories of 1989

Reacting to complaints from the amateur community, postal inspectors investigated Michael Harrison, WB2PTI, of Long Island, New York, for running full-page Dentron and Atlas advertising in amateur publications. Both firms were out of business when resurrected by Harrison. The postal service had Harrison arrested when the advertised products were not delivered nor funds returned. He is out on \$25,000 bond awaiting trial.

Earthquakes in the US and the USSR were the major emergency of 1989. Amateurs assisted survivors in Armenia as well as those in our own bay area. Happy amateurs gained access to the 17 meter (18.068-18.168 MHz) band on January 31, 1989.

The FCC released new streamlined Part 97 Amateur Service Rules in June. The FCC's amateur regulations are now organized into six subparts and two appendices. The VEC's question pool committee was forced to once again revise all of the banks of questions used in license examinations, including the new Novice and Technician pools released in April that were to take effect in November.

Much to the dismay of many who wanted to obtain a station call sign of choice, the FCC refused to adopt a special call sign assignment system. The Commission had previously proposed to continue issuing primary amateur call signs. Additional (secondary) amateur call signs, however, would be sold by a Special Call Sign Coordinator (SCSC) in the private sector. The SCSC then would maintain an on-line system relating any issued secondary call signs to the primary call sign issued by the FCC. The FCC concluded that although the program would be handled by a private organization, it still would be costly to them. The proceeding was terminated.

Several amateurs, including accredited VEs in Puerto Rico, had their licenses suspended or revoked for participating in a scheme to obtain amateur radio licenses by fraudulent means. California amateur, Kevin Mitnick, N6NHG, went to prison for computer hacking.

The Canadian government signalled their intent in February to do away with all amateur subband allocations in their Amateur Service. It caused a major ripple of discontent among amateurs in the United States. Telegraphy/digital subbands would no longer exist in Canada. Instead, if approved, Canadian amateurs



would be allowed to operate any mode on any frequency within an authorized band, limited only by a maximum bandwidth specification.

Not only were new Part 97 rules issued, but Part 15 regulations were issued as well. Part 15 covers low-power unlicensed devices. As a general rule, unlicensed Part 15 transmissions are allowed throughout the spectrum, the amateur bands included. Amateurs are concerned about interference to their operations.

Three FCC Commissioners—including a new Chairman, Al Sikes—were seated in mid-1989. New thinking at the Commission is certain to impact future amateur service rulemaking. Congress proposed to levy a \$30 (House version) or \$35 (Senate) licensing fee on the Amateur Service.

Due to an on-the-air dispute, the FCC began formally investigating amateur third-party traffic in October. Many phone patches, especially those on the 20 meter amateur band, appear to be business related. The FCC also is looking into amateur bulletin broadcasts and code practice transmissions. Many amateurs object to the amount of HF spectrum these communications consume.

### What's in Store for 1990?

The two biggest amateur events next year are bound to be the "coming" of code-free amateur communications and the "going" of amateur communications on 220-222 MHz. It will be a busy rule-making year for the Commission as they develop rules for implementing these two new communications services.

### More Novice/Technician Question Pools

The VEC's Question Pool Committee has once again revised Element 2 and 3A. These are the question sets required for the Novice and Technician classes. The revision was necessitated by massive rule changes. The newly revised pools have just been released into the public domain and must be used on all Novice and Technician examinations administered after June 30, 1990. This is the second time that the QPC has revised the questions within the last year. Cost of the new Novice and Technician Pools are \$2.00 each postpaid (\$4.00 for both). Be sure to ask for the July 1, 1990 version.

We also have copies of the new FCC Part 97 Rules & Regulations issued during the summer, and we have incorporated the recently issued errata. The Part 97 Rulebook is \$2.95 postpaid. (W5YI, P.O. Box 565101, Dallas, TX 75356, VISA/MasterCard telephone orders 10 AM to 2 PM).

See you next month.

73, Fred, W5YI

Fiscal Year	Test Sessions	Elements Admin.	Persons Examined	Upgrade Percent	Persons Per Session
1985	2644	55,981	36,937	55.2%	14.6
1986	3733	62,065	42,528	59.4%	11.4
1987	4252	75,184	47,676	59.6%	11.2
1988	4739	88,949	52,836	60.6%	11.1
1989	5342	93,744	55,863	60.7%	10.5

Table V- VEC system statistics—fiscal year basis. The VEC System which examines applicants for Technician and higher class licenses continues to expand. There are now more than twice as many test sessions as there were five years ago. The passing rate continues to increase slightly; about 60% of those taking exams successfully upgrade. The number of applicants attending each session has declined somewhat.

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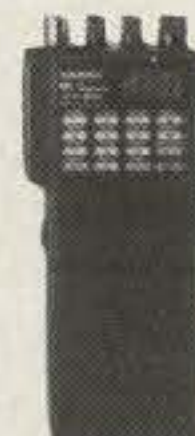
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## "HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

### *DX Operating Tips*

It is natural for new amateurs to want to contact distant stations, which is referred to as working DX, or DXing. It is also natural for beginners to be a bit intimidated by the contests, fast sending, and pile-ups commonly associated with DX. This article is intended to reduce initial fears and to encourage new amateurs to work DX.

**Contests.** There are contests on the air every weekend. Some contests occur weekdays. Some weekends have several contests in progress at the same time. Whether or not you consider yourself to be a contest operator, working a few DX contests is a good way to get started toward earning the hundreds of existing DX awards that are available. This magazine provides excellent coverage of all domestic (U.S.A.) and DX contests. Note the ones you want to enter to contact DX stations. Required contest exchanges are very brief and they are stated in contest announcements. If you don't have the contest rules available, simply listen to what responding domestic stations are sending, and send the same type report. Contest exchanges are often just the contest contact numbers (in sequence, starting at 001) and signal reports (which may not be honest).

If you are participating in a DX contest to work new countries, and you do not care about your contest score, you should be selective about which DX stations you call. Sweep the bands from end to end several times. Ascertain the call-sign of the DX station in each case to determine whether or not you want a contact with her/him. If it is a country you already have confirmed on the band being used, you will probably decide to continue your listening search for a needed DX QSO. Even if you are not serious about scoring well in a DX contest, it is helpful to submit a copy of your contest log for check usage by the contest sponsor. Such cooperation is appreciated. There is no better way to increase code receiving proficiency than operating code contests.

**Identification.** If the DX station has made a normal CQ call, it is okay to answer her/him with a standard 2 by 2 or 3 by 3 response. However, a 1 by 2 re-



*Here is 36-year old Laurel Varner, KB0EJW, of Mystic, Iowa. His station includes a Heath DX-60 transmitter, Heath HM-102 SWR/power meter, MFJ antenna tuner, Hallicrafters SX-101-A receiver, manual telegraph key, and dipole antennas for 15 and 40 meters. He has worked amateurs in several states, and his first real DX contact was with a Belgian amateur. In addition to amateur radio, Laurel flies radio-controlled model airplanes. He is also a licensed airplane pilot.*

sponse usually suffices, if one answers on frequency; this means the RIT/clarifier/offset should be turned off, or the control should be zeroed to where no offset exists. If the DX station is working a steady string of stations (almost as if she/he is in a contest), simply send your own call-sign as the DX station indicates completion of a contact (QSO) with some other station; this is usually a "73" or "TNX." Just send your call-sign one time; do not QRM the operation with repeated calling. Instead of sending their entire call-signs, some operators just send the suffix of their call-signs. This is a poor practice because it is illegal and it is an improper station identification. A single proper station identification (do not send DE/from) is satisfactory. It is extremely important to be courteous in this type of operation.

**License Class.** Do not believe that you must have Extra class operating privileges to work DX effectively. It is common for rare DX stations to operate just above the Extra class segments (14026 kHz on code, as an example) so they can work all General, Advanced, and Extra class U.S.A. amateurs. If you have a Novice or Technician license, you have many opportunities to work DX on the 10 and 15

meter Novice bands. Many DX stations operate regularly in the 10 meter Novice voice segment (28.3 to 28.5 MHz, SSB). In addition to two-way code (A1A) contacts in the 15 meter Novice band, many DX operators answer code CQ calls (21.15 and up, usually) with SSB/J3E voice replies. Such contacts are legal for Novices and Technicians. Simply switch to the voice mode (USB) to listen to the DX station, and switch to the CW mode to send A1A code to the DX station.

**Listen.** When you hear a pile-up of stations calling, do not join in until you have found the DX station they are calling. The DX station often uses a different receive frequency to minimize interference on her/his transmit frequency. Rare DX stations usually have stations answering on a frequency that will not cause interference to their transmit frequency. I often hear amateurs call on the DX station's transmit frequency, without having listened long enough to learn that the DX operator is listening for replies on a different frequency. If you do not hear the stations the DX operator contacts, it is very likely that she/he is operating "split," using separate transmit and receive frequencies. It is important to listen so that you will be able to operate intelligently.

**Pile-Ups.** Do not be afraid to join the fray, but please do so in an intelligent manner. Listen to determine if the DX operator is using a system to minimize QRM (man-made interference). Good DX operators often indicate the specific areas they are listening to hear, such as U.S.A. (the whole country), EU (Europe), AF (Africa), Asia, SO AM (South America), VK/ZL (Australia and New Zealand), W1 (U.S.A., New England), etc. The DX operator may indicate that only mobile or QRP (low power) stations should call. As always, listen carefully and cooperate. If there is a huge pile-up on a DX station, it is advisable to tune the band and listen for another station from the same area. If you are a Novice or Technician operator, it is a good idea to check the General through Extra segments of a band for DX activity. If you hear DX stations working amateurs in your area, move back to the Novice segment and make CQ DX calls. Under such conditions, you have a good possibility of working DX stations.

I frequently have DX stations answer my CQ calls in the Novice bands. I am always glad to have opportunities to thank



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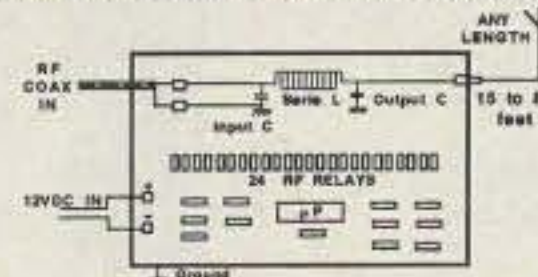


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CIRCLE 18 ON READER SERVICE CARD



DX operators for working U.S.A. Novice and Technician amateurs. Do not drive DX amateurs off Novice bands with long contacts because most DX amateurs are in U.S.A. Novice bands to provide a QSO (contact) and QSL (card) to as many new amateurs as possible. The DX QSL is going to be received through the ARRL Incoming DX QSL Bureau in most cases, so do not send your mailing address unless it is requested. Some DX operators have told me they work U.S.A. Novice bands to avoid hectic contest-type operation; they simply want to have relaxed normal contacts. Such DX operators make their intentions clear by initiating conversations.

**Power.** Do not believe that you need a kilowatt (1000 watts) and a beam antenna to work DX. Many of us run low-power (QRP) or medium power (50 to 250 watts) with simple wire antennas, and we work DX very well. Using low/medium power and wire antennas tends to develop improved operating capability. Power does not replace brains. I have noticed that many high-power operators are short on patience. The ARRL defines QRP as a maximum of 10 watts input (to the final RF amplifier) or 5 watts output. I am one of many operators who have worked thousands of DX contacts while operating QRP. Some QRP enthusiasts regularly work DX running just a few milliwatts to their antennas.

**Propagation Predictions.** Do not let poor condition predictions convince you that you should not try to work DX. Predictions are just intended to provide guidelines. Actual propagation conditions can be radically different from those which are forecast. If propagation predictions are available use them. If they show FOT (frequency of optimum transmission) data, determine when a desired area of the Earth is likely to be worked on a band you can operate. If only MUF (maximum usable frequency) data is shown, use a band just below the stated MUF. FOT data is more useful than MUF data, since FOT is more specific.

**QSL Cards.** Most DX QSL cards are received via the ARRL incoming DX QSL Bureau. You do not have to be an ARRL member to receive DX cards via this system. However, you must provide self-addressed stamped envelopes (SASEs) to their local group to receive incoming DX cards. A data sheet can be requested; send an SASE (with your request) to the American Radio Relay League, Incoming DX QSL Bureau, 225 Main Street, Newington, CT 06111. If you want a detailed explanation of QSL cards, QSL bureaus, and QSL managers, I will be glad to supply a reprint of my QSL article at no charge. Send a large (10 by 13 inches) self-addressed envelope to my California address with quadruple first-class post-

age (85¢) attached. Please include a note stating what you want me to enclose in your envelope. As you become more active (and proficient) working DX, you will quickly reach the point where it is too expensive and too time consuming to send cards directly to the DX amateurs you contact. The best (and easiest) way to forward QSL cards to DX stations is via the ARRL Outgoing DX QSL Bureau, which is only available to ARRL members. A data sheet can be requested from the ARRL. Be careful to only submit cards destined for the countries served by the bureau.

**Quiet Band.** Do not let a quiet band stop you from trying to work DX. I have had many DX stations answer my CQ calls on bands which seemed to be dead. You have to make calls to get results. One does not need a license to listen.

**Reports.** Unfortunately, several DX (and U.S.A.) operators find it easier to give everyone a 599 (code) or 59 (voice) report instead of providing accurate reports. If you hear a DX station telling everyone their signals are 599/59, do not hesitate to call because you do not believe your signal will be that strong at the DX station. Give it a try.

**Speed.** When using code to work DX, it is common for the high speed to bother newer amateurs. Regardless of your code receiving proficiency, you can determine the callsign of the DX station if



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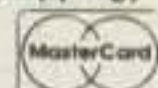
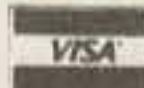
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you listen very carefully several times. Similarly, the operator's other information can be picked out of high-speed transmissions. Once the callsign has been determined, you are well on your way to a DX contact. Simply send at a speed you can copy; most good operators will automatically slow down (QRS) to the speed used by the slower operator. Do not send code faster than you can receive it. If necessary, ask the DX operator to QRS. One-way contacts are no help in amateur radio.

**Splits.** As previously detailed, DX stations (particularly rare DX stations) usually transmit on one frequency and listen on another frequency. If such operation seems strange to you, read the applicable portion of your equipment's operating instructions. Split-frequency operation is an easy technique to master. It is a sensible way for a rare DX station to be operated.

**Strong Signals.** Do not be discouraged if you hear extremely strong signals from other stations trying to contact the DX station you want to work. Those deafening signals may not be as strong as your signals at the DX station. A simple trick to use to outsmart the "big guns" is to move your transmit frequency to the exact frequency of the station that last worked the DX amateur; being exactly on the frequency to which the DX amateur is listening is a big advantage.

**Weak DX Signal.** Assuming the use of similar equipment and antennas, signal strengths are usually about the same at both ends of a DX contact. However, this is not always so. Do not hesitate to call a DX station just because her/his signal is weak. I have had many good contacts with DX stations whose signals were not much above the existing noise levels. If the weak DX station is working other stations in your vicinity, you have a good possibility of completing a contact. Many rare DX stations have a zero in their callsigns. It is a good practice to work every DX station you hear with a zero in her/his callsign.

**Summary.** I hope this brief introduction prompts several readers to get on the air and work DX stations. Working DX is a fun part of amateur radio. Your DXCC total will increase rapidly once you decide to give DX a try.

## Photographs Wanted

Photographs of new amateurs in their shacks provide introductions to a few of the newer licensees. Photograph size is unimportant, but good definition, contrast, and subject matter are important. Color pictures can be used, but black-and-white photographs are preferred. Operating activities and achievements, plus a self-introduction, are needed with each picture. Send an SASE if a picture

must be returned. A free one-year CQ subscription (or renewal) is awarded to the one amateur whose picture I select as the winner for the month. If you are a subscriber, please enclose the mailing label (or copy) from your latest CQ issue. One award is made each month, no matter how many photographs are printed. DX amateurs, who frequently work the American Novice bands, are also urged to submit photographs.

## Printed Aids

Previous Novice columns contain information that is useful to new and aspiring amateurs. Many of these items have been reprinted for distribution to students of licensing courses I instruct. For ease of use, these printed aids have been separated into six categories. These categories are introduction, code, theory, station, operating, and miscellaneous. Outdated items are continually replaced with

newer material. Fifteen dollars brings a complete set of current printed aids, including shipping costs. A list of these printed aids will be sent to anyone who requests it and sends a business-size (#10) self-addressed and stamped envelope to my California address. Licensing-course instructors are welcome to revise and/or duplicate these items to suit their requirements.

## National Contest Journal

Tom Taormina, K5RC, edits the *National Contest Journal*. He is a contest operator with three decades of experience. His address is Box 800228, Houston, TX 77280-0228 (telephone 713-461-8873). Contest information can be sent to his home address. The NCJ one-year (six issues) domestic (U.S.A.) subscription rate is \$10. Subscriptions should be mailed to NCJ Circulation, ARRL, 225 Main Street, Newington, CT 06111.

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## A LOOK AT THE WORLD AROUND US

### Mobiling Today: More Notes For Success

**T**his month's column is a continuation or expansion of our September 1989 feature on HF mobiling today. It is slightly late to be called part two, but it contains additional information that should be shared, and I could not write it sooner due to moving QTH. Meanwhile, you've had time to notice the increasing amount of mobile activity on our upper HF bands. The weather has also cooled so you can now perfect your own mobile setup and add some finishing touches without sweltering in the summer heat. The old adrenalin always pumps better when temperatures drop below 60 or 70 degrees, right? (Don't answer that!)

Part one outlined the quick and easy way to go HF mobile in a success-proven manner. Some important points were mentioned only briefly, however, and could easily be overlooked. Let's therefore expand on SWRs and grounding, preventive maintenance, and helpful hints, and quickly review some new antenna goodies announced since part one appeared in print. I am sure you will find my notes and ideas quite useful for long-term mobile enjoyment.

This two-part feature on mobiling is primarily aimed at assisting new mobileers rather than guiding big-time HF operators and Honor Roll DXers through assembly

of a super system. They already know most of the ropes; newcomers do not. Assuming you get rolling mobile, however, you can learn while enjoying. Being actively involved in any new area (being an "insider" rather than an "outsider") always opens more doors to additional information.

#### SWRs, Grounds, and Preventive Maintenance

Keeping a close tab on your antenna system's connections and its SWR is the best advice I can offer new mobileers. You set it to a low/below 1.5 to 1 level during installation, true, but connections can work loose during daily travels and rain and road grime continuously eat away at under-body ground straps. Deterioration usually goes unnoticed until you embark on a long trip with plenty of TVI-free operating in mind and find your rig has reduced its output due to a damaged antenna or broken connection. Tisk, tisk. Checking and logging your SWR on a regular basis may not alert you to all such surprise problems, but it sure reduces their odds of occurring. Another point: If your SWR varies widely when other cars pass you, it is a good indication of insufficient ground strapping. This point mainly applies to the 20 meter and higher bands. SWR variations on the longer wavelength bands of 80/75 and 40 meters are typical unless you are the only traveler on the freeway. If your new-style economy

transceiver does not include SWR metering, incidentally, check out the Diamond SX-600 or MFJ 816 SWR meter. The SX-600 includes HF and VHF sensors plus an SSB average and peak power wattmeter. MFJ's 816 is a small, low-cost SWR-bridge you can store in the glove compartment when it is not in use.

I must also emphasize that the best way to ensure good long-run performance is by making all antenna and ground connections shiny clean and using star washers that "bite into the metal" during initial installation. Right now is a good time to recheck your own mobile antenna setup. If rust and corrosion are becoming visible or coax "pigtailed" have been left exposed to the weather, a brief refurbishing could improve your signal 3 or 4 dBs. *Unscrew your whip from its mount and look for gray-white oxidation in its socket or around whip threads. This film is an insulator, and the antenna's base is a high current point. Together they can usurp more than half of your rig's output power.* You can measure corrosion resistance with an ultra-low reading ohmmeter, but why waste time. Just assume it is more than one ohm and clean it like you would clean battery connections. Likewise, replace all lugs or washers that are beginning to rust. If the coax ends have not been sealed, you can bet the cable has been ruined by moisture. Do not waste time beating a dead horse: replace the full length of coax! The new marine-grade RG-8X available from

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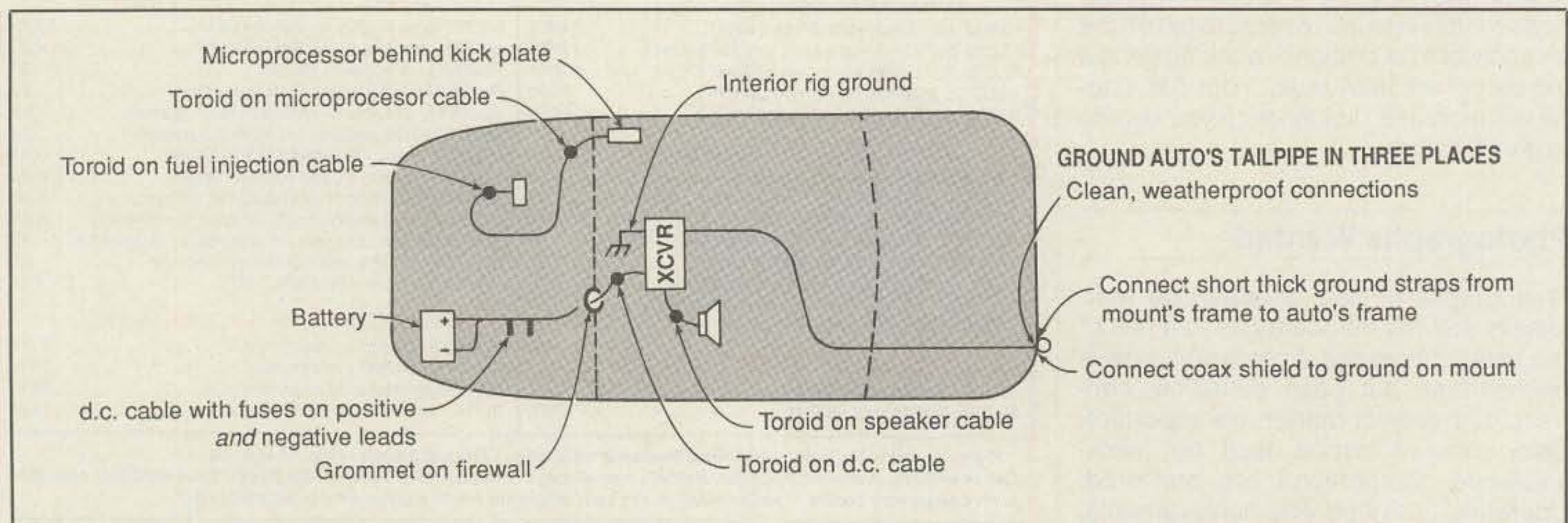


Fig. 1 - Basic outline for mobile rig grounding and "toroiding" as discussed in the text.





Fig. 2- Heil's new BM-5 single ear headset and boom mic is a fantastic contesting and mobiling aid, especially when combined with VOX operation. Check your state's laws to ensure a one-ear 'phone is acceptable.

Certified Communications ("The Wireman") is a very good choice (see CQ's Advertiser's Index).

Double check the ground straps you installed from the antenna mount's base to the car's frame. If corrosion is visible, replacing them is usually quicker than attempting repairs. Be sure you have zero-resistance connections, then weatherproof all exposed terminals with Coax Seal®. Follow this same procedure for the ground straps you added to your car's tailpipe to reduce ignition noise, except do not apply Coax Seal® to this hot surface. If you never grounded your car's tailpipe, get busy. Even a simple jumper made from old wire and two alligator clips will suffice for a couple of days, and tailpipe grounding is vital to reducing ignition noise (in other words, do it any way you can—just do it!). Remember to recheck and reseal all connections and replace your coax every two to three years, and your mobile setup will deliver good, dependable performance.

Did you include the interior ground connection between your transceiver's cabinet and the car's frame like I emphasized in part one? This is a very important step that is easy to overlook or excuse by saying the rig is grounded through its coax shield or negative DC power lead. Nay, nay, I say. Those are DC grounds, not an RF ground. You may need to use your trusty VOM for guidance and scrape some paint off the metal under a front seat or the firewall to secure a solid frame ground connection, but it is worth the ef-

fort. Improved signal radiation is only one benefit. This at-rig ground is also very effective for minimizing RF feedback in today's computerized and half-plastic cars. The microprocessor used in modern fuel-injected autos is usually mounted behind the right (passenger's) side kick panel (with unshielded cables, no less!), and a couple of watts of stray RF will drive it bonkers. Your transceiver has a ground lug on its rear panel. Use it! I use an alligator clip on mine so the transceiver can be quickly installed and removed for security when leaving the car unattended. If I forget the clip, a hot mic and stumbling engine remind me of the omission.

### Additional Notes

An effective 2-minute fix for external mobile speakers with RF "hash" during transmit involves installing a small toroid near the rig's plug. The "four packs" of snap-together toroids sold by dealers nationwide work fine for this purpose. Simply wrap as many turns of the speaker cable as possible around the core, snap it shut, and place it out of sight. Since you have three toroids left, install one on the transceiver's DC power cable (near the rig, not under the hood), and install the other two on each end of the microprocessor and fuel injection's control cable. My previous notes on grounding and "toroiding" are summarized in fig. 1 for your convenience.

If you wish to go first-class mobile,

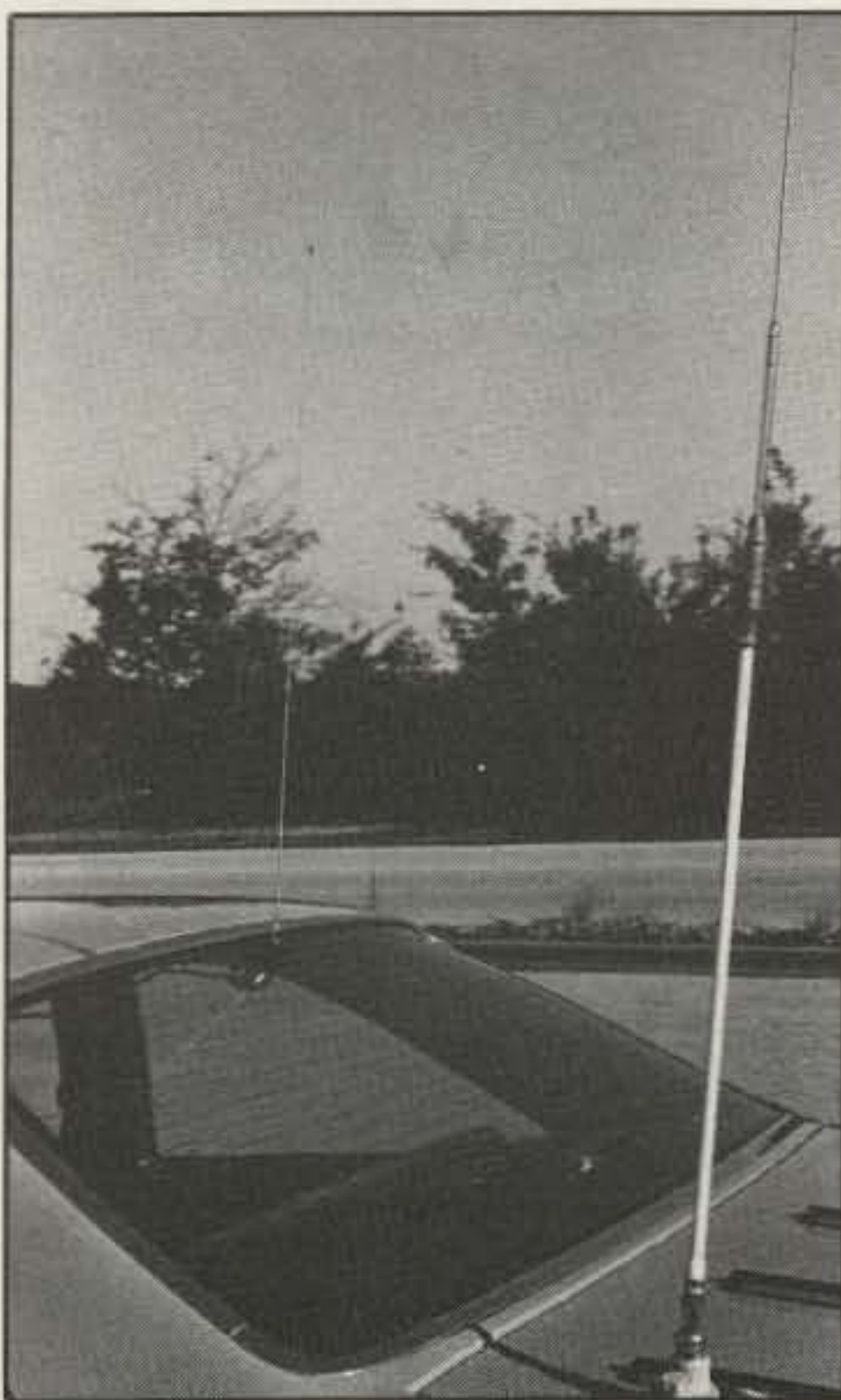


Fig. 3- The new MO-4/RM-10 Mini Hustler installed and ready for action on my XYL, WB4OEE's car.

check out Heil Sound's new BM-5 single ear headset with adjustable boom mike shown in fig. 2. It is a gem for hands-free operating, and its HC-4 "DX mike element" adds noticeable clarity and punch to your signal while minimizing road noise. Heil's address is: Heil Ltd., No. 2 Heil Drive, Marissa, IL 62257 (phone 618-295-3000).

As a perfect finishing touch to your setup, install gold-and-teslon PL-259s on the coax cable. As you probably know, gold is a superb electrical conductor and teflon is a super insulator. These top-grade connectors are available at quite reasonable costs from The Radio Works, Box 6159, Portsmouth, VA 23703.

Need more guidance on mobiling? My new *Modern Amateur's Mobile Handbook* is now rolling off MFJ's new presses. You can order it toll-free from 1-800-647-1800. W6AAQ also has a very good book entitled *40 Years of Mobileering*. It is available directly from Don, W6AAQ. The books complement rather than compete with each other. Check them out!

### New Antenna Goodies

A couple of neat mobile antenna items were announced during late 1989, so I naturally added them to my own paraphernalia. You may also find them attractive for your mobile setup, so here is the story.

Our first item is Hustler's new MO-4 mast and extension tip rod package for assembling a Mini Hustler antenna. The MO-4 is only 21 inches tall, and its tip rods are 26 inches. They are used with your present RM/RM-S series Hustler resonators to assemble an HF antenna with an overall height between 40 inches for 10 meters and 70 inches for 80/75 meters. You simply change tip rods, screw its resonator onto the MO-4 mast, and *viola*—a nice and unobtrusive Sunday antenna for your Caddy or BMW.

I mounted my Mini-Hustler on the trunk lid of XYL WB4OEE's Mercury Topaz as shown in fig. 3. I double checked the mount's ground, fired up the rig, and croaked—super high SWR. After a full day of rechecking and retuning, I called Hustler's service department. They double checked and sure enough, it didn't work. The boys handled it beautifully, however, and we had the solution two days later. Tip rod dimensions on the original MO-4 instruction sheet only worked with super/kilowatt resonators. Dimensions for regular/300 watt resonators are significantly different, and you probably will not be able to tune them without a ball-park guide. Hustler thus revised their MO-4 sheet's dimensions, and the new dimensions are now being included in all MO-4 packages. It is also shown in fig. 4 to assist present MO-4 system owners and amateurs purchasing



MO-4 packages from a dealer's existing stock. If you want to be a good Elmer, make a copy of fig. 4 and pass it on to your local dealer or post it on your club's bulletin board. Now back to our tale of two Hustlers.

Using fig. 4's dimensions I reassembled the Mini Hustler for 10 meters, and it worked right off the bat. I tweaked its center frequency with two 1/4 inch adjustments, and its 1.5 to 1 SWR bandwidth was 400 kHz. A test contact and comparison against a full-size Hustler indicated the "Mini's" signal was approximately one S-unit or 3 dB weaker—a reasonable

compromise for an HF whip that slips into parking decks and garages without folding.

Now for some notes. Since the MO-4 mast was unusually heavy (a lead pipe!), I switched to a 20 inch bottom section from my Texas Bugcatcher shown in part one. A 1/4 inch readjustment of the tip rod was the only necessary correction for this mod. My new ultra-lightweight "Mini" is shown in fig. 5. Another point (or opinion): While all Hustler resonators will work with the MO-4, I consider using this miniature antenna on 40 or 80/75 meters like putting air brakes on a turtle. It is

### Approximate Exposed Tip Rod Lengths

Band (meters)	Standard Resonator's Length	Super/Kilowatt Resonator's Length
80	34 1/2"	23"
40	27 1/2"	26"
30	14 1/2"	not manufactured
20	14 1/2"	16 1/2"
17	21 1/2"	not manufactured
15	15 1/2"	15 1/2"
12	16 1/2"	not manufactured
10	11 1/2"	17 1/2"

Note: These dimensions for use with MO-4 mast. Also: Add two inches to all dimensions for insertion into a resonator's tip rod receptacle.

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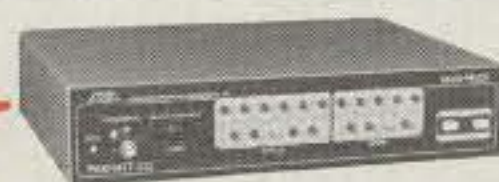
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Fig. 4- Revised dimensions for the new MO-4 Mini Hustler. Pass along this information to friends having problems with early production Mini Hustlers.

simply too much coil and not enough whip.

The acid test then followed. I readjusted my 30 meter resonator's tip rod a'la fig. 4, snapped it on the MO-4, fired up my 20 watt Kantronics single bander on 10.109 MHz, and answered K6SS's CQ. He returned immediately with a 58 report, and my (the XYL's) car was in an RF hole! Steep embankments blocked it in two directions and apartment buildings blocked it in the other two directions. My little 4 foot antenna was actually below ground level and comparable to using a center-loaded 19 inch antenna on 10 meters! As I have said before, 30 meters is one great QRP band! Further checking the Mini 30 with my big rig and Diamond SWR bridge indicated a 1.5 to 1 bandwidth of 20 kHz and an unexplained reduction of RF output. Hmmm... base impedance matching was obviously needed, and that brings us to another new item you will like.

WD4BUM, the manufacturer of popular "Ham Stick" mobile antennas, recently announced his low-loss base impedance matching coil for HF whips. Helically-loaded antennas like the Ham Sticks, Valor, Ten-Tec, etc., need some type of feedpoint matching. Small capacitors added between the whip and ground are the usual answer, but one is required for each band and their leads break after umpteen bandchanging wiggles. Enter the new inductive match shown in fig. 6. You install it by unscrewing a whip, centering the coil and its spade lug on the whip's bottom section, then refitting the whip and connecting the tap lead to a ground screw. The tap lead's alligator clip is then moved between coil turns until an optimum impedance match is achieved. Not only does a base coil provide better matching and greater transfer of RF energy to the antenna, but one coil can be used on all HF bands by simply moving its tap.



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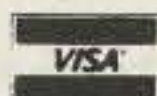
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- **Harmonic Suppression** Down 60DB @ Rated Output
- **Intermodulation Distortion** Down 30 DB Minimum
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- **Cabinet Size:** 14 3/4" x 14 3/4" x 6"
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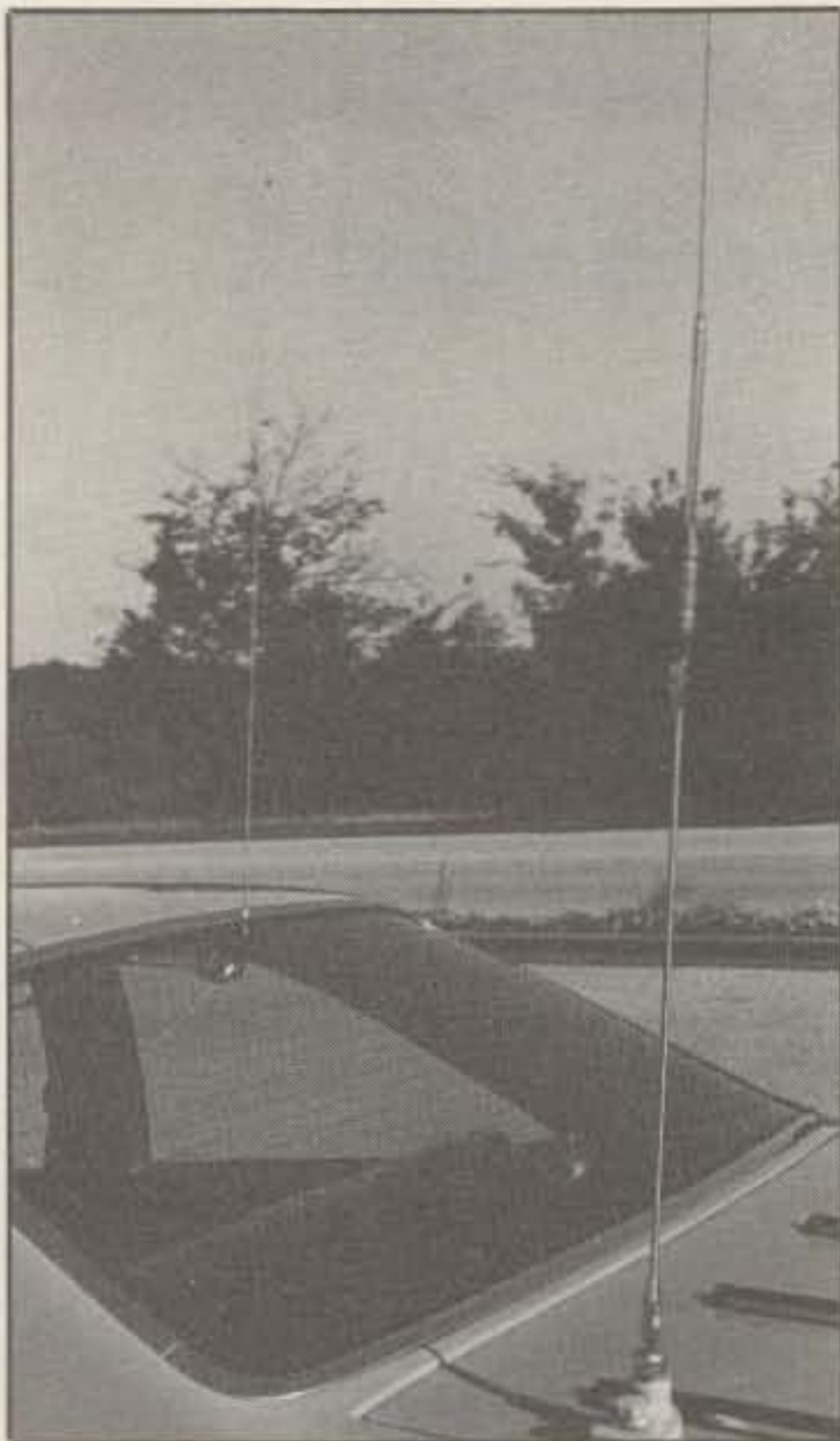


Fig. 5- My "homebrewed" ultra-light-weight Mini Hustler. A bottom rod from a Texas Bugcatcher replaces original MO-4 mast. My arrangement is not suggested for Hustler resonators larger than the RM-20.

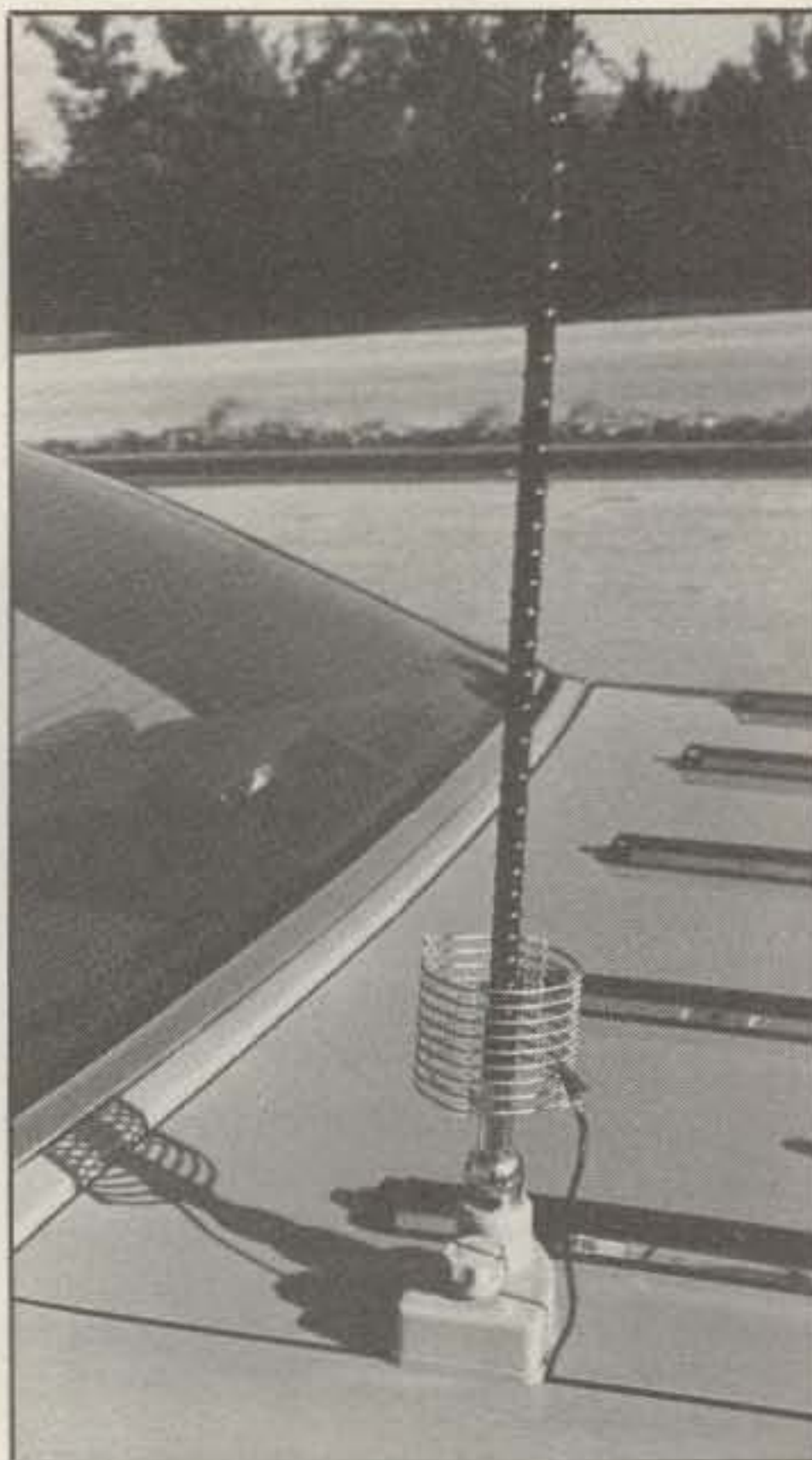


Fig. 6- WD4BUM's new base impedance matching coil for HF antennas. Coil installs in less than a minute and makes a noticeable improvement in the antenna's radiation efficiency.

The WD4BUM matching coil worked beautifully with my 20 and 30 meter Ham Sticks (good low-cost antennas with low wind resistance), so I confidently added it to the 30 meter Mini Hustler discussed earlier. The improved impedance match allowed my 100 watt transceiver to deliver its full output to the antenna. Nice! Remember this goodie when you are striving to assemble a high-performance mobile setup. It is a gem.

*Flash:* We recently talked mobile-to-mobile with Wes, WB0UVN, and he home-fabricated a super mobile mount for today's bumperless cars (see fig. 7). It consists of heavy aluminum formed with

a bending brake to exactly fit in his Oldsmobile's trunk lid. Three large screws and bolts hold it in place, and a large ball mount on its top holds Hustlers like a bulldog. The mount is painted to match the car. Clever!

### Finale

As we wrap up this two-part feature on mobiling, I must also emphasize that you are not limited to "in motion" travel to enjoy hamming from the car. Indeed, some of my most unique contacts were conducted while stopped in a shopping

mall's lot or parked beside the office during lunch. In this respect, the mobile setup could be compared to a modified version of a 2 meter handheld. The difference is its larger "carrying case" for the rig and its worldwide range. This portable/mobile idea is especially appreciated when vacationing at a previously unseen condo or cottage. I have been faced with that situation more times than the law allows, and carrying my own ready-to-operate setup has been a sheer blessing. When installing my trunk-stored rotary dipole or R-5 half-wave vertical was not possible, I simply tucked the transceiver under one arm and headed for the car. In fact, I plan to use this concept for operating from Ono Island during the coming month. Visitors are not allowed to stay on Ono Island unless they own property, so I

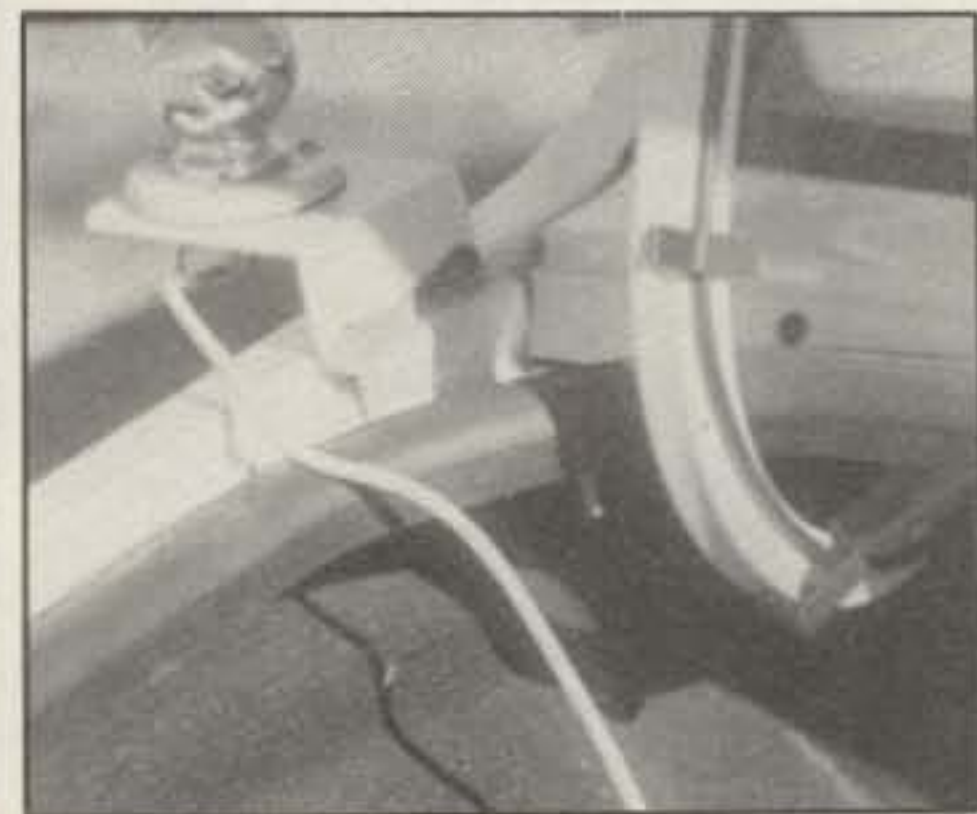


Fig. 7- WB0UVN's homebrewed antenna mount is a neat idea other mobileers should consider. It is the next best thing to body mounting, and the holes will not lower the car's resale value.

plan to operate fixed-mobile from some of its dock areas. Assuming I survive that venture (and aeronautical mobile operation from an open bi-plane with rigs strapped to me "parachute style" along the way), my next step is OSCAR satellite and Novice/WARC band operation from the Caribbean. I have a C6A license in hand, but need advice on a ham-favoring cottage or hotel. Other islands like Martinique also look great. Maybe you have some suggestions on licensing and lodging.

Let's now conclude with some previews of coming attractions—err, column features. Some really beautiful classic rigs you can build are lined up for next time: a simple two-tube "Globe Trotter" receiver right out of the golden 30s, an acorn-tube transmitter, and a wood-frame 6L6 rig. Does a single 117N7 transmitter also sound interesting? Following columns will highlight the new microsats, whys and hows of SSB digital audio, and more keys. The year is looking great; stay with me and I will keep you informed on all the action!

73, Dave, K4TWJ

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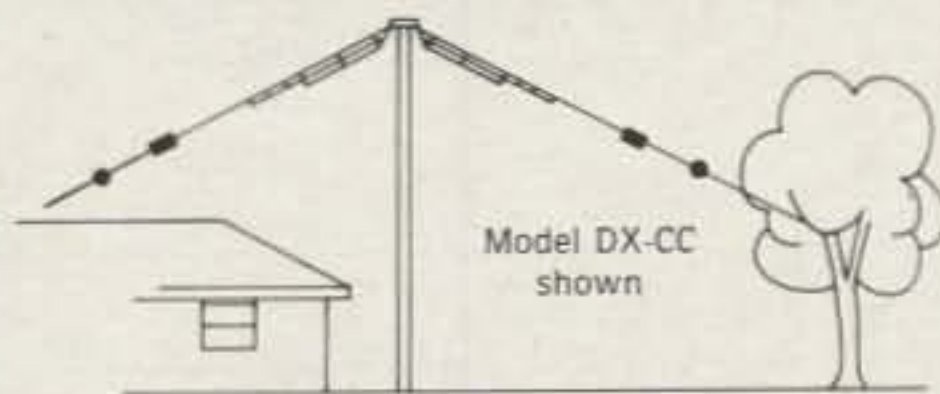


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## CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

### Building A "CONVERS" Conference Node!

Soon after the article about the CONVERS node ("CONF") appeared on page 44 of the October 1989 issue of CQ, I began receiving mail as though the post office was giving quantity discounts on stamps. There are many questions about how we build the CONVERS nodes that we described in that article. Here in middle Georgia we are using the same type on 145.050 MHz as Jack, N700, is using on 28.195 MHz LSB (1200 BPS) in southeast Arizona. Perhaps I've awakened some sort of sleeping giant with that short article, because requests for more information about it continue to arrive at my central Georgia QTH.

At this writing Jack, N700, and I are discussing the possible addition of another CONVERS node similar to the "CONF" node. This one will be a 2400 BPS CONVERS node that will be on a nearby frequency, and it will be a stand-alone CONVERS node that will relieve some of the traffic that has hit the "CONF" since the article first appeared last October. The present "CONF" node is handling a large group at 1200 BPS each afternoon and evening. The second reason for adding the second CONVERS at 2400 BPS is to try moving traffic to and from it at a faster speed, and at the same time to introduce many packeteers to the useful aspect of the higher speed and to Phase Shift Keying.

Next month we will cover how we add the 2400 BPS modem to the TAPR TNC-2 and clones. We will also cover some of the TNCs which are not clones and how they can be made to operate at 2400 BPS.

#### There is a Method to The Madness

The only problem encountered thus far with the CONVERS node is the time it takes to send the packets to each station and to "ACK" each packet received from those stations.

There is a way to circumvent the packet(s) being sent to every station in the roundtable, and that by using the **/Mes-**

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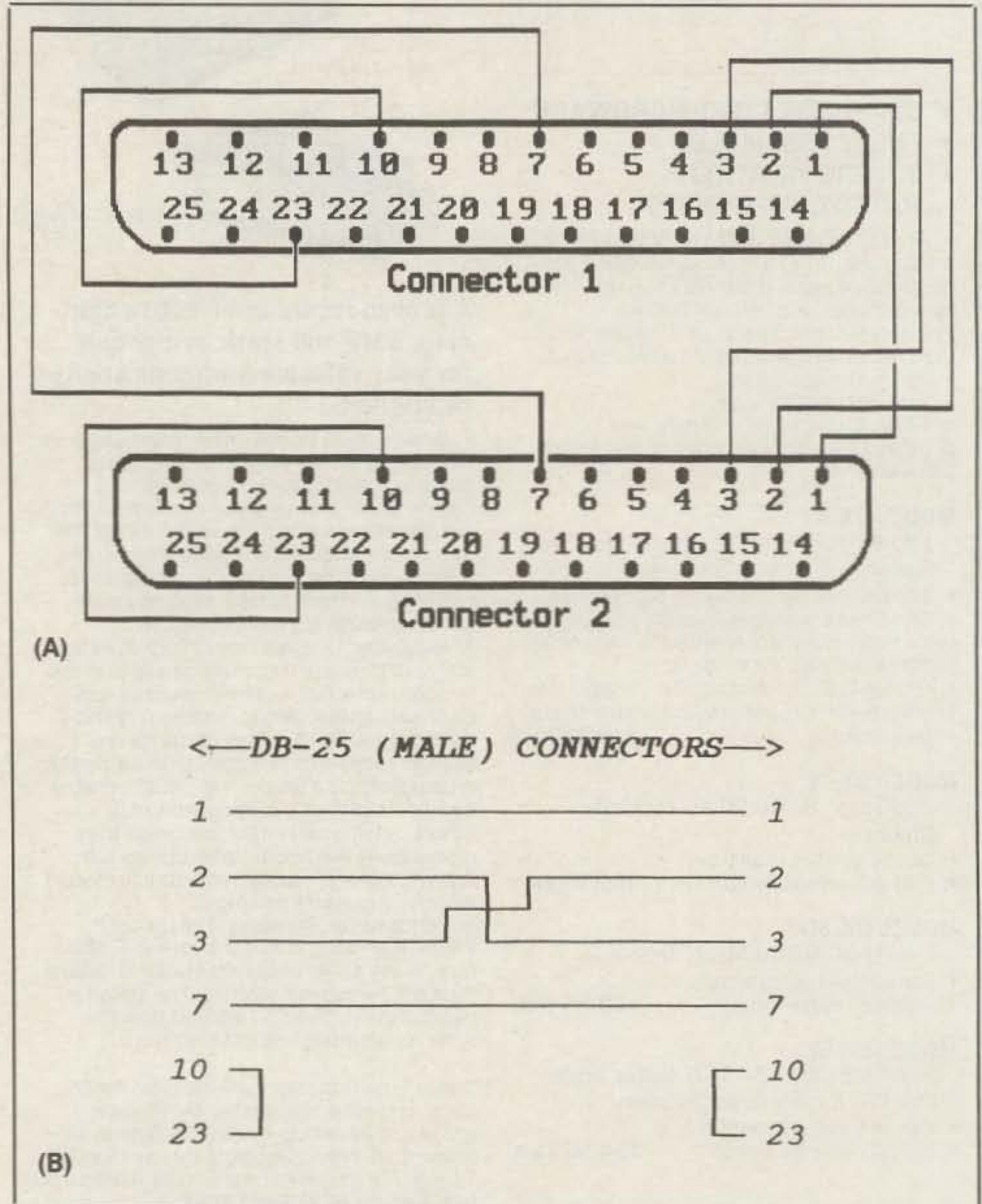


Fig. 1—(A) Special cable for NETWORK node to CONVERS node gateway interfacing. Note that lines from pin 2 and 3 of connector 1 are reversed at connector 2. (B) Dual port (gateway) "special" RS-232 cable.

sage (CALLSIGN) feature of the CONVERS node. This is part of the HELP menu which you receive when you connect to the CONVERS node for the first time.

Perhaps soon I'll detail the manner in which we build the 2400 BPS node, and this too will help your LAN to utilize the same methods to move the net and

roundtable sessions at a much faster pace.

#### It Has Many Uses and Applications

In a stand-alone environment this CONVERS node can be used for networking,



since it is supported in the node tables of other nodes. Even though the CONVERS node is a "TERMINAL" node, it can double as a digipeater.

The CONVERS node enables the Local Area Network (LAN) users to incorporate the system for roundtables and swap-shop nets.

Perhaps one of the best applications that we've used it for is the "weather-watch" node. Several stations can be connected to the same channel within the CONVERS node, and all connected stations on the weather watch channel within the CONVERS node can receive the same information. The station disseminating information will only need to send the weather information or bulletin once. The local CONVERS node certainly got its workout during the hurricane Hugo threat a few months ago. Since that time the 05 LAN has added gateways and nodes to link central Georgia to the Georgia and South Carolina coastal areas.

This brings up another application of the CONVERS node. During the pending danger of the storm and following a catastrophe, the CONVERS node can be utilized to pass health and welfare traffic in a net or roundtable manner.

### User Easy

The CONVERS node supports multiple on-line conferences or roundtables be-

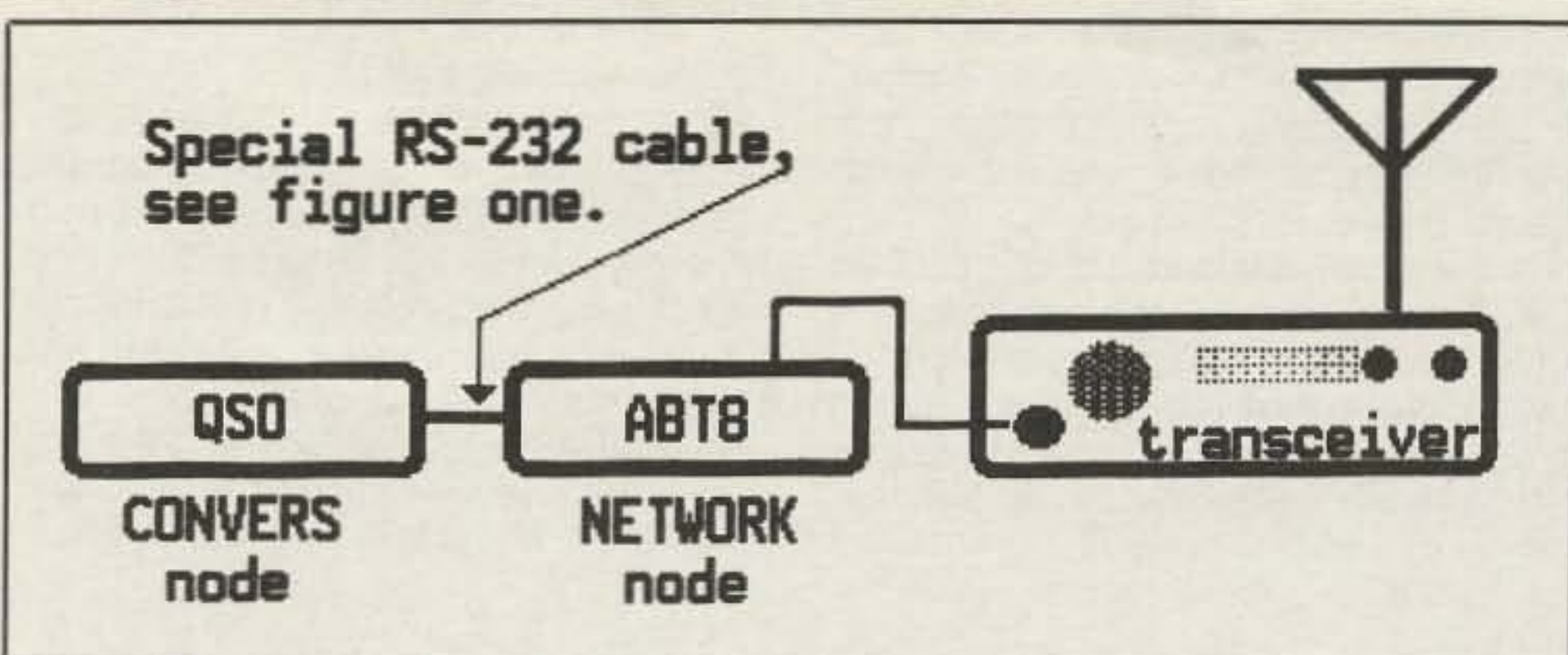


Fig. 2- This pictorial illustrates the manner in which the CONVERS node is connected to the NETWORK node for "gateway" connecting.

tween keyboard users. It can be connected to in the same manner as any networking node. After making the connect, press the < enter > key once to initialize the connect, and you're on your way.

The code is burned into a 27C256 EPROM which fits into the TAPR TNC-2 or clones, such as the PAC-COMM TNC-200, Tiny-2, Micro-Power, and the MFJ Enterprises MFJ-1270B and MFJ-1274.

The callsign of the CONVERS will appear in the net-type node tables just as any other node will appear. It will allow connecting in the same manner as the net-type node. The difference is that the

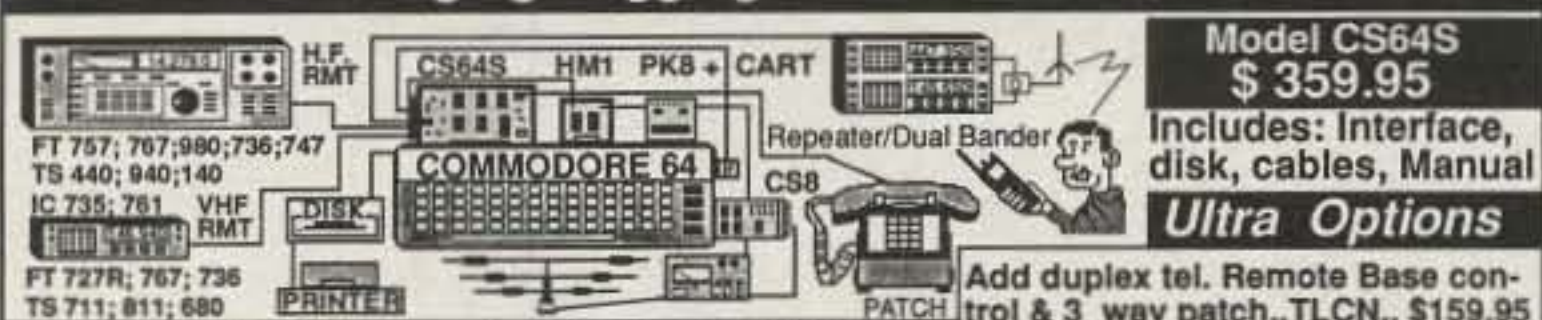
CONVERS will only digipeat; it will *not* allow calls to be made "from" it. The CONVERS node is a "TERMINAL" node!

The CONVERS node operates as a stand-alone system or it may be used with a cluster of nodes.

### Let's Get Busy

The current production TAPR TNC-2 and clones come equipped with 32K RAM, and they are already modified to receive the CONVERS node EPROM. The gateway modification that uses a jumper from pin 1 of JMP 9 to pin 23 of the RS-232 con-

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necter is the only modification to be made to the late-model TNC-2 clones. It is not necessary to make this modification if the CONVERS node is to be used in a "stand-alone" configuration.

In the event you have one of the older TNC-2 clones that do not have the modifications already made to it, then the following information may be of some help to you. The CONVERS node functions best when they are equipped with 32K of RAM. Let's look at how we increase the RAM from 16K to 32K as we begin our project.

### Increasing TNC Brain Power, or "Adding 32K of RAM"

1. Remove all power from the TNC-2.
2. Remove the cover by removing the mounting screws on the side of the cabinets.

3. Remove JMP5 jumper. This disconnects the lithium battery.

4. Remove 8K RAMs at U24 and U25.
5. Remove the circuit board from the bottom plate. Cut the trace that is connected between the center pad and the pad closest to R29 of JMP 12. Connect a jumper wire between the center pad and the pad closest to C28 of JMP12.

A removable jumper for JMP 12 is provided. Remove the jumper from pin 2 and 3 of JMP 12 and install it on pin 1 and 2 of JMP 12.

6. Install 32K RAM chip at U25 (U24 will be left empty). Some 32K RAMs which may be used are NEC 43256C-15L, Hitachi HM64456L-15 or HM62256L-15, and Toshiba 55257PL-15.

7. Carefully remove the EPROM (U23, 27256) from the TNC-2 board. *Make note of the orientation of the IC.*

8. Install the new CONVERS node (27C256 EPROM) firmware on the TNC-2

board at U23. Make sure that *no* IC pins are bent under the IC or left outside the socket. Make sure that the notch on the IC is pointed in the same direction as the original EPROM.

9. Install JMP5 jumper.
  10. Replace the cover of the cabinet.
- If you plan to use the CONVERS node in conjunction with a standard network node, then you should make this final modification to the TNC-2.

Connect a wire from pin 1 of JMP 9 to pin 23 of the RS-232 connector. Be sure to construct the TNC-to-TNC cable as illustrated in fig. 1. Notice the jumper from pins 10 to 23 at each end of the interface cable on the DB-25 connector. Double check all wiring and connections!

### A New Era for Your LAN is About to Happen

This addition to the TNC-2 sets into motion a new era of packet communications for your LAN. Connect the CONVERS TNC to a stand-alone node (if used) using the specially constructed RS-232 cable, or make the TNC to radio connection and let's make the initial tests:

Attach your standard RS-232 cable (pins 2, 3, 4, 5, and 7 connected end to end) to the RS-232 port and set the terminal program to the correct settings or those to which you have configured the DIP switch on the TNC.

After you've made the necessary hardware modifications, connect the TNC to a terminal and turn on the power. You should get a "CONVERS NODE" sign-on message.

Now verify the node alias and callsign. Next perform an **ESC C** <enter>. This should give you the "CONNECTED to:" etc. Now press a **I/H** <enter> (no spaces). The CONVERS node should respond with the HELP menu.

Try any of the commands listed in the menu, and ascertain that everything is working as it should. If both a network node and the CONVERS node are to be combined, you will need to construct the special interconnecting cable shown in fig. 1.

Do an **ESC-D** to disconnect, or you may exit by using one of the "E"xit (**I/E**), "B"ye(**B**), or "Q"uit(**Q**) commands listed in the HELP menu. Finally, remove the terminal-to-node/TNC cable. I strongly recommend operating the system in a "test" environment until you are happy with the CONVERS node's behavior and operation. Be sure the two nodes have different SSIDs and a different alias in each. Make certain that both callsigns are correct.

Once connected, configured, and with the correct callsigns, you will be able to "GATEWAY" between the node and the "CONVERS" node, if it is configured as a "piggy-backed" or node "add-on" (see fig. 2).

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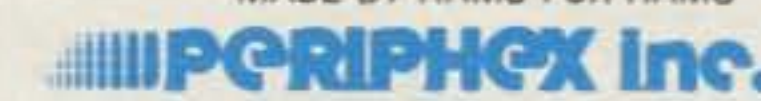
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CIRCLE 55 ON READER SERVICE CARD



## THE SCIENCE OF PREDICTING RADIO CONDITIONS

### 1990 Looks Like a Great Year—Perhaps the Greatest!

As expected, the past year, 1989, was a great year for worldwide propagation on the HF amateur bands. Conditions during 1990 are expected to be even better.

The latest 11-year sunspot cycle, Cycle 22, rose rapidly during 1989 from a level of 142 in January to an estimated level of 190 by the year's end. It is expected to reach its maximum level of intensity during early 1990, with a possible count of 192 or greater. This will mark Cycle 22 as one of the strongest cycles observed during the 250 years that sunspot records have been kept. There is a fairly good chance that Cycle 22 may even surpass the record maximum of 201 established during 1957.

Solar activity during 1990 is expected to range between a level of 191 in January, through its peak value, then slowly decline, reaching approximately the 141 level by the end of the year. Considering the natural relationship that exists between the sunspot count, solar radiation, the strength of the ionosphere, and propagation conditions on the HF bands, an exceptionally strong ionosphere is expected during 1990—certainly the strongest since 1957, and perhaps the strongest ever. This means that HF propagation conditions during the new year should be better than they have been for the past 33 years, and perhaps better than ever before!

#### The Course of Cycle 22

According to worldwide records compiled by the Royal Observatory of Belgium, the monthly median sunspot number for September 1989 was 177. Daily values fluctuated from a low of 80 on September 25th to a high of 296 on the 9th. This results in a 12-month running smoothed sunspot number of 149 centered on March 1989. A smoothed sunspot number of 191 is forecast for January 1990.

The 10.7 cm solar flux level for September 1989 was 228, as reported by the Algonquin Radio Observatory in Ottawa, Ontario.

Fig. 1, provided by the Space Environment Laboratory of the National Oceanic and Atmospheric Administration, Boulder, Colorado, depicts graph-

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#### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for January 1990

Propagation Index.....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 1-2, 5, 19, 21, 24, 27-28	A	A	B	C
High Normal: 3-4, 6-7, 18, 20, 22, 25-26, 31	A	B	C	C-D
Low Normal: 8, 11-13, 16-17, 23, 29-30	A-B	B-C	C-D	D-E
Below Normal: 9, 14-15	B-C	C-D	D-E	E
Disturbed: 10	C-E	D-E	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9.  
 B—Good opening, moderately strong signals varying between S6 and S9+, with little fading or noise.  
 C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.  
 D—Poor opening, with weak signals varying between S0 and S3, and with considerable fading and noise.  
 E—No opening expected.  
 3dB per S-Unit.

#### HOW TO USE THIS FORECAST

1. Find propagation index associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the propagation index, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a propagation index of 3 will be excellent (A) on January 1-2, good (B) on the 3rd and 4th, excellent (A) on the 5th, good (B) on the 6th and 7th, etc.

ically the rise of Cycle 22 to date for both smoothed sunspot numbers and smoothed values of 10.7 cm solar flux. Note that the present cycle appears to be well on its way to being perhaps the most intense cycle ever recorded. According to fig. 1, the peak should occur 42 months after the start of the cycle, or by March 1990. There is a 90% chance that the peak count will fall between 175 and 230, with a median prediction of approximately 205. If this comes to pass, Cycle 22 would be the most intense ever recorded. Incidentally, SEL came closest to predicting the course of the previous sunspot cycle, Cycle 21.

Another source for the prediction of Cycle 22 during 1990 is the Solar-Terrestrial Physics Division, National Geophysical Data Center, Boulder, Colorado. They predict a peak of 192 ( $\pm 33$ ) for February 1990.

On the other hand, Dr. A. Koeckelenbergh, Director of the Royal Observatory of Belgium, the world's official keeper of solar data, predicts that the peak of Cycle

22 may have already occurred with a count of 179 during September 1989.

The new year will certainly be an exciting one, and we should know by the year's end which prediction came closest to fact.

#### Flash Report of CQ WW DX Contest Phone Weekend

According to worldwide observations made during the CQ WW DX Phone Contest weekend of October 28 and 29th, conditions were normal or better, with no significant degradations. The 10.7 cm solar flux level was 170 on the 28th and 174 on the 29th. The geomagnetic A-index on a world-wide basis was 10 on both the 28th and 29th. On the CQ scale, from initial reports it looks as if both days were High Normal for most of the time and to most areas of the world.

#### January Conditions

During January it should continue to be a toss-up between 10 and 15 meters for best DX propagation honors during the daylight hours. Both bands are expected to open to all areas of the world often with exceptionally strong signals. Ten meters should have a slight edge from mid-morning through the early afternoon hours, while conditions on 15 meters should be optimum during the late afternoon hours and into the early evening. Excellent short-skip openings are forecast for 10 meters during the daylight hours for distances between approximately 1200 and 2300 miles. Similar short-skip conditions are expected on 15 meters from shortly after sunrise through the early evening hours for distances between 1000 and 2300 miles.

Excellent propagation conditions are forecast for 20 meters, for both DX and short-skip openings, just about around-the-clock. For DX openings conditions should peak shortly after sunrise and again during the late afternoon and early evening hours, often to as late as midnight. For short-skip openings less than 1000 miles, conditions are expected to be optimum from mid-morning through the late afternoon hours; for openings between 1000 and 2300 miles, optimum conditions are expected during the late afternoon and early evening. Frequent



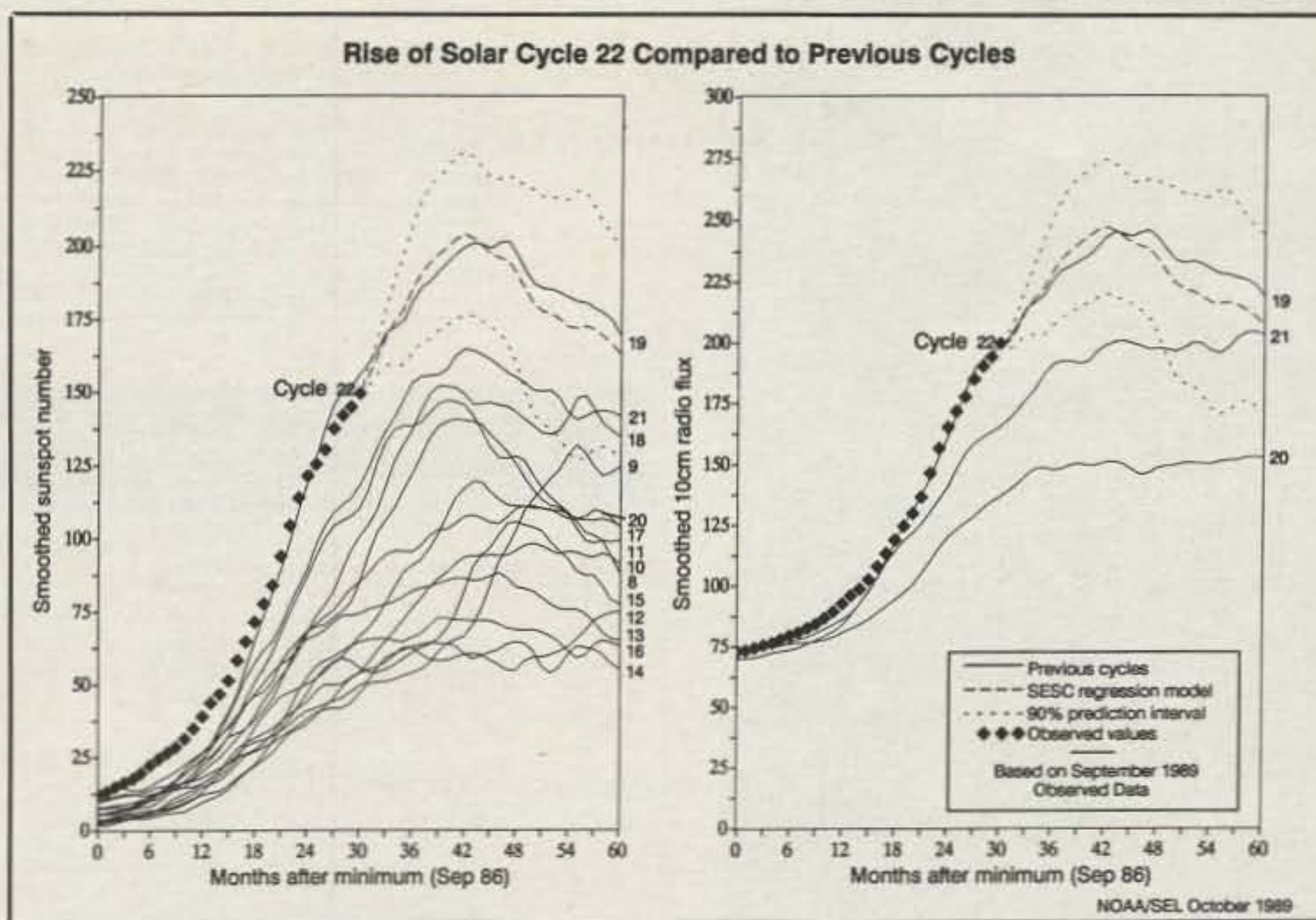


Fig. 1— Rise of solar Cycle 22 compared to previous cycles.

short-skip openings are also forecast for this band during the hours of darkness.

Excellent DX conditions are forecast for 40 meters during January, with openings expected to all parts of the world from shortly before sundown, through the hours of darkness, and until shortly after sunrise. During the daylight hours short-skip conditions should be optimum for openings between approximately 100 and 600 miles. Skip is expected to lengthen during the late afternoon, and by nightfall short-skip conditions should be optimum for openings between approximately 800 and 2300 miles.

Fairly good DX openings are also forecast for 80 meters to many areas of the world during the hours of darkness. Optimum short-skip conditions for openings between approximately 50 and 250 miles should occur during the daylight hours. During the late afternoon and early evening short-skip openings should increase to distances between 250 and 1500 miles, and by nightfall openings up to and beyond 2300 miles should be possible.

DX openings to some areas of the world should be possible on the 160 meter band during the hours of darkness. Short-skip openings up to a distance of 1300 miles also should be possible on a regular basis during the hours of darkness, and frequently the skip will extend out as far as 2300 miles. Daylight absorption will limit openings severely during the daylight hours, with only very infrequent openings possible up to distances on the order of 150 miles or so.

All-in-all the New Year is off to a good start. January should be a good month for propagation conditions on all HF bands. Atmospheric noise levels (static) should

also be at their lowest values of the year in the northern hemisphere, and signal levels are expected to be exceptionally strong during many band openings.

### Short-Skip Charts

This month's column contains a Short-Skip Propagation Chart for use in the continental United States for distances between 50 and 2300 miles. (The maximum distance generally possible for one-hop, short-skip propagation is 2300 miles.) Special prediction charts centered on Hawaii and Alaska are also included. The charts appearing in this month's column are valid through the months of January and February 1990. See last month's column for detailed DX Propagation Charts for use during January.

### VHF Ionospheric Openings

Unusually good DX openings on 6 meters to many areas of the world should continue through January. Look for peak conditions towards Europe and Africa an hour or two before noon, and towards the Caribbean area and Central and South America from an hour or two before to about an hour or two after noon. Check for 6 meter openings towards the Pacific, Australasia, and the Far East during the late afternoon and into the sunset period. Trans-continental openings should be possible beginning at about noon. Chances are best for 6 meter openings during January on those days expected to be High or Above Normal (see the Last Minute Forecast at the beginning of this column).

The *Quadrantids*, a major meteor shower, should take place between January 1st and 3rd. Expect a peak of approximately 40 meteors an hour on January 2nd. There should be sufficient ionization produced by this shower to permit meteor-type openings on the VHF bands.

A seasonal slump is expected in trans-equatorial (TE) propagation conditions during January. Some infrequent openings should be possible, however, between southern tier states and countries well south of the equator in this hemisphere. The best time period to check for T.E. openings on 6 meters is between 7 and 10 PM local time.

The best time to check for auroral-scatter openings and other forms of sporadic-E propagation on both 6 and 2 meters is during periods of radio storminess. Check the Last Minute Forecast for those days during January that are expected to be Below Normal or Disturbed.

73, George, W3ASK

#### HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (10 through 40 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An \* indicates the best time to listen for 80 meter openings.

2. The *propagation index* is the number that appears in ( ) after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

- (4) Opening should occur on more than 22 days
- (3) Opening should occur between 14 and 22 days
- (2) Opening should occur between 7 and 13 days
- (1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific *propagation index* is likely to occur, and the signal quality that can be expected.

3. Times shown in the Charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. On the Short-Skip Chart appropriate *daylight* time is used at the *path midpoint*. For example on a circuit between Maine and Florida, the time shown would be EDT, on a circuit between N.Y. and Texas, the time at the midpoint would be CDT, etc. Times shown in the Hawaii Chart are in HST. To convert to daylight time in other USA time zones add 3 hours in the PDT zone; 4 hours in the MDT zone; 5 hours in the CDT zone; and 6 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 15 or 3 P.M. in Los Angeles; 18 or 6 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to *daylight* time in other areas of the USA subtract 7 hours in the PDT zone; 6 hours in the MDT zone; 5 hours in the CDT zone; and 4 hours in the EDT zone. For example, at 20 GMT it is 16 or 4 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts c.w. or 300 watts p.e.p. on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts c.w. or 1 kw p.e.p. on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

5. Propagation data contained in the Charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado 80302.



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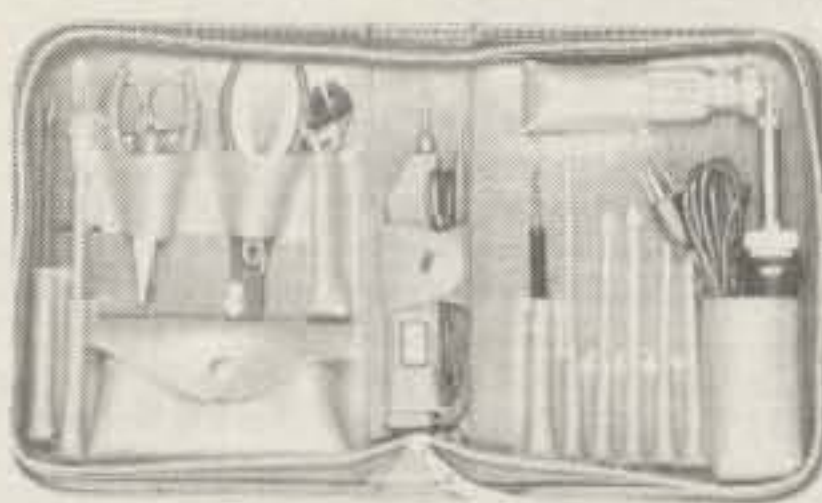
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CIRCLE 52 ON READER SERVICE CARD

## CQ Short-Skip Propagation Chart January & February 1990 Local Standard Time at Path Mid-Point (24-Hour Time System)

Band (Meters)	Distance From Transmitter (Miles)			
	50-250	250-750	750-1300	1300-2300
10	Nil	Nil	07-08 (0-1) 08-09 (0-2) 09-10 (0-3) 10-12 (0-4) 12-15 (0-3) 15-17 (0-2) 17-18 (0-1)	07-08 (1) 08-09 (2-3) 09-10 (3-4) 10-12 (4) 12-15 (3-4) 15-16 (2-4) 16-17 (2-4) 17-18 (1-3) 18-19 (0-3) 19-20 (1-2) 20-21 (0-1)
15	Nil	07-08 (0-1) 08-10 (0-2) 10-15 (0-3) 15-17 (0-2) 17-18 (0-1)	06-07 (0-1) 07-08 (1-3) 08-10 (2-4) 10-15 (3-4) 15-17 (2-4) 17-18 (1-4) 18-19 (0-3) 19-21 (0-1)	06-07 (1) 07-08 (3-2) 08-18 (4) 18-19 (3) 19-21 (1-3) 21-23 (0-1)
20	09-11 (1-2) 11-14 (1-3) 14-15 (1-2) 15-17 (0-1)	06-07 (0-2) 07-09 (0-3) 09-11 (2-4) 11-14 (3-4) 14-15 (2-4) 15-17 (1-4) 17-19 (0-3) 19-20 (0-2) 20-06 (0-1)	06-07 (2-3) 07-08 (3) 08-09 (3-4) 09-17 (4) 17-19 (3-4) 19-20 (2-4) 20-21 (1-4) 21-23 (1-3) 23-02 (1-2) 02-06 (1)	06-07 (3-2) 07-08 (3) 08-12 (4) 12-14 (4-3) 14-21 (4) 21-23 (3-4) 23-01 (2-3) 01-04 (1-2) 04-06 (1)
40	07-08 (0-2) 08-09 (1-3) 09-10 (2-4) 10-19 (4) 19-21 (2-3) 21-00 (1-2) 00-07 (0-1)	07-08 (2-3) 08-09 (3) 09-11 (4-3) 11-15 (4-2) 15-19 (4) 19-21 (3-4) 21-00 (2-4) 00-02 (1-3) 02-06 (1-2) 06-07 (1-3)	07-08 (3-1) 08-09 (3-2) 09-11 (3-1) 11-15 (2-1) 15-17 (4-2) 17-18 (4-3) 18-00 (4) 00-02 (3-4) 02-06 (2-4) 06-07 (3-4)	07-08 (3-1) 08-15 (1-0) 15-17 (2-1) 17-18 (3) 18-06 (4) 06-07 (4-3)
80	07-08 (2-4) 08-10 (4) 10-15 (4-3) 15-00 (4) 00-04 (3-4)	07-08 (4-3) 08-09 (4-2) 09-10 (4-1) 10-15 (3-1) 15-16 (4-1)	07-08 (3-1) 08-09 (2-0) 09-16 (1-0) 16-18 (2-1) 18-20 (4-3)	07-08 (1-0) 08-16 (0) 16-18 (1-0) 18-20 (3-2) 20-04 (4)

	04-07 (2-3) 18-04 (4) 04-07 (3-4)	16-18 (4-2) 18-04 (4) 04-07 (3-4)	20-06 (4) 06-07 (4-3)	04-06 (4-3) 06-07 (3-1)
160	09-17 (1-0) 17-19 (3-2) 19-06 (4) 06-08 (3) 08-09 (2-1)	17-18 (2-1) 18-19 (2) 19-21 (4-3) 21-05 (4) 05-06 (3) 06-07 (3-2) 07-08 (3-1) 08-09 (1-0)	17-18 (1-0) 18-19 (2-1) 19-21 (3-2) 21-03 (4-3) 03-05 (4) 05-06 (3-2) 06-07 (2-1) 07-08 (1-0)	18-19 (1-0) 19-21 (2-1) 21-03 (3) 03-05 (4-2) 05-06 (2-1) 06-07 (1-0)

## ALASKA January & February 1990 Openings Given in GMT #

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	17-18 (1) 18-20 (2) 20-22 (3) 22-00 (2) 00-01 (1)	15-16 (1) 16-17 (2) 17-21 (3) 21-23 (4) 23-00 (3) 00-01 (2) 01-02 (1)	12-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-02 (3) 02-03 (2) 03-05 (1)	06-12 (1) 07-11 (1)*
Central USA	17-18 (1) 18-20 (2) 20-00 (3) 00-01 (2) 01-02 (1)	15-16 (1) 16-17 (2) 17-20 (3) 20-23 (4) 23-01 (3) 01-02 (2) 02-03 (1)	12-16 (1) 16-18 (2) 18-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-03 (3) 03-04 (2) 04-06 (1)	06-08 (1) 08-13 (2) 13-14 (1) 07-12 (1)*
Western USA	18-19 (1) 19-20 (2) 20-21 (3) 21-23 (4) 23-00 (3) 00-01 (2) 01-02 (1)	16-17 (1) 17-18 (2) 18-20 (3) 20-01 (4) 01-02 (3) 02-03 (2) 03-04 (1)	12-16 (1) 16-18 (2) 18-22 (3) 22-02 (4) 02-04 (3) 04-05 (2) 05-07 (1)	04-05 (1) 05-06 (2) 06-14 (3) 14-15 (2) 15-16 (1) 05-10 (1)* 10,14 (2)* 14-15 (1)*

## HAWAII January & February 1990 Openings Given in Hawaiian Standard Time #

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	07-08 (1) 08-09 (2) 09-13 (4) 13-14 (3) 14-15 (2) 15-16 (1)	06-07 (1) 07-09 (4) 09-12 (3) 12-15 (4) 15-17 (3) 17-18 (2) 18-19 (1)	12-14 (2) 14-17 (4) 17-21 (3) 21-00 (2) 00-06 (1) 06-08 (3) 08-09 (2) 09-12 (1)	17-18 (1) 18-20 (2) 20-02 (3) 02-03 (2) 03-04 (1) 19-20 (1)* 20-01 (2)* 01-03 (1)*
Central USA	07-08 (1) 08-09 (2) 09-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (1) 07-09 (4) 09-13 (3) 13-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	08-13 (2) 13-14 (3) 14-20 (4) 20-00 (3) 00-02 (2) 02-05 (1) 05-06 (2) 06-08 (3)	17-18 (1) 18-20 (2) 20-21 (3) 21-01 (4) 01-03 (3) 03-04 (2) 04-06 (1) 19-20 (1)* 20-22 (2)* 22-01 (3)* 01-03 (2)* 03-05 (1)*
Western USA	07-08 (1) 08-09 (2) 09-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-08 (2) 08-12 (3) 12-18 (4) 18-20 (3) 20-21 (2) 21-22 (1)	08-10 (4) 10-15 (3) 15-22 (4) 22-01 (3) 01-04 (2) 04-06 (1) 06-08 (3)	17-18 (1) 18-19 (2) 19-20 (3) 20-03 (4) 03-05 (3) 05-06 (2) 06-07 (1) 19-20 (1)* 20-21 (2)* 21-04 (3)* 04-05 (2)* 05-06 (1)*

#See explanation in "How To Use Short-Skip Charts" in the box at the beginning of this column.

\*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 forecast rating of (2), or higher.

Note: The Alaska and Hawaii Propagation Charts are intended for distance greater than 1300 miles. For openings over shorter distances, use the preceding Short-Skip Propagation Chart.

Check for 6 Meter openings at times when the 10 Meter forecast rating is shown as (4).



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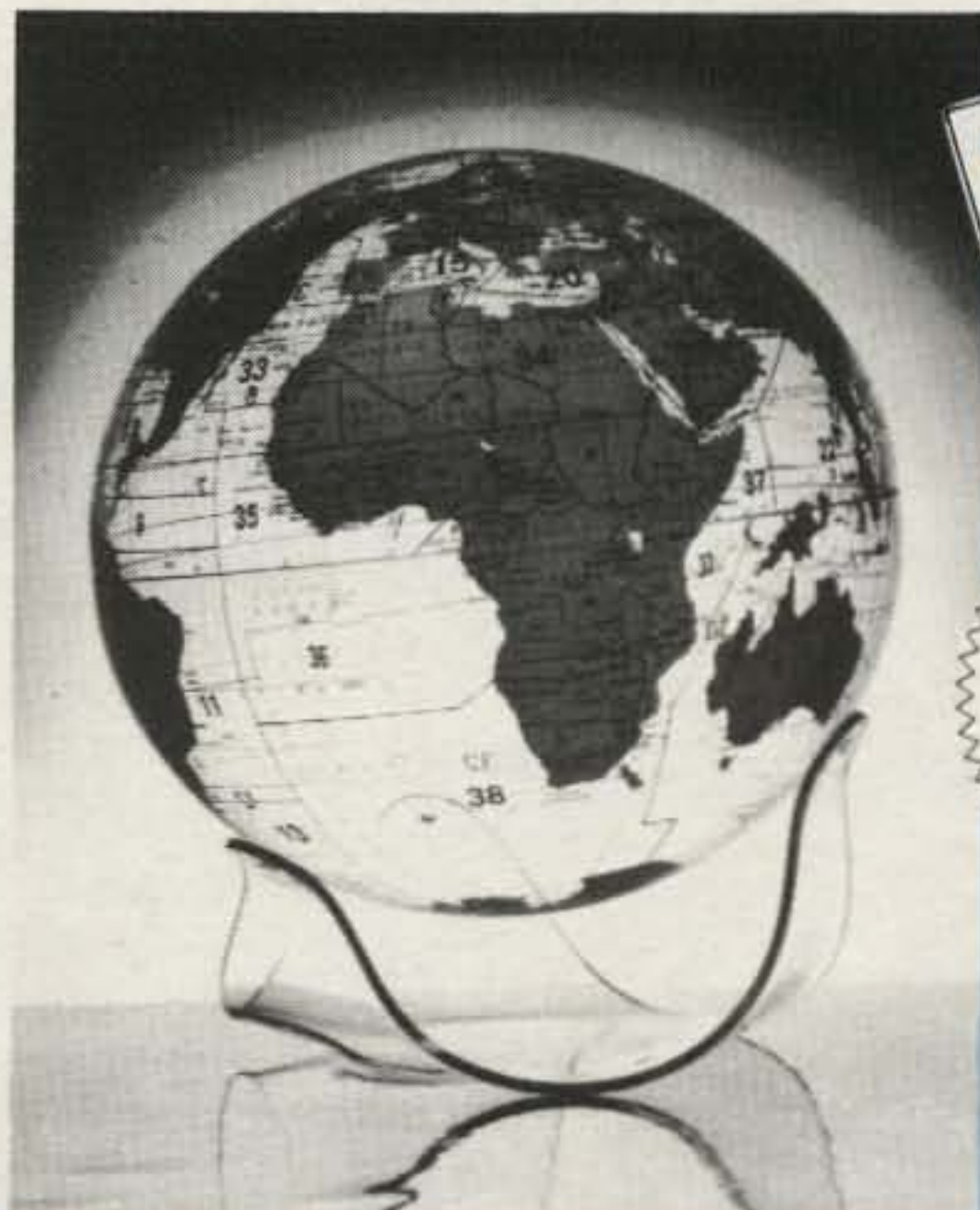
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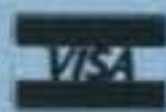
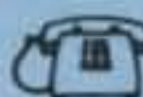
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## NEWS/VIEWS OF ON-THE-AIR COMPETITION

### Contest Expeditions

**F**or me, it was approximately 3,657 days since the last one. The 1979 CQ WW SSB Contest was the first and only time I had operated as a DX station, using the callsign HI8XWP. Since then I've heard from many amateurs that contest operating simply amounts to the useless bantering of numbers and letters, eliminating the usefulness of our sacred frequencies for more worthwhile endeavors. Perhaps through the sharing of my experiences I can shed a different light on the subject.

Beginning more than 12 months ago, I became very good friends with Luis Tino-co, TI2LTA. Aside from QSL manager duties and providing general advice on DX and contesting, Luis and I discovered a common thread—our mutual passion for operating in contests! As time progressed over the past year, we concluded that a multi-single operation in Costa Rica would be not only fun but potentially competitive. This was the beginning of an unbelievable contest experience as TI1J.

Even as I boarded the plane, I realized that contest operating was much more than exchanging numbers and letters. Coincident with my travel plans was the Americas Presidential Summit. And yes, six rows in front of my seat was the President of Uruguay (CX). Fortunately, I avoided making a scene on the plane by resisting the temptation to arrange contest schedules with CX on six bands. Arriving in San Jose rested and refreshed I began to realize, yet again, how much fun contest operating can be.

Unlike the PJ1B-like operations, I had the good fortune to walk into a completely functional contest station. We were favored with the technical/operating expertise and enthusiasm of Gerardo Guzman, TI2OY. In a large sense I felt enormous guilt as I marveled at the significant work my Costa Rican friends had completed, which without Gerry's help would not have been possible. Hoping for a vertical multiplier spotting antenna, I arrived to see a tribander Yagi at 50 feet. Expecting a TS440 multiplier station, I came to see a TS930 (the TS440 was connected to a truck battery in the event we lost power!). Luis's IC781 run station setup completed the feeling of total euphoria. It seemed that everyone contributed within the San

#### Calendar of Events

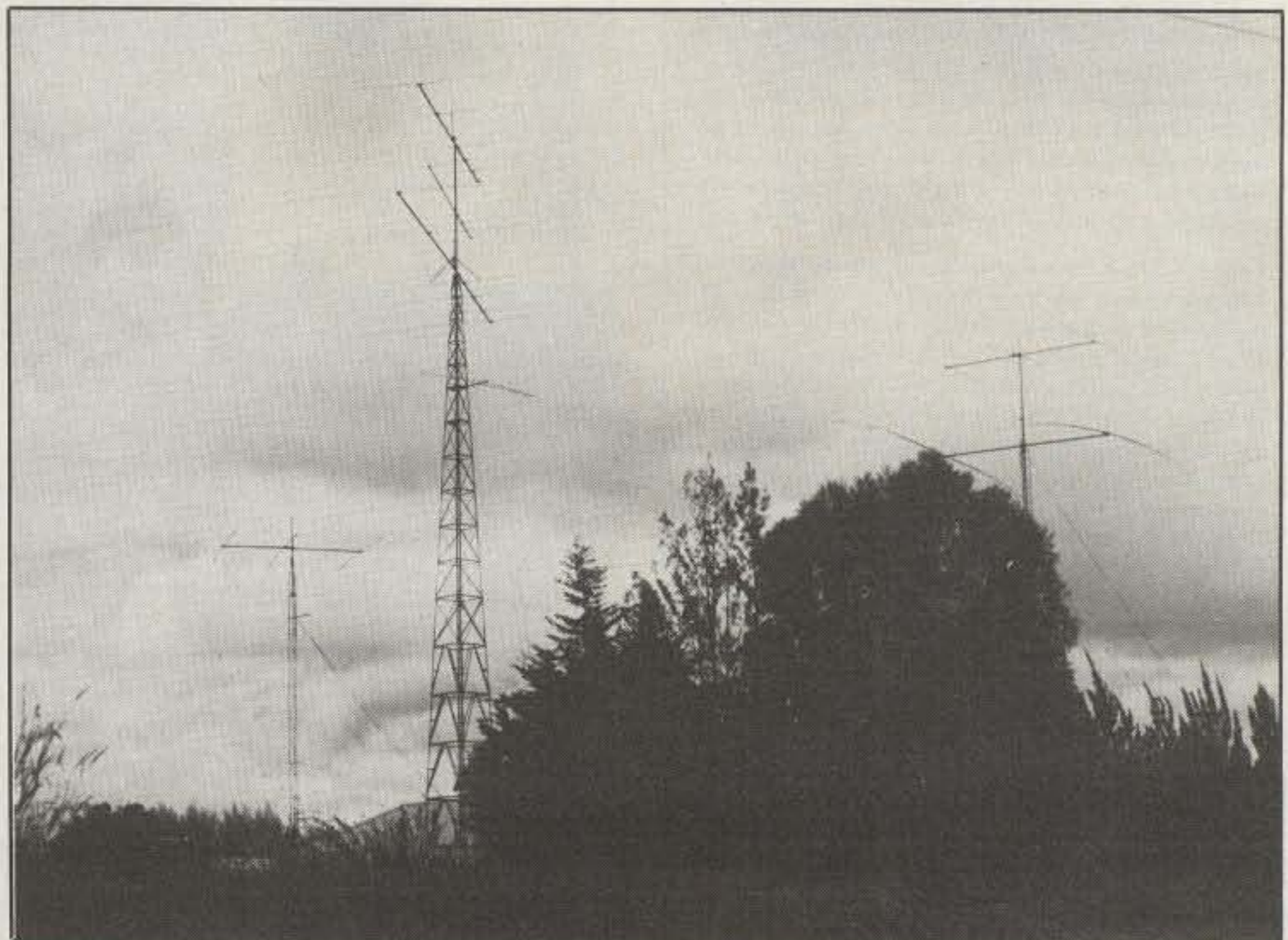
Dec. 31	CARF Winter Contest
De.31 Jan.1	ARRL Straight Key Night
Jan. 6-7	Hunting Lions CW Contest
Jan. 6-7	ARRL RTTY Roundup
Jan. 6-7	Caltech Quickie CW Contest
Jan. 13	SCCC Novice Contest
Jan. 13-14	Hunting Lions SSB Contest
Jan. 13-15	ARRL Jan. VHF Sweepstakes
Jan. 14	ARCI QRP Winter Phone Sprint
Jan. 20-21	Texas QSO Party
Jan. 20-21	North Dakota QSO Party
Jan. 20-21	Michigan QRP Club CW
Jan. 26-28	<b>CQ WW 160 Meter CW Contest</b>
Jan. 27-28	UBA CW Contest
Jan. 27-28	YL-ISSB YL/OM CW Contest
Jn.27 Feb.4	ARRL Novice Roundup
Jan. 28-29	1990 Winter Classic Radio Ex.
Feb. 3	Carnaval de Quebec CW
Feb. 3-4	Vermont QSO Party
Feb. 3-5	New Hampshire QSO Party
Feb. 10	Carnaval de Quebec SSB
Feb. 10-11	QCWA CW Party
Feb. 17-18	ARRL DX CW Contest
Feb. 23-25	<b>CQ WW 160 Meter SSB Contest</b>
Feb. 24-25	UBA SSB Contest
Feb. 24-26	Maine QSO Party
Mar. 3-4	ARRL DX SSB Contest
Mar. 9-11	Japan Int'l. CW DX Contest
Mar. 10-11	QCWA SSB Party
Mar. 24-25	YL-ISSB YL/OM SSB Contest
Mar. 24-25	<b>CQ WW WPX SSB Contest</b>



The TI1J operating crew (left to right): TI2LTA, K1AR, TI2KD, and TI2OY.

Jose area. Carlos, TI2KD, donated his tower/antenna, and TI2HP gave us VHF gear for local multiplier spotting. K1AR provided the pencils (and you wonder why I felt guilty?).

Thursday night before the contest Luis, his XYL, and I decided to enjoy a quiet dinner at a local restaurant so that we could plot our final operating strategies. It was there that we uncovered one of the many Costa Rican contesting secrets—Neptune Soup. Advertized as a meal that invigorates the mind and



The TI2LTA antenna farm.

2 Baldwin Street, Windham, NH 03087





Monday night gathering of Costa Rican amateurs at the QTH of TI2LTA.

warms the soul, we decided that it would be good medicine for our pending operation. Miraculously there was a constant supply that kept reappearing at the house during the weekend. I can't say for sure that our QSO rate increased after an individual serving, but it sure did taste good!

And so the contest began. We chose to start on 10 meters because the band sounded good and it was open to the States and Japan; 371 QSOs later that proved to have been a good decision at 0100Z. The contest was simply an event. We were loud everywhere and often had pileups so large that we had to choose random letters to weed out callsigns. This was the first time Luis had operated in a multi-single environment. It didn't take him long to learn the ropes as BY4SZ was passed to my run position on 20 meters with a light tap on the shoulder.

When all was said and done, we made 8800 QSOs and 700 multipliers (including 138 countries on 10 meters) for a claimed score approaching 15 million. Even though we didn't win (darn those 3 point guys), we experienced something that few hams will ever share.

So, you ask, what's so different about this operation? The contest operating was fun and unequalled in my experience, but the friendship, teamwork, generosity, and intangibles are what really made me realize that contesting is more than exchanging numbers. Contesting eliminates all international borders. It allows language barriers to disappear. Moreover, acquaintances become close friends and share in ways that I've never experienced in the casual 20 meter SSB QSO.

Monday night after the contest Luis invited nearly 20 Costa Rica amateurs to

his house to celebrate our operation and enjoy each other's company. We ate and drank, hugged each other and generally had an experience that I've never seen in any of my local club meetings. My friends in Costa Rica are really something to marvel at and admire. Perhaps they're typical of other contesters around the world who enjoy our hobby and want to share that excitement with others. Next time you're exchanging a "59001" with someone, take a second to think about Luis, Gerry, Carlos, and the thousands of contest operators around the world like them.

### Mike Colesante, KC8C, Silent Key

The contest community tragically lost one of its own in recent months. Mike Colesante, KC8C, was an avid contest operator, a faithful member of PVRC, and a regular at W3LPL. Mike's passing was premature as he succumbed to colon cancer at the early age of 37 years old. Mike was always known for helping others. If you would like to share in his memory, tax-deductible donations are being accepted in Mike's name and can be sent to: Mike Colesante KC8C Cancer Research Fund, c/o Mid-Atlantic Cancer Research Foundation, 2300 Eye Street NW, Suite 527B, Washington, DC 20037, USA.

### FCC Ruling— Guest Op Callsigns

Many amateurs have been confused by Part 97.119(a) of the new Part 97 concerning station identification. This rule states, in part, ". . . No station may transmit unidentified communications or

signals, or transmit as the station call-sign, any call-sign not authorized to the station." Contest operators have historically chosen to use their own callsigns when operating other stations. This is due to a variety of reasons but inevitably results from the ensuing QSL burden, call-sign familiarity, ease of call-sign, and other factors. In response to numerous inquiries (including my own), the ARRL asked the FCC for a clarification of this rule. The FCC Personal Radio Branch governing Amateur Radio replied with the following:

"When another Amateur comes to your house to operate your station, there are two possible station identification situations. First, you may designate him as the control operator of your station. Accordingly, he must identify with your station's callsign when operating within the limits of your license (He signs his call following your call when he operates with privileges that exceed yours.). You both share responsibility for the station operation as outlined above. Secondly, you may simply "loan" your equipment to your friend. The equipment in your shack then becomes his temporary station location. He is the station licensee and control operator. Remember, a station location is any place you can have radio equipment—a basement, car, or specific geographic location. In this case, he (guest operator) identifies with his own station callsign and is solely responsible for the operation of the station.

"Often hams will travel to another, more effective station to snag a rare DX country through a pileup or work a contest, and want to use their own callsign for DX or contest credit. This is fine under situation two described above."

### Final Words

This month's activities have been filled with column writing, answering volumes of QSL cards, and of course duping a 8800 QSO contest log. I've been receiving some interesting correspondence from you lately. Please keep your input flowing. Your thoughts often drive what appears in this column. Remember, the deadline for April issue is February 5th.

73, John, K1AR

### U.B.A. SWL Competition

January 1 to December 31, 1990

The U.B.A. (Belgium Amateur Radio Union) is again sponsoring this year-long competition for the benefit of SWLs.

There are five categories: Phone, CW, RTTY (AMTOR, ASCII, packet), and SSTV (FAX) for single operators. And all modes for clubs and multi-operators.

Use all 6 bands, 1.8–28 MHz.

Each station heard counts 1 point on each band. Each country heard is a multi-



plier (counted once only). Final score is total of different stations heard on all bands times the country multiplier.

To enter the competition you must report your progress to the Contest Manager on April 1 and September 1. Your final log must be submitted no later than January 20, 1990. There will be certificates and trophies to the winners in each category and area.

The U.B.A. suggests that you use their special log forms. Your requests for log forms and more detailed information should be directed to the Contest Manager. Include 3 IRCs if in Europe; 4 IRCs for all other areas (\$2 US).

Contest Manager: Marc Domen, (ONL 6945), P.O. Box 38, Borgerhout, B-2200, Belgium.

### Caltech Quickie CW Contest

1700-2100Z Sat., Jan. 6

This is a new one and only 4 hours long, so be alert or you'll miss it. The intent is to provide some operating activity to replace the void left by the cancellation of ARRL QSO Parties and the 73 Magazine World SSB Championships. US and Canadian stations work each other in this one as Single Operator, All Band, CW-only entries.

**Exchange:** Former callsign (or

"none"), name, state/province. Guest operators send their own current or former calls and their own names. Former callsigns may be any one call if you possess several.

**Scoring:** You may work a station once per band. Multiply the total number of QSOs by your state/province multiplier (count multipliers only once in the contest, not per band). The Canadian multipliers are Maritime (VE1, VO1, and VO2), VE1-7, and Yukon/NWT (VY1 and VE8).

**Frequencies:** Use 10, 15, and 20 meters only between xx.030 and xx.050 MHz.

**Awards:** There will be a trophy awarded to the highest scoring entrant. Certificates will be awarded to the highest scoring station in each state (100 QSOs minimum) and to the top ten finishers.

The usual penalty and disqualification clauses exist. Send logs to: California Institute of Technology Amateur Radio Club, Caltech 218-51, Pasadena, CA 91125. Entries must be postmarked no later than February 10, 1990 to be eligible for awards. MS-DOS formatted diskettes will be accepted as logs. Include an SASE for full rules and/or results.

### ARRL RTTY Roundup

1800Z Sat. to 2400Z Sun., Jan. 6-7

This is the second annual all-digital contest sponsored by the ARRL. Any station may work any other station worldwide. You may operate more than one digital mode, but QSOs and multipliers are counted once only regardless of modes used.

Operation is limited to 24 hours out of the 30-hour contest period. Two rest periods must be taken in two separate blocks of time and clearly marked in the log.

**Modes:** Baudot, RTTY, ASCII, AMTOR, and packet.

**Bands:** 3.5-30 MHz on those frequencies recommended for digital operation (no 10, 18, or 24 MHz).

**Categories:** Single operator, multi-band, (1) less than 150 watts output, (2) 150 watts or more. And multi-operator, single transmitter, all band.

**Exchange:** Signal report and QTH. State for the U.S., province for Canada. DX will send a serial QSO number.

**Scoring:** One point per QSO. A station may be worked once per band for QSO credit.

**Multiplier:** Each US state (48), each VE province (12), and each DXCC country, counted only once, not once per band. (KH6 and KL7 are countries; VO1/VO2 counts as one VE province).

Entries with 200 or more contacts must submit a duplicate QSO check sheet.

**Awards:** Certificates to the top-single operator, both low and high power, and multi-operator scorers in each ARRL/CRRL section, and each DXCC country.

Novice/Tech entrant with at least 50 QSOs will also receive a certificate.

Detailed information appeared in the November issue of QST. Contest forms are available from the ARRL for an SASE and two units of first-class mail and are recommended.

Postmark your entry by February 7th and send it to: ARRL RTTY Contest, 225 Main Street, Newington, CT 06111.

### SCCC Novice Contest

1700-2100Z Sat., Jan. 13

This is another quickie in the spirit of the Caltech Quickie CW Contest. The object is for U.S. Novices to work as many other stations as possible during the contest period.

**Exchange:** Consecutive QSO number, operator's name, and station's 5-digit Zip Code. Non-USA stations may substitute their age for the Zip Code.

**Scoring:** You may work the same station on SSB and CW. Final score is calculated by multiplying the total number of QSOs by the total number of final 2-digit combinations in the Zip Code multipliers (maximum 100).

**Frequencies:** The entire contest is limited to 10 meters. The first 3 hours are SSB only from 28.3 to 28.5 MHz. The final hour is CW only from 28.1 to 28.3 MHz.

**Awards:** There will be a trophy awarded to the highest scoring Novice station. Certificates will be issued to the highest scoring station in each call area (100 QSOs minimum) and to the top 10 in the final results.

The usual penalty and disqualification clauses exist. Send logs to: Southern California Contest Club, Box 4, Sierra Madre, CA 91025. Entries must be postmarked no later than February 17, 1990 to be eligible for awards. MS-DOS formatted diskettes will be accepted as logs. Include an SASE for full rules and/or results.

### ARRL VHF Sweepstakes

1900Z Sat. to 0400Z Mon., Jan 13-15

This is the 43rd ARRL January VHF Sweepstakes. ARRL Headquarters recommends that you use the official log forms. It will make your log keeping and the scoring much easier. A large SASE to Newington will get you the necessary forms.

Complete rules will be found in the December issue of QST. They are a bit complicated, so look them over carefully.

### ARCI QRP Winter SSB Sprint

2000Z to 2400Z Sunday, Jan. 14

Like the "Homebrew" CW Sprint last month, this is also a 4-hour shorty with a similar format except for the homebrew feature.

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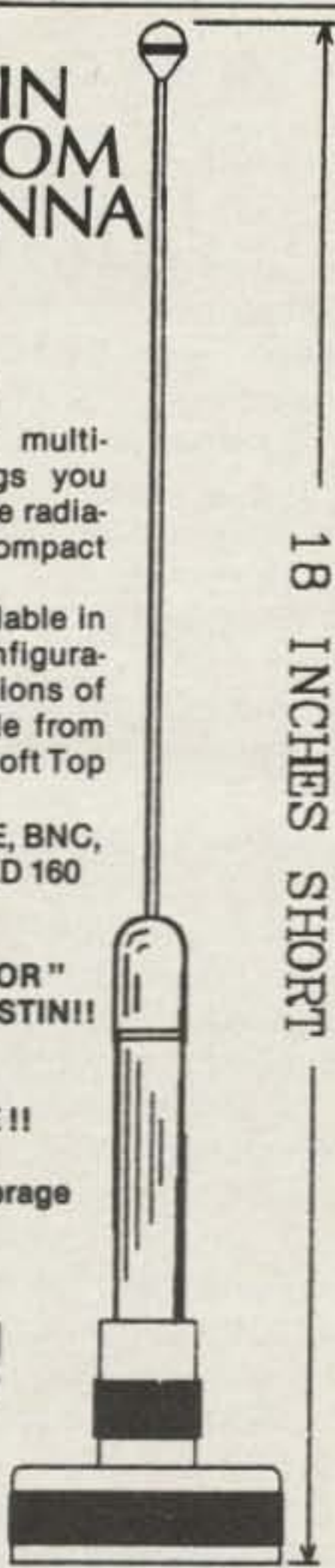
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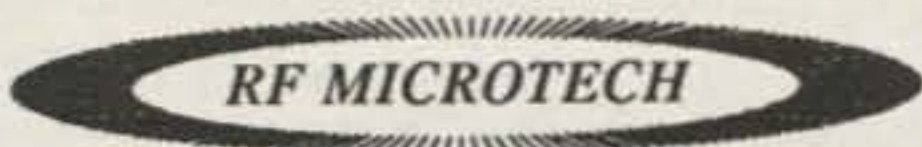
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**Exchange:** RS and state, province, or country. ARCI members will include their membership number. Non-members include their power output.

**Scoring:** Contacts with members 5 points. With non-members 2 points. If on a different continent 4 points.

**QTH Multiplier:** Sum of different states, provinces, and countries worked on each band.

**Power Multiplier:** Up to 2 watts PEP  $\times 10$ , 2–10 watts  $\times 7$ . Over 10 watts is a check log.

**Power Supply Multiplier:** Battery supply  $\times 1.5$ , solar/natural  $\times 2$ .

**Final Score:** Total QSO points from all bands  $\times$  QTH multiplier  $\times$  power  $\times$  power supply multipliers.

**Frequencies:** 1810, 3985, 7285, 14285, 21385, 28385, 28885, 50885 kHz.

**Awards:** Certificates to the top three overall scorers, and to the top scorer in each state, province, and country in which two or more entries are received.

Include a summary sheet showing the scoring, a dupe sheet for entries with 100 or more QSOs, and other essential information. Sample log forms are available and also a copy of the results. Include a large SASE for each.

Mailing deadline for logs is February 14th to: Red Reynolds, K5VOL, 835 Surryse Road, Lake Zurich, IL 60047.

### Texas QSO Party

0000Z Sat. to 1800Z Sun., Jan. 20–21

This year's party is again organized by the West Texas DX Association. The same station may be worked on each band and each mode, and mobiles in each county change. Single operator only.

**Exchange:** QSO no. and QTH. County for Texas stations. State, province, or country for others.

**Scoring:** Texas stations score 1 point per QSO on phone, 2 points if on CW, fixed or mobile. (In-state contacts permitted for QSO and multiplier credit.) Non-Texans same as above. However, Texan phone mobiles are worth 5 points, CW mobiles 7 points.

**Multiplier:** Texans use states, VE provinces, DX countries, and Texas counties. Non-Texans use Texas counties (maximum of 254).

**Frequencies:** CW—3565, 7065, 14065, 21065, 28065. Phone—3940, 7260, 14280, 21370, 28600. Novice—3710, 7110, 21110, 28110, 28375.

**Awards:** Certificates to the top scorers in each state, VE province, and DX country, and top 10 Texas stations. There are also plaques for the overall winners in six different areas: U.S., U.S. Novice, DX, VE, Texas fixed, and Texas mobile.

All logs must be received by March 14th. They go to: Les Bannon, WF5E, 3400 Bedford, Midland, TX 79703.

### North Dakota QSO Party

0000–0800Z & 1600–2400Z Sat., Jan. 20  
0800–1600Z Sun., Jan. 21

Sponsored by the Red River Radio Amateurs of Fargo, North Dakota, this one will make one of the rarer states available for WAS and County Hunters.

The same station may be worked once on each band and each mode.

**Exchange:** RS(T), and QTH. County for ND stations; state, province, or country for others.

**Scoring:** Count 10 points for phone QSOs, 20 points for CW, and 50 points for RTTY. ND stations add 1000 bonus points for working 5 Novices.

**Final Score:** ND stations multiply total QSO points from all bands by sum of states, provinces, and countries worked per band and mode. Others multiply by total number of ND counties worked (maximum of 53).

**Frequencies:** CW—35 kHz up from band edges. Phone—1835, 3905, 7280, 14295, 21380, 28450. Novice—25 kHz up from edges of Novice bands.

**Awards:** Certificates and plaques. Include a large SASE with your entry for a copy of the final results.

Mail logs by February 28th to Mike Beaton, KD0A, 2301 18th Ave. S., Fargo, ND 58103.

### Michigan QRP CW Contest

1200Z Sat. to 2359Z Sun., Jan. 20–21

This is the 10th annual CW contest sponsored by the Michigan QRP Club. The contest is open to all amateurs and all are eligible for awards.

**Classes:** (A) Less than 250 milliwatts. (B) 1 milliwatt to 250 watts. (C) 1 watt to 5 watts. (D) Over 5 watts.

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

**Exchange:** RST; state, province, or country; and Club membership number. Non-members send power output.

**Scoring:** Contacts with members 5 points. Non-members 1 point. Bonus of 1.25 if power used is 100% battery, and 1.5 for natural power.

**Final Score:** Total QSO points  $\times$  states, provinces, and countries worked per band  $\times$  power bonus if applicable.

**Frequencies:** 1810, 3560, 7030, 7040, 14060, 21060, 28060. Novice—3710, 7110, 21110, 28110 kHz.

**Awards:** Certificates to top scorers in each state, province, and country.

Use a separate log for each band and include a summary sheet showing the scoring, operating class, and equipment used, plus the usual signed declaration.

Logs must be received no later than Feb. 16th by L.T. Switzer, N8CQA, 654 Georgia, Marysville, MI 48040. Include a large SASE for a copy of the results or for sample forms.

### CQ WW DX 160 M Contest

CW: Jan. 26–28 SSB: Feb. 23–25  
2200Z Friday to 1600Z Sunday

Complete rules were published in the December issue and are the same as those we have been using in past years. Following is a brief rundown.

**Exchange:** RS(T) and QTH. State for the U.S., areas for Canada, prefix for DX, country abbreviation for those with unusual prefixes.

Stations operating in a state different from that indicated by the call are required to sign portable.

**Scoring:** Contacts with stations in own country 2 points, other countries in same continent 5 points, and with other continents 10 points.

**Multiplier:** Each U.S. state (48), Canadian area (13), and DX country. (ARRL and WAE country lists and WAC boundaries are the standards.)

**Awards:** Certificates to the top-scoring stations in each U.S. state, Canadian area, and DX country. And an assortment of 11 plaques for U.S. and world winners.

**Penalties:** Three contacts will be deleted for each duplicate that has not been removed.

**Disqualification:** Taking credit for excessive duplicate contacts, and the usual assortment of rules violations and unsportsmanlike conduct.

The traditional "DX Window," 1825–1830 kHz, that has been a part of 160 since the start of DXing on the top band, is being phased out, but a new spot, 1907–1912 kHz, has been created for Pacific DX.

Mailing deadline for logs is February 28th for CW entries and March 31st for the SSB section.

They can be sent directly to the 160 Contest Director, Donald McClenon, N4IN, 3075 Florida Avenue, Melbourne, FL 32904. They can also be sent to CQ 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. Be sure to indicate CW or SSB on the envelope.

### ARRL Novice Roundup

0001Z Sat. Jan. 27 to 2359Z Sun. Feb. 4

It's a nine-day long contest, but only 30 hours of actual operating time is permitted for scoring.

Novice/Tech will work each other and higher class licensees who, of course, are limited to contacting Novice/Tech only. All bands and modes open to Novice/Tech can be used.

**Exchange:** Signal report and ARRL section (country for DX stations).

**Scoring:** One point for phone QSOs, two points for CW, including RTTY and packet.

**Multiplier:** Each ARRL section plus each DXCC country. There is also a bo-



nus for stations holding a code proficiency certificate.

**Final Score:** Add your code bonus to your QSO points total and multiply that total by your multiplier.

**Awards:** Certificates to every Novice/Tech who submits a valid entry. Higher class licensees are not eligible for awards.

The use of official forms is not only highly recommended, but is a *must*. A large SASE to ARRL Novice Roundup will get you a contest package with all the necessary forms. The December issue of QST had a detailed announcement with suggestions and operating details not covered here.

Postmark your entry no later than March 4th to: ARRL Novice Roundup, 225 Main Street, Newington, CT 06111.

### U.B.A. CW/SSB Contest

Phone: 1300Z Sat. to 1300Z Sun.,  
Jan. 27-28  
CW: 1300Z Sat. to 1300Z Sun.,  
Feb. 24-25

This one is sponsored by the Belgium Amateur Radio Union (U.B.A.) and is any station working any other worldwide. Numerous operating awards are available and contest QSOs may be credited towards these awards.

**Classes:** 5 categories exist—Single Operator, All Band/Single Band, Multi-Operator/Single Transmitter, QRP 10 watts, and SWL.

**Frequencies:** CW—3500-3560, 7000-7035, 14000-14060, 21000-21060, 28000-28060 kHz. SSB—3600-3650, 3700-3800, 7040-7100, 14125-14300, 21200-21400, 28500-28800 kHz.

**Exchange:** RS(T) and consecutive serial number. Belgian stations also give their province abbreviation.

**Multipliers:** All Belgian Provinces, prefixes: ON4-9, DA1-2, and European countries.

**Scoring:** QSOs with ON, DA1-2 count 10 points. European QSOs count 3 points. All others are 1 point. Final score is total QSO points times total multipliers.

**Awards:** There are several awards available, including trophies and certificates to the high scorers in each operating class.

Send your final results no later than 30 days after each contest mode to: UBA HF Contest Committee, Galicia Jan, ON6JG, Oude Gendarmeriestraat 62, B-3100 Heist Op Den Berg, Belgium.

### YL ISSB QSO Party

CW: Jan. 27-28 SSB: Mar. 17-18  
0001Z Saturday to 2359Z Sunday

The party is open to all, but the emphasis is on membership participation. Rules

and logging format are much too lengthy and complicated to list here. Strongly suggest you send a large SASE to WA9AEA for more details.

**Categories:** Single operator, DX-US Partners, and YL-OM Teams.

**Exchange:** Call, RS(T), QTH (state, prov., terr., dist. or country), name, ISSB number, YL-OM teammate, DX-US partner.

**Points:** One point for non-member contacts, 3 points for member contacts on the same continent, and 6 points if in a different continent.

**Multiplier:** Only contacts with member stations count as a multiplier. There

are ten different categories.

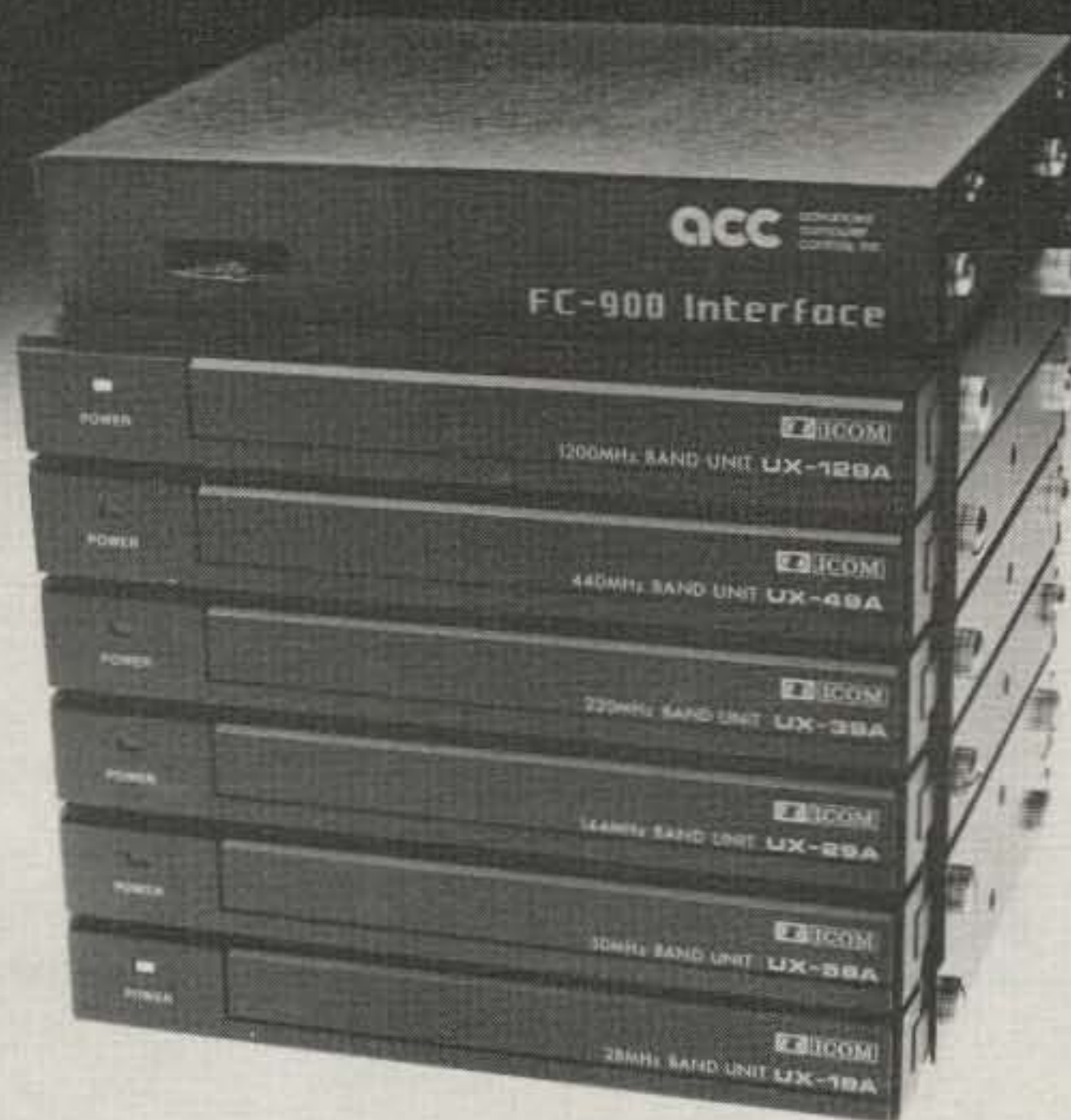
**Frequencies:** The General portions of the CW and phone bands, 10 through 80 meters. Avoid 14332 used by ISSB Net. Check 40 and 80 hourly. VHF and UHF may be used simplex.

**Awards:** Category and QTH area winners.

**Logs:** Should be set up as outlined in the exchange and should indicate at least two 6-hour rest periods. A summary sheet showing the scoring and other essential information would be helpful.

Mailing for all entries is April 30th, and they go to: Bill Early, WA9AEA, P.O. Box 401, McHenry, IL 60050-0401.

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## Classic Radio Exchange

2000Z Sun. to 0400Z Mon., Jan. 28-29

This is the winter edition of this unusual event. The format is still the same as it has been for the past years. Object is to restore and operate older equipment with like-minded hams, not required in the exchange, but a distinct advantage in the scoring.

A classic radio is any equipment at least 10 years old. Homebrew solid-state gear is age rated for scoring at 25 years old, plus age of a similar design article. Homebrew tube gear age is established as the actual year of such an article.

The same station may be worked on each band and each mode, and with different equipment combinations. Non-contesters may be worked for credit also.

**Exchange:** Name, RS(T), QTH, receiver and transmitter type, and other interesting conversation.

**Scoring:** Multiply total QSOs by total number of receivers, transmitters, state/provinces/countries worked on each band and mode. Multiply that total by your Classic Multiplier, the total age of all receivers and transmitters used. Three QSOs minimum per unit. Multiply age by

two if gear is a transceiver.

**Frequencies:** CW—60 kHz up from low edge of band. Phone—3880, 7280, 14280, 21380, 28580. Novice/Tech.—3720, 7120, 21170, 28120, 28320.

**Awards:** Certificates and appropriate memorabilia are awarded for highest scores, longest DX, exotic equipment, best excuses, and other unusual achievements.

This year send your log, comments, anecdotes, pictures to: Marty Reynolds, AA4RM, P.O. Box 13354, Atlanta, GA 30324. Include a large SASE for a copy of the "Classic Radio Newsletter" with the results.

## Vermont QSO Party

0001Z Sat. to 2400Z Sun., Feb. 3-4

The Vermont QSO Party is sponsored by the Central Vermont Amateur Radio Club and offers a great opportunity to snag this rare state.

**Exchange:** RS(T) and QTH. County for VT stations (2-letter designators); state, province, or country for others.

**Scoring:** All stations credit 1 point/SSB QSO, 2 points/CW or RTTY QSO. VT stations multiply QSO points by number

of VT counties, states, provinces, and DXCC countries. Others simply use counties. Twenty (20) bonus points may be added to your final score for working the W1BD club station. A station may be worked three times on each band (SSB/CW/RTTY).

**Final Score:** Final score is calculated by multiplying QSO points times total multiplier and adding bonus points.

**Frequencies:** CW—3540, 3720, 7040, 7120, 14040, 21040, 28040; RTTY 3620, and 90 kHz from lower band edge; SSB—25 kHz up from lower edge of General and 10 meter Novice band, 50110, 144200.

**Awards:** Certificates will be awarded to the highest scorer in each state, VE province, and DXCC country. All Vermont participants will receive awards. Other special awards are available including a plaque to the highest scoring VT station. W/VT award is available for those working 13 of 14 Vermont counties.

Logs must be received by March 1, 1990. Be sure to include an SASE for final results. Send logs and comments to: D. Loverin, WA1PDN, 50 Liberty Street, Montpelier, VT 05602.

## New Hampshire QSO Party

1900Z Sat. to 0700Z Sun., Feb. 3-4

1400Z Sun to 0200Z Mon., Feb. 4-5

This year's party is again sponsored by the NH Amateur Radio Association. It is New Hampshire stations working all others, including Novices. As with most QSO Parties, the same station may be worked once on each band and mode.

**Exchange:** RS(T) and QTH. County for NH stations; state, province, or country for others.

**Scoring:** All stations credit 1 point/SSB QSO, 2 points/CW QSO, and 5 points/Novice QSO. NH stations multiply QSO points by number of NH counties, states, provinces, and DXCC countries. Others simply use counties. Twenty (20) bonus points (maximum of 140) may be added to your final score for working NHARA members: WB1CAG, NY1Z, N2BD, W1GUA, W1WQM, K1RD, and WB1HBB.

**Final Score:** Final score is calculated by multiplying QSO points times total multiplier and adding bonus points.

**Frequencies:** CW—1810, 3535, 7035, 14035, 21035, 28035; SSB—1875, 3935, 7235, 14280, 21380, 28380, 50115, 144205; Novice—3735, 7135, 21135, 28135.

**Awards:** Certificates will be awarded to the highest scorer in each NH county, state, VE province, and DXCC country. Logs must be received by March 10, 1990. Be sure to include an SASE for final results. Send logs and comments to: Mount Moriah Repeater Society, c/o Bud Valcourt, NY1Z, 19 Teague Drive, Salem, NH 03079.

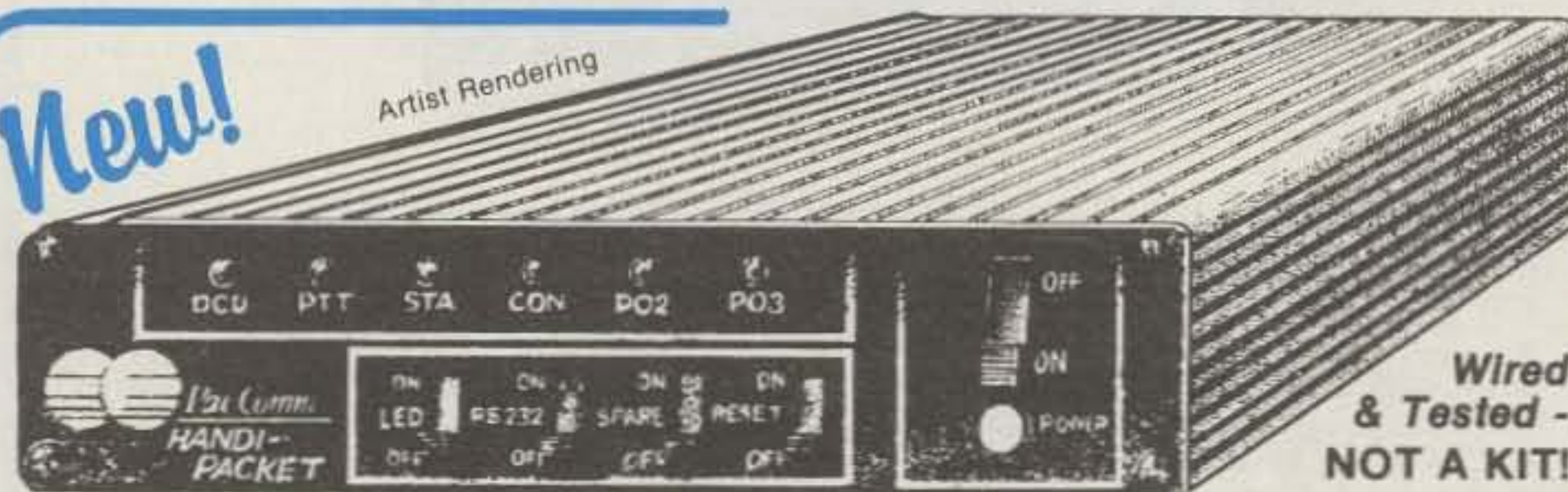


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<p><b>RS-M SERIES</b></p>  <p><b>MODEL RS-35M</b></p>	<ul style="list-style-type: none"> <li>• Switchable volt and Amp meter</li> </ul> <table border="1"> <tbody> <tr> <td>RS-12M</td> <td>9</td> <td>12</td> <td>4 1/2 x 8 x 9</td> <td>13</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Separate volt Amp meters</li> </ul> <table border="1"> <tbody> <tr> <td>RS-20M</td> <td>16</td> <td>20</td> <td>5 x 9 x 10 1/2</td> <td>18</td> </tr> <tr> <td>RS-35M</td> <td>25</td> <td>35</td> <td>5 x 11 x 11</td> <td>27</td> </tr> <tr> <td>RS-50M</td> <td>37</td> <td>50</td> <td>6 x 13 3/4 x 11</td> <td>46</td> </tr> </tbody> </table>	RS-12M	9	12	4 1/2 x 8 x 9	13	RS-20M	16	20	5 x 9 x 10 1/2	18	RS-35M	25	35	5 x 11 x 11	27	RS-50M	37	50	6 x 13 3/4 x 11	46																				
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<p><b>RS-S SERIES</b></p>  <p><b>MODEL RS-12S</b></p>	<ul style="list-style-type: none"> <li>• Built in speaker</li> </ul> <table border="1"> <tbody> <tr> <td>RS-7S</td> <td>5</td> <td>7</td> <td>4 x 7 1/2 x 10 3/4</td> <td>10</td> </tr> <tr> <td>RS-10S</td> <td>7.5</td> <td>10</td> <td>4 x 7 1/2 x 10 3/4</td> <td>12</td> </tr> <tr> <td>RS-12S</td> <td>9</td> <td>12</td> <td>4 1/2 x 8 x 9</td> <td>13</td> </tr> <tr> <td>RS-20S</td> <td>16</td> <td>20</td> <td>5 x 9 x 10 1/2</td> <td>18</td> </tr> </tbody> </table>	RS-7S	5	7	4 x 7 1/2 x 10 3/4	10	RS-10S	7.5	10	4 x 7 1/2 x 10 3/4	12	RS-12S	9	12	4 1/2 x 8 x 9	13	RS-20S	16	20	5 x 9 x 10 1/2	18																				
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<p><b>VRM/VS-M SERIES</b></p>  <p><b>MODEL VS-35M</b></p>	<ul style="list-style-type: none"> <li>• Separate Volt and Amp Meters</li> <li>• Output Voltage adjustable from 2-15 volts</li> <li>• Current limit adjustable from 1.5 amps to Full Load</li> </ul> <table border="1"> <thead> <tr> <th></th> <th colspan="2">@ 13.8VDC @ 10VDC @ 5VDC</th> <th>@ 13.8V</th> <th></th> </tr> </thead> <tbody> <tr> <td>VS-20M</td> <td>16</td> <td>9</td> <td>4</td> <td>20</td> </tr> <tr> <td>VS-35M</td> <td>25</td> <td>15</td> <td>7</td> <td>35</td> </tr> <tr> <td>VS-50M</td> <td>37</td> <td>22</td> <td>10</td> <td>50</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Variable rack mount power supplies</li> </ul> <table border="1"> <tbody> <tr> <td>VRM-35M</td> <td>25</td> <td>15</td> <td>7</td> <td>35</td> <td>5 1/4 x 19 x 12 1/2</td> <td>38</td> </tr> <tr> <td>VRM-50M</td> <td>37</td> <td>22</td> <td>10</td> <td>50</td> <td>5 1/4 x 19 x 12 1/2</td> <td>50</td> </tr> </tbody> </table>		@ 13.8VDC @ 10VDC @ 5VDC		@ 13.8V		VS-20M	16	9	4	20	VS-35M	25	15	7	35	VS-50M	37	22	10	50	VRM-35M	25	15	7	35	5 1/4 x 19 x 12 1/2	38	VRM-50M	37	22	10	50	5 1/4 x 19 x 12 1/2	50						
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\* ICS—Intermittent Communication Service (50% Duty Cycle 5 min. on 5 min. off)

CIRCLE 121 ON READER SERVICE CARD



# ANTENNAS & ACCESSORIES

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

BY KARL T. THURBER, JR., W8FX

## This and That—Part III

Last time we hit on a variety of Antennas & Accessories topics, highlighting antennas such as the Sabre HF Log Periodic, Texas Bug Catcher, and Challenger DX-V. Turning to software, we peeked into the DXLOG DXCC recordkeeper, the LOG-EQF logger, and Wonder Plus, a powerful DOS shell. This month we'll steer the same general course for a variety of antennas and accessories topics. First let's turn to antennas.

### Antenna Potpourri

**Orion OR-2300 Rotator.** Loren Fleet of Orion Business International provided some details on their new heavy-duty rotator, the OR-2300. In case you haven't seen the ads, the Orion rotator is based on the "old reliable" worm gear design; the control box has a large meter, reversal delay circuit, and a variable speed control. The OR-2300 has an antenna wind load area capacity of 35 sq. ft., a maximum vertical load of 1800 lbs., and a maximum horizontal load of 2400 lbs. The rotator handles masts from 1 3/4 inch to 3 1/2 inch O.D., and operates down to -20 degrees Fahrenheit. Accessories include a rotator control box and housing lightning arrestor; a special flex-mount for using the rotator with misaligned masts; and a lower mast bracket for top-of-mast mounting. Retail price is \$859.

According to Loren, the OR-2300 was designed to fit most popular towers in use today, such as the Tri-Ex W series, U.S. Tower TX Series, and the Rohn 25. The worm-gear set used provides excellent braking power and is said to eliminate the need for a mechanical brake.

I asked Loren about the rotator's ability to handle very large and heavy arrays, such as the Sabre HF Log Periodic which we described last month. He indicated that he had discussed this possibility with the Sabre folks several months ago, and the consensus was that the OR-2300 could easily handle the task with its 35 sq. ft. wind load area capacity and vertical load rating of 1800 lbs.

Fig. 1 is a cut-away drawing of the OR-2300. For more information, contact Orion Business International, Inc., P.O. Box 9577, Canoga Park, CA 91309.

**C.A.T.S. Update.** Speaking of rotators, I received a flyer indicating that the C.A.T.S. rotor (rotator?) repair and parts service now has available the "Brak-D-Lay" board. Providing a 7 second delay time for brake engagement on the CDE/Hy-Gain series of amateur rotators, the 1.75-inch-square board is designed especially for the old Ham 'M' control box and fits inside of it. Complete instructions are included for mounting the unit in various models, including the Ham 'M', 2, 3, 4, and T\*X. The boards



The Orion OR-2300 rotator, along with its control box, is shown here. It is made in the U.S.A. by Orion Business International, Inc. (Photo courtesy Orion)

carry a 90-day guarantee; to simplify user servicing, the units are constructed from standard parts. The price is \$25 plus \$1 shipping and handling.

Write to C.A.T.S., 7368 S. R. 105, Pemberville, OH 43450 for more information. Repair and reconditioning services are also available.

**Livewire Antenna Systems.** Putting an innovative wrinkle in the ordinary garden-variety HF dipole, a few gents in Savannah have come up with a simple system to give good halfwave dipole performance without giving up the convenience of easily switching operating bands.

In the Livewire Antenna System, each HF band has its own wire set pre-cut to resonate on that particular band. Switching to another band requires only unscrewing one wire set and screwing in another. For example, if you have a 20 meter antenna up for daytime DX, all you do is drop it down, unscrew the 20 meter wires, and screw in the 80 meter wires; you're then set for 80 meter nighttime skip. The swapping-out process is said to take about 5 minutes.

The convenience of this design is particularly evident where limited space for antennas is a problem. It's also a good one for the traveling amateur: instead of lugging several antennas, all you need is one center connector and coax feedline, and the wire sets for the bands on which you intend to operate. Doing so saves on storage space and weight while traveling.

The system is designed to be weather resistant, durable, and capable of handling the full legal power limit. Models are available to cover the 10, 12, 17, 40, and 80 meter bands. All cover the entire band except for the 80 meter

model; it's bandwidth is limited to 200 kHz for a 2:1 SWR. Wiresets are of nylon-jacketed, 19-strand No. 12 AWG copper.

The antenna systems are priced from \$25 for the 10 meter system to \$55 for the 80 meter version; they include the center coax connector (but not the coax), one wireset, and insulators. Additional wiresets are from \$25 to \$45, depending on band.

For more information, write to Livewire Antenna Systems/Horizon Engineering and Design, P.O. Box 30161, Savannah, GA 31410-0161.

**Summitek DL-146 PORTABEAM.** The DL-146 is a three-element delta loop for 2 meters. According to design engineer Steve Peterson, he wanted an antenna with good gain and portability, and easy field assembly under adverse conditions. The product he ended up with was a version of the proven delta loop with gain about equivalent to a four-element Yagi-style parasitic array.

The DL-146's three elements and male BNC-equipped feedline all store inside the antenna's 34 inch boom. Thus, you can throw the antenna into the car trunk or even stuff it into a backpack, since it's practically indestructible when collapsed.

Steve indicates that there are no small parts that need to be manipulated during field assembly. To get it up and radiating, you just pop off one end cap which is secured to the boom,



Photo shows the Summitek DL-146 PORTABEAM three-element delta loop for 2 meters. (Photo courtesy Summitek)

317 Poplar Drive, Millbrook, AL 36054



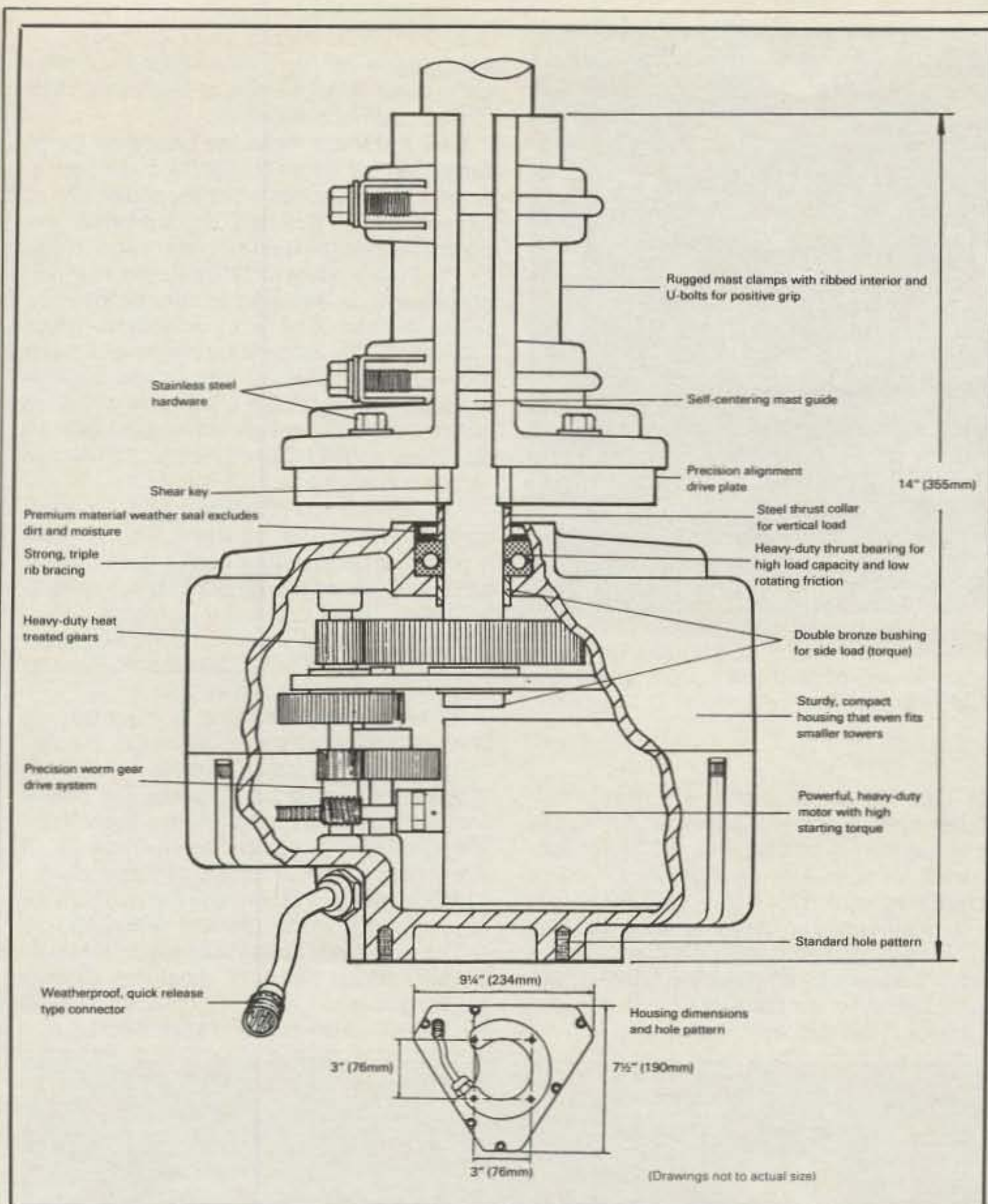


Fig. 1 - Here is a cutaway view of the heavy-duty Orion OR-2300 rotator. The unit is designed to meet the most severe amateur antenna system requirements. (Photo courtesy Orion Business International, Inc.)

remove the three element sets and the feedline, replace the end cap, insert the three elements into the color coded holes, and clip on the feedline. The antenna is then ready for connection to your HT or other BNC-connector-equipped radio.

While Steve specifically developed the antenna for emergency field use, it's come in handy for field day and other portable work. The antenna has even been used with a 2 meter HT to receive full-quieting slow-scan TV (SSTV) from the space shuttle and from Oscar 11 during the Transpolar Ski Trek Expedition—from inside a schoolroom.

According to a chart Steve sent, the maximum SWR at band edges (144 and 148 MHz) is about 1.4:1, and each antenna comes with its own VSWR graph. The antennas can be set up with either vertical or horizontal polarization; each is furnished with a 4 inch PVC handle for hand use. Planned accessories include a threaded mast kit for field use—though the antenna's threaded mounting "T" lets you design accessory masts and mounting brackets for your specific requirements using readily available PVC pipe and connectors. The DL-

146 weighs 19 ounces and is priced at \$84.95.

For additional specs, contact Steve Peterson at Summitek, P.O. Box 520011, Salt Lake City, UT 84152.

**The Iceman Cometh to KM5H.** Hopefully, when you look out your hamshack window on a stormy winter day, you won't see what Ken Adams, KM5H, saw when his area experienced a major ice storm two years ago.

Ken has a 20 meter Hy-Gain 204 array at 50 feet, that he previously converted to three elements. Over a 72 hour period, the ice built up to a thickness of about 2 inches. A 3/8 inch eyebolt that held one end of the truss snapped, but to his amazement, the elements and boom straightened out when the ice thawed. Ken notes that for those who may be interested in the technical effects of the ice, his 20 meter Yagi was resonant at about 12.8 MHz when it was fully coated! The scary part, said Ken, was when large chunks of ice dropped from 50 feet.

**Cushcraft AR-10 Mod.** With propagation what it has been lately, it seems that most everyone is migrating to 10 meters. Bill Smith, W5USM, is going the other direction. He's

come up with a simple modification of the popular Cushcraft AR-10 10 meter vertical for 15 meter use.

As Bill explains, the AR-10 halfwave vertical may easily be modified to work on 15, with assembly and tuning just as described in the Cushcraft instructions. To make the modification, replace the top section of tubing, which is a 48 inch length of .500 inch, .047 inch wall thickness aluminum, with a 10 foot section of similar tubing. Adjust the overall length of the antenna to 22 feet, which is about one half-wavelength at 21 MHz.

Replace the 10-meter coaxial matching stub with a stub 29 inches long. Tune the gamma matching ring for 21 MHz just as it is tuned for 28 MHz; on the antenna Bill modified, no re-tuning from the 10 meter tap point was required. The modified antenna should be elevated-mounted with the base at least high enough to clear nearby rooflines. A 15 foot base height should be adequate.

Modified in this way, Bill reports that the 15 meter antenna exhibits essentially a flat SWR curve across the entire band. The performance is excellent for DX work; Bill thinks it's somewhat better than a quarterwave vertical, with the advantage that the halfwave vertical doesn't require radials. However, he finds that, as expected, the 15 meter halfwave vertical doesn't seem to work quite as well as a horizontal dipole over 1,500 to 2,000-mile paths, due to the vertical's lower angle of radiation.

**Part 97 and Antenna Structures.** According to the ARRL, the newly rewritten Part 97 Amateur Rules have been officially issued by the FCC. Without doubt, they are the most sweeping changes in the amateur radio rules we've seen in decades.

Interestingly, the new rules have something to say about "limited preemption" governing the placement and height of antenna structures. This legally codifies the FCC's declaratory ruling in this area and is basically good news for those fighting preemption battles with local authorities. Subpart A, General Provisions, Para. 97.15(e) reads:

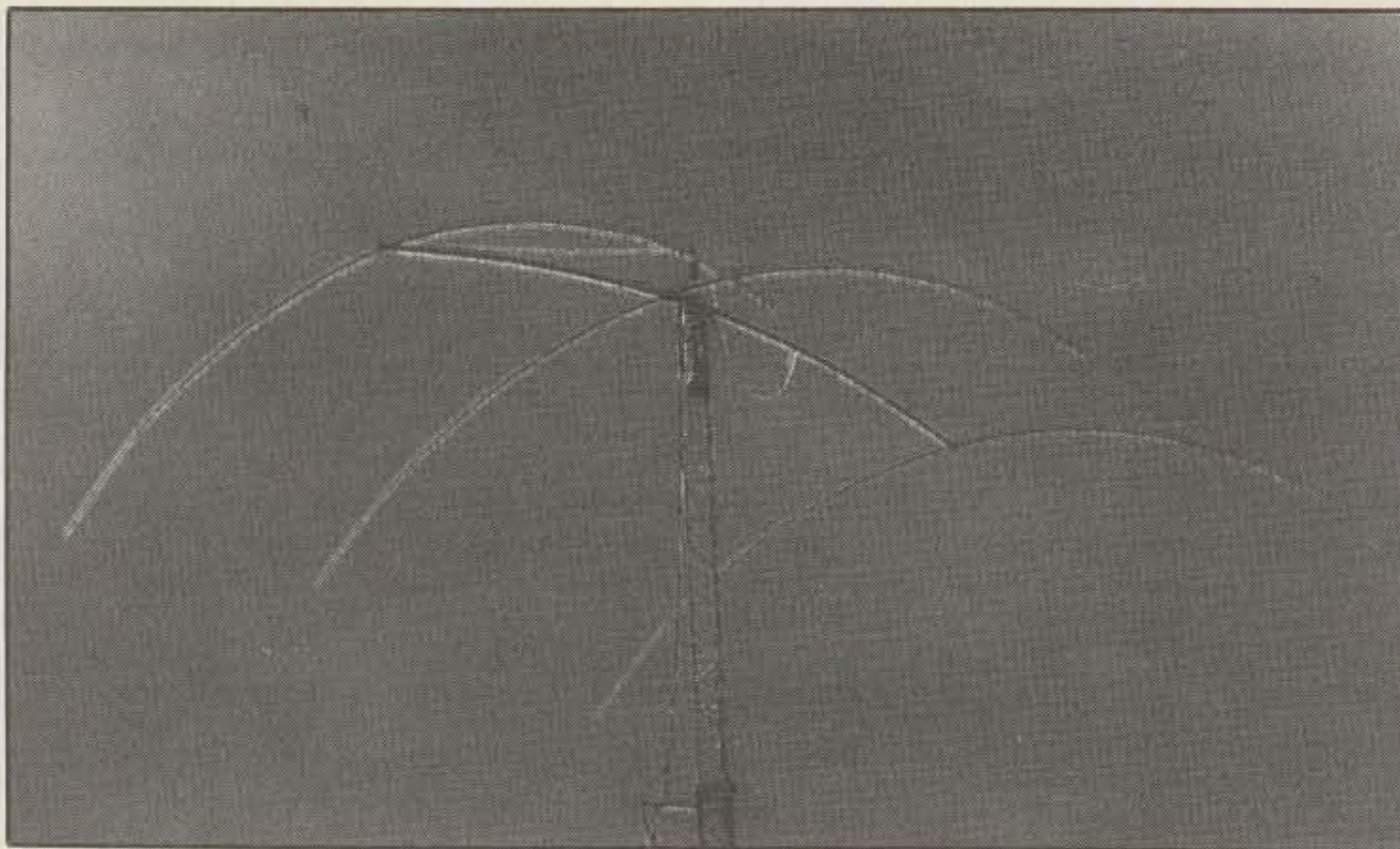
"Except as otherwise provided herein, a station antenna structure may be erected at heights and dimensions sufficient to accommodate amateur service communications. [State and local regulation of a station antenna structure must not preclude amateur service communications. Rather, it must reasonably accommodate such communications and must constitute the minimum practicable regulation to accomplish the state or local authority's legitimate purpose.]"

The ARRL is rewriting the entire *FCC Rule Book* publication to reflect the new Part 97; the new *Rule Book* should be available as you read this. The revised publication is expected to contain new sections on state and local antenna regulation, as well as malicious interference, emissions, the Amateur Auxiliary, obscene transmissions, and other confusing and controversial topics. The new 8th Edition is #0453-8 and is priced at \$9 plus postage and handling from the ARRL, 225 Main St., Newington, CT 06111.

Bear in mind that the FCC rules address local preemption issues, but not deed restrictions—a related area of contention that we have highlighted in past columns. This is another major "sticky wicket" area for amateurs, one on which the FCC is unlikely to be able to help.

**Surplus Single-Band HF Verticals.** Bob





Here's what Ken Adams, KM5H's modified Hy-Gain 204 looked like after a Christmas ice storm. When the ice melted, the elements and boom straightened out, the only loss being a 3/8 inch eyebolt that snapped. (KM5H photo)

Grinnell at Surplus Sales of Nebraska ("where the hard to find parts are found and on hand") is selling heavy-duty chromate-plated mast sections and accessories, manufactured to military specs by Rockwell/Collins, as single-band HF verticals. Three different models are available that cover 40, 80, and 160 meters. The 40 meter vertical (\$195) is unloaded, while the 80 meter (\$265) and 160 meter (\$295) verticals are sold with a loading coil and capacity

hat. (The 160 meter vertical is similar to that constructed by Louis B. Burke, Jr., W7JI, and described in his article "The 160 Meter Top-Loaded Vertical Antenna Revisited," which appeared on p. 40 of the May 1989 CQ.)

Each antenna consists of seven 6 foot long chromate-plated aluminum mast sections, a heavy cast aluminum base insulator with U-bolts, 225 feet of nonconductive guy rope, and stainless steel clamps. Radial kits, ground

rods, lightning arrestors, and mounting pipes are available. For more information and a catalog, contact Surplus Sales of Nebraska, 1315 Jones St., Omaha, NE 68102.

**New Antennas from the Lakeview Company.** George Shira, WD4BUM, has added a several new antennas to his expanding line of inexpensive HF, VHF, and UHF antennas. One is a dual bander covering 2 meters and 70 cm. The \$19 mag-mount mobile antenna has individual elements, resonant on each band to provide automatic bandswitching with no inductive losses. The antenna functions as a quarterwave on 2 meters and as a three-quarterwave on 440 MHz. The antenna is equipped with a strong chrome-plated magnet with 15 feet of coax and PL-259 connector; a BNC connector is available for \$2 extra.

Another new antenna is designed to capitalize on 10 meter band conditions. It's a vertically polarized quarterwave base antenna which can be adjusted from 28 to 29 MHz. It uses fiberglass vertical and radial elements, and is equipped with an aluminum mount to fit 1 inch to 1 1/2 inch masts. The \$39.50 antenna is set up for direct connection to a PL-259.

For details and a catalog, contact George Shira, WD4BUM, at the Lakeview Co., Inc., Rt. 7, Box 258, Anderson, SC 29624.

**Smiley Antenna Co. Catalog.** The Smiley line features high-quality "tuned antennas," with special emphasis on "rubber duckies" of every description. Their line of ducks covers 118 through 932 MHz in more than a dozen different styles to fit most handi-talkies (HTs).

The U.S.-made Smiley ducks typically boast 50 watt power handling capability. Exterior coverings are of PVC or of a mil-spec material (MPQ-2000), a solvent- and acid-resistant cov-

## Superior Communications Accessories\*

### SWR/Power Meters



**CN-400 Series**  
BASE/MOBILE METERS  
3.5 thru 450 MHz  
SO-239/N-Type  
Back Lit



**NS-600 Series**  
BASE METERS  
1.8 thru 2500 MHz  
SO-239/N Type  
Back Lit



**CN-100 Series**  
P.E.P. READING METERS  
1.8 thru 525 MHz  
SO-239/N-Type  
Rated up to 2 kW CW



**DP-800 Series**  
DIGITAL  
DISPLAY METERS  
1.8 thru 525 MHz  
SO-239/N-Type  
Back Lit



**ELECTRONIC  
KEYER**  
8-50 WPM Perfect  
3:1 dot/dash/space  
ratios, LED Indicators



**ANTENNA TUNERS**  
1.8 thru 30 MHz (17 Bands)  
200 W CW (3.5-30 MHz)  
100 W CW (1.8-3.4 MHz)



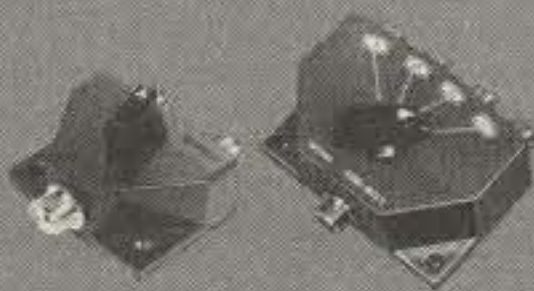
**LINEAR AMPLIFIERS**  
144 thru 148 MHz  
For hand held and mobile use



**AUDIO FILTERS**  
Four stages of filtering... Variable bandwidth over broad range... Razor sharp CW reception... Built-in speaker... PLL tone decoder circuitry.

### COAXIAL SWITCHES

1.8 thru 2000 MHz with SO-239, N-Type and BNC connectors... Insertion loss less than 1:1.2... Unused terminals grounded for your protection... Rated up to 2.5 kW PEP... High dB terminal isolation.



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(213) 538-1043 ■ FAX (213) 538-1096

\*Specifications subject to change without notice ■ All models and types not represented.

CIRCLE 23 ON READER SERVICE CARD



ering. A synthetic rubber dip provides a weather seal, as well as a dielectric constant and a mechanical "web effect" between the coils of the spring, to prevent distortion of the duck's coil. Copper-plated radiating elements are used. The universal bases are flow-soldered and are of nickel plated brass, and they accept 14 different types of connectors.

A number of magnetic mounts are also available. These allow you to easily convert simple HT-style rubber duckie antennas into mobile or emergency antennas. The mobile duckies are available in a wide range of interchangeable styles, from a regular rubber duckie to a  $\frac{5}{8}$ -wave telescopic whip. The "universal based" system used allows instant conversion from a rubber duckie to a mobile duckie in the matter of a few seconds.

For a catalog and specs, write to Smiley Antenna Company, Inc., 408 La Cresta Heights Road, El Cajon, CA 92021.

**Our Goof.** In last October's column we described Bob Branch, KJ7I's approach to dealing with deed restrictions in his development. Unfortunately, in the photo on p. 76 which described his twin-flagpole phased HF verticals, his callsign came out "K7KI." For the record, he's KJ7I. Sorry, Bob!

## Software Topix

**APR.** Paolo Vivani, I1VVP, has issued APR, an inexpensive packet radio terminal emulation program for the Apple II and IBM PC that features the WA7MBL YAPP binary file transfer protocol. New features include split-screen terminal emulation; text-file uploading; logging of operating sessions; printer support; state-

of-options display; baud-rate adjustment from within the program; and YAPP uploading and downloading for 8-bit file transfers. APR also features compatibility with the TNC-220 and KPC-2 controllers; choice of 40- or 80-column screens; VIDEX 80 support for Apple II+ users; and support of the Apple II+, IIe, IIc, and IIgs computers. Both 5.25 and 3.5 inch disks are available. For more details, write to Paolo Vivani, I1VVP, C. So. Brunelleschi 36, I-10141 Torino, Italy. (I'm sure that Paolo would appreciate a couple of IRCs when requesting information.)

**LOGic.** Dennis Hevener, WN4AZY, has issued LOGic, a very comprehensive and flexible computerized logging program to meet the needs of rag chewers, paper chasers, traffic handlers, and contesters. The program presently is available for the IBM PC with a minimum of 512K RAM, as well as the Atari ST or Mega with minimum 1 MB RAM. Dennis plans versions for the Macintosh and Amiga.

LOGic interfaces to computerized radios for remote control of frequency and mode, and automatic logging of mode, frequency, and band, using a small external interface program. According to Dennis, any radio that can interface to an RS-232 port can be made to work with LOGic. New radios can be added without changing the main program.

Some of the program's features include easy-use-screens with online help; up to 20 pages of notes per QSO; easy retrieval, with paging through QSOs and searching by any field; and automatic display of direction, distance, time zone, DXCC country, third-party status, and ARRL outgoing bureau status upon entry of call or state. LOGic also features automatic time, band, and mode logging; automat-

ic out-of-band warning; and data import to other programs. The number of QSOs the program can handle is limited only by disk space. Numerous customizable report writing, awards tracking, and contest support features also are included.

Additional features with computerized radios include keypad entry of frequency and mode; 24 radio memories per bank, with any number of banks; and storage of frequency, mode, and comment from the radio.

LOGic is priced at \$75. A demo version is available on the GENie and CompuServe information networks, and also directly from the company. A professionally printed, indexed 50-page user's manual is included with the full program, along with a separate 50-page manual that describes the operation of the report writer.

For a free information packet, contact Dennis Hevener, WN4AZY, at Personal Database Applications, 2634 Meadow Bend Court, Duluth, GA 30136-6037.

**RTP Version 1.04.** A full-featured "freeware" IBM PC terminal program for packet radio use is being distributed through "try before you buy" freeware/shareware channels by the Wake Digital Communications Group.

A sampling of some of the many RTP functions and modes for operating a packet station include optional connect messages; a "Net Master" mode and "Quick Save" capture; configurable NTS traffic handling; and function-key editing. Other features include printer capture; upload and download of ASCII, Xpacket, Xmodem, and binary files; type-ahead buffering; configurable scroll-back buffer; two- and three-way split screens; optional connect alarm; and more.

## NEW Cross-Needle CN-101 SWR/Power Meter



- Frequency: 1.8 thru 150 MHz
- Power Range: 15/150 W/1.5 kW
- Input Connectors: SO-239

Simultaneous display of SWR and Power readings by quick reference cross needle display... P.E.P. monitoring... Normally displays average RF Power.



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## NEW Automatic Digital Display DP-800 Series SWR/Power Meters



- Frequency: 1.8 thru 525 MHz
- Power Range: 0 thru 1.5 kW
- Input Connectors: SO-239/N-Type

Simultaneous digital display of SWR and Power readings... Quick reference bar graph switchable for either SWR or Power readings... P.E.P. reading monitoring, normally displays average RF Power... Variable illuminated display... Audible beeping indication of SWR fluctuation for the handicapped or indirect monitoring.



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CIRCLE 47 ON READER SERVICE CARD

Say You Saw It In CQ

CIRCLE 48 ON READER SERVICE CARD

January 1990 • CQ • 105



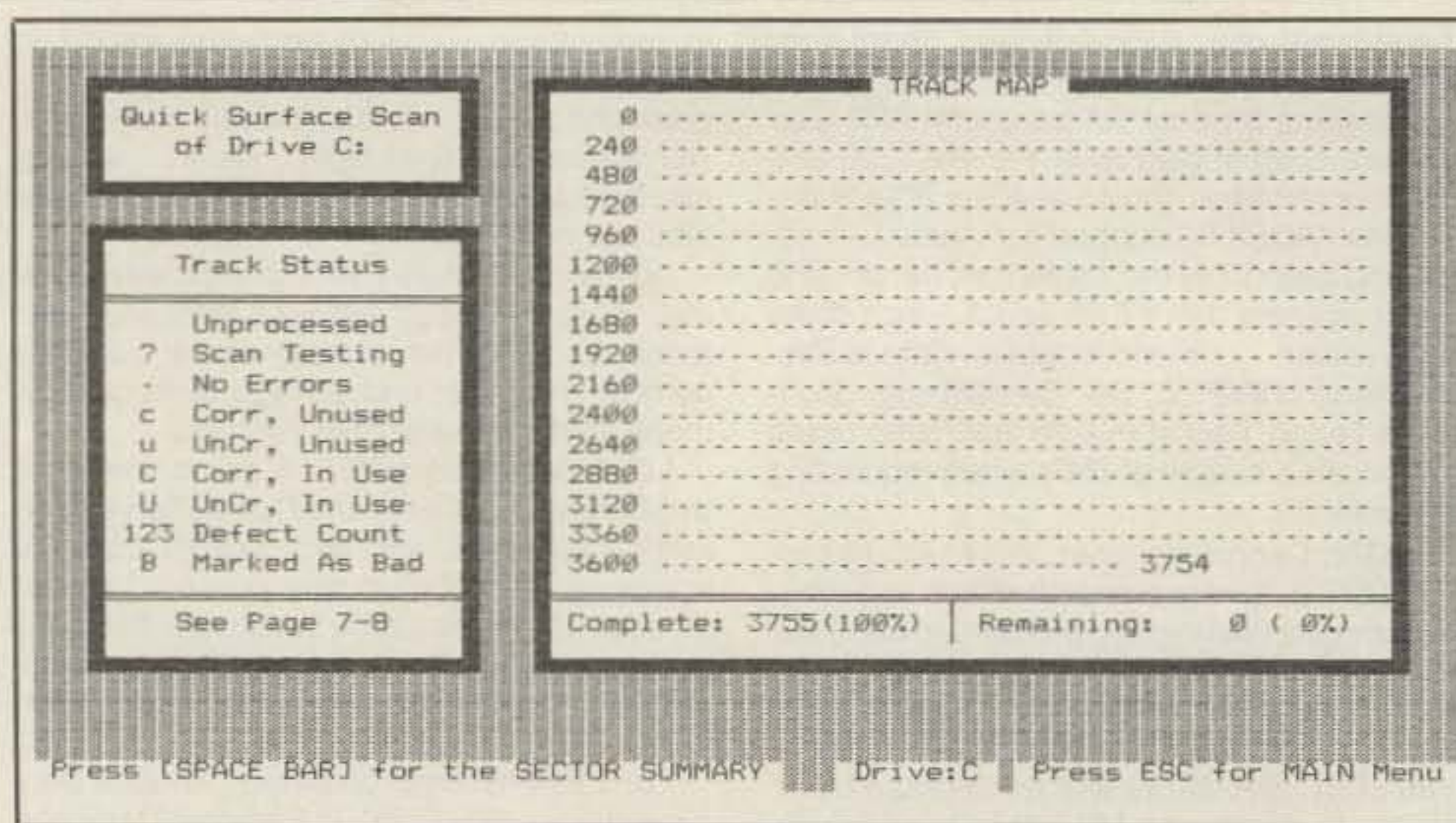


Fig. 2- Look, ma, no cavities! That's basically what this screen dump of the SpinRite "Quick Surface Scan" of my hard disk is showing. No errors were noted on my hard drive.

According to Carl Moreschi, N4PY, the program is designed to run on an IBM PC, PCjr, XT, AT, or PS/2 along with a TAPR-type terminal-node controller or multimode TNC, such as the AEA PK232, Kantronics KAM, or MFJ-1278; 256K computer RAM is required.

As the program is distributed through free-ware/shareware channels, the authors request a \$30 donation from users. For more information on RTP, send an SASE to either: Carl Moreschi, N4PY, Rt. 3, Box 260, Franklinton, NC 27525; or Ed Stephenson, AB4S, 700 Madison Ave., Cary, NC 27513.

**SpinRite.** Are you concerned about the 20, 30, 40, or more megabytes (MB) of data that you have stuffed onto your PC's hard disk (HD) and have exposed to risk? I am, even though I regularly back up the HD, since I know that someday (hopefully not soon!) the HD will run into problems. What concerns me is that there has been little in the way of "preventive medicine" that the average user can apply to head off problems.

SpinRite seems to offer a good solution to

this concern. A very competent program developed by Gibson Research, it's a *nondestructive* low-level hard disk (HD) reformatter developed to fill the need for a reliable hard disk low-level format maintenance utility. Its beauty is that it lets you reformat your hard disk, if needed, while leaving all your data in place. You don't have to backup and then manually reformat your disk and restore the data.

SpinRite also optimizes the sector interleave to achieve the maximum possible data transfer rate; identifies, diagnoses, and repairs surface defects and low-level format damage to your HD; reads and restores "unreadable" and "uncorrectable" HD data; and even detects early signs of premature HD failure. When problems are found on the HD, the program corrects the problems and notifies you long before they become too great to correct.

The program is simple to use, and it works with most IBM compatibles and HDs (though a few HDs and their controllers are incompatible with SpinRite). A companion program, Spin-

Test, is also included so that you can make "quick and dirty" checks of your HD's status.

The package is priced at \$59 and is available from Gibson Research Corporation, 22991 LaCadena, Laguna Hills, CA 92653. (The company offers a very complete free information packet that not only tells about SpinRite, but also gives the complete lowdown on hard disk data storage and the many things that can go wrong with HDs, including their "premature death." It makes for very interesting reading, indeed!)

Fig. 2 shows the results of a "quick surface scan" of my own HD; fig. 3 depicts the performance evaluation results. Both checks gave my HD a clean bill of health. A separate report of my system parameters showed that the HD data transfer rate was satisfactory, so that I had no need to do a low-level reformat.

As this issue of CQ went to press, Gibson Research announced the release of SpinRite II. The new release contains a number of enhancements and subtle changes that should make it an even more valuable and useful hard disk utility. Present owners of the original SpinRite, which we described in this month's column, can upgrade to the new version for \$25.

**WordStar 5.5.** Seems like we're always sitting at our trusty three-year-old IBM PC-XT clone, either evaluating new software or writing up our column and other articles. Lately, wordprocessing has accounted for about 70% of our computer time. Thus, when the opportunity came about to check out the new WordStar® 5.5, we jumped at the chance.

WordStar is a solid, old-line "high end" wordprocessor that's been around since 1979. Its roots lie in Rob Barnaby's WordMaster, developed in the 1970s when the thought of turning your personal computer into a typewriter or wordprocessor was just emerging. WordStar was probably the first *integrated* word processor, one that allowed you to edit and print from the same program, rather than forcing you to load separate text editing and printing modules. Its success also helped MicroPro International (now WordStar International) go public with its stock in 1984.

Despite the fact that the company has sold over 3 million copies to date, and for years was virtually the industry standard in wordprocessing, WordStar has been known as a difficult program to learn, with its rather unwieldy menus and command structure. Too, WordStar has tended to rest on its laurels, letting rivals like WordPerfect and Microsoft Word walk away with much of their market. Version 5, though, has a lot of nice features and enhancements that may just turn around that process.

The new update is a very powerful one. It has an especially nice touch-typing interface, arranged so that your fingers don't have to leave the home row; this can greatly increase typing speed. WordStar 5.5 is designed to work well even on older, slower PC-XT machines (like mine); a fast 80286- or 80386-based PC isn't required for power and high-speed performance. New to Version 5 is a complete set of IBM-standard pull-down menus that cover practically every function, to help you in learning the commands.

Some other new features include the ability to integrate text and graphics, letting you capture images from almost any graphics program and insert them anywhere in your documents. There's an excellent Advanced Page Preview™, where you can view both text and graphics, to see how your entire document will

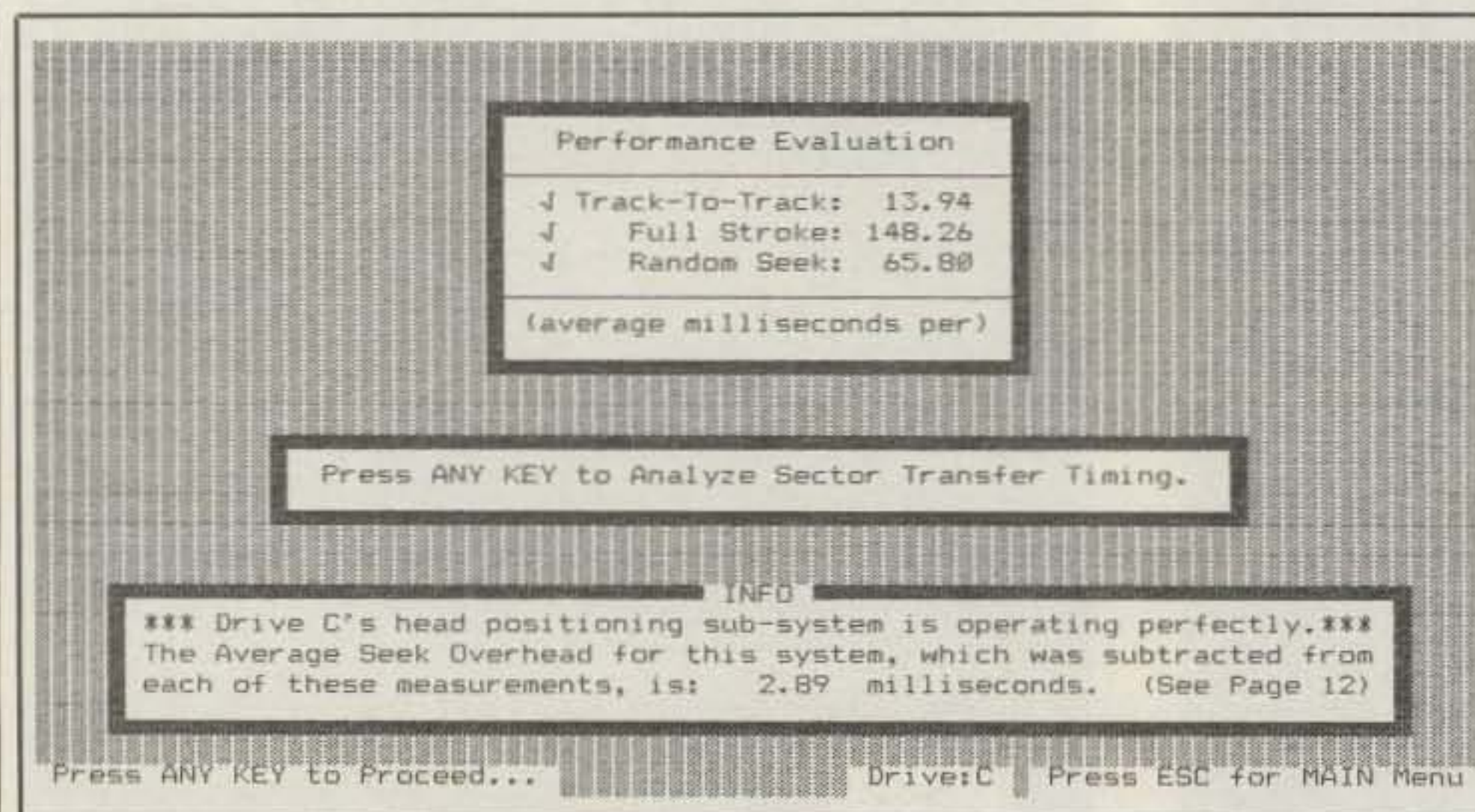


Fig. 3- Depicted here are the performance evaluation results from running SpinRite on my hard disk; the program says that the head positioning sub-system is operating perfectly. I also ran a check of the drive system parameters (not shown), which indicated that my HD's data transfer rate was satisfactory. Thus, modification of the sector interleave was not necessary.



look, or examine individual page layouts. There also are paragraph style sheets that speed up document setup, a handy typewriter mode for typing envelopes and other "quick and dirty" documents directly on your printer, multilingual spelling and hyphenation, full laser printer support, an automatic installation program, and a built-in calculator. Also included is a large (220,000-word) thesaurus and a fast 100,000-word spell checker.

Other features allow you to import files from various spreadsheets into WordStar without making separate conversions; convert files to and from other popular wordprocessors; and merge data from spreadsheets and database programs for mailing. You can easily create complex macro commands to automate operation; organize, update, and sort mailing lists; and print labels and envelopes. There's also a telecommunications module that lets you go on-line to access information and transmit files back and forth. Another add-in is a comprehensive DOS shell that performs a host of disk housekeeping tasks, and a top-quality outlining program from another manufacturer.

Do I like the "new" WordStar? Yes, indeed. It possesses more power than I'll likely ever need in a wordprocessor. It can even handle document indexing, multiple newspaper style columns, and true bottom-of-the-page footnoting.

However, a few things did irk me. One relates to the fact that a number of modular add-in programs, some from other manufacturers, are included. This is a fine bonus, but most of the add-ins are not fully integrated with WordStar, working in different ways and requiring that you learn different commands with them. Hopefully, in a future revision, this "mix-and-match" characteristic will be overcome.

Another annoyance, albeit minor, is that the program still seems rooted in the early "techie days" of wordprocessing, where the user was routinely expected to learn arcane command sequences to get his program to do his bidding. Although the optional pull-down menus have eliminated most of this drudgery, WordStar is still based on a system of hard-to-remember control-key-prefaced commands and a multitude of so-called "dot commands" which are typed into the text for certain functions and formatting purposes. You may still have occasion to use these commands, especially if you don't use the menus.

Despite the fact that WordStar still has a little way to go before it finally reaches home, I found the program to be an excellent value. This is especially true when all the new enhancements are factored in, even though the list price of \$495—often heavily discounted—is rather steep for the occasional user.

For more information, write WordStar International, 33 San Pablo Avenue, San Rafael, CA 94903.

**Bundling WordStar 5.5.** Many CQ readers are probably saying that while a top-line wordprocessor is fine for those who can make use of its many features, for my purposes I'll stick with the \$49 model I picked up at the local software emporium or the off-brand text editor that was tossed in when I bought my PC.

One reason I discussed WordStar here is that if you shop carefully, next time you upgrade to a new computer or printer, you may find the current version of WordStar bundled-in as a freebie. You'll find that WordStar is a darned sight better than the typical "free" wordprocessor that's often part of a tossed-in

"integrated" software package.

One company that does top-line software bundling is DAK Industries—you know, the California outfit that puts out those slick color catalogs chock full of electronic gadgets and computers. In a recent catalog, DAK offered WordStar 5.5 and several other well-known, topnotch programs free with the purchase of their \$1999 IBM PC-AT compatible EGA/color computer. They also offered WordStar free with the \$399 purchase of a high-quality, 24-pin Seikosha printer. Amazingly, the price of the printer and WordStar together are less than WordStar's list price! Thus, if you do any wordprocessing at all, and are thinking about a new PC or printer, by all means consider the bundling-in offers from DAK and any others.

For a copy of the DAK catalog, write or call DAK Industries Incorporated, 8200 Remmet Ave., Canoga Park, CA 91304 (phone 1-800-888-7808).

**Books to Learn WordStar By.** While WordStar comes with a thorough, 660-page user's guide and a 60-page installation manual, you'll find that several books will help in learning the program's ins-and-outs. Most of these are

available in general interest bookstores.

Osborne/McGraw Hill offers three titles: *Using WordStar Professional, Series 5 Edition*, by Carole Boggs Matthews and Martin S. Matthews; *WordStar Professional Made Easy*, by Walter A. Ettlin; and what is perhaps the most comprehensive resource, the 822-page *WordStar Professional: The Complete Reference*, by Matthews and Matthews. By the time you read this, *WordStar 5.5 Made Easy* should also be on the shelves.

Hayden Books/Howard W. Sams has Vincent Alfieri's *The Best Book of WordStar*, featuring Release 5 information; and Que Corporation has updated Steve Ditlea's popular *Using WordStar to Release 5*.

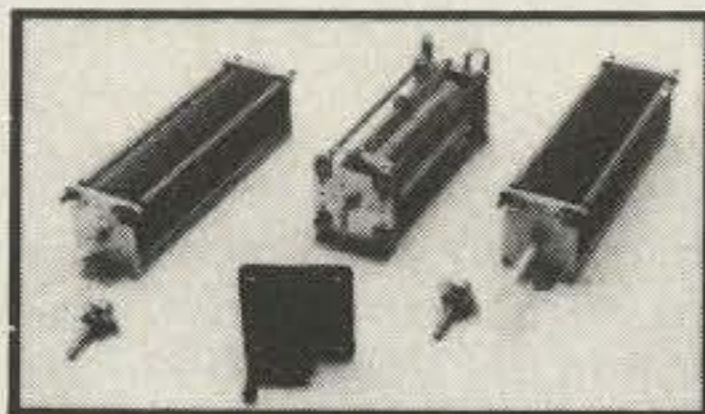
## Wrapping It Up

That's all for this time, gang. Next month, more Antennas & Accessories topics of current interest. See you then.

*Overheard:* Much better than counting your years is to make all of your years count.

73, Karl, W8FX

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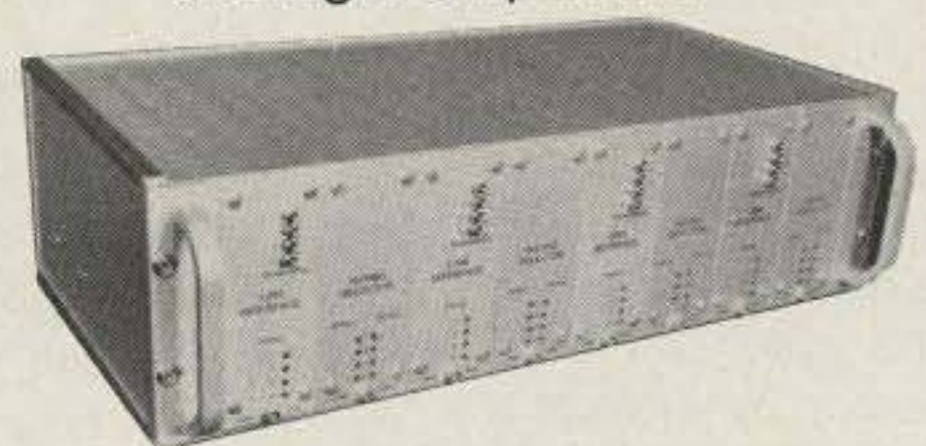
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**Announcing:**

# The 34th Annual CQ World-Wide WPX Contest

**SSB: March 24–25, 1990**

**CW: May 26–27, 1990**

**Starts: 0000 GMT Saturday**

**Ends: 2400 GMT Sunday**

**I. Contest Period:** Only 30 hours of the 48 hour contest period permitted for Single Operator stations. **Off periods must be a minimum of 60 minutes in length and clearly marked in the log.** Multi-operator stations may operate the full 48 hours.

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

**III. Bands:** The 1.8, 3.5, 7, 14, 21, and 28 MHz bands may be used. No WARC bands.

**IV. Type of Competition:** 1. Single Operator (a) All Band, (b) Single Band (one entry per operator). 2. Multi-operator, All Band *only*. (a) Single Transmitter (only one transmitter and one band permitted during the same time period, defined as 10 minutes, no exception), (b) Multi-Transmitter (one signal per band permitted). **NOTE:** All transmitters must be located within a 500 meter diameter or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitter.

**V. Exchange:** RS(T) report plus a progressive three-digit contact number starting with 001 for the first contact. (Continue to four digits if past 1000.) Multi-transmitter stations use separate numbers for each band.

**VI. Points:**

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

B. Contacts between stations on the same continent but different countries are worth one (1) point on 28, 21, and 14

MHz, and two (2) points on 7, 3.5, and 1.8 MHz. **Exception: For North American stations only—contacts between stations within the North American boundaries count as two (2) points on 28, 21, and 14 MHz and four (4) points on 7, 3.5, and 1.8 MHz.**

C. Contacts between stations in the same country are permitted for multiplier credit but have zero (0) point value.

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

A. The letter/numeral combinations which form the first part of the amateur call will be considered the prefix. Examples: N8, W8, Y22, Y23, WD8, HG1, HG19, WB2, WB200, KC2, KC200, OE2, OE25, U3, GB75, ZS66, NG84, etc. Any difference in the numbering, lettering, or order of same shall constitute a separate prefix. A station operating from a DXCC country different from that indicated by its callsign is required to sign portable. The portable prefix must be an authorized prefix of the country or call area of operation. In cases of portable operation, the portable designator would then become the prefix. Example: N8BJQ operating from Wake Is. would sign N8BJQ/KH9 or KH9/N8BJQ, and KH6XXX operating from Ohio would not sign /KH8 which is normally assigned to American Samoa, but could sign /W8, /N8, /K8, etc., or any other prefix authorized for use in the US 8th district. Portable designators without numbers will be assigned a zero (0) after the second letter of the designator to form the prefix. Example: N8BJQ/PA

would become PA0. All calls without numbers will be assigned a zero (0) after the first two letters to form the prefix. Example: XEFTJW would count as XE0, RAEM would count as RA0, etc. Maritime mobile, mobile, /A, /E, /J, /P, or interim license class identifiers do not count as prefixes.

B. Special event, commemorative, and other unique prefix stations are encouraged to participate.

**VIII. Scoring:** 1. Single Operator (a) All Band score, total QSO points from all bands multiplied by the number of different Prefixes worked. (b) Single Band score, QSO points on the band multiplied by the number of different Prefixes worked. See VII.

2. Multi-Operated stations. Scoring in both these categories is the same as the All Band scoring for Single Operator.

3. A station may be worked once on each band for QSO point credit. However, **prefix credit can be taken only once** regardless of the number of different bands on which the same station and/or prefix has been worked during the entire contest.

**IX. QRPp Section:** (Single Operator Only). Power must not exceed 5 watts output to qualify for QRPp section competition. **You must denote QRPp on the summary sheet and state the actual maximum power output used for all claimed contacts.** Results will be listed in a separate QRPp section and certificates will be awarded to each top scoring QRPp station in the order indicated in Section X. These certificates will be marked QRPp and will show your power output. QRPp stations will be competing



only with other QRPp stations for awards. All other information contained in these rules is applicable to this section.

**X. Awards:** Certificates will be awarded to the highest scoring station in each category listed under Section IV.

1. In every participating country.

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

All scores will be published. However, to be eligible for an award, a Single Operator station must show a minimum of 12 hours of operation. Multi-operator stations must show a minimum of 24 hours.

A single band log is eligible for a single award **only**. If a log contains more than one band, it will be judged as an all band entry, unless specified otherwise. However, a 12 hour minimum is required on the single band.

In countries or sections where the returns justify, 2nd and 3rd place awards will be made.

#### **XI. Trophies, Plaques and Donors:**

##### **SSB**

##### **Single Operator, All Band**

WORLD - Stanley Cohen, WD8QDQ

U.S.A. - Atilano de Oms, PY5EG

CARIB./C.A. - Auturo Gigante, Jr., HI8GB

EUROPE - Jim Hoffman, PY5ZBA

\*JAPAN - The DX Family Foundation

SO. AMERICA - Ron Moorefield, W8ILC

WORLD QRPp - Dayton A.R.A.

##### **Single Operator, Single Band**

WORLD - John N. Reichert, N4RV

\*WORLD 21 MHz - Lee Wical, KH6BZF

WORLD 7 MHz - William Diggins, WA8LXJ

EUROPE - Myron E. Crofoot, WB4VQO

JAPAN - Ken Ruddock, K6HNZ

\*JAPAN - 28 MHz - Joe Arcure, W3HNC & Toshi Kusano, JA1ELY (Terry Appleton, W4GSM Memorial Award)

U.S.A. 3.7 MHz - Lance Johnson Engineering

U.S.A. 7 MHz - William Diggins, WA8LXJ

U.S.A. 14 MHz - Doug Zwiebel, KR2Q

U.S.A. 21 MHz - Bernie Welch, W8IMZ Memorial

U.S.A. 28 MHz - Novice/Tech. only - Jon Engelhardt, KA0ZFX

##### **Multi-Operator, Single Xmtr.**

WORLD - Mike Badolato, W5MYA

##### **Multi-Operator, Multi-Xmtr.**

WORLD - Henry Thel, VE7WJ

NORTH AMERICA - James Dixon, NL7HI (Burt Curwen, KL7IRT Memorial)

U.S.A. - Glenn Tracey, KC3EK

##### **Contest Expedition**

WORLD - Kansas City DX Club

• • •

##### **CW**

##### **Single Operator, All Band**

WORLD - Terry Baxter, N6CW

U.S.A. - Steve Bolia, N8BJQ

\*JAPAN - The DX Family Foundation

OCEANIA - Tom Morton, KT6V

\*CANADA - Canadian Amateur Radio Federation (C.A.R.F.)

WORLD QRP/p - QRP A.R.C.I.

##### **Single Operator, Single Band**

WORLD - Pedro Piza, Jr., NP4A

(Pedro Piza, Sr., KP4ES Memorial)

WORLD 3.5 MHz - Lance Johnson Eng.

U.S.A. - Kansas City DX Club

U.S.A. 21 MHz - Wayne Carroll, W4MPY

U.S.A. 14 MHz - Gene Walsh, N2AA

U.S.A. 7 MHz - Dennis Younker, NE6I

ASIA - Bruce Frahm, K0BJ

Oceania 3.5 MHz - Les Myers, K0SCM

##### **Multi-Operator, Single Xmtr.**

WORLD - Ron Blake, N4KE

U.S.A. - Austin Regal, N4WW

##### **Contest Expedition**

WORLD - Ed Roller, K4IA

• • •

##### **Combined SSB/CW**

SINGLE OPERATOR, ALL BAND - EU-

ROPE - Les Nouvelles DX Group

##### **Club (SSB & CW)**

WORLD - CQ Magazine

U.S.A. - Northern Ohio A.R.S. (N.O.A.R.S.)

*\*Donor is responsible for this trophy.*

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

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

**XIII. Log Instructions:** 1. All times must be in GMT. All breaks must be clearly marked. Single operator and multi-single logs must be submitted in chronological order. Multi-multi logs must be submitted chronologically by band.

2. Prefix multipliers should be entered only the FIRST TIME they are contacted.

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

4. An alphabetical/numerical check list of claimed PREFIX multipliers must

be sent along with your contest log. (A prefix is counted one time only.)

5. Each entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, and the contestant's name and mailing address in BLOCK LETTERS.

Also submit a signed declaration that all contest rules and regulations for amateur radio in the country of the contestant have been observed.

6. Official log and sample summary sheets are available from CQ. A large self-addressed envelope with sufficient postage or IRCs must accompany your request.

If official forms are not available, you can make your own.

7. Computerized logs will be accepted. Logs submitted on disk must contain all required information (Time, Band, Call, RST & NR Sent, RST & NR Rcvd, New Prefix, and QSO Points). The disk files must be in ASCII format and in chronological order for single operator and multi-single stations. Multi-multi stations submit logs chronologically by band. A sorted multiplier file and dupe sheet file are also required. Other formats (.bin, .dbf, .wks, etc.) may also be acceptable; however, please check with the contest director before submitting. Only MS-DOS compatible disks will be accepted. Please use 5¼ floppies (either 360K or 1.2M) or 3½ floppy (720K) only. A written summary sheet must accompany the disk, showing all required scoring information, the category of competition, and off times, as well as the normal signed declaration and your name and address in BLOCK LETTERS. A hard copy of the log, or the original log, may be requested for further cross-checking or in the event the file cannot be used.

**XIV. Disqualification:** Violation of amateur radio regulations in the country of the contestant, or the rules of the contest, unsportsmanlike conduct, taking credit for excessive duplicate contacts, unverifiable QSO's or multipliers will be deemed sufficient cause for disqualification. (Incorrectly logged calls will be counted as unverifiable contacts.) Actions and decisions of the CQ WPX Contest Committee are official and final.

**XV. Deadline:** All entries must be post-marked no later than **May 10, 1990** for the SSB section and **July 10, 1990** for the CW section. **Indicate SSB or CW on the envelope.** Extensions may be granted if requested.

All logs go to: **CQ Magazine, WPX Contest, 76 N. Broadway, Hicksville, NY 11801 U.S.A.**

Questions pertaining to the WPX Contest can be sent to: WPX Contest Director, Steve Bolia, N8BJQ, 4121 Gardenview Dr., Beavercreek, OH 45431 U.S.A.

*Please remember to send in early for the WPX Contest Logs and Summary Sheets.*



## NEWS OF COMMUNICATION AROUND THE WORLD

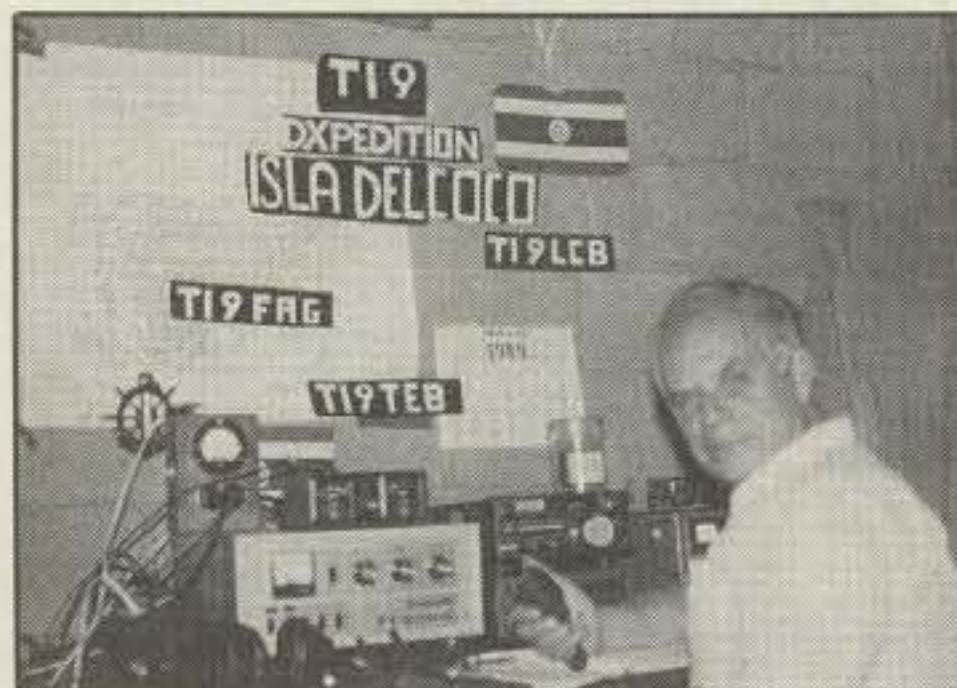
## New Year's Resolutions

**A**s DXers celebrate a new year (and a new decade), they may take a moment to look back on their past operating practices, and resolve to improve them in the future. The pursuit of DX, especially on 20 meter SSB, but also on other bands and modes, is too often debased by the poor operating habits of a minority of DXers. If even a few of these operators improved their skills, every DXer would benefit, from increased rates of QSOs, and less frustrated DX stations. Have a look at this suggested list of New Year's resolutions, and resolve to improve your operating habits in the coming year (and decade).

**1. I resolve not to tune up on top of a DX station.** Few operating habits are as annoying to the DX station and to those trying to work the DX station as the long tuner-upper on frequency. Everyone winces as the operator slowly, painstakingly twiddles the knobs on the amplifier to eke out the last couple of watts. What is worse than the torture to the poor tubes in the amplifier is that the practice is totally unnecessary.

Even if a DXer does not own a dummy load (for which there is little excuse), the DXer can certainly move a few kilohertz away from the DX station to tune up. Better yet, on a day when the bands are shut down, a considerate DXer will tape paper behind the knobs of the amplifier, and tune up the amp on common DX frequencies on each band. By marking the positions of each knob on the paper, labeled with the frequency, the DXer can then move to a given band or frequency, and pre-set the amplifier controls. This can eliminate on-the-air tune-up completely.

**2. I resolve to listen more and transmit less.** A good DXer spends more than 90% of his or her operating time listening. Listening not only helps the individual DXer by providing information about the band conditions, callsign of the DX station, QSL information, operating schedule, etc., but listening also helps every other DXer by eliminating those repetitive questions. DXpeditions in particular are plagued by the frequent "What's your QSL information?" "When are you going to be on 80 meters (RTTY, CW, 160, 10, etc.?)?" and the worst, "What's your call?" If most DXers simply listened for a



Luis Castro, TI2LCB, operated from Co-cos Island as TI9LCB last May.

few moments, they would not only get the desired information, but they would also permit more DXers to contact the DX station.

**3. I resolve to stay well-informed.** The well-informed DXer is the successful DXer. By keeping up to date with accurate DX information, a DXer can work more countries in less time and reduce QRM. For example, DXpedition stations may work many stations without giving their callsign, listening frequency, QSL information, etc. A DXer who is knowledgeable about the details of the DXpedition already knows this information and can work the station more quickly and refrain from cluttering the bands with questions. When Ron Wright, ZL1AMO, was on the North Cook Islands in September, a well-informed DXer knew his callsign, ZK1CQ, his operating frequencies and habits (Ron says he's listening up, but often works stations *below* his transmit frequency), and his QSL route—ZL1AMO, direct only.

There are several ways a DXer can stay on top of DX news. One is by sitting in front of the rig much of the time, listening. Much DX news eventually finds its way to the airwaves. (Beware the rumors mills, however, especially on DX nets; the vast majority of information is simply wishful thinking.) For those DXers without the time to listen to the bands all day, there are several DX newsletters available which provide comprehensive DX information. The classified ads in this magazine contain ordering information on these publications. Send these a business-size, self-addressed, stamped envelope for samples and prices. (I have a distinct prejudice for *The DX Bulletin* be-

cause I write it, but the other newsletters deserve a look, too.) Another way to keep up with happenings on the bands is via your local PacketCluster® DX spotting network. If you don't have a DX packet spotting network running in your area, get together with some of the local amateurs and start one. Such networks are excellent sources of DX information.

**4. I resolve to refrain from making duplicate contacts.** DXers often make "insurance" contacts (a second contact on the same band and mode). These duplicate contacts always deprive another DXer of a contact with that station. Ask any DXpedition operator what his greatest problem is (after the ubiquitous "When are you going to be on 80?"), and he will answer "insurance contacts." DXpeditioners would rather call unanswered CQs than work a station twice on the same band and mode. Martti Laine, OH2BH, reported that one WØ station (an old-timer who should know better) worked the XF4L Revillagigedo DXpedition *eight* times on 10 meter SSB, once each day!

As with tuning up on top of a DX station, there is no excuse for "insurance" contacts. First, the DX station and the DXer should both ensure that the contact is "in the log" before confirming it. A good DX station will always give the entire callsign of the station worked. When the DXer hears his or her call repeated by the DX station, he or she knows that the call is "in the log," and there is no reason for a duplicate contact. If the DX station fails to repeat the entire call, and the DXer has some doubt about which station got through the pile-up, that DXer has some justification for making a second contact, but *on a different band or mode*.

Increasing numbers of DX operators are using computer logging systems which flag duplicate contacts instantly. When Tom Gregory, N4NW, operated from the Congo as TN4NW, he used Don Greenbaum, WB2DND's computer logging system, which displays all contacts with a given station as soon as the call is typed into the computer. Tom was unsympathetic, to say the least, about "insurance" contacts.

**5. I resolve not to be a "DX policeman."** Nor to police the policemen. Nor to police those policing the policemen. DX policemen are self-appointed masters of ceremony on the DX station's fre-



## The WPX Program Mixed

1417 VU2DNR 1418 WB5KYK

### SSB

2091 DL8AAV 2095 YC2OK  
2092 JR3FQB 2096 G4XTA  
2093 YC0RX 2097 WA5UFH  
2094 JI1QGQ 2998 YB0RX

### CW

2595 IK8DDY 2598 N7JB  
2596 DL6SF 2599 G4KZZ  
2597 IK1CPB

### WPX

251 KA1RRX 252 KB4TLH

## Endorsements

Mixed: 500 VE2DWH. 550 ONL-2169. 600 ONL-2169. 650 ONL-2169, JA7XBG. 700 IK2ILH, JA7XBG. 750 JA7XBG. 800 KF4FP, JA7XBG. 1050 K9UQN. 1100 K9UQN. 1150 K9UQN. 1200 NE6I. 1250 JA6GWU. 1350 WB4RUA. 1400 WB4RUA. 1450 SM6CST. 1500 SM6CST. 1650 K2POF. 1700 N6JM, K2POF. 1750 N6JM. 1800 I1EEW. 1850 I1EEW. 1950 I84FD. 2000 W1BWS. 2050 W1BWS. 2100 W1BWS, IN3ANE. 2150 W1BWS.

SSB: 350 YC2OK, G4XTA, DL6SF, YB0RX. 400 YC2OK, G4XTA, DL6SF, OZ1DYI, YB0RX, JA7XBG. 450 DL6SF, YB0KX, JA7XBG. 500 DL6SF, YB0RX. 600 G4SVB, DL6SF, YB0RX. 650 G4SVB, YC7DF, DL6SF, YB0RX. 700 I8IYW, NE8Q, YC7DF, YB0RX. 800 I8IYW, YC7DF, YB0RX. 850 I8IYW, NE6I. 900 I8IYW. 950 WA2FKF, I8IYW. 1000 WA2FKF, HK6BER. 1050 WA2FKF, HK6BER. 2300 WD8MGQ.

CW: 350 IK8DDY. 400 DL5XAS, IK8DDY. 500 JA7XBG. 550 WB5MTV, JA7XBG. 600 WB5MTV, JA7XBG. 650 I1EEW. 700 K3SF. 750 JA2GCW. 800 IK3GER. 850 NE6I, JA2GCW. 900 JA2GCW. 950 I5SMX, K9UQN, JA2GCW. 1000 I5SMX. 1350 SM6CST. 2100 W4VQ. 2150 W4VQ. 2200 W4VQ. 2250 W4VQ.

10 Meters: VE4CE  
20 Meters: JA7XBG  
40 Meters: N7JB  
80 Meters: KS3F

Asia: I8IYW, WB3DNA  
Africa: I8IYW, VE1ACK, HK6BER, WB3DNA  
No. America: I8IYW, VS6UW, WB3DNA  
So. America: I8IYW, WE2L, VE1ACK  
Europe: WB3DNA  
Oceania: I8IYW, WB3DNA

**Award of Excellence Plaque Holders:** NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DE0DXM, DK4SY, UR2\*\*, AB9O, FM5WD, I2DMK, W4BQY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, HI8LC, KA5W, K0JN, W4VQ, KF2O, K3UA, HA8XX, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB0G, HB9CSA, F6BVB, W1BWS, YU7SF, G4BUE, N3ED, DF1SD, K7CU, I1POR, LU3YLW4.

**Award of Excellence Plaque Holders with 160 Meter Endorsement:** N4KE, I2UIY, W8ILC, W1BWS, NN4Q, G4BUE, LU3YLW4, I4EAT, VE7WJ, W9NUF, N4NX, VK9NS, DE0DXM, VE7IG, K9BG, AB9O, FM5UD, SM0DJZ, DK5AD, SM6CST, I1JQJ, W3ARK, HI8LC, KA5W, UR2\*\*, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF2O, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KB0G, F6BVB, W4BQY, YU7SF, W5UR, N4NO, DF1SD, K7CU, I1POR, W8RSW.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to CQ WPX Awards, P.O. Box 1351, Torrance, CA 90505-0351 U.S.A.



Malaysia amateurs and their wives include, from left, Hugh Blair, 9M2HB, and Loan Blair; Kevin Walton, 9M2ZZ, and Kim Walton; and Joe Sciuto, 9M2/N4MQX, and Kim Sciuto.

quency. These so-called DXers tell those stations transmitting on top of the DX station that the DX station is listening split, give out QSL information, and provide helpful hints such as "Shut up. He's transmitting." Every one of these comments is totally unnecessary, and all simply QRM the pile-up. If the DX station is listening off frequency, this will quickly become apparent to all but the most obtuse DXer. And there are sources of QSL information other than DX policemen.

**6. I resolve to be courteous at all times.** Even when the actions of other DXers are obnoxious, objectionable, or downright illegal, the good DXer keeps his or her temper, and refrains from telling the other amateur what he or she really thinks about the activity. Write a letter instead, and wait at least one day before mailing it.

**7. I resolve to follow proper QSL procedures.** Another chronic complaint of DX stations and DXpeditioners is bad QSLing. DXers who put local time or date on the card, who don't have their callsign on the same side of the card as the QSO data, who don't provide an SASE or SAE and postage, who send a follow-up QSL within a few weeks, or whose handwriting makes doctors look like calligraphers drive QSL managers crazy. With a few noted exceptions, QSL managers are a dedicated and hard-working breed, and a DXer should try to make their task as easy as possible. Ross Forbes, WB6GFJ, who coordinated the 3D2XX Rotuma QSL team, actually received a collect telephone call on his unlisted number from an impatient DXer seeking a card.

**8. I resolve to keep my station technically clean.** Some DXers seem to feel that if some audio compression is good, then a lot of it is better. Or that they can increase power output by turning up the microphone gain. Or that introducing a little hum on their CW signal will make it more distinctive in the pile-ups. The truth is that a clean, well-modulated signal is easier for the DX station to copy, and the one

most likely to break the pile-up. Work with another DXer in another part of the country to find the best settings for the mic gain and compression, or maximum drive into the amplifier. Note these settings and don't exceed them. The spurs, clicks, and unintelligible audio should be confined to the "band" just below 10 meters, where they don't know any better.

Another way to reduce QRM on the DX bands is to use minimum power for each contact. Not only is this an FCC requirement, but it is also common courtesy.

## The WAZ Program

### 10 Meter Phone

341 K0JZM 342 JA1KRW

### 15 Meter Phone

303 YC0HET 306 YC0LOG  
304 YC0WWL 307 YC0DAJ  
305 YC5ODQ 308 4X4DK

### 20 Meter Phone

770 LU9DBK 773 4X6DK  
771 WM5G 774 WB2GOK  
772 HC2RG

### 10 Meter CW

69 SM6CST 70 W6JTI

### 15 Meter CW

157 NY6M/KH2 160 JI1FOL  
158 KA2DIV 161 K9IW  
159 KF2O 162 WB5MTV

### 20 Meter CW

338 KA2HMJ 341 WA5VGI  
339 KX1T 342 WB2GOK  
340 KD2SX 343 WR7C

### 40 Meter CW

112 JA2NQC 113 N6RJ

### 80 Meter CW

25 SM3EVR

## ALL BAND WAZ SSB

3411 YB4TE 3420 WB2GOK  
3412 YC0RX 3421 W5LJI  
3413 YC5ODQ 3422 JR4SRW  
3414 YB8QD 3423 W5XQ  
3415 YB0PHM 3424 WA4OBZ  
3416 KA2CKS 3425 IK5EEG  
3417 K9LJN 3426 W5BWA  
3418 VK5NVV 3427 N9AKE  
3419 W4JR 3428 5T5CK

### Phone/CW

6635 LU1DOW 6647 KD2SX (CW)  
6636 KE5PO 6648 KD9KN  
6637 KX2A 6649 KZ2L  
6638 DK7BY 6650 OE5OI  
6639 N2MF 6651 G4ASL  
6640 SM6JWW 6652 VS6UW  
6641 VE3HI 6653 JF1DLY  
6642 JQ1PGV 6654 RB5RR  
6643 K9LJN 6655 W2KTF  
6644 IK0IOL 6656 WB2GOK  
6645 NM7M 6657 W5USM  
6646 KD2SX 6658 HA5HR

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (65 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.

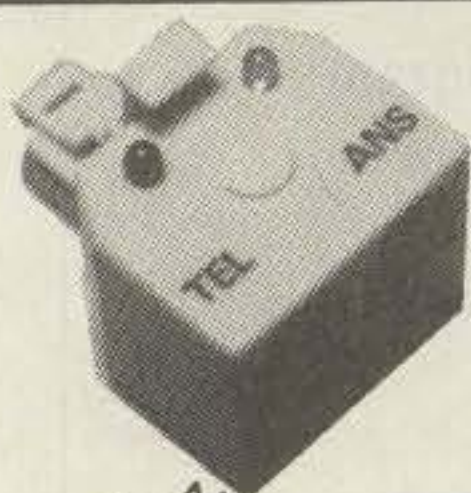


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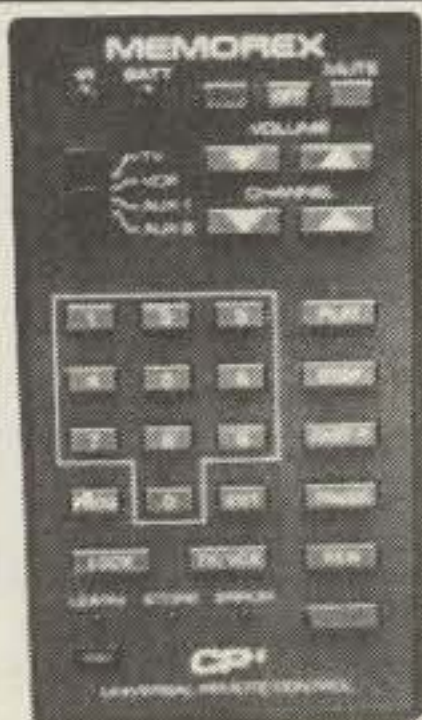
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NS7Z

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- |                |                 |
|----------------|-----------------|
| 1. K1VKO, 199  | 13. K9GX, 199   |
| 2. N4WW, 199   | 14. AA4V, 199   |
| 3. UQ1GXX, 199 | 15. K2UU, 199   |
| 4. W7OM, 199   | 16. YU2CBM, 199 |
| 5. W0JLC, 199  | 17. HA8XX, 198  |
| 6. SP9PT, 199  | 18. K7UR, 198   |
| 7. K9YRA, 199  | 19. PY7ZZ, 198  |
| 8. K5UG, 199   | 20. K6SIK, 198  |
| 9. K8EJ, 199   | 21. VE7DX, 198  |
| 10. N2MF, 199  | 22. W0PGI, 198  |
| 11. K9TSQ, 199 | 23. NY2E, 198   |
| 12. SP6CZ, 199 |                 |

611 Stations have attained the 150 Zone level, as of  
October 1, 1989.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (65 cents) size 4 1/2 x 9 1/2 to the W A Z Manager, Leo Haijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

When I was operating from Gambia as C5AAQ, I came across three very loud W2 stations in the same town rag-chewing on 20 meters about the lack of African stations on the band. I broke in and explained that if they wouldn't run a kilowatt to talk across town, or, better still, move up to 2 meters for local communications, there would be more space on 20 meters for African stations, such as myself. (They were kind enough to relinquish the frequency to me.)

9. I resolve to send my complete call. The practice of sending the last two letters of one's callsign has dramatically reduced pile-up efficiency. While the practice may have some value in nets, it hampers DX pile-ups. The DX station must ask for the complete callsign, rather than giving a report. This extra exchange cuts into the number of DXers the DX station can work in a hour, and thus the total number of DXers who work that DX station. A DXer has nothing to lose by sending the entire callsign in a pile-up, and everything to gain in increased efficiency.

With a little help from DXers around the world, every amateur can work more DX, with less frustration, and everyone can enjoy DXing more.

## Antarctica

January is not only a time for making New



One of the most active amateurs in the Dominican Republic is Julio Henriquez, HI3JH, shown here with his wife, who is blocking the view of his CQ contest award. (Photo courtesy WB2WOW)

Year's resolutions, but it is also a time to work Antarctic stations. The numerous scientific bases on and around Antarctica see most of their annual activity in the middle of their summer, in January and February. Compared to the very small number of scientists who winter over at the bottom of the world, there are thousands of people in the area during the first two months of the year. This is thus the best time for a DXer to work the numerous prefixes and DXCC countries in the Antarctic region.

The easiest countries to work in the region are Antarctica, Falkland Islands, and Macquarie Island. There is almost always an amateur on Macquarie, and sometimes several during the summer months. This past year Graham Currie, VK0GC, has been the most active Macquarie operator. The Falklands are also often on the bands, and at times of the day more convenient for stateside DXers. Most of the VP8 stations one hears are in the Falklands. (But listen closely; some are in the rarer VP8 countries.)

Antarctica itself boasts dozens of stations, many of which are very active. KC4AAA at the South Pole, KC4USA at Little America, and KC4AAC at Palmer station are often available on the amateur bands. (KC4AAA-KC4AAF, and KC4USA-KC4USZ are US Antarctic stations.) Stations with the 4K1 prefix are Russian Antarctic amateurs. All are located on Antarctica itself except for 4K1F, which is in the South Shetlands. Many other countries have bases on Antarctica, including France (FT-Y), Chile (CE9), Argentina (LU-Z), Poland (HF0POL), Great Britain (VP8), Japan (8J1RL and 8J1RM), South Africa (ZS7), New Zealand (ZL5), Australia (VK0), and Belgium (OR4).

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MHB-5820,220 Mhz. 3dB 5/8	29.00
MHB-5802, 2 meter non-radial 3dB	29.00
MHB-2002,220 non-radial,3dB	29.00
BMFT-120,1/4wave,black,118-512	21.00
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MUF-4505NGP,430-450 non-radial	38.00
MAX-9053,902 MHz.	31.00
MAX-SCAN 1000,Scanner Antenna	19.95

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MBX-250,220 MHz Omni Base	59.50
MBX-430,430-450 Omni Base	54.50

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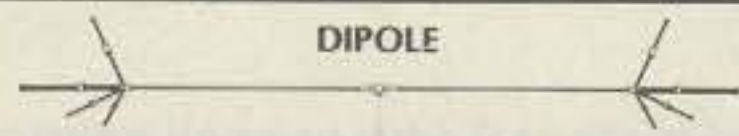
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## CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Total countries are now 321. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be made at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement. All updates must be accompanied by an SASE for confirmation. The fee for endorsement involving the issuance of a sticker is \$1.00.

### CW

W9DWQ	321	N4PN	315	W0SR	311	YU2TW	301	WA4DAN	294	JH1VRQ	282
K2FL	321	DL7AA	315	N2KW	311	I3OBO	301	K4CXY	292	I2QMU	281
K4CEB	321	N6AV	315	K8PYD	310	K2OWE	301	N5DX	291	K7ZR	280
K2TQC	321	W1NG	315	EA2IA	310	WB4RUA	300	I8WY	291	I5XIM	280
SM6CST	321	N4KG	315	AA6AA	309	DL6QW	300	WA4JTI	290	G3KMQ	280
N4JF	320	W8KPL	314	K9IW	309	W0HZ	300	KQ9W	290	W2LZX	280
ON4QX	320	K9AB	314	W9RY	308	NN4Q	300	IT9QDS	290	KB9XG	280
K9MM	320	DL8CM	314	IT9ZGY	308	K3FN	298	N4AH	290	W9NUF	280
K6JG	320	OK1MP	314	W4OEL	307	DJ7CX	297	W1WLW	289	K9TI	280
DL1PM	320	N6CW	313	W6SN	307	K8LJG	297	W4BV	289	HB9AFI	279
W4BQY	318	W2FXA	312	SM6CTQ	306	N8MC	297	K1VHS	289	KA2DIV	279
SM3EVR	317	K6EC	312	W9WAQ	305	WD9IIX	296	G2GM	289	WA4IUM	278
K6LEB	317	YU1HA	312	W2UE	305	KD8V	296	K8NA	288	DL1QT	277
N6AR	317	W0IZ	312	AB4H	304	W1WAI	295	W6YQ	287	KA3R	276
W6PT	316	DJ1XP	311	K9BWQ	304	W9WAQ	295	G2FFO	287	NS7Z	276
K4XO	316	W6ID	311	WD9IIC	303	W6DN	295	W9SC	287	K4SE	275
N4MM	316	K9QVB	311	WA8DXA	302	N5FW	294	DJ2PJ	286	W3BBL	275
DL3RK	316	K3UA	311	W7CNL	302	IT9TQH	294	K2JF	283	F3TH	275
K1MEM	316										

### SSB

K2FL	321	I8ACB	316	NA5W	312	K8VFX	305	I6PLN	299	WA6DTG	288
W6EUF	321	K8PYD	316	W8ILC/QRPp	312	EA1QF	305	KA8T	299	KA9TNZ	288
W4UG	321	K4XO	316	I2MQP	312	K4RIG	305	DJ7CX	298	N6CGB	288
VE1YX	321	OA4OS	316	NN4Q	312	K8ZZU	305	WA4IUM	298	EA3KW	287
K6WR	321	W8JXM	316	KR9O	312	I4WZK	305	K9SM	298	AB9E	287
EA4DO	321	N4KG	316	W4SSU	311	SM6CST	305	I8LEL	298	W9SC	287
VE3MR	321	A18S	316	K6EC	311	KD8V	304	JH4PRU	298	PA0XPO	287
DL9OH	321	N6AHU	316	K8NA	311	K8YM	304	EA9IE	298	I2EOW	287
I8AA	321	W0SR	316	NJ0C	311	I1POR	304	XE1HI	298	N8BJQ	286
YU1HA	321	VE3MRS	316	W2CC	311	W6MFC	304	K5DUT	297	N3ARK	286
I0ZV	321	WB1DQC	316	WA4DAN	311	KB0SY	304	HP1JC	297	N9CPW	286
OZ3SK	321	XE1AE	315	W9OKL	311	XE1KS	303	YU7KV	297	K9MNT	286
N4JF	320	I8YRK	315	I8XTX	311	W2LZX	303	XE1OW	297	T12JJP	286
F9RM	320	I4ZSQ	315	WB3DNA	311	KB0U	303	WD9GQV	297	KB5RF	285
W9DWQ	320	I8KDB	315	WA4WTG	311	K0GT	303	WB3GPR	296	I8IGS	285
T12HP	320	K9LKA	315	K9HQM	311	G4ADD	303	KB3KV	296	KF5AR	285
W4DPS	320	ON5KL	315	AG9S	311	KS0Z	303	I0SGF	296	KC7EM	284
W0YDB	320	OZ8BZ	315	KB4HU	311	W0ULU	303	K8NWD	296	WB3HAZ	283
K6YRA	320	K9AB	315	DK2BL	310	W4BQY	303	W0IYR	295	VE3MV	283
I4LCK	320	N6AW	315	AA6AA	310	K1MEM	302	KK0C	295	ZP5JCY	283
ZL3NS	320	K1UO	315	WA4JTI	310	N5FG	302	G3XTT	295	I4CSP	283
4Z4DX	320	W7OM	315	AB9O	310	W6FET	302	VE3XO	295	I8DVJ	283
OK1MP	320	G4CHP	315	W4UW	310	I3OBO	302	K13L	295	AE2B	282
DJ9ZB	320	YV5DFI	315	KU9I	310	K9UAA	302	IN3ANE	295	A19R	282
KS2I	320	KB8DB	315	N6AHV	310	KP4EQF	302	I7UNX	295	TG9EP	282
YU1AB	320	VE7DX	315	KB9OC	310	N5FW	302	VE3DLR	295	N1ALR	282
VE3GMT	320	W9RY	315	W8IMZ	310	I5EFO	302	WD0BNC	294	WA8YTM	282
PY1APS	320	I4EAT	315	K1MIZ	310	KQ9W	302	I5BDE	294	PY2DBU	281
ZS6LW	319	VE3XN	314	I2QMU	310	XE1MDX	302	WB3CQN	294	NP4CC	281
W3AZD	319	YS1RRD	314	NY5L	310	WB4PUD	302	KB8O	294	NX0I	281
N4MM	319	K8LJG	314	IV3YRN	310	KE4HX	302	K4JLD	293	G4FAM	280
W4EEE	319	K3UA	314	I8KCI	310	VE2PJ	302	K4SE	293	KU9Z	280
ZL1AGO	319	W3GG	314	XE1OX	310	WA3HUP	301	KC8JH	293	XE1XM	280
K9MM	319	I2LLD	314	N4PN	309	VE3FJE	301	A15I	293	W9VA	280
N7RO	319	W1NG	314	WD9IIX	309	WB4NDX	301	W9NUF	293	KB5DN	279
W0SFU	319	W1LQQ	314	K9QVB	309	YU2TW	301	KD5ZM	293	EA6DE	279
K6JG	319	SM4CTT	314	K4CXY	309	N4CRU	301	WB6OKK	293	JH8NYK	279
OZ5EV	319	W6SN	314	W6NLG	309	KZ0C	301	W5LLU	293	KX5V	279
IT9ZGY	319	WB4UBD	314	W4UW	309	N8BKF	301	VE6PW	293	WN5K	279
W2SUA	319	KZ2P	314	VK4VC	308	WT4T	301	T12LTA	293	K4BYK	278
VE2WY	319	K9IW	314	YV5AIP	308	KB2HK	301	WA4LOF	292	VE3IUE	278
W9JT	318	N2KW	314	N6AV	308	K7LAY	301	AC0A	292	DF6EX	278
YV1KZ	318	W7FP	313	A18M	308	KB9KD	301	VE3FEA	292	KG9N	278
W9SS	318	EA4LH	313	NS7Z	308	K2JF	301	VP9CP	292	I8WYD	278
W4NKI	318	W8PCA	313	YV1AJ	308	WE2L	301	W8LKG	292	WB0UFL	277
DL6KG	318	N2SS	313	K8CMO	308	KE4VU	301	SV1JG	292	W4PTT	277
OE3WWB	318	OE2EGL	313	I0MBX	307	VE4AT	300	VE3IPR	291	WD0DMN	277
K5OVC	318	ZL1BIL	313	KV2S	307	SV8CS	300	W4JFE	291	K8YVI	277
YS1GMV	318	K2JLA	313	VK3JF	307	G4GED	300	DU9RG	291	HK6BER	277
W8ILC	318	WZ4I	313	NJ2C	307	WB5TED	300	XE1CI	291	N0AMI	276
N6AR	318	IT9TGO	313	VE4SK	307	I2ZGC	300	KB2MY	291	N7ASL	276
KM2P	318	K0GT	313	KB3OQ	307	NW5K	300	ZL1BOQ	291	WA4OPW	276
DJ1XP	317	W2FGY	313	KA9ABC	307	WB6GFJ	300	KB7VD	291	KC2RS	276
KD8VM	317	F2MO	312	W4UNP	307	JH1VRQ	300	K9TI	291	WA9IVU	276
CT1FL	317	W0SD	312	W42MID	307	WB6PSY	300	KB1JU	291	K0HOW	276
N4WF	317	K9RF	312	WA4ECA	307	IT9TQH	300	KF5DX	291	I2WZX	276
K9BWQ	317	K4MQG	312	N4KE	306	K4LR	300	VE3CKP	290	KC4MJ	276
EA2IA	317	K9HDZ	312	KB5FU	306	KA3HXO	300	KC2FC	290	KA5YCM	276
K4POV	317	LA7JO	312	KE3A	306	IK8BQE	300	F6BFI	290	WB1EAZ	275
WD8MGQ	317	LU3YL	312	K3LUE	306	WA2FKF	300	JA5PUL	289	VE7BSM	275
W6DN	317	N6OC	312	W6BCQ	306	K1VHS	300	W9TA	289	VE5FX	275
VE7WJ	317	9H4G	312	CX4HS	306	IK8CNT	300	A19U	289	W0FF	275
SV1ADG	317	W4UNP	312	WD8PUG	306	WA9RCQ	300	WD9IIC	289	I8INW	275
I0AMU	316	KC8EU	312	KZ8Y	305	WA0TKJ	299	OK1AWZ	288	WB8TLI	275



tries in the Antarctic region are South Shetlands and Kerguelen. This past year HL5BDS (QSL to HL1ASS) was very active from the South Shetlands, and the Argentines often are active from their Deception base. In addition to the above-mentioned 4K1F, CE9AN-CE9BZ stations are in the South Shetlands. Stations on the French island of Kerguelen can be identified by their FT-X callsign format. These stations are often found in the French DX Foundation's net on 14256 kHz around 0000Z. FT4XI, FT5XH, and FT5XA are stationed on Kerguelen this year.

Most of the other Antarctic DXCC countries are available only by DXpedition, and usually a major (really expensive) one. The planned 3Y0B Bouvet operation and the 1987 3Y1EE Peter I Island operation are typical of the logistics necessary to put these rare countries on the air for DXers. The smaller French islands sometimes have a resident amateur, such as the now-departed FT5ZB and FT4ZE on Amsterdam. The Australia island of Heard hasn't been significantly active since the two operations in 1983. The Australians visit the island regularly to service the weather station there, the

### CQ DX Awards Program

#### SSB

1711	4X6DK	1717	YC5ODQ
1712	W3YN	1718	KM2P
1713	TI2JP	1719	CE1YI
1714	N7LUB	1720	IK1LBL
1715	YB0AY	1721	VK5NWW
1716	YC0RX		

#### CW

763	K8TV	765	WB4FLB
764	KV1M	766	N1HN

#### SSB Endorsements

320	I0ZV/321	300	WA9RCQ/300
320	PY1APS/320	275	TI2LTA/293
310	W2SUA/319	275	N6CGB/288
310	KM2P/318	275	TI2JP/286
310	K4PQV/317	275	HK6BER/277
310	WD8MGQ/317	250	CE1YI/265
310	W6DN/317	250	4X6DK/252
310	VE7WJ/317	250	I8IYW/258
310	SV1ADG/317	200	YC5ODQ/200
310	WB1DQC/316	150	IK1LBL/176
310	KR9O/312	150	VK5NWW/150
310	I2MOP/312	150	WL2C/150
310	KB4HU/311	28 MHz	4X6DK
310	AG9S/311	28 MHz	N7LUB
300	CX4HS/306	3.5/7 MHz	4X6DK
300	WB4PUD/302		

#### CW Endorsements

320	SM6CST/321	275	WA4IUM/278
310	K3UA/311	250	AG9S/259
300	W9WAQ/305	200	N1HN/208
275	N8MC/297	150	K8TV/169
275	W6DN/295		

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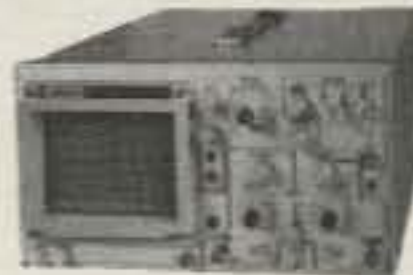
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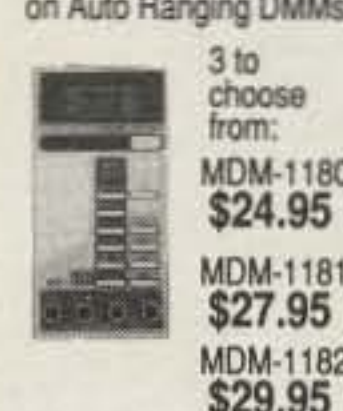
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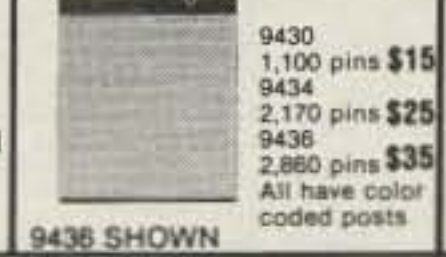
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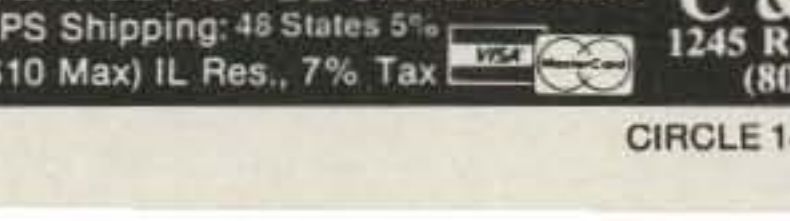
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 FK8FU to NA5U  
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 FR9A to F6FNU  
 FV9NDX to F6AJA  
 FY5EW to F6BFH  
 FY5YE to W5JLU  
 GW1QA to DK3NP  
 H44/OH4ML to OH4ML  
 HB8/DL1ECO to DL1ECO  
 HB8/DL9YBY to DL9YBY  
 HB9AHT/J6L to HB9AHT  
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 IF8PN to IK8BQE  
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 J37AJ to W2KF  
 J73D to W2OB  
 J73EH to WA4W1P  
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 JX7DFA to LA2KD  
 JY8YD to K8PYD  
 JY9IU to HB9AHA  
 K4SXT/DU3 to WB4KZW  
 KC6YU to JH1NBN  
 KE9A/DU3 to WB9YXY  
 KH3/KN8E to K9UIY  
 KX6WS to KX6BU  
 LU1ZA to LU2CN  
 LU1ZA to LU2CL  
 LY2BZ to UP2BZ  
 N7ET/DU7 to N7ET

NT8X/EA to EA7CZR  
 NY6M/KHZ to NY6M  
 OD5/SM6DQO to SM6DQO  
 OD5SK to G14TUE  
 OD5VT to HB9CRV  
 OF8AM to OH2QV  
 OH8BDA to OH2BDA  
 OY1R to W2KF  
 OY3QN to OZ1ACB  
 P29HS to JH5KZC  
 P29KN to WA4SFQ  
 PA8GAM/ST2 to PA8GIN  
 PA8LVB to PA8LVB  
 PA63CXC to PA3CXC  
 PA63DBG to PA3DBG  
 PA63DOB to KA8TGK  
 PA63ERL to PA3ERL  
 PA63EWM to PA3EWM  
 PAG3DOB to KA8TEK  
 PJ2/NX1L to N1CIX  
 PQ2/PY26CW to PY2KP  
 PY8RF to PY8FF  
 PY26CW/PQ2 to PY2KP  
 PY2TG/PY8T to PY2TG  
 R8Y/RA9YZ to UA9YX  
 RABAD/JT to RA9YD  
 RA1QQ/RA8Q to RA1QX  
 RB6M/RT5UY to UB4MM  
 RF4Q/UA3QKQ to UA3QKQ  
 RH8AA to RB7GG  
 RI10A to U18OAA  
 RV8YF to RB7GG  
 SB1A to EA2JG  
 S2/SM8AGD to PIRATE  
 SV8GY/8 to K7MO  
 SV7DP to KA1DE  
 SV8/I5DCE to I5DCE  
 SV8QG to SV1QG  
 T19CC to T12CC  
 T38BC to ZL2QW  
 T32AB to N7YL  
 T58DX to I2JSB  
 T5CT to K4CIA  
 TA3C to DL5YCC  
 TA3F to DL5YCC  
 TE8UP to KC7YN  
 TF/W6ZH to W6ZH  
 TH9A to FD1HWB  
 TI1J to K1AR  
 TI188D to TI4SU  
 TJ1BW to DL6FAL  
 TJ1MW to N4MUJ  
 TJ1RP to VE2CH  
 TK5LN to F6FNU  
 TK9A to F6FNU  
 TL8A to F6FNU  
 TL8DD to W8XM  
 TL8HW to WB4LFM  
 TL8RM to F6FNU  
 TL8SC to K4UTE  
 TL8WD to DL8CM  
 TR2A to F6FNU

TT8CW to F2CW  
 TU8A to F6FNU  
 TU2PA to KE0LS  
 TU2VE to WB4UBS  
 TZ6VV to N0BLD  
 U5GWV to K0TLM  
 U8BQ to UJ8BQ  
 UA8BEZ/UA10 to RA3YA  
 UA8KBA to UA1ATX  
 UA8KCB to UA0KCL  
 UA10IL to UA9MA  
 UA9ZL to UA9YAB  
 UB5MAL/UA10 to UZ1PWA  
 UD6DDI to UD6DFF  
 UD6DKW to W3HMK  
 UF6FDR to UF6FFF  
 UI1C to UI8IAJ  
 UM7MG to UM8MRG  
 UQ8GZV to UA9FBV  
 VQ9DM to N5DM  
 UV6ALN/JT to RW6AA  
 UW1ZC/VA10K to VA10K  
 UZ1ZZZ/A to UA1ZX  
 UZ2FWA to UA2FM  
 V31BB to K3FEN  
 V47NXX to KC8JH  
 V63AO to KC6IN  
 VK8AE to VK2DEJ  
 VK8GC to VK9NS  
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 VP9HE to KD8FW  
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 VQ9SM to N5DM  
 VQ9SS to N6SS  
 VQ9TC to N0JCV  
 VQ9VR to K6VRS  
 VS6WV to K0TLM  
 VU2AIR to W8XM  
 VU2TTC to W8XM  
 VU2WAP to WA2YMX  
 VU2ZAP to W3HMK  
 W3WKP/VP9 to W3WKP  
 XE2UZL to W6UZL  
 XT2PS to DL1HH  
 XU1SS/DU6 to YB3CN  
 XX9SW to KU9C  
 Y33UL to Y66QL  
 Y48DDR to Y54NL  
 YE5R to YB5NOF  
 YJ8AB to KC4MJ  
 YK1AA to DJ9ZB  
 YL2RG to UQ1GXX  
 YS1ECB to EA7EKX  
 YS1MAE to WN5K  
 ZA5DD to PIRATE  
 ZB2/F2JD to F6AJA  
 ZC4JL to ZC4BURO  
 ZC4WP to G0BHA

ZD7KM to G3JKB  
 ZD7VC to WT8S  
 ZD8DQ to KB4FEP  
 ZD8FZ to G4ZVJ  
 ZD8RP to G0BNA  
 ZD8SE to G3XKR  
 ZD8VJ to G4ZVJ  
 ZF2LJ to KB6SFD  
 ZK1CQ to ZL1AMO  
 ZK1RS to ZL4DO  
 ZK1XN to SM5BOQ  
 ZM1AAT to ZL1AAT  
 ZM1BSG to ZL1BSG  
 ZM4IJ to ZL4IJ  
 ZS1IS to KC1AG  
 ZS3E to K8EFS  
 ZS3UN/OH7NRW to OH7XE  
 ZS8MI to ZS6PT  
 ZV7AA to PT7AA  
 ZV7SY to PT7CQ  
 ZY8FA to PT7AA  
 ZY8FR to PY8FF  
 3V8PS to BOX 473, TUNIS  
 4K8FH to BOX 9, CHERSKY,  
 678830, USSR  
 4X6DT to BOX 5616, BEER-  
 SHEVA  
 5N29HKK to BOX 105, KANO  
 6W1AAD to OLIMPIO, BOX  
 971, DAKAR, SENEGAL  
 8R1J to BOX 5571 GEORGE-  
 TOWN  
 9K2HA to BOX 58158 RABIAH  
 85351  
 9V1YC to BOX 1265, SINGA-  
 PORE, 9117  
 A35KB to BOX 1, NUKALOFA,  
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 BY4RB to BOX 413, ZHEN-  
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 BY4RSA to BOX 538, NAN-  
 JING  
 BZ1AG to PO BOX 2916, BEI-  
 JING  
 BZ1OK to JANG, BOX 2916,  
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 BZ4AA to BOX 085 205,  
 SHANGHAI PRC  
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 BZ4RCC to BOX 1827, NAN-  
 JING, CHINA  
 BZ4RDX to BOX 1827, NAN-  
 JING, CHINA  
 BZ4ROM to BOX 538  
 C6AFV to BOX F3563, FREE-  
 PORT  
 CM6TL to BOX 25 CFGOS  
 CN2AQ to BOX 40, TANGIERS  
 EL7X to PO BOX 538, MON-  
 ROVIA  
 J28TY to ARAD BP 1076 DJI-  
 BOUTI

J73MH/FG to BOX 245, ROS-  
 EAU, DOMINICA  
 JT1BC to PO BOX 639, OLAN  
 BATOR 13  
 JT1BS to BOX 676, ULAN  
 BATOR 13  
 LU6XPA to PO BOX 96, USHU-  
 AIA CITY, TIERRA DEL FUE-  
 GO ISLAND/NW  
 LY1BYL to PO BOX 2189, VIL-  
 NIUS, LITHUANIA 232049  
 LY38Q to BOX 37, PANE-  
 VEZYS 235300 LITHUANIA,  
 USSR  
 PZ1DY to BOX 9131, PARBO  
 RD6DZ to PO BOX 213, KIRO-  
 VABAD 374723  
 RL7PEO to BOX 11, SARKANO  
 472340  
 RT2J/UB4SWA to BOX 13 SIM-  
 FEROPOL 333038  
 RT8J/UB3JWW to BOX 13,  
 SIMFEROPOL 333038  
 RT9J/UB4JCF to BOX 13, SIM-  
 FEROPOL 333038  
 T77GM to BOX BORGIO  
 TA2AO to OSMAN, BOX 676,  
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 BE ZIP 734001  
 UB8MK to PO BOX 1777,  
 FRUNZE, KIRGHIZ 720023  
 USSR  
 UO58KW to BOX 4057, KISH-  
 INEV  
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 SUNFEROPER 333038  
 UW9VA to BOX 1, OSINNIKI,  
 KEMFROVO, 652810 USSR  
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 1250, INDIA  
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 Y11BGD to PO BOX 7075,  
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 SION ISLAND 4000



Abdul, 9K2DZ, with the microphone, entertains Lefty, KE4VU, in Abdul's computer-filled shack. Abdul is active on RTTY as well as SSB, and will accept schedules from DXers needing Kuwait.

visits are brief, and they seldom include an amateur.

The British Antarctic islands have a small resident population, but very little amateur activity. VP8BUB on Bird Island in the South Georgia chain has been very elusive. VP8BXX is on Signy Island in the South Orkney group, and the Argentines sometimes operate from their Orcadas base in the South Orkneys using the LU1ZA callsign. South Sandwich is one of the rarest countries on the amateur bands, ranking 11th in *The DX Magazine's* comprehensive Most Wanted Countries survey. A group of amateurs headed by Tony DePrato, WA4JQS, hopes to mount a DXpedition to the South Sandwich group this year as VP8BZL. If this succeeds, that will mean the two Most Wanted countries in the Antarctic region will be available to DXers within a few months of each other!

How many Antarctic countries, prefixes, and stations do you have confirmed?





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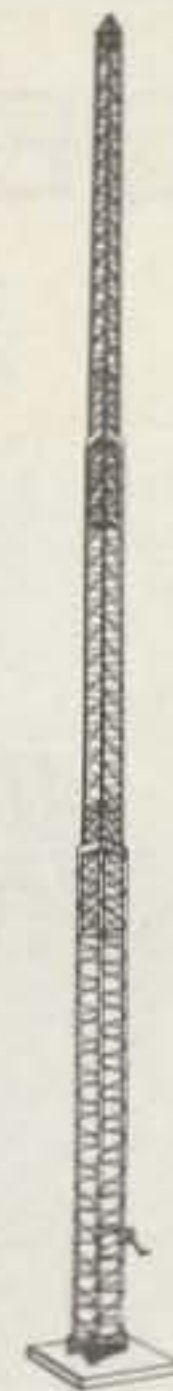
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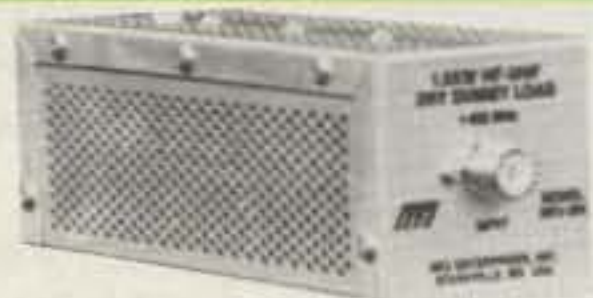
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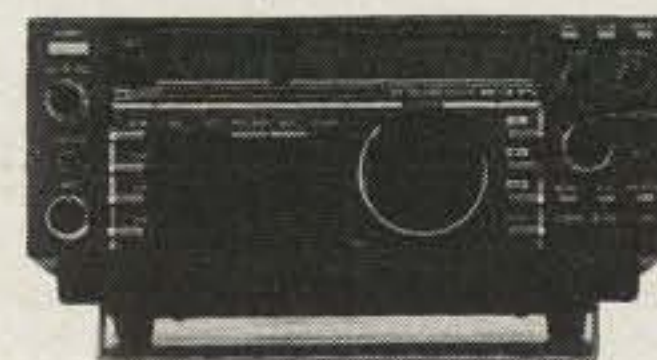
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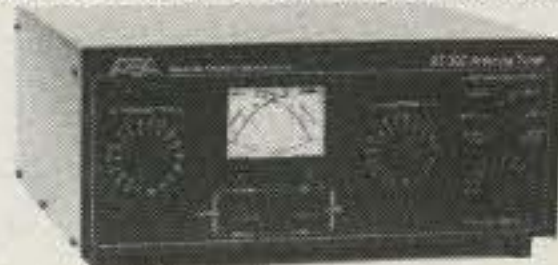
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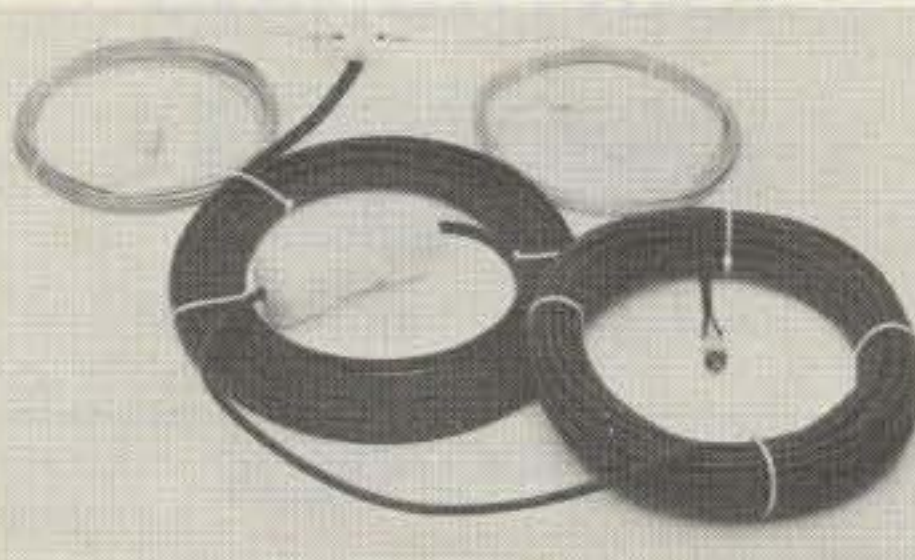
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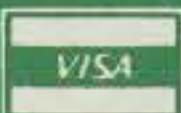
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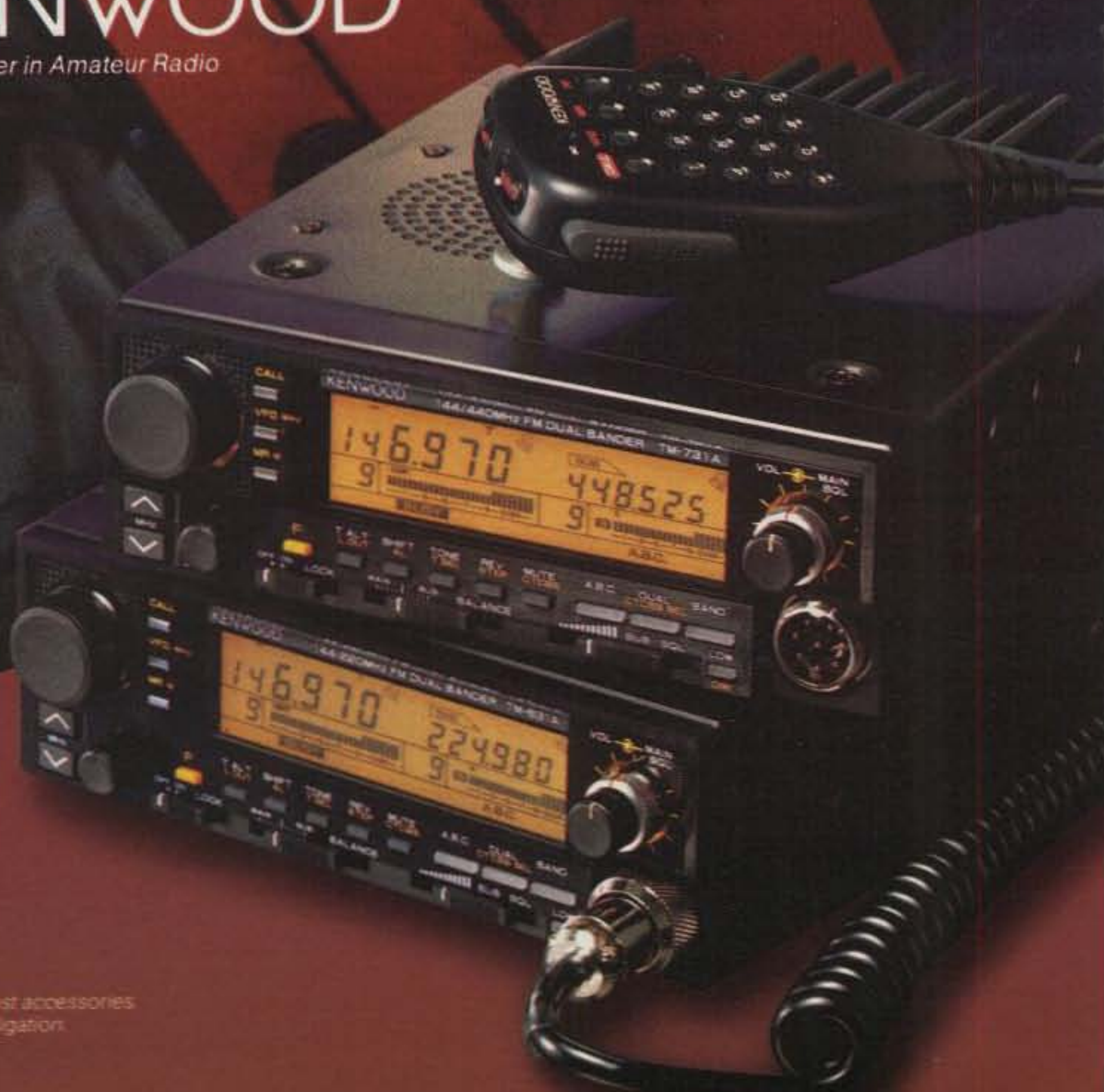
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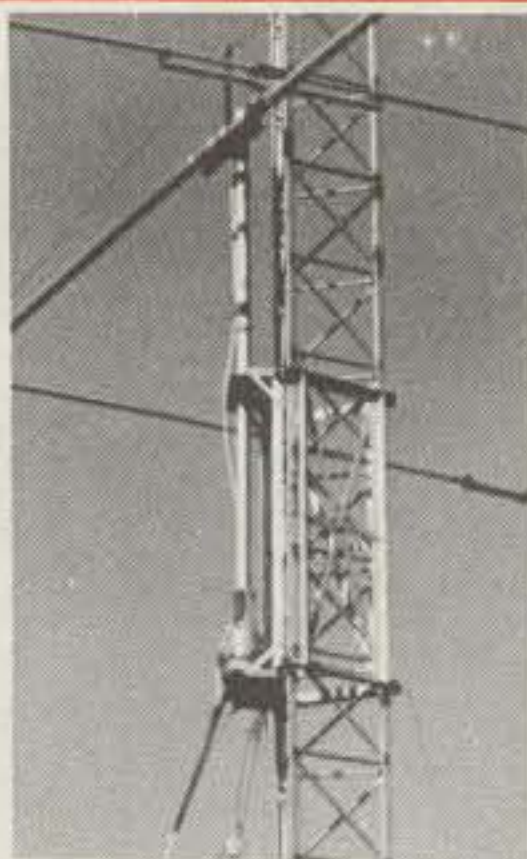
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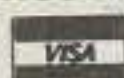
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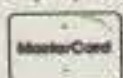
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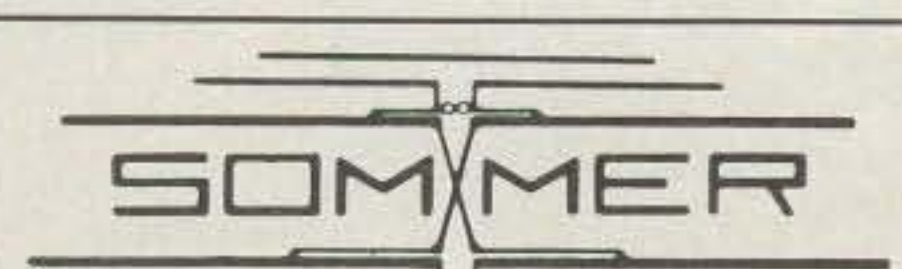
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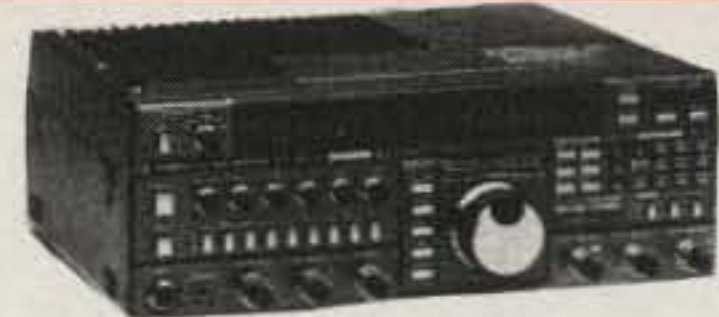
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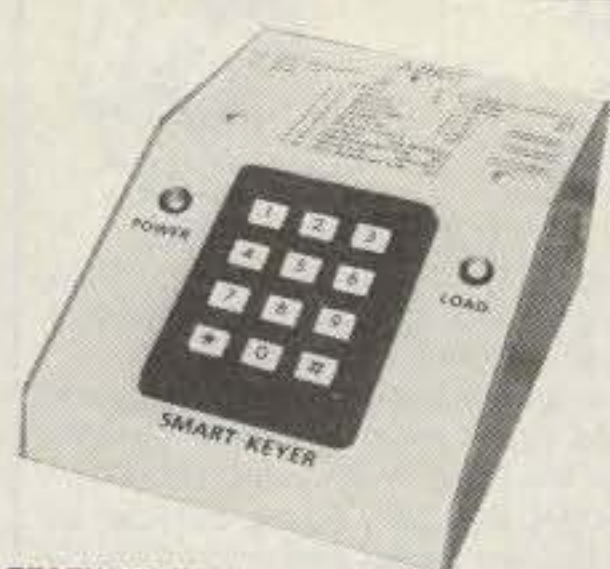


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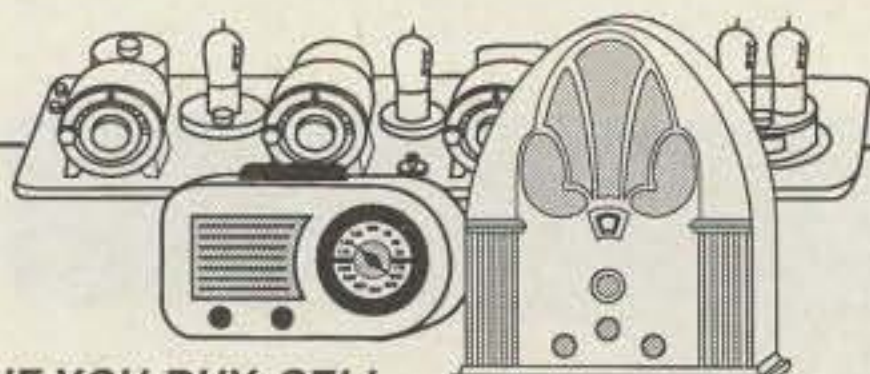
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MRF559	2.25	2SC2539	19.75	4CX1000A	459.95
MRF607	2.50	2SC2559	28.25	8877	599.50
MRF629	3.25	2SC2630	23.00	<b>EIMAC TUBES</b>	
MRF630	3.75	2SC2640	15.00	8874	359.50
MRF641	20.50	2SC2641	16.00	8875	399.95
MRF644	23.00	2SC2642	28.25	3CX800A7	339.95
MRF646	26.00	2SC2694	46.75	3CX1200A7	469.00
MRF648	31.00	2SC2695	31.75	3CX1500A7	699.50
MRF660	13.25	2SC2782	32.75	3CX3000A7	719.95
MRF843/F	21.00	2SC2879	21.00	4CX250B	99.95
MRF846	37.75	2SC2904	32.50	4CX350A	199.50
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to get on packet...  
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For FM, it's an excellent low-cost alternative for FM communication via your local amateur repeater. Great for control links too. And it's compatible with the RFC VHF 30-watt amplifier if you wish to out-reach your local repeater.

## The specs:

- 2 meters, 144-148 MHz range
- Dual conversion superhet - 10.7 MHz IF, 455 kHz 2nd IF
- PIN diode switching, less than 5ms
- 2-watts or greater output, crystal controlled, mic & speaker jacks provided
- DB-9 data connector with direct-buffered connections to varicap and detector.
- Mic, speaker, extra channel crystals and technical reference manual optional.

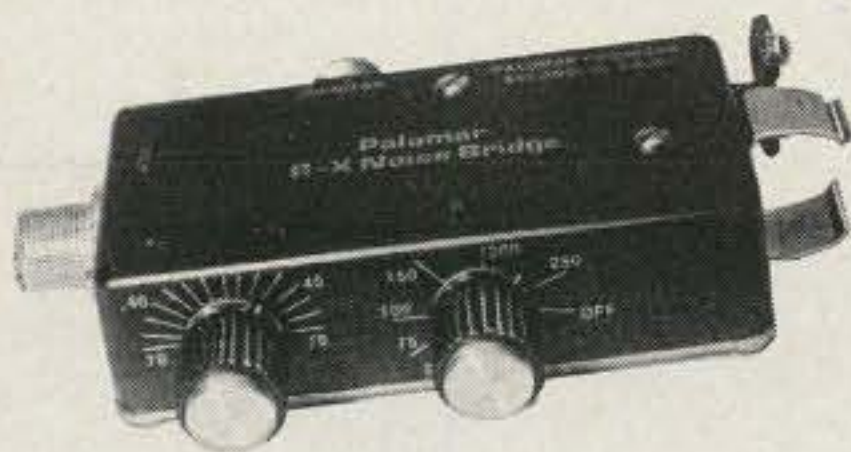
For more information contact the factory. To purchase, contact your favorite Kantronics dealer.

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## R-X NOISE BRIDGE



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Phone: (619) 747-3343

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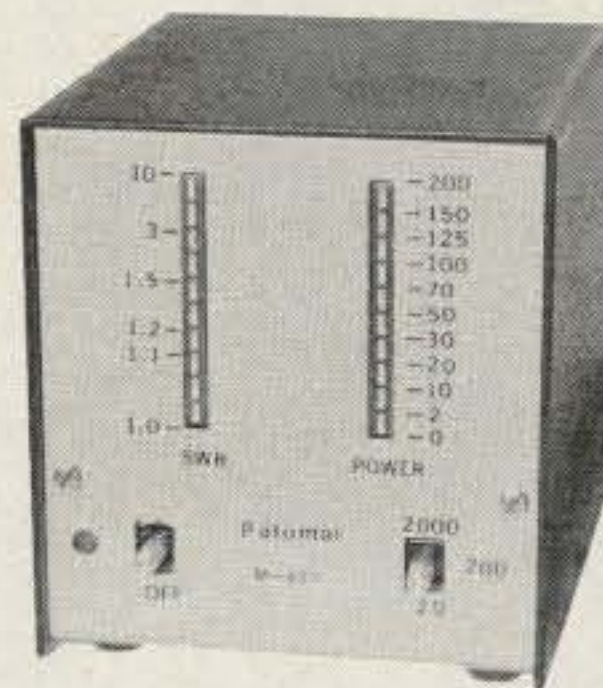
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Model M-827 \$139.95 + \$4 shipping/handling U.S. and Canada. California residents add sales tax.



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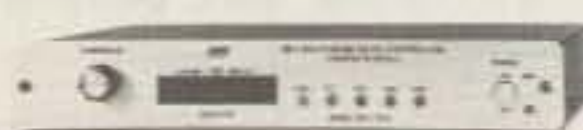


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2 METER HANDHELD SPECIFICATIONS	YAESU FT-411/811	ICOM IC-2SAT/IC-4SAT	KENWOOD TH-215/TH-415
Memory Channels	49	48	10
VFOs	2	1	1
Memory Channels Store Any Offset	49	10	10
Wide Receiver Frequency Range (MHz)—VHF	140-173	138-174	141-163
Wide Receiver Frequency Range (MHz)—UHF	430-450	440-450	438-450
Built-in CTCSS Encode/Decode	Included	Option	Encode Only
Memory DTMF Autodialer	10	None	None
CTCSS Paging	✓	Option	—
Programmable Battery Saver	✓	✓	✓
Backlit LCD Display	✓	✓	✓
Backlit DTMF Keypad	✓	—	—
APO, Automatic Power Off	✓	✓	—
1 MHz Up/Down Stepping	✓	✓	✓
Vinyl Case	✓	Option	Option
Scan For CTCSS Tone	✓	—	—
Built In VOX	✓	—	—
Clock	—	✓	—
Odd Split, Any Tx Or Rx Frequency In Any Memory Channel	49	10	1
Suggested Retail Price	\$406.00*	\$439.95*	\$349.95*

DUAL-BAND HANDHELD SPECIFICATIONS	YAESU FT-470	ICOM IC-32AT	KENWOOD TH-75A
Memory Channels	42	20	20
VFOs Per Band	2	1	1
Wide Receiver Frequency Range (MHz)—VHF	130-180	138-174	140-164
Wide Receiver Frequency Range (MHz)—UHF	430-450	440-450	438-450
Built-in CTCSS Encode/Decode	Included	Option	Encode Only
Memory DTMF Autodialer	10	None	None
Dual Receive With Balance Control	✓	—	✓
CTCSS Paging	✓	—	✓
Cross Band Full Duplex	✓	✓	✓
Programmable Battery Saver	✓	✓	✓
Backlit LCD Display	✓	✓	✓
Backlit DTMF Keypad	✓	—	—
Alternating Band Scan	✓	✓	✓
Cross Band Repeater	✓	—	—
Power Output on 2 Meter and 440	2.3W	5.0W	1.5W
APO, Automatic Power Off	✓	—	✓
1 MHz Up/Down Stepping	✓	✓	✓
Memory Channels Store Any Offset	42	20	20
Vinyl Case	✓	Option	Option
Odd Split, Tx Or Rx, Any Frequency In Any Memory Channel	42	20	2
Suggested Retail Price	\$576.00	\$629.00	\$549.00

## YAESU

17210 Edwards Road Cerritos, CA 90701 (800) 999-2070

Data and prices obtained from latest available manufacturers' brochures & printed material. October, 1989.

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ICOM

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Once in a lifetime, a transceiver is introduced that's so extraordinary and innovative that it opens a totally new era in HF communications. ICOM's pacesetter IC-781 proudly exhibits that hallmark achievement with futuristic designs and features of true legendary proportions. Whether DX'ing, contesting, pioneering new interests or enjoying unquestionable top-of-the-line performance, the IC-781 is indeed today's standard of excellence!

**Multi-Function Five Inch CRT.** Displays frequencies, modes, memory contents, operating notes, RIT, two menu screens, plus a panoramic view of all signals in a selected range. A portion of the screen also serves as a display for data modes like RTTY, AMTOR, and PACKET.



**Unique Spectrum Scope.** Continuously indicates all signal activities and DX pileups with your operating frequency in the center. Selectable horizontal frequency spans of 50,

100, and 200KHz for each side of the frequency you're listening to. Vertical range indicates relative signal strengths. A contesteer's dream!



**Dual Width Noise Blanker** includes MCF filter plus level and width controls to eliminate pulse and woodpecker noise with minimum adjacent-signal interference.

**Incomparable Filter Flexibility.** Independent selection of wide and narrow SSB filters plus CW filters. Second and third CW IF filters are independently selectable!

**Dual Watch.** Simultaneously receives two frequencies in the same band! Balance control adjusts VFO A/B receive strength levels. You can check additional band activity, even tune in your next contact, while in QSO without missing a single word!

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**A Total Communications System!** Includes built-in 100% duty AC supply, high speed automatic antenna tuner, iambic keyer, semi-automatic or full QSK CW break-in to 60 wpm, Audio Peaking Filter (APF), RF speech processor, multiscanning, 105dB dynamic range, all-band/all-mode receiver with general coverage, and much more!

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