

ICD 08241

# Amateur Radio

SERVING AMATEUR RADIO SINCE 1945

FEBRUARY 1988 \$2.50

CANADA \$3.50



## BY1PK's Mini-DXpedition To New York City

... Page 11



Solar Powered  
2 Meter FM  
at KA40WX



THE RADIO AMATEUR'S JOURNAL

# KENWOOD

...pacesetter in Amateur Radio

DX-celence!

## #1 Rated HF!

### TS-940S Competition class HF transceiver

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

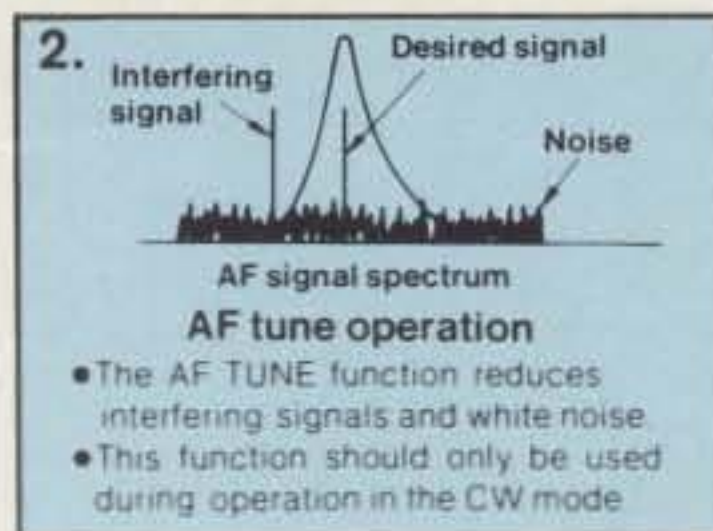
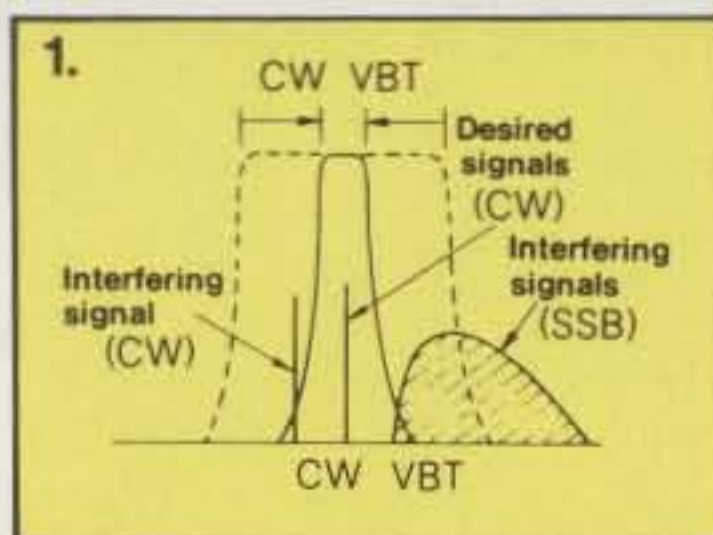
- **100% duty cycle transmitter.** Kenwood specifies transmit duty cycle **time**. The TS-940S is guaranteed to operate at full power output for periods **exceeding one hour**. (14.250 MHz, CW, 110 watts.) Perfect for RTTY, SSTV, and other long-duration modes.
- **First with a full one-year limited warranty.**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

#### Optional accessories:

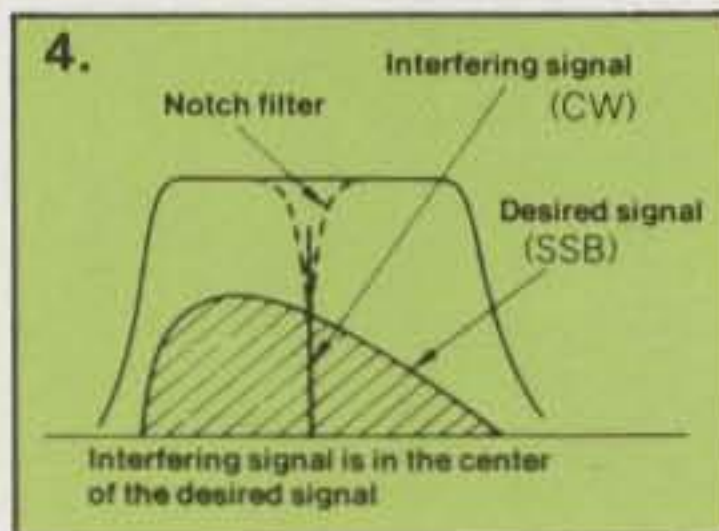
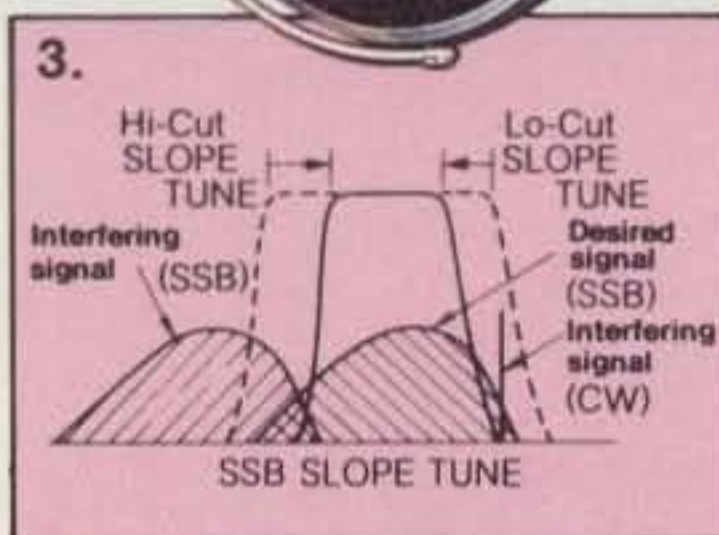
- AT-940 full range (160-10m) automatic antenna tuner
- SP-940 external speaker with audio filtering
- YG-455C-1 (500 Hz), YG-455CN-1 (250 Hz), YK-88C-1 (500 Hz) CW filters; YK-88A-1 (6 kHz) AM filter
- VS-1 voice synthesizer
- SO-1 temperature compensated

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

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



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



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

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

# KENWOOD

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

# KENWOOD

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ALL NEW!

## Double Vision



ACTUAL SIZE FRONT PANEL

### TM-721A Deluxe FM dual bander

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

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

#### Optional Accessories:

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

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

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

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



TM-721A shown with optional RC-10.

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

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# KENWOOD

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NEW!

## Affordable DX-ing!

### TS-140S

HF transceiver with general coverage receiver.

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

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



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

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

#### Optional Accessories:

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



### TS-680S

All-mode multi-bander

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



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# The Radio Amateur's Journal



**ON THE COVER:** Here's George Muller, KA4OWX, of Homestead, FL, showing us how he uses solar power to run his 2 meter HT aboard his boat. Photo by Larry Mulvehill, WB2ZPI.

FEBRUARY 1988

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# Zero Bias AN EDITORIAL

**R**ecently we moved the *CQ* offices. No, we didn't leave beautiful downtown Hicksville. We moved from the fourth floor of the office building where Dick and I started (or restarted) *CQ* 8½ years ago to larger quarters on the third floor. Sometimes when you move to a larger area, things just expand to fit the available space. This time, however, the space was organized not only to fit our present needs, but to allow for growth. We did enjoy a benefit inherited from the previous tenant, namely a "conference room." While we aren't big enough or stuffy enough to actually have a whole area devoted to conferences, Dick and I looked at the area and thought it would make an ideal space for a station and display. So far it's been in the planning stages, but we can definitely say that it's not going to be a memorial station or a museum.

What we have in mind is an area that features equipment and activities found in the three electronic magazines that we publish—amateur radio, naturally, as represented by *CQ*; all forms of short-wave listening (and viewing) as depicted in the pages of *Popular Communications*; and some of the devices and techniques published in the pages of our newest publication, *Modern Electronics*. It will be an area not only for visitors, but for all of us who work here, too.

So far it only consists of a big room with big windows, a big table, a big bulletin board, and big dreams. I'll let you know how things are going with this project as they progress. In the meantime, don't start packing up some of that "good stuff" in your basement thinking that at last you've found a home for it. We're not looking for donations.

## More In 1988

In the last month or so I've been approached by a few well-known, knowledgeable folks out there with ideas about doing more columns for *CQ*. While I do appreciate the thoughts and the offers, there comes a time when you really can have too many columns. It almost becomes an Editor's nightmare when there are too many areas to be covered and not enough space for them all. This year I'm going to try a different approach to new material.

At the moment I've been corresponding with two potential columnists for *CQ*. While both areas deserve more coverage, it would be almost impossible to run them both. I'm proposing to these people that they do their columns on an alternating basis. It's something that hasn't been done before as far as I know, and it at least will give some consistent coverage for our readers. We'll see what happens in the next few months.



*Here I am with my better half, Bonnie. K6IR snapped this proud moment in November after I received the award from the Radio Club of America.*

Another area of expansion that will take place this year is within our Novice Column. Now with the Novice license good for ten years, there's a need for material for those who have achieved the Novice license and yet still can be classified as beginners. Bill Welsh, W6DDB, our Novice Editor, will be broadening some of the material in the column to include things for the beginner. It will cover getting on the air, learning about different modes, and in general covering all those things in amateur radio that we weren't born knowing.

## Are We Having Fun Yet?

I hope so. Spring is on the way, and the best is yet to come. Now is the time to start thinking of getting together some gear to try mobile operation. Most of the rigs you have surprisingly enough will work on 12 VDC. In fact, that was probably one of the reasons why you bought it in the first place. There's plenty of 2 meter gear from which to choose, and all of the modern HF gear is readily adaptable to the car. All you need is a battery cable, which probably comes with the rig, and an antenna. If you haven't tried it, give it some thought. There are plenty of accessory items that will help to safeguard your equipment, and there is mounting hardware for just about any configuration of gear you have.

We all know that there's lots of DX around for a contest weekend, and with a little bit of work you can pick up some rare ones. What you may not know is that many DXers are also County Hunters looking for those rare counties. For a change, you can be the object of a DX pileup if you're operating from one of the choice locations. It doesn't require humongous power levels or tremendous an-

tenna arrays to do it. It just requires that you happen to be in the right place geographically to be desired DX.

## CQ's Editor Receives Award

In the December issue I told you about being made a Fellow in the Radio Club of America. Ken Miller, K6IR, was gracious enough to take pictures during the evening, and this week I received prints from Ken. Many thanks, Ken. Also honored that evening was Gordon West, WB6NOA. Gordon spent some time at the *CQ* offices earlier during the day, and we had a chance to interview him about his famous Weekend Novice Course and his educational package, the "21 Day Novice." You can read the interview elsewhere in this issue. Gordon and *CQ*'s Fred Maia, W5YI, have teamed up to produce some of the best Novice educational material around.

## Travels With CQ

This month starts the official travel season for 1988, and we will be at the 28th annual Tropical Hamboree in Miami during the first weekend of the month and the Ohio State ARRL Convention in Cincinnati the last weekend of the month. Steve Bolia, N8BJQ, our WPX Contest Director, will join me in manning the booth at Cincinnati. By that time we should have available our March issues, which will feature the results of the 1987 *CQ* WPX Phone Contest. Perhaps we can get Steve to autograph your copy of the results if you show up at this event. Cincinnati is a new one for us, and I'll let you know what it was like next time.

Although I've often threatened it, I think I'll start a food contest for the 1988 season. By the time we get to Miami I'm going to work out some sort of standardized grading system for evaluating what passes for food at hamfests. I'm also going to work on a suitable prize for the group that puts on the hamfest with the best food, and I probably also should have one for the group that offers absolutely the pits in edibles. We've got a whole year to work on this one. Samples from YL seminars on the joys of microwave cooking do not count.

## What's In A Word

You might want to pay close attention to WA4BLC's article in this issue. At first glance it might seem simple, but for those of you planning your 1988 aluminum and steel forest, it bears a lot of weight. The right word can mean the difference between getting what you want or feeling the wrath of your local zoning board and community. This is definitely not the time to show off how technically proficient you are with words and engineering.

73, Alan, K2EEK



# Handheld DX with the DX Handy™

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

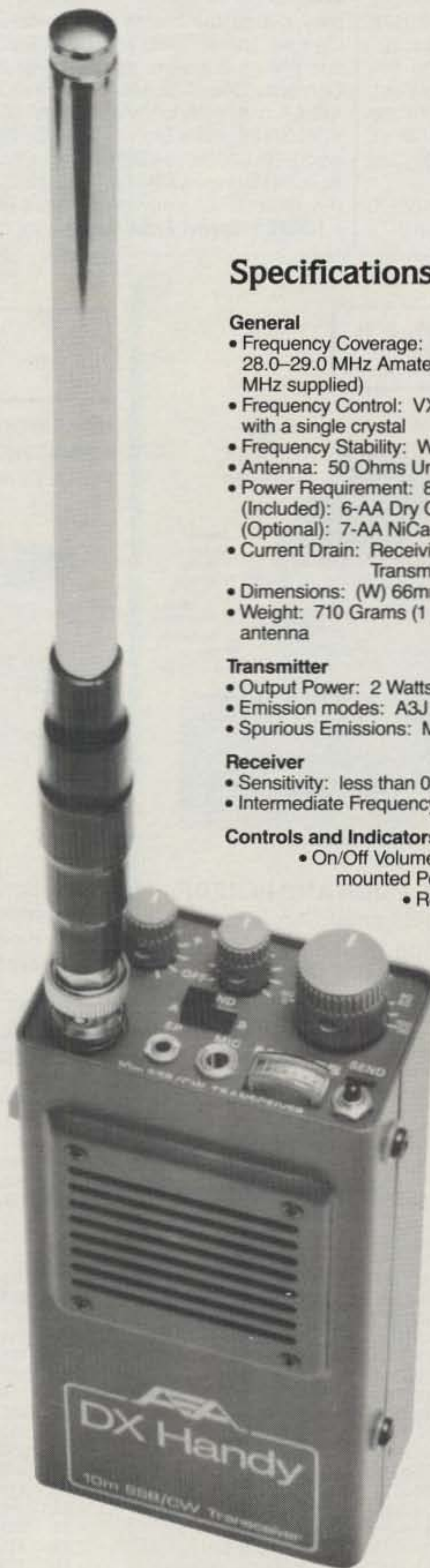
Two variable crystal oscillators (VXOs), each with 50 KHz range, can be selected with a top panel switch. Crystals for 28.250 to 28.300 and 28.300 to 28.350 Mhz are included, and other crystal ranges for the 10 meter band are also available at a nominal cost.

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

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

**AEA**  
**Advanced Electronic Applications**

P.O. Box C2160  
Lynnwood, WA 98036-0918  
(206) 775-7373



## Specifications

### General

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

### Transmitter

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

### Receiver

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

### Controls and Indicators

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

**AEA Retail \$379.95**

**Amateur Net \$319.95**

Specifications and prices subject to change without notice or obligation.

# Announcing

## Correction

The "pin out" information for the LM317K and LM340K in "The Flea Market Special" (Nov. 1987, pp. 74-76) is incorrect. Pin 1 is "control," Pin 2 is Vin, and the case is the output. The original diagram is correct for the Fairchild 78x00 series of regulators. Brian Stokes, WD9GYO, spotted this error and pointed it out to us.

• **Special Event Station Calgary, Canada** - K6ELX/VX6 and KB6IUA/VX6, employees of ABC's

*Wide World of Sports*, will operate from Calgary during the month of February for the Olympic games. SSB and CW 10-80 meters and FM on 2 meters and 220. For a special Olympics QSL, QSL via the bureau attention K6ELX, or directly to the operators' addresses: K6ELX/VX6, Elliot Block, P.O. Box 486, Hollywood, CA 90028, or KB6IUA/VX6, Chuck Pharis, 9604 Hillhaven Avenue, Tujunga, CA 91042. (For direct QSLs a number 10 SASE is a must.)

• **NORAC's Special Event Station** - VE7NOR will

operate during the Vernon Winter Carnival, Feb. 5th to 14th, on 14.235, with possible operation on all other bands depending on conditions. Any station contacting club station VE7NOR will qualify for a commemorative certificate. To receive the certificate send QSL info and 2 IRCs or \$1.00 to NORAC, Box 1706, Vernon, BC Canada, V1T 8C3.

• **St. Catharines, Ontario, Canada** - The Niagara

(continued on page 100)

## THL CORP.

### AMPLIFIERS • COUPLERS



THL THE INDUSTRY LEADER IN DESIGN AND PERFORMANCE add-on accessory VHF/UHF amplifiers, antenna couplers and now HF LINEARS too. When power out is your problem, stop in for the THL brand solution.

## SANTEC

### NOW! MOBILES AND PORTABLES FROM THE FEATURE - PRICE LEADER



The right features and the right stuff formulate the features everyone asks to have. Add quality, parts and construction, stir up a great price and you've got SANTEC's formula for customer satisfaction. See one at your dealer TODAY!

SANTEC  
SANTEC  
SANTEC

FM-240  
ST-20T  
KT-220M

2-Meter Mobiles  
2-Meter Portable  
Marine Band Portable

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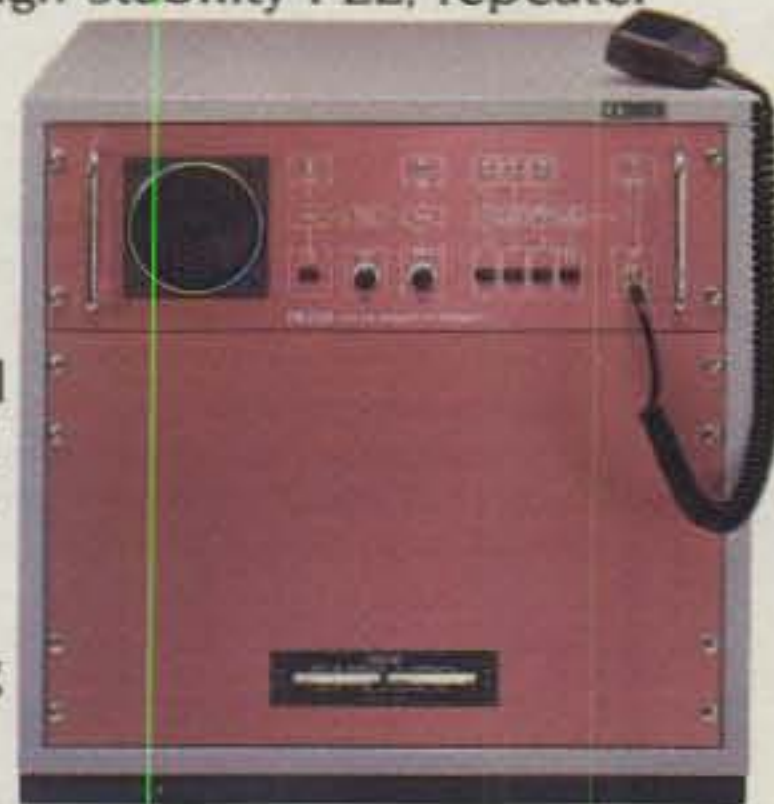
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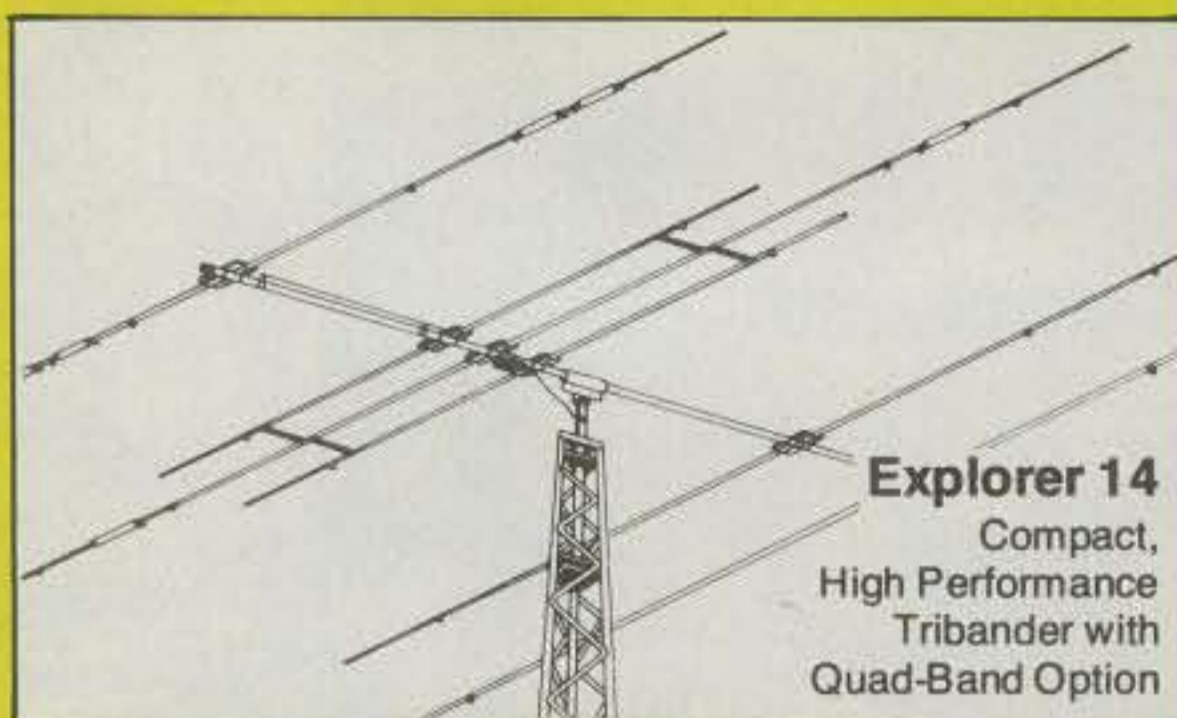
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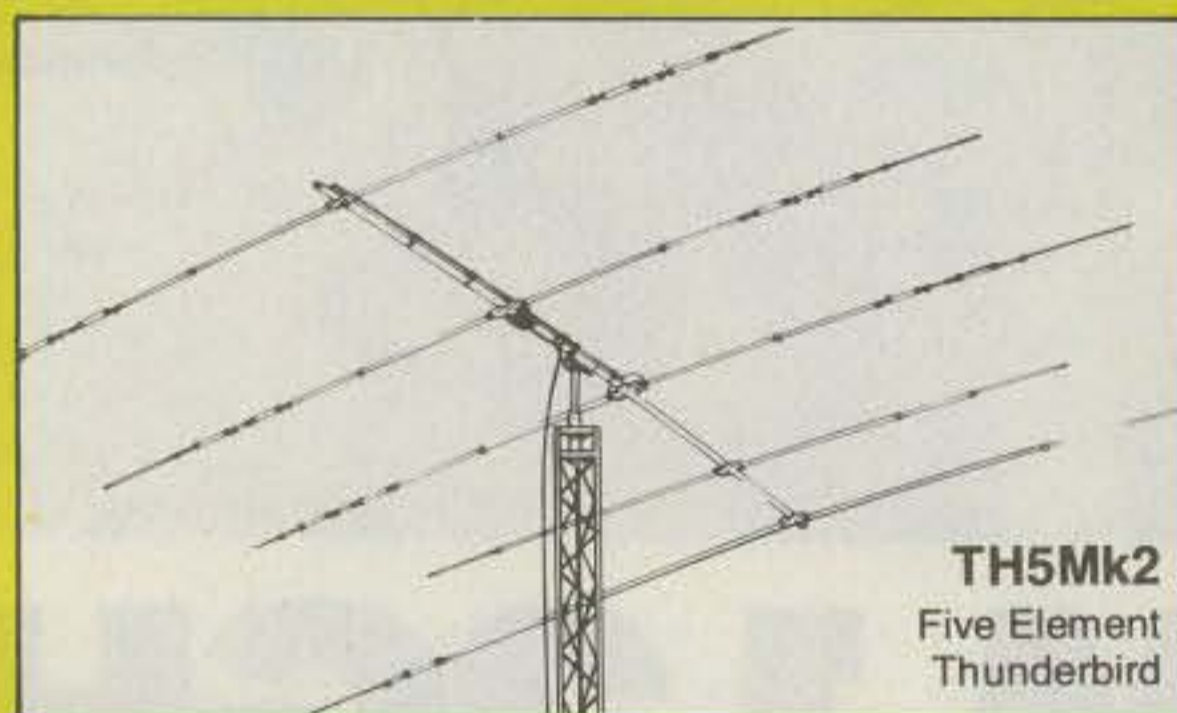
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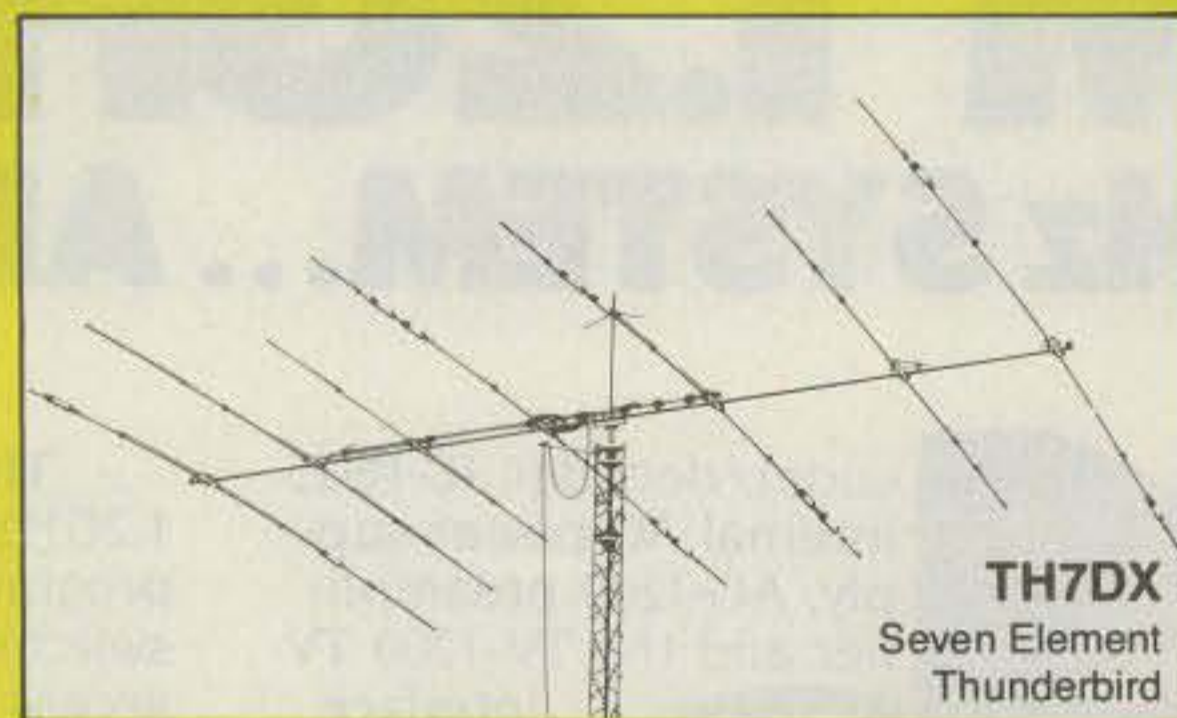
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## Our Readers Say

### Proud To Be A Ham

Editor, CQ:

Recently one of the local hams in Dubuque, Iowa found his ham ticket to be a real lifesaver. Mel McDermott, WB0AQS, became a ham shortly after he retired. He has enjoyed QSOs with local hams, is active on HF, and is the real inspirational drive for our 10-meter Nut-Net which meets at 7:30 local time on 28.430 MHz daily. This net meets primarily to keep the local Novices and Technicians "radio-active." It gives them a chance to ragchew with other local hams as well as an occasional DXer. Mel has also been in charge of Special Events for our Great River ARC, has taught radio classes at the junior high, and has helped many students get their ham ticket.

Hams frequently are called upon to help with communications during times of emergency. Mel found himself in service during the Mexico City earthquake disaster. He has also helped others by putting through an autopatch for servicemen who would like to talk to their families back home. He has been active in MARS. Mel has helped many and is truly and active ham, although he prefers to call himself an "appliance operator."

Mel, who is 78 years young, has had a bit of heart trouble lately, so when he began feeling ill while visiting Bud Nessler, KB0QL, he thought it best to go home and lie down. On his way home Mel decided that it was he who needed help. He called Bob Wagner, W0YLQ, on 2 meters to have an ambulance come to get him. Bob used the local autopatch to reach the 911 emergency number. Meanwhile, Mel blacked out and his foot slipped off of the brake pedal. His car rolled backward down the street, jumped the curb, crossed the sidewalk, rolled through some shrubbery, and came to rest against a house. Another ham, Bob Crippes, WB0WSE, who lived in the vicinity was monitoring the frequency and decided to go to Mel's aid. He hopped on his bicycle and arrived at the reported corner about the same time as the ambulance. Mel, of course, could not be found since his car was fairly well-hidden by the shrubbery. Mel eventually awakened and could see the ambulance and Bob from his spot. Once again Mel had to use his 2 meter rig. This time it was to contact Bob and let him know where he was.

Mel had to have a pacemaker installed in his chest, but he is now back to sassing his wife, Loretta. At first he was a little concerned that his hamming might come to an end if his radio were to interfere with his pacemaker. After a checkup with and without the radio, however, Mel was told he could operate his radio, although he cannot operate his car.

It is very comforting to know that there are people like Mel McDermott, Bob Wagner, Bob Crippes, and countless other hams who are willing to help people in distress. Ham radio has been good for Mel. It is a terrific hobby, and it is people like these who make me proud to be a ham.

Mike Jozefowicz, NS0U  
Dubuque, IA

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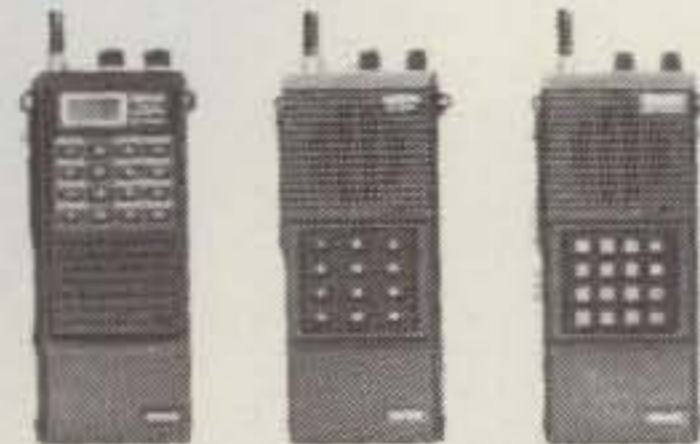
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**For most of us, a DXpedition is supposed to take place in a rare, exotic place where the inhabitants don't normally speak your language. If you're BY1PK, that place is New York City. KM2X relates a 10-hour mini-DXpedition to the Big Apple this past October by BY1PK and two associates.**

## **BY1PK Makes A DXpedition To New York City**

BY FRANK WEN\*, KM2X

**S**urprise, surprise! I was surprised by receiving a letter from BY1PK in mid-October saying that they were coming to the US and were anxious to meet with me. The ARRL had extended an invitation to the CRSA (China Radio Sports Association), the counterpart of the ARRL in China.

So here they were for the first time on an official visit to the USA. Their itinerary was San Francisco; Newington (headquarters of the ARRL and IARU—the International Amateur Radio Union); New York City; Washington, DC; Chicago; San Francisco; and then back to Beijing (*bei* means north; *jing*, capital). The group consisted of three members: Wang Xun, Deputy Secretary General of CRSA and also the group leader; Tong Xia Yun, Director of BY1PK; and Liu Wen Bin, the interpreter.

Working a DX station is a challenge to any DXer. Imagine the situation when a DX station suddenly appears at your front door. In a state of some panic, I didn't know what to do. Nervously I picked up the phone and called Harvey McCoy, W2IYX, the famous DXer who publishes the *Long Island DX Bulletin*, and discussed the matter with him. The reason I called him goes back some six years ago, or about one year before BY1PK returned to the air. Harvey and I were planning to invite some key Chinese officials and potential amateurs to visit the US for the purpose of stimulating resumption of amateur activities in China. Unfortunately, the plan fell through due to lack of financial support. We wanted our invitation to be more easily acceptable to our guests by covering all the expenses, including round-trip airfare. A good idea,

\*P.O. Box 30548, JFK Station, New York 11430



BY1PK's QSL card.

but too big for our digestion. Later on Harvey blamed me jokingly for not having a rich uncle, and I blamed him for failure to choose the correct lottery number. We were even. Hi!

Anyway, upon receipt of my phone call, Harvey started contacting the Long Island DX Association's Chairman, Walter Grosser, W2TE; North Jersey DX Club members; *CQ* magazine's Alan Dorhoffer, K2EEK; etc., for the purpose of organizing a welcome dinner party. Everyone was very enthusiastic about this. In the meantime I kept close contact with David Sumner, K1ZZ, the ARRL's executive vice president, regarding our plan. Dave gave lots of advice and helped us with the plans. In addition to the dinner, I arranged for a visit to the Hall of Science Radio Club and its station, which is located inside the Science Museum of Queens,

New York City, through their chairman, Emil Guarino, WB2KVY; president, Arnold Schiffman, WB2YXB; and chief operator, Alan Serchuk, KD2XM. The BYs accepted the invitation with thanks but could not visit due to lack of time.

At 9:30 a.m. on Friday, October 30, 1987 the BY team arrived by train at New York City's Penn Station from Hartford, Connecticut. The ARRL dispatched its International Programs Manager, Mr. Naoki Akiyama, N1CIX (formerly JH1VRQ, once known as the "DX Terror of Tanashi"), to escort the BY team during their visit to New York City and Washington, DC. Naoki is very capable, speaking English, Japanese, and Spanish.

For an important occasion such as this I took a day off to accompany the group and served as tour guide. I picked them up at the corner of 34th Street and 7th



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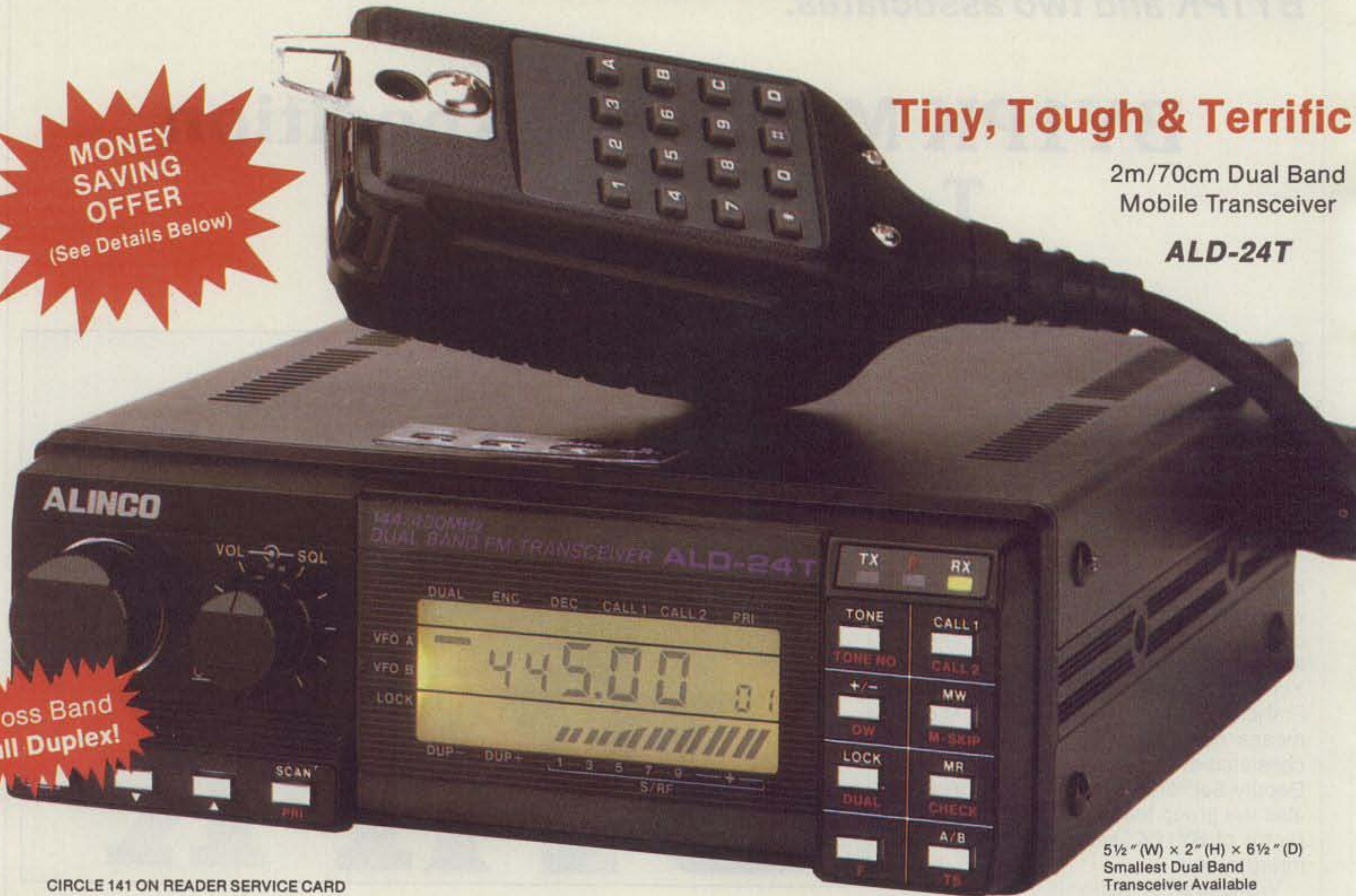
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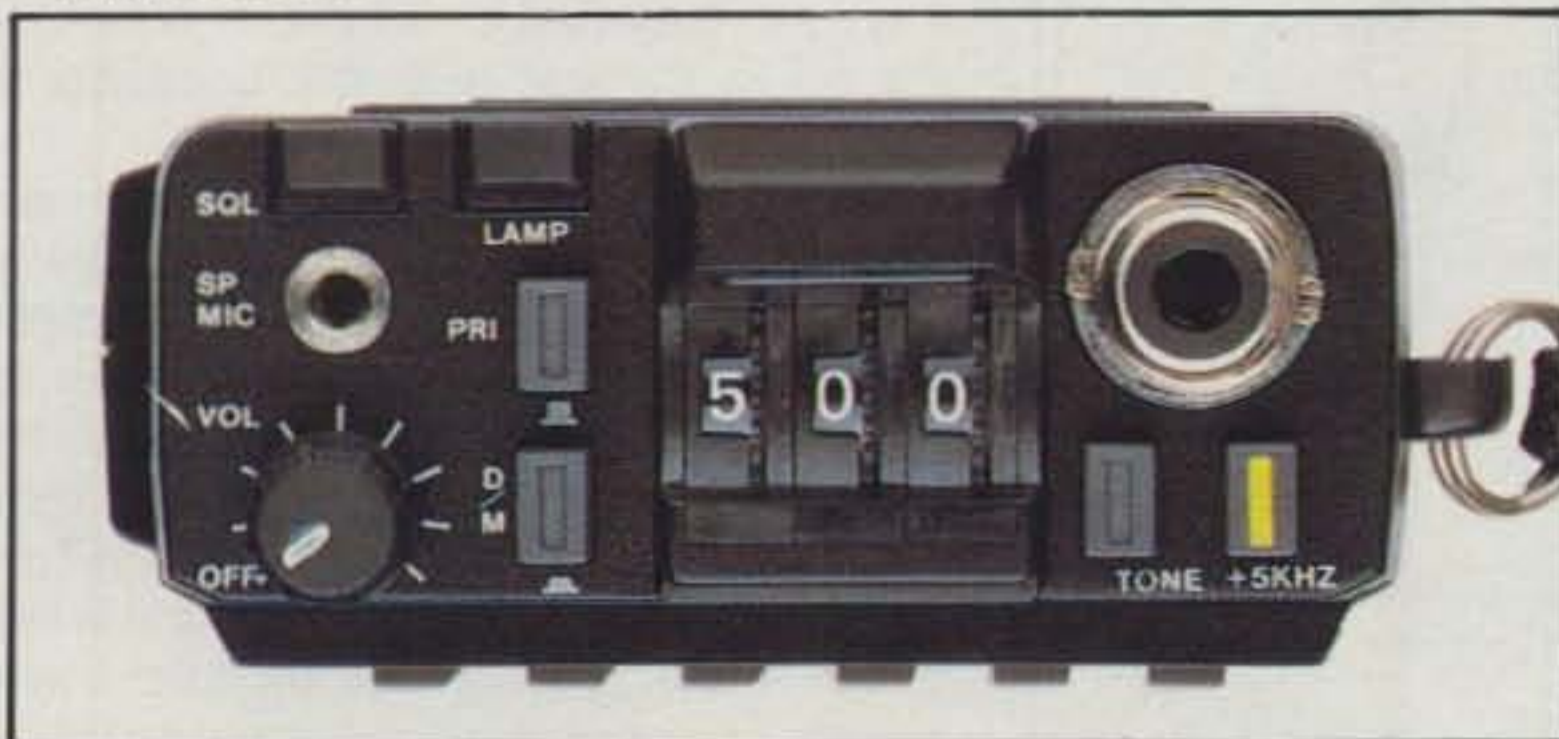
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A surprise visit to Barry Electronics, the only surviving amateur radio equipment store in New York City. Left to right standing: Steven Weinstein, NI2C; Lewis Reinbery, W2BIE; and Walter Sutherland, N4QDG. Sitting: Frank Wen, KM2X (formerly C1BC, Chinese old call sign); Wang Xun, Duty Secretary General of China Radio Sports Association; and Tong Xia Yun, Director of BY1PK.

Avenue in Manhattan. (A note to visitors not familiar with New York City. The city is comprised of five boroughs—namely, Manhattan, Queens, Brooklyn, The Bronx, and Staten Island. All of the boroughs have a street named Broadway, and many have 7th Avenue, 34th Street, etc. Manhattan is the main borough and is the world financial center. New York City is the largest city in the world by area of 8,900 square kilometers. New York State has more amateurs than any other state except California.) We had five people and three big, heavy suitcases to be

carried in my car. The trunk could only fit two suitcases, so the remaining one had to go into the passenger area. Three of us squeezed into the front seats, with two and a suitcase in the back. That was how we started our sightseeing in the Big Apple (the nickname for New York City).

Our first stop was the famous Empire State Building. N1CIX took Wang and Liu up while Tong and I waited in the car. The Empire State Building is 102 stories, 1250 feet (381 meters) high. Parking a car in New York City during weekday working hours is impossible. The best and easiest



Wang was taking a picture of the Statue of Liberty, which is not visible in this picture. The Twin Towers of the World Trade Center are in the background.

way is for the driver to sit in the car parked by the sidewalk and wait. Should the police come and chase the car for blocking traffic, the driver will circle around the block, and return to the same spot to continue waiting. That is how we New Yorkers play our cat-and-mouse game daily. I told Wang and Liu that if upon return they didn't find the car, stay put.

I allowed 45 minutes for the group to go up and return. When they came back, they complained that they had spent most of the time waiting in line to buy tickets, getting into the elevator, etc. The actual time spent seeing the great view of New York City from a skyscraper and taking souvenir pictures was only 5 minutes. Anyway, they had been there. Mr. Tong stayed in the car with me because he didn't feel too well.

Our original plan was first to see places such as Times Square, Rockefeller Center, Fifth Avenue, the United Nations, Radio City—those landmarks located in the uptown area—then finish the tour by going downtown to see Chinatown, the Statue of Liberty, the Twin Towers, and Wall Street. However, the weekday traffic in the city was terrible. It was almost impossible to go cross town, so we were forced to see things on the west side first. We drove to the starting point of the famous Broadway, at the tip of Manhattan Island. We didn't take the ferry to Liberty Island where the Statue of Liberty stands because it would have taken half a day. The weather was cloudy but with good visibility. We viewed the statue with an 8 x 30 binocular and posed for pic-



At the tip of Manhattan Island. Left to right are Tong, Wang, Liu, and Wen. The Statue of Liberty is clearly in view in the background.



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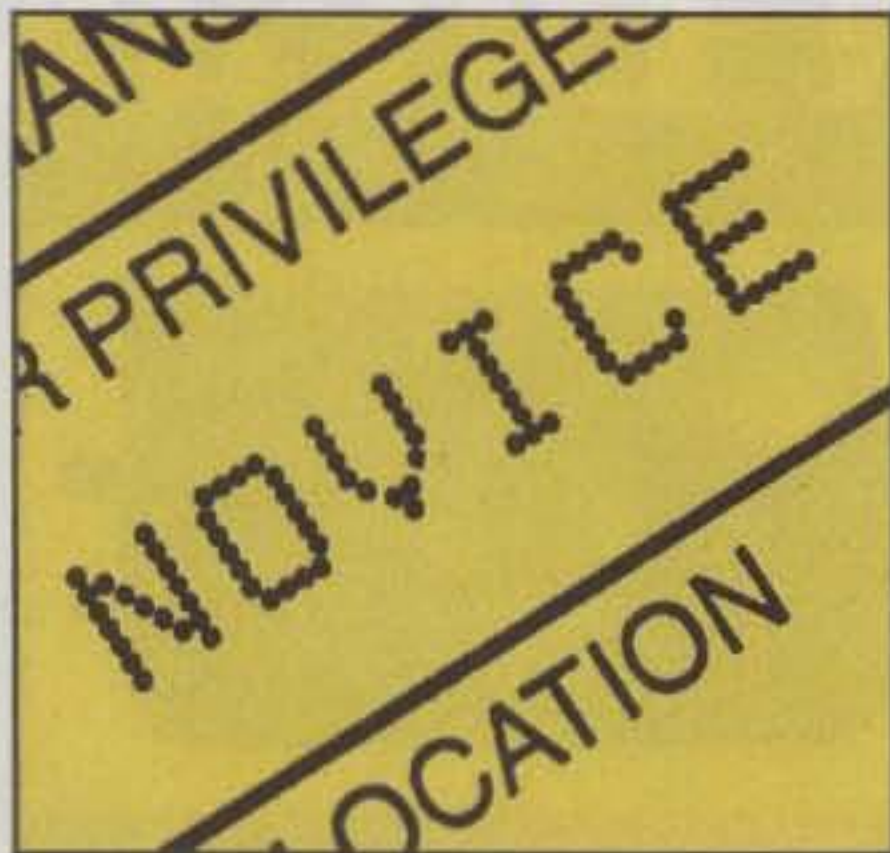
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*Tong was posing for a picture with the Twin Towers as background. The towers are each 110 stories and 1353 feet tall. Note that a 300 foot tall TV broadcasting antenna tower is on top of one of the towers. How would you like to put your antenna up there!*

tures with the statue clearly in view in the background. From the same location looking north, the World Trade Center (or the Twin Towers, as it is also named) was in view.

One exciting event during the stay in New York was a surprise visit to Barry Electronics, the only remaining store in New York City selling amateur equipment and parts. The thought had flashed through my mind as we drove down Broadway that it might be a good idea for the BYs to see various types of amateur gear and how they are marketed. When we dropped into Barry Electronics, Lewis Reinbery, W2BIE, was running the store and could not believe what he saw. Two other amateurs, Steven Weinstein, NI2C, and Walter Sutherland, N4QDG, were shopping in the store and were also surprised. We spent a few minutes browsing and posed for a picture. To our disappointment, we did not meet either one of Barry's three musketeers—namely, Kitty, WA2BAP, Mark, K2CON, and especially Jan Bridge, KB2RV, who is a diehard DXer. At the time of the visit Jan was in Hawaii enjoying a vacation. Commented W2BIE, "Jan is going to die for missing this opportunity." Jan, cheer up. Let's go to China next time!

After the Twin Towers, we drove around Wall Street and the adjacent areas. It took some talking for me to explain to our guests what was going on in

Wall Street. I hope they grasped some idea of what a stock is and why people buy or sell it.

As it was lunch time, without hesitation we headed for New York's Chinatown, the largest of its kind in the western hemisphere. We went to the restaurant where President and Mrs. Carter once dined. Just a few minutes after we sat down, Alan Singer, N2KW, who is the chief operator at the United Nations' club station, 4U1UN, rushed in to join us for lunch. Alan invited the BYs to visit 4U1UN. Again due to lack of time the group was unable to make the trip. Besides, 4U1UN isn't open to visitors before 5 p.m. If we had waited to pay a visit, it would have been almost impossible to catch the 7:55 p.m. departure flight for Washington, DC from La Guardia Airport.

While we were at the restaurant, I saw Tong had a stack of blank BY1PK QSL cards in his pocket. It is one of the most sought after QSL cards. I borrowed N2KW's 2 meter handie-talkie and got on the two local repeaters, expecting a QSO with someone or a pile-up. A station worked would have been entitled to a BY card. I tried for approximately 15 minutes with no answer and was disappointed. Perhaps everyone was at lunch or the signal never left the building. Anyway, I tried.

After lunch we took a stroll in Chinatown. We then headed towards the United Nations. The United Nations has special meaning to the BYs, or any Chinese mainland. First, China was one of the five founders of the UN. Second, the resumption of seats at the UN by the mainland

Chinese marked the turning point for opening China's door to the outside world, including amateur radio. We parked our car by the roadside and took a few snapshots using the UN building as the background.

At this moment it was 4:30 p.m. in New York, or 5:30 a.m. in Beijing. It had been a long day for our guests. Signs of fatigue were visible on their faces. I drove them to my QTH, which is located only 2 miles from La Guardia Airport. Their visiting my QTH was a great honor for me. I showed them my station, pictures, the QSL card I received from BY1PK, and anything and everything that I thought would please our guests.

I had made the first QSO with BY1PK on 20 meter CW with a vertical antenna and good timing in April 1982. The BYs were surprised to see my old C1BC QSL card. C1BC was the Chinese call sign assigned to me in 1946. I, as well as all amateurs in China, lost my amateur gear and records during the Chinese civil war. However, I got back a copy of my C1BC card from LU6AJ after 38 years. In 1948 when I was operating in Shanghai, signals from South America, especially LU6AJ, were very strong. Believe it or not, LU6AJ was sometimes stronger than the BBC and Voice of America from the loud speaker of my home-brewed seven-tube superheterodyne. So I remembered that call sign by heart. One day I decided to write to him, and he responded with a copy of my C1BC card, which I had sent to him some 38 years ago. To me this was a miracle. Thank you, LU6AJ!



*Alan Singer, N2KW, joined us for lunch at a Chinatown restaurant. Left to right are Liu, Wen, Wang, Singer, Tong, and Akiyama. Akiyama is the International Programs Manager of the ARRL who was assigned to escort the BYs during their visit to New York City and Washington, DC. Akiyama, N1CIX, is a DXer, formerly JH1VRQ and once known as the "DX Terror of Tanashi."*

After resting at my QTH, Tong felt better and asked me to call Harold Robins, W2KN, to join us. Harold became an old friend of Tong because not only is he a veteran DXer, but he is also a seasoned traveler to China. The phone call did not go through, however, because it was made after office hours. Several weeks later, though, W2KN dropped by my QTH and showed me an album full of correspondence, pictures, and QSL cards about his amateur radio ventures in China. He also showed me a news article about this visit by BY1PK that had been published in the *New York Daily News*.

Mr. Wang, the Deputy Secretary General of CRSA, and a gentleman and a scholar, started ragchewing over a cup of coffee and a snack. He indicated that private or individual amateur station licenses are under consideration in China. It may not be too long, if everything works out smoothly, before individual BY stations are on the air. However, a license cannot put a station on the air. Equipment is needed. Affording equipment would be a problem. Another problem facing all the Chinese amateur stations today is the expense of printing and mailing QSL cards. The expenses can easily occupy a substantial portion of their income. I suggested to Mr. Wang that setting up an outgoing QSL bureau similar to that of the ARRL might solve most of the QSLing problem, providing plenty of manpower is available.

Everyone was enjoying the conversation. N1CIX shared his DX experience with me, and my XYL explained to Mr. Wang about life in New York, etc. Suddenly we realized that it was time to head for the airport. As I mentioned before, my



Posing in front of a Chinatown public telephone booth, which is of oriental design. The huge building in the background is the Confucius Building.

QTH is very close to La Guardia Airport and within minutes we were there. After dropping the group at the check-in entrance, I drove to the parking lot. I was being followed. It was Shelly Weil, K2BS. He saw the KM2X license plate on my car and followed me. He had heard of the BYs' visit several days ago and wanted to meet them. The only chance he had was to come to the airport and help send them off, and he had driven 50 miles just for that.

The greatest asset that we radio ama-

teurs possess, I think, is not our technical knowledge about electronics, not the participation in a national emergency, but the instant, unreserved, open-hearted friendship among us, as demonstrated here by K2BS, W2IYX, N2KW, W2KN, and many others. K2BS himself is a legend. He worked 300 countries on SSB and CW, 10-80 meters, with a 1 KW mobile rig installed in his car. He steers the car with his left hand and operates the transceiver, a mike, or even a bug with his right hand. He promised me a demonstration because I said I didn't believe it.

Now came the climax of the trip and the unfortunate part. When we finished taking a couple of pictures and turned back to pick up the carry-on baggage, Mr. Liu found that his briefcase was gone. There was \$300 in cash and the airplane tickets for San Francisco to Beijing in it. Fortunately, their individual passports and airplane tickets for U.S. domestic flights were not in the case. We did the best we could to find the lost baggage, but it was gone. N1CIX and I felt especially embarrassed and sorry because we were the hosts. We would like to take this opportunity to express our apology to the BYs.

The airplane was on time. I sent the group to the plane's door and said *Gia Jan* (will be seeing you). This concluded a ten hour tour of New York City by BY1PK.

Aside from the stolen baggage incident, the visit had been a very pleasant one. New York City will long be remembered by our guests. My thanks to all the amateurs who helped make sure that the BYs saw this great city, and my apology to those who offered help but did not have a chance to meet with the BYs.



The BYs visiting New York City's Chinatown, the largest of its kind in the western hemisphere. Left to right are Singer, Tong, Wang, Wen, and Liu.

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### UHF Coax Connectors

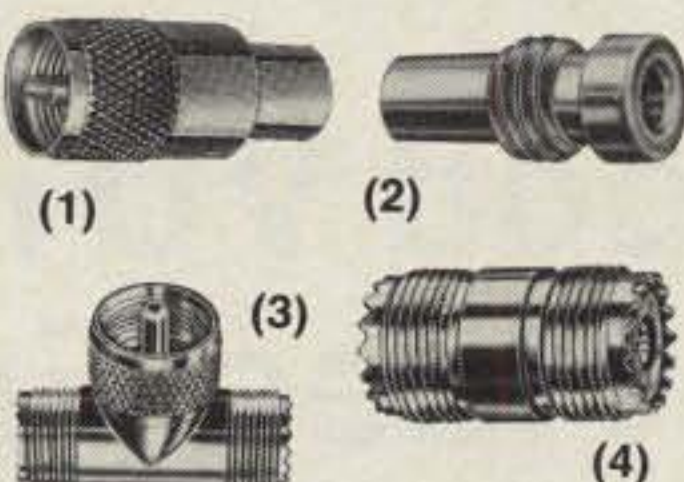


Fig.	Description	Cat. No.	Only
1	PL-259 Plug	278-205	2/1.99
2	Reducer for RG59, RG8M	278-204	2/ .99
	Reducer for RG58	278-206	2/ .99
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4	Double-Female Coupler	278-1369	1.49

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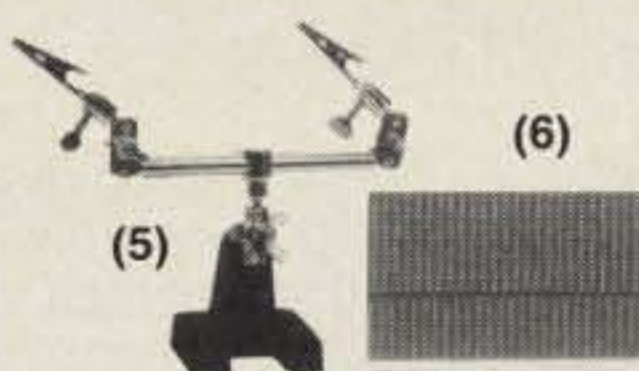
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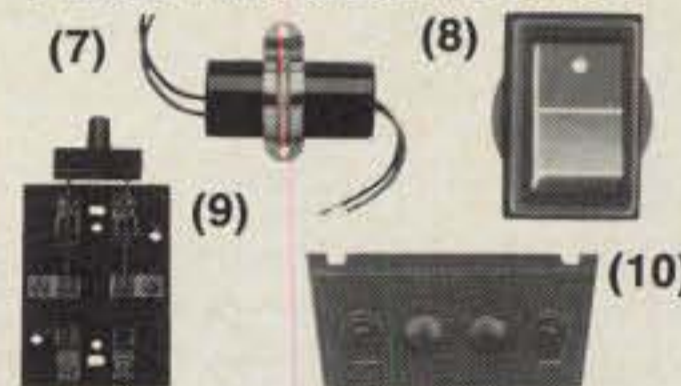
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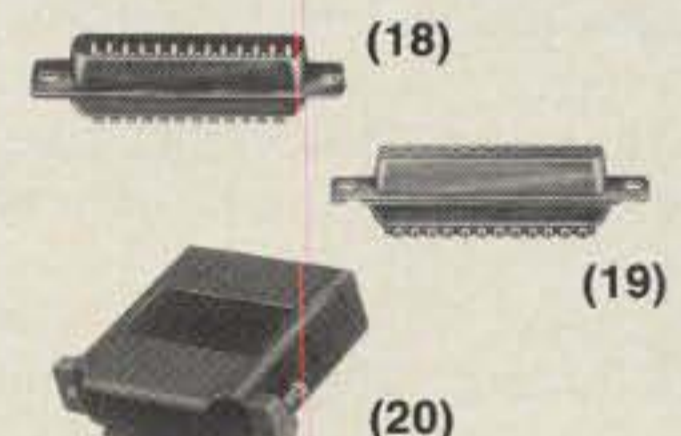


Fig.	Type	Pos.	Cat. No.	Only
18	D-Sub Male	25	276-1547	1.99
19	D-Sub Female	25	276-1548	2.99
20	Hood for Above		276-1549	1.99
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—	Hood for Above		276-1539	1.99

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BY GEORGE M. EWING\*, WA8WTE

**A**lthough there are many possible ways for the amateur who is interested in using a personal computer for amateur radio applications to go, two of the most popular computers are the Commodore C-64 and the IBM PC-compatible MS-DOS machines. Both of these computer families have one thing in common: They can make use of inexpensive surplus monochrome video monitors. This allows you to build a system for your station saving quite a bit of money. You will still have a display with a lot better resolution than the typical junk-TV-and-RF-modulator setup.

After a good deal of searching, I think I have found what is probably about the

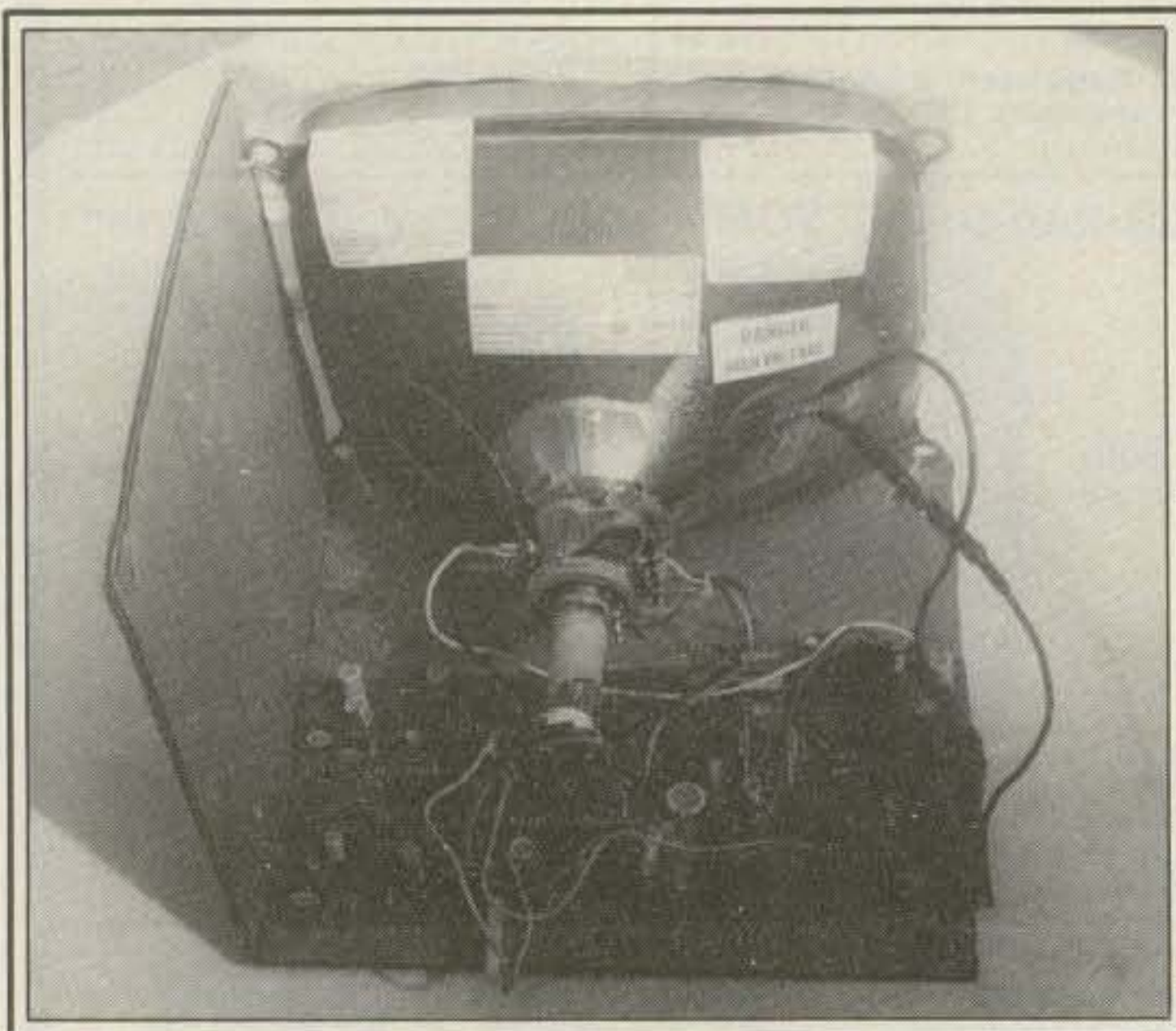
cheapest good-quality monitor for both the Commodore C-64 and IBM-compatible do-it-yourselfer. This bargain package is a green screen, 12-inch composite video monitor originally made by Elston for Commodore and some other original equipment manufacturers (OEM) purchasers. The medium-speed green phosphor also should lend itself nicely to various non-computerized ham applications such as ATV, slow-scan, weather satellites, facsimile, etc. It is available in new, unused condition from a number of mail-order dealers who advertise regularly in ham magazines and computer publications like the *Computer Shopper*.

The price is usually in the \$20 to \$25 category for single units, and sometimes quite a bit cheaper in quantities. You might want to look into this if you are a

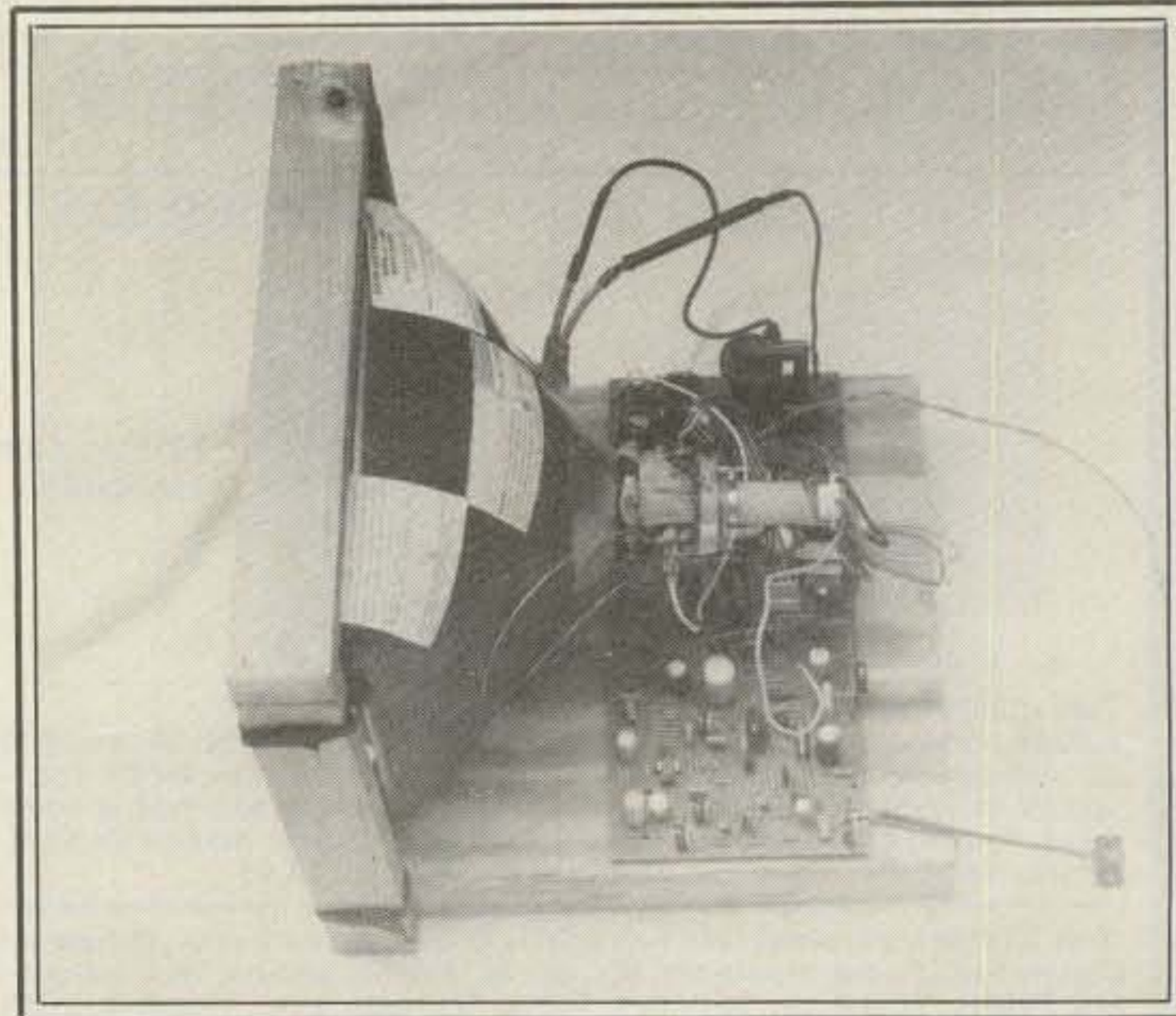
member of a club or user group, or need a number of cheap monitors for a school class, Scout explorer troop, etc. This item has also begun to turn up at hamfest flea markets and swap-shops. I got mine for \$20 plus UPS shipping from Lolir Computer Warehouse, a chain of mail-order dealers in Texas.

Note that this is a *composite* video monitor, not the TTL monochrome type that is more common with IBM-PC compatible clones. It will work fine with PC color graphics cards that provide composite video, though. The resolution is plenty good enough for ordinary text, spreadsheets, and RTTY. I'm using mine with a second-hand Techmar Graphics Master card that happened to come with my system. This was a fairly expensive card when new, but other adapters like

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



The Elston monitor as it arrives from the seller.



WA8WTE's plywood housing for his monitor.

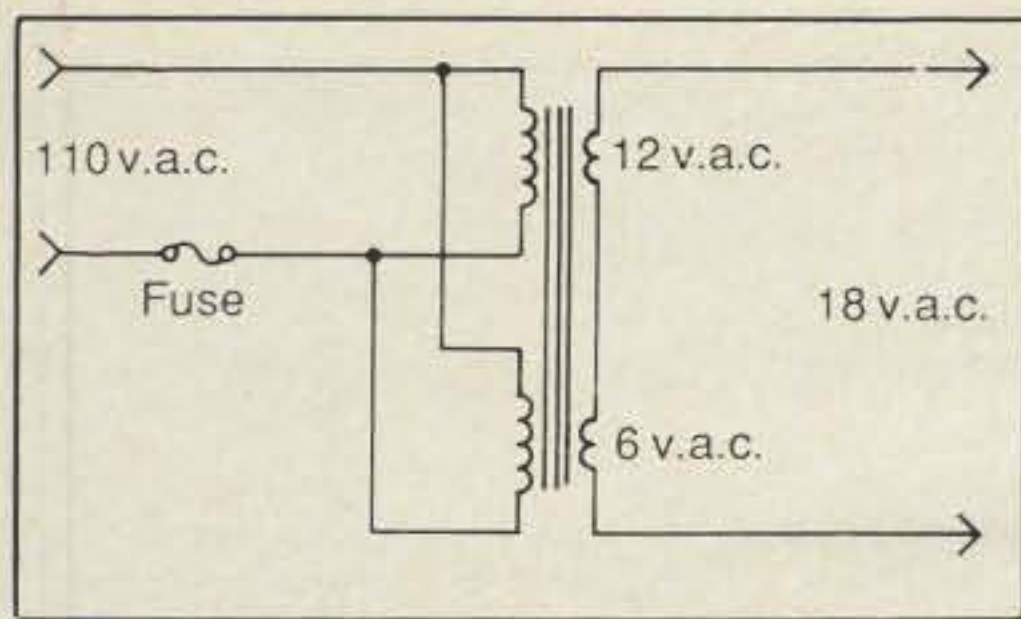


Fig. 1—Diagram displaying proper method for connecting the secondaries of two transformers so that the voltages “add.”

the original IBM PC color graphics card, or any card that has a composite video output, ought to work okay.

Bear in mind, though, that in some cases the software you are running may think you are using a true color display instead of a green or amber monochrome one, and you may have to make allowances. Fortunately, most MS-DOS PC-compatible software these days has some sort of provision for dealing with this, and avoiding “invisible” or eye-straining combinations. For example, the excellent and inexpensive Shareware word processing package PC Write™ has a menu of “%” commands to set colors for different displays. The much more expensive Word Perfect™ has a menu that allows you to select different color combinations for bold and regular type, screen background, etc.

If you are compiling a ham application program in Turbo Pascal, for example, the runtime code uses a four-value integer array called “Colortable.” This allows you to change the four colors at will by writing to the table. Some PC graphics cards also have a group of special escape or control commands to make the same kinds of adjustments through the hardware itself. In the Graphics Master GMBIOS, this is done with combinations of the “ALT,” Up-Cursor, and “Pg Up” or “Pg Dn” keys.

Likewise, many good C-64 programs such as the later releases of Paperback Writer, Printed Word, Wordmaster Se-

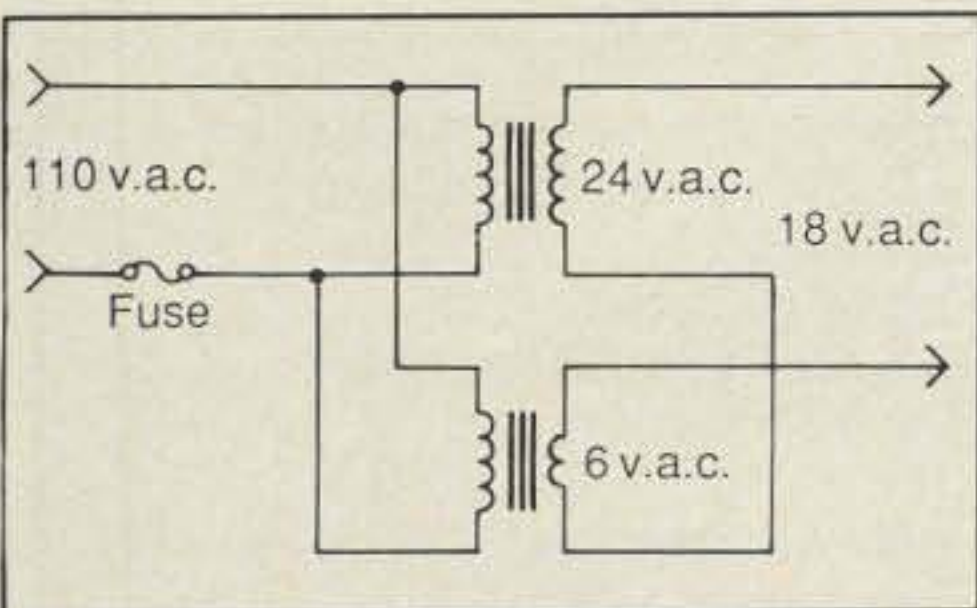


Fig. 2—This wiring setup produces an output equal to the difference of the two secondary voltages.

nior, etc., have provisions for color selection that allows more legible operation with a monochrome screen. C-64 BASIC programs that don't have this feature are usually fairly easy to patch.

The bargain-priced Elston monitor requires a source of AC in the 17–22 V range to power its internal regulated supply. You must install a cable to feed video from the DIN output jack on your C-64 (pins #2 and #4) or the RCA phono plug on your PC's graphics card. Some simple mechanical provisions must be made for mounting the monitor in an enclosure.

First, the AC supply: You need something that will provide about 17–21 volts at a couple of amps. The electronics will actually work at levels down to about 11 or 12 volts and still provide a legible display. If the AC supply voltage falls below 15 or 16 volts, you will lose your internal voltage regulation. The lines of text will tend to “swim” slightly from side to side.

If you can find one, the ideal AC supply would be a transformer designed for the purpose, such as the surplus 17 V IBM PC Jr. transformers sold by a number of dealers. Look through the mail-order surplus catalogs and try swap meets and ham-fests for other good candidates. Radio Shack also carries a good one, providing about 18 V at a couple of amps, for around \$7 (Cat. #273-1515).

Another approach is to combine a couple of lower voltage filament transformers, or a couple of windings on a multi-purpose transformer, to deliver the needed voltage. Fig. 1 shows a 12.6 V and a 6.3 V filament transformer hooked up with their primaries in parallel and their secondaries in series to generate about 18–19 V. Note that the secondaries are in phase. If you only get 7 to 10 volts out of this combination, reverse one of the secondary windings. (You can substitute one half of a 12.6 V center-tapped winding for the 6 V transformer in any of these examples.)

Fig. 2 shows a 24 V and 6 V filament transformer also in series-parallel. This time the 6 V winding is wired out of phase, to deliver around 18 V. Fig. 3 shows three filament windings in series on a power transformer from an old, '60s vintage) tube-type TV set. These typically had a couple of 6 V windings or a center-tapped 12 V winding for tube filaments, usually color coded green, and a 5 V winding, usually color coded yellow, for the vacuum rectifier tube. Other windings, usually pink or red, are probably high voltage, and should be carefully isolated, and any loose ends insulated.

If you are a real lamination hacker, it is possible to calculate the turns-per-volt ratio of an oddball transformer, tear it apart, and then rewind a custom secondary. It may be possible to rebuild the monitor's power supply with a different voltage regulator, allowing it to run on 12

VAC without the “swimming” effect, but you need a schematic (see below) and a little extra experience and patience.

**Always** use common-sense safety procedures when working with old transformers. Be **sure** you have correctly identified the windings before hooking up power. Check winding resistance with an ohmmeter, check for shorts to the frame, etc. **Always** have a fuse or circuit breaker in the primary line, and be careful! “Smoke-testing” an old transformer by putting a lower voltage, such as 12 VAC, on the 120 VAC primary at first is a good idea. Secondary windings will then exhibit roughly 10% of their rated voltage; i.e., a 24 VAC winding will show about 2.4 V, etc. This way, if you guess wrong identifying a 350 V secondary winding, 35 V is a lot less lethal!

Safety is also a consideration when working around “naked” CRT tubes. Modern tubes are more rugged than the ones of yore. A 12-inch monitor tube isn't quite the implosion bomb that a big color TV tube can be. But you should still be careful, especially when working with metallic tools around the neck and socket. Wear gloves and safety goggles.

Unlike many surplus monitors by Ball Brothers, Motorola, etc., the Elston monitor does not have a wire or sheet metal frame. The CRT and the circuit board arrive strapped to a three-sided cardboard shipping cradle with nylon cable clamps, floating in a box of foam plastic peanuts.

The monitor is brand new, but there is absolutely no documentation with it. None of the Commodore or Sams technical manuals I could find had any information at all on this model. After a little detective work, I did find a source of schematics. I talked with the engineering department at Elston, and they will provide a schematic, postpaid, for \$20. You must write to them and provide them with the

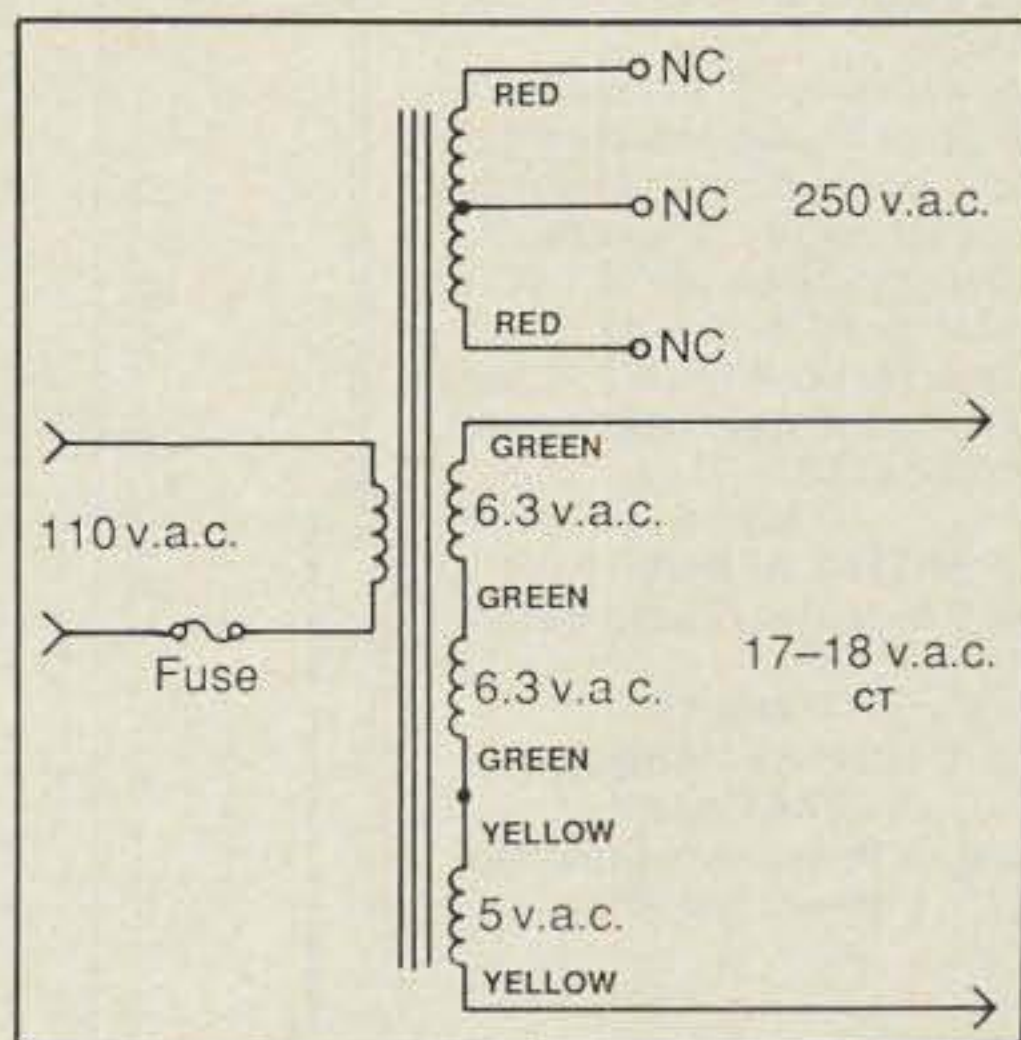
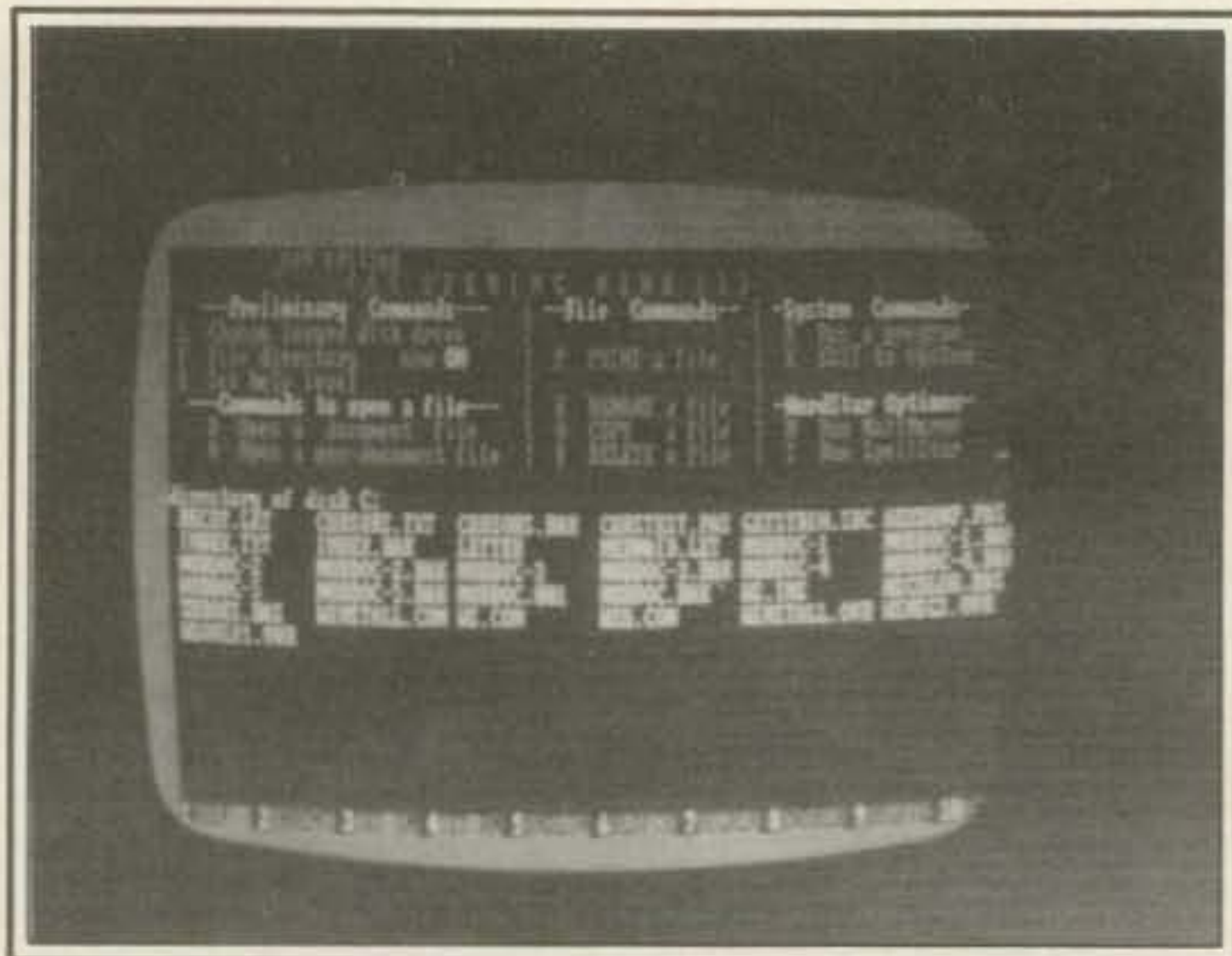


Fig. 3—Combining the output of several secondary windings on a single transformer can sometimes produce the desired voltage.



Opening menu of Wordstar™ as displayed on the Elston monitor.

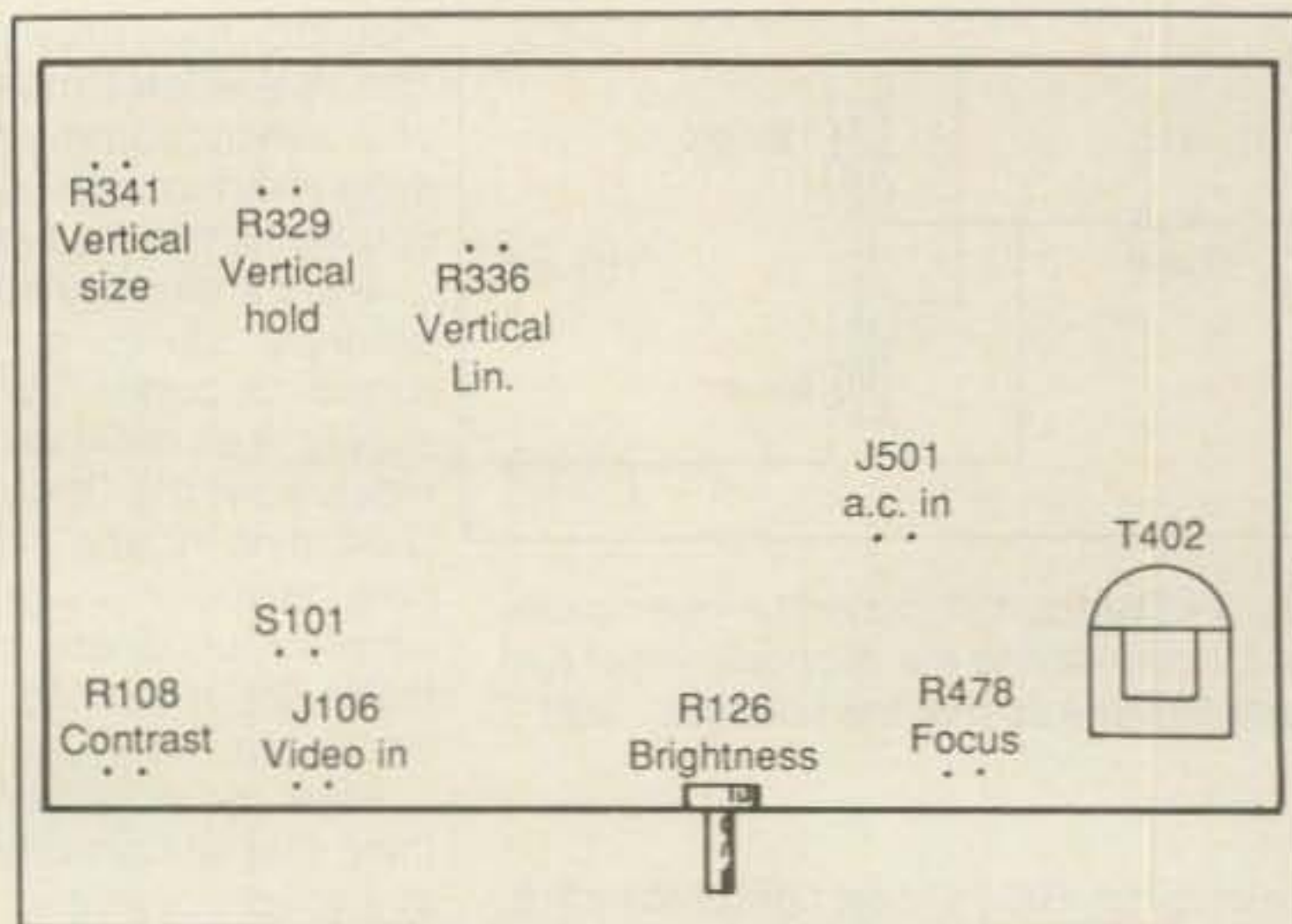


Fig. 4— Layout of the significant controls and jacks for the Elston monitor circuit board.

model number, etc., of your monitor. Look at the stickers on the back of the CRT tube itself.

This price strikes me as a little steep; you'll be paying as much for a schematic as you will for the monitor itself, but it might be worth it if you're going to buy a number of monitors for a class, club, or user group. Fig. 4 shows the layout of some of the more important landmarks on the Elston circuit board. The AC supply voltage goes in on the two male connec-

tor pins at J5401, between the big heat-sink and the bridge diodes, CR504 and CR505. Composite video and ground go in on the male pins at J106.

The 2-pin jumper at S101, just above the video connector, puts a terminating resistor across the video input line, useful to prevent ghosts, noise, and VSWR problems, especially on long coaxial lines to remote tubes. You should use good quality 72 ohm coax for long runs, not shielded audio wire. If you are going to "daisy-chain" a number of monitors together for classroom use, etc., S101 should be shorted on just the last monitor in the line. If you are just running a short line (a meter or less) from your computer or graphics card to the monitor, you may not need the jumper. My monitor has a noticeably brighter picture without the jumper.

Besides an AC power supply and a video cable, you need some kind of protective enclosure for the monitor. The simplest way is to find a dead 12-inch television set or monitor, remove the guts (**remember safety precautions**), and install the new tube and circuit board. I built up a test frame out of a 12-inch square piece of 1/2-inch plywood and scrap 1" x 2" lumber.

The CRT is shock-mounted on the wood frame with home-made rubber straps cut from an old truck inner tube. Nylon cable ties or military surplus shock mounts will work, too. The circuit board is stuck down on the plywood top with double-sided sticky foam tape.

You can also build a metal enclosure, or custom-mount the tube in a station console or desktop. If you use a metal enclosure, both the circuit board ground and the CRT aquadag (the aquadag is the black conductive carbon coating on the back of the tube) should be safely grounded to the chassis. There is a black wire from circuit board ground to a spring wire clip on the yoke that makes contact with the back of the tube.


My power supply was similar to the one in fig. 1, made from a 12 V transformer from an old CB power supply in series with a filament transformer from a "dead" Sanyo color TV set. The two together provide about 19 V under load. Since they tended to get quite warm to the touch after a few hours of use, I mounted them on a separate small chassis with a surplus muffin fan for cooling.

In conclusion, despite a bit of tinkering that was necessary to get it going, the Elston monitor has provided a clean, stable, green-screen display for text, RTTY, programming, and static graphics. The factory adjustments on the one I got were right on the money, with no sign of pin-cushioning or focus problems. If yours does need adjusting, all the controls on the board are plainly marked. The CRT's green phosphor is a bit on the slow side, though. Fast-moving graphics for arcade games or animation programs do tend to leave a noticeable "comet-tail" effect. Also, the plain glass tube face does pick up glare in a brightly-lit classroom or hamshack. Some sort of after-market glare shield might be a good idea. Still, when you consider that you get a working monitor for less than the retail list price of the Amperex 12-inch tube alone, it's not a bad deal!



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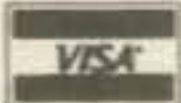

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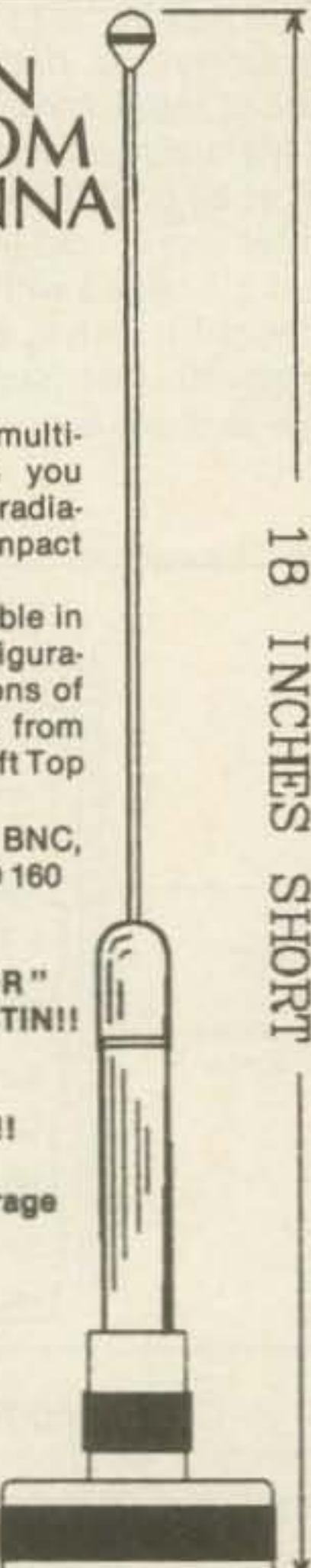
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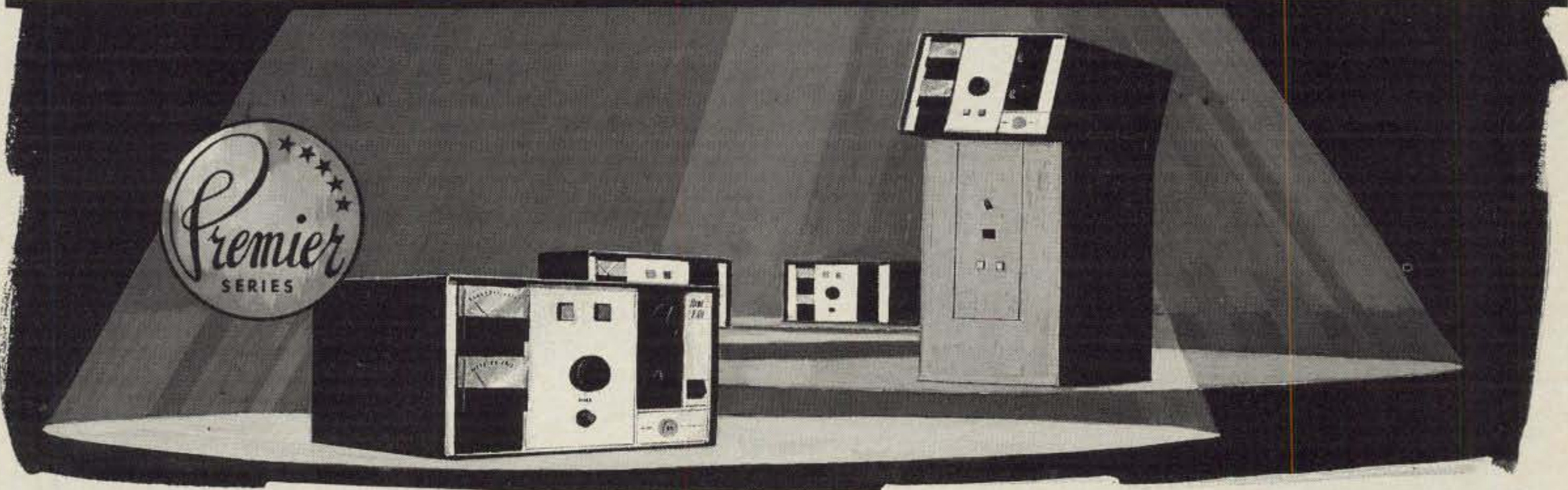
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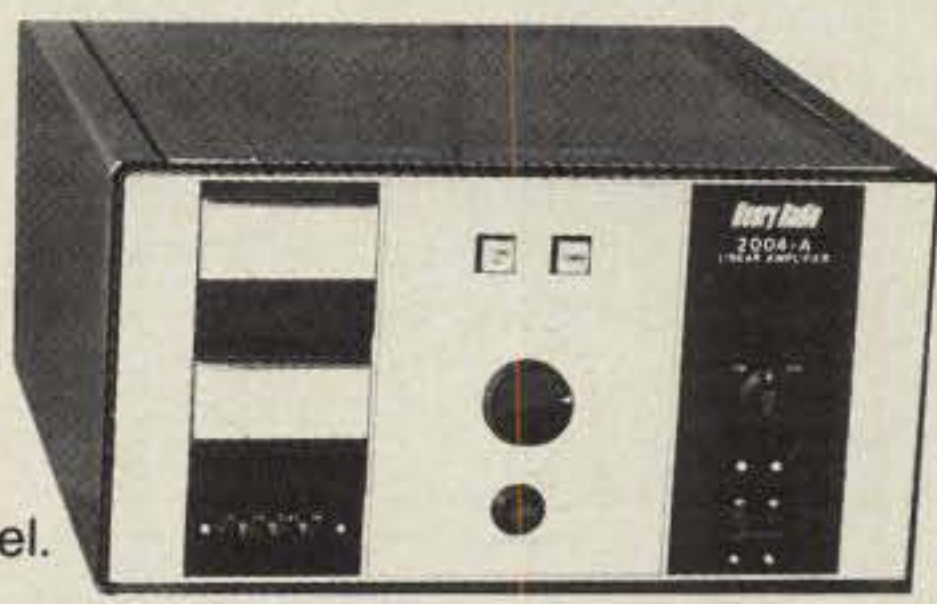
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## CQ Interviews:

# Gordon West, WB6NOA

## President, Gordon West's Radio School

Recently Gordon West, WB6NOA, dropped by the CQ offices. We took that opportunity to interview him.

**CQ:** Gordon, you have a reputation of being enthusiastic, flamboyant, energetic and a real "go getter." Over the years you've been a very popular figure in Amateur Radio circles. Recently some people have called your "Weekend Novice Class" a scam. How do you answer that?

**West:** It is not a scam! My weekend Novice courses work. Do they lead to "bad operators?" Usually not. Probably not anymore so than 14 week Novice courses. Our course has turned out some really good Novice operators.

Some people just react to the title of the course without ever finding out what we do. I agree that most people can't learn the code in just one weekend. I agree that there is little value in rote memorizing 280 written questions. There's a lot more to our course than that.

**CQ:** How is that possible in one short weekend?

**West:** The advertising for the class starts a minimum of 90 days before the weekend. Prospective students come out of the woodwork wanting to sign up for the course that will "get them a license in 2½ days." We preregister them and send them our Novice code and theory course, which is a complete *home study* package. We require a deposit or full payment. We encourage them to begin preparing for the class. Read the book and listen to the tapes.

I don't take anyone into the course unless they preregister at least 30 days before the beginning. The only exception that I make to this is someone who has already spent time studying code and theory on their own. If I take someone in at the last minute, there has been no time for them to prepare. They have little chance of passing.

It's been my experience that students rarely come to class without cracking the books. Look, they've made a commitment in terms of registering and paying money. They have the materials. We encourage them without moralistic high pressure. In fact we call them occasionally just to get to know them personally before class starts. If they have questions, we answer them. That gives us a chance to do some gentle persuading to



*Surrounded by equipment and enthusiastic students, West ties an abstract concept from Novice theory to the real world of amateur radio.*

learn the code and work on the theory before class starts. So it is really a 30 day course or 60 day course or whatever with an intensive weekend mop up session.

**CQ:** Why not call it that then instead of a "weekend" course?

**West:** Simple marketing. The title gets their attention. One of the biggest challenges that an amateur radio instructor faces is enticing prospective students into the classroom for the very first time. "Weekend Novice Class" does the trick. The students covet the license. They can visualize a class that starts on Friday evening and ends Sunday evening. For some people that is a lot less threatening than a class that runs for two or three months. It is just a way of gently helping some people around a roadblock that they perceive between themselves and their goal. It moves the students out of their indecision and puts them into the action mode. This is where we want them.

**CQ:** Where do you conduct your classes?

**West:** I like hotels. Their meeting rooms are usually vacant on the weekends, and not too expensive. I usually contact the catering department and ask them what

the options are. Sometimes I find that the room comes very inexpensive when I order some food items—but the doughnuts usually cost about \$1 each! An average hotel bill for one of my classes is around \$1200. I like to do what I can to minimize distractions for my students.

**CQ:** It sounds like you keep things moving? What is a typical class like from beginning to end?

**West:** I try to get to the hotel around 3 on Friday to start setting up for the 7 PM class. The first thing that I want the new students to see is a lot of real, "live" equipment operating. We have HF, VHF, packet, RTTY and anything else that can easily be set up with mobile antennas.

The students arrive between 6 and 7. We take care of any paperwork and double-check that they have been practicing the code and studying the theory. If they haven't been practicing, we let them know at the very beginning they will have a hard time getting through the test on Sunday evening. However, we still encourage them to take the class and take the test later after additional study.

We start promptly at 7 with ARRL's



Some of the extras that West gives his students and sends out with mail order copies of his Novice home study course. The package of extras weighs two pounds.

The Radio Amateur's Novice Voice Class is the home study package that West sends to students well in advance of the weekend course. A student using this package should be well-prepared for the Novice exam. (See October 1987CQ, page 70, for a complete review of the course.)

new video. It is a great ice-breaker and really gets their attention. After the video and a quick break, we take a look at the rules and regulations. We also give them the first code session. Class ends by 10.

Class starts promptly at 9 Saturday morning. We intersperse the theory with code practice. We follow the exact order of questions in the textbook. We relate the questions to the real world of amateur radio so students may better understand the background behind them. We provide three coffee breaks and lunch during the day. Class ends between 5 and 6.

Many students like to watch us demonstrate the equipment Saturday night. If there is a local dealer nearby, we try to arrange a tour just to keep the excitement high.

Sunday morning class starts promptly at 9 again. We review the code and give several practice tests so that the students can get a feeling for what the exam will be like. Students send us code to check their proficiency. We finish our theory review. I then give them two sample tests similar to the one they will take later.

During Sunday lunch, we prepare the room for the afternoon exams. The team of volunteer examiners take their place at the head tables. Since we are dealing with Novice exams, the team of volunteer examiners need not be certified by a VEC. They must possess a General Class license or higher and must be 18 or older. They must not have any connection with selling amateur equipment. Under no circumstance would I or anyone assisting me teaching give the exams. The examiners never reveal to us which exam that they will be using.

The examiners give the exams. After the code test, students turn in their paperwork for grading. Most examiners use a fill-in-the-blank or multiple-choice exam. They may also look for one minute of perfect code. A 45 minute break allows the examiners time to retest anyone who came close but didn't pass the first time.

At about 4, the theory test is administered to everyone who passed the code test. I recommend that 3 different versions of the exam be used so that everyone next to each other has a different test. This allows a retest in a case where someone almost passes the first time. When someone fails to pass the retest, I recommend that they wait a week and take it again.

After all the paperwork is complete, I like to photocopy it before sending it to the FCC. Many hotels have copiers. Some VE teams will allow a Novice who hasn't received his/her license yet to take an upgrading exam if they present the photocopy of their Novice 610 form. Of course, there is always the danger of the 610 form being lost in the mail. So copying the paperwork just makes good sense.

Before the new Novices leave, I pass out packets of information that will be useful to them. We have promotional discount certificates from local merchants. CQ provides a coupon good for a free issue. Kenwood, ICOM, and Yaesu all have a \$25 equipment rebate program. We have frequency charts, a world map and even a license holder supplied by CQ for mounting the license when it arrives. We do everything we can to get them going.

**CQ:** How does this compare to the package that you send out when someone ord-

ers your Novice theory and code course?

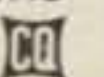
**West:** It is identically the same package of extras. People who've been around for a while know where to turn when they want to buy something. Most Novices don't. So I try to give them enough promotional literature to get them started, at least. Remember the "Welcome Wagon" that helped you get set up in the new neighborhood when you first moved in? That's what I want to do for the new Novices. This is what sets our course apart from others offering the same text and tape. Altogether, there is about 2 pounds of extras that I mail with my copies of the Novice training package. That's why I have to charge a little bit more for postage.

**CQ:** Any parting words or thoughts about Novice training and support for our readers?

**West:** Nothing beats a 12 week evening Novice class. It's the best way to present the material in an unhurried fashion. Some people are in too much of a hurry or just don't have the free time to commit to something like that. They want or need a faster way to go. Some students just get bored with the pace of a 12 week course and drop out.

We can either turn these people off about amateur radio or offer them a classroom alternative that ultimately gets the same job done as the 12 week class. The weekend class, which is really a home study course with a weekend finale, works well.

Gordon West can be reached at Gordon West's Radio School, 2414 College Drive, Costa Mesa, CA 92626; phone 714-549-5000.



# CQ REVIEWS:

## The MFJ-931 Artificial Ground

BY KARL T. THURBER, JR.\* W8FX

Several months ago, at the ARRL National Convention, Martin Jue of MFJ asked me to check out a new product he was particularly proud of, the Model 931 Artificial RF Ground. It's an intriguing little gadget which, at first glance, seems to be an antenna tuner. It is a tuner of sorts, but it's really used to "tune" a ground system.

As it turns out there is method to MFJ's madness in coming up with such an unusual device. The idea is to help create a usable "RF ground" with random length HF antennas, such as you might erect in an apartment, condo, motel, or other less-than-ideal operating environment, one which may make impossible the installation of a conventional antenna. The device, via its tuning mechanism, effectively places a far away ground directly at your rig for RF purposes. Or it helps you to tune a "counterpoise" used as an artificial ground when a "real" RF ground isn't possible.

It does this by tuning out the reactance of the counterpoise, accomplished by adjusting the variable inductor and capacitor in the unit so as to produce maximum RF ground current using the built-in RF ammeter. This effectively resonates the

random-length wire you've strung along the ground and converts it into a tuned counterpoise system, to present an effective low impedance near ground potential to your rig.

OK, so what's a counterpoise? This is a type of capacitive ground that can be effective when an extensive buried ground system, or at least a good "cold water pipe" ground, isn't available—as in the operating situations we mentioned. To work well, the counterpoise should be large enough to have a considerable capacitance to ground, meaning that it should cover as much ground area as can be managed. The counterpoise's shape can be anything that's convenient; oblong or square designs are fairly easy to construct. Often, large-area counterpoises are up to a half-wavelength in radius, though the actual radius or the length of the individual wires which make it up aren't critical. But for the type of simple, insulated-wire counterpoise that you might install in a temporary lashup, MFJ simply suggests an insulated wire no more than one-quarter wavelength at the operating frequency.

The counterpoise's height isn't important, though it should be routed so as not to be tripped over. If outdoors, that means installing it seven to ten feet above ground. It's best not to let the counter-



*If it looks like a tuner, and it acts like a tuner . . . ? It must be MFJ's 931 "Artificial Ground" unit for restricted antenna situations.*

poise touch the earth, since when it does the losses are likely to be increased in that the counterpoise tends to act rather as a poorly conducting ground.

While the MFJ-931 is primarily designed to assist in "tuning" the counterpoise, it can also help to electrically "place" a far away ground close to the rig, by tuning out the reactance of the wire that connects the ground to the rig. Often, in an apartment or motel unit you can get a fair "cold water" ground, particularly if the living unit is at first-floor level, but it may be one that is not equally effective on all bands. The MFJ unit, by its tuning capability, can help to eliminate

\*317 Poplar Dr., Millbrook, AL 36054

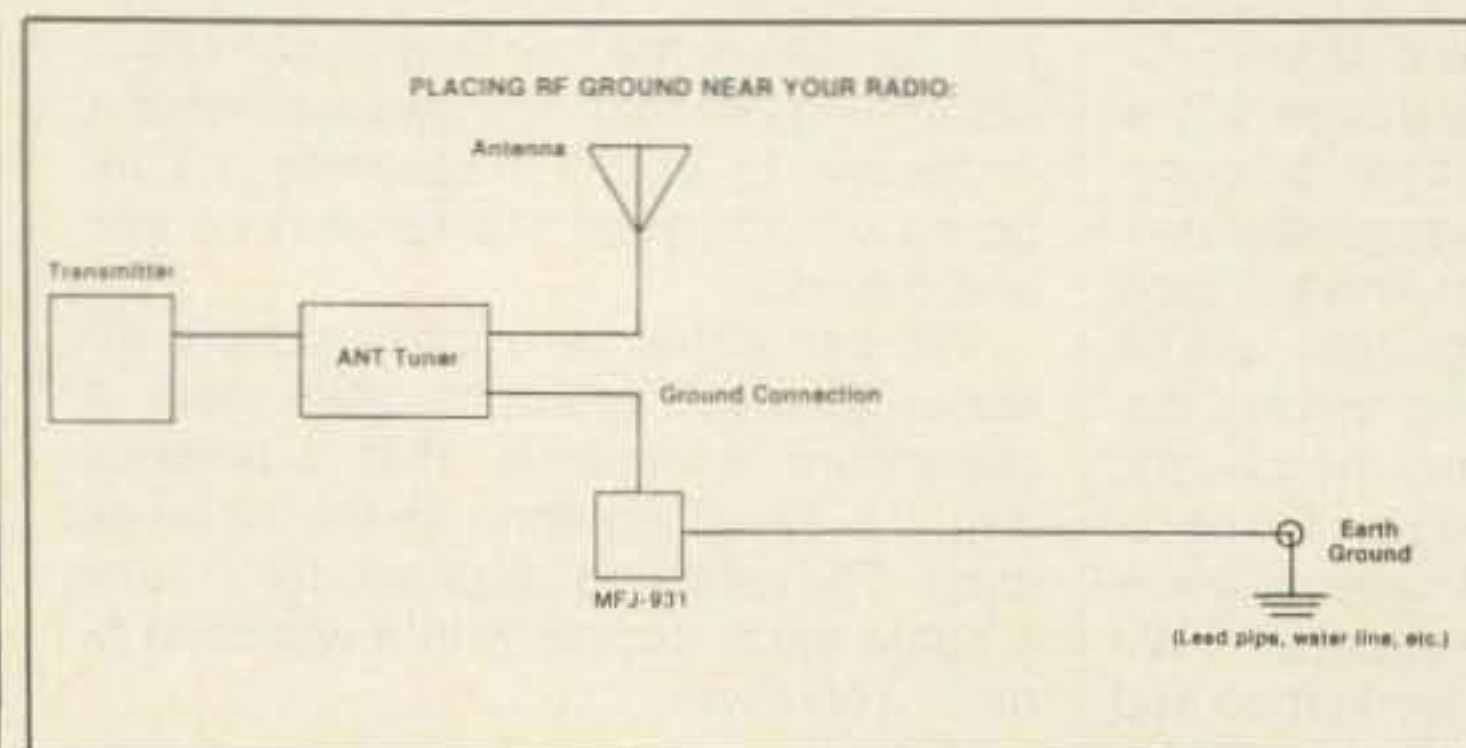


Fig. 1—The sketch, above, shows how the MFJ-931 Artificial RF Ground is used to effectively place a distant earth ground near your equipment. The unit is tuned for maximum ground current in operation.

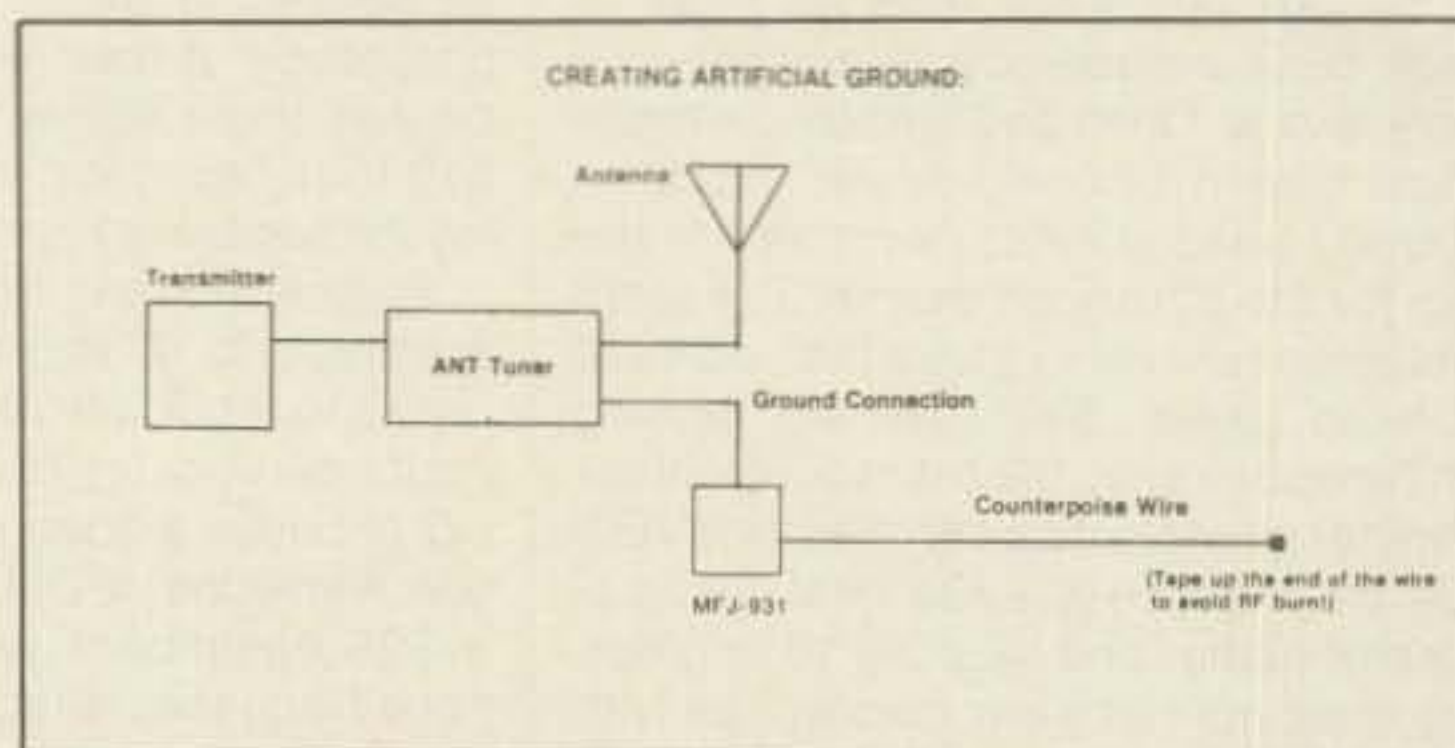


Fig. 2—Shown here are the interconnections when the MFJ-931 is used to create an artificial ground using a counterpoise wire. In all cases, the unit does not eliminate the need for a DC electrical ground for safety purposes.

the annoying effects of RF "bites," RF feedback, TVI/RFI and other problems caused by an inadequate RF ground system. Of course, you still need a wide-range antenna tuner or transmatch to couple the random wire antenna to your transmitter or transceiver, and you should expect to experience some interaction between the MFJ Artificial RF ground and your antenna tuner.

This is a rather novel product that MFJ has come up with, and it certainly has its place to help you operate under conditions where you might otherwise not be able to operate effectively. But the MFJ-931 won't do anything to further improve an RF ground system if you already have a good one, and it won't compensate for the inadequacies of a poorly installed singlewire antenna. It also won't eliminate the need for a DC electrical (as opposed to RF) ground for your equipment's safe operation. For its intended purpose, however, it has a place. I had a lot of fun experimenting with my unit and playing with indoor counterpoises and random length wire antennas. The unit seemed to do the job it was designed to do.

Fig. 1 shows a typical hookup for the unit for placing a distant RF ground near to your rig, while Fig. 2 depicts how the unit is installed to tune a counterpoise. For more details, contact MFJ Enterprises, P.O. Box 494, Mississippi State, MS 39762.

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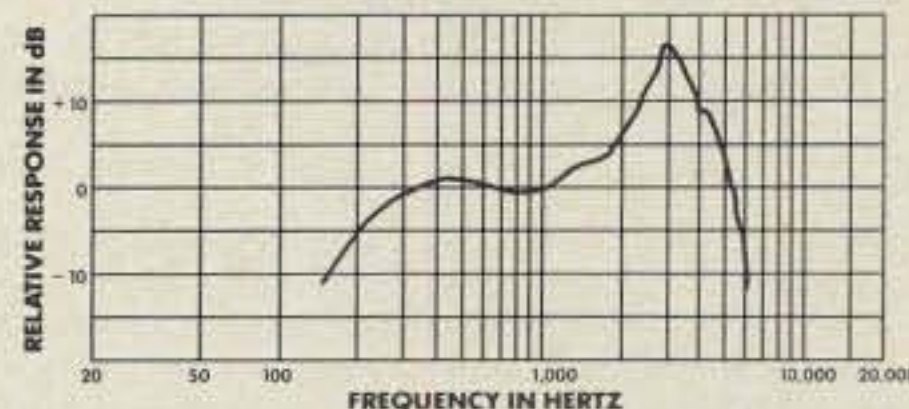
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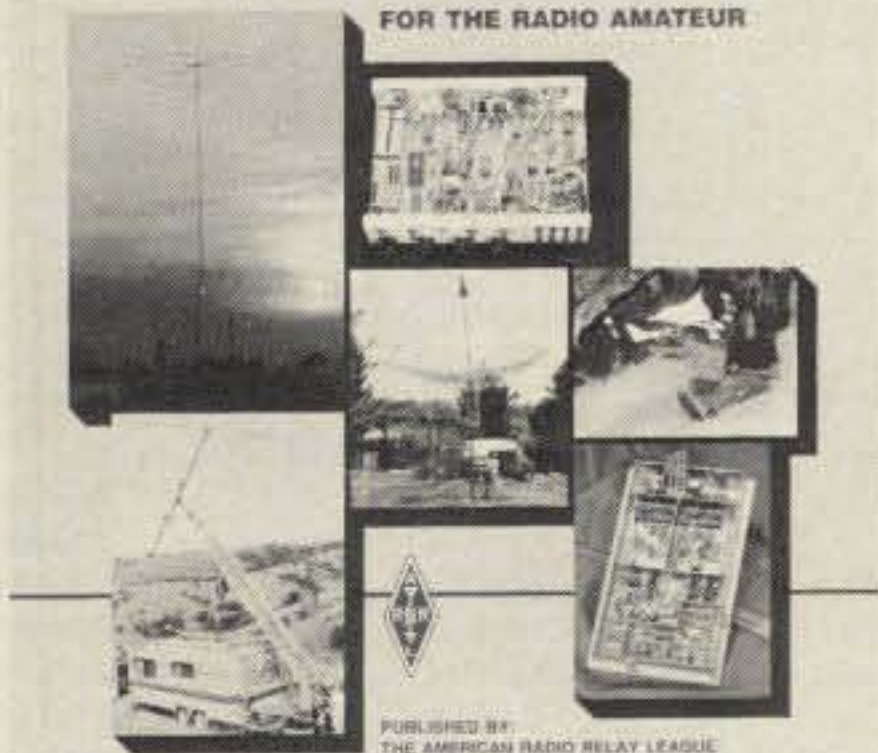
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PC 22

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CIRCLE 146 ON READER SERVICE CARD

**WAZ EME? Maybe, someday. KA1BC and crew provided us with Zone 2. How about Zone 23 next?**

# Moonbounce Expedition To VO2 Land

BY DAVE GROSS\*, KA1BC

On September 9, 1987 we rolled eastward on US Rt. 1 toward the Maine-New Brunswick border. The light rain increased steadily as we made our way. We wondered if our plan, first proposed during a "Bull session" late last winter, was such a good idea after all. The crew consisted of Norm, WA1IVB; Dave, KA1BC; and Joe, K1RQG as well as Al, Dave's father, who proved invaluable as negotiator, pit-stop coordinator, taxi driver, and provider of fine homegrown fruits and vegetables for the trip. A silent but very important partner in this effort was Tom, VO1CA, trustee of the Southern Labrador DX Group. He had invited us to use the call VO2DX.

Months of work and a practice run done earlier in August were about to be put to the test. Anxiety reigned as we approached Canadian Customs at St. Stephen, N.B. Agents were taken aback at the sight of us. We were invading with a heavily loaded pickup and a van with four 24 ft long 432 MHz yagis, a fully assembled "H" frame and various other hardware on the roof. After a few questions we were on our way up the Trans-Canada Highway bound for the Newfoundland ferry terminal at North Sydney, Nova Scotia. After fifteen hours of driving through the year's heaviest rains in the Maritime Provinces, we arrived at the terminal. At midnight we left the pier on the M.V. Caribou, the newest ferry on CN Marine's Newfoundland run.

Less than five hours later we rolled off the ferry into predawn darkness at Port Aux Basques, Newfoundland. By eight AM we were safely at Deer Lake and turned up the Viking Trail for the run up the Northern Peninsula to St. Barbe and the Labrador ferry. The skies had cleared and we made excellent time, arriving at St. Barbe just as the Labrador ferry was unloading. We were fortunate to get on the ferry, Northern Princes, for the after-

\*RFD BOX 197, Penobscot, ME 04476



The VO2DX EME crew at the Quebec-Labrador border (left to right), K1RQG, Joe; KA1BC, Dave; and WA1IVB, Norm.

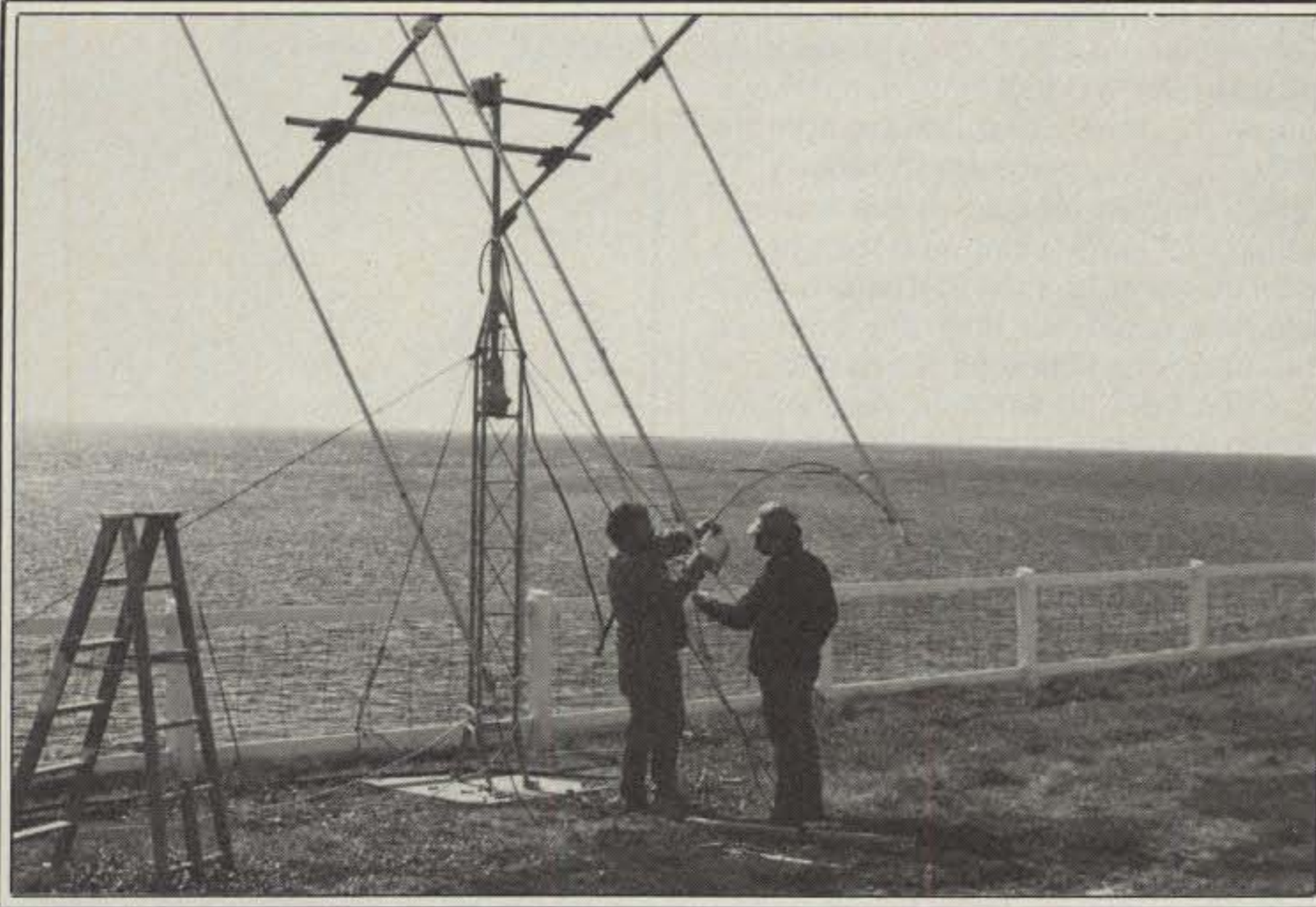
noon run and in two hours we landed at Blanc Sablon, Quebec just two miles from the Labrador border. A short drive brought us to the site chosen for the EME effort, near L'anse Au Clair, in grid square GO11OK. Thirty two hours and approximately 1200 miles after leaving home, we had a pair of HF stations on the air as VO2DX. These were used primarily as liaison on 75 Meters to our homes back in Maine and contact on 20 Meters with the 432 MHz Moonbounce Net (1600 UTC, 14.345 Mhz, every Saturday and Sunday). We did, however, work a few stations on 10 and 20 Meters just prior to a heavy aurora which limited later HF operations. Our first EME skeds were set for the following evening. Since we had arrived in Labrador a day earlier than planned, we had a little time to relax.

Friday morning arrived and all hands

went to work getting the 432 EME station set up and checked out. A Rohn tower top section on a four foot square of  $\frac{3}{4}$ " plywood provided the support for the "H" frame and four thirty one element, ten wave length, home-brew yagis. Other equipment on the tower included a Ham IV for azimuth control, KR-500 for elevation, remote MGF 1402 preamp built by W1ZX at the power divider, and Andrews FSJ1-50  $\frac{1}{4}$ " Helix for phasing lines. Sixty feet of  $\frac{7}{8}$ " Helix and control cables were our link back to the van from which we operated. The station in the van consisted of a Yaesu FT-757GX II, a Microwave Modules LTDMMT 432/28-S transverter, 100 watt solid-state driver to a home-brew pair of 3CX400U7 coaxial triodes, which yielded 1000 watts to the feedline under ideal conditions. This was supplemented by an MFJ audio filter and Grandmaster

No - 29 - 30





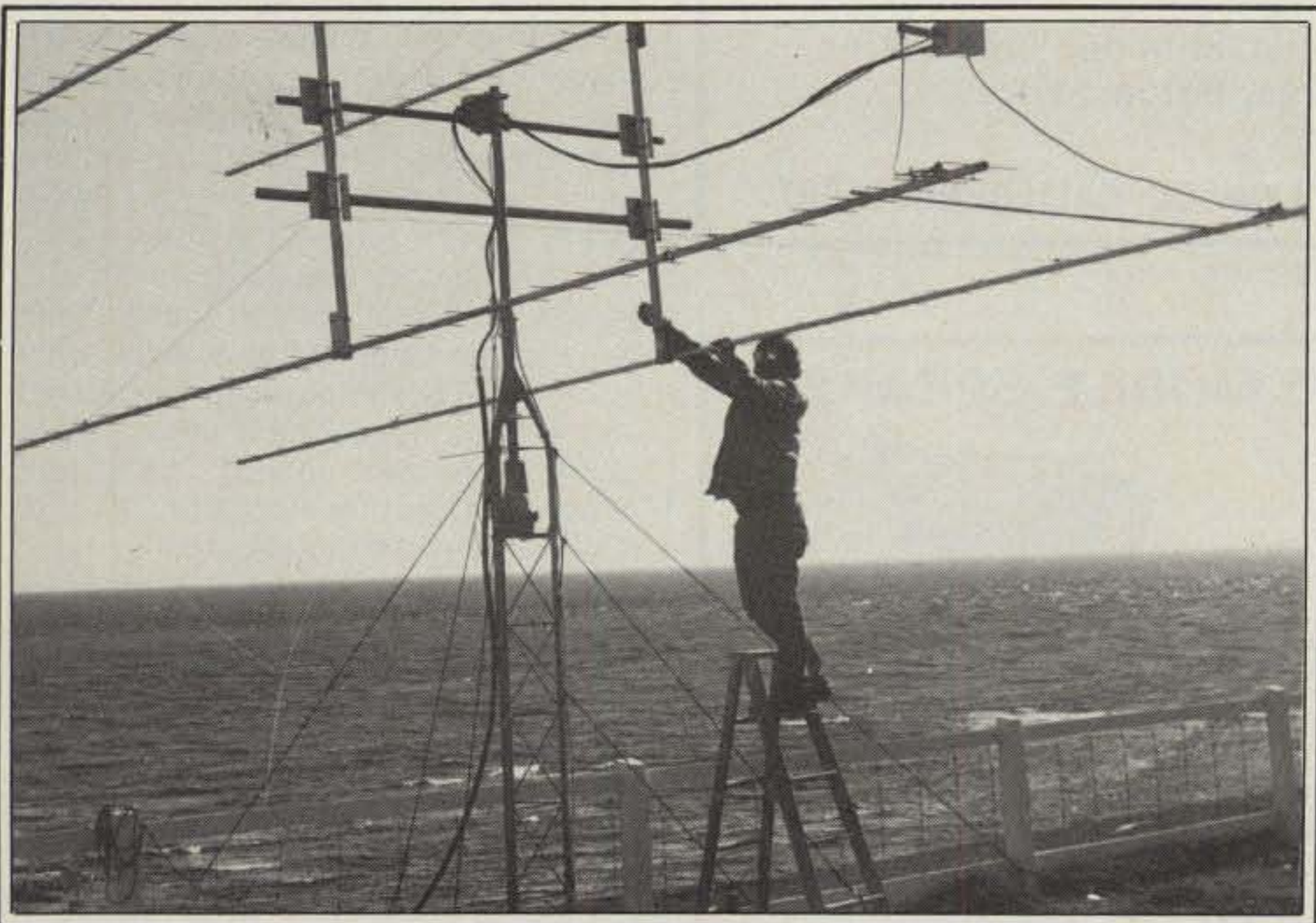
Joe and Norm assemble the power divider and relay box.

keyer. All the equipment ran on nicads in the van except the final amp which ran on borrowed shore power.

Four hours after we began setting up the EME station we were ready. We were just waiting for the moon to rise so that we could check the azimuth and elevation calibrations. Magnetic anomalies made our compass readings useless in aligning the array, but once the moon rose, we were ready to go. Our first sked was at 0200 UTC with DL9KR, but shortly after we checked the system out we heard Jan calling CQ at 0045 UTC and gave him a

call. Jan, DL9KR, responded with a 559 report. We replied with 559, exchanged pleasantries, and then celebrated our first EME QSO from VO2DX. Unless disputed we feel this is the first ever EME QSO on any band from Labrador.

We were extremely elated with our initial success. As the evening wore on we worked the following stations in addition to DL9KR: Y23BD, K1FO, W1JR, NC11, OE5JFL, G3LTF, G3SEK, N9AB, K5JL, HB9SV, W0SD, K2UYH, K4QIF, N6AMG, N4GJV, and W5RCI. During the confusion in the middle of the night and our first at-



Joe puts the final touches on the alignment of the array.

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1500W

### MODEL VS1500A ANTENNA COUPLER

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tempt to work AI, K2UYH, we had the MFJ Grandmaster keyer and the internal keyer in the Yaesu in series. AI was totally baffled and frantically tried to complete with us to no avail. (Sorry about that, AI.) But we did complete a couple hours later on random. We had partial contacts with KL7WE and W8IDU and heard many more in the QRM which we had never experienced on EME before. Operations for the first day ceased at 1500 UTC, moonset on the South Coast of Labrador. We had agreed amongst ourselves that if we made one EME contact, the expedition would be a success. So the first night total of seventeen was fantastic.

While Joe was trying to work N7ART on Saturday morning, a tourist from Oregon stopped by to see what in the world we were doing. Trying to explain EME to her was beyond the realm of possibility, and indications were that she thought we were crazy spies. She did, however, provide us with bad news that the Northern Princes, our only escape back to Newfoundland, had suffered mechanical problems and was not expected to run for a couple of days.

We now realized that had we not pushed ourselves on Thursday to catch the after-

noon ferry to Blanc Sablon, we would still be on the South side of the Belle Isles Straights and VO2DX would not have been. At this time we decided to operate into the night but cease around 0800 UTC to allow time to tear down the system, pack up, get some sleep and then get in line for the ferry, as soon as it was running again. We could not take any chances getting back to Maine as Norm and Joe had to be back to work on Wednesday morning and the ferry is first come first on.

Saturday at 1600 UTC, Joe checked into the 432 EME net on 14.345 MHz and received reports that many stations had heard us the previous night and desired skeds. We took many skeds for Saturday night, most on fifteen minute sequences, then shut down for a few hours for food and sleep.

At 0230 UTC on September 13, 1987 VO2DX was again "on the moon". The previous night had been totally clear, but tonight the clouds started to roll in. The first contact was with OK1KIR on random followed by G3LQR. Then without fail Murphy struck. The azimuth read-out quit and not to be outdone the elevation rotor quit all together. These were the only two real failures we encountered during the



The crew waits for moonrise on the Straight of Belle Isle. The 35 ft. whip on the van was used for 20M liaison with 432 MHz EME net.

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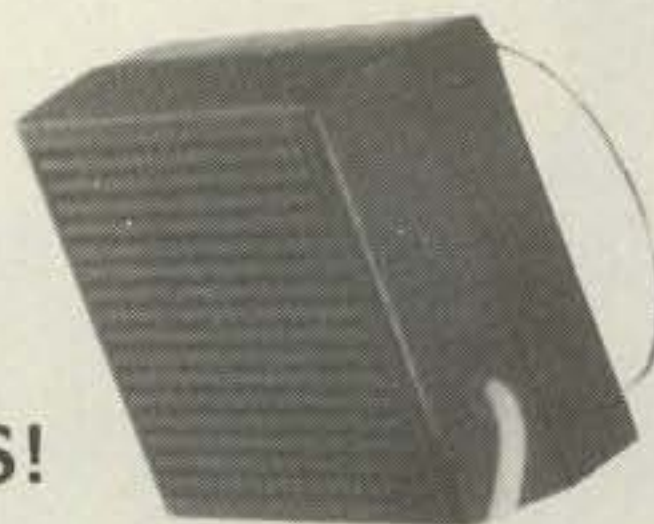
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whole trip. We had not planned on the line voltage variations causing problems, but it did drop at times as low as 100 volts lowering power out of the final to below 400 watts. Joe had brought a 30 AMP variac, which did help maintain average power around 850 watts out. Every fifteen minutes the array would be visually aligned. Despite heavy cloud cover, we kept the antennas pointed at the moon. We went on to work PA3CSG, WA9FWD, WA3FFC, W8IDU, VE4MA, WB5AFY, and W0RAP. Heard were KD0GT, YU1IQ, Y22ME and many others not identified due to QRM and fast fading. By 0830 UTC on Sunday we had nine more confirmed for a total of twenty six contacts via the moon.

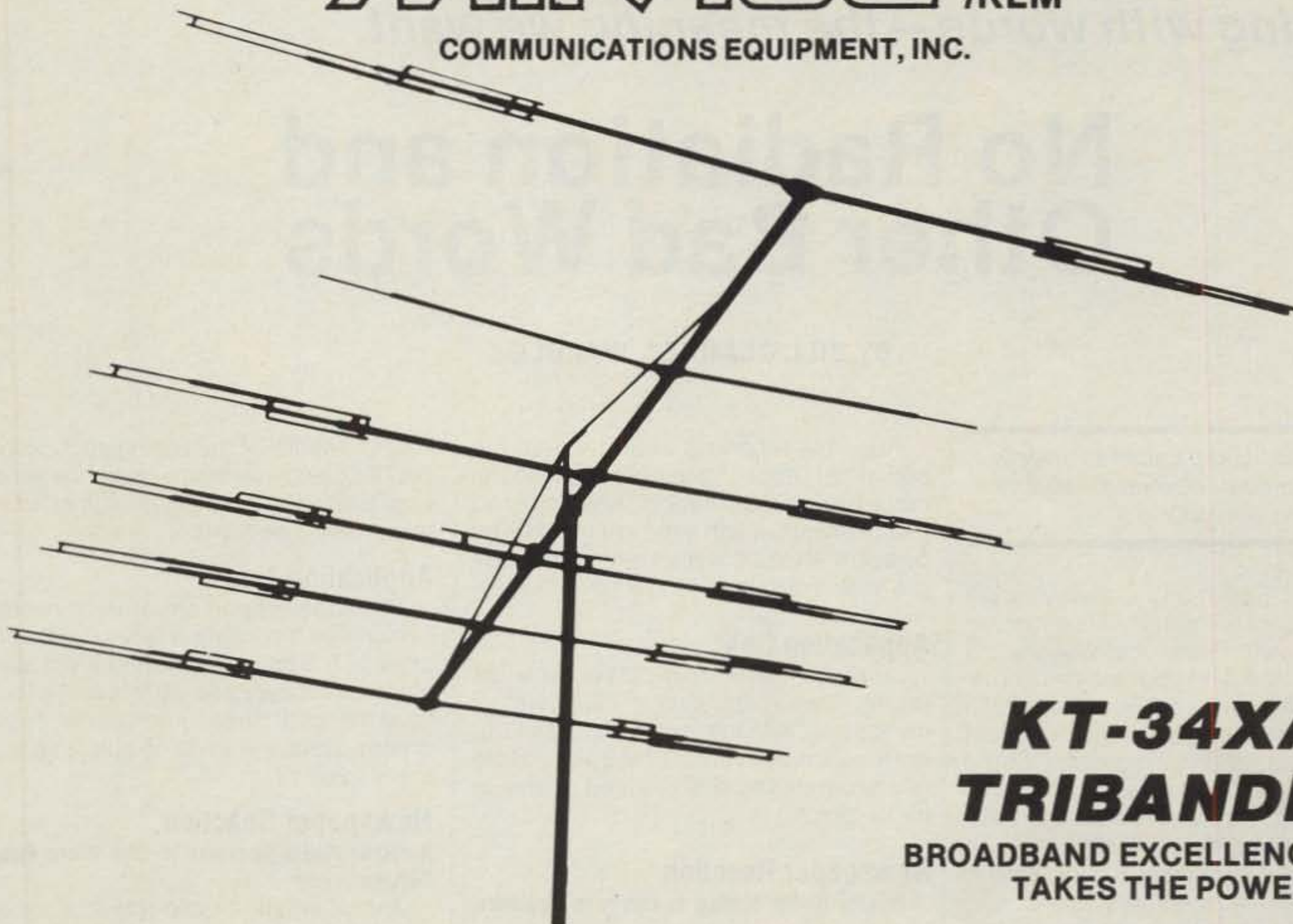
We then began tearing down the EME as well as HF stations and packing them away for the long trip home. Back at the motel we all got some much needed rest and a good meal which of course included Kennebec potatoes fresh from AI's garden and prepared under his strict supervision in the motel kitchen.

Monday morning we boarded the Northern Princess at Blanc Sablon and reluctantly sailed for St. Barbe, Newfoundland. Then followed the long drive to Port Aux Basques to catch the midnight ferry to Nova Scotia. After a very rough crossing and another 550 miles of driving we arrived at home on Tuesday afternoon, already talking of plans to do it again next year . . . maybe with four more yagis.



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KLM's field proven KT-34A is the heart of the "XA" model. The boom length of the "XA", however, has been doubled, and one tri-resonant and one full size 10 meter element have been added. These changes increase the gain to **11-11.3 dBd** on 10M, **9-9.5 dBd** on 15M, and **8.5-9 dBd** on 20M. Two driven elements are used to make the KT-34XA unusually broadbanded (a concept applied to many KLM antennas). Gain is virtually flat across each band except for 10 meters which has been optimized for the DX'er, 28-29 MHz. The chart shows the remarkable performance qualities of the KT-34XA.

The KT-34XA's design represents the first major advancement in tribander technology in over 20 years! The conventional traps, coils, and capacitors have been discarded in favor of integral linear loading and hi-Q air capacitors, all composed of aluminum tubing. These give the KT-34XA a conservative power handling capability of 4 KW PEP and an unusually high level of operating **efficiency**. Linear loading also makes full  $\frac{1}{4}$ -wave elements possible on 15 and 10 meters, and brings 20 meters much closer to the desirable  $\frac{1}{4}$ -wave than any conventional tribander.

BANDWIDTHS:...	14.0-14.350 MHz	GAIN:.....	8.5-9dB
	21.0-21.50 MHz		9-9.5dB
	28-29 MHz		11-11.3dB
VSWR:.....	1.5:1	BOOM LENGTH:...	32 ft. x 3" O.D.
FB/FS:.....	20dB/40dB	TURN RADIUS:.....	21.5 ft.
FEED IMP.:.....	50 ohms w/balun	WINDLOAD:.....	9 sq. ft.
BALUN:.....	3-60-4:1 5KW PEP	WT. (LBS.):.....	75 lbs.
ELEMENT LENGTH:.....	24 ft.	MAST:.....	2" O.D. (standard)

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**What's in a word? An awful lot, especially these days. WA4BLC shows us how to convey meaning with words—the meaning we want.**

# No Radiation and Other Bad Words

BY BILL CLARKE\*, WA4BLC

---

*The most powerful cause of error is the war existing between the senses and reason. (Pascal)*

---

**T**he word Radiation is a very scary word to most of the public. It is generally associated with "radio activity", and I don't mean the kind you find on 20 meters. Members of the public not associated with amateur radio (government leaders, civic leaders, members of the press, and neighbors) think of radio activity as exposure to Atomic Radiation, Radon Gas, X-Rays, even LASERS.

Your local government is quite likely to have influential members on zoning boards and planning commissions that don't know anything about radio (amateur or otherwise). This should be of primary concern to the amateur radio operator, because, in the name of public safety, these people get excited when they hear words about radiation. Some of these folks can make life very miserable for amateur radio operators. After all, their approval is required for most antenna installations.

Many zoning problems are the result of misunderstanding. If amateurs spoke with clarity, a considerable amount of such problems could be avoided. Of course, I realize there is some successful activity going on with the FCC pre-emption of local laws involving antennas. However, pre-emption is not a panacea for all amateur vs. zoning board disagreements. Long protracted legal battles are costly, time consuming, and often only partially successful. Besides, why carry a big stick when it is not needed?

Now you ask, what am I getting at? Just this: Be careful about what technical words you use when describing amateur radio. Don't use frightening words when describing your existing/planned radio system with the non-amateur public. Use simple terms that are easy to understand—terms that don't alarm.

Read the following excerpts from hypothetical local zoning applications made by amateurs seeking permission to install towers. Each example is followed by a portion of a possible newspaper article referring to the application.

## Application One

... tower is needed to increase radiation levels, thereby increasing the power of my station. With the installation of a larger RF radiating system I shall be capable of concentrating the radiated power in many directions...

## Newspaper Reaction

### Private Radio Station to Increase Radiation Levels

A local private radio operator recently applied to the Zoning Commission for permission to increase the radiation levels at his home. A public hearing will be held as part of the application review...

As you can see by the wording of the first application, and the media reaction to it, misunderstanding was running rampant. The poor amateur tried to sound professional by impressing the zoning commission with important sounding words like radiation, RF, power, etc. The newsman panicked, because he did not understand the jargon the amateur used in his application. The net result is the needless alarming of the public and a

possible denial of the zoning application. Just because someone misunderstood what was said. Simplification in word selection was needed.

## Application Two


... antenna support structure is needed to increase my amateur radio station efficiency. The improved antenna will allow me to direct my radio signals to the locations needed. These improvements will greatly assist me in doing public service in the event of...

## Newspaper Reaction

### Amateur Radio Operator to Give More Public Service

A local amateur radio operator has applied to the zoning commission for permission to install an improved antenna system. The new antenna system will aid him in performing public service. A hearing will be held as part of the application review process.

Well, now you see why it pays to make yourself clear and to use easily understood terms that will not alarm anyone.

Don't give anyone a chance to misunderstand you. For all too often the misunderstanding will linger long after the explanation to clarify the point has been made. By merely selecting alternative words and phrases we can make ourselves understood with clarity and avoid sounding scary. 

## Table I Recommended Alternative Words

Old	New
RF radiation levels	radio energy
antenna radiation pattern	antenna signal pattern
reflector, driver, director	antenna components
radiation pattern	aiming the signal
radiators	wires or components
radiation of RF energy	transmission of radio signals
tower	support structure
guy wires	safety wires

*"Old" words and phrases, understood by all amateurs, should be exchanged for "new" ones to prevent misunderstanding by the non-amateur public.*

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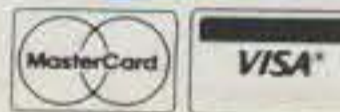
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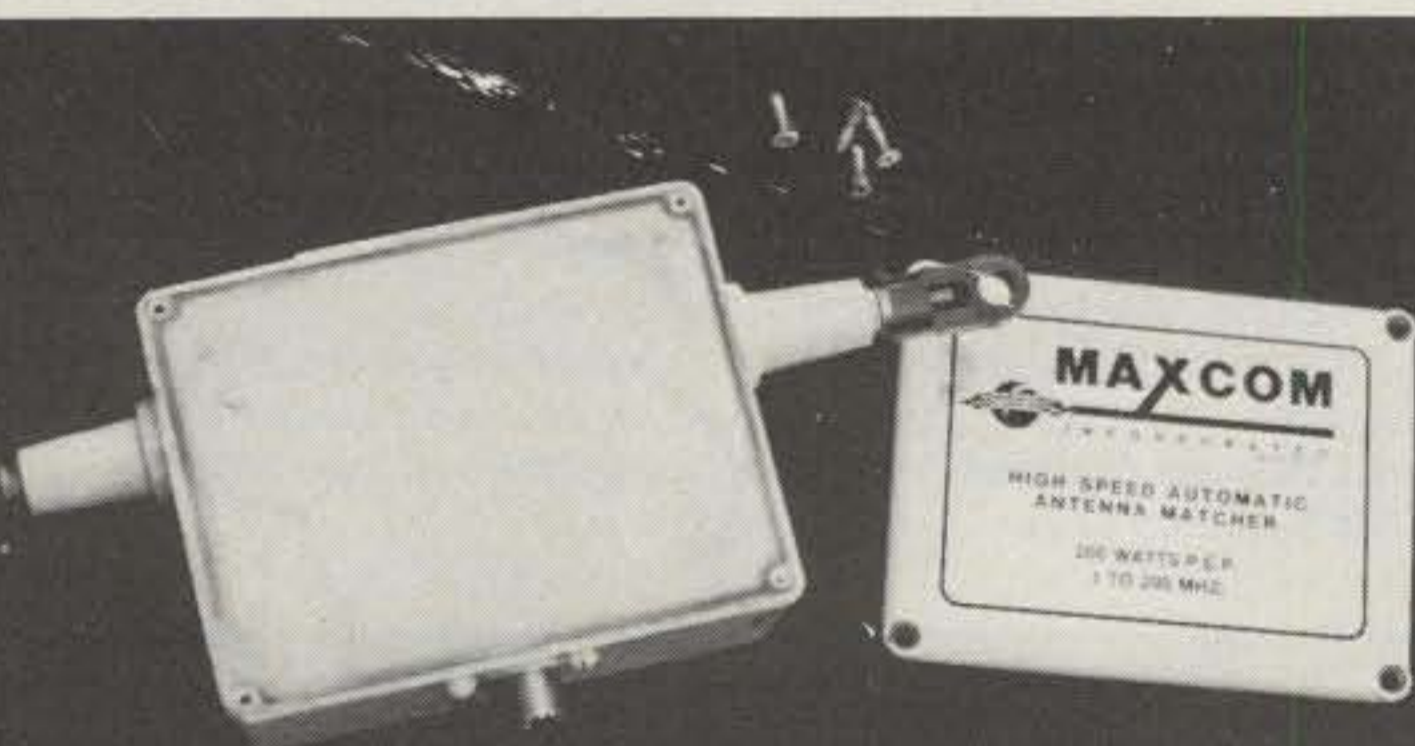
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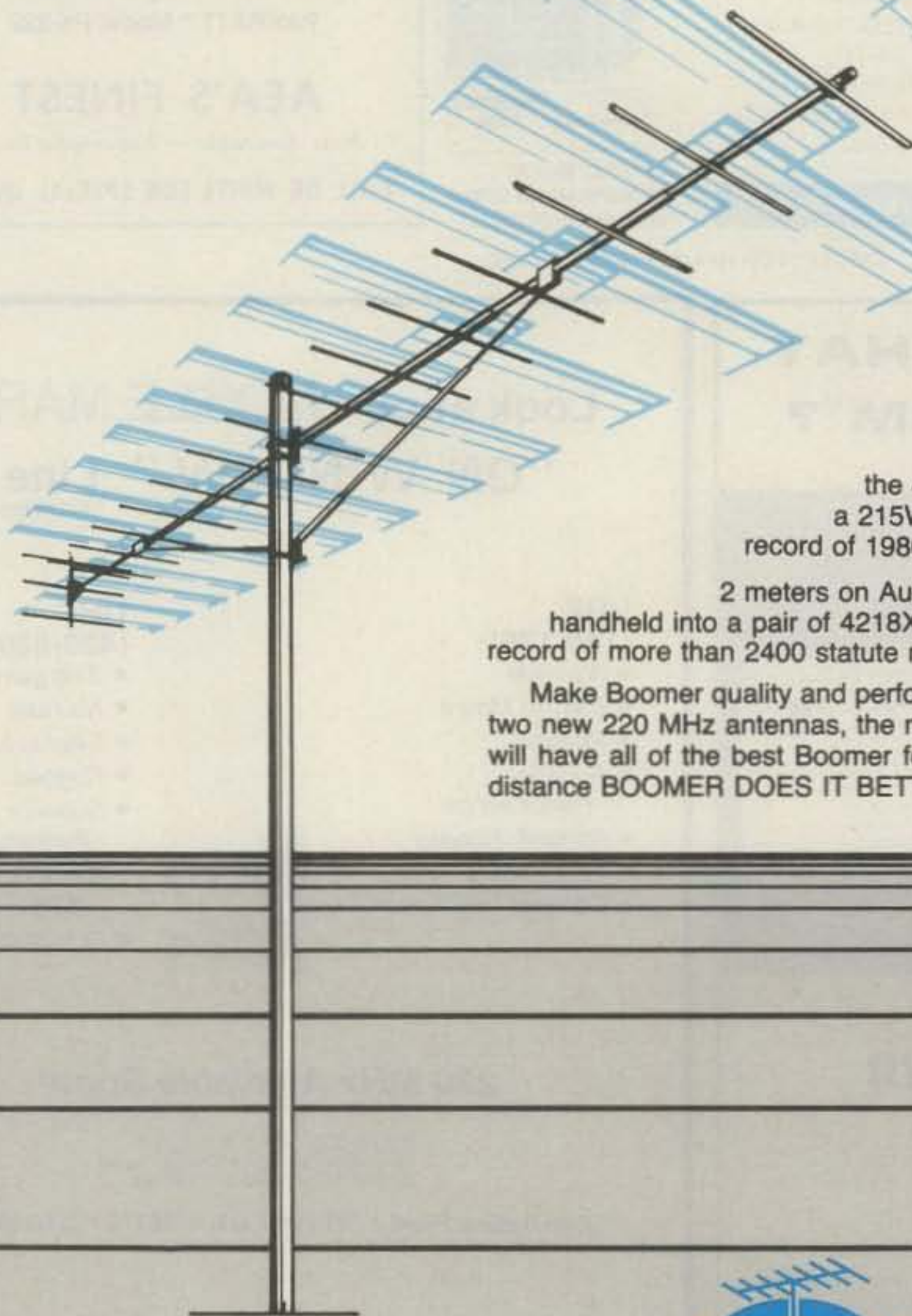
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2 meters on August 3, 1987 Gordon West WB6N0A, using a 1/2 watt handheld into a pair of 4218XL Boomers contacted KH6HME in Hawaii a distance record of more than 2400 statute miles.

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**Anybody got a match? W4FA describes an easy-to-build but often overlooked tuner that's a real winner. You'll always have a match with this design.**

# The Double-L HF Antenna Tuner

BY JOHN J. SCHULTZ\*, W4FA/SV0DX

The double-L tuner design presented in this article is not a new design. It has been around in various forms for years but has been a bit neglected in comparison to Pi-network or T-network (one inductor) tuner type designs. However, the double-L tuner design, which is a form of a T-network tuner, has a lot going for it. It is relatively easy to construct and will match almost an infinite range of impedances. Also, it does not seem prone to some of the false resonance conditions exhibited by other tuner designs.

## Circuitry

Fig. 1(a) shows the T-network design common to more than half of the commercially available tuners. Most of the automatic antenna tuners available on the market also use this design. The design does allow one to match a fair range of impedances with modestly priced and dimensioned components. The latter is an important factor in automatic tuner designs since it would highly complicate such designs if provisions had to be made to switch in padding capacitors across the variable capacitors on certain bands. However, this design sometimes exhibits a false resonance with certain high SWR antenna loads so that the transmitter power is essentially almost all dissipated in the coil L. I have seen this happen with both manual and automatic tuners using the design of fig. 1(A).

On the other hand, I have never seen it happen with the design of fig. 1(B). That design would be very difficult to implement in an automatic tuner design since the coils would have to be bandswitched. Or, if continuously variable inductors were used, the automatic tuning time could be intolerably long. However, the design of fig. 1(B) does lend itself almost ideally to the homebrew construc-

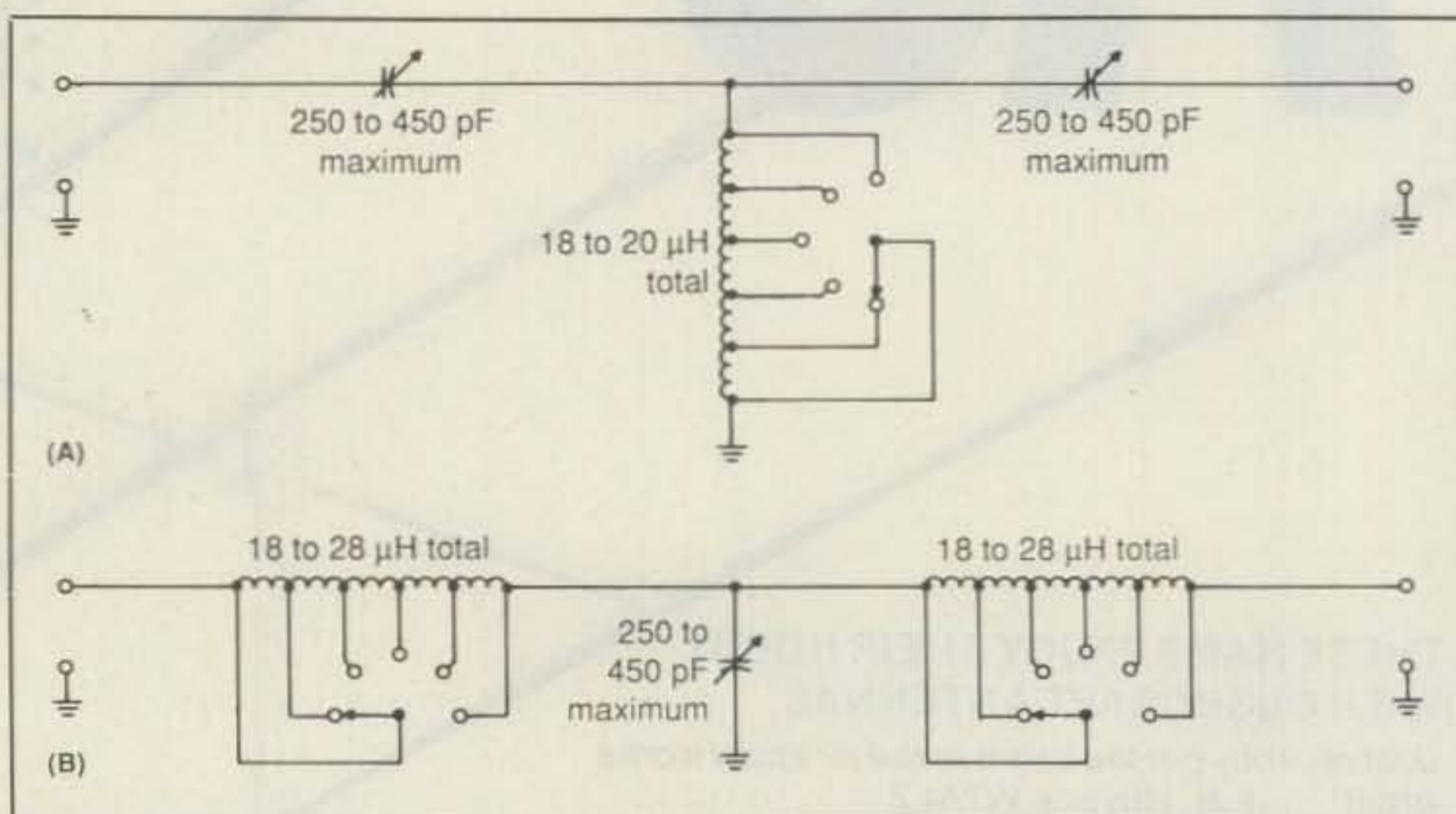


Fig. 1— Variations of the T-Match using tapped coils.

tion of a wide-range, easy-to-assemble manual tuner.

## Double-L Circuitry

Fig. 2 presents a more detailed circuit of the subject tuner with various component options. Two variable inductors are used. This may seem like an expensive approach but it is well worth it. The continuously variable inductors allow almost any load to be precisely matched without a lot of back and forth tuning as would be the case if bandswitched inductors were used. If you just can't obtain two variable inductors for some reason, one inductor could be a taped coil, with as many tap points as possible. Certain loads will then require reversing the in/out connections for a precise match. The use of 18 μH inductors and a 300 pF variable capacitor will allow you to match even highly reactive loads with more than a 10:1 SWR over the 80-10 meter range.

It will also allow you to match moderately reactive loads on 160 meters, al-

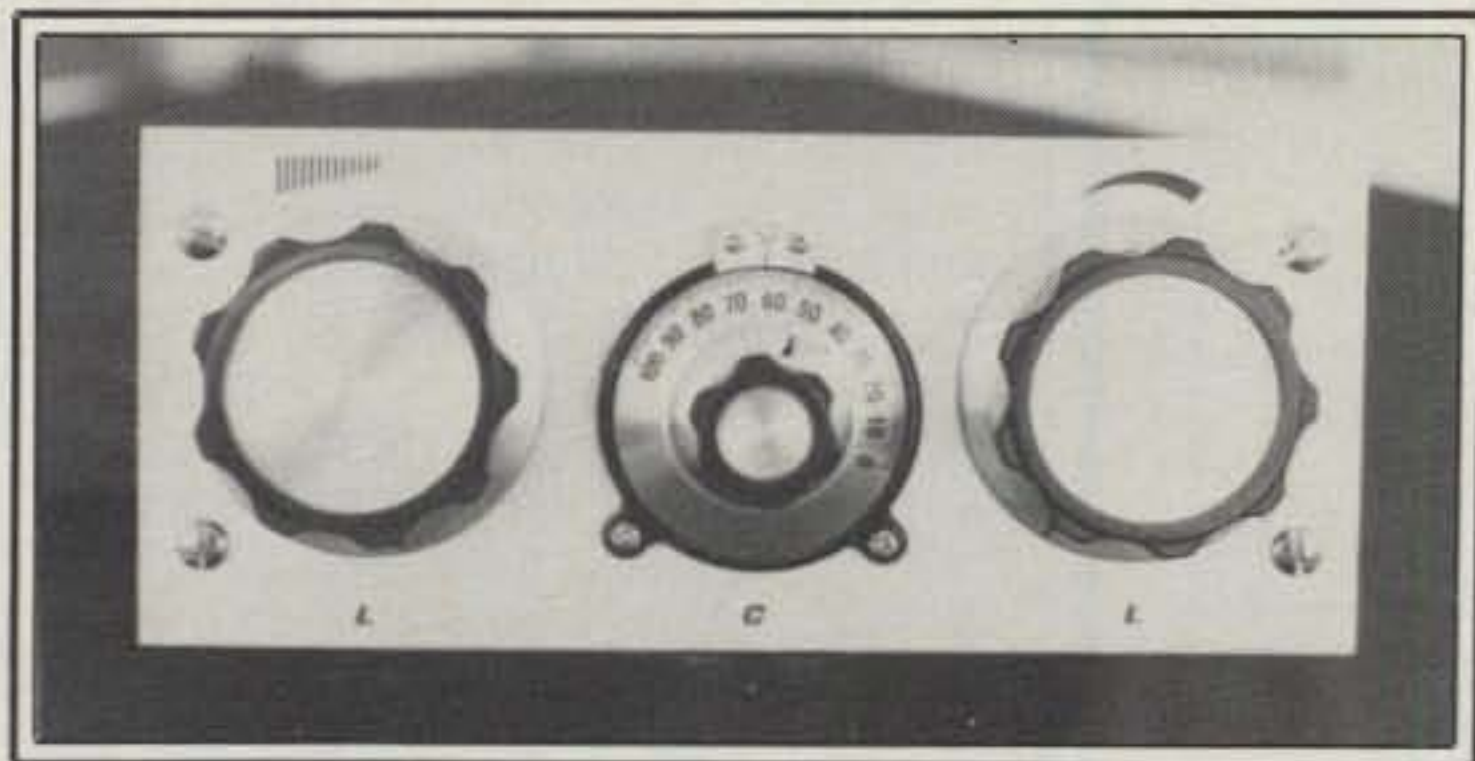
though I can't give a precise figure for the matching range. Increasing the inductance values to 28 μH and the capacitor value to 450 pF will allow a much greater range of matching possibilities on 160 meters but I can't believe the added component cost is worth it compared to pruning a 160 meter antenna for a good match. If you are not interested in operation below 30 meters, 10 μH variable inductors and a 250 pF variable capacitor are entirely adequate for 30 to 10 meter operation.

Fig. 2 shows an optional balun at the output of the tuner so you can use the tuner with a balanced transmission line. Any standard toroid core balun can be used, as found in numerous handbooks. The balun should, of course, be dimensioned to handle the maximum power output to be used with the tuner. The tuner itself will handle a nominal 1 KW output. A kit balun such as that sold by Amidon Associates would be an excellent choice.

Provision was made for adding an ex-

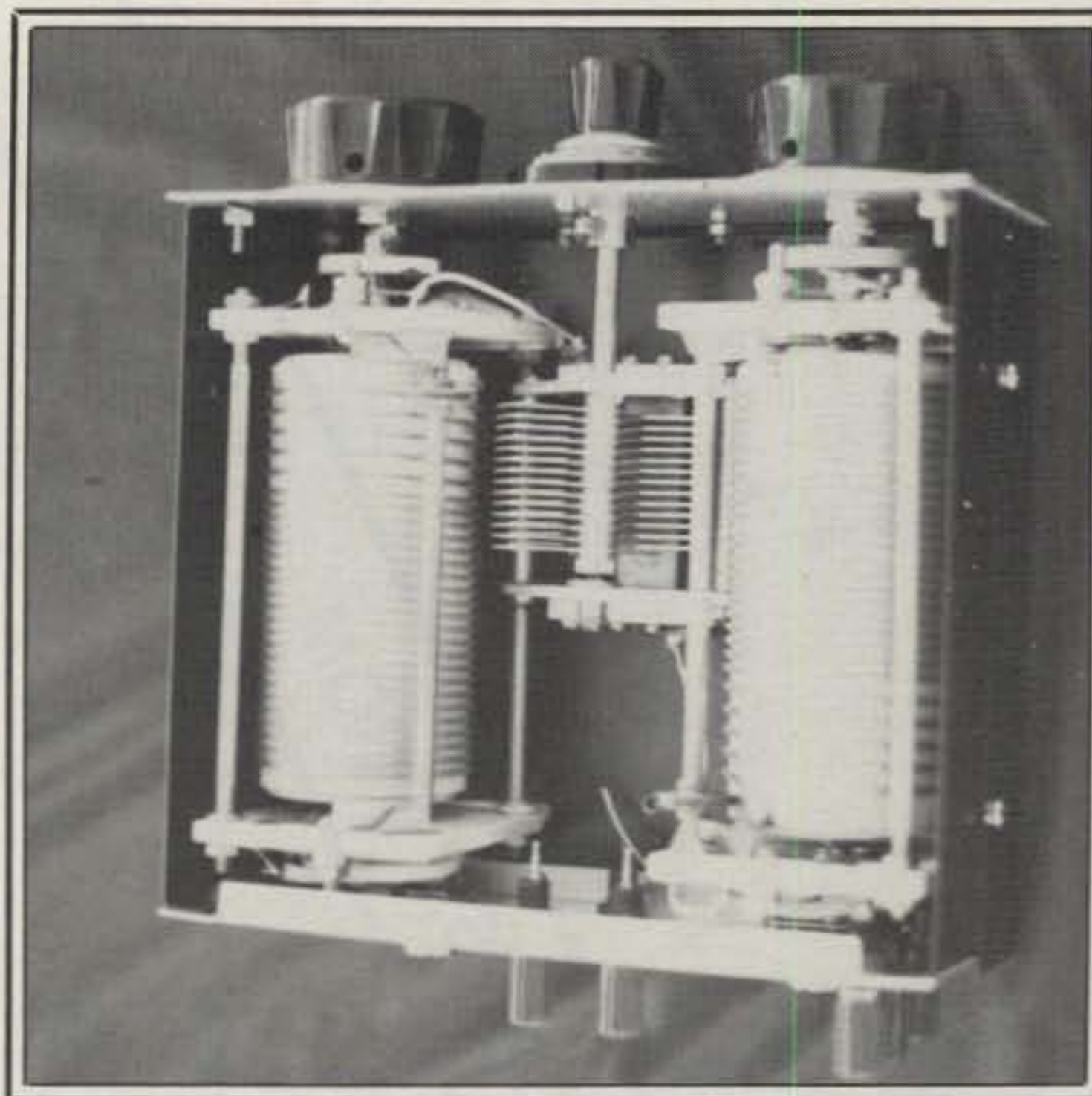
\*CQ Magazine





The simple front panel of the tuner. Fairly large knobs for the inductors and a small one for the vernier drive for the variable capacitor work out nicely.

All of the space inside the enclosure is utilized. Note that insulated shaft couplers must be used on the variable inductors. The space behind the variable capacitor is reserved for the mounting of a toroid-core balun.



ternal fixed capacitor across the variable capacitor. The use of an external capacitor will rarely be necessary unless you are trying to match an extremely low impedance antenna load. However, it is very easy to add the provision for an external capacitor connection during construction of the tuner so I recommend it.

## Construction

The front and interior photographs of the tuner pretty well illustrate its construction. But, I should emphasize that there is nothing critical about construction of the tuner. You can construct the tuner in an elaborate or in a spartan manner. The photographs illustrate construction tending towards the latter concept. You could easily use a larger size enclosure

and incorporate a built-in SWR meter, dummy load, bypass and antenna selection switching, etc.

The "compact" design illustrated by the photographs will probably satisfy most requirements. I used an enclosure that measured  $3\frac{3}{4} \times 7 \times 7\frac{1}{2}$  inches and was a "no-brand" import item. The Ten-Tec company manufactures some very good quality enclosures, and their model LG-8 or LW-8 is highly recommended for the compact construction of this tuner. They measure  $3\frac{3}{4} \times 7 \times 7\frac{1}{4}$  inches.

The two variable inductors are arranged so that their wide pitched windings are towards the front panel of the tuner for one inductor and towards the rear panel of the tuner for the other inductor. The reason for arranging things this way can be seen from the front panel

markings on the tuner. The right hand inductor increases in value as it is rotated clockwise while the left hand inductor increases in value as it is rotated counterclockwise. The idea behind this arrangement is that it provides a very good "feel" as to how much inductance is active using the center variable capacitor as a reference point (fig. 2).

The manner in which the strapping on each end of the inductors must be done to achieve the rotational properties just described is quite simple to understand one you have an inductor in hand and look at the connection points. But, you should be sure that you have it right before wiring the inductors in the circuit. Also note that when drilling the holes to physically mount the inductors that some makes of inductors have the centerline for the mounting holes slightly offset from the centerline of their coil. Again, it should be an obvious thing one you have an inductor in hand.

The inductors have, in a sense, a built-in vernier action since they are a multi-turn device and can be precisely set for any fraction of a turn. I used a 6:1 vernier drive with the variable capacitor. It is not absolutely necessary but allows much easier tuning when highly reactive loads are being matched with exhibit "touchy" tuning. The drive also has a calibrated scale for easy resetability. No turns counter is used with the variable inductors. This was a personal preference to simplify construction. As long as the variable capacitor could be precisely reset, I felt that a turns counter on the inductors would not be really necessary and it proved out that way in practice.

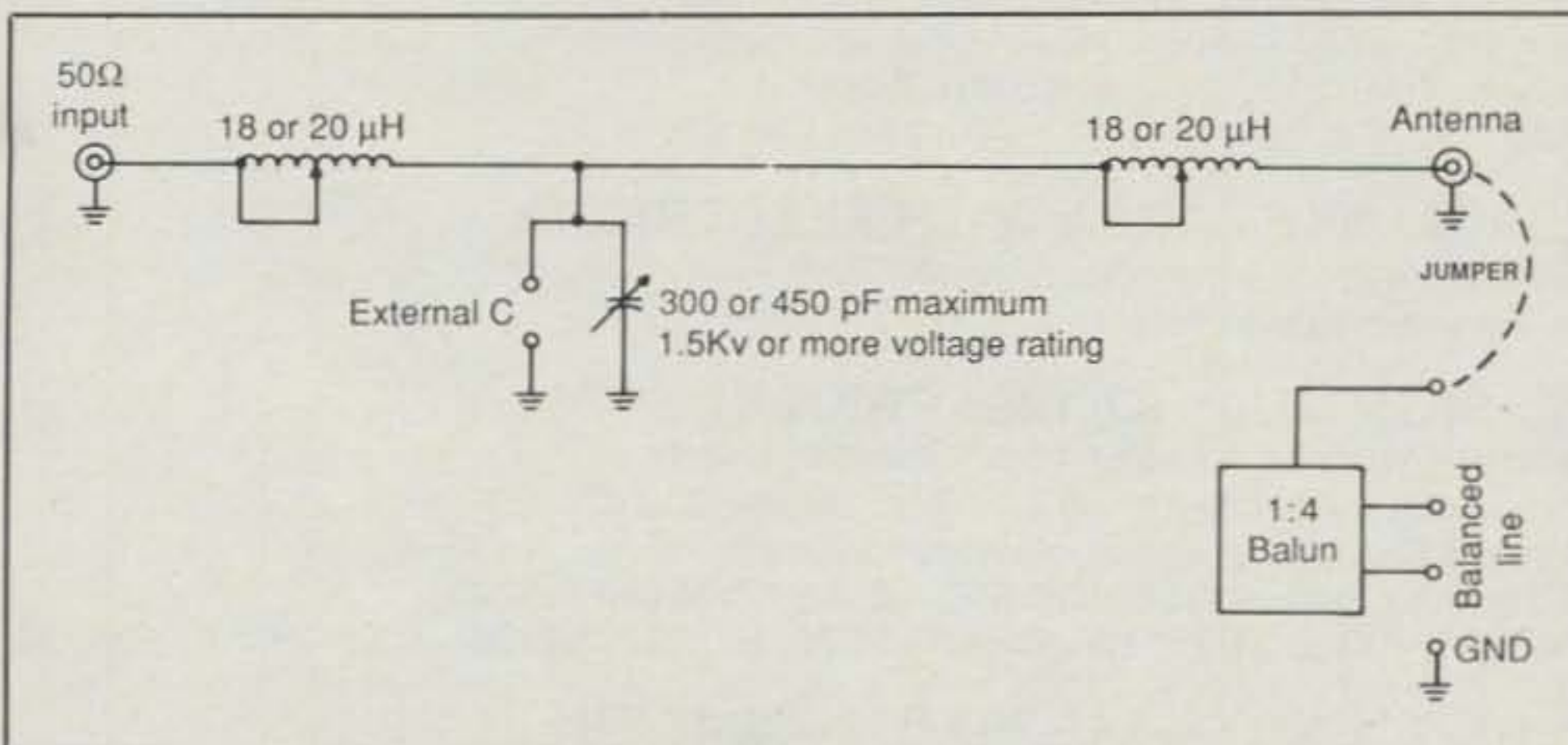
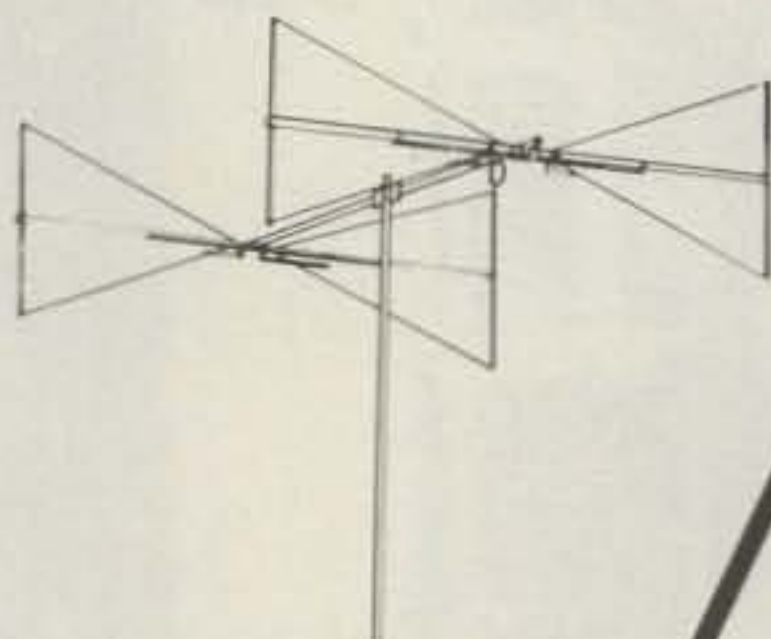


Fig. 2—Recommend circuit for the "Double-L" tuner. See text for discussion of design variations and other component values.

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### Operation

Since this tuner will match a great range of load impedances, there is the possibility that different component settings will provide a match for the same antenna load. The general idea is to achieve a match using the minimum amount of inductance. Once you use the tuner a bit it is very easy to get a feel for the component settings, even without turn counters on the inductors. If you get confused about the setting of the inductors, you can always quickly rotate them inward until they come to their stop at minimum inductance. If your transceiver has a built-in SWR meter, use that meter to set the tuner. If an external SWR meter is used between a transceiver and the tuner, keep the interconnecting coaxial cables as short as possible.

### Parts and Cost

As with almost any project of this type, the cost will depend almost entirely upon how good you are at securing the necessary components at a reasonable price. The most expensive items will be the variable inductors. Brand new, they can cost over \$70.00, but they can often be found at flea markets and from surplus outlets at a fraction of that price. One source to check for surplus inductors is Fair Radio, P.O. Box 1105, Lima, Ohio 45802.

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MRF646	40W 407-512	25.00	54.00
MRF648	60W 407-512	31.00	66.00
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# CQ REVIEWS:

BY LEW McCOY\*, W1ICP

## The Larsen Antennas Dual-Band Coupler for 2-Meters and 450 MHz



A small black box that does the job.

The proliferation of dual band rigs for 2 meters and 450 MHz has been considerable in the last few years. Here in the Western U.S. there is extensive dual band operation. Also, there has been a continuing growth of this same type of operation in the rest of the country. One technical problem that stems from this two band operation is at the output of the dual band transmitter. Such a rig must be capable of feeding two different antennas (or a dual band antenna) and handling the different loads presented.

Larsen Antennas has designed and is marketing the Model AD-2/70 dual band coupler or duplexer to fill this need. The AD-2/70 is small, measuring 1 3/4 inches high by 2 5/8 inches wide and 3 inches deep. There are three SO-239 connectors mounted on the metal box, which is completely shielded.

Referring to fig. 1, there are three ways in which the duplexer can be used. Assuming the use of a dual band antenna and both VHF and UHF rigs, the system at "A" could be employed. Similarly at "B" a dual band rig and dual band antenna can be accommodated. Different antennas could be taken care of by the method at "C".

Specifications provide a usable bandwidth of 120 to 230 MHz for VHF and 320 to 500 MHz at UHF. The crossover fre-

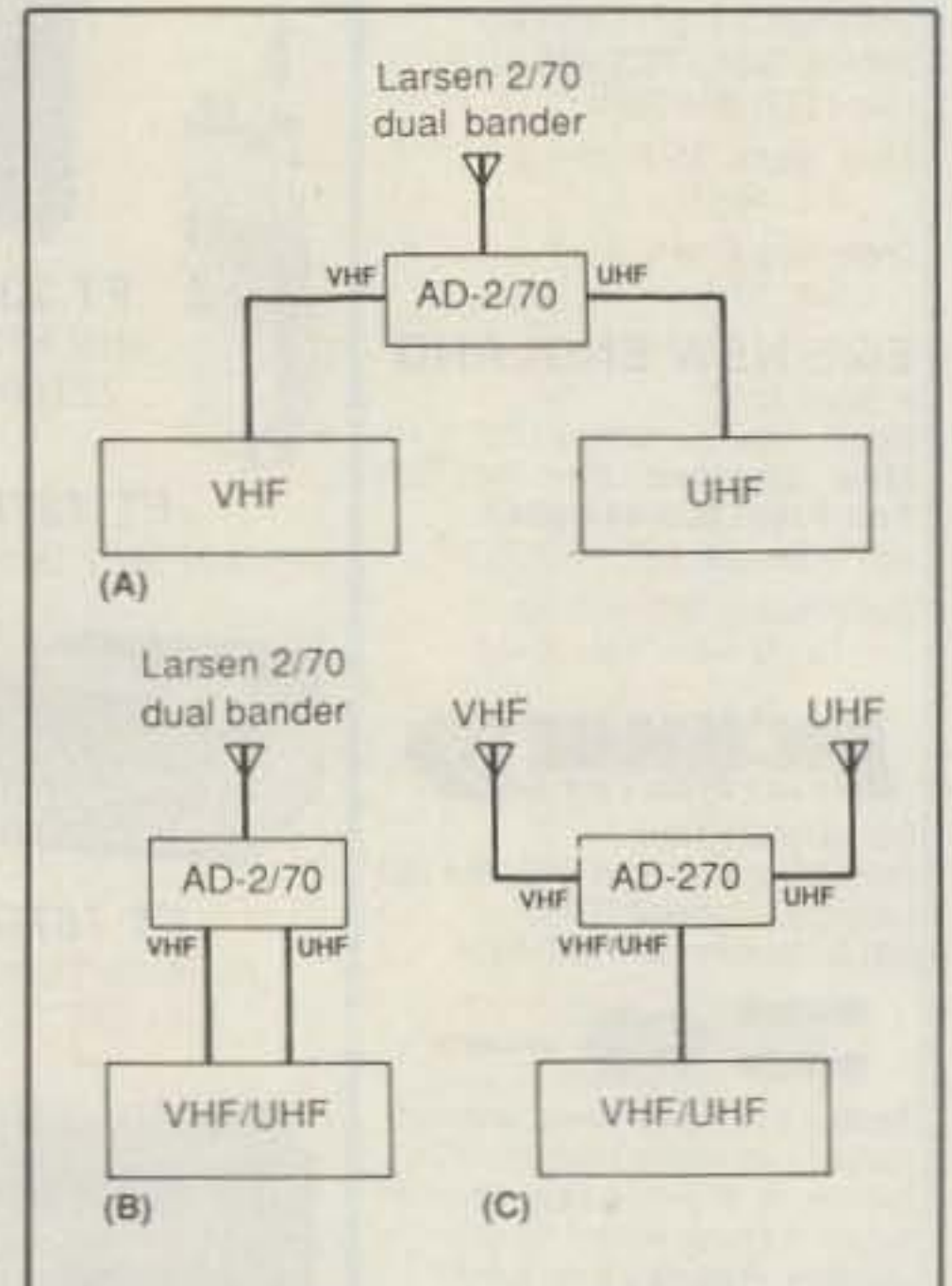


Fig. 1— These are the three methods of using the duplexer.

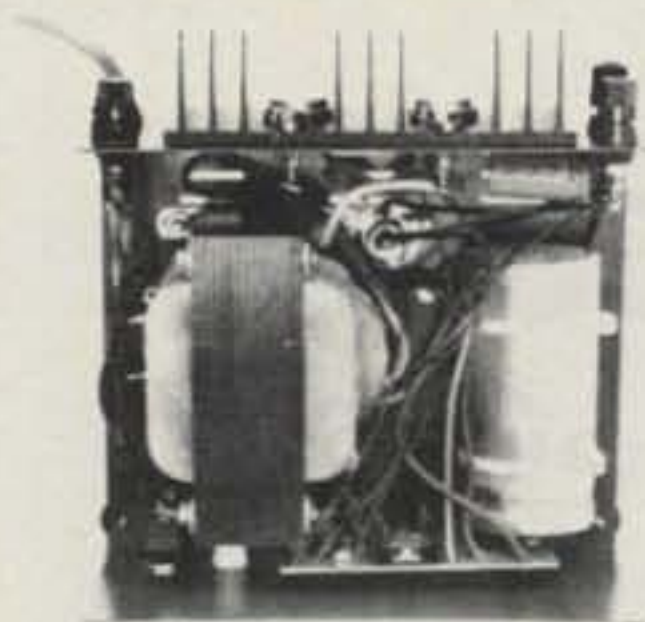
quency at VHF is 235 MHz and 310 MHz at UHF with the center frequency at 283 MHz. Suppression of VHF at 430 MHz is better than minus 50 dB. At 140 MHz the UHF signals is attenuated by better than 60 dB. Nominal impedance is 50 ohms at all ports. The power handling capability is 200 watts into a 50-ohm impedance.

The ports are marked for VHF, UHF and DUPLEXED. The DUPLEXED port is a composite of all frequencies while the VHF port is VHF only and UHF is UHF only. Larsen recommends that the duplexer should not be operated with any port unterminated.

I tested the duplexer with a Larsen dual band antenna and also with separate antennas. I could note no attenuation of received signals either with or without the duplexer (and I have some very weak signals to deal with).

The duplexer is in the \$40 price class. It is manufactured by Larsen Electronics, Inc., 11611 N.E. 50th Ave., Vancouver, WA 98668 (206-573-2722) Toll Free order No. 1-800-426-1656.

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



INSIDE VIEW — RS-12A

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MODEL RS-50M



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RM-35A	25	35	5 1/4 x 19 x 12 1/2	38
RM-50A	37	50	5 1/4 x 19 x 12 1/2	50
• Separate Volt and Amp Meters				
RM-12M	9	12	5 1/4 x 19 x 8 1/4	16
RM-35M	25	35	5 1/4 x 19 x 12 1/2	38
RM-50M	37	50	5 1/4 x 19 x 12 1/2	50

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RS-4A	3	4	3 3/4 x 6 1/2 x 9	5
RS-5A	4	5	3 1/2 x 6 1/8 x 7 1/4	7
RS-7A	5	7	3 3/4 x 6 1/2 x 9	9
RS-7B	5	7	4 x 7 1/2 x 10 3/4	10
RS-10A	7.5	10	4 x 7 1/2 x 10 3/4	11
RS-12A	9	12	4 1/2 x 8 x 9	13
RS-12B	9	12	4 x 7 1/2 x 10 3/4	13
RS-20A	16	20	5 x 9 x 10 1/2	18
RS-35A	25	35	5 x 11 x 11	27
RS-50A	37	50	6 x 13 3/4 x 11	46

### RS-M SERIES



MODEL RS-35M

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt. (lbs.)
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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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MODEL VS-35M

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VS-12M	9	5	2	12	4 1/2 x 8 x 9	13
VS-20M	16	9	4	20	5 x 9 x 10 1/2	20
VS-35M	25	15	7	35	5 x 11 x 11	29
VS-50M	37	22	10	50	6 x 13 3/4 x 11	46
• Variable rack mount power supplies						
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

### RS-S SERIES



MODEL RS-12S

- Built in speaker

MODEL	Continuous Duty (Amps)	ICS* Amps	Size (IN) H x W x D	Shipping Wt. (lbs.)
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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

# CQ REVIEWS:

## The Kenwood TM-3530A 220-MHz FM Transceiver

BY PETER R. O'DELL\*, WB2D

**R**emember the first FM rig you bought? I do. It had six crystal-controlled channels with a mighty 1-watt transmitter. It was easy to operate, because it didn't do much but receive and transmit on the selected channel. We've come a long way in 15 years.

The Kenwood TM-3530A measures in at about the same size as that rig. It is only 2½" x 7" x 7½" (HWD), but it packs almost as many features as today's top-of-the-line HF rigs. One of the secrets to this engineering marvel is the use of dual microprocessors. The first thought that came to my mind was "Bet it's not easy to operate." After all, progress does have its price.

Boy, was I wrong. Once you've read through the manual, you will find that the TM-3530A is as easy to use as a crystal rig when you are in the memory mode (with over 15 channels). Unlike the crystal rig, though, it does so much more. You can make operating with this radio as complicated or as simple as you like. That's what I call versatility.

Since the mid 70s, digitally synthesized rigs have ruled the market. They provide full frequency coverage of whole bands or band segments. Changing frequencies can be a cumbersome process though. Various methods of frequency entry have been offered to the amateur public. Diode matrices, thumb-wheel switches, side-by-side rotating knobs, concentric rotating knobs, keyboards, up-down scan, and more have been used as frequency entry systems. In my opinion, none of these by itself approaches the convenience of the old crystal radios.

Then came memory channels. At first memory channels just stored the frequency. Now top-of-the-line rigs like the TM-3530A have memory channel operation that stores transmit offset information, PL® information, and even telephone numbers.

The beauty of this rig is that you can set up things for the local repeater and use it for months without doing anything more than rotating one knob to switch memory



Front view of the Kenwood TM-3530A. The numerous controls give a hint to versatility of this unit. Good design has made it easy to use, too.

channels. When you need them, the other features are there. I like that.

### Frequency Control and Programming

The Kenwood TM-3530A manual is excellent. Because you are dealing with microprocessors in the unit, you must follow the steps exactly to get the desired results. Kenwood is to be congratulated on the attention they have paid to this manual. Suffice it to say, you will have no trouble getting the unit to function if you read the manual. Therefore, I am not going to spend a lot of time describing the steps necessary to encode or invoke most of the functions of the TM-3530A.

In the non-memory channel mode of operation, you set the operating frequency with a keypad on the front panel. If you prefer, you may move the operating frequency up or down by depressing the corresponding keys on the microphone. If you have the receiver on scan, you may disable the scan after the TM-3530A has come to rest on a particular frequency. All these methods get you where you want to be. Just pick the one right for your operating style.

You can scan either the whole band or any segment of it. Scan steps can be changed, too. You can select time-operated (interval varies with control setting)

or carrier-operated scanning. Once you have memory channels programmed in, you may scan them. You have the option of locking out particular channels as you scan. These operations are straightforward and easy to implement. The only limit is your imagination.

You can program in a priority channel that gives you the flexibility you would have with an additional receiver. When this function is active, the TM-3530A checks for activity on the priority frequency every six seconds regardless of the frequency or mode of operation. When activity is found on the priority channel, the Kenwood sounds a "double beep." This feature is great for your favorite repeater or DX alert frequency.

Although there are technically 23 memory channels, some people may find it difficult to make constructive use of all of them. Channels 15/16 and 17/18 are paired for "odd ball" splits. That is, you must program the receive frequency into one channel of each pair and the transmit into the other. Channels "D" and "U" are used, primarily, to set limits for band scanning. I did not come close to using all the channels, but other operators might.

### The Receiver

Receive signals are filtered with a low-pass network in the receiver front end.

\*Associate Editor, CQ

After amplification, the signal is mixed with the local oscillator, producing the first IF frequency of 20.935 MHz. The IF signal then passes through a helical resonator and two-stage crystal filter, which provides excellent adjacent channel rejection. The second IF is 455 kHz.

One of the things I observed while driving through the downtown Hartford area (locally known as "intermod alley") is that the TM-3530A is not susceptible to overloading. This is not true of a number of other radios that I have used (including a couple that I own).

At the same time, sensitivity is excellent. Checking the TM-3530A against my old standard crystal-controlled rig, I found that the Kenwood outperforms "old reliable" by a factor of several miles when mobile. I would say that Kenwood has come up with an impressive design for the TM-3530A receiver front end. They have achieved both selectivity and sensitivity without sacrificing one for the other.

Where scanning is concerned, the squelch system is quite important. Squelch activity can be accomplished any number of ways, but for FM operation a high-frequency noise system is one of the best, if not the best. Kenwood uses such a system with the noise detection circuit tuned to 30 kHz. In addition, the TM-3530A has circuitry that determines the center of the incoming signal. In practical terms, what this means is that I did not notice the TM-3530A under- or overshooting the center frequency of a received signal when scanning.

I found the received audio to be crisp and clean, and there seems to be plenty of it. Even in mobile operation, I did not find the need for an external speaker.

### The Transmitter

Signal reports from other stations indicate that the TM-3530A transmit audio is as good as the receive. The transceiver comes standard with a high-quality dynamic mobile microphone. A similar microphone with autopatch (DTMF tone pad) capabilities built in is available. If you plan on using the autopatch from your car frequently, this microphone would be well worth the extra investment. The review unit came with the "plain vanilla" microphone, so I used the multifunction pad on the front panel for autopatch. To make a call safely, I found it necessary to pull to the roadside.

Output power is specified at a minimum of 25 watts in high power and adjustable up to 20 watts in low power. Although it is not mentioned by Kenwood, high power is also adjustable (VR3). This is useful for operators who want to reduce the output power level in both positions to avoid overdriving an amplifier. Current drain at full power output is rated at 6.5 A.

The review unit came with the optional

TU-7 CTCSS (PL®) unit. It took about 2 minutes to install the TU-7. Simply remove the bottom cover, attach the TU-7 circuit board with a screw, and plug in the jumper cable. That's all there is to it. Individual tones out of the 32 possible ones are selected from the front panel and stored (memory channel operation). If you prefer a different tone board (for a nonstandard tone), there is plenty of room inside the unit for installation. Hook-up in such cases should be straightforward.

### General Observations

The TM-3530A is as pretty with the top and bottom covers off as with them on. Rugged, clean construction is evident throughout the unit. There is plenty of room between components to test and troubleshoot, should that ever become a necessity. One of the options that Kenwood offers is a service manual for the TM-3530A. I strongly recommend purchasing the manual at the same time as the radio. It is just common sense to own the service manual for any piece of your equipment. This holds true even if you have no plans to service it yourself. At the very least, it will increase the resale value.

One repeater that I use frequently requires a series of digits on a DTMF pad to bring up the repeater. I found that storing the command string in one of the telephone number memories made this operation quick and painless. So even if you don't make a lot of autopatch calls, you may find use for the "telephone number memory" feature. Up to 15 different 7-digit numbers can be stored in memory.

The TM-3530A is equipped to take advantage of Kenwood's Digital Channel Link (DCL). DCL is an advanced computerized automatic station control system. With the optional MU-1 installed, DCL receives and transmits control data that allows stations to automatically switch frequencies. It makes possible digitally coded squelch action to limit incoming calls to those transmitting the proper data. Other optional equipment permits the display of the calling station's call sign.

Another option available for the TM-3530A is the VS-1 voice synthesizer. Mobile operators and visually impaired operators should find this option quite useful. Pushing a button on the front panel causes this unit to "announce" the operating frequency.

All operating parameters programmed into the TM-3530A are retained in memory with the aid of a lithium backup battery. Kenwood estimates that this battery should last at least five years before needing replacement. Although the manual suggests returning the unit to an authorized service center for replacement, it could be done by almost anyone with some experience with a soldering iron.

With the battery removed, the TM-

3530A would reset itself to the default values. All programming would have to be entered again. In fact, the unit can be reset without removing the battery. Simply depress the reset control on the front panel while turning on the power. This should cure most glitches in programming.

The custom LCD readout provides visual information about frequency, offset, signal strength, tones, phone numbers, scan, memory channel, and more. In darkness, a soft-green hue surrounds the illuminated keypad on the front panel, making nighttime operation more convenient.

The power cord comes with a fuse in each leg. For mobile operators this is a very desirable feature. Should the grounding strap from the frame to battery ever fail in your vehicle, your TM-3530A would not "be asked" to act as an alternate ground route for the electrical system.

From all perspectives, the Kenwood TM-3530A seems to be a top-notch performer. If you are looking for top-of-the-line performance in a 220 FM rig, you should give serious consideration to the TM-3530A. Price class for the transceiver is \$480; for the TU-7 (PL®), \$37; for VS-1 voice synthesizer, \$55; and for the MU-1 DCL, \$45. Additional information is available from your local dealer or Kenwood, P.O. Box 22745, Long Beach, CA 90801-5745.

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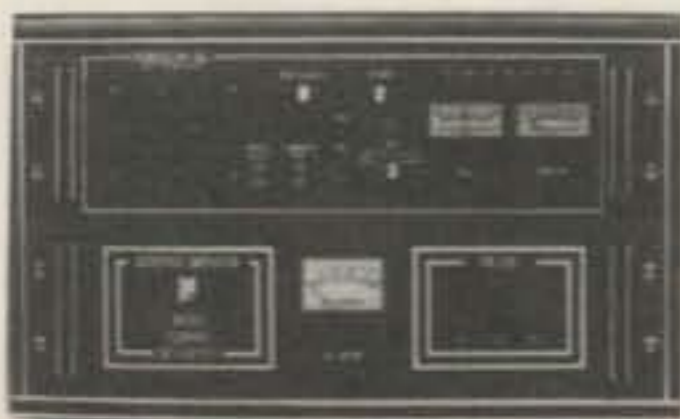
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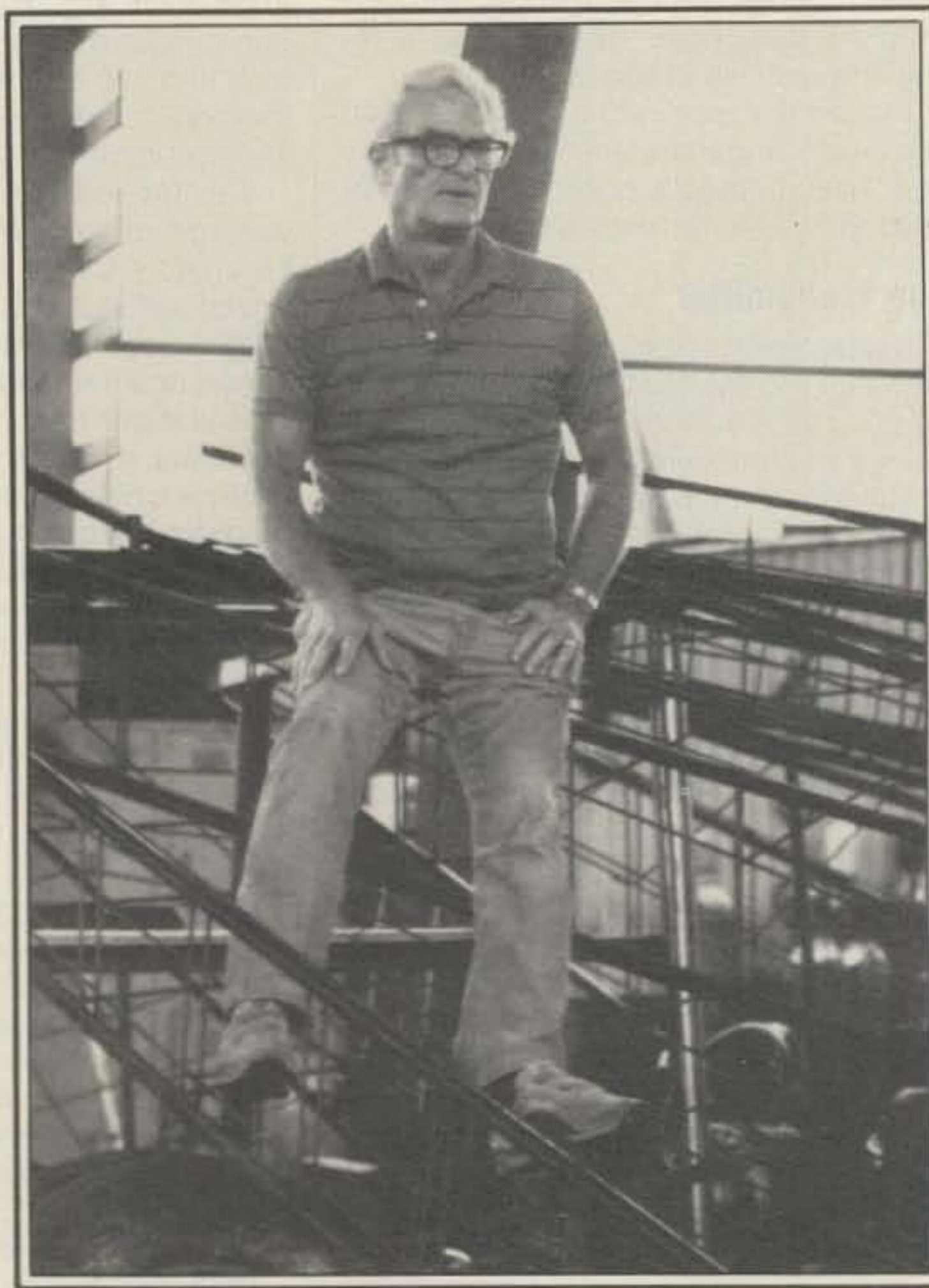
CIRCLE 28 ON READER SERVICE CARD

# Amateurs Float through the Rose Parade

**B**y the time that this appears in print, the 1988 Tournament of Roses will be just a fond memory for most, albeit somewhat fuzzy for some. Herbert "Pete" Hoover, W6ZH, is operating club station W6KA from the American Red Cross float, "Images of Hope." This is in keeping with this year's theme, "Thanks to Communications."

Hoover hopes his efforts call attention to the important role amateur radio operators play by providing emergency communications during times of disaster. Grandson of President Herbert Hoover, Pete is the Red Cross's Western Operations Disaster Communications Committee Chairman. He has been involved in several emergencies in the 40 years that he has been licensed.

The float, funded entirely by contributions from Red Cross volunteers and staff, is the first in a series of year-round activities celebrating the 125th Anniversary of the Red Cross movement. Hoover (below) sits atop the unfinished float during construction.







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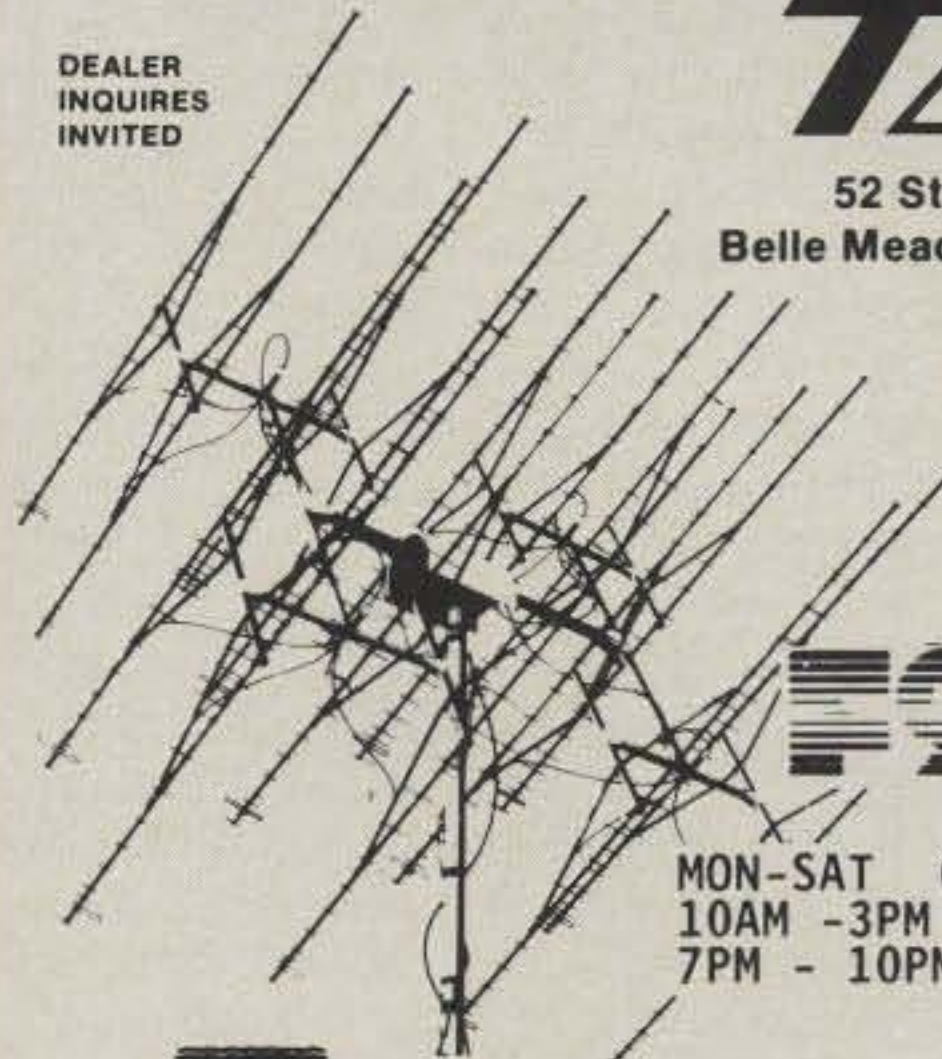
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## PRINCIPLES, PRACTICES, AND PROJECTS FOR THE VHFER

*From The Mailbag*

I intended the December and January columns to all be in the December issue, which would have allowed me to wax philosophical in the January issue—you know, how great it's been to have the column last this long, how much fun it's been, and all that. It *has* been fun; it's also been a bit of work—more than a bit for someone who juggles a career, a family, and numerous hobbies, as I do.

Without *your* support and feedback, this particular job would not be worth the effort. I really appreciate all the cards and letters received each week, and I try to reply to each in some way. Please let me know if I've let you down in this regard. Some correspondence probably gets lost, and I apologize for this. Keep writing. I will get back to you.

Hap Griffin, WA4UMU, wrote to ask about possibly converting the obsolescent Dentron Clipperton-V 2 meter amplifier from grounded grid to grounded cathode and improving the output link design. Hap, the Clipperton-V's I've seen are grounded cathode, using a single 4CX250B in a lumped-constant plate circuit, link coupled. There did not appear to be enough room to replace the tank coil with a more conventional stripline tank circuit. If the amplifier suffers inefficiency, it is more likely caused by tank losses than by the link itself, but you might try using a link made of larger gauge wire to see if it makes any difference. Things such as silver-plating the tank components usually don't make any difference, if the original copper components are well bonded together.

I did not care much for the Clipperton-V's power supply circuit. From what I recall, the power transformer was undersized for the application, and the screen voltage was derived from a series string of zener diodes. An amplifier of this power level should really be supplied by a 230 volt mains, but I think the Clipperton-V provided only for 115 volt primary operation. Such corner-cutting is rarely justified, and as such I was never a big fan of the company's products. However, if you have a particular problem with the amplifier, perhaps I can help. Send me a detailed description of the problem, along with a copy of the amplifier's schematic diagram, and I'll do some U.S. Mail troubleshooting for you! These amps are not

complicated and most problems are easily solved.

Bob Rossi, W2HG, has a new publication of interest to VHF/UHFers pursuing VUCC (VHF/UHF Century Club) awards. He offers a *Grid Square Workbook* subtitled "Used to Track Grid Squares for ARRL's VUCC Award." That pretty much explains the 14-page booklet, which contains a grid-square checklist and QSL tracking aids. What it does *not* include is a grid-square map, a handy accessory for any VHFer's station. The *Grid Square Workbook* is available directly from the author, Bob Rossi, at 75 Olde Erie Trail, Rochester, NY 14626. The cost is \$3.50 postpaid.

The 1987 Mid-Atlantic VHF Conference, sponsored by the Mt. Airy VHF Club ("Packrats") in October 1987, was a real success, based on the turnout and interest level of the attendees. The Conference was an excellent prelude to the large outdoor fleamarket that followed the next day. Unfortunately, the fleamarket saw a cold, rainy day, while the (indoor) conference day was beautiful. It figures.

Proceedings of the Mid-Atlantic Conference are available from the League and are worth the price. What the proceedings do not include, however, are the results of the "6 Meter DX Window Panel" discussion. This group discussion was quite interesting, and many comments merit repeating. The moderator of this hour-long session was WB2NPE, a well-known VHFer and contester from southern New Jersey who organized this part of the conference. The panel members included W3XO, W1JR, KT2B, W3IWU, and myself. We each had an opportunity to speak briefly on our personal feelings, but the attendees, who numbered more than 100, made the majority of the comments.

The purpose of this panel discussion was to offer evidence that our currently followed bandplan (in the U.S.) is not serving the best interests of DXers both here and abroad, and to try to offer workable solutions to this problem. True, many 6 meter operators probably couldn't care less about working DX and are just in it for the fun of ragchewing, exchanging QSLs, chasing awards, or whatever, but there are a growing number of DXers on the band, and this trend will continue as more countries become authorized to use 50 MHz. The first 50 MHz DXCC is nearly

within the grasp of several long-time DXers, and a few bad apples on the band will surely spoil things for the entire barrel of us.

While we did not settle this issue, I believe it was agreed that the biggest problem encountered by DXers both here and abroad is the heavy population on and around 50.110 MHz. This "calling frequency" is too often used for local ragchews, meteor burst and aurora QSOs, contesting, and so forth—all of which precludes using it for real DX work. Yet, 50.110 MHz is where most of the DX stations spend their time calling and listening for us.

An excellent example of how our "calling frequency" habit kicked us right between the eyes occurred during the ARRL June VHF QSO Party in 1987. While many dedicated (U.S.) 6 meter DXers were marginally copying weak European signals on and near 50.110, the band was handing us single- and double-hop E-skip over every conceivable path in the States, making it impossible for the real DX work to go on amongst a thousand contesters piling up on "the calling frequency." It's true that we could try a "DX calling frequency" up higher in the band, away from the fracas, but all attempts to make this work have failed, possibly because we can't convince the DX stations to spend their time listening in a part of the band where they've never heard anyone, or maybe, as some contend, because 6 meters often opens from the bottom end up. (Some, like W2DRZ, believe that the band is frequency sensitive to propagation, making the lowest possible frequency in the band the best for DX work.)

W3ZZ proposed using CW for DX work, in a window below 50.100. W2PAU concurred with this remark and said we should encourage DX stations to use CW more. This prompted a discussion about DX work being split-frequency, the way it is on 40 meters. Of course, dual VFOs (or a separate receiver) would be required for those choosing this mode of operation. W3XO recalled that 50.110 MHz became the calling frequency merely because the older rigs, like Swan 250's, had inaccurate dials, and users figured that if they stayed 10 kHz away from the (phone) band edge, they'd probably be in the band most of the time! K2TXB favored all DX operation below 50.110, split or not; W2ZKE proposed all contest oper-

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ations be limited to 50.200 and above! (You can always pick out the interest group represented.) I made a comment that we should solicit information from west-coast 6 meter enthusiasts to see how they deal with the problem of trying to work the Pacific, including JAs, amongst U.S. QRM. In a DXpedition to W6 in November 1979, I found that requesting all JAs to reply in CW helped me work more stations, faster than I possibly could on phone.

PA0ZN commented that we all use too much power, and going QRP would solve many problems. WD4MUO said that amateur radio is self-policing, and a DX window based on gentlemen's agreement should work. W2PAU reminded us that many DXpeditions have frequency restrictions. KA3B informed us that the JA1UT Chinese operation used and favored split-frequency operation. WA3AXV was opposed to a window, feeling it would exclude too many operators and reduce activity. And so it went. Based on KT2B's tape-recorded transcript, at least 23 attendees made comments re the 6 meter DX window. In addition, N3AHI, WA1OUB, VE1YX, W2CAP, and WB2OTK, plus a number of DX stations, were represented by written comments submitted prior to the conference. If any reader has strong feelings on this matter, please mail them to me. Let's get this thing resolved before the coming solar cycle peak!

As for me, I'm forming a new club called the National Organization for the Implementation of Segmenting our Ether; NOISE. Only kidding.

Speaking of DX, I heard from PA3BFM that the Dutch PTT (equivalent to our FCC) has ruled that Dutch amateurs will be allowed limited privileges on 6 meters effective March 1, 1988. The Dutch band will be 50.00-50.45 MHz, CW only, with 30 watt output power limit; however, unlike the U.K. rule, they will not be controlled as to ERP (effective radiated power), so we're hopeful they can make up for low power with high antenna gain. Frank, PA3BFM, expects that SSB and eventually FM will also be allowed on 6 meters in the Netherlands someday. He goes on to say, "As our PTT always intends to work in European context, you might expect similar action from other European PTTs such as DL, HB9, SM, OZ, and maybe LX or ON (speculation on behalf of PA3BFM)."

I sure hope so, Frank! While I only have 49 countries confirmed on 6, there are those who are up in the seventies, and I'm sure they are starting to taste that 6 M DXCC.

W400 wrote in November to inform us of more 6 meter DX activity. First, YN3CC (Nicaragua) should be active by now, using an FT620B loaned by K3ZO on October 30. Next, HP3XUH (Panama), who is ex-KH6JJI, is now active on 6 and had worked N5TX and W5FF (this info from

PZ1AP via K5ZMS). PZ1AP via W400 tells that he's going to try 6 meters again from his Surinam QTH, where he has a TS520 plus transverter setup with a 3-element beam. Arnie says that when he had the rig on the air earlier last year, he only heard the French Guiana beacon (FY7THF) and W4WHK, but he's going to give the band another try. Next, Alfonso J. Alvarez Calderon (no callsign given) via W400 lets us know he's active on 50, 144, and 432 MHz from Lima, Peru. Alfonso's setup on 6 includes a 3-element beam, but he didn't mention rig or power. The good news is, we can reach him via 14.101 MHz packet, which he checks daily. Thanks, Gene, for all the news.

WB0CQO of Murray, IA wrote to announce to the world that he's on 6 and 2 meters from EN31. Joe's using an FT-101/FTV650B and FTV250, plus 3 elements at 55 feet on 6 meters and 19 elements at 65 feet on 2 meters. He says, "Activity here in the midwest is not quite what you have in the east, but we try. I am ready for QSO from here in Clarke County, IA." Good deal, Joe. We'll be looking for you.

WB9MSV wrote back in September to tell of his (then) recent expedition to EN56. Using just 25 watts to a 3-element beam at 10 feet, Larry made aurora and tropo contacts on 2 meters from this rare grid in Michigan's upper peninsula. He

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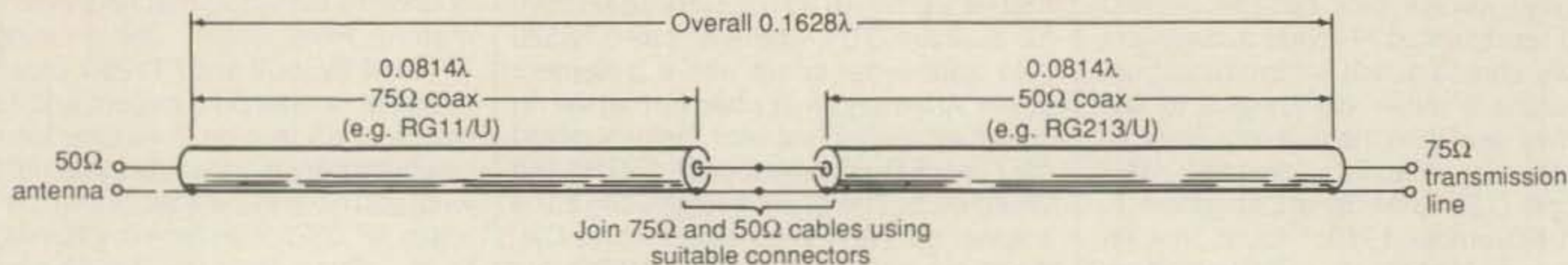


Fig. 1— Non-synchronous transformer (see text).

wrote that he was developing some black-and-white photos to send in with the story of that operation. I'm still waiting, Larry! Keep up the good work and see you in the pileups.

Encomm, Inc. announces two new amplifiers from Tokyo Hy-Power Labs: the HL-180V, a 170 watt output unit for 2 meters which automatically adjusts for input drive levels from 3 to 25 watts; and the HL-250U, a 250 watt output unit for 70 cm which will adjust for input drive levels from 10 to 25 watts. These products have unique attributes in addition to the automatic input level selection: They both feature LED power-level indicators and over-voltage protection, and the HL-250U has an internal "low noise" GaAsFET pre-amplifier. Further, the latter unit is the most powerful solid-state amplifier for 70

cm on the market, offering a 3 dB advantage over most popular units. For further information, contact Encomm, Inc., 1506 Capital Ave., Plano, TX 75074.

The Midwest VHF Society's October 1987 newsletter contained a useful tip on matching 75 ohm CATV "hardline" to 50 ohm antennas. They credit OD5CG for this information, and I'll credit N8AXA for reproducing it in their newsletter. The diagram is shown in fig. 1. According to a recent Midwest VHF Society newsletter, the group plans to run the antenna measuring competition at the Dayton Hamvention in 1988. Good show, guys. We'll all look forward to that one. Parties interested in more information on the Midwest VHF/UHF Society are invited to contact Terry, W8NJR, at 1821 E. Troy-Urbana Road, Troy, OH 45373.

If you have a PC-compatible computer and enjoy VHF/UHF work, you're a candidate for "VHF PAK" software from Bob Mobile, WA1OUB. Bob's communications utility programs are becoming quite well known and were reviewed in the October 1987 issue of the "Midwest VHF Report," edited by WB0DGF. The programs include distance and beam heading to lat/long data, six-digit grid from lat/long, meteor-scatter predictions, moon location az/el (plus sky noise, path degradation, and windows), moon tracking in real time, EME capability, vertical radiation angle for horizontal antennas, and other useful functions. For further information, contact WA1OUB at RFD #2, Box 442, Hillsboro, NH 03244.

See you next month. Until then . . . .

73, Steve, WB2WIK

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April 29, 30, May 1, 1988

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- Giant 3 day flea market • Exhibits
- License exams • Free bus service
- CW proficiency test • Door prizes

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A maximum of 3 spaces per person (non-transferable). Tickets (valid all 3 days) will be sold IN ADVANCE ONLY. No spaces sold at gate. Vendors MUST order registration ticket when ordering flea market spaces.

### Special Awards

Nominations are requested for 'Radio Amateur of the Year', 'Special Achievement' and 'Technical Achievement' awards. Contact: Hamvention Awards Chairman, Box 964, Dayton, OH 45401.

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### Hamvention Video

VHS video presentation about the HAMVENTION is available for loan. Contact Dick Miller, 2853 La Cresta, Beavercreek, OH 45324

### 1988 Deadlines

Award Nominations: March 15

Lodging: April 2

License Exams: March 26

Advance Registration and banquet:

USA - April 4      Canada - March 31

Flea Market Space:

Orders will not be processed **before** January 1

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Lodging Information: (513) 223-2612

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HAMVENTION is sponsored by the Dayton Amateur Radio Association Inc.

### Lodging Reservation Form

Dayton Hamvention - April 29, 30, May 1, 1988

Reservation Deadline - April 2, 1988

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Arrival Date \_\_\_\_\_

Before 6 pm     After 6 pm

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Rooms:  Single     Double (1 bed, 2 persons)

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Deposit required - Room deposit must be paid directly to the hotel or motel by date shown on the confirmation form sent to you. Use canceled check for confirmation.

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### Advance Registration Form

Dayton Hamvention 1988

Reservation Deadline - USA-April 4, Canada-March 31

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#### How Many

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Grand Banquet \_\_\_\_\_ @ \$16.00\*\*      \$ \_\_\_\_\_

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(Max. 3 spaces) \$50/2 adjacent

Admission ticket must \$150/3 adjacent \$ \_\_\_\_\_

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\* \$10.00 at door

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**Lighted Cross-needle Meter** reads SWR, forward and reflected power in one glance. Has 200 and 2000 watt ranges. 6 position antenna switch handles 2 coax lines, random wire and balanced lines. 4:1 balun. 250 pf, 6 kv variable capacitors. 12 position ceramic Inductor switch. Smaller size matches new rigs: 10 3/4 x 4 1/2 x 14 7/8 inches. Flip stand for easy viewing. Requires 12V for light.

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**MFJ's cross-needle SWR/Wattmeter** gives you SWR, forward and reflected power -- all at a single glance! SWR is automatically computed -- no controls to adjust. Easy-to-use push buttons select three power ranges that give you QRP to full legal limit power readings. Reads 20/200/2000 W forward, 5/50/500 W reflected and 1:1 to 1:5 SWR on easy-to-read two color scale. Lighted meter needs 12 V. ±10% full scale accuracy. 6 1/2 x 3 1/4 x 4 1/2 inches.



## COMPACT SPEAKER

**MFJ-280 \$18.95**  
**Mobile speaker.** Tilt bracket on magnetic base. 3 1/2 mm phone plug. Use with 8 and 4 ohm impedances. Handles 3 watts audio.



## HANDHELD TELESCOPING ANTENNAS WITH BNC

**MFJ-1710**, \$9.95, 3/8 wave 2 meter. Pocket clip. 5 3/4" - 24 1/2".  
**MFJ-1712**, \$14.95, 1/4 wave 2 meter; 5/8 wave 440 MHz, 7 1/4" - 19".  
**MFJ-1714**, \$16.95, 1/2 wave 2 meter. End-fed halfwave dipole. Shorter, lighter, more gain, less stress than 5/8 wave mounted on handheld. When collapsed it performs like rubber duck.



## MFJ "DRY" DUMMY LOADS

**MFJ-262 \$64.95** **MFJ-260 \$26.95**  
**MFJ's "Dry" dummy loads are air cooled** -- no messy oil. Just right for tests and fast tune up. Non-inductive 50 ohm resistor with S0-239. Full load to 30 seconds, de-rating curve to 5 minutes.  
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**MFJ-407B \$69.95**  
**MFJ-407B Deluxe Electronic Keyer** sends iambic, automatic, semi-auto. or manual. Use squeeze, single lever or straight key. Plus/minus keying. 8-50 WPM. Speed, weight, tone, volume controls. On/Off. Tune. Semi-auto switches. Speaker. RF proof. 7x2x6 inches. Uses 9 V battery. 6-9 VDC or 110 VAC with AC adapter, MFJ-1305, \$9.95.



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**MFJ-206 \$79.95**  
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**Plus** you get high performance HF/VHF/CW modems, software selectable dual radio ports, precision tuning indicator, 32K RAM, AC power supply and more.

**You'll** find it the most user friendly of all multi-modes. It's menu driven for ease of use and command driven for speed.

**A** high resolution 20 LED tuning indicator lets you tune in signals fast in any mode. All you have to do is to center a single LED and you're precisely tuned in to within 10 Hz -- and it shows you which way to tune!

**All** you need to join the fun is an MFJ-1278, your rig and any computer with a serial port and terminal program.

**You** can use the MFJ Starter Pack to get on the air instantly. It includes computer interfacing cable, terminal software and friendly instructions . . . everything you need to get on the air fast. Order MFJ-1282 (disk)/MFJ-1283 (tape) for the C-64/128 and VIC-20 or MFJ-1284 for the IBM or compatible, \$19.95 each.

## Packet

**Packet** gives you the fastest and most reliable error-free communications of any amateur digital mode.

**With** MFJ's super clone of the industry standard -- the TAPR TNC-2 -- you get genuine TAPR software/hardware plus more -- not a "work-a-like" imitation.

**Extensive** tests published in *Packet Radio Magazine* ("HF Modem Performance Comparisons") prove the TAPR designed modem used in the MFJ-1278 gives better copy with proper DCD operation under all tested conditions than the other modems tested.

**Hardware** DCD gives you more QSOs because you get reliable carrier detection under busy, noisy or weak conditions.

**A** hardware HDLC gives you full duplex operation for satellite work or for use as a full duplex digipeater. And, it makes possible speeds in excess of 56K baud with a suitable external modem.

**Good** news for SYSOPs! New software lets the MFJ-1278 perform flawlessly as a WORLI/WA7MBL bulletin board TNC.

## Baudot RTTY

**You** can copy all shifts and all standard speeds including 170, 425 and 800 Hz shifts and speeds from 45 to 300

baud. You can copy not only amateur RTTY but also press, weather and other exciting traffic.

**A** high performance modem lets you copy both mark and space for greatly improved copy under adverse conditions. It even tracks slightly drifting signals.

**You** can transmit both narrow and wide shifts. The wide shift is a standard 850 Hz shift with mark/space tones of 2125/2975 Hz. This lets you operate MARS and standard VHF FM RTTY.

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

**A** receive Normal/Reverse software switch eliminates retuning and Unshift-On-Space reduces errors under poor receiving conditions.

## ASCII

**You** can transmit and receive 7 bit ASCII using the same shifts and speeds as in the RTTY mode and using the same high performance modem. You also get Autostart and selectable "Diddle".

## CW

**You** get a Super Morse Keyboard mode that lets you send perfect CW effortlessly from 5 to 99 WPM, including all prosigns -- it's tailor-made for traffic handlers.

**A** huge type ahead buffer lets you send smooth CW even if you "hunt and peck".

**You** can store entire QSOs in the message memories, if you wanted to! You can link and repeat any messages for automatic CQs and beaconing. Memories also work in RTTY and ASCII modes.

**A** tone Modulated CW mode turns your VHF FM rig into a CW transceiver for a new fun mode. It's perfect for transmitting code practice over VHF FM.

**An** AFSK CW mode lets you ID in CW.

**The** CW receive mode lets you copy from 1 to 99 WPM. Even with sloppy fists you'll be surprised at the copy you'll get with its powerful built-in software.

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

## Weather FAX

**You'll** be fascinated as you watch WEFAX signals blossom into full

fledged weather maps on your printer. Other interesting FAX pictures can also be printed -- such as some news photographs from wire services.

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

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

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

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

**You** can transmit FAX pictures right off disk and have fun exchanging and collecting them.

## Slow Scan TV

**The** MFJ-1278 introduces you to the exciting world of slow scan TV.

**You'll** not only enjoy receiving pictures from thousands of SSTVers all-over-the-world but you can send your own pictures to them, too.

**You** can print slow scan TV pictures on any Epson graphics compatible printer. If you have an IBM PC or compatible you can print to screen in near real time or from disk with the MFJ-1284 Starter Pack.

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

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

**The** MFJ-1278 transmits and receives 8.5, 12, 24, and 36 second black and white format SSTV pictures using two levels.

## Contest Memory Keyer

**Nothing** beats the quick response of a memory keyer during a heated contest.

**You'll** score valuable contest points by completing QSOs so fast you'll leave your competition behind. And you can snag rare DX by slipping in so quickly you'll catch everyone by surprise.

**You** get iambic operation with dot-dash memories, self-completing dots and dashes and jamproof spacing.

**Message** memories let you store contest RST, QTH, call, rig info -- everything you used to repeat over and over. You'll save precious time and work more QSOs.

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

**A** weight control lets you penetrate QRM with a distinctive signal or lets your transmitter send perfect sounding CW.

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**Turn** on your MFJ-1278 and it sets itself to match your computer baud rate. Select your operating mode and the correct modem is automatically selected.

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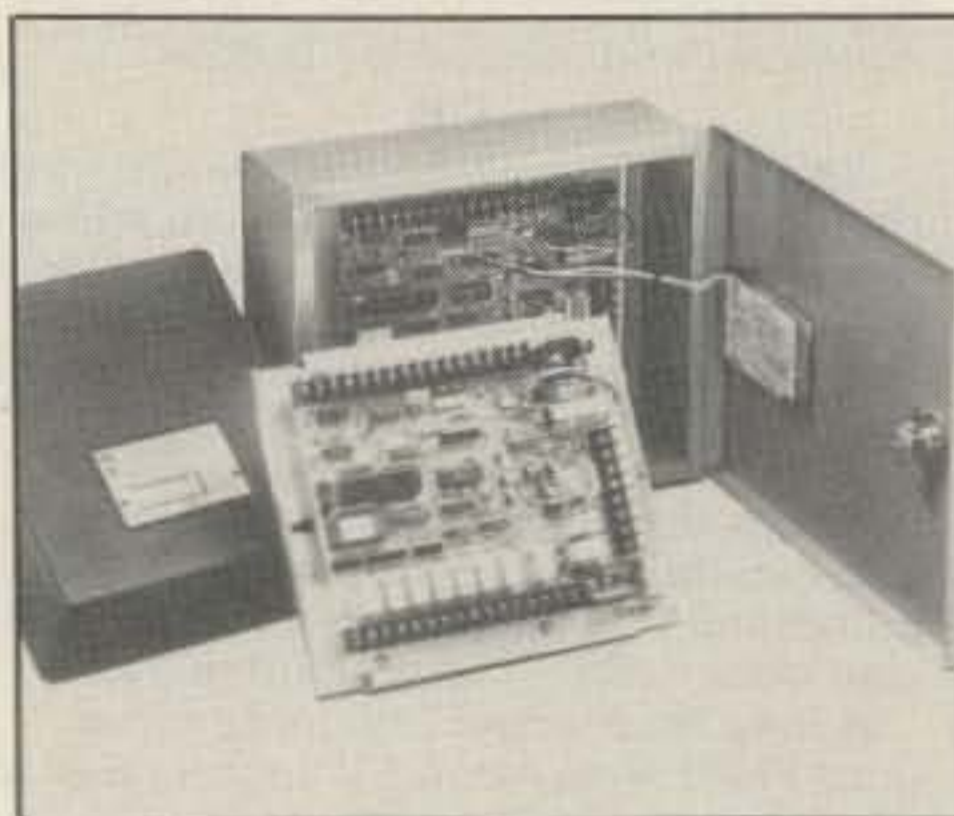
# CQ Showcase



## New Kenwood Transceivers

Kenwood has announced 2 new transceivers to complement their HF line. The TS-140S is an all band, all mode high performance 100 watt HF transceiver that includes a general coverage receiver. The TS-680S includes the same features as the 140S and also sports a ten watt six meter section.

A built in programmable band marker allows the user to mark frequencies necessary to stay within the limits of his license. It can also be used by contester to mark the active band segments. A Morse Code beeper status indicator signals memory bank conditions etc. Both transceivers have dual digital VFOs, 31 memory channels, programmable scanning, automatic sideband selection and more. At press time, suggested retail price for the TS-140S was \$900 and for the TS-680S, \$1000. For more information, contact Kenwood, 2201 E. Dominguez St., Long Beach, CA 90810 or check number 101 on the reader service card.



## Remote Control

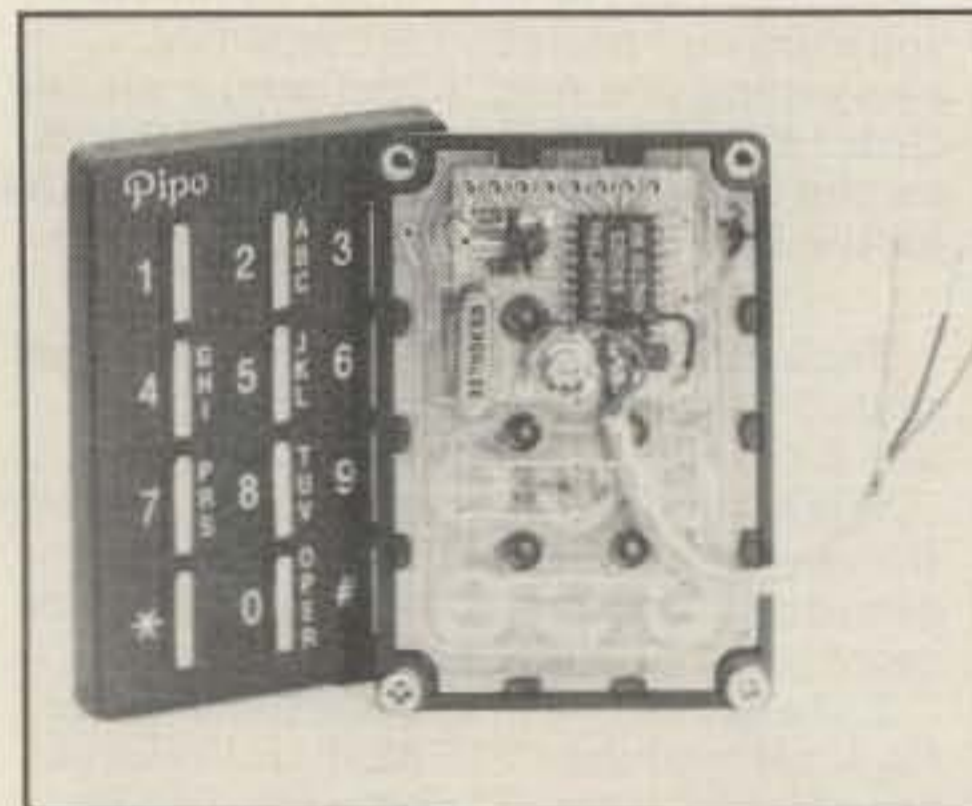
Monroe Electronics has introduced the Model 6005 Remote Control for control and monitoring of repeater and remote base sites (or other electro-mechanical devices). The 6005 is a telephone remote control system capable of answering telephone calls and giving the calling party access to eight remote control relays and the ability to interrogate eight status input points for remote control and monitoring. It is accessible by telephone line or two/four-wire hard wired audio port. Other features include automatic reporting of input status changes via telephone line, optional retention of output status after power interruptions,

selectable momentary or latching relay action and selectable enable or disable of call back. Accessory cards are also available. For more information, contact Monroe Electronics, Inc., 100 House Avenue, Dept. 627, Lyndonville, NY 14098 or check number 106 on the reader service card.



## RS-232 Connector Kit

Jensen Tools now makes available a 273-piece RS-232 Commercial Connector Kit priced in the \$69 range. Featuring both male and female connector shells and matching pins and sockets, the kit provides everything that a technician needs to repair or replace RS-232 connectors in the field. The kit includes an insertion-extraction tool, also. For more information, contact Jensen Tools Inc., 7815 S. 46th Street, Phoenix, AZ 85040 or check number 104 on the reader service card.



## New DTMF Encoders

Pipo Communications has announced a new line of enhanced DTMF (Touch-Tone R) encoders. Steel keys and sealed gold dome contacts provide unsurpassed durability for the P7 and P8 series. The P7 series have the standard 12 keys for numbers 0 through 9 and symbols \* and #. The P8 series have these keys plus A through D, for a total of 16. Both series are available in horizontal or vertical format. For more information, contact Pipo Communications, PO Box 2020, Pollock Pines, CA 95726-2020 or circle number 103 on the reader service card.



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RS-12M Same As RS-12A, With Meter	82.46
RS-20M Same As RS-20A, With Meter	100.76
RS-35M Same As RS-35A, With Meter	143.46
VS-20M Same As RS-20M, Adj. Volt./Curr.	119.06
VS-35M Same As RS-35M, Adj. Volt./Curr.	161.76
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CIRCLE 118 ON READER SERVICE CARD





# Antennas & Accessories

a monthly feature by  
KARL T. THURBER, JR., W8FX

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

## From the Bookshelf

This month we continue with more computer topics as columnist Thurber rounds up and pulls down from the bookshelf some excellent books for your perusal. Stay tuned for some good late-winter reading for a cozy hamshack!

—K2EEK

Now that you have all your new software installed, so to speak, we're going to round up several computer books we think you'll find useful in learning how to use the new software. This time we'll focus on books on learning and using the MS-DOS operating system for the IBM-PC and getting a hard disk (HD) drive up and running. Mastering both areas, of course, is important if you're using an IBM or IBM clone in the shack. While we're on the bookshelf, we'll take note of some other good reading matter and we'll also highlight some new antenna equipment. First, let's survey a few computer books.

### From the Computer Bookshelf

A little over a year ago we placed a third computer in our hamshack to keep our Commodore 64 and 128 company. Our addition was a CorData PC-400, a fully compatible IBM-PC clone with 512K memory and two floppy disk drives. After running without a hard drive since we first installed the CorData, when prices became too attractive to resist, we finally broke down and installed a 30 megabyte (MB) hard disk (HD) drive on the computer. Sort of amazing when you think of it: less than five years ago I wrote about being the proud owner of a Vic-20 computer with all of 5K (kilobyte) memory, and I wondered how I'd use all that RAM!

This \$370 HD addition increased both computing power and convenience of operation by an order of several magnitudes. It's indeed nice to have most of the software we use installed on the computer's HD and available for use almost instantly, rather than having to load each program from a floppy disk each time we want to use it. True, it was a job to get the HD up and running, and to become more familiar with the MS-DOS operating system (necessary if you're going to use a hard drive). These tasks were made much easier by our acquiring several excellent "how to do it" texts, and we'd like to share several of them with you. Of course, in addition to the books we also acquired some HD management and operating software to simplify the task of keeping the HD under control, but we'll hold off on discussing these until another time.

We're going to look at several MS-DOS and hard drive management texts here, and the best way to do that is to group the titles we examined by publisher.



In the next few months we'll be taking a look at some of the best utilities for the IBM-PC—ones we've found quite useful in the hamshack. One of these is Referee™, a memory resident program manager from Persoft. (W8FX photo)

**Brady Books/Prentice Hall Press.** The Brady Bunch, oops, Brady Books Series is issued by the big New York publisher Prentice-Hall. I found their computer books to be of uniformly good quality. Published under the Brady name are dozens of excellent computer texts, not only for the IBM-PC, but also for the Macintosh, Apple, Commodore, and other machines. In a recent Brady catalog I stopped counting at 125 computer books, plus a dozen book/disk packages.

One of the Brady MS-DOS books I particularly liked was Peter Norton's *MS-DOS and PC-DOS User's Guide* priced at \$18.95. While the 1984 edition I received was in need of updating to reflect new DOS versions, the basic information was excellent, being presented by one of the acknowledged masters of the operating system used in IBM and compatible computers. Just before I wrapped up this column, I received his excellent encore, *Peter Norton's DOS Guide* (\$19.95), which covers DOS through version 3.2.

Another very handy Brady book, and one out of which I get a good deal of use, is Robert Krumm's *Getting the Most From Utilities on the IBM PC*. At \$22.95, Krumm's book is a valuable guide to many of the popular utility programs, such as the Norton Utilities systems utility package, background utilities such as Sidekick and Turbo Lightning, and keyboard enhancers the like of ProKey and SuperKey. The book also has good, straightforward information on what you need to know about MS-DOS to work effectively with these programs.

Though not a book about DOS or HD management, another one you might want to have for when the unthinkable happens to your computer is Henry F. Beechhold's *The Brady Guide to Microcomputer Troubleshooting and Maintenance*. For \$17.95, having the book on hand is plain good insurance for the day when "the chips go down," or for learning more

about how your computer works and how to properly maintain it. The book also covers simple repairs and adding peripheral devices, and it includes a troubleshooting and repair tutorial.

A new Brady book should be out by the time you read this. It's what may prove to be "the" survival book on HDs, *The Hard Disk Companion* by Peter Norton and Robert Jourdain. Though it wasn't published at the time I wrote this, it's expected to weigh in at 400 pages and to be priced at \$21.95.

For a Brady Books catalog, write to the Prentice Hall Press, One Gulf & Western Plaza, New York, NY 10023.

**Que Books.** The HD setup and management book that I found to be the most comprehensive and of the most use to me in setting up my system was Don Berliner's *Managing Your Hard Disk*. This 559-page monster is bargain-priced at \$19.95, being chock full of excellent tips you can use in the process of efficiently storing and retrieving programs and data on your HD. The book explains how to use programs that normally won't run on a hard disk, activate "menu programs," use memory resident programs, and back up valuable data. This is the kind of book that I find necessary to keep close by the computer, certainly not more than an arm's length away. For more information and a catalog, write to Que Corporation, 7899 Knue Road, Indianapolis, IN 46250.

**More HD Books: Sybex and MIS Press.** While my all-around HD bible is the Berliner book I just described, there are two other specialized HD books that I found quite useful. Once I got the basics down pat, Jonathan Kamin's Sybex book *Power User's Guide to Hard Disk Management* is hard to beat at \$19.95. While Kamin's book is designed for the so-called "power user," the guy who wants maximum performance from a souped-up and powerful PC, it's nevertheless quite readable by even the less-experienced computerist. It's published by Sybex, Inc., 2021 Challenger Drive #100, Alameda, CA 94501.

Kamin's book includes hard disk fundamentals, tree-structured directories, backup procedures, RAM disks, and menus, and it includes a number of fairly simple batch, BASIC, and COM files you can easily type in to automate a number of the more complex HD management tasks. Handily, for those who don't care to mess with keying in the dozens of programs included in the book, the author has them on a disk which also includes some of the more useful public-domain HD management programs. The programs disk is available directly from the author for \$15. If you're interested in it, contact Kamin Consulting Services, 3985 Lyman Road, Oakland, CA 94602-1858. If you get this book, by all means order the accompanying disk; you won't be sorry you did.

Another HD management book, this one oriented to applications software, is Emily Rosenthal's *Hard Disk Software Management* from the Management Information Source, Inc.

317 Poplar Drive, Millbrook, AL 36054

(MIS). While this is mainly a business rather than home-user oriented book, its clear and concise treatment of how to effectively use popular software applications on a HD is readily transferable to home and hamshack applications. She includes detailed techniques of mastering DOS, installing the programs and writing menus for them, managing memory, and finding the files you need. The 251-pager is priced at \$21.95 from the MIS Press, 1107 N. W. 14th, Portland, OR 97209. Like most of the computer book publishers, they have available a free catalog of their books for the asking.

**Sams/Hayden/Waite Group Books.** Sams is well known to most of us for their wide range of electronics book titles, but they also publish a long list of computer books. Some of the best of these are those relating to mastering DOS, the disk operating system—a working knowledge of which is extremely useful in HD management.

My favorite Sams/Waite Group DOS book is *Tricks of the MS-DOS™ Masters*, by Angermeyer, Fahringer, Jaeger, and Shafer. The sorcerer on the book's cover provides a hint of the "magic" and wealth of advanced tips on the operating system contained within. The 542-page, \$24.95 book includes much technical but highly readable and understandable information on the MS-DOS operating system, including what Sams calls with some pizzazz batch file magic, tree-structured wizardry, screen and debugger secrets, and secrets of add-on software and hardware. Despite the mild hype, this to me is also a "must-have" book, and it's well-organized for easy reference, with special "trick," "caution," and "information" icons to help you locate what you need to know. The detailed index and table of contents round out a very practical, timesaving, and interestingly presented text that's excellent for the serious MS-DOS user.

Though Angermeyer's book is by far my favorite book on DOS, Sams also publishes several other helpful DOS books under the Waite Group label. These include *Discovering MS-DOS* (O'Day, \$17.95); *Understanding MS-DOS* (O'Day and Angermeyer, \$16.95); *MS-DOS Bible* (Simrin, \$19.95); and *MS-DOS Developer's Guide* (Angermeyer and Jaeger, \$24.95)—in ascending order of technical difficulty, from the simplest to the most complex. And, while I haven't yet had the opportunity to peruse it, Sams also publishes a 250-page HD setup and management book, *Hard Disk Management Techniques* (Carrabis, \$19.95).

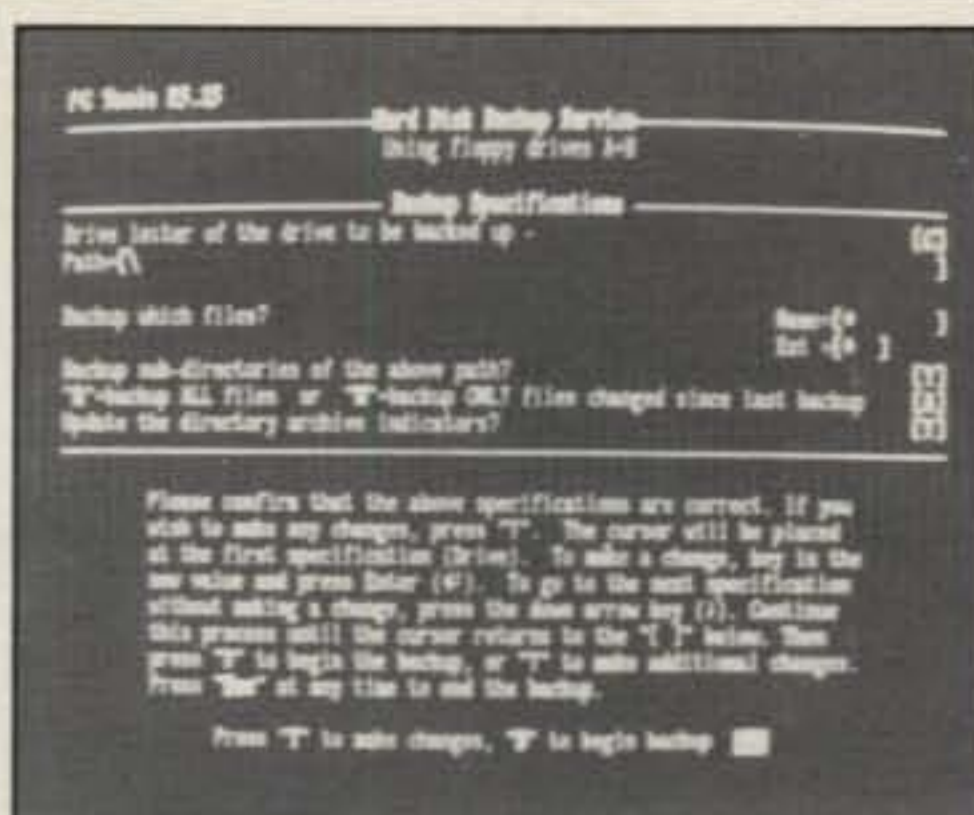
Something certainly worth obtaining is Sams' impressive 120-page catalog, which includes titles not only in computers and electronics, but also their repair documentation, published as the PHOTOFAC<sup>®</sup>, COMPUTERFACTS<sup>™</sup>, and VCRfacts<sup>™</sup> series. Contact Howard W. Sams & Company, 4200 West 62nd Street, Indianapolis, IN 46268.

## Good Hamshack Reading

Okay, enough about computer books this month. Let's now turn to some amateur radio oriented magazines and newsletters in which you may be interested.

**Kit Builders Journal (KBJ).** Are you a kit builder from way back? Or perhaps you only recently built your first kit? I wish I had had a copy of Heath's New KBJ when I was up to my neck in building KnightKits, EICOs, Edu-Kits, and the like (remember them?).

The new Heath magazine is a very specialized one, for those who get their enjoyment



Here's another program we'll take a look at in the coming months as we highlight some of the most useful utilities for the IBM-PC. It's the PC TOOLS, an all-around topnotch disk utility from Central Point Software. Stick with us! (W8FX photo)

from building kits (mostly Heathkits, almost the only game in town these days). It includes reviews and other kit-building information on electronic (including amateur radio) and non-electronic kits, as well as other DITY (do-it-yourself) projects. Understandably, the emphasis is on Heath products, "for the purpose of fostering the exchange of ideas to enhance their usage of Heath equipment," so you probably won't see too many disparaging words about Heaths.

KBJ includes "how-to" information sections on building and using their products, tips from Heath technical consultants on correcting problems and improving kit performance, small construction projects, modifications, questions and answers, and other information for kit builders. The magazine also has promotional tie-ins with Heath products which include discount prices for subscribers on some Heathkits.

As a writer, I found the magazine interesting from one aspect in particular—how they pay KBJ contributors, which is "in kind." Kit builders who submit major articles that reach print are given, in addition to a certificate of recognition and appreciation, a "Kit Buck" worth \$200 toward the purchase of any Heath/Zenith product; the Kit Bucks can be collected and accumulated toward future purchases. Thus, while getting your construction project or other article published in KBJ won't make you rich, it may help you own a few more Heathkits!

The bi-monthly magazine is \$14.95 in the U.S. from Kit Builders Journal, Heath Company, Hilltop Road, St. Joseph, MI 49085; individual issues are \$2.50.

**Novice World.** At last summer's ARRL National Convention I learned of a new ICOM beginner newsletter, *Novice World*. The fledgling publication is billed as "your personal guide to enjoying amateur radio in style." Naturally, "in style" tends to mean using ICOM equipment, but the little newsletter nevertheless has good tips on setting up your first station, on-the-air operating, nontechnical equipment information, signal propagation, antennas, and the like—with an emphasis on the "new ballgame for Novices" aspects of last year's operating privileges enhancement.

The newsletter, which runs about eight pages, is free; hopefully, it can survive and prosper at this bargain-basement price. The editors ask that readers make the newsletter a

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The International Callbook lists 481,000 licensed radio amateurs in countries outside North America. Its coverage includes South America, Europe, Africa, Asia, and the Pacific area (exclusive of Hawaii and the U.S. possessions).

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

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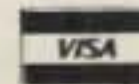
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two-way affair, with readers' requested information guiding their topic selections. As they suggest, "Tell us about your rigs, your first QSO, best DX, fun, anything! Then watch for your related stories herein. All letters will be enthusiastically received, read, and answered as time permits."

Fair enough. If you're interested in corresponding, or in receiving upcoming editions of the newsletter, write to ICOM's Novice World, c/o ICOM America, Inc., 2380-116th Avenue, N.E., Bellevue, WA 98004.

**The Worksteader News.** Several months ago we presented a short discussion of the "electronic cottage" phenomenon, where increasing numbers of people are working out of their homes rather than participating in the usual office environment. To a great extent this is made possible through the personal computer. The PC allows you to engage in a great deal of commercial business activity from your home such as freelance writing, wordprocessing, financial and tax preparation services, database and mailing list management, telecommunications, and the like.

One newsletter that's made to order for such new-breed workers is *The Worksteader News*, 2396 Coolidge Way, Rancho Cordova, CA 95670. The newsletter centers around presenting late news and tips on what it calls "the greatest Third Wave trend," working at home. It includes information and resource material on home work organizations, advice from home work employers, obtaining a home-based job, and the like. The newsletter typically runs about 10 pages. Sample issues are \$1, and a one-year subscription is \$24. The same people also publish *The Work-at-Home Sourcebook* (\$13.95), which includes cross-indexed job bank and occupational information.

**Ad Astra.** I don't own an Atari computer (never have), but I continue to be fascinated with this extremely interesting six-times-per-year newsletter published by Gil Frederick, VE4AG, for the Atari Microcomputer Network (130 Maureen St., Winnipeg MB R3K 1M2 Canada). We've mentioned *Ad Astra* a couple of times before in the column, and obviously think very highly of the typically 18-page newsletter. As I said, I don't own an Atari, but I find Gil's well-in-

tegrated coverage of the Atari end of the computer business, ham radio topics, equipment modifications, packet radio, computer operating tips, etc., to make excellent reading—even more so for those who actively use an Atari in their hamshack.

While I've focused mainly on the newsletter, I should mention that it is actually the journal of the Atari Microcomputer Net, a nonprofit organization of amateurs, SWLs, and Atari computer enthusiasts who share a common interest. Amateurs and SWLs are encouraged to directly participate in the national weekly (Sunday) on-the-air meetings which start at 1600Z on 14.325 MHz, or on the regional nets following the national net, from 1830Z on or about 7235 MHz. Net coordinator is Dave Byrd, KD7VA. (If nothing is heard, try a "CQ Atari" call on these two frequencies.)

Subscriptions to *Ad Astra* are \$10 (\$13.50 Canadian) to North America, and \$15 (\$20 Canadian) for mailing elsewhere. Contact Gil Frederick, VE4AG, for information on the net, membership, and the newsletter.

### New Ham Shack Equipment

**Spi-Ro Dipoles and Verticals.** I recently received a flyer from Spi-Ro which outlined their ready-made HF dipoles and verticals. I was impressed with the variety of products they now offer, including two fairly inexpensive "high tech" gas-filled discharge lightning arrestors.

Spi-Ro features several single-band limited-space shortened dipoles, with models for 160, 75/80, and 40 meters; these range in length from 38 to 100 feet and cost about \$45 to \$50 depending on the band. The antennas make use of Spi-Ro's "Antenna Shorteners," which look to outward appearances like traps, and which are also sold separately. You can place the shorteners in series with the antenna elements to reduce the physical length of a dipole by over 40%.

Spi-Ro offers full-size dipoles for 6 through 160 meters and multiband trap antennas for 10 through 160 meters in several two- to six-band combinations. They also offer four different multiband trap verticals especially designed for nautical, trailer, and field-day-site use. These are available in 3-, 4-, 5-, and 6-band combinations for custom coverage of 10 through 160 meters, and they can be used either as true verticals or as slopers. In addition, the antenna traps are available separately should you want to "roll your own" multibander.

For more details of their expanding line of antennas and accessories, write to Spi-Ro Manufacturing, Inc., P.O. Box 1538, Hendersonville, NC 28793.

### Wrapping It Up

We're out of space, so we'll have to hold the rest for next time! This month we focused on several general-interest computer books, especially those which I found useful in expanding my PC setup to include a hard disk (HD) drive. We also discussed some useful hamshack reading matter, including Heath's new *Kit Builders Journal*, and we discussed some new antenna products.

**Overheard:** Even if you can get to the faulty part in your rig, you probably don't have the tool to get it off!

Next month join us for more Antennas & Accessories subjects of current topical interest. See you then.

73, Karl, W8FX

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**BandAid:** this is probably the most comprehensive propagation forecasting program available to amateur radio operators. You can make MUF & LUF graphs and tables, grayline predictions, maintain a QSL database, find international beacon frequencies, locate any station on a world map, maintain a database containing information on over 550 targets, time zone conversions, authorized frequency listings, and have control over many of the programs defaults. Over the years, we've sold hundreds of BandAids & Mufplots. Through steady improvements, BandAid is still the best propagation program available (with the possible exception of MufMap) Now includes 8087 support. BandAid runs on IBM PCs and compatibles, requires 256K and a color/graphics card (color monitor not required). Still only \$69.

**Mufplot:** a popular propagation program for C64 and Apple II users. MUF & LUF graphs & tables, distance/bearing calculations, and more ... Hundreds in use ... Still a deal at \$30.

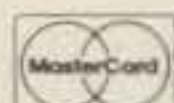
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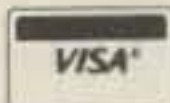
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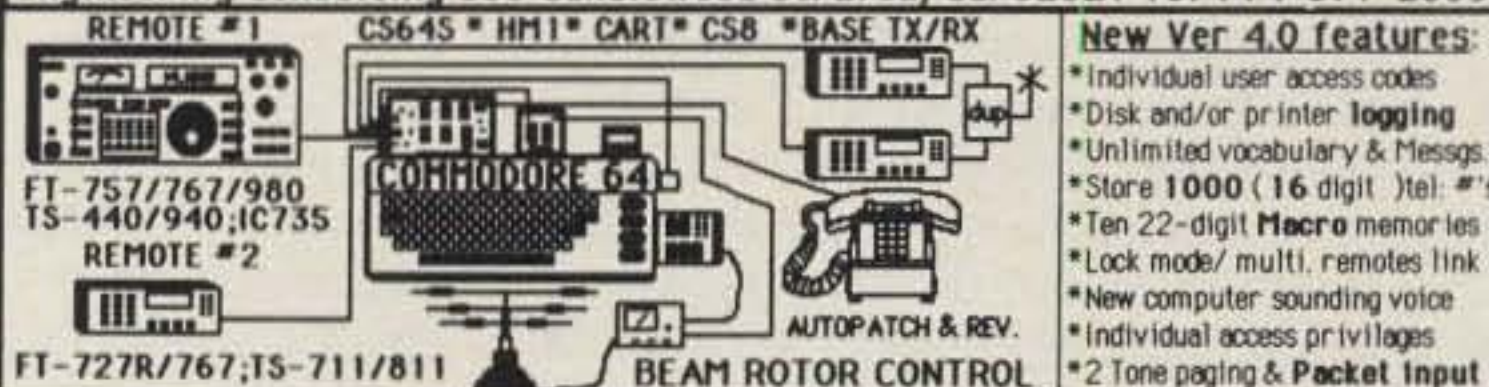
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## INFO ON AMATEUR RADIO LICENSING

### *The Age of the Amateur: The History of Communications - Part IV*

**A**mateur radio began soon after Guglielmo Marconi received the first radio signals sent across the Atlantic Ocean in 1901. Marconi considered himself an amateur, and he inspired hundreds of others to experiment with radio communications. Despite inadequate equipment and the complete lack of electronic textbooks, the early tinkerers got their crude devices to function.

During the first twelve years of its existence, amateur radio blossomed without government regulations of any type. During the period 1902 to 1912, twenty-eight bills dealing with radio were introduced into Congress. Amateurs began to get into trouble with the government in 1909. Many of them had better and more powerful stations than those of the military and commercial services. In 1909, amateur stations accounted for most of the total stations on the air. It was the amateur that dominated the airwaves. This situation led to much legislation that began with the Roberts Bill of 1909.

This bill, sponsored by the government (meaning the Navy), met with no organized resistance from the amateur fraternity since amateurs were not yet organized into any sort of an association through which they could lobby collectively. It was the Marconi Company, a commercial radio carrier, that defeated this bill. They argued that competing commercial companies and the Navy had obsolete equipment without adequate tuners. The Marconi Company said they had superior tuners and, in fact, were the only ones other than amateurs to have them.

The legislative battle continued and the Marconi Company was consistently the friend of the amateur during the struggle. The Marconi Company had no quarrel with the amateur since they were not greatly troubled by their interference. At the same time they recognized amateur radio as a useful training ground for their operators and mechanics. An even more important consideration was from a public relations standpoint. The Marconi Company claimed that legislation was needed only because competing telegraph companies had inferior equipment and got much valuable free advertising

on the theme, "Let us handle your communications, since we obviously can do it much better."

Furthermore, the Marconi Company wanted to sell equipment to the Navy and the Navy refused to buy because of the higher costs. The Marconi Company felt that if they defeated the Navy's plan to abolish amateur radio and thus reduce interference that the Navy would be forced to modernize their equipment—and modernization would probably mean the purchase of Marconi equipment.

To counteract the Marconi "pro-amateur" publicity—other commercial/military interests started their own propaganda campaigns. Proponents and opponents of amateur radio began hurling charges and countercharges. It was really quite the topic of the day! It was estimated that there were four thousand amateur stations on the air by 1910.

During the early part of 1910, two bills were introduced that provided for the registration of different classes of stations and made it illegal for outsiders to interfere with these stations. The amateur, who was not mentioned by name, was to be dealt with by the simple means of declaring him a lawbreaker if he interfered with any of the registered government or commercial stations. Although the bills passed in the Senate, they failed to pass in the House and were eventually discarded.

On December 11, 1911, the Alexander Bill was introduced in the House. It followed along the lines of previous attempts, having as its object the termination of amateur radio without defining it by name. This bill too was defeated. All in all, during 1912, thirteen bills pertaining to radio were introduced into the Congress. One bill (H.R.23716), which the Navy tried to put through, would have allowed only government ownership and operation of all radio facilities.

Despite the defeat of all of these bills, 1912 was to be the year that effective regulation of the amateur finally took place. During the London World Radio Conference of 1912, historic "Regulation Fifteen" specified that "private (meaning amateur) stations could not use wavelengths in excess of two hundred meters except by special permission." The legislators had a new plan! Rather than abolish amateur radio—they would restrict ama-

teur operation to radio wavelengths of 200 meters and less—which according to the professional and amateur engineer were essentially worthless for anything but the most limited communications.

Incorporated into this law were two additional requirements . . . the licensing of receiving stations and the right to arrest and prosecute an amateur without first warning him or allowing the operator the opportunity to close down his station. The 200-meter wavelength restriction passed both houses but the two additional provisions were eliminated.

On August 17th, President Taft signed the bill into law. Radio in the US had its first regulations with amateurs being consigned to the vast wasteland of 200 meters and down. The Radio Act of 1912 also provided for the first federal licensing of radio stations.

#### **Amateur Operators Band Together**

One night in March 1914, Hiram Percy Maxim, an inventor and ardent radio amateur tried in vain to contact Springfield, MA, from his station in Hartford, CT, some 23 miles away. His equipment could not transmit over this distance, but a station in between the two points relayed his message and also relayed back a prompt reply. This incident led Maxim to conceive of an organization devoted to relaying messages through amateur stations across the country.

He and Clarence Tuska, a college student, founded the ARRL in May 1914, and they started publishing a magazine named *QST* in 1915. The journal, which was quickly accepted, encouraged rapid growth in amateur radio. The relay idea represented an ideal basis for the needed national amateur organization.

ARRL initially was part of the *Radio Club of Hartford*, but after a falling out in 1915, Maxim and Tuska incorporated the League under the laws of CT. The Radio Club of Hartford and the ARRL each went their separate ways. To pay the bills, amateur relay stations were assessed 50¢ dues. If not paid, their station call signs were dropped from succeeding issues of the call book.

#### **The Near End of Amateur Radio**

Today, few amateurs realize that the era of amateur radio nearly ended with

National Volunteer Examiner Coordinator,  
P.O. Box 10101, Dallas, TX 75207



World War I. The fate of amateur radio, silenced by the war from 1917 to 1919, was hanging in the balance in the days immediately following the signing of the Armistice. The US government, having had supreme authority over communications in wartime, was inclined to keep it. The war had not ended a month before Congress was considering legislation that would have made it impossible for the amateur radio of old to be resumed.

At the pleadings of ARRL's H. P. Maxim, the bill that would have ended amateur radio for all time was defeated. On October 1, 1919, the wartime ban on amateur radio transmissions was lifted. Amateur radio continues as the *only* hobby regulated by international treaty and by local/state/federal government regulations.

### From the Mailbag

We seem to be getting a considerable amount of inquiries relating to conducting the Novice and Technician amateur radio tests. Let's try and sort out the confusion that seems to exist.

**Novice Testing:** The entry level amateur radio license is the Novice class. It is taken in two parts. One element consists of a thirty-question multiple-choice written (or oral) test. The questions, choices and the correct answers are all known and widely published. The thirty ques-

tions are selected by volunteer examiners from a pool of 302 questions covering nine different topics. VEs are not permitted to change any of these questions.

The VEs must select a specified number of questions from each topic. An applicant passes the Novice written/oral Element 2 examination when twenty-two out of the thirty questions are correctly answered. The questions are on FCC regulations, operating procedures, elementary electronic theory and equipment generally used by beginning amateur radio operators.

The other test, Element 1(A), involves Morse code text transmitted at a speed of five words per-minute. A word is defined as five characters. Government rules allow volunteer examiners (VEs) wide latitude in determining whether you pass the telegraphy examination. It is customary, however, for applicants to be required to correctly copy 25 characters in a row—or answer seven out of ten questions about the transmitted telegraphy text.

These questions can be in any format including fill-in-the-blank, true/false, multiple choice, essay . . . or identifying various portions of the transmitted text. The important point is for the examiners to be satisfied that you can indeed comprehend telegraphy at 5 wpm. The code test can be sent by hand or can be on a cassette tape—which is usually the case. It is the volunteer examiners who decide

which code testing format is to be used. As a general rule, no code sending test is required—although this is optional with the examiners.

The Novice examination is usually conducted in a less formal atmosphere than the Technician (or higher class) tests. Two currently licensed General Class (or higher level) amateurs are required to administer the Novice Elements 1(A) and 2. Novice examinations are most often conducted at one's home or at the end of a Novice amateur radio class. The VEs usually submit the successfully completed and certified application (Form 610) directly to the FCC.

**Technician Class Testing:** Only one additional (written) examination is needed to upgrade to the Technician level. You must correctly answer 19 out of 25 multiple-choice questions selected from a bank of 288 total questions. Again, a few questions are selected from each of the same nine general topics - and again, all questions, multiple choices and the correct answer are a known published factor.

While two (General Class or higher) volunteer examiners can administer the Novice tests, you must attend a more formal examination session to pass your Technician Class examination. This is because the Novice requirements have always been administered informally by amateur volunteers in the field. The Technician (and higher) tests previously were



Rob, WA3QLS



Paul, WA3QPX

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Katherine, KA3IYO



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administered at Federal testing centers.

In an economy measure, the FCC went to an all-volunteer amateur radio testing system for the remaining classes in 1984. A team of three volunteer examiners with Advanced or Extra Class amateur radio operator licenses are required to conduct amateur radio operator examinations at the Technician (or higher) level. Furthermore, these VEs must be approved (or accredited) by a VEC who has entered into an agreement with the FCC to coordinate amateur (Technician and higher class) testing.

The Technician through Extra Class examinations are handled under a completely different and separate testing program... called the *VE/VEC System*. A Volunteer Examiner Coordinator (of which your author is one) acts as the liaison between the activities of the examiners and the FCC. The VEC usually supplies the written and/or telegraphy examinations to the VE team—although the examiners can (as of 1987) design their own tests if they follow the proper test construction techniques.

While Novice examiners will submit your application directly to the FCC, the examiners that administered you your Technician tests will submit your application and examination results to their VEC along with the appropriate test session reports. If you wish to take your Novice and Technician class tests at one sitting, you must attend one of the more formal VE/VEC test sessions.

Another major difference is that while Novice examinations are free of any cost to the applicant, there will undoubtedly be a charge to take the Technician test. This cost varies among VEC operations, but most will be charging \$4.55 during 1988. The fee is charged even if you fail your Technician Element 3(A).

### Novice and Technician Privileges

New Novice operators have code operating privileges in the 80, 40, 15 and 10 meter bands. Effective March 21, 1987, entry level amateurs can now operate in the voice mode in the 10 meter, and 222 and 1270 MHz bands. This generally means USB on 10 meters (between 28.3

and 28.5 MHz) and FM at 222.1-223.91 MHz and 1270-1295 MHz. (Actually Novices are authorized to use telegraphy on all of these bands, but little CW operation takes place other than in the HF region.)

Novices are also authorized to operate in the digital mode—such as packet computer-to-computer communication. Novices are not permitted to establish or be the control operator of repeaters or beacon stations.

Technician Class operators additionally get all amateur operating privileges above six meters (50-54 MHz) including the very popular two-meter ham band. Novices and Technicians are restricted to 200 watts PEP on ten meters. Maximum Novice power level at 222 MHz is 25 watts peak-envelope-power, 5 watts PEP at 1270 MHz. Technicians can operate with full amateur power levels at 222 and 1270 MHz, i.e., 1,500 watts PEP.

### Where to Find Question Pools, Test Sessions

The Novice and Technician question pools are no longer changed annually. Except for changes in FCC regulations, they are now revised every three years. New Novice and Technician questions won't be going into effect *until November 1989*—nearly two years from now! You can purchase the Novice or Technician question pools from us (W5YI-VEC PO Box 10101, Dallas, TX 75207) for \$4.00 each plus \$1.25 postage or from most VECs or amateur radio outlets.

Finding a test session can usually be as simple as asking local amateurs in the neighborhood. Most know who gives tests and where. A phone call to your local distributor also should work for you. Most amateur radio clubs also have testing programs for all license levels.

Unfortunately, many General Class amateurs do not know how to administer the Novice tests—that is, how to select the questions and conduct the examination. We have available a Novice testing kit for \$4.95 that contains a Novice textbook with the 302 question pool with complete answers and explanations, pre-designed examinations and test design formula (if the VE wants to design their own exam), FCC Form 610 applications and instructions. Use the Dallas address above and add another \$3.95 if a 5-wpm code test tape is needed.

Successful Novice applications, certified by two VEs, should be forwarded to: FCC, P.O. Box #1020, Gettysburg, Pennsylvania 17326, within ten days of examination. The Form 610 application is returned to the applicant if only one of the two required elements is passed. This application serves as a *Certificate of Successful Completion of Examination (CSCE)* when retaking the failed test. There is no longer any waiting period for retaking a failed examination.

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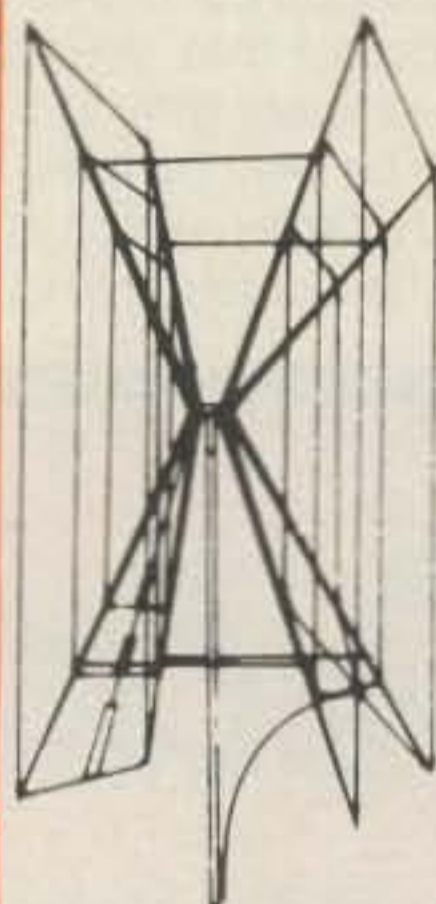
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CIRCLE 29 ON READER SERVICE CARD

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

### Novice Operating Privileges

The changes that occurred March 21, 1987 significantly revised operating privileges available to Novice class amateur radio operators. This article covers existing Novice privileges completely and simply.

**15, 40, and 80 meters.** Novice privileges remain the same on the 80, 40, and 15 meter bands. Radiotelegraph (A1A code) emissions are permitted at a maximum output power of 200 watts peak envelope power (PEP). This 200 watt power limitation applies to all classes of amateur radio operators using these Novice bands. The 80 meter Novice band is 3700 to 3750 kHz, which is also 3.7 to 3.75 MHz. The 40 meter Novice band is 7100 to 7150 kHz, which is also 7.1 to 7.15 MHz. The 15 meter Novice band is 21,100 to 21,200 kHz, which is also 21.1 to 21.2 MHz.

**10 Meters.** Novice privileges on 10 meters were expanded. Code (A1A) is now allowed from 28,100 to 28,500 kHz, although code is normally just used from 28.1 to 28.3 MHz. F1B digital communications are permitted from 28.1 to 28.3 MHz. As usual F1B (digital communication) is not allowed on frequencies where voice communications are conducted; therefore, F1B is not authorized in the 28.3 to 28.5 MHz Novice voice (J3E SSB) segment. Novice and Technician licensees are allowed to run a maximum output power of 200 watts (PEP) in the 28,100 to 28,500 kHz 10 meter Novice bands. General, Advanced, and Extra class licensees may run a maximum output power of 1500 watts when operating in the 10 meter Novice band. In other words, the power limitation imposed on all classes of amateur licensees in the 80, 40, and 15 meter Novice bands does not apply to the 10 meter Novice band.

**1.25 Meters.** The 1.25 meter Novice band extends from 222.1 to 223.91 MHz. Novices are allowed to use every emission type that is available to Technician through Extra class licensees operating their 220 to 225 MHz band. Novices are limited to a maximum output power of 25 watts (PEP) when operating on this band. Technician through Extra class licensees are permitted to run a maximum output power of 1500 watts (PEP) on this band. The emissions available to Novices operating in this band are A1A, A2A, A2B,



*This is Judy Weierbach, KA3PZI, of Bethlehem, Pennsylvania. Her husband, Ken, is KA3PGW. Her father, Raymond Ramson, is KA3ORJ. Her uncle, Norval Ramson, is W1NWW, and he is credited with getting the family involved in amateur radio. QSL cards from these four amateurs are posted on the wall behind the Kenwood TS-430S transceiver. Judy is a member of the Lehigh Valley Amateur Radio Club. She is preparing to upgrade to General and is close to qualifying for a Worked All States award.*

A3C, A3E, A3F, F1B, F2B, F3C, F3E, F3F, G3E, and N0N. The meanings of these emission designations are as follows:

#### First Letter

- A double sideband amplitude modulation
- F frequency modulation
- G phase modulation
- J single sideband, suppressed carrier
- N no modulation (true CW)

#### Number

- 0 no modulation signal (true CW)
- 1 single channel carrying quantized or digital information, without using a modulating subcarrier
- 2 single channel carrying quantized or digital information, using a modulating subcarrier
- 3 single channel containing analog information

#### Last Letter

- A telegraphy for aural reception
- B telegraphy for automatic (machine) reception
- C facsimile (fixed picture, no sound)
- E telephony (voice)
- F television (momentary pictures, with sound)

N no information transmitted (true CW)

Evaluation of the preceding information reveals that a few typical Novice emissions are:

- N0N continuous wave (CW)
- A1A carrier on/off telegraphy
- A3E double sideband amplitude modulated voice
- F1B frequency-shift-keyed (FSK) radioteletype
- F3E frequency modulated telephony (voice)

**23 Centimeters.** The Novice 23 centimeter (.23 meter) band is from 1270 to 1295 MHz. The entire band is 1215 to 1300 MHz, which is available to Technician through Extra class licensees. Novices are limited to a maximum output power of 5 watts (PEP) in their segment of this band, whereas higher class licensees may run a maximum output power of 1500 watts (PEP). All classes of amateur radio operators share the same emission privileges on 23 centimeters. These emission privileges are the 13 types previously listed in the 1.25 meter Novice band coverage.

**Opportunities.** The information in the preceding paragraphs should help you become familiar with the existing Novice bands, plus the emission types and output power which Novices may use on those bands. Worldwide communications opportunities exist on 10 meters (digital and voice) and 15 meters (radiotelegraph) during daylight hours. Good medium-distance code contacts are available at night on 40 and 80 meters. The 1.25 meter and 23 centimeter bands provide opportunities to try 13 types of emissions including radiotelephone (amplitude, frequency, phase, and single sideband), radioteletype (frequency shift keying and audio frequency shift keying), radiotelegraph (carrier on-off and modulated carrier keying), facsimile (AM and FM), and television (AM and FM). I advise you to try as many bands and emissions as possible. You may find that you like some band or emission that you have not tried so far in your amateur radio career.

**Novice Test.** The existing 30-question Novice written examination does not provide adequate coverage of the emissions now available to Novices. The test would have to be expanded to at least 50 questions to come close to covering the scope

2814 Empire Ave., Burbank, CA 91504



Sixteen-year-old Oliver Barrett, KB7AKJ, of Sandy, Utah was in contact with KX6DC in the Marshall Islands when this picture was taken. Oliver shares this station with his father (Dallas, WA7MEL). The station includes a Ten-Tec Corsair 560 transceiver, a tuner for an inverted-L antenna, a 5-band vertical antenna, a 10-15-20 meter Yagi-Uda, beam antenna, 2 bugs (semi-automatic telegraph keys), and a straight key. Oliver has worked 30 states and 8 foreign countries. He upgraded to Technician and should soon have a General license.

of the existing Novice privileges. If you know people who are considering obtaining Novice licenses, it is advisable to suggest that they pass the existing 30-question test. The examination has to become more difficult when questions are added to cover the 14 modes of emission Novices are authorized to use. There is also a possibility that the license examination may someday include an operating test. This change is long overdue. It would reduce the percentage of nonoperating license holders, increasing the percentage of active operators.

**Equipment.** Careful perusal of any recent issue of this magazine will disclose that manufacturers are offering many items that can make it easy for Novices to try different bands and modes. New transceivers, antennas, and auxiliary equipment are advertised on the pages of each issue. As an example, one company sells a handheld transceiver that provides long-range communication (DX) possibilities on 10 meters. Take the time to read the advertisements and product reviews. If you are interested in a particular product, request a sales brochure from the manufacturer or from their distributor.

**Eliminating Confusion.** The FCC granted a wide variety of operating privileges to Novices. Existing Novices were grandfathered into privileges they may never have studied. To a large degree the same situation exists with people who pass the existing 30-question Novice test. If you have an amateur radio club in your area, it is advisable to attend a few of its meet-

ings to become acquainted with some of its members. Do not hesitate to seek information. It is possible that active amateurs will allow you to visit them and to observe their stations in operation. This type of activity can help you obtain a good understanding of the equipment and accessories related to transmitting and receiving code, teletype, voice, facsimile, and television signals. The magazine advertisements and brochures are helpful, but nothing is as good as live operation. Do not hesitate to ask for help. Another source of information is the convention or hamfest. Some convention talks are usually on subjects that could be of interest to newer amateurs.

**Operating.** If you have a license, it is to your benefit to use it. Amateur radio has far too many licensed amateurs who seldom operate. I have met a few licensed amateurs who have never been on the air. The major enjoyments associated with amateur radio are related to operating. You do not have to be an expert to enjoy operating an amateur radio station. One does not have to spend a lot of money to establish a station that can provide many years of operating enjoyment. Get on the air and operate; try everything. The American Radio Relay League (ARRL) publishes a book that is very useful to newer amateurs. *The FCC Rule Book* should be available at local radio/electronics stores. If not, it can be obtained by writing to the ARRL, 225 Main Street, Newington, CT 06111. In addition to a complete set of the current FCC rules and regulations (Part 97, Amateur Radio Service), it contains band plans for 1.25 meters and 23 centimeters, plus a lot of other useful information. The ARRL has many excellent publications, and the FCC rule book is one of the most helpful ones ever printed.

**Printed Aids.** Previous Novice columns cover many subjects of interest to Novices. If you would like to have a list of the



Seven-year-old Brian Kalita, KB8AYB, of Defiance, Ohio is a first-grade student at Spencer Elementary School. He follows in the footsteps of his father (Dwight, ND8Y), who was first licensed at age 12. Brian is also interested in music, and he plays the organ.

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available printed aids, send your request to my California address, including a self-addressed stamped envelope. Instructors are welcome to duplicate existing material or to change it to meet their class needs. More than 1500 sets of printed aids have been sent to instructors, clubs, or individuals during the past 35 years. A complete set is available at \$15, which includes shipping charges (write to my California address). Material continually changes, causing outdated items to be dropped and new items to be added. I have conducted amateur radio licensing courses on a regular basis since 1948. Most of my course printed ads have been printed in a CQ Novice column, and previous issues of CQ can usually be purchased at \$2.50 each from CQ, 76 North Broadway, Hicksville, NY 11801.

John Hooker, KA7SIU, of Prescott, Ari-

zona submitted the following comments to be shared with readers of this Novice column.

"I attended a meeting of my local amateur radio club tonight and found it to be disappointing. I had hoped for an educational program to be presented, but no such luck. There was just a bunch of older guys chatting with each other. I talked with a fellow sitting next to me, and then I left. As I drove home, I asked myself, "Why am I a ham?" I think the answer is that I was fascinated by the glow of vacuum tubes, and I was amazed that radio could be used to transport sound so well. When I was a Boy Scout, I worked hard to learn the code. The code continued to be a challenge to me in the Prescott High School Amateur Radio Club. I let it drop, but became interested again 25 years later, and I picked up my Novice license. I

have worked about 150 code contacts, including several very long ones (rag-chews). I purchased a license manual to study for a General license. It is dry reading, and I doubt that I will ever use 10 percent of it. Most equipment is now solid state, and it is common practice to have it repaired by factory representatives.

"I wondered what one has to say to the amateurs one contacts, and I decided it is not much. I have not had an opportunity to handle any emergency traffic, and this may never happen. I cannot operate 2 meter FM [voice] with a Novice ticket, and I doubt that it would be of interest anyhow. It might be nice to chat with local amateurs through repeaters, but the telephone is easier and cheaper to use than buying a transceiver and upgrading my class of license. I do not like contests, and I am not interested in earning operating awards.

"However, I do enjoy picking up old tube rigs and getting them going. I like to have them light up my darkened shack as I enjoy code contacts. I think I'll keep my dipole up off the ground and avoid becoming one of the many Novice dropouts.

"The present licensing program provides a good introduction to electrical and electronic fundamentals. It is a boost to future engineers and technicians. However, much of the theory one must know to upgrade to a Technician or General license is older than the vacuum tube rigs I cherish. Ham radio should recognize the fact that miniaturization and complexity make it impractical for an average amateur to service modern equipment. Licenses should be separated into two categories, with one for operating and the other type for technical skills. Presently, one does not have to prove operating ability to obtain a license that authorizes operating privileges on the amateur bands. Amateur radio has slipped from being a leader; it is now a passive follower."

## Photographs Wanted

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

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1310 RG217/U 50 ohm 5000 watt dbl shld .....	85
1450 RG174/U 50 ohm .100" od mil spec .....	14

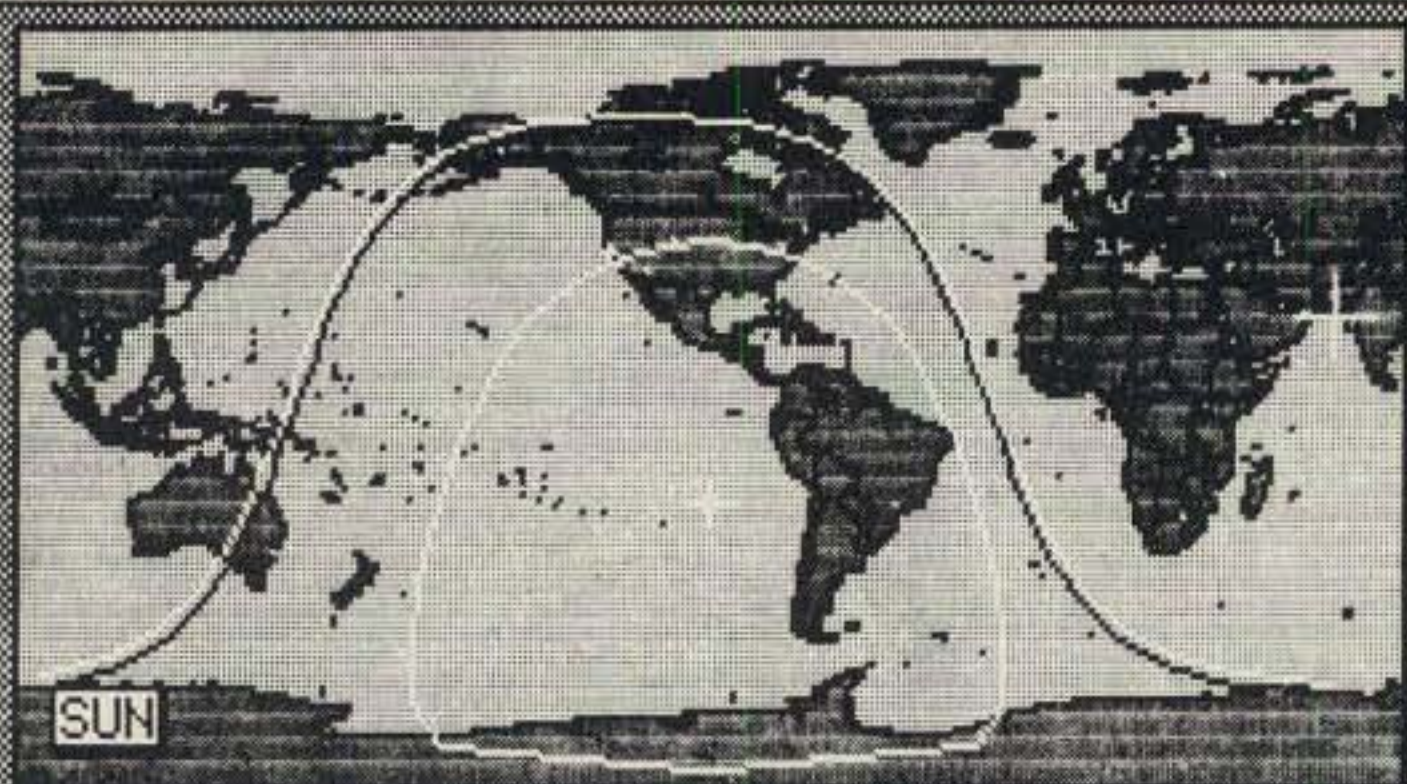
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Our new units can handle continuous key for 5 to 6 times our old units. Think what that means to improving the life of the transistor as well as giving a tremendous margin to operating capabilities.

The dissipation of heat build up is accomplished by using a CNC mill to imbed copper directly into the aluminum heat sink. Copper is 2 1/2 times more conductive than aluminum and this permits the even distribution of heat throughout the total heat sink, and the most rapid heat removal from the transistors junctions.

### NEW 2 METER B3036 AMPLIFIER

Approximately February 1st we will have available a new 2 meter amplifier. 30 watts in will generate 360 watts output. All circuits except the pre amp will be diode controlled.

This unit was designed by some of the best RF engineers in the world. The pre amp is gas fet with .5dB loss. It also has a helical resonator built into the pre amp circuit. The unit is approximately 13 x 5 3/8 and the transistors are mounted on a copper base milled into the heat sink. The unit has a built in fan to control heat dissipation. The unit is powered by 13.6vdc but will require approximately 40 amps.

This unit will carry our normal 5 year warranty (1 year on transistors). This is the best in the industry.

### HEAVY DUTY BOOM OPTION FOR LARGE H.F. ANTENNAS

Our larger H.F. antennas have available an optional heavy duty boom for extreme conditions. The boom is still three inches in diameter but the wall is one quarter inch thick. This construction uses splice sections of similar one quarter inch wall material instead of our present swage technique to join the boom sections. This optional boom is a special order item available through your dealer.

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## A LOOK AT THE WORLD AROUND US

### More Classic Keys and Telegraph Tales

**O**ur June 1987 *CQ* World of Ideas column featuring classic keys created an absolute landslide of favorable remarks, fascinating notes, and "next-time corrections" from amateurs and professional telegraphers worldwide. Indeed, all of our previous articles highlighting classic keys, gear, and nostalgic tales from past eras have created a proverbial blowout of excitement. Interest of that magnitude is too significant to take lightly, so I'm continuing the views this month with a fascinating variety of key notes and tales I'm sure you'll enjoy.

I'm also expanding those views with a new self-published full-size book, *Golden Classics of Yesteryear*. It will be advertised in next month's *CQ*. Watch for it! *Golden Classics* covers subjects from sparks to the 50s, nostalgic tales, rig views, "build 'em" schematics, refurbishing notes, and loads of keys views. It's perfect guidance for building a 20s rig, a 30s receiver, a 40s transmitter, or a genuine homemade bug.

Thanks to everyone's letters and notes, our mailbag is once again overflowing. Indeed, a "blanket reply letter" with my handwritten notes returned via your SASE is becoming a necessity. Whew! Our special thanks to W0AP, KL7IXX, AD9E, W6YY, W2LYH, W4RHZ, K0JW, VO1HP, Albert Lewis, and Howard McElroy (Ted McElroy's nephew, now living on Long Island). If I'm overlooking others, please let me know for more "next-time corrections." Maybe there's an invisible magic in light blunders. Our previous right-on-track keys articles (including full tales of Vibroplex and McElroy) created only half the excitement of our June '86 feature. Don't put off replying even if this month's column is perfectly correct. We'll revisit "keys" again soon. It's a blast!

#### Which Code Is Which?

Our first highlighted topic is a corrected view of the American Morse and Continental Telegraph Codes (fig. 1). Hopefully, everyone recognizes the Continental code as what we use on today's amateur bands (with a few exceptions I'll explain later!). The American Morse, however, was used with the classic

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TELEGRAPH CODES	
MORSE	CONTINENTAL
Used on Land Lines in United States and Canada	Used on Submarine Cables, Wireless and on Land Lines in Foreign Countries
A	A
B	B
C	C
D	D
E	E
F	F
G	G
H	H
I	I
J	J
K	K
L	L
M	M
N	N
O	O
P	P
Q	Q
R	R
S	S
T	T
U	U
V	V
W	W
X	X
Y	Y
Z	Z
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0
Period	Period
Comma	Comma
Interrogation	Interrogation
Colon	CH (Ger.-Span)
Semi-Colon	Parenthesis
Dollars (\$)	Finis
Dash (-)	Distress Call

Fig. 1—Side-by-side comparison of Continental and American Morse codes. Note differences in various letters and use of l-o-o-n-g dashes.

sounders and landline telegraph systems of previous times. That is, or was, from approximately the mid 1800s until around World War II. The American Morse was also used with many early US wireless communications, and knowledge of both codes was a vital consideration in commercial licensing.

As KL7IXX relates, the two codes also played a role in the Titanic story. "Operators aboard the Titanic (using Continental code) became irritated with operators aboard a couple of US Navy vessels that were using American Morse, and insulted them (remember, this was 1912).

The Navy boys either switched off their equipment or ignored the Titanic's calls, and thus didn't respond to later distress calls. These notes were brought to light during the official inquiries following the incident."

KL7IXX also points out the sounders illustrated in June 1987 were the "local circuit" type. That is, they are usually around 4 ohms resistance and were used on a separate/local circuit in series with a battery and its own relay points. Mainline sounders were physically larger and higher in resistance (30 ohms to 400 ohms). Fine-tuning magnet adjustments





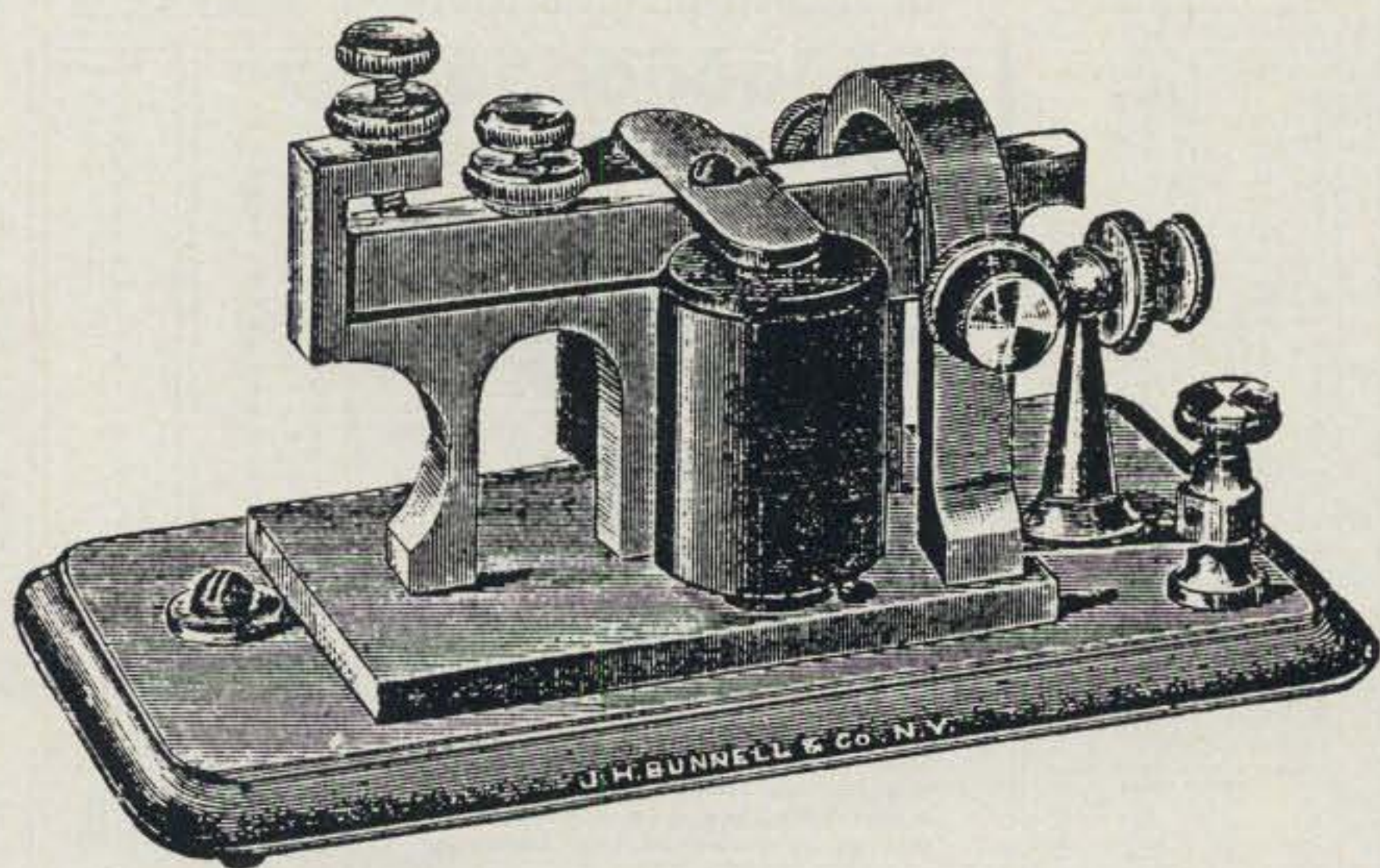
Fig. 2—Samuel F. B. Morse transmitting his historic 1844 message that initiated a new era in rapid communications. (Photo courtesy AD9E)

## The Giant Sounder.

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PATENT, FEBRUARY 16th, 1875,

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We call attention to the fact that our original Giant Sounders, as shown above, have become, since their first introduction in 1875, the standard of excellence throughout the United States, and have also been adopted exclusively upon the Government Telegraphs of England.

They give a loud, clear sound, with just half the amount of local battery generally used on other forms of Sounders.

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Giant Sounders, wound with fine wire to 20 ohms resistance for Main Line use (without relay), on lines up to 15 miles in length. 4 00

Fig. 3—Reprinted ad of the Jesse H. Bunnell telegraph sounder (courtesy of W4RHZ). Mate this with fig. 4, tune to 3545 kHz, and relive the legend!

were included to compensate for line losses during wet weather.

A sounder emits two slightly different types of clicks during operation (as one fellow described, "klick and kalunk"). A dot is recognized as the two clicks very close together, and a dash has more time separation with a noticeable "kalunk" as its bar returns to stop. Looking at fig. 1 and visualizing this effect also indicates American Morse can't be sent via modern electronic keyers or keyboards. Hand keys and bugs are necessary here. Example: A "T" is a dash, and an "L" is a l-o-o-n-g dash. Interesting, indeed!

Fig. 2 shows a classic view of Samuel FB Morse transmitting the historic 1844 message "What hath God wrought!" between Washington, DC and Baltimore, Maryland. Morse's invention created worldwide excitement. The Sultan of Turkey sent him a decoration of diamonds; Prussia and Austria sent gold medals; the King of Denmark sent him a Knight's cross; and Yale made him a Doctor of Laws. A bronze statue was erected in his memory in New York City's Central Park.

Morse's original telegraph was made using an artist's old canvas stretcher. Wooden clock gears pulled a roll of paper across the stretcher while a pencil hanging from a pendulum made zig-zag marks denoting dots and dashes. An electromagnet attached to a bar in the middle of the stretcher moved the pendulum. This printed concept was used for several years before a 15-year-old employee, James Francis Leonard, discovered the dot/dash sounds could be recognized by ear. The now classic telegraph sounder was the next evolution in the US. Meanwhile, Europe continued perfection of the Ink Register—a device that printed received dots and dashes on paper. Kare Wallman, SM5DSB, has an original Ink Register in his telegraph collection, and promises to send a photo for our next "Keys Revisited," so stay tuned!

### Birth of Western Union

A vast number of private telegraph companies quickly sprang up in the eastern United States. The New York and Mississippi Valley Printing Telegraph Company began operation with 550 miles of wire. Approximately 50 other small telegraph companies also began operation. There was no interconnection of lines, messages were manually transferred between companies, and the cost of single telegrams was as high as \$20. The NY and MVPTC thus pursued a unified service for linking east and west. After purchasing eleven other lines in five states, their name was changed to the Western Union Telegraph Company.

At the outbreak of the Civil War, rapid communications between east (Missouri) and west (California) became paramount. Pony Express required up to ten

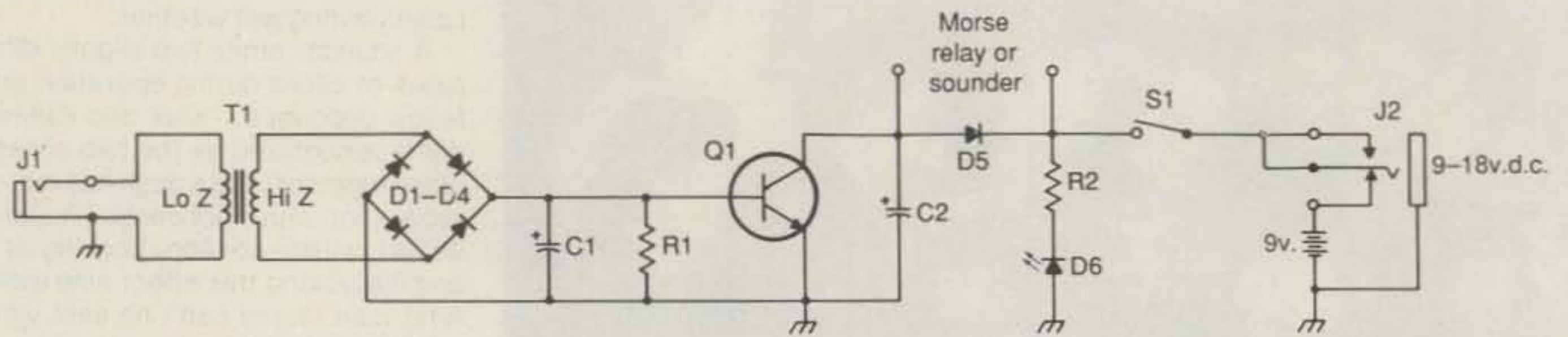


Fig. 4—Morse box tone converter. This unit interfaces your transceiver's audio output and a telegraph sounder. It is battery powered, so you can use it for field or mobile demonstrations. (Schematic courtesy AD9E)

**Parts List**

- C1: 5 mFd, 35V RS272-1012
- C2: 10 mFd, 35V RS272-1013
- D1-4: Bridge rectifier 1A 50V PIV, RS276-1161
- D5: LED, RS276-C66/68/69
- D6: Silicon rectifier 1A, 600 PIV, RS276-1104
- J1: Open circuit jack, RS272-252/251
- J2: Closed circuit jack
- Q1: NPN, TIP31
- R1: 10K, 1/2 watt
- R2: 1K, 1/2 watt
- SW1: SPST
- T1: Audio output
- TS1: To suit
- RS274-255/53/92
- RS276-2017
- RS271-034
- RS271-023
- RS275-324
- RS273-1380
- RS274-315 handy!

**Note:** 4 ohm sounders are not recommended. If optimum sounder/relay current is desired, insert a series resistor in the collector circuit. Adjust for:

- 30 ohm M/L sounder, .070 ma
- 50 ohm sounder, .110 ma
- 120 ohm M/L sounder, .040 ma
- 400 ohm sounder (series), .030 ma
- 400 ohm sounder (parallel), .060 ma
- 25 ohm relay, .060 ma
- 100/150 ohm relay, .040 ma

days to carry messages across hostile Indian and rugged Rocky Mountain territory. Western Union engineers thus planned and assembled those now historic lines.

One of today's largest commercial museums on old-time telegraphy is housed in the Western Union Telegraph offices at 655 South Orcas Street, Seattle, Washington. Over 100 pieces of memorabilia are shown in the mezzanine. There are collector's items from Western Union offices and employees, diagrams and photos of early telegraph development, plus information on submarine cable laying and wiring of the continent.

Morse's original canvas-stretcher system and classic stock tickers are also included. The lobby reflects a turn-of-the-century theme with oak flooring, brick walls, old-style counter, writing ledgers,

Fig. 5—Reprint of McElroy chart of codes and signals. Remember learning to speed print Morse by his illustrated method?

old-time signs, and wax figures with khaki-green and navy-blue Western union uniforms. Be sure to visit this fascinating museum when traveling to Seattle. Our special thanks to Joseph Rice, W4RHZ, for the previous data. Joe put together a very impressive pamphlet that is our source for this information.

Take a look at fig. 3. It is a reprinted copy of the classic J.H. Bunnell telegraph sounder ad. (Besides helping you understand the items we're discussing, it will help you recognize them in hamfest flea-markets.) Some folks ask \$40 or \$50 for these items, so show them the "new from factory" price of \$3.50 and start haggling cost . . . and good luck! We assume no liability for "klick and kalunk" sounds aside the head from said items!

Remember, also, sounders were manufactured in a wide variety of sizes and styles from "Pony" types to "local" and "longline" varieties. Some had upright coils; some had horizontal coils. All are absolute gems. Three to six volts DC usually puts them into action, and when properly adjusted and used with American Morse, they're beautiful to hear. That brings in an exciting "modern situation" you'll surely find intriguing.

### What's That Sound?

Assuming the classic telegraph "gig" has captured your interest, the circuit shown in fig. 4 "brings it to life" modern style. The diagram is compliments of Bill Dunbar, AD9E, president of the Morse Telegraph Club and editor of its magazine, *Dots and Dashes*.

This unit connects between the speaker or earphone jack of your super modern SSB/CW transceiver and an old-time telegraph sounder. Yup . . . copy Morse in old-time clicks! Of course you really need to copy American Morse to bring out its inner beauty, but that's no big problem. There's a genuine *American Morse Net operating every day* on 3545 kHz at 1300 UTC and 0030 UTC. The operators use handkeys, bugs, and sounders just like the old landlines. If the action is slack when you tune in, wait a while for things to pick up. Remember that "retired lifestyles" are often comfortably casual.

The sounder interfacing circuit is quite conventional and not critical in layout. Parts are available at Radio Shacks nationwide. T1 matches your rig to Q1 and isolates the two circuits. The bridge rectifier assures smooth operation at low signal levels. R1 is base bias for the keying transistor, Q1. C2 and D5 prevent keying transients. R2 and D6 are an optional tuning aid. A 9 volt battery can be used for powering the sounder, or you can use an external DC supply. Remember to disconnect/disable the battery if/when using external power. If you have additional questions, or wish to join the Morse Telegraph Club, write to Bill Dunbar, AD9E,

1101 Maplewood Drive, Normal, Illinois 61761. Can you visualize the genuine nostalgic impact of having a working sounder next to your rig? Wow!

### Key Notes

As W6YY and several others brought to light, the official name for the side-swiper shown in June '87 CQ is a "double action key." They are manual in operation, and although their lever moves horizontally, both "sides" connect to the same keying wire. Both sides are thus used for making dots and/or dashes, and everything is in the wrist's action. As W6YY relates: "To send a V, move the lever to the left as a dot, to the right for another dot, return to the left as a dot, to the right for another dot, return to the left as a third dot, then go to the right for a dash." He's been using one of these keys since the 20s and handles it like a pro.

Albert Lewis of Nantucket, Maine reports he used an unusual Balanced Wheel Bug, but we don't have a photo of that item. The wheel resembled a small bicycle counterpart with spokes, and it was mounted horizontally on a 3 inch steel base. Does anyone have a photo of this obviously quite rare key?

Although the photocopy of McElroy Charts and Codes shown in fig. 5 can't be reproduced with original clarity, it's a kaleidoscope of interesting study (use a pocket magnifier). The "ole boy" shows us Japanese, Greek, Russian, Arabic, Turkish, International, and American Morse Codes. There are also Q codes, X codes, aeronautical signals, military insignias, McElroy with his awards, flag signals, a guide to speed printing for code copy—lordy! The only hint this is an advertisement is on the bottom line. Ted was quite a character, eh?

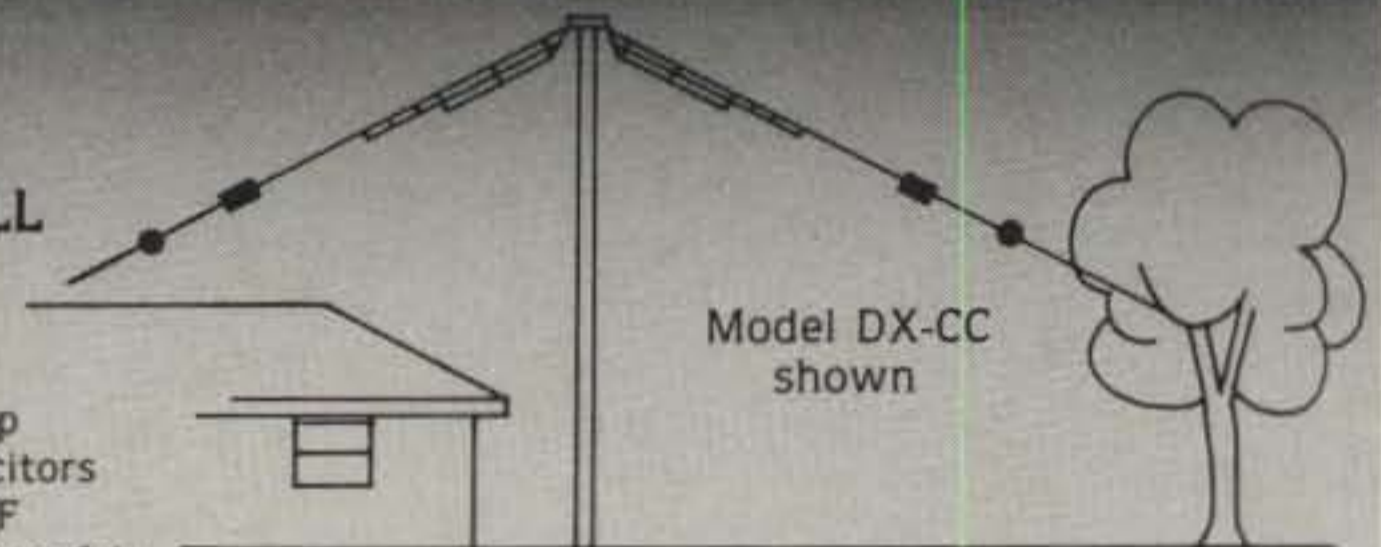
### Wrap Up

Enough, enough! That winds down this "Keys Revisit" and sets the stage for yet another sequel. As usual, we welcome your notes and comments. When writing, please include an SASE and understand usual column response averages 18 letters a day, and 15 minutes are necessary for each reply (plus I'm still young and work 40-plus hours per week). "Blanket letters" and quick notes are vital. It's all great fun, however, and I wouldn't trade it for . . . even a new IC-781! Amateur radio is great! Enjoy, enjoy!

73, Dave, K4TWJ

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## NEWS OF CERTIFICATE AND AWARD COLLECTING

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

**Eldred J. Daigre, W5ILR**  
**USA-CA All Counties #543**  
**All SSB, 6-4-87**

"I recall someone once stating that some County Hunter had completed USA-CA in about ten months. Well, I hereby claim the dubious honor of having taken the longest to complete USA-CA—21 years, 5 months, and 16 days. My first identifiable county hunting contact occurred on 3943 MHz (the old CHC net) with K9VIE, K9LLX, and K9CSL. I was an avid DXer and joiner back then, having achieved DXCC, WAC, WAS, and being well on my way to WAZ, WPX, and others. But I'm getting ahead of myself.

"I had completed high school and just barely entered college when World War II began. The announcement that 18-year-old youths were to be drafted prompted me to voluntarily enlist in the U.S. Army Air Corps in order to evade the Infantry. I completed pilot training in April 1943, and although I was not the youngest to graduate, it seemed that as a 19-year-old Second Lieutenant I must have looked the youngest. My youthful enthusiasm prompted me to volunteer for every overseas assignment that came along so I could single-handedly end World War II. But the gods smiled on me and I didn't get overseas until April 1946, after WW II had ended. This overseas assignment was the first of many spanning some 38 years. They included a second tour in Germany during the Berlin Airlift where I flew 126 missions; three years in the Philippine Islands as a Communications/Electronics Staff Officer in an Air Rescue Group; and shorter tours to Alaska and England. There were also many trips to exotic places such as Warsaw, Athens, Ankara, Tripoli, Casablanca, Tokyo, Okinawa, Hong Kong, Paris, London, Copenhagen, Azores, Hawaii, and Guam.

"I guess the most enjoyable period of my military career was at Dyess AFB, Texas flying the six jet engine B-47. During this time I progressed from Aircraft Commander to Lead Crew Commander, Instructor Pilot, and Operations Officer.

"My wife's ill health about that time was a motivating factor in my decision to apply for routine military retirement. Fortunately, her health improved within a couple of years of my leaving active military service, so I moved to Georgia for a



*Ed Daigre, W5ILR, at a Mobile Amateur Radio Awards Club Convention.*

position as a civilian employee of the U.S. Army. After 28 months with the Army I accepted an offer in Iceland as the civilian Assistant Communications/Operations Officer with the U.S. Naval Communications Station. One promotion led to another, and we wound up staying five years, then back to the home office in Portsmouth, Virginia for the next eight years. It was during this period that I became actively engaged in mobile operation. In a 22-month period I covered all of VA, WV, and DE, and parts of MD, OH, PA, KY, TN,

and NC. In ten months of this period I put 47,000 miles on my car.

"Shortly thereafter my career plans changed, and I again found myself operating as a DXer from Naples, Italy. I was the second American to receive a permanent-resident license (W5ILR/I8) after the reciprocal agreement was signed, and the first 8-land foreigner to be licensed—as IK8BBN.

"Perhaps next to finishing USA-CA and operating as a DXer from Iceland and Italy, one of my most interesting experiences happened in 1958 while stationed in Wichita, Kansas. I was operating as K4GBX/Ø and contacted K5GBX, a YL in Texas. This identical suffix contact was a first for both of us. Exactly one week later I ran across KØGBX on 20 meters and related the previous contact with K5GBX, suggesting he keep a lookout for her since she also operated frequently on 20 meters. After the QSO I signed and went QRT. About one hour later I returned and again turned on the rig to hear KØGBX signing off with K5GBX. I tried to break the QSO and make it a three-way 'GBX' suffix contact, but KØGBX didn't hear me and went QRT. I did, however, work K5GBX again. I'm not a mathematician, but I imagine there is someone reading this story who could come up with the statistical probabilities of a three-way suffix unscheduled contact, as that would have been.

"I operate exclusively SSB, and the reason for that is the fact that I began amateur radio with a General class license after completing a military communica-



*Ed, W5ILR (aka IK8BBN), enjoying convention festivities with friends.*

333 South Lincoln Ave., Mundelein, IL 60060

## USA-CA Special Honor Roll

John F. Kray, KA2CNG  
All Counties #551, Mixed, 10-17-87

James W. Glasscock, W0FF  
All Counties #552, Mixed, 10-30-87

tions theory and code operations course. Since I was not forced to operate CW as a Novice, I failed to learn any appreciation for CW. In 1974 I upgraded to Advanced, and I still feel that Extra class for SSB-only operation provides little incentive for the effort it would require for me to upgrade further.

"Incidentally, amateur radio is not my only hobby. I also enjoy occasional private flying, golf, and music. My music collection consists of approximately 1420 records, tapes, and discs, mostly Dixieland Jazz and Big Band Easy Listening. I won't reveal my golf scores.

"Since my full retirement in March 1985, we live in Abilene, Texas, next door to Dyess AFB. Dyess is the home of the B-1B bomber.

"As it took me over 21 years to complete USA-CA, it would be futile to attempt to identify all of those individuals who were most helpful. However, I must acknowledge the efforts of Galen, KB5FU, who volunteered to drive from south Texas to north Missouri to give me my last three counties for USA-CA. Dedication like that is rare, even among all of the fine, outstanding hams I've met in county hunting. To Galen, and to all of you not personally acknowledged herein, my sincere thanks for helping me attain USA-CA #543.—Ed, W5ILR."

## Awards Issued

John F. Kray, KA2CNG, completed the

## USA-CA Honor Roll

3000		1000	
W0FF	583	WA6MUK	989
		KC2CD	990
		K10W	991
2500		WA6OCI	992
WA6OCI	657	KS3F	993
W0FF	658		
2000		500	
WA6OCI	722	KF4BU	2202
		N7JB	2203
1500		IK5ACO	2204
KC2CD	809	K6EW	2205
WA6OCI	810		

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

chase and filed his application for All Counties #551, Mixed, on 10-17-87.

James W. Glasscock, W0FF, collected all of his confirmations and received All Counties #552, USA-CA 3000 #583, and USA-CA 2500 #658, Mixed, dated 10-30-87.

Adam Quandt, WA6OCI, took another big step by claiming USA-CA 2500 #657, USA-CA 2000 #722, USA-CA 1500 #810, and USA-CA 1000 #992, All 20M SSB Mobiles, dated 10-21-87.

John K. Thompson, KC2CD, qualified for USA-CA 1500 #809 and USA-CA 1000 #990, along with his USA-CA 500 #2201 reported in the January column, All 20M SSB Mobiles, dated 9-30-87. Sorry I missed that last month, John.

Dr. Theodore Palmer, WA6MUK, received USA-CA 1000 #989, Mixed, dated 10-1-87.

Clifford H. Ahrens, K10W, filed his application and qualified for USA-CA 1000 #991, Mixed, dated 10-17-87.

Joel C. Dennis, KS3F, received USA-CA 1000 #993, All SSB, dated 10-31-87.

USA-CA 500 certificates went to:

Harold J. "Hud" Huddleston, KF4BU, USA-CA 500 #2202, Mixed, 10-19-87.

James D. Bradley, Jr., N7JB, USA-CA 500 #2203, Mixed, 10-24-87.

Giorgio Baldassari, IK5ACO, USA-CA 500 #2204, All SSB, 10-29-87.

Sam Creason, K6EW, USA-CA 500 #2205, All CW, 10-30-87.

## Awards Available

**Associazione Radioamatori Italiani Awards.** General rules for the A.R.I. Awards apply to all awards issued by the Associazione Radioamatori Italiani and should be read together with the conditions which govern each individual certificate.

All information requests must be sent to the ARI Awards Manager, c/o ARI, Via D. Scarlatti 31, 20124 Milano, Italy, and must be accompanied by one IRC.

ARI awards will be issued to any amateur who submits to the manager:

- A letter, dated and signed, with name, address, and call of the applicant. He must certify that all administrative rules in his own country and the spirit of amateur radio have been respected in effecting the QSOs upon which the application is based;
- The complete list of QSLs, with call sign, date, frequency, reports, time, and type of emission (CW, AM, SSB, RTTY);
- QSL cards for checking;
- 10 IRCs or \$3 for foreign applicants.
- QSL cards must be submitted without corrections, erasures, or additions and must be clearly legible. If the type of transmission is not shown, two figures (RS) count as Phone (AM, not SSB) and three (RST) as CW.

To get an award in a specific class, the cards must show the corresponding data in clear manner. In appreciation of the decisions of the Region I of IARU, all foreign applicants may send a check list of the cards (without QSLs) duly certified by a member of the headquarters of their national amateur radio society. The ARI Manager reserves the right to check, on request, one or more QSLs. ARI Headquarters decisions are final. Any card falsification will result in disqualification.

Send the application to the following address: ARI Award Manager, c/o ARI, Via D. Scarlatti 31, 20124 Milano, Italy.

**Certificato Del Mediterraneo (CDM).** The above

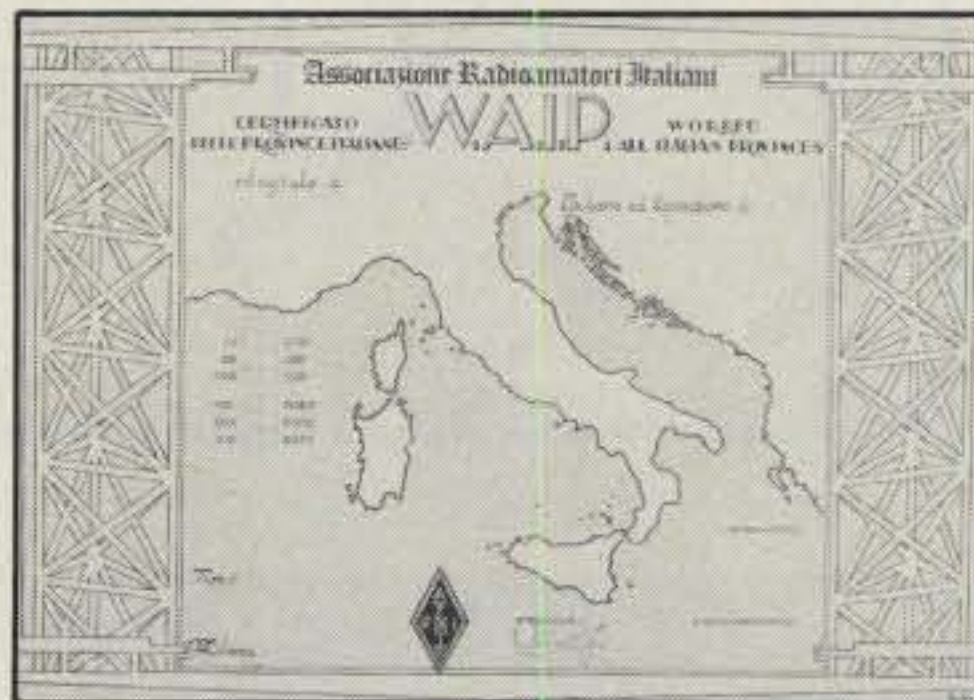


*Certificato Del Mediterraneo (CDM) offered by Associazione Radioamatori Italiani.*

general rules for A.R.I. awards are applicable, along with the following information.

The CDM is issued to those amateurs who can show confirmation of a two-way contact since June 1, 1952 with a fixed amateur station in at least 22 countries of the list (*pay attention*—in the list there is no peninsular Italy), and at least 30 amateur stations of peninsular Italy (total: 52 QSLs). The same station may be worked once only. The CDM is issued in two classes—phone and CW.

List of countries: Spain, Balearic Islands, Spanish Morocco, French Morocco, France, Algeria, Corsica, Trieste (before Dec. 31, 1957), Sardinia, Sicily, Lebanon, Egypt, Greece, Dodecanese Islands, Crete, Turkey, Syria, Yugoslavia, Albania, Malta, Gibraltar, Cyprus, Monaco, Tunisia, Israel, and Libya.



*Worked All Italian Provinces (WAIP) Award available from Associazione Radioamatori Italiani.*

**Worked All Italian Provinces (WAIP).** The above General Rules for A.R.I. awards are applicable, along with the following:

The WAIP is issued to those amateurs who can show confirmation of a two-way contact since January 1, 1949 with a fixed amateur station in at least 60 provinces of the Italian Republic, for foreign amateurs; and a fixed amateur station in at least 75 provinces of the Italian Republic, for Italian amateurs. The same station may be worked twice or more, if in different provinces. The minimum reports considered are RST 338 and RS 33.

List of the Italian provinces: Agrigento, Alessandria, Ancona, Aosta, Arezzo, Ascoli Piceno, Asti, Avellino, Bari, Belluno, Benevento, Bergamo, Bologna, Bolzano, Brescia, Brindisi, Cagliari, Caltanissetta, Padova, Palermo, Parma, Pavia, Perugia, Pesaro, Pescara, Piacenza, Pisa, Pistoia, Pordenone, Potenza, Ragusa, Ravenna, Campobasso, Caserta, Catania,

Catanzaro, Chieti, Como, Cosenza, Cremona, Cuneo, Enna, Ferrara, Firenze, Foggia, Forli, Frosinone, Genova, Gorizia, Grosseto, Reggio Calabria, Reggio Emilia, Rieti, Roma, Rovigo, Salerno, Sassari, Savona, Siena, Siracusa, Sondrio, Taranto, Teramo, Imperia, Isernia, L'Aquila, La Spezia, Latina, Lecce, Livorno, Lucca, Macerata, Mantova, Massa, Matera, Messina, Milano, Modena, Napoli, Novara, Nuoro, Terni, Torino, Trapani, Trento, Treviso, Trieste, Udine, Varese, Venezia, Vercelli, Verona, Vicenza, and Viterbo.

**BARTG RTTY Awards.** The British Amateur Radio Teleprinter Group (BARTG) offers the following three RTTY awards. BARTG was the first RTTY group to organize a series of awards, starting back in 1966 with the QCA Award. Applications and inquiries should be directed to BARTG Awards Manager, Ted Double, G8CDW, 89 Linden Gardens, ENFIELD, Middlesex EN1 4DX, United Kingdom.

**Quarter Century Award—QCA.** This award, offered by BARTG, is available on the submission of satisfactory proof of two-way RTTY

communication with 25 different countries. Stickers are available in increments of 25 up to a total of 200. The award is also available to SWLs on a "heard" basis.

Applications for the award may be made by any of the following methods.

- Submission of QSL cards for the countries being claimed. These cards are returned after checking. Alternatively, submission of photocopies of these QSL cards is acceptable (and preferred). Such copies must show clearly both call signs and establish beyond any doubt that a two-way RTTY contact took place.

- Claims will also be accepted based on a check list containing call signs of stations worked, date and time of QSO, and band in use. This list is (and the QSL cards) to be examined by the awards manager of a national radio society or two officers of a recognized radio club. The signed check list and any fees are all that is required under this method.

- Claims can also be accepted based on a contest log submitted for an RTTY contest sponsored by the British Amateur Radio Tele-



Quarter Century Award (QCA) offered by the British Amateur Radio Teleprinter Group.

printer Group. The claims should be made at the same time as the contest log is submitted.

*Note:* For the purpose of establishing country status, the ARRL DXCC List is the standard reference in order to honor reciprocal arrangements which BARTG has with other groups.

The cost of the award is UK 0.90 pound Sterling, overseas \$4 US, or 20 recent IRCs. The cost of extra stickers is UK 0.20 pound Sterling, overseas 3 recent IRCs. If QSLs are to be returned, add 0.50 pound Sterling or 5 IRCs.



VHF/UHF Century Award offered by the British Amateur Radio Teleprinter Group.

**VHF/UHF Century Award.** This range of awards, offered by BARTG, is available to licensed amateurs, and to SWLs on a "heard" basis, on the submission of satisfactory proof of having worked/heard the necessary number of different stations using RTTY as the mode of communication.

The award is available separately for three different bands, and the minimum number of contacts on each band are as follows:

- 144 MHz—100 different stations worked/heard.
- 432 MHz—50 different stations worked/heard.
- 1296 MHz—10 different stations worked/heard.

Additional stickers are available for each additional 25 stations worked/heard up to a total of 250. On the 1296 MHz band the endorsements go up in steps of 10.

Application for the award may be made by any of the following methods.

- Submission of a check list of QSL cards held, listing call sign, date and time of contact, and report received. The awards manager will make random selection from this list and will ask to see those cards, which will be returned with the award.

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• Claims will also be accepted based on a check list as above, but the check list must be witnessed (with the QSL cards) and signed as correct by the awards manager of a national radio society, or by two officers of a recognized radio club.

• Claims can also be accepted based on a contest log submitted for any VHF/UHF contest sponsored by the British Amateur Radio Teleprinter Group. The claim for the award should be made at the same time as the log is submitted.

Cost of the award including postage and packing in the UK is 0.90 pound. Cost of additional stickers in the UK is 0.20 pound. The cost of the award to destinations outside the UK will depend on postal rates, but a quote is available free on request.



Members Award available from the British Amateur Radio Teleprinter Group.

**Members Award.** The basic requirement for the BARTG Members Award is the submission of proof of having worked or heard a minimum of 25 different members of the British Amateur Radio Teleprinter Group using RTTY as a mode of transmission. Contacts may be on any mixture of amateur bands, although the award can be endorsed for one-band operation if requested—e.g., "All 80 Metres," etc. Additional stickers are available for each additional 25 stations worked or heard.

Applications for the award may be made by either of the following methods.

• Submission of a check list of QSL cards held, listing call sign, date and time of contact, and report received. The awards manager will make a random selection from this list and will ask to see those cards, which will be returned with the award.

• Claims will also be accepted based on a check list as above, but the list must have been witnessed (with the QSL cards) and signed as correct by the awards manager of a national radio society, or by two officers of a recognized radio club.

*Please note:* Extracts from station logs or samples of "hard copy" are not acceptable as evidence, and this policy is in line with the normal rules for the issuance of awards as exercised by all major amateur radio societies.

Cost of the award, including postage and packing in the UK, is 0.90 pound. Cost of additional stickers in the UK is 0.20 pound. The cost of the award to destinations outside the UK will depend on postal rates, but a quote is available on request.

*Note:* I hope the new year is off to a good start for you!

73, Dorothy, WB9RCY

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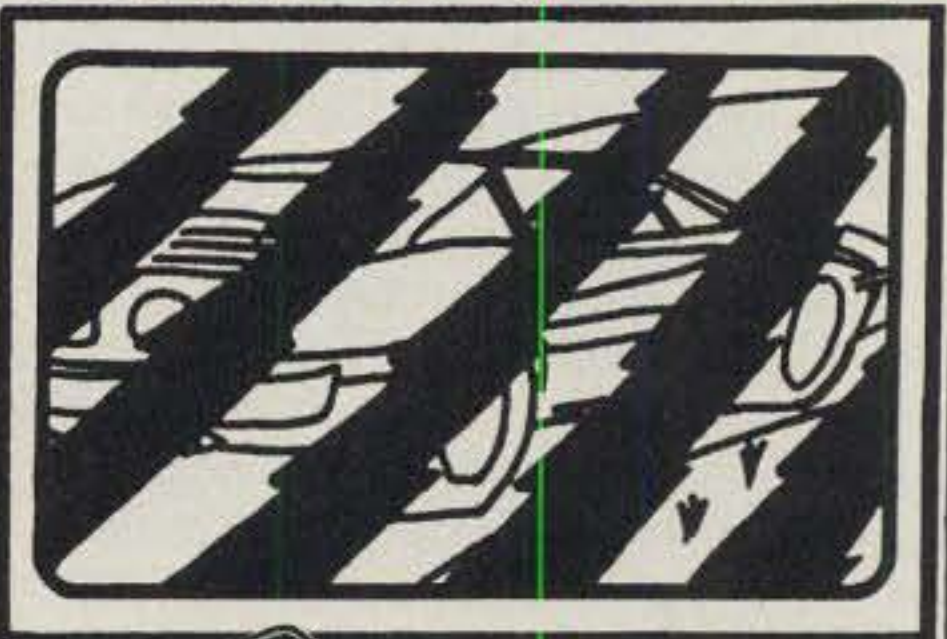
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# Contest Calendar

a monthly feature by  
FRANK ANZALONE, W1WY

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

I have always been interested in contests, and being directly associated with the CQ contest program for over 30 years, I find the subject matter in the *National Contest Journal* very interesting, but sometimes controversial.

For instance, there is the letter from a W8 who participates in contests but "I only submit logs in contests where I stand a pretty good chance of winning." He goes on to say he finds contesting great for filling in blank spaces for different awards. I wonder if he submits a log for those events.

Fortunately, the vast majority who participate in contest activity are more appreciative of the hard work and time put in by the many volunteers, and the expense picked up by the organizers, and they show their appreciation by submitting a report.

One does not have to be competitive on a world or national level to enjoy contest operating. Set your own standards—to be the best in your state within your own club, or to better your last year's score.

Most of the major contests have many categories of competition. In our CQ World Wide a single operator can operate all band, six different single bands, QRP, and ten different stateside areas. And how about the many regional areas in other countries? Have you tried to work all cantons, provinces, or call areas in some of the European activities? Try it. It's lots of sport and you don't have to put in a 24-hour effort to accomplish it. But send in your entry regardless of your score. You have the satisfaction of knowing you have accomplished what you set out to do.

I recall back in the early days of the World-Wide, I received a log from the legendary Don Wallace, W6AM, with a very modest score. I questioned Don, "How come all those rhombics and equipment and such a low score?" I don't remember Don's exact words, but he made no apologies for his low score. He was in it for his personal enjoyment, and sent in his log to make sure the friends he contacted would receive credit.

The Classic and Homebrew Exchange listed for Jan. 24-25, was received too late to include in last month's calendar. Rules are the same as those used in the fall edition in September. Logs go to: Jim Hanlon, W8KGI, 5560 Linworth Rd., Worthington, OH 43085.

14 Sherwood Road, Stamford, CT 06905

### Calendar of Events

Jan. 24-25	Classic Exchange
* Jan. 29-31	<b>CQ WW 160 M. CW Contest</b>
* Jan. 30-31	YL ISSB CW QSO Party
* Jan. 30-31	White Rose SWL Contest
* Jan. 30-31	French DX CW Contest
Jan. 30-31	UBA (Belgium) CW Contest
* Jn.30 -Fb.7	ARRL Novice Roundup
* Feb. 6	AGCW-DL Straight Key Pty
Feb. 6-7	RSGB 7 MHz Phone Contest
Feb. 6-7	Crazy 8's HF, VHF, UHF
Feb. 6-7	Vermont QSO Party
Feb. 6-7	New Hampshire QSO Party
Feb. 7	North America CW Sprint
Feb. 13-14	Dutch "PACC" Contest
Feb. 13-14	QCWA CW QSO Party
Feb. 13-15	YLRL YL-OM Phone Contest
Feb. 14	North America SSB Sprint
Feb. 20-21	ARRL DX CW Contest
Feb. 20-21	RSGB 7 MHz CW Contest
Feb. 22-26	Operation Search Contest
<b>Feb. 26-28</b>	<b>CQ WW 160 M. SSB Contest</b>
Feb. 27-28	Land of Legend Contest
* Feb. 27-28	French DX Phone Contest
Feb. 27-28	UBA (Belgium) SSB Contest
Feb. 27-29	YLRL YL-OM CW Contest
Mar. 5-6	ARRL DX Phone Contest
Mar. 12-13	QCWA Phone QSO Party
Mar. 12-13	RSGB Commonwealth Contest
Mar. 13	ZERO District QSO Party
Mar. 19-20	Virginia QSO Party
Mar. 19-20	YL ISSB Phone QSO Party
Mar. 19-21	BARTG Spring RTTY Contest
Mar. 20-21	Wisconsin QSO Party
<b>Mar. 26-27</b>	<b>CQ WW WPX SSB Contest</b>
Mar. 26-27	UBA SWL Phone Trophy
Apr. 9	Israel ARC Contest
<b>May 28-29</b>	<b>CQ WW WPX CW Contest</b>

\* Covered last month.

Deadline for the May issue is February 15th, and March 15th for the June issue. Using my home address will give you a few days grace.

73 for this time, Frank, W1WY

### U.B.A. (Belgium) Contest

CW: Jan. 30-31 SSB: Feb. 27-28  
1300Z Saturday to 1300Z Sunday

Organized by the Union of Belgian Amateurs this will be an annual affair the last full weekends of January and February.

**Classes:** Single operator, single and all band. Multi-operator, single transmitter, all band only. QRP, 10 watts. And SWL. Single operators are limited to 18 hours, off periods of at least 1 hour and clearly indicated in the log.

**Bands:** All five bands, 10-80 meters according to IARU band plan for Region 1.

**Exchange:** RS(T) and QSO number start-

ing with 001. Belgians will include their province. There are 9 provinces: AN, BT, HT, LB, LG, LU, NR, OV, WV.

**Scoring:** QSOs with ON, DA1, and DA2 count 10 points. With European communities 3 points (DL, I, F/TK, LX, PA, EI, G, OZ, SV, CT, EA). All other countries 1 point. Own country can be worked once per band for QSO credit.

**Multiplier:** Belgian provinces, 9 per band. Belgian prefixes, 8 per band. European communities, 11 per band.

**Final Score:** Total QSO points times the total multiplier from each band (maximum of 28 per band).

**Awards:** The new "UBA Award" to the highest scoring station in each class in each country. Certificates to other participants. There are other special awards. The Worked ALL Belgian Provinces Award for contacts with all provinces on two different bands is available without proof of QSL cards.

Use a different log sheet for each band. Include a summary sheet showing the scoring, off periods, and other essential data. The usual signed declaration is also requested.

All entries must be postmarked no later than 30 days after the end of the contest and go to: UBA HF Contest Committee, Att: Galicia Jan, ON6JG, Oude Gendarierstraat, 62, B-3100 Heist op Den Berg, Belgium.

### RSGB 7 MHz Contest

SSB: Feb. 6-7 CW: Feb. 20-21  
1200Z Saturday to 0900Z Sunday

It's the world working the British Isles on SSB 7.040-7.100 and CW 7.000-7.030 MHz. (How about the US on SSB, split frequency?)

Following rules are for areas outside the British Isles.

**Exchange:** RS(T) plus a serial number starting with 001.

**Scoring:** Europeans get 5 points for each B.I. contact. All other areas earn 15 points per contact. Contacts with GB5CC will count as a country multiplier and 50 points for all contestants.

**Multiplier:** All other areas count each different B.I. prefix worked (i.e., G2, GD3, GI4, etc.). Total of 49 available.

**Final Score:** Total QSO points times the total prefix multiplier worked.

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

There is an SWL section. Only B.I. sta-





**HF Equipment Regular SALE**

IC-761 HF xcvr/SW rcvr/ps/AT ..... 2499.00 2149  
 HM-36 Scanning hand microphone 47.00  
 SP-20 Ext. speaker w/audio filter .. 149.00 139<sup>95</sup>  
 FL-101 250 Hz 1st IF CW filter ..... 73.50  
 FL-53A 250 Hz 2nd IF CW filter .... 115.00 109<sup>95</sup>  
 FL-102 6 kHz AM filter ..... 59.00  
 EX-310 Voice synthesizer..... 59.00



IC-751A 9-band xcvr/1-30 MHz rcvr 1699.00 1449  
 PS-35 Internal power supply ..... 219.00 199<sup>95</sup>  
 FL-32A 500 Hz CW filter (1st IF).... 69.00  
 FL-63A 250 Hz CW filter (1st IF).... 59.00  
 FL-52A 500 Hz CW filter (2nd IF) ... 115.00 109<sup>95</sup>  
 FL-53A 250 Hz CW filter (2nd IF) ... 115.00 109<sup>95</sup>  
 FL-33 AM filter..... 49.00  
 FL-70 2.8 kHz wide SSB filter ..... 59.00  
 RC-10 External frequency controller 49.00



IC-735 HF transceiver/SW rcvr/mic 999.00 869<sup>95</sup>  
 PS-55 External power supply..... 219.00 199<sup>95</sup>  
 AT-150 Automatic antenna tuner ... 445.00 389<sup>95</sup>  
 FL-32A 500 Hz CW filter ..... 69.00  
 EX-243 Electronic keyer unit ..... 64.50  
 UT-30 Tone encoder ..... 18.50

**Other Accessories Regular SALE**

IC-2KL 160-15m solid state amp w/ps 1999.00 1699  
 PS-15 20A external power supply ..... 175.00 159<sup>95</sup>  
 PS-30 Systems p/s w/cord, 6-pin plug 319.00 289<sup>95</sup>  
 MB Mobile mount, 735/751A/761A... 25.99  
 SP-3 External speaker ..... 65.00  
 SP-7 Small external speaker ..... 49.00  
 CR-64 High stab. ref. xtal for 751A... 79.00  
 PP-1 Speaker/patch ..... 179.00 164<sup>95</sup>  
 SM-6 Desk microphone ..... 47.95  
 SM-8 Desk mic - two cables, Scan.... 89.00  
 SM-10 Compressor/graph EQ, 8 pin mic 149.00 139<sup>95</sup>  
 AT-100 100W 8-band auto. antenna tuner 445.00 389<sup>95</sup>  
 AT-500 500W 9-band auto. antenna tuner 589.00 519<sup>95</sup>  
 AH-2 8-band tuner w/mount & whip 659.00 589<sup>95</sup>  
 AH-2A Antenna tuner system, only.... 519.00 449<sup>95</sup>  
 GC-5 World clock ..... 91.95 89<sup>95</sup>

**VHF/UHF base multi-modes Regular SALE**

IC-275A 25W 2m FM/SSB/CW w/ps 1235.00 1079  
 IC-275H 100W 2m FM/SSB/CW ..... 1389.00 1229  
 IC-375A 25W 220 FM/SSB/CW..... 1399.00 1249  
 IC-475A 25W 440 FM/SSB/CW w/ps 1399.00 1249



# ICOM

IC-475H 75W 440 FM/SSB/CW..... 1599.00 1429  
 IC-575A 25W 6/10m xcvr w/ps 1399.00 1249



IC-471A\* 25W 430-450.... **CLOSEOUT** 979.00 749<sup>95</sup>  
 PS-25 Internal power supply ..... 125.00 114<sup>95</sup>  
 AG-1\* Mast mounted preamplifier ... 99.50  
 IC-471H\* 75W 430-450 ... **CLOSEOUT** 1399.00 989<sup>95</sup>  
 PS-35 Internal power supply ..... 219.00 199<sup>95</sup>  
 AG-35\* Mast mounted preamplifier 99.75

\*Preamp \$9<sup>95</sup> with 471A or 471H Purchase

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

SM-6 Desk microphone ..... 47.95  
 EX-310 Voice synthesizer ..... 59.00  
 TS-32 CommSpec encode/decoder.... 59.95  
 UT-15 Encoder/decoder interface ... 33.95  
 UT-15S UT-15S w/TS-32 installed.... 96.00

**VHF/UHF mobile multi-modes Regular SALE**

IC-290H 25W 2m SSB/FM **CLOSEOUT** 639.00 549<sup>95</sup>  
 IC-490A 10W 430-440.... **CLOSEOUT** 699.00 399<sup>95</sup>

**VHF/UHF/1.2 GHz FM Regular SALE**

IC-27A Compact 25W 2m FM w/TTP mic 429.00 379<sup>95</sup>  
 IC-27H Compact 45W 2m FM w/TTP mic 459.00 399<sup>95</sup>  
 IC-37A Compact 25W 220 FM, TTP mic 499.00 439<sup>95</sup>  
 IC-47A Compact 25W 440 FM, TTP mic 549.00 489<sup>95</sup>  
 PS-45 Compact 8A power supply ... 145.00 134<sup>95</sup>  
 UT-16/EX-388 Voice synthesizer ... 34.99  
 SP-10 Slim-line external speaker ... 35.99  
 IC-28A 25W 2m FM, TTP mic ..... 469.00 409<sup>95</sup>  
 IC-28H 45W 2m FM, TTP mic ..... 499.00 439<sup>95</sup>  
 IC-38A 25W 220 FM, TTP mic..... 489.00 429<sup>95</sup>  
 IC-48A 25W 440-450 FM, TTP mic .... 509.00 449<sup>95</sup>  
 HM-14 Extra TTP microphone ..... 59.00  
 UT-28 Digital code squelch ..... 39.50  
 UT-29 Tone squelch decoder ..... 46.00  
 HM-16 Speaker/microphone ..... 34.00

IC-900A Transceiver controller..... 589.00 529<sup>95</sup>  
 UX-29A 2m 25W unit ..... 295.00 269<sup>95</sup>  
 UX-29H 2m 45W unit ..... 339.00 309<sup>95</sup>  
 UX-39A 220MHz 25W unit ..... 349.00 319<sup>95</sup>  
 UX-49A 440MHz 25W unit ..... 339.00 309<sup>95</sup>  
 UX-59A 6m 10W unit ..... 339.00 309<sup>95</sup>  
 IC-3200A 25W 2m/440 FM w/TTP.... 649.00 579<sup>95</sup>  
 UT-23 Voice synthesizer..... 34.99  
 AH-32 2m/440 Dual Band antenna ... 39.00  
 AHB-32 Trunk-lip mount ..... 35.00  
 Larsen PO-K Roof mount ..... 20.00  
 Larsen PO-TLM Trunk-lip mount.... 22.00  
 Larsen PO-MM Magnetic mount .... 22.00  
 IC-1200A 10W 1.2GHz FM Mobile.... 699.00 629<sup>95</sup>  
 IC-1271A 10W 1.2GHz SSB/CW Base 1269.00 1129  
 AG-1200 Mast mounted preamplifier 105.00  
 PS-25 Internal power supply ..... 125.00 114<sup>95</sup>  
 EX-310 Voice synthesizer..... 59.00  
 TV-1200 ATV interface unit..... 139.00 129<sup>95</sup>  
 UT-15S CTCSS encoder/decoder ... 96.00  
 RP-1210 1.2GHz 10W 99 ch FM xcvr 1529.00 1349  
 RP-2210 220MHz 25W repeater ..... 1499.00 1329  
 RP-3010 440MHz 10W FM repeater... 1299.00 1149



**Hand-helds Regular SALE**

IC-2A 2-meters..... 289.00 259<sup>95</sup>  
 IC-2AT with TTP..... 319.00 279<sup>95</sup>  
 IC-3AT 220 MHz, TTP 349.00 299<sup>95</sup>  
 IC-4AT 440 MHz, TTP 349.00 299<sup>95</sup>  
 IC-02AT/High Power 409.00 349<sup>95</sup>  
 IC-03AT for 220 MHz 449.00 389<sup>95</sup>  
 IC-04AT for 440 MHz 449.00 389<sup>95</sup>  
 IC-u2AT with TTP ..... 329.00 289<sup>95</sup>  
 IC-u4AT 440 MHz, TTP 369.00 329<sup>95</sup>

Accessories for micros - CALL \$

IC-12AT 1W 1.2GHz FM HT/batt/cgr/TTP 473.00 419<sup>95</sup>  
 A-2 5W PEP synth. aircraft HT..... 499.00 449<sup>95</sup>  
 A-20 Synth. aircraft HT w/VOR..... 599.00 529<sup>95</sup>

**Accessories for all except micros Regular**

BP-7 425mah/13.2V Nicad Pak - use BC-35 79.00  
 BP-8 800mah/8.4V Nicad Pak - use BC-35... 79.00  
 BC-35 Drop in desk charger for all batteries 79.00  
 BC-16U Wall charger for BP7/BP8..... 21.25  
 LC-11 Vinyl case for Dix using BP-3 ..... 20.50  
 LC-14 Vinyl case for Dix using BP-7/8 ..... 20.50  
 LC-02AT Leather case for Dix models w/BP-7/8 54.50

**Accessories for IC and IC-O series Regular**

BP-2 425mah/7.2V Nicad Pak - use BC35.... 49.00  
 BP-3 Extra Std. 250 mah/8.4V Nicad Pak .... 39.50  
 BP-4 Alkaline battery case ..... 16.00  
 BP-5 425mah/10.8V Nicad Pak - use BC35 65.00  
 CA-5 5/8-wave telescoping 2m antenna ..... 19.95  
 FA-2 Extra 2m flexible antenna ..... 12.00  
 CP-1 Cig. lighter plug/cord for BP3 or Dix .... 13.50  
 CP-10 Battery separation cable w/clip ..... 22.50  
 DC-1 DC operation pak for standard models 24.50  
 MB-16D Mobile mtg. bkt for all HTs..... 25.99  
 LC-2AT Leather case for standard models.... 54.50  
 RB-1 Vinyl waterproof radio bag..... 34.95  
 HH-SS Handheld shoulder strap..... 16.95  
 HM-9 Speaker microphone..... 47.00  
 HS-10 Boom microphone/headset..... 24.50  
 HS-10SA Vox unit for HS-10 & Deluxe only 24.50  
 HS-10SB PTT unit for HS-10..... 24.50  
 ML-1 2m 2.3w in/10w out amplifier ..... **SALE** 99.95  
 SS-32M CommSpec 32-tone encoder ..... 29.95

**Receivers Regular SALE**

R-71A 100kHz to 30MHz receiver..... \$979.00 849<sup>95</sup>  
 RC-11 Infrared remote controller.... 70.99  
 FL-32A 500 Hz CW filter ..... 69.00  
 FL-63A 250 Hz CW filter (1st IF) .... 59.00  
 FL-44A SSB filter (2nd IF)..... 178.00 159<sup>95</sup>  
 EX-257 FM unit..... 49.00  
 EX-310 Voice synthesizer ..... 59.00  
 CR-64 High stability oscillator xtal 79.00  
 SP-3 External speaker..... 65.00  
 CK-70 (EX-299) 12V DC option..... 12.99  
 MB-12 Mobile mount ..... 25.99  
 R-7000 25MHz to 2GHz scan rcvr ..... 1139.00 999<sup>95</sup>  
 RC-12 Infrared remote controller.... 70.99  
 EX-310 Voice synthesizer ..... 59.00  
 TV-R7000 ATV unit..... 139.00 129<sup>95</sup>  
 AH-7000 Radiating antenna ..... 99.00 (8)

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tions are to be logged. Scoring same as above. The same station may be logged only once, and the station being worked may only be repeated once in every three contacts logged.

**Awards:** Certificates of merit will be awarded to the first, second, and third place scores to European and to non-European stations.

Include a summary sheet showing the scoring and other essential information, including the usual signed declaration that all rules and regulations have been observed.

SSB logs must be received by March 30th and CW by April 23rd. They go to: G3HCT, HF Contest Committee, Brookland, Ullenhall, Nr. Henley in Arden, Warks. B95 5NW, England.

### Crazy 8's HF, VHF, UHF Contest

1400Z Sat. to 2300Z Sun., Feb. 6-7

As the name implies, this is a crazy one organized by the Cuyahoga Falls ARC of Ohio. You can use all bands, all modes, and all types of transmission.

Stations in the 8th call district can work everyone. Those outside the district work 8th district stations only.

**Exchange:** State, province, or DX country. Grid locator for VHF/UHF stations.

**Scoring:** One point per QSL on each band (1.8 MHz to 1296 MHz, except 10 MHz).

**Multiplier:** There are two groups of multipliers:

1. Number of bands used (minimum of 3 QSOs per band). VHF/UHF grid squares worked. States and DX countries worked.

2. Number of modes and type of contacts made. (minimum of 3 QSOs, for a credit of 8 points, in each of 18 different categories.)

**Final Score:** Total QSOs times the sum of the Group 1 and 2 multiplier. (A total of 21 available.)

*(As I said last year, this is a crazy one. You'll never make it without an official scoring sheet. Better send a large SASE to KA8NRC for details.—ed.)*

**Awards:** All entrants will receive a certificate of participation and one of special accomplishment to those qualifying (enclose a 37¢ SASE). There is a plaque for the "Top Banana" in the contest.

Send your logs and requests to: Anthony Luscre, KA8NRC, 5441 Park Vista Court, Stow, OH 44224. (Mailing deadline is March 15th.)

### Vermont QSO Party

0001Z Sat. to 2400Z Sun., Feb. 6-7

This event is again being sponsored by the Central Vermont ARC. The same station may be worked three times per band—once each on phone, CW, and RTTY—for QSO points.

**Exchange:** RS(T) and QTH. County for VT; state, province, or DX country for others.

**Scoring:** One point per phone QSO; 2 points if on CW or RTTY. VT stations multiply total by (VT counties + states + VE provinces + DX countries) worked. All others use VT counties for their multiplier (maximum of 14). Work the club station W1BD and add 20 bonus points to your score. VT counties: AN, BN, CA, CN, EX, FN, GI, LA, OG, OL, RU, WA, WM, WR.

**Frequencies:** Phone—3910, 7230, 14260, 14320, 21360, 28570, 50110, 144.2 (no repeaters). CW—3540, 3720, 7040, 7120, 14040, 21040, 21140, 28040. RTTY—3620 and 90 kHz from lower edge of other bands.

**Awards:** Certificates to the top-scoring station in each state, VE province, and DX country, and each Vermont station submitting a log. There is an annual plaque to the highest scoring Vermont station.

**Frequencies:** Phone—the first 25 kHz up from the beginning of the general phone band edge. Novice—10 meter band. And 50110, 144.2. CW—3540, 3720, 7040, 7120, 14040, 21040, 21140, 28040. RTTY—3620 and 90 kHz from lower edge on other bands.

The W/VT Award is available to stations working 13 of the 14 Vermont counties.

Official log forms are available by sending a large SASE to WA1PDN.

Mailing deadline for party entries is March 1st to: D. Loverin, WA1PDN, 50 Liberty Street, Montpelier, VT 05602.

### New Hampshire QSO Party

1900Z Sat. to 0700Z Sun., Feb. 6-7  
1400Z Sun. to 0200Z Mon., Feb. 7-8

The New Hampshire ARA is again sponsoring this year's party. The same station may be worked on each band and mode for QSO points, but the multiplier is counted once only. NH to NH contacts are permitted for QSO and multiplier credit.

**Exchange:** RS(T) and QTH. County for NH stations; state, VE province, or DX country for others.

**Scoring:** One point per phone QSO, 2 points per CW/RTTY, 5 points per Novice/Tech.

NH stations multiply total QSO points by number of NH counties, states, provinces, and DX countries worked (U.S., Canada, Alaska, and Hawaii not DX countries).

Others use NH counties for their multiplier (maximum of 10).

Add 20 bonus points to final score for each QSO with a NHARA member station: WB1CAG, WB1FFZ, N1BYQ, K1RD, W1WQM, W1OC, W1FN (maximum of 140).

**Frequencies:** CW—1810, 3535, 7035, 14035, 21035, 28035. Phone—1875, 3935, 7235, 14280, 21380, 28380, 50115, 144205 (no repeaters). Novice—3735, 7135, 21135, 28135, 28380.

**Awards:** Certificates to top scorers in each NH county, each state, province, and DX country (5 QSO minimum).

Mailing deadline for logs is March 12th to: Mount Moriah Repeater Society, c/o Bud Valcount, N1BYQ, 19 Teague Drive, Salem, NH 03079. Include a large SASE for a copy of the results.

### North American "Sprint"

CW: Feb. 7 SSB: Feb. 14  
Sunday 0000Z to 0359Z (Sat. night)

This is the spring edition of the "Sprint" run by the National Contest Journal. As the name implies, it's a shorty, only four hours long.

North Americans will be contacting other North American stations as well as stations in other countries, single operator only. North American boundaries are as defined by the rules used in the CQ WW DX Contest.

**Exchange:** Call, QSO no., name, and QTH (state, Canadian area, or country).

**Scoring:** Multiply total QSOs by the sum of states, Canadian areas, and other North American countries worked for your final score (U.S. and VE not countries; KH6 not a state). There are eight Canadian multipliers: VE1/VO1/VO2, VE2-VE7, VY1/VE8. Non-North American countries do not count as a multiplier.

**Frequencies:** Three bands only: 80, 40, and 20 meters. CW—3540, 7040, 14040. SSB—3900, 7225, 14280. (Plus or minus QRM.)

**Awards:** A trophy to the highest scoring entrant. Certificates to the top scorer in each U.S. call area, Canada, and other country. Also to the ten top scores, to each member of the winning team, and the highest scoring entrant on each team.

Team competition is limited to a maximum of 10 operators as a single unit. Pre-contest registration is required for each team before the start of the contest—with W6OAT for the CW and K7GM for the SSB.

There are other detailed rules, a special QSY rule, disqualifying penalties, etc. I suggest you write to W6OAT or K7GM if you do not have a copy of the *Contest Journal*.

Entries must be received no later than 30 days after the end of each "Sprint."

The CW go to: Rusty Epps, W6OAT, 651 Handley Trail, Redwood City, CA 94062.

The SSB to: Rick Niswander, K7GM, 910 W. Claremont, Phoenix, AZ 85013.

### 1987 "PACC" Results U.S.A. and Canada

KA1DWX	4,191
W1END	1,140
W1WY	600
W1DMD	588
W1OPJ	144
KF1B	42
<b>KA2PHQ</b>	<b>260</b>
W2ION	80
<b>KZ3B</b>	<b>231</b>
<b>K4FPF</b>	<b>540</b>
WK4F	220
W4YN	144
WA4VEK	54
<b>W5FO</b>	<b>816</b>
W5FS	407
N5TP	308
W5EIJ	54
<b>K6EID</b>	<b>308</b>
W6UQF	286
KN6O	70
W6NNV	54
<b>N6ZX/7</b>	<b>176</b>
<b>N9DJ</b>	<b>854</b>
K9WA	420
<b>VE1ASJ</b>	<b>860</b>
<b>VE3FGL</b>	<b>4,260</b>
VE3MR	704
<b>VE4MF</b>	<b>300</b>
<b>VO1SA</b>	<b>3,312</b>
VO1QST	2,160

Certificate winners are listed in boldface.

### Dutch "PACC" Contest

1200Z Sat. to 1200Z Sun., Feb. 13-14

It's the world working The Netherlands on all six bands, 1.8 through 29.7 MHz, in the band sections recommended for contest operation by the IARU. The same station may be worked on each band, but on one mode only, phone or CW, for QSO and multiplier credit.

**Categories:** Single operator, multi-operator, and SWL.

**Exchange:** RS(T) plus a QSO number starting with 001. Dutch stations will add two letters to identify their province. There are 12 provinces: DR, FR, GD, GR, LB, NB, NH, OV, UT, FL, ZH, and ZL.

**Scoring:** Each QSO with a PA/PB/PI station counts one point. DX stations determine their multiplier by the number of provinces worked on each band (maximum of 72).

**Final Score:** Total number of QSO's times the number of provinces worked on each band.

**Awards:** Certificates to the top scoring station in each category in each country and call areas of JA, LU, PY, UA9/0, VE/VO, VK, W/K, ZL, and ZS. Also second- and third-place awards if returns justify.

SWL's must log the call of the Dutch station as well as the station being worked and both serial numbers. Scoring same as above. Indicate the multiplier in a separate column in your log only the first time it is worked on each band. In-

clude a summary sheet showing the scoring, your name and address in block letters, and the usual signed declaration.

Mailing deadline is March 31st to: PACC Contest, Att: F. Th. Oosthoek, PA0INA, P.O. Box 499, 4600 AL Bergen op Zoom, The Netherlands.

### QCWA QSO Party

CW: Feb. 13-14 SSB: March 12-13  
0001Z Sat. to 2400Z Sun.

This is the 31st annual QSO Party for the Quarter Century Wireless Association. It's a closed, fun party open to QCWA members only to renew old friendships and meet new members. Rules are the same as those used last year and were given in detail in the QCWA News. Following is a brief summary.

CW and SSB are separate activities and require separate log entries. The same member may be contacted on each band for QSO points, but the chapter multiplier is counted once only. The "AL" multiplier can be used once for each state, province, and DX country worked.

**Exchange:** QSO number, name, chapter (name or number), and state. If no chapter affiliation use "at large," or "AL."

**Points:** One point for each QCWA member worked on each band.

**Multiplier:** Each new chapter and one "AL" contacted, counted as indicated above.

**Score:** Total number of QSOs multiplied by the sum of different chapters worked, plus one "AL" contact for each different state, province, and DX country worked.

**Frequencies:** CW—3545, 7045, 14045, 21055, 28055. SSB—3915, 7245, 14295, 21365, 28615. Plus or minus 15 kHz. Also 160 meters and 6 and 2 meters simplex.

**Awards:** Plaques to the top scorer in each party. Party QSOs can be applied to the many QCWA awards. Make your request on the summary sheet of your entry.

The standard QCWA log form has 20 contacts to the page. If you prepare your own, have columns for time in GMT, station worked, QSO number sent and received, name, chapter, state, band, RS(T), points, and multiplier.

Mailing deadline for both CW and SSB is March 28th. CW logs go to: E.B. Charlton, W5MD, 1533 Outrigger Dr., Baton Rouge, LA 70816. SSB logs go to: William L. Goforth, W5URR, 3540 Delaware St., Baton Rouge, LA 70805.

### YL-OM Contest

SSB: Feb. 13-15 CW: Feb. 27-29  
1400Z Sat. to 0200Z Mon.

It's the YLs working the OMs in this annual activity organized by the YLRL. All bands may be used, but cross-band contacts or contacts with stations on net frequencies do not count.

Phone and CW are separate contests and require separate logs. The same sta-

tion may be worked once on each band. Use only 24 hours out of the 36-hour contest period and indicate breaks in your log.

**Exchange:** QSO number, RS(T), and state, province, or country.

**Scoring:** Each QSO is worth 1 point. Multiply total by the number of US states, VE provinces, and DX countries worked.

There is also a power multiplier of 1.5 for stations running 100 watts or less on CW, and 200 watts PEP on SSB. Multiply your final score by the above factor if you qualify.

There is a penalty of three contacts for each duplicate contact removed from the log by the contest committee.

**Frequencies:** CW—3555, 7055, 14055, 21135, 28195. SSB—3955, 7255, 14265, 21395, 28395. Plus or minus 15 kHz.

**Awards:** First-place cups to both YL and OM winners in each contest; second- and third-place winners will receive certificates. Top scorers in each US and VE call area and each DX country will also receive certificates, provided there are at least two logs from that area or country with a minimum of ten contacts.

All entries must be postmarked no later than March 15th. This year they go to: YLRL V.P., Carol Shrader, WI4K, 4744 Thoroughgood Dr., Virginia Beach, VA 23455 USA.

### ARRL International DX Contest

CW: Feb. 20-21 Phone: March 5-6  
0000Z Saturday to 2400Z Sunday

Rules are the same as last year. However, I strongly recommend that you study the announcement in the December issue of QST for more details. Also send a large SASE (2 IRCs for DX) for sample log and entry forms.

All bands may be used, 1.8 through 28 MHz, but not 10, 18, or 24 MHz. Aeronautical or maritime mobile stations cannot be worked for contest credit. Following is a brief outline.

**Categories:** Single operator, both single and all band. Multi-operator, one transmitter and two transmitters. Also multi-operator, multi-transmitter. Also QRP, all band only (5 watts or less output). Multi one and two transmitter stations must remain on a band at least 10 minutes once a contact is made. Multi-transmitter stations no limit, but only one signal per band.

**Exchange:** RS(T) and state or province for W/VE; RS(T) and power input for DX stations (three-digit number).

**QSO points:** W/VE stations earn three points for each DX contact. DX get three points for each W/VE contact.

**Multiplier:** Each DXCC country worked on each band for W/VEs. DX stations use US states (48), District of Columbia (DC), and VE districts VE1-8, plus VO and VY1 for their multiplier (10). (Maximum multiplier of 58 per band.)

**Final Score:** Total QSO points times the sum of the multiplier from each band. Entries with 500 or more QSOs must include a QSO check sheet.

**Awards:** Certificates given in each category, in each country, and in each ARRL section, plus a wide selection of plaques. Also certificates to DX stations making over 500 QSOs.

Disqualification regulations will be strictly enforced and are listed in the official rules. Mailing deadline for all entries is April 7th, and they go to: ARRL DX Contest, 225 Main Street, Newington, CT 06111.

### Operation Search Contest

0800 Mon. to 2000 Fri. (EST) Feb. 22-26

This is the second year for this activity sponsored by the Council for the Advancement of Amateur Radio in the New York City schools, in association with the ARRL Hudson Division Education Task Force. Rules have been modified and improved.

**Classes:** (I) Individual Single Operator, (C) Non-school Club or group, and (S) School Club.

**Exchange:** RS(T), class, state, or DX country.

**Scoring:** One point for phone QSOs, 2 points for CW. (Packet or RTTY count as CW.)

**Multiplier:** State plus DX country plus

2X for "C" class QSOs plus 5X for "S" class QSOs.

**Final Score:** Total QSO points times sum of multiplier.

No more than 24 hours of the 60 hour contest period may be used for scoring. Off periods must be at least 30 minutes and clearly indicated in the log.

The same station may be worked on both modes (and it is assumed on each band).

**Awards:** Certificates to the three top entries in each class.

Check sheets are required for entries with 100 or more contacts. A summary sheet showing the scoring and signatures of all operators, including club officers or trustees, is also requested.

Postmark entries within 30 days after end of contest to: Operation Search, Att: Martin Smity, KA2NRR, 1021 East 81st Street, Brooklyn, NY 11236.

(Include a large SASE for copy of results or for more information about Operation Search.)

### CQ WW 160 Meter SSB Contest

2200Z Fri. to 1600Z Sun., Feb. 26-28

Just a reminder that the SSB section of our 160 Meter Contest will be coming up the last full weekend of this month.

Extensive coverage has been given to this event, with complete rules in the November issue and a briefing in last month's Calendar. Therefore, it would

serve no purpose to repeat them again. They are the same rules that have been used these past many years and are well known worldwide.

Mailing deadline for your entry in last month's CW contest is February 29th, and March 31st for this month's SSB section.

They can be sent directly to the 160 Contest Director, Donald McClenon, N4IN, 3075 Florida Ave., Melbourne, FL 32904. And, of course, they can always be sent to the CQ office. CQ 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. (Be sure to indicate CW or SSB on the envelope.)

### Land of Legend Contest

1600Z Sat. to 2359Z Sun., Feb. 27-28

This is a new one sponsored by the Newark ARA of Ohio, the object being to activate club participation and for certificate hunters.

Look for club members on 3860, 7235, 14250, 21335, and 28450 kHz on SSB.

Exchange a signal report, your name, and QTH.

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Send your log and a large SASE by March 31st to: Newark A.R.A., P.O. Box 149, Newark, OH 43005.

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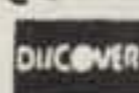
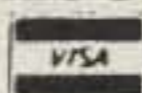
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## THE SCIENCE OF PREDICTING RADIO CONDITIONS

The Royal Observatory of Belgium reports a monthly median sunspot number of 61 for October 1987. Activity peaked with a count of 101 on October 15th and 16th, and was as low as 22 on the 24th. This results in a smoothed sunspot number of 24 centered on April 1987, as Cycle 22 continues to increase slowly. A smoothed sunspot number in the mid to upper 40s is expected for February 1988.

There was a corresponding increase in the 10.7 cm solar flux level during October. The Algonquin Radio Observatory in Ottawa, Canada reported a mean value of 98 for the month.

### Forecast for Cycle 22

Several predictions for the probable course of the new solar cycle, Cycle 22, made by leading solar experts were discussed in last month's column. Of all the predictions made for the peak of the previous cycle, Cycle 21, the *Sargent-Ohl* prediction proved to be closest to the observed date and value. The *Sargent-Ohl* prediction for the peak of the new cycle is shown graphically in fig. 1. They predict the cycle to peak during May 1991 with a smoothed sunspot count of 118.6. This data was reported in private correspondence, and has also been published by the Space Environment Services Center (SESC), Boulder, Colorado in Report PRF 626, September 1, 1987.

Evidence of the new cycle's effect upon 6 meter F2-layer ionosphere propagation was received recently from John Butrovich, W5UWB. He reports what appears to be the first openings on this band via F2 reflection during the new cycle. On September 20th at 2028 GMT he worked HC2FG from his QTH at Kingsville, Texas. This was followed during the next two hours with contacts with OA8ABT and HK1BAU, as well as several backscatter contacts with U.S. 5th call area stations.

### CQ World-Wide DX Phone Contest Critique

The High Normal conditions predicted in this column for October 24th, the first day of the Phone Contest, seem to have occurred. The 10.7 cm solar flux reported for the day was 88, and the geomagnetic A-index was 15 at mid-latitudes and 14 at high latitudes. This combination of solar flux and geomagnetic indices is typical of High Normal conditions. Initial reports

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### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for February 1988

Propagation Index .....	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 5-6, 16, 19	A	A	B	C
High Normal: 4, 7-10, 17, 20, 23	A	B	C	C-D
Low Normal: 3, 14-15, 18, 21-22, 24, 26-27	A-B	B-C	C-D	D-E
Below Normal: 1, 11, 13, 25, 28-29	B-C	C-D	D-E	E
Disturbed: 2, 12	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 S1 and S3, and with considerable fading and noise.

E—No opening expected.

### HOW TO USE THIS FORECAST

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

from contest participants appear to agree that conditions on October 24th were much as predicted.

Conditions were expected to drop somewhat on the 25th, to vary between *High and Low Normal*. Actual conditions seem to have been somewhat more variable, all the way from High Normal to Disturbed during the course of the day! Solar flux was reported to be 93, somewhat higher than on the previous day. The geomagnetic A-index at mid-latitudes was 18. This combination is borderline between High and Low Normal, much as expected. But trouble occurred at higher latitudes. A local radio storm developed causing the A-index in that area to climb to 44, in the Disturbed region. At times during the day conditions were poor for openings passing through or near to the polar regions. At least one report of visible auroral displays has been received from Sweden, but it is likely that similar displays occurred over northern Canada and Alaska. Initial reports from contest participants seem to agree that conditions on 10 and 15 meters were not as good on the 25th as they were on the first

day of the contest. A number of reports, however, noted an improvement in conditions on the lower frequency bands. This often happens with certain types of radio storms. All in all, the 1987 Phone Contest seems to have been a good one, but perhaps not quite as good as forecast.

### Computer Program for CQ Propagation Charts

An interesting letter was received recently from Jack Baldwin, who has written a small Basic computer program for the bimonthly CQ DX Propagation Charts. Data entry has been made simple, according to Jack, and corresponds to the format of the charts. The advantage of the program is that the data in the charts can easily be rearranged by country, by band, by time, or by any of the given variables. The program also gives time in GMT as well as in local time.

Jack is willing to make a written copy of the program available without charge for an SASE. If you provide him with a formatted disk, he will copy the program for either IBM-type PCs or the TRS80. Be sure to include postage for return of the disk. Jack's address is: Mr. Jack Baldwin, 2423 W. Tucana Street, Tucson, AZ 85745.

### DX Conditions

A seasonal decline is expected in 10 meter DX openings during February, but some good ones should still be possible, especially during periods when conditions are High or Above Normal. The band should occasionally open towards Europe and the east, particularly from the eastern half of the country, between 9 a.m. and noon. Better conditions should exist towards South America and various regions of Africa, with fairly regular openings possible between 1 and 5 p.m., and occasionally as early as 9 a.m. Some good openings are expected towards Oceania and Asia between 2 and 6 p.m., but these should favor the western half of the country.

Fifteen meters looks good for worldwide DX during most of the daylight hours. The band is expected to open first towards Europe, Africa, and the east about 9 a.m., and often remain open to as late as 2 p.m. Openings towards South America should be possible throughout the day, with conditions peeking between noon and 4 p.m. Openings towards Oceania, the Far East, and Asia look best between 4 and 8 p.m., favoring the western

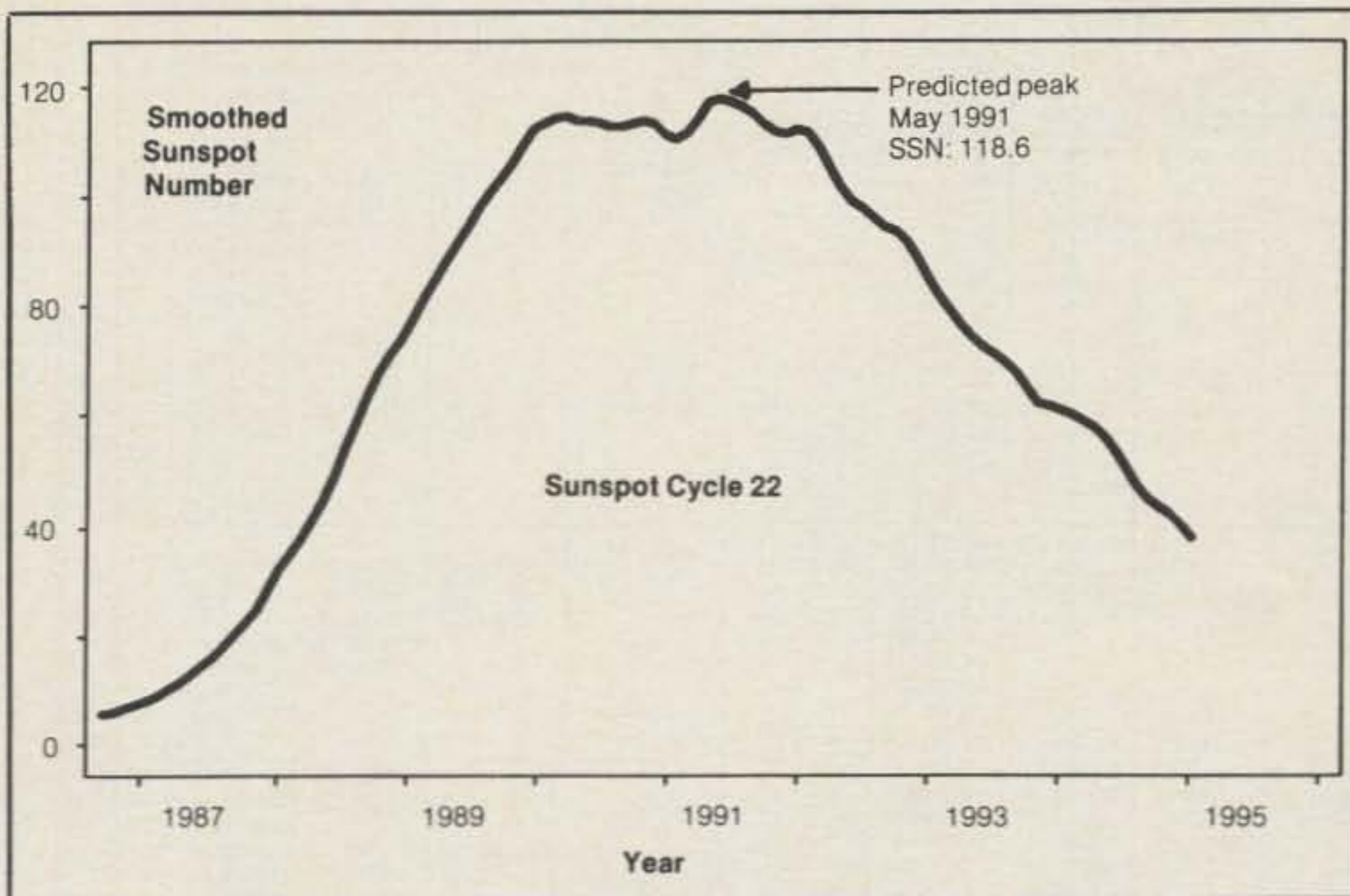


Fig. 1— Predicted sunspot numbers from the Sargent-Ohl method.

states. The path to Antarctica should peak on 15 meters between 4 and 7 p.m.

On 20 meters look for a window of fairly good openings in almost all directions for an hour or two after sunrise. The band should peak again toward Europe and the east between 11 a.m. and 3 p.m. in the eastern half of the country and between noon and 2 p.m. in the west. Towards Africa, propagation should be best on this band between 2 and 6 p.m. Best bet for long-path openings from the western states to Europe and Africa is for a period of about two hours immediately after sunrise. Openings towards the south should peak again during the late afternoon, with the band remaining open towards South America until as late as midnight when conditions are High or Above Normal. Check until midnight for openings to Antarctica as well. Evening openings on 20 meters should also be possible to Oceania, the Far East, and Asia, with signals expected to peak between 7 and 9 p.m. in the eastern states, and 7 to 11 p.m. in the west.

Fairly good 40 meter openings are forecast to most areas of the world during the hours of darkness in February. Check between 7 p.m. and 2 a.m. for openings to Europe; between 7 p.m. and midnight towards Africa; and between 8 p.m. and 5 a.m. for openings towards the south. From the West Coast, the band should open to Oceania, the Far East, and Asia between midnight and 7 a.m., with openings extending towards the East Coast between 4 and 7 a.m. local time.

Eighty meter openings are also forecast to most areas of the world during the hours of darkness. Conditions are not expected to be as good as 40 meters, with weaker signals and higher levels of static. Best bet for openings to Europe and

the east is between 8 and 10 p.m. in the western half of the country and from 8 p.m. to about midnight in the east. Conditions are not expected to be very good towards Africa, but check between 8 p.m. and 11 p.m. for an occasional opening. Best bet for openings towards South America is between 8 p.m. and 5 a.m. From western states there is a chance for some openings to Oceania between midnight and 6 a.m., with possibilities in the eastern states between 3 and 7 a.m., local time. Conditions to the Far East are expected to be poorer, but with an occasional opening possible, particularly from western states, between 4 and 7 a.m.

Static levels are expected to increase on 160 meters during February, but some DX openings should be possible during the hours of darkness. Expect signals to peak when it is sunrise on the easternmost part of a path. For example, openings towards Europe and the east should peak between midnight and 1 a.m. in the Eastern time zone, while openings towards Oceania should peak between 5 and 6 a.m. in the Pacific time zone, etc.

### Short-Skip Openings

No significant skip openings are expected on 160 meters during the daylight hours, but openings up to 1300 miles should be possible at night, often extending to the one-hop limit of 2300 miles. On 80 meters expect openings up to 250 miles during the day, and between 500 and 2300 miles at night. On 40 meters daytime skip should be possible between 250 and 750 miles, extending to between 750 and 2300 miles during the evening to about 9 p.m., and between 1500 and 2300 miles until sunrise. On 20 meters, daytime skip should range between 750 and 2300 miles to about 4 p.m. Between 4 and

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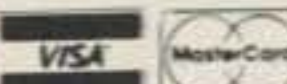
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**HOW TO USE THE DX PROPAGATION CHARTS**

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An \* indicates the best time to listen for 160 meter openings; \*\* indicates best times for 10 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

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

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

4. Times shown in the charts are in the 24-hour system, where 00 is midnight, 12 is noon, 01 is 1 A.M., 13 is 1 P.M., etc. Appropriate standard time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 8 hours in PST Zone, 7 hours in MST Zone, 6 hours in CST Zone, and 5 hours in EST Zone. For example, 13 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 04 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the propagation index will increase by one level; for each 10 dB loss, it will lower by one level.

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

Central & South Asia	08-11 (1) 19-21 (1)	08-10 (1) 19-21 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-21 (1)	19-22 (1) 04-06 (1)
South-east Asia	10-13 (1) 18-20 (1)	08-10 (1) 17-19 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-21 (1)	05-07 (1) 19-22 (1)
Far East	17-19 (1)	16-17 (1) 17-19 (2) 19-20 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-18 (1) 18-20 (2) 20-22 (1)	05-08 (1) 05-07 (1)*
South Pacific & New Zealand	12-14 (1) 14-16 (2) 16-18 (1)	10-14 (1) 14-16 (2) 16-18 (3) 18-19 (2) 19-20 (1)	09-11 (2) 11-19 (1) 19-23 (2) 23-06 (1) 06-07 (2) 07-09 (3)	00-01 (1) 01-02 (2) 02-05 (3) 05-07 (2) 07-08 (1) 03-07 (1)*
Australasia	09-11 (1) 16-18 (1)	08-12 (1) 14-16 (1) 16-19 (2) 19-21 (1)	06-07 (1) 07-09 (3) 09-10 (2) 10-14 (1) 14-16 (2) 16-19 (1) 19-22 (2) 22-00 (1)	02-04 (1) 04-06 (2) 06-08 (1) 04-06 (1)*
Caribbean, Central America & Northern Countries of South America	09-11 (1) 11-12 (2) 12-14 (3) 14-16 (2) 16-18 (1)	07-08 (1) 08-09 (2) 09-11 (4) 11-13 (2) 13-16 (4) 16-17 (3) 17-18 (2) 18-20 (1)	22-00 (2) 00-06 (1) 06-07 (2) 07-09 (4) 09-10 (3) 10-14 (2) 14-16 (3) 16-19 (4) 19-22 (3)	18-19 (1) 19-20 (2) 20-03 (4) 03-05 (3) 05-06 (2) 06-07 (1) 20-22 (1)* 22-03 (2)* 03-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-11 (1) 11-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	07-08 (1) 08-10 (2) 10-13 (1) 13-15 (2) 15-16 (3) 16-17 (4) 17-18 (2) 18-19 (1)	13-15 (1) 15-16 (2) 16-18 (3) 18-20 (4) 20-21 (3) 21-23 (2) 23-06 (1) 06-08 (2) 08-10 (1)	19-21 (1) 21-03 (2) 03-06 (1) 21-05 (1)*
McMurdo Sound, Antarctica	Nil	14-17 (1) 17-19 (2) 19-20 (1)	17-19 (1) 19-23 (2) 23-01 (1) 06-08 (1)	22-00 (1) 00-04 (2) 04-06 (1)

\*Predicted times of 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.

South-east Asia	08-10 (1) 18-20 (1)	09-12 (1) 16-17 (1) 17-19 (2) 19-20 (1)	06-07 (1) 07-10 (2) 10-12 (1) 16-18 (1) 18-20 (2) 20-21 (1)	04-07 (1)
Far East	16-19 (1)	14-16 (1) 16-18 (2) 18-20 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-18 (1) 18-21 (2) 21-23 (1)	02-04 (1) 04-06 (2) 06-08 (1) 05-07 (1)*
South Pacific & New Zealand	11-13 (1) 13-14 (2) 14-15 (3) 15-16 (2) 16-17 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-19 (2) 19-20 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-18 (1) 18-20 (2) 20-21 (3) 22-00 (2) 00-02 (1)	22-00 (1) 00-01 (2) 01-06 (3) 06-07 (2) 07-08 (1) 00-02 (1)* 02-05 (2)* 05-07 (1)*
Australasia	14-15 (1) 15-17 (2) 16-18 (1)	08-14 (1) 14-16 (2) 16-18 (3) 18-19 (2) 19-21 (1)	06-07 (1) 07-09 (3) 09-12 (2) 12-15 (1) 15-17 (2) 17-19 (1) 19-21 (2) 21-01 (1)	02-04 (1) 04-06 (3) 06-07 (2) 07-08 (1) 04-05 (1)* 05-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	08-09 (1) 09-10 (2) 10-14 (3) 14-15 (2) 15-16 (1)	07-08 (1) 08-09 (2) 09-13 (3) 13-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	07-09 (4) 09-11 (3) 11-15 (2) 15-16 (3) 16-18 (4) 18-21 (3) 21-00 (2) 00-06 (1) 06-07 (2)	18-19 (1) 19-20 (2) 20-00 (3) 00-02 (4) 02-03 (3) 03-04 (2) 04-06 (1) 19-21 (1)* 21-03 (2)* 03-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	08-11 (1) 11-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	07-08 (1) 08-13 (2) 13-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-20 (1)	14-15 (2) 15-16 (3) 16-19 (4) 19-20 (3) 20-00 (2) 00-02 (1) 04-06 (1) 06-08 (2) 08-14 (1)	19-20 (1) 20-02 (2) 02-05 (1) 21-03 (1)*
McMurdo Sound, Antarctica	Nil	13-16 (1) 16-18 (2) 18-20 (1)	16-19 (1) 19-23 (2) 23-02 (1) 07-09 (1)	22-02 (1) 02-04 (2) 04-06 (1)

**February 15 - April 15, 1988  
Time Zone: EST (24-Hour Time)  
EASTERN USA TO:**

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central Europe & North Africa	09-12 (1)	08-09 (1) 09-10 (2) 10-13 (3) 13-14 (2) 14-15 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-12 (3) 12-14 (4) 14-15 (3) 15-17 (2) 17-19 (1)	17-18 (1) 18-19 (2) 19-22 (3) 22-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 19-21 (1)* 21-00 (2)* 00-02 (1)*
Northern Europe & European USSR	08-11 (1)	08-09 (1) 09-12 (2) 12-13 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-13 (1) 13-15 (2) 15-17 (1) 00-03 (1)	17-19 (1) 19-02 (2) 02-03 (1) 20-01 (1)*
Eastern Mediterranean & Middle East	08-11 (1)	08-09 (1) 09-11 (2) 11-13 (1)	06-07 (1) 07-09 (2) 09-12 (1) 12-15 (2) 15-16 (3) 16-18 (2) 18-20 (1) 00-02 (1)	18-20 (1) 20-23 (2) 23-00 (1) 20-23 (1)*
Western Africa	09-11 (1) 11-13 (2) 13-14 (1)	07-09 (1) 09-10 (2) 10-12 (3) 12-14 (4) 14-15 (3) 15-16 (2) 16-17 (1)	05-06 (1) 06-08 (2) 08-13 (1) 13-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-20 (2) 20-22 (1)	18-21 (1) 21-01 (2) 01-03 (1) 22-02 (1)*
Eastern & Central Africa	09-11 (1)	08-10 (1) 10-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	07-09 (1) 12-14 (1) 14-15 (2) 15-18 (3) 18-19 (2) 19-20 (1)	19-22 (1) 22-00 (2) 00-01 (1) 20-00 (1)*
Southern Africa	09-10 (1) 10-12 (2) 12-14 (1)	07-10 (1) 10-13 (2) 13-15 (3) 15-17 (2) 17-18 (1)	07-14 (1) 14-16 (2) 16-18 (3) 18-20 (2) 20-22 (1) 00-01 (1)	18-20 (1) 20-23 (2) 23-00 (1) 21-23 (1)*

**Time Zones: CST & MST (24-Hour Time)  
CENTRAL USA TO:**

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Southern Europe & North Africa	09-11 (1)	08-09 (1) 09-13 (2) 13-14 (1)	00-07 (1) 07-09 (2) 09-11 (1) 11-13 (2) 13-15 (3) 15-16 (2) 16-18 (1) 22-00 (1)	17-19 (1) 19-22 (2) 22-00 (3) 00-01 (2) 01-02 (1) 20-22 (1)* 22-00 (2)* 00-01 (1)*
Northern & Central Europe & European USSR	09-11 (1)	07-09 (1) 09-11 (2) 11-12 (1)	06-07 (1) 07-10 (2) 10-12 (1) 12-13 (2) 13-15 (3) 23-01 (1)	19-22 (1) 22-00 (1) 00-02 (1) 22-01 (1)*
Eastern Mediterranean & Middle East	09-11 (1)	07-09 (1) 09-11 (2) 11-13 (1)	07-12 (1) 12-15 (2) 15-17 (1) 22-00 (1)	19-22 (1) 20-22 (1)*
Western Africa	09-10 (1) 10-12 (2) 12-14 (1)	07-09 (1) 09-10 (2) 10-12 (3) 12-13 (4) 13-15 (3) 15-16 (2) 16-17 (1)	06-12 (1) 12-14 (2) 14-15 (3) 15-16 (4) 16-17 (3) 17-19 (2) 19-21 (1)	18-20 (1) 20-23 (2) 23-01 (1) 21-00 (1)*
Eastern & Central Africa	09-12 (1)	08-11 (1) 11-15 (2) 15-17 (1)	06-12 (1) 12-14 (2) 14-16 (3) 16-18 (2) 18-19 (1)	19-22 (1)
Southern Africa	08-09 (1) 09-12 (2) 12-13 (1)	07-09 (1) 09-11 (2) 11-14 (3) 14-15 (2) 15-16 (1)	05-07 (2) 07-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-20 (1) 23-01 (1)	19-22 (1) 20-21 (1)*
Central & South Asia	07-09 (1) 17-19 (1)	08-10 (1) 19-21 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-21 (2)	05-07 (1) 18-20 (1)

**Time Zone: PST (24-Hour Time)  
WESTERN USA TO:**

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Southern Europe & North Africa	09-11 (1)	08-09 (1) 09-12 (2) 12-14 (1)	05-07 (1) 07-09 (2) 09-11 (1) 11-13 (2) 13-14 (3) 14-16 (2) 16-18 (1) 22-00 (1)	19-20 (1) 20-22 (2) 22-00 (1) 20-22 (1)*
Northern & Central Europe & European USSR	Nil	07-08 (1) 08-10 (2) 10-12 (1)	06-07 (1) 07-09 (2) 09-12 (1) 12-13 (2) 13-15 (1) 22-00 (1)	19-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Eastern Mediterranean & Middle East	Nil	07-08 (1) 08-10 (2) 10-12 (1)	07-12 (1) 12-14 (2) 14-17 (1) 22-02 (1)	18-21 (1)
Western Africa	08-10 (1) 10-12 (2) 12-14 (1)	07-09 (1) 09-12 (2) 12-15 (3) 15-16 (2) 16-17 (1)	04-06 (1) 06-08 (2) 08-12 (1) 12-14 (2) 14-17 (3) 17-19 (2) 19-21 (1)	18-22 (1)
Eastern & Central Africa	09-12 (1)	08-10 (1) 10-13 (2) 13-14 (1)	06-08 (1) 12-14 (1) 14-16 (2) 16-18 (1)	18-20 (1)
Southern Africa	09-12 (1)	07-10 (1) 10-14 (2) 14-15 (1)	06-08 (2) 08-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-19 (1) 23-01 (1)	18-21 (1)
Central & South Asia	17-19 (1)	07-09 (1) 16-17 (1) 17-19 (2) 19-20 (1)	16-18 (1) 18-20 (2) 20-22 (1) 06-07 (1) 07-09 (2) 09-12 (1)	05-07 (1) 19-21 (1)



South-east Asia	09-11 (1) 17-19 (1)	08-10 (1) 15-17 (1) 17-19 (2) 19-22 (1)	07-08 (1) 08-11 (2) 11-13 (1) 20-22 (1) 22-00 (2) 00-02 (1)	00-02 (1) 02-05 (2) 05-07 (1)
Far East	15-17 (1)	12-14 (1) 14-17 (2) 17-18 (3) 18-19 (2) 19-20 (1)	06-07 (1) 07-09 (2) 09-11 (1) 11-13 (2) 13-15 (1) 15-17 (2) 17-20 (3) 20-22 (2) 22-02 (1)	00-02 (1) 02-07 (2) 07-08 (1) 02-06 (1)*
South Pacific & New Zealand	12-15 (1) 15-17 (2) 17-18 (1)	10-14 (1) 14-16 (2) 16-19 (3) 19-21 (2) 21-22 (1)	06-07 (1) 07-09 (3) 09-11 (2) 11-17 (1) 17-19 (2) 19-20 (3) 20-22 (4) 22-00 (3) 00-02 (2) 02-04 (1)	19-21 (1) 21-22 (2) 22-23 (3) 23-05 (4) 05-06 (3) 06-07 (2) 07-08 (1) 22-01 (1)* 01-05 (2)* 05-06 (1)*
Australasia	12-15 (1) 15-17 (2) 17-18 (1)	09-12 (1) 12-16 (2) 16-19 (3) 19-20 (2) 20-21 (1)	07-08 (1) 08-10 (3) 10-12 (2) 12-17 (1) 17-19 (2) 19-22 (3) 22-01 (2) 01-04 (1)	00-01 (1) 01-02 (2) 02-05 (3) 05-06 (2) 06-08 (1) 02-04 (1)* 04-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	09-11 (1) 11-12 (2) 12-14 (3) 14-15 (2) 15-16 (1)	06-07 (1) 07-09 (2) 09-12 (3) 12-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-07 (2) 07-09 (3) 09-14 (2) 14-16 (3) 16-19 (4) 19-21 (3) 21-23 (2) 23-06 (1)	18-20 (1) 20-01 (3) 01-03 (2) 03-06 (1) 19-21 (1)* 21-02 (2)* 02-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-11 (1) 11-13 (2) 13-15 (3) 15-16 (2) 16-17 (1)	07-08 (1) 08-09 (2) 09-11 (1) 11-13 (2) 13-15 (3) 15-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	12-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-20 (3) 20-23 (2) 23-05 (1) 05-07 (2) 07-09 (1)	18-20 (1) 20-01 (2) 01-03 (1) 22-02 (1)*
McMurdo Sound, Antarctica	13-16 (1)	12-15 (1) 15-18 (2) 18-20 (1)	16-19 (1) 19-20 (2) 20-22 (3) 22-00 (2) 00-02 (1) 05-06 (1) 06-08 (2) 08-10 (1)	22-02 (1) 02-04 (2) 04-06 (1)

7 p.m. the skip is expected to lengthen to between 1500 and 2300 miles, with the band out for short-skip by 8 p.m. on most days. On 15 meters skip should range between 1300 and 2300 miles during most of the day to about 6 p.m., with the band usually dead for short-skip after that time. An occasional F-layer short-skip opening may be possible on 10 meters during the afternoon, for distances between approximately 1500 and 2300 miles. Some sporadic-E openings over shorter distances may also be possible.

### VHF Ionospheric Openings

No significant meteor showers are expected during February, and very little sporadic-E propagation is likely to occur. Best chances for ionospheric openings on the VHF bands during February should result from auroral activity expected during periods when HF conditions are Below Normal or Disturbed. Such openings on 2 and 6 meters, usually characterized by flutter fading and signal distortion, result from the intense regions of ionization that accompany auroral displays. Auroral-type openings usually range in distance from a few hundred up to approxi-

mately 1300 miles. Check the "Last Minute Forecast" at the beginning of this column for those days during February that are expected to be Disturbed or Below Normal.

Trans-equatorial propagation (TE) usually improves during the spring months and particularly when a solar cycle rises.

Some TE openings may be possible on 6 meters, in February, between South America and the southern states. The

best time to check for TE openings is between 7 and 10 p.m., local time.

This month's propagation charts contain band opening predictions for major DX paths for the period of February 15 through April 15, 1988. A short-skip propagation forecast for February appeared in last month's column. Instructions for the proper use of these charts appear at the beginning of this column.

73, George, W3ASK

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## NEWS OF COMMUNICATION AROUND THE WORLD

*Should you ask me, whence these stories?  
Whence these legends and traditions,  
With their frequent repetitions,  
And their wild reverberations?  
I should answer, I should tell you,  
I repeat them as I heard them,  
Never wonder, each is true . . .*

**H**ere in the western reaches on the 38th parallel, spring generally comes in mid-February. Cycle 22 has helped bring the Local DXers through the fading winter, but the brighter days and the trees in bloom will always mark the start of a new DX season. February brings the CQ WW 160 Meter Contest. It also brings questions.

"What do you mean by CBA?" was the first question down the line, it being closely followed by the query, "What does SASE mean?" These were not surprises. There have been no real surprises since one newly-minted DXer asked, "What does 'CQ WW' mean?" Knowledge sometimes comes slowly; it does not automatically come with the license. There are yet things in DXing that only DXers understand and it is still a fact that only a DXer can truly understand another DXer.

Recently, however, a letter came from Stephen Clark, K9BJ, down in the Lincoln country of Illinois, and it was again realized that while most DXers will understand the acronyms of CBA, SASE, and always CQ WW, much of the understanding extends only to the present. To many, if it was not part of the DX past, it does not and did not exist. Stephen writes. . . .

"I have a fascination with the old DXpeditioners: Gus Browning, Don Miller, Danny Weil, and others. I find the information about them sparse at best. The Old Timers around here don't have a lot of knowledge about these people. I am considering writing an article or short book about the history of DXpeditions, but I have no idea how to research the subject or where to start. I need information on countries activated, equipment used, dates, etc.

"There are a lot of newcomers to DX like myself who would find the information very exciting. Any advice?"

What could we say? And, incidentally, what would you say? Where is it possible for an inquiring DXer to learn about the great DX adventures that have gone before? How does one learn about the problems, the planning, the efforts, and the triumphs and disappointments? Where is the record of the legends and traditions of DXing?

Frankly, there is not much of anything on record. There are vast treasures of personal remembrances held by DXers, but there is little readily available to those who come late to the scene. We mentioned this to the Old Timer on one of his early spring trips down the hill. Every spring he becomes active again after sitting out most of the rainy season. We have



*Back in 1970 you could find XV5/XU and XW8 on the bands most days. And you could find some big-gun DXers at the SEAsia DX Conventions. On the left is Don Riebhoff, then signing HS3DR. Fred Laun is in the middle; he signed HS5ABD. On the right is George Nchita, YO2BN. Don Riebhoff was killed in an auto accident in Spain last year. Fred Laun is currently at the U.S. Embassy in Managua. Many DXers will say that those were the Great Days of DXing.*

learned not to ask what he did during the dark months of the winter solstice. Each year it is the same. He sets out to read all the books he has not yet read, sitting by the rig every day and listening to the W7PHO Family Hour. His task is never quite finished before the warm days of late winter bring him striding down the hill, ready for another season of DXing—and another season of answering questions. This time we did not ask him what "CBA" or "SASE" meant. We mentioned K9BJ's letter and the paucity of historical fact and references on DXing. We thought it a good subject, sure to warm his blood. It did.

"You have mentioned this before," were his first words, and we had to admit to the charge, it being a continuing concern. But we also pointed out that while some were getting interested in preserving the historical record of DXing, there was still a long way to go. Always was the fear that important, vital DX history and DX lore might be permanently lost. We were certain that he would be in agreement with us, the remembrance still with us of how it had taken a couple of months last year to cool him down when it was found that there was no certain record of who had been the originator of the idea for the DXCC. Back then he held the firm belief that he definitely did know the source for the idea—that is, almost definitely. Finally he conceded: "I think I know, but then I remember that being just a little bit wrong is very much different from being exactly right. When reviewing the record of DX and the DXCC, we must be exactly right. There is no other way!" Thus the question of the DXCC is still unanswered.

We did talk about K9BJ's letter and the idea

that Stephen had put forth, and his asking about the feasibility of sending out audio tapes with a list of questions and having the old-time DXers answer them. The Old Timer nodded his head in agreement. "It's a good idea," he said, "and certain to provide some valuable information. But how far back do you go, and what is an 'Old Timer'? We quickly agreed that anyone who was working DX in Cycle 20 would qualify. There have been a lot of new DXers and a lot of new DX since then. However, it was evident that the Old Timer was looking beyond that cycle, and we knew that he was again looking with a glance that went through a window and into the distance, where he saw something—the remembrances of the DX days long gone with their faded echoes and faded memories. Sometimes we saw some ourselves when thinking of those other days. But what the Old Timer saw we never would, because he had been DXing long before we showed on the scene. And somehow we did not want to lose the days that he had known. Finally he spoke again.

"The idea is good, as such ideas always will be," the Old Timer continued. "But what is important? What should be saved? What thought has been given to that?" We suspected that he was trying to catch us in some vague generalizations, but we were ready.

"Everything is important," we quickly responded. "Everything and anything. All DX information has some value, be it solid fact or gossip, relevant or irrelevant. It should be collected and retained for possible future reference." Though the Old Timer did not disagree with us, it was evident that he wanted more discussion. "Anything else?" he asked, and that did it.

"Look," we said. "Back in 1848 Kit Carson and General Fremont passed down the trail that was at the foot of the hill here. We know they were here, where they made their camp, but there was a gun fight down there where the slough comes in from the bay, and no one has ever been able to explain why. Four-hundred years ago Sir Francis Drake careened his vessels here in the county. They are very sure of that. The problem these days is that they are not sure just where he did it. Only a couple of months back a fellow was here raising funds for the restoration of Drake's ancestral home, Buckland Abbey. This was a retired British admiral and former head of the Royal Navy's Personnel Department. These were bits of history which have become blurred with the years. At times it seems that the same thing might be happening with DXing. Is DXing such a minor thing that we should lose the record?" The Old Timer stopped us by holding up his hand. "I believe," he said, and we got our feet back onto the ground—for a bit, anyhow.

"I know what you mean," he said, "and one does not have to be long in years to realize that the span of DX remembrances can be very short. It is a bit strange to note that while many of the big figures out of the DX past are still around, often they are found to be fading into the background, forgotten. Just mention some of the old-time DXers and their DXpedition ef-

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## The WPX Program

### Mixed

1305	SM6CST	1308	DJ0KE
1306	IK2BTI	1309	IBDVJ
1307	HA5NK	1310	PY4DM

### SSB

1918	CE3ZI	1922	IBDVJ
1919	YU1PJ	1923	K1BAZ/DV1
1920	K3NEE	1924	DJ5HU
1921	IK8GCS	1925	CE5FSB

### CW

2477	YU1PJ	2480	OK3KSO
2478	WA6HYB	2481	KC7EM
2479	OK3THM	2482	PA3DXO

### Endorsements

Mixed: 450 SM6CST, IK2BTI, HA5NK, PY4DM, 500 SM6CST, IK2BTI, HA5NK, K1BAZ/DV1, PY4DM, 550 SM6CST, IK2BTI, IK8CNT, PY4DM, 600 PY4DM, SM6CST, IK2BTI, K1BAZ/DV1, 650 SM6CST, IK2BTI, KC7EM, K1BAZ/DV1, PY4DM, 700 SM6CST, K1BAZ/DV1, PY4DM, 750 SM6CST, PY4DM, 800 SM6CST, PY4DM, 850 SM6CST, PY4DM, 900 SM6CST, PY4DM, 950 SM6CST, KS3F, 1000 SM6CST, 1050 SM6CST, NE6I, N2CIC, 1100 SM6CST, N2CIC, 1150 SM6CST, 1200 SM6CST, 1250 SM6CST, 1300 SM6CST, K2OLG, 1650 W1BWS, 1700 W1BWS, 1750 W1BWS.

S.S.B.: 350 CE3ZI, IK8GCS, 400 CE3ZI, IK8GCS, 450 SM6CST, CE3ZI, IK8GCS, 500 SM6CST, IK2AEQ, 550 SM6CST, KC7EM, 600 SM6CST, 650 SM6CST, KA7AIG, 700 NE6I, IT9ONV, 750 K9HDZ, 850 K3IXD, 950 ZL1AGO, N2CIC, 1000 IK5ACO, N2CIC, 1050 IK5ACO.

CW: 350 DJ0KE, 450 SM6CST, 500 SM6CST, K1BAZ/DV1, 550 SM6CST, K1BAZ/DV1, 600 SM6CST, K1BAZ/DV1, 650 SM6CST, 700 SM6CST, IK5DEY, G3VQO, 750 SM6CST, NE6I, IK5DEY, K4MF, 800 SM6CST, IK5DEY, K4MF, 850 SM6CST, 900 SM6CST, 950 SM6CST, 1000 SM6CST, 1050 SM6CST, I7PXV, 1100 SM6CST, I7PXV, KL7AF, 1150 SM6CST, 1300 IT9VDQ, 2150 W3ARK.

10 Meters: SM6CST, CE3ZI  
15 Meters: SM6CST, K4MF  
20 Meters: SM6CST, IK8CNT, K4MF  
40 Meters: SM6CST  
80 Meters: SM6CST  
160 Meters: SM6CST

Asia: SM6CST, YU1PJ, IK8CNT, K1BAZ/DV1  
Africa: SM6CST  
No. America: SM6CST, CE3ZI, K1BAZ/DV1, K4MF  
So. America: SM6CST, NE6I  
Europe: SM6CST, YU1PJ, DJ0KE, K1BAZ/DV1  
Oceania: SM6CST, K1BAZ/DV1

Award of Excellence Plaque . . . SM6CST

Award of Excellence 160 Meter Bar . . . SM6CST, VE3XN.

Award of Excellence Plaque Holders: IQJX, WA1JMP, K0JN, W4VQ, KF2Q, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMO, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, IBYRK, 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, AB90, FM5WD, I2DMK, W4BOY, SM6CST.

Award of Excellence Plaque Holders with 160 Meter Endorsement: DK5AD, W3ARK, LA7JO, W4VQ, K6JG, W4CRW, N4MM, SM0AJU, KF2Q, K5UR, OK1MP, N5TV, W8CNL, W1JR, W6OUL, W4BOY, W5UR, N4NO, W8RSW, N4KE, I2UIY, W8ILC, W1BUS, NN4Q, G4BUE, LU3YL/W4, I4EAT, VE7WJ, W9NUF, N4NX, VK9NS, DE0DXM, K9BG, AB90, FM5WD, SM0DJZ, VE3XN, SM6CST.

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.

forts and too often you will draw a blank look. Take Gus Browning and Don Miller, for examples. How many know their stories? A week or so back I was going through my files and there on the cover of the August 1962 issue of *CQ* is W0MLY, George McKercher. How many know of George's African efforts back then, even though he still shows up regularly at the International DX Convention. Mention Don Miller and the usual reaction is one of disdain, though many do not know why. Whether your memory of Don is good or bad, he did have an impact on DXing, a far greater impact than appreciated by those who have come late to the DX scene. But I am only mentioning the W/K DXers. How many know about the work of overseas amateurs such as Marty Laine, OH2BH, Frank Turek, DL7FT, and Franz Langer, DJ9ZB, just to name a few. In recent years the Japanese have done a lot of notable DX work in Southeast Asia. Except for the fact that some rare stations have been heard, little is known about these efforts. It is not right!"

The Old Timer paused, and we slipped in a few of our own, maybe just to keep his blood warm. "Yes, and how about the Colvins? Certainly their efforts should be remembered not only for their endurance, but also for the wide span of DX countries they have put on the air, including new ones. And Eric Sjolund, SM0AGD, how about him?" We were getting a bit warm ourselves, and we could have gone on tossing in names and calls almost forever it seemed. About the same time we realized that we both were saying what the other already knew, and except for making us feel good, it was taking us nowhere. We were just agreeing between us that the story of DX should be saved and told, but presently there is no such record—not yet.

"We had to tell Stephen back there in Springfield," we said, picking up the thread of the matter again, "that the best source, possibly the only source in many instances, for early and late DX history will be the amateur magazines—*CQ*, *QST*, and others with long publishing histories. The DX bulletins came on later in the action.

But there have been some efforts in recent years to achieve a more permanent record. The Clipperton effort in 1978 published a fine record of the effort. DJ9ZB has turned out several recountings of his DXpedition efforts. And Jim Smith, P29JS (VK9NS), and his wife Kirsti, VK9NL, did a wonderful job with their *Heard Island Odyssey*. That book is worth reading for the story alone. The DXpedition effort makes it even more valuable.

In 1974 Darlees Magen, HC2YL, picked up the pieces after the tragic loss of her husband and wrote the story of her DX travels when she went around the world operating from numerous countries along the way. This was published in a soft-bound volume, and even now it can evoke some vivid memories of those days back in the early seventies. The more you think about it, the more you realize that there is a richness in DX experience and endeavor that should not be forgotten. Ever!" We were getting revved up again and thought that it was time to stop. Certainly the Old Timer was not the one who needed convincing, as he had been on this track long before we arrived.

We thought that possibly we had run our string out with our exhortations, and we just sat quietly for a moment. Finally the Old Timer smiled and put a question to us: "Do you know what a decremeter was used for?" he asked, and we had to admit that the term was not familiar. "Well," the Old Timer continued, "it was

once advocated that every amateur should have access to a decremeter so that he would be aware of the decrement and get it down to the legal limit." We were still ignorant of the term, and the Old Timer smiled, leaning a bit close to really stick in his needle. "Of course, knowing most everything, you are aware that the term *decrement* meant the approximate measurement of your bandwidth back in the spark days, right?"

Wrong! We still had to admit that the term had been unknown to us before his visit. But the Old Timer was not yet finished with his needle.

"And of course you know," he continued, "that back in the twenties, just after WW I, the ARRL made use of the term *Citizen Radio* for amateurs on the new phone mode. For awhile *QST* even proclaimed that it was everlastingly devoted to Citizen Wireless. But back in the early twenties any radio at all was a mystery and a novelty, and a number of magazines were published, aiming at those who just listened—BCLs, SWLs, and even those who were working to hear all states on the broadcast bands. But as radio developed, the various interests went their own way, and within a year *QST* dropped the 'Citizen' from its cover format, going back to 'Amateur.' However, back then the phone column in *QST* was entitled 'The Junior Operator.' Phone operators were called 'novices' or 'BCLs,' the tone of any comment about phone operators not too subtly indicating that such could not really be considered amateurs."

We had to think over this. The more we thought, the more we recalled other information from the past. How back in 1923 it had been big news when Leon Deloy, F8AB, worked 1MO and 1XAM on 3 MHz or 100 meters. That was an event to remember. And how these days to work Europe on 75 meters is hardly but a start on your 5BWAZ. Even then

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629 SM7LPY

### 80 Meter Phone

41 JA4IKD

### 40 Meter CW

67 K2UU 68 JA3JOR

### All Band WAZ SSB

3148 W5KUY 3150 WA4ECA  
3149 SM7LOX

### Phone/CW

6183	N6NF	6192	WB9EEE
6184	HK1AMW	6193	HA5NK
6185	W0JRN	6194	DF3PN
6186	I2BUH	6195	KG7EM
6187	ON4KR	6196	N8FGH
6188	HB9BKP	6197	SM5DUT
6189	PA3BWS	6198	SM3AFR
6190	JA1IT	6199	YV1OB
6191	DF3TZ	6200	N6NF

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*How do you work Taiwan? For many it has been a case of working BV2A or BV2B. Both are Tim Chen, and here he is relaxing at the operating position—relaxing because the gear had some problems and Matt Harper, K4KIU, was visiting. Matt says that conditions were not good. He operated 40 CW a bit but could only raise some W6s and W7s. But then again, the bands are always open to 6- and 7-land. DXers know that.*

the endless calling of "CQ" was a problem. In February 1921 the ARRL held a "CQ Party." The object was for every amateur to get on the air at the same time, everyone calling "CQ" to get it out of their system forever. It was not a complete success. We remember back then when the local and mysterious electronic genius had tall towers on one of the hills here and signed 6XAC. Everyone knew about him, but no one really understood him. Even DXing got a start in 1922 when QST started a department labeled "International Amateur Radio."

The realization finally came that the Old Timer was on the same frequency with us, and while we found much to discuss that was vital and important a half-century back, there were others with similar experiences, too much of which was not known and might be lost to future DXers. "Those were the good days for sure," the Old Timer intoned, "but what are you going to do to ensure that they will be remembered?" We had a quick answer for that query.

"Why us?" we demanded, immediately thinking that he was the old one with the old tales and old memories. After all, there always has to be an equitable division of tasks. There have to be workers and there have to be thinkers. We were remembering what we had learned years back at the local DX club: there is always an adequate supply of thinkers; it is the workers that are always in short supply. The Old Timer shook his head.

"It will always be every DXer's job," he advised. "Never should any effort be considered too insignificant to record, and never should any DXpedition be thought not worthy of remembering. Where there are DXers such as K9BJ who want to undertake the task, they should be encouraged. Even when a DXer cleans out his shack to make room for more let's say mementos, thought must be given to saving such material for those interested in research. Old DX bulletins, old amateur magazines, old convention programs are valuable, and to these must be added the record of DXpeditions. Certainly somewhere there will come someone with the training and ability to write the full history of DXing. That is inevitable. Have no doubt!"

### The WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with CQ master prefix list. Scores are based on the current prefix total regardless of an operator's all-time count. Honor Roll must be up-dated annually by addition to, or to confirm present total. If no up-date, file will be placed into "inactive" until next up-date. Lifetime Honor Roll fee \$2.00 (U.S.) for each mode, with no fees required for up-dates.

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2953	K2VV	2002	I8YRK	1470	K8LJG	1193	YU2TY	877	I2CZQ
2805	W2NC	1990	N2AC	1451	KL7AF	1185	W4UW	848	W9JBR
2619	K6JG	1969	WA8YTM	1442	N6JM	1159	AIBS	840	I2EAY
2606	VE3XN	1945	W9NUF	1436	I1POR	1156	N8BJQ	791	YT7WW
2502	K6XP	1924	K5UR	1415	G4FAM	1153	N2AIF	788	G4SDJ
2402	W4BQY	1859	PY1APS	1405	DK5AD	1127	JA6GWU	773	YU7DR
2401	N4NO	1836	YT7DX	1374	W6OUL	1108	YU1GR	759	OE1KJW
2359	W9DWO	1825	EA2IA	1366	K2POF	1106	N2CIC	752	KL7VZ
2297	YU2TW	1776	PY4OD	1347	I2UIY	1083	DF6EX	747	KD8IW
2297	N4MM	1761	K9BG	1345	YU7AJD	1080	WD9IIC	729	G4OBK
2220	N6JV	1736	W0SFU	1304	AB9O	1074	VK9NS	726	K18B
2123	I2PJA	1723	IN3ANE	1300	AC2J	1067	I1WXY	715	K6UXO
2104	N9AF	1676	KF2O	1293	SM0AJU	1066	NE6I	695	W5ASP
2072	I2PHN	1675	N5TV	1279	SM6CST	1010	I0AOF	680	YU1PJ
2069	N6CW	1603	CT1LN	1278	3A2LF	1007	A16Z	668	N3KR
2056	YU7BPO	1593	I2MOP	1269	K2OLG	1004	PY2DBU	665	KC7EM
2047	W1NG	1553	SM6DHU	1266	YU2CO	1003	I1EEW	650	W9IAL
2020	SM7TV	1541	W5PWG	1249	W7CB	1000	K13L	637	F6HMJ

#### SSB

3122	F9RM	1717	I8YZP	1207	I1POR	1020	SM0AJU	755	IT9ONV
2837	I0ZV	1699	W9DWO	1204	KC8YM	1006	N2CIC	752	K9BQL
2509	K2VV	1681	WF4V	1201	I8KCI	993	AG2K	726	NE6I
2391	ZL3NS	1638	K5UR	1200	KL7AF	984	W0ULU	710	N2AIF
2320	K6JG	1578	I4CSP	1186	PY4OD	981	K8LJG	698	I2KKL
2257	K2POA	1573	I2MOP	1178	SM6DHU	962	W3GXX	698	KC2FC
2218	CT1UA	1553	W1NG	1172	CT4UW	957	I1EEW	698	G4KHF
2210	K6XP	1549	WA8YTM	1169	W4UW	942	I2EOW	694	A16Z
2191	I0AMU	1538	ZP5JCY	1144	I5ZJK	939	WA2FKF	675	IK2DUU
2120	I2PJA	1533	NJ0C	1131	N6FX	930	N4IB	665	AB1U
2073	N4MM	1532	WA4QMQ	1111	CT1BY	900	I2TZK	661	VO1AW
2053	I2PHN	1508	CT1LN	1106	AB9O	848	K3IXD	659	I4UFH
2005	I3ZKD	1507	W9NUF	1095	K5RPC	828	W6OUL	657	KE6KT
2003	W0YDB	1457	CT1FL	1087	IK5ACO	813	WN5MBS	652	CP8HD
1945	WD8MGQ	1412	W3ARK	1071	NN4Q	808	KK5P	650	W5ILR
1904	I4ZSQ	1406	KF2O	1062	E8BAKN	792	YB3CEV	642	OE5BGL
1844	OZ5EV	1387	XE1OX	1060	CX9CO	787	G4SDJ	622	SM6CST
1825	N4NO	1350	N5TV	1048	PP2ZDD	779	CT1AHU	611	HR1FC
1820	CT4NH	1343	AC2J	1047	EA3AQC	766	I0PSB	605	VK9NS
1808	W4BQY	1307	EA2IA	1035	WB8ZRL	759	K8ZZU	600	KB4HU
1781	VE1YX	1303	G4CHP	1032	PY4VX	758	I3ZSX		
1761	I8YRK	1232	W2NC	1030	F6BVB				

#### CW

2562	W2NC	1779	OZ5EV	1292	W1NG	1011	AK9Z	800	I8YRK
2415	K2VV	1674	YU7SF	1289	JE1JKL	1001	AK2H	777	EA5QR
2198	N6JV	1672	YU7BCD	1259	IT9VDO	984	DJ1YH	744	CT1LN
2185	WA2HZR	1584	N4MM	1246	JA1KRU	969	LA9XG	743	NE6I
2134	ON4QX	1554	VO1AW	1224	N6FX	969	G4FAM	707	WB8ZRL
2092	N4NO	1525	K5UR	1160	K2POF	947	W9PWM	705	OE1KJW
2029	W3ARK	1519	PY4OD	1151	SM6CST	940	SM0AJU	693	G3VQO
1989	K6JG	1500	W9NUF	1131	KF2O	935	T14SU	656	K6UXO
1978	N6CW	1488	I1YRL	1125	SM6DHU	915	AB1U	654	W0JIE
1947	W9DWO	1448	EA2IA	1117	I7PXV	905	VE1ACK	644	JA2GCW
1900	VE7CNE	1414	N4YB	1050	KL7AF	904	YU2CO	634	OZ5UR
1895	W4BQY	1371	WA8YTM	1047	W1WAI	871	A16Z	625	W6YMH
1880	K6XP	1350	N5TV	1026	K8LJG	854	KN7K	602	VK9NS
1870	G2GM	1309	I2DMK	1026	F6HKD	813	VE4AEX	602	G4SSH
1801	N2AC	1306	KA7T						

The Old Timer was quiet for a bit, possibly because there was little more that could be added to the matter. Definitely we both were in agreement. After a bit he spoke again. "What did you say is the name of this fellow in Illinois?" he asked. We had it right at hand.

"Stephen Clark, K9BJ, is the person," we said. "He lives on RR2, Winch Lane, Springfield, Illinois 62707. Actually, he does write for a living. He is a technical writer for a manufacturing company. And don't forget that the Northern California DX Foundation will also accept DX material and records for its archives."

The foundation long ago moved to preserve these records of the DX past."

The Old Timer was soon gone, leaving with the promise to scan the material in the shack to cull out what might be of historical note or even just worth remembering. Later we thought of how the Old Timer had always expounded along the lines of saving the past for the future. It did sometimes take a bit of effort to get him moving.

Come to think of it, even now it can be exciting to recall the 1922 trans-Atlantic tests when efforts were made by amateurs to get their sig-



Here you can see some of the reasons why BY-China almost disappeared from the Most-Wanted-Country list between 1980 and 1987, going from #1 to #96 in six years. Seated is Wang Xun, Deputy General Secretary of the Chinese Radio Sports Assn. (CRSA). Standing from the left are David Siddall, K3ZJ, President of the U.S. Senate club station, W3USS; then Tong Xiao-Yong, Director of BY1PK; and Liu Wen-Bin, Secretary of CRSA and interpreter for the visit. (K3ZJ photo)

nal across the Atlantic. To qualify to participate, an amateur had to demonstrate that his signal would cover 1200 miles. The surprise came when the qualification signals were heard in Europe; 316 American stations were heard when the tests were finally run. America transmitted, and Europe listened. Some still say things have never changed.

The first two-way communications. In late November 1923, following an unsuccessful effort early in the year, 8AB in France worked K.E. Warner, 1MO, and John Reinartz, 1XAM, for the first two-way Atlantic communications by amateurs. It was a tremendous breakthrough.

We remembered that maybe a bit late. When we first tied into the village DX club years back, John Reinartz was one of the Locals down the peninsula. It took us years to realize just how significant his efforts in DXing had been. We often have thought that it should not have been that way. But then we were working the "now" DX and had little knowledge of what had gone before. Perhaps others have come to consider their knowledge incomplete. DXers should gain awareness of DX past.

## CQ Awards

Several of the CQ awards programs went through a recent revision, and workers in the DX vineyard might want to update their files as well as check on any possible changes.

Rather than taking the space to list the changes, we will steer you in the direction you might take for the particular award in which you are interested.

Rules and application forms for all of CQ's awards can be obtained by sending a request with SASE to CQ, 76 North Broadway, Hicksville, NY 11801. Further info can be gotten from the award managers listed below.

The CQDX Award is administered by Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208.

The Worked All Zones (WAZ) Award is administered by Leo Haijzman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Leo includes the 5BWAZ in his work. Learn the zones as WAZ continues to be about the most difficult of the major DX awards.

The WPX (Prefix) Award is handled by Norman Koch, K6ZDL, Box 1351, Torrance, California 90505-0351. There are no limits to this operating award, as there never will be a shortage of new prefixes.

The USA-CA County Award is administered by Dorothy Johnson, WB9RCY, 333 South Lincoln Avenue, Mundelin, Illinois 60060. There are 3076 counties to be worked to cover all the possibilities in this award, and there is a lot of action among those working for the award. The main concern in this award is keeping track of the counties worked. A record book for the award is available for \$1.25 from CQ headquarters in Hicksville.

## Needed Country List

Long ago the Old Timer noted that needed country lists are relative things—relative to your QTH and to the QTHs of those supplying the information. All this is to again note that the JAs often have trouble with the Caribbean, Europeans with the Pacific, and the Suffering Sevens with most everything going. But the lists are interesting, informative, and possibly even ego-enhancing when you note that you have a handful of those in the rarified top-ten category.

Take a look at the top ten in the 1987 DX Bulletin's poll. Also indicated are the standings back in 1980.

1987 Poll		1980 Standing
1. Albania	84% needed it	4
2. Burma	77% needed it	3
3. Bouvet	74% needed it	12
4. So. Yemen	74% needed it	7
5. Vietnam	71% needed it	17
6. Afghanistan	68% needed it	19
7. No. Yemen	67% needed it	20
8. Laos	59% needed it	49
9. Bangladesh	58% needed it	49
10. Spratley	55% needed it	53

When you compare the standings in 1980 against those in 1987, you will quickly note that some of the top ten in 1980 are gone from the list. These are:

	1980	1987
China	# 1	#96
Laccadives	# 5	#19
Heard Is.	# 6	#47
Kampuchea	# 8	#18
Andamans	#10	#14

The 1980 list did not show a #2 nor #9 standing.

What were the bottom ten in the hundred countries listed in 1987? In order they were Kermedec (17% needing); South Shetland 17%; Kure 16%; Navassa 16%; Turkey 15%; Midway Island 15%; China 15%; Mali 15%; Minami Torishima 14%; Zaire 11%; and Mauritania 11% in the #100 spot. To end things, Peter I Island was the 28th most needed with 39% of those responding needing it.

## Niue

There will be activity from this Pacific stop in late February; the target dates are February 21–26. Jan Scheuerman, WB2JCE, and Mary Lou Brown, NM7N, will be the operators. The calls signed will be ZK2JS by WB2JCE and ZK2MB by NM7N. QSL to their home CBA, SASE needed.

They will operate both CW and SSB, CW generally being 25 kHz above the band edge. The full list of planned CW frequencies are 7025, 14025, 21025, 21125, 28025, 28125,

and 28300. On SSB look for them at 14225, 21300, and 28300 kHz.

## Republica Arabe Saharaui Democratica

Last July it was noted that this one was in the works and that a new country might come. Seeing that we write three months ahead, it gave the opportunity to live in anticipation. In October the anticipation became reality, and S0RASD showed with OH2BH, EA2OP, and EA2JG doing the operating. They operated for 8 days, making over 11K QSOs.

There was a Kenwood rig left with a local at the end of the initial operation, and you might catch S01A on the air. This is Raama, who speaks a number of languages. In addition to Arabic, he is fluent in French and Spanish and competent in English.

When can you send in your card for DXCC credit? Documentation had been submitted to the ARRL by Thanksgiving, there being many, mostly in Spanish. Indications were that the DXAC would have a look at them, then the Awards Committee would take a look, and then there would be a period of contemplation and a decision. Maybe by the time you read this there will be a decision. Maybe you will still be waiting.

Meanwhile, get the QSL in your hand. If you have not already found the route, it is: Arseli Etxeguren, EA2JG, Las Vegas 81, 01479 Luyando (Alava) Espana.

## Fernando De

Ah, the joys of DXpeditioning! Blue skies with the towering cumulus clouds on the horizon, gentle breezes, the wind warm, and cold beer at hand. Just lounge in those shorts and absorb the good times, working the pileups.

That's as it says in the DX poster, everything in the background and Frank Anzalone, W1WY, pointing a stern finger and saying "I Want You To Go!" But is it that way when you go? Not always.

Last fall the Natal DX Group happily gathered their gear and headed for Fernando de Noronha, the Brazilian Air Force handling the

## 5 Band WAZ

Standings as of November 1, 1987

New recipients of the 5 band worked All Zones:

JA2BL

The top 11 contenders for 5 Band WAZ are:

1. N4WW, 199	7. SP6JCY, 199
2. K6YRA, 199	8. W2YY, 198
3. SM0BZH, 199	9. K7UR, 198
4. W8UVZ, 199	10. K9GX, 198
5. K9CEB, 199	11. G4BWP, 198
6. DJ9ZB, 199	

437 Stations have attained the 150 Zone level.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (39 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Leo Haijzman, 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.

transport arrangements for the personnel and gear. Leave the worrying to them! It was an hour and 20 minute flight to the island.

After checking in at the island hotel, the gear was set up. Even one of the locals, PY0FG, showed up to help. ZY0FKL, along with ZY0FCM, was on the air late in the afternoon, RTTY and CW being offered on 10 and 15. Everything was ready, but the propagation was not.

The next morning things were still bad, but surprisingly, JAs and DUs were being heard calling weakly on CW and RTTY. Then late in the afternoon conditions improved. They could even hear some W/Ks coming through, and Europe and Africa were being worked. Wait 'til the morrow!

The morrow came; the antennas were gone. Some local horses had gotten tangled in with the antennas during the night, and the antennas were gone. Gone! Dipoles had to be improvised to get back on the air.

During the 4-day stay they worked 1200 QSOs, working 10 to 40, and using RTTY, AMTOR, CW, and SSB.

The calls used, with the home calls in parenthesis, were ZY0FMC (PS7BF), ZY0FCA (PS7WB), ZY0FKL (PS7KM), ZY0FCM (PS7PC), and ZY0FRT (PS7BY). If in doubt, QSL to: Natal DX Group, Caiza Postal 385, 59081 Natal, RN, Brasil.

Will they go again? You bet! Look for the Natal DX Group from the island again this coming September. They will be there with their gear and saddle and spurs. They are also anticipating better propagation. Start listening in early September.

## RTTY WAZ

It is a possibility, but it is not done easily. The first RTTY WAZ went to F8XT. Quickly following were #2 TG9VT, #3 DK3CU, and #4 JA1ACB. There have also been some single-band, 20 meter RTTY WAZ awards: #1 is JR2CFD, #2 went to I5FLN, and #3 went to TG9VT. The first worldwide application received completing all 40 Zones was JR2CFD. CQ magazine salutes this hard-working radio amateur of Japan, and we hope to give you the details of his station in an upcoming issue.

This new WAZ award is available as (1) Mixed Frequencies and (2) Single Band (A-80/B-40/C-20/D-15/E-10 meters). W4KA is the custodian of this as well as the other WAZ awards.

## Grand Turks

Mike Lonneke, W0YR, and Lee Bergren, W0AR, will be in VP5-land operating with their own calls /VP5 from January 15th to 24th (hopefully you'll receive this issue in time). Look for them on the usual frequencies; they will be on most bands. QSL to their home QTHs.

Mike notes that a new DX club is being formed in the Chicago area, and if you are looking for a compatible group, drop him a line at WMAQ, Merchandise Mart Plaza, Chicago, Illinois 60654.

## Some Short Notes

There has been some planning for a Spratly operation in March. By the time you read this things may be a bit more solid. Who owns the Spratlys? The Philippines claim and occupy a handful. Vietnam says that some of them are the sacred homeland and holds on to about ten, while Taiwan tells them to back off since they say they also hold a piece of the land.

## CQ DX Awards Program

### SSB

1565	N6AHU	1570	YC0PHM
1566	K3NEE	1571	YB8VM
1567	WB5VFL	1572	KN8D
1568	8P6OV	1573	VE3NSZ
1569	IV3JWR		

### CW

711	KD9NT	713	KD7SO
712	KO7V	714	VE3NSZ

### SSB Endorsements

310	ZS6LW/317	300	WB4UBD/305
310	OZ3SK/317	300	K4CXY/302
310	W0YDB/316	275	XE1CI/291
310	CT1FL/315	275	G4ADD/289
310	OZ8BZ/315	275	KC7EM/284
310	W1NG/314	275	N2CIC/283
310	K8LJG/314	250	KD9BG/250
310	W1LQO/314	200	VE3NSZ/227
310	N6OC/312	150	YB0BOK/157
310	N6AHU/311	150	YB8VM/153
310	VE3MRS/310	150	K3NEE/150
310	W9RY/310	OSCAR	VE3NSZ

### CW Endorsements

310	W1NG/315	275	K4CXY/286
310	DL1PM/312	150	KC7EM/167
275	W9RY/293	150	G3DPX/153
275	K8LJG/297	3.5/7 MHz	KD7SO

Total number of active countries is 317. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an s.a.s.e. is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

There is also a report that Sabah has an anchor on one of the reefs and wants no trespassers. Why all the interest? Years back a petroleum geologist advised that the seismic charts show enough possibilities to make a Texan jig in six-eighth time. And the Law of the Sea, quoted in arguments to change the DXCC criteria, also provides for sovereignty up to 200 miles offshore from an island or mainland.

While worrying about the DXCC, the results of the study and poll and cogitation should be known about this time. What to look for? Not much in the way of changes according to the advance tremors. There may be some rewriting to eliminate a few ambiguities, but nothing to threaten the basics. One learns eventually that it is easier to give than to take back. Any parent can tell you that. Results on a vote by the DXAC to roll the starting date for the DXCC CW Award back to 1945 should be out by now.

Jack Sproat, W4LCL, is now in Amman for a long stay and has been issued JY9LC. Jack notes that the Royal Jordanian Amateur Society operates JY6ZZ mostly on 20 meters, often from 1300Z to 1500Z. JY9LC is project manager on a water project in Jordan and expects to be there for some time.

There is no VP2M QSL Bureau. Thus, it is best to get the needed QSL information when you work a VP2M. Down in that area Aruba was given a second look back before Christmas, the DXAC doing the looking.

W4KA notes that 91 stations qualified for the 50th Anniversary WAZ Award. And on WAZ, KC4AAA at the southern pole can be counted for any one of Zones 12, 13, 28, 29, 30, 32, 38, and 39.

At one of the recent conventions there was a

story as to how one of the recent Revilla Gigeo operations ran into trouble. The Mexican authorities were told that XF4DX was deliberately jamming military traffic. They were off the air for 40 hours until some high-level resources found nothing to substantiate the charges.

If you have spent recent years worrying about sunspots, you can relax for the next several. Cycle 33 is well on its way. The good Doctor Koekelenbergh predicts that the smoothed 12-month sunspot number for February will be 33. Keep in mind that this is a 12-month average centered on last September. During February it will be up within sight of the hundred mark. Prepare! The Great Days of DXing are approaching!

K8MN was due in Guinea-Bissau a month or so back and had been promised a license. He was hoping for J5UMN. Ron Wright, ZL1AMO, will be out soon; it will be the Auckland/Campbell Islands-ZL9 operation in February. You might catch ZC4AP in the United Kingdom Sovereign Base on Cyprus around 21265 kHz after 1300Z on Sundays. It's a sked with G0IHK.

K4TLA will be in J3-Grenada during February and March. The ARRL CW Test will be February 20-21; the Phone Test will be March 5-6. The CQ WW 160 Meter SSB Test comes the last weekend in February, while the CQ WW WPX SSB Test is the last weekend in March. VK9ZG is reported as being active from Willis and will be there until around March. Listen around 14230 kHz after 1400Z.

The great International DX Convention at Visalia is around the corner. The Southern California DX Club will host the gathering this year. Start your planning. At this meeting if it is not pure DX being spoken, it is pure DX contesting being heard. And everyone there is a pure DXer. There are no others.

73, Cass, WA6AUD

## QSL Information

A22RB to KA3BYY	V47Z to W4MGX
AY7DXT to LU5EK	W8KKF/C6A to W4KKF
AZ4F to LU1FM	V9GW/J7 to W9GW
C30W to OH3TY	XE2GKG to YASME
CW4C to CX4CR	ZB2X to OH2KI
CW2B to CW4BBH	ZF2JI to W4KA
CW5A to CX5AO	ZF2KN to WB0JWC
CW8B to CX5BBH	ZK1XO to KA7NLE
CT3EU to G3PFS	ZP5AA to ON4WE
DJ30S/EA8 to DJ30S	ZY5EG to N2AU
FY5YE to W5JLU	4U42UN to NA2K
FJBA to F6AJA	8P6HR to K4BAI
FK/JH4RHF to JH4RHF	8P9AY to K1COW
GB6AR to G4XKR	9H3DX to DF2UU
HK4R to HK4FZ	9Q5DA to KC4NC
HH2MC to KB4IT	9Y4TT to W4UYC
HC8DX to K6VNX	CEBCID to Sergio Cortez, Correo Isla Juan Fernandez, Chile
HI8DLA to HI8TL	CO2BB to C.P. 6022, Habana, Cuba
HL9MM to KA6V	CO5HI to Box 785, Santa Clara, Cuba
IA5KBA to IA5PLB	N4EXR/TA2 to Glenn Whited, PSC 208, APO New York 09254
JW5E to LA5NM	TJ1BP to VE3NPL, 228 Trudeau Drive, Sarnia, Ontario N7S 4K6
J28EO to F6FYD	TZ5MG to Box 2095, LeLystad, 8203AB, Netherlands
KH2F/KH4 to N2AU	XX9TTT to Box 36411, Tel Aviv, 61363, Israel
LZ9A to LZ1KDP	XX9JN to Jose Neves, Box 468, Macau
N8BJD/J6 to W8IMZ	5H3RB to Roel Bouwman, Box 9534, Dar es Salaam, Tanzania
OD5VT to HB9CRV	9K2SH to Salah H. Al-Saif, Box 34541 Edailiya, Kuwait 73256
P4BV to WA6AHF	
PJ8J to K4PI	
SU1ER to N6CW	
TF5TP to DL7MQ	
TE2EY to TI2LCR	
TI8M to TI8CBT	
TV7MTN to F1HWB	
TZ6VV to N0BLD	
T30RY to OH1RY	
V2AO to KE4OC	
V44NX to N8GCW	
VE2LJ (Zone 2) to VE3JDO	
VU2TTC to W8XM	
WB4PJW/VP5 to WB4PJW	
VP9AD to W3HNK	

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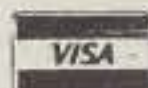
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## Announcing

(from page 6)

Peninsula ARC is holding their 10th annual big event hamfest and dinner dance on Feb. 6 at the C.A.W. Hall St. Catharines, Ontario. Admission \$3, tables \$12 commercial and \$5 non-commercial. Talk-in on 147.24/84. For further information write to NPAR, Inc., P.O. Box 692, St. Catharines, Ontario L2R 6Y3, or phone 416-937-0590.

• **Vienna, Virginia** - In celebration of its 25th anniversary, the Vienna Wireless Society will operate K4HTA from 1300Z Feb. 6 to 2400Z Feb. 7 at the Vienna Community Center. Suggested frequencies: phone 28.400 and lower 25 kHz of General 80, 40, 20, 15 meter phone bands; cw 14.025; 2 meters FM Repeater at 146.685 (-.600). For commemorative QSL send SASE to QSL Manager, K4HTA, P.O. Box 418, Vienna, VA 22180.

• **Dearborn, Michigan** - The 18th annual Livonia ARC's Swap 'n Shop will be held on Feb. 7 from 8 a.m. to 4 p.m. at the Dearborn Civic Center in Dearborn, Michigan. ARRL/VEC amateur examinations will be given by the Motor City Radio Club. Talk-in on 144.75/35 and 146.52. Reserved table space (8 foot minimum) available. For further information, send SASE (4" x 9") to Neil Coffin, WA8GWL, Livonia ARC, P.O. Box 2111, Livonia, MI 48151.

• **Lorain, Ohio** - On Feb. 9 the Northern Ohio ARS (NOARS) will host its annual Winterfest at Gargus Hall in Lorain, Ohio. Doors open at 6:30 a.m. for seller/dealer setup and 8 a.m. for general admission. For information, contact John Paul Jones, WA8CAE, c/o 41751 North Ridge Road, Elyria, OH 44035. Phone (216) 324-3181 days, (216) 282-4256 evenings.

• **Traverse City, Michigan** - The Cherryland ARC will hold its 15th annual Swap N Shop on Feb. 13 at the Immaculate Conception Middle School gymnasium, Traverse City, Michigan from 8 a.m. through 1:30 p.m. Admission \$3.00; tables \$5.00. Talk-in on 146.85 repeater. For information, contact Mick Glasser, N8DBK, 4102 Peninsular Shores Dr., Grawn, MI 49637 (616-276-9203).

• **Newburgh, New York** - The Orange County ARC will operate WB2SON Feb. 13, 1500Z-2200Z, from Washington's headquarters to commemorate George Washington's birthday. Suggested frequencies: 3.860, 7.230, 14.260. Also local 2 meter repeaters and packet will be active for contacts. For certificate, send QSL and 9" x 12" SASE (39 cents) to OCARC, c/o Barbara Christopher, N2AWI, RFD 2, Box 447, Walkkill, NY 12589.

• **Melville, Long Island, New York** - The LIMARC Hamfest will be held on Feb. 14 at the Electricians Hall, Melville, Long Island. Doors open 9 to 3. Admission \$4.00 to all, \$3.00 after 11:30 a.m. Sellers 4' x 6' tables are \$12 or bring your own at \$1.50 a foot, 6 foot minimum, helpers pay admission. Registration in advance only, check payable to LIMARC. Talk-in on 146.85. For more information contact Hank Wener, WB2ALW, 53 Sherrard Street, East Hills, NY 11577 (516-484-4322) or Mark Nadel, NK2T (516-796-2366).

• **Marlboro, Massachusetts** - The Algonquin ARC will hold their electronics hamfest/fleamarket on Feb. 14 from 10 a.m. to 2 p.m., sellers 8

a.m., at Marlboro Middle School Cafeteria. Talk-in on 146.01/61 and 146.52. Admission \$2.00. Tables \$8 in advance, \$10 at the door. Wheelchair accessible. For more info contact Dan, KB1WW, at 1-617-481-1587 or write to AARC, Box 258, Marlboro, MA 01752.

• **Mansfield, Ohio** - The Mansfield Mid\*Winter Hamfest/Computer Show will be held on Feb. 14 at the Richland County Fairgrounds, Mansfield, Ohio. Prizes, forums, and fleamarket. Doors open at 7:00 a.m. Tickets \$3.00 in advance and \$4.00 at the door. Tables \$5.00 in advance and \$6.00 at the door (half tables available). Talk-in, call W8WE on 146.34/94. Advanced ticket/table orders must be received and paid by Feb. 4. For additional information or advanced tickets/tables send SASE to Dean Wrasse, KB8MG, 1094 Beal Road, Mansfield, OH 44905, or phone (419) 589-2415 after 4 p.m. EST.

• **Loveland, Colorado** - The Loveland Repeater Association will sponsor a special events station in conjunction with the Loveland Valentines activities. Operation will be up 25 kHz from the lower edge of the General phone bands and up 25 kHz from the lower edge of the Novice 10 meter band, on 1300 UTC to 0700 UTC Feb. 14-15. Send SASE for QSL to KA0VFF, Michael H. Walker, 3816 Ash Ave., Loveland, CO 80538.

• **Salem, Oregon** - The Salem and Oregon Coast Emergency Repeater Associations will sponsor the 1988 Ham Fair on Feb. 20 beginning at 9 a.m. at the Polk County Fairgrounds. Admission is \$4.00 in advance or \$5.00 at the door. Activities include ARRL/VEC testing, fleamarket, exhibits, and commercial dealers. Talk-in on 146.26/.86. For more information write to Salem Repeater Assn., P.O. Box 784, Salem, OR 97308.

• **Harlingen, Texas** - The South Texas Amateur Repeater Society (STARS) is sponsoring a hamfest Feb. 20-21 at Casa de Amistad (civic center) on Fair Park Blvd. Doors open at 9 Saturday morning. Talk-in: English, 147.39 MHz; Spanish, 146.70. For more information, contact Dr. David Woolweaver, K5RAV, 2210 South Sunshine Strip, Harlingen, TX 78550, telephone 512-425-7744 or 512-425-3128.

• **Sarasota, Florida** - The Sarasota Amateur Radio Association will hold the Sarasota Hamfest & Computer Show Feb. 20-21 at the Roberts Arena. On-site parking is available for 5000 cars, and RV hookups can be assigned to those requesting them in advance. For more information, contact Al Matlick, W2TKU, at 813-923-7008.

• **Brooksville, Florida** - The Hernando County Amateur Radio Association will hold its sixth annual hamfest on Feb. 27 at the Hernando County Fairgrounds on US Hwy 41. Amateur exams will be held. For more information, SASE to HCARA, Hamfest Chairman, PO Box 1721, Brooksville, FL 34601.

• **Cuyahoga Falls, Ohio** - The Cuyahoga Falls Amateur Radio Club will hold its 34th annual hamfest Sunday Feb. 28 at the Akron North High School from 8 a.m. to 3 p.m. For more information, SASE to Bill Sovinsky, K8JSL, 2305 24th St., Cuyahoga Falls, OH 44223, phone 216-923-3830.

• **LaPorte, Indiana** - The LaPorte Amateur Radio Club is sponsoring its Winter Hamfest Sunday Feb. 28 at the LaPorte Civic Auditorium. Forums include the Midwest Microwave Society's Construction Exhibit and Seminar. Talk-in on 146.61 and 145.52 MHz. For more information, SASE to Lynn L. Warner, WB9TSC, LPARC, PO Box 30, LaPorte, IN 46350.

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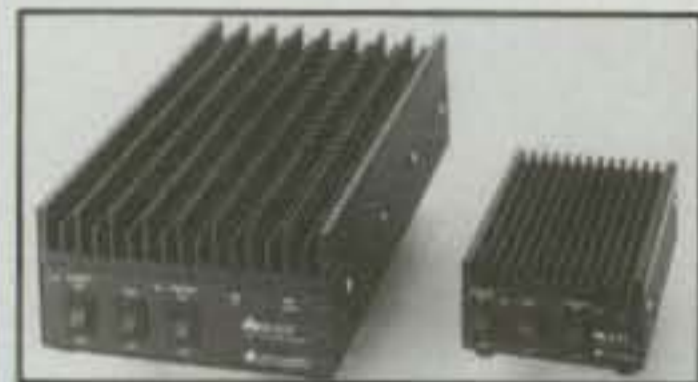
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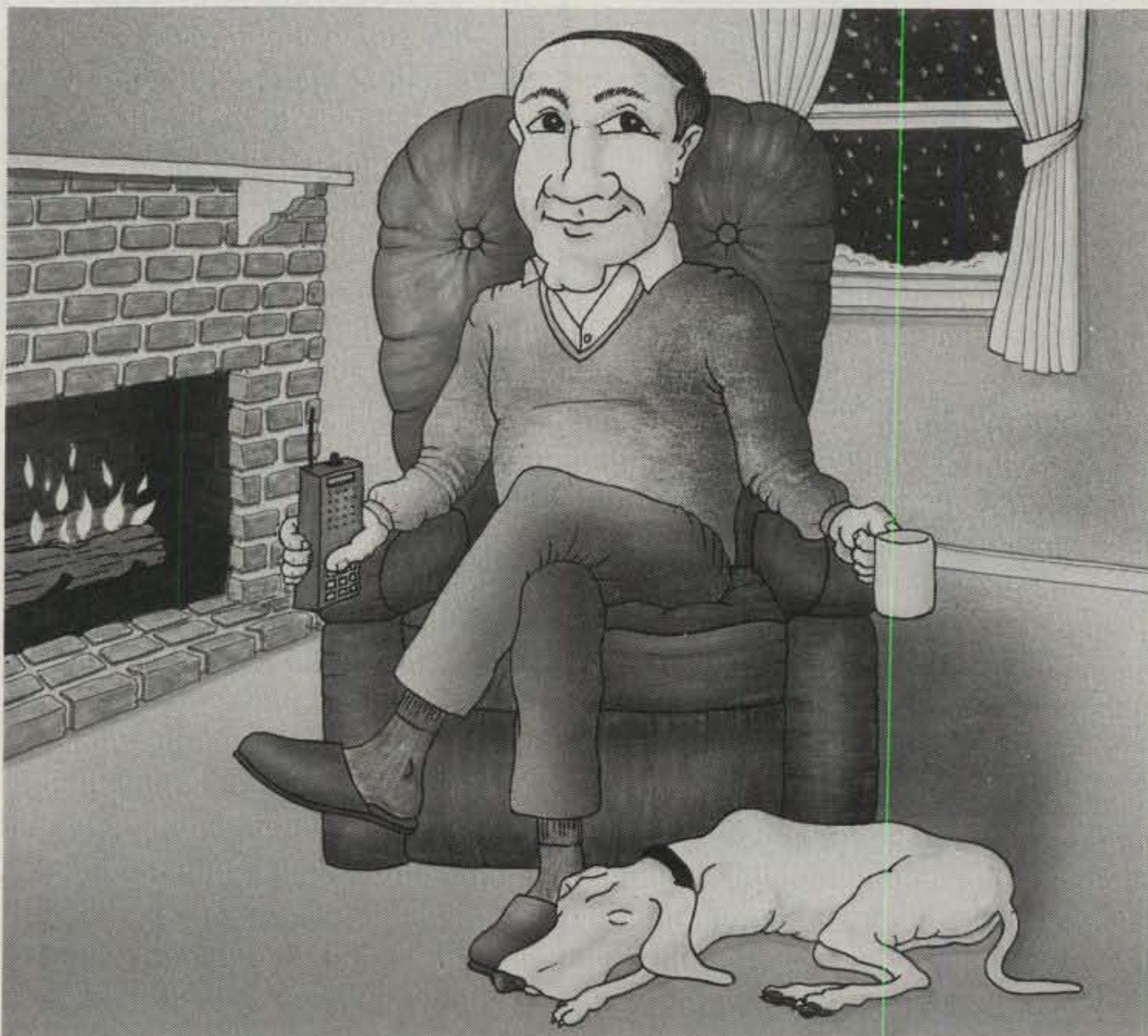
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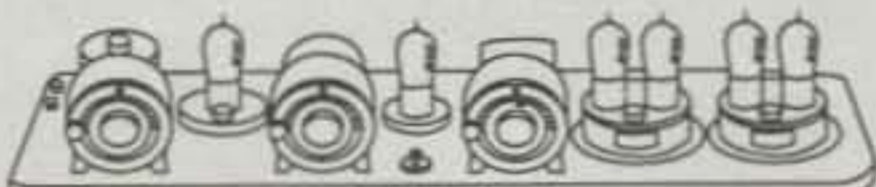


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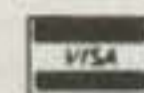
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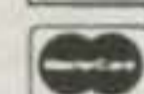


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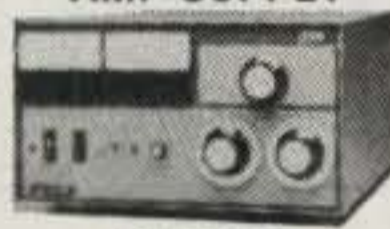
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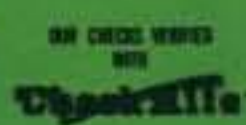
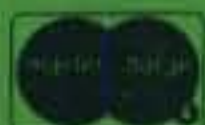
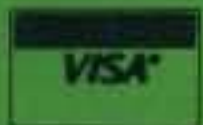
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Operate on 6m, 2m, 1 1/4 m, 70cm, 900 MHz and 1.2 GHz using only one antenna and one feedline. No tuning is required and the VSWR is 2:1 or less across the entire frequency range with excellent forward gain. The boom is made of high quality aluminum and the elements are pre-cut for easy assembly. Each model can be mounted for either vertical or horizontal polarization. Create VHF/UHF log periodics are great for the amateur bands, scanners and numerous other applications.

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No brake!

(Lower mast bracket available)

Second overlay



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Preset function

Manual control

**RC5A-3**

RC5-1	10 sq. ft.	\$251
RC5-3	10 sq. ft. preset	\$328
RC5A-2	25 sq. ft.	\$399
RC5A-3	25 sq. ft. preset	\$459
RC5B-3	35 sq. ft. preset	\$736

(All rotators are UPS shippable)

See Lew McCoy's Review In August 1987 Issue Of CQ.



Creative Design Co., LTD.®

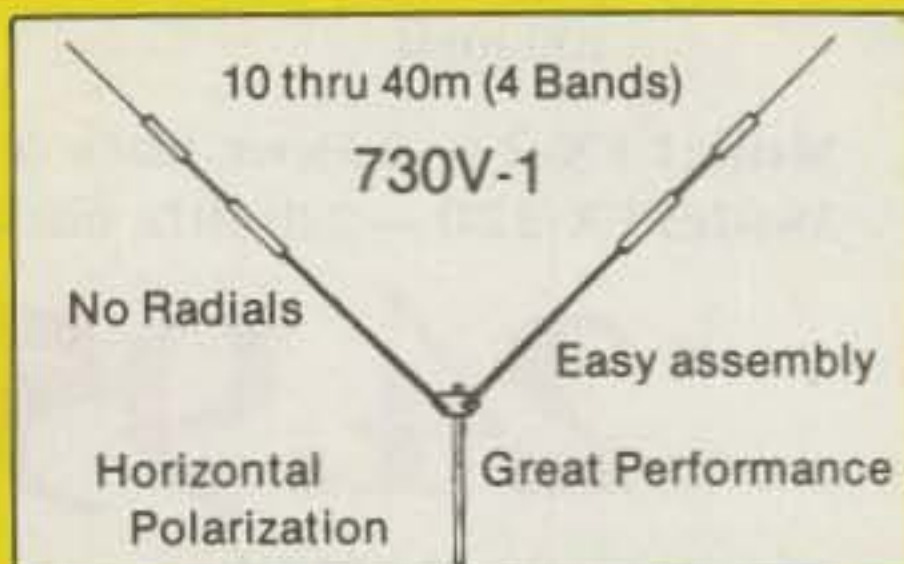


714X-3

### 714 Series Tribanders 15-20-40 Meters

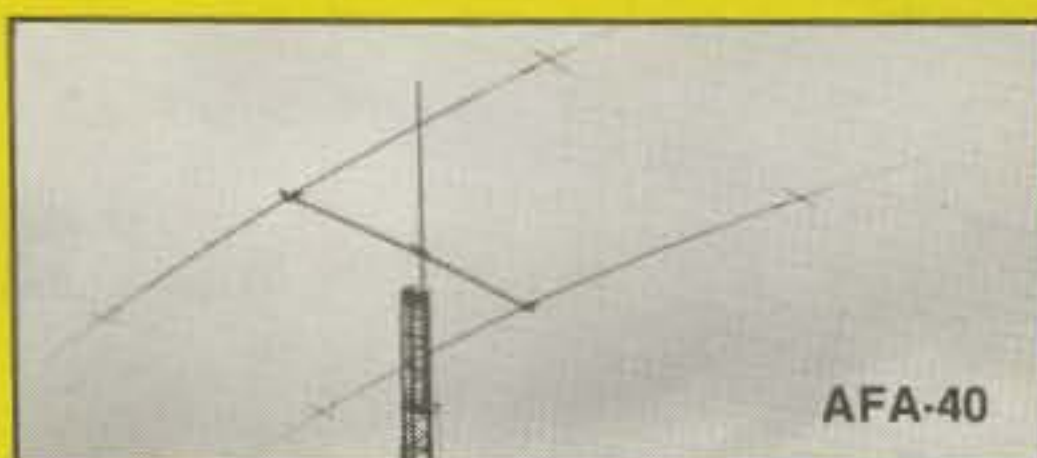
Model	Elements 40-20-15	Boom Length	Longest Element	Turning Radius	Wgt. Lbs.	Power PEP	Price
714T	2/4/4	28'6"	43'	25'3"	71	2 kw	\$574.
714X	3/4/4	32'5"	44'	26'2"	75	2 kw	\$762.
714T-3	2/4/4	28'6"	43'	25'3"	75	3 kw	\$707.
714X-3	3/4/4	32'5"	44'	26'2"	80	3 kw	\$928.

(Prices include balun)



The 730V-1 is a V-dipole consisting of two 19 ft. heavy duty, self-supporting elements and bracket with an efficient balun that is ready for mounting on a standard TV mast. Rotation is not necessary. The V-dipole is superior to standard vertical antennas in gain, noise and efficiency. **\$159 UPS**

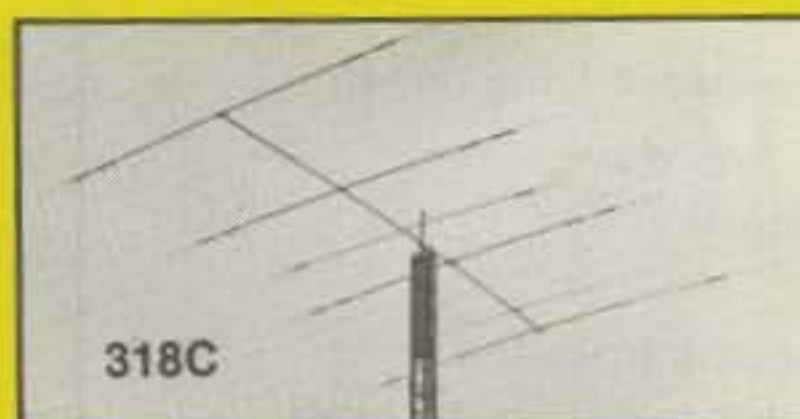
### AFA-40 2 Element Phased Arrays



AFA-40

Model	Freq Mhz	Boom Length	Longest Element	Turning Radius	Wgt. (Lbs)	Power PEP	Price
AFA-30	10	12'11"	32'1"	18'	29	1.5 kw	\$258.
AFA-40	7	16'8"	47'10"	25'7"	42	3 kw	\$388.
AFA-75-1	3.8	29'6"	80'	42'7"	148	4 kw	\$1,940.

(Prices include balun)



318C

### 318 Series Tribanders 10-15-20 Meters

Model	Elements 20-15-10	Boom Length	Longest Element	Turning Radius	Wgt. (Lbs.)	Power PEP	Price
318JR	3/3/3	13'1"	31'1"	15'9"	28	1.2 kw	\$289.
318	3/3/3	16'4"	31'1"	17'4"	40	2 kw	\$345.
318B	3/4/4	20'11"	31'1"	18'4"	49	2 kw	\$434.
318C	5/5/5	29'10"	31'1"	21'	58	2 kw	\$643.

(Prices include balun)

Prices do not include shipping.

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Yaesu Cincinnati Service Center 9070 Gold Park Drive, Hamilton, OH 45011 (513) 874-3100.

Prices and specifications subject to change without notice. PL is a registered trademark of Motorola, Inc. FT-33R shown with optional FNB-9 battery pack.

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WANTED: ICOM model IC402 UHF TCVR for OSCAR use. HP1AC Cam, Box 6-583, El Dorado, Panama, Panama.

WANTED: Dial part #100-449 for Heathkit Models SB-301 or SB-401. Loretta Hausmann, KA3QBT, 6256 Montague St., Philadelphia, PA 19135.

FOR SALE: YAESU Twins FR-101 receiver F1-101 transmitter, must sell \$500 or best offer. Call (608) 297-7107, Ed Wolvin, Rt. 4, Box 216, Montello, WI 53949.

WANTED: Collins KW-1 and Ten-Tec Argonaut. Dean Manley, KH6B, 2058 Ainaola Dr., Hilo, HI 96720.

WANTED: Hammarlund HC-10 SSB Converter. Will pay approx. \$50 U.S. plus shipping. Terry Robinson, VK3DWZ, 21 Russell Ave., Woodend, Vic., 3442, Australia.

A GROUP OF FORMER US HAMS living in Greece would like to ask anyone in USA who speaks Greek to join us at 14285 kHz every afternoon from 1700-2200 Greek time.

FOR SALE: Two 1920's 4 inch Marco vernier dials, exc. cond., \$6 ea. plus shipping; power supply, 13.8 VDC @ 4a output, regulated, like new, \$15 plus shipping. H. Lash, 19E. 157th Street, South Holland, IL 60473.

WANTED: Info on a RAILFAN's NET., Mint, round, S-Line. Sell: TH7DX, aluminum tower, local pick up only. T. Colbert, WA8MLV, Burton, Ohio 44021.

YAESU FT-726R 50, 144, and 432 MHz CW filt., MD-1 and YM-4B mikes \$1200. Clem Duval, W8VO, 33727 Brownlea, Sterling Hgts., MI 48077.

WANTED: Manual and schematic for DX-20. Parts for SX-28. Q.R. Galbraith, K5TVC, 4303 Kingsway, Farmington, NM 87401.

GE PORTAMOBIL ACCESSORIES WANTED: Power cords, dry cell supplies, etc. Jim, 121 Hilton, Elgin, IL 60120.

572-B TUBES WANTED. Also 1986 Callbook. Larson, Box 1721, Niland, CA 92257, W6TBA.

NATIONAL RADIO MANUAL and NCL-2000 factory parts lists. SASE. Max Fuchs, 11 Plymouth Lane, Swampscott, MA 01907.

FOR SALE: Used HQ1-Mini Quad Antenna in good condition, inc. 50 feet of RG8U coax and assy. instructions, \$50. Local only, call 354-6031. Bob Bradley, W9WGD, 1002 Forest Road, La Grange Park, IL 60525.

HAM KEY HK-2 paddles & homebrew keyer \$26; half-size (67 foot) 80M dipole VGC \$23; PIPO 16 key touchtone pad \$25. C. Bright, 4115 Buckley Ridge Ct., St. Louis, MO 63125 (314-544-5584).

HEATH HW-100, HP-23A, Shure 444, HW-101 updates (VFO, CWF, tubes), \$195. Call for on-the-air demo. K1LEC (802) 886-8121.

WANTED: 17AB10 tube. N4ZB, 1420 Mount Vernon Drive, Holiday, FL 34690.

KENWOOD TS180S transceiver with DFC, extra SSB filter, CW filter, service manual, \$495. Include SASE. AA1K, Jon Zaines, 145 Farm House Lane, Bear, DE 19701.

WANTED: 1941 U.S. Callbook. Good condition. W.D. Carr, W3LDD, 4113 Webster Rd., Havre de Grace, MD 21078 (301-939-2433).

COMMODORE CBM computer complete with floppy disk drive and monitor \$165.00 plus UPS. Phone 419-784 4349, Defiance, Ohio, KA8SMR.

KENWOOD TS940 OWNERS: Easy to install EPROM makes tuning in signals simple with an SSB/CW slow tuning rate of 2 kHz. Faster turning gives faster tuning rate. \$25. Giehl Electronics, P.O. Box 18335, Cincinnati, Ohio 45218.

30L-1, ROUND EMBLEM, \$525. Tom, K4RV, 123 Pine Bluff Drive, Warner Robins, GA 31088 (912-929-2030).

FOR SALE/TRADE: 1920-30s Antique Radios, Zeniths, Pilot, Philco, Victrola, other antiques and electronic gear. SASE for list. Sumter Hickman, 1008 West 10th, Plainview, TX 79072 (806-293-5809).

NEED specifications of AMERICAN TIME PRODS, INC. type 2003, 400 cycles frequency standard. George, SV8KS, 23 Kolokotroni St., GR491 00, Kerkyra, Greece.

CLASSIC HALLICRAFTERS GEAR For Sale: SX-99 Receiver, fair shape, HT-20 transmitter, good shape with manuals, \$200, you ship. Jim Leatham, K7BTB, Box 875, Parks, AZ 86018 (1-602-635-2117).

WANTED: Basketcase SB-200. Also want ARR MML-144VDC Preamp. C. Hays, 3675 Estates Dr., St. Louis, MO 63033.

SALE OR TRADE: SONY ICF-2010 receiver, IBM clone clock/calendar board \$10, want good 2m all-mode. 1551 NW 19th Apt. 2201, Grand Prairie, TX 75050 (214-660-6935).

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WANTED: Crystal Filter for Swan-500, 5173-5175.5 kHz. W5UBS, 613 No. 14th Street, Quincy, IL 62301, (217-222-3067).

YAESU FT-101ZD xcvr, mint condx, new driver and amps, \$400 firm. W8WYT 313-474-2328.

DATA WANTED on an RCA Brunswick Radiola Model AR-813 with Brunswick Balke-Collender phonograph console. Dick Randall, K6ARE, 1263 Lakehurst Rd., Livermore, CA 94550.

MILLEN High Voltage Connectors #37001. Red or Black. New. \$4.00 each postpaid. Ralph, KA1FAA, 16 Hansom Rd., Andover, MA 01810.

FOR SALE: Tempo S-1 with leather case, touchpad, rubber-duck, and connections for an outside ant., \$95; 4-band vert. ant., \$30. Wanted: MFJ 1270 packet interface, packet program for CoCo 2 on tape, 1 KW HF amp and 1 KW VHF amp. Tony E. Byrum, N5JVA, 322 Richmond, Rockwell City, IA 50579.

C.P.I. PARTS and accessories, some new, some used. Also new hardware for C.P.I. Gear. Send wants to Brian Hussey, 2374 Cayuga Ct., Burlington, Ont. Canada L7P 3L5.

TRANSMATCH Enclosure (Sept. 86 CQ) \$35 plus shipping. Tellers CK or MO only. E. Erickson, 343 Catherine St., S. Amboy, NJ 08879-1810.

FOR SALE: Microlog AIR-1. Work RTTY and CW with your C-64 computer. Manual and diskette, \$75.00. H.C. McDonald, N5AX, 2749 Apollo, Barstow, CA 92311.

VISTA XXR 20 AMP pwr supply \$50; 2 meter 1/2-wave cowl mount disguise ANT \$10; Antenna Specialists 2M/auto radio splitter \$10. Charles Bright, 4115 Buckley Ridge, CT., St. Louis, MO 63125.

CUBIC ASTRO 103 SS 9 Band trnscv 10-160 Dual VFO Pwr, Spkr, Man., mint, less than 10 hours use. Save \$600. Call Hal, K6UZ, 619-726-3579.

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NCL2000 AMP, 20 watt in, KW out, works FB. Ask \$600. N4TZ, Terry Zivney, N94 W15635 Ridgeview, Menomonee Falls, WI 53051, (414-255-9058).

WANTED: The "Marine Radiotelegraph Operator License Handbook" by Edward M. Noll (Publisher: Sam's Publishing Co.). Contact: N4PIT, Ray Leist, 15410 Timberline Dr., Tampa, FL 33624 (813-962-1345).

WANTED: Bird 43 wattmeter, Johnson antenna tuner, vacuum variable capacitor, antenna rotator, antenna books. N8EA, 1515 Sashabaw, Ortonville, MI 48462.

FOR SALE: Hallicrafter SX-99 receiver as new, XLNT @ \$70. Ward Becht, 625 Tufts Ave., Burbank, CA 91504.

SELL: Used Amateur-SWL-CB equipment. SASE for list. Joe Bedlovics, 241 Dover Street, Bridgeport, CT 06610.

IRL FSK 1000 RTTY/CW interface \$185. Macrotronics Terminal Modem \$100. Both units for/compatible Apple II+ with cables, software. Excellent condition. NU6A, 10446 El Braso Drive, Whittier, CA 90603-2410.

B & W ANTENNA AS-80 for 80, 40, and 20. 78 ft. long. New, never used, \$73. Ken Massie, 115 Woodlawn Dr., Ironton, OH 45638 (614-532-9606).

WANTED: Low band General Electric Porta-Mobil. Reasonable. Jim, 4193 Central, Elgin, IL 60123.

SELL METERS: 100 ma, 300 ma, 350 ma, 500 ma, 1A, 3A, 4A DC. Lee McKee, W0BX, 1820 Briarwood, Mussatine, IA 52761.

WILSON WE-800 2M synthesized mobile (12W) or portable (1W) xcvr with 16 key Pipo TTP \$125. Taylor 5/8 2M mag MT ant \$15. Charles Bright, 4115 Buckley Ridge Ct., St. Louis, MO 63125.

WANTED: Heath DX-20 manual-schematic, or copy. Hallicrafters "PM-23" speaker. O.R. Galbraith, 4303 Kingsway, Farmington, NM 87401.

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As of February 1, 1988 CCS will be including toroid cores for the input-output cables. We will be using interior garland to obtain an improved RFI ground. We believe that in addition to the Command Center and special cables already supplied with the HR8810 these improvements are helping us produce one of the finest RFI reducing IBM compatible computers available to the Amateur Radio market.

CCS, Inc. will also be including Ham.Com., an Amateur Radio communications program, with each HR8810 shipped. Ham.Com is fully interrupt driven to virtually eliminate birdies caused by long instruction loops. The program provides computer control of Kenwood 440's and 940's, a separate-screen notepad, voice synthesizer emulation for the vision impaired, 30 user definable macros, PK232 control, a QSO file, ASCII and Binary file transfer and much more. A very good program, it is a welcome addition to our complete system. Another Ham computer communications program is available with the HR8810 as an option. ExpertQ from Expertedge offers the operator more radio and TNC Options, FAX, a three time zone time window, 10 function keys, 26 rapid access memory buffers and more. Highly recommended by many, ExpertQ is available as an option for an additional \$50.00.

The HR8810 includes a 4.77/10 MHz motherboard with 640K RAM, two 360K floppy disk drives. Hercules monochrome graphics controller card, 14" CTX monochrome high resolution TTL monitor, two serial ports, one parallel port, one game port, clock/calendar with battery backup and floppy disk controller, AT enhanced style keyboard, three shielded interface cables, and a Command Center providing surge, spike, EMI, and RFI filtering. The computer is housed in an AT Jr. style case with keyboard lock, turbo button and hardware reset. The system includes MS-DOS 3.3\* and the communication software Ham.Com. The cost of the HR8810 as configured above is \$1050.00 and is available in kit form at a reduced price. Of course, if you would prefer a different configuration we can custom build it to your specs for only the difference in price of components.

For more information on the HR8810, custom programming, available software, expansions and all of CCS, Inc. products and services call, write, or use the reader service card.

\*MS-DOS is now 3.3

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WANTED: Pt. 5KC crystal filter for SX-146 Rx, and 32MC, 33MC, and 33Pt5MC 10 Meter Crystals for HT-46 Tx. Loren Dudley, 14 Valley Rd., Bath, ME 04530.

WANTED: HF No Tune amp for mobile service. 500 watts output. Remote operation. Carl, 2317 Rio Grande, Orange, TX 77630 (409-886-3243).

CUSHCRAFT 20-el DX beam, PARKS converter, 432 MHz, pkg. \$35 plus shpg. Bank CK/MO only. W2CVW, 343 Catherine, S. Amboy, NJ 08879-1810.

FOR SALE: Heath HW-5400 xcvr with PS/clock/spkr, SSB filter, keypad entry, and Shure 444D mike. \$500 plus shipping. WA2HAL, 212-877-0980.

WANTED: BUG, used, cheap. N6JUG, Jim Beaudry, Box 881452, San Francisco, CA 94188-1452.

HRO7 four-gang capacitor and grey dial NEW UNUSED fits all HRO series. Best offer. Include SASE USA. OK for reply VE7TK, OK any call book or 604-522-2418.

CQ, QST HANDBOOKS for sale, SASE for list and prices. W3ICZ, Hemlock Farms, Box 1580, Hawley, PA 18428.

COMPLETE INFO-TECH unit, including Model 300 keyboard that generates Morse, RTTY, ASCII; also Model M200E tri-mode converter for CW, RTTY, ASCII, with a Sanyo 9 inch video monitor. I have all the manuals and patch cords for receive of signals. \$425 complete. Guz, WB2EZU, 5084 Chapman Pkwy, Hamburg, NY 14075.

NEEDED: Owners and Service Manuals for Radio Shack DX-150A Rcvr. KA1INX.

MFJ-1229 interface manual set up for ICOM radios with reed relay and ICOM xmit cable & plug \$75. N4IKN, Paul Amodeo, 1339 Claburn Cir., Port Charlotte, FL 33948.

WANTED: Heathkit Mohawk receiver in good cond., unmodified. Thomas Donabedian, 14 Mason St., Worcester, MA 01609, (617-756-7091).

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WANTED: FTV-250, FTV-650B, SP-101PB, FV-101B to complete a Yaesu station. Will trade C-64 comp. w/1541 Dr. and 1224 MFJ interface; or cash. John Werner, RT#1 Box 244A Booneville, Arkansas 72927 (501-928-5747).

WANTED: Stations to make meteor scatter skeds with on 28 MHz. Please give description of equipment and antenna at your QTH. Please include phone number with reply. Larry Jones, WB5KYK, Rt 12 Box 139c, Laurel, MS 39440 (601-426-2403).

FOREIGN TELEGRAPH, wireless and ham keys wanted. Dick Randall, K6ARE, 1263 Lakehurst Rd., Livermore, CA 94550.

SELL: 19 in. cabinets, 66 in. and 43 in. high. Good condx. Also have blank panels. Best offer. Pickup in Houston, TX. K8CSG, 14834 Falling Creek Dr., Houston, TX 77068.

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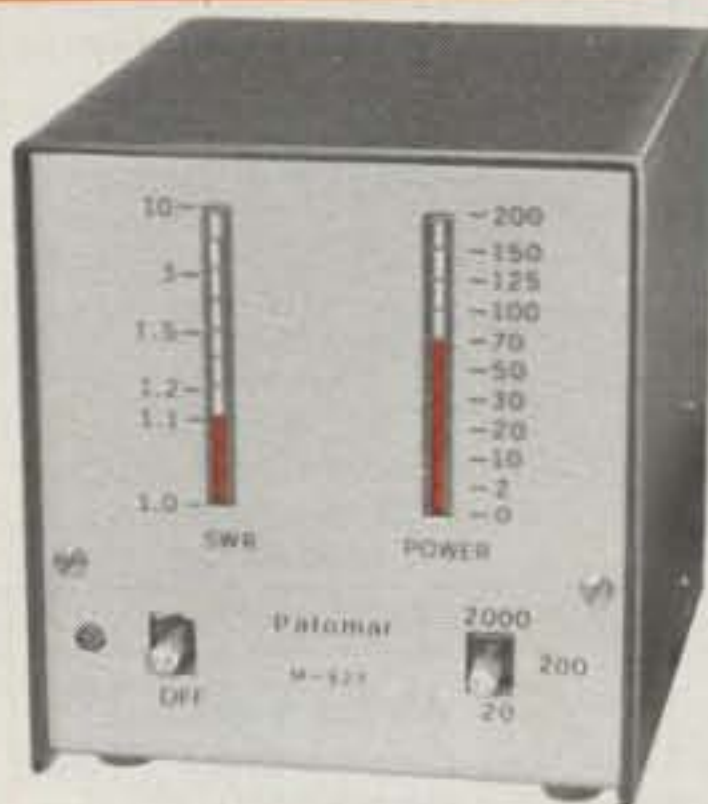


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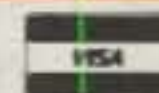


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### ICOM



**IC-900** SIX BANDS IN ONE MOBILE

- Remote Controller, Interface A Unit, Interface B Unit, Speaker, Mic and Cables
- Six Band Units to Choose
- 10 Memories Per Band
- Programmable Band Scan
- Fiber Optic Technology

### ASTRON CORPORATION



Power Supply

- RS7A ... \$48
- RS12A ... \$68
- RS20A ... \$88
- RS20M .. \$105
- VS20M .. \$125
- RS35A .. \$133
- RS35M .. \$149
- VS35M .. \$165
- RS50A .. \$189
- RS50M .. \$215
- RM50A .. \$219
- VS50M .. \$229

### KENWOOD



**TH-25AT**  
POCKET-SIZED AND POWERFUL

- Frequency Coverage: 141-163 MHz (Rx), 144-148 MHz (Tx)
- Front Panel DTMF Pad
- 5 Watts Output
- 14 Memories
- TH-45AT Available for 440 MHz

### YAESU



**FT23/73R**

- Super "Mini" HT's
- Zinc-Aluminum Alloy Case
- 10 Memories
- 140-164 MHz, 440-450 MHz
- 2W Battery Pack or Optional 5W Pack

### ICOM



**IC-μ2AT**

**IC-μ4AT**

MICRO HT'S FOR 2M, 440

- Pocket Size HT Fun
- Ten Memories
- LCD Readout
- Wideband Coverage
- Up to 3 Watts Output
- 32 Built-in Subaudible Tones

### PK-232 (PAKRATT)



Data Controller With 6 TRX/RX Modes

- PACKET
  - MORSE CODE
  - BAUDOT (RTTY)
  - ASCII
  - AMTOR
  - WEATHER FAX
  - All You Need is a RS-232 Compatible Computer or Terminal and Your Radio
- HAM NET \$319.95

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• MOST ORDERS SHIPPED SAME DAY •

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CIRCLE 68 ON READER SERVICE CARD

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YAESU

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RECONCEPTS

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# Introducing the only mobiles that double as answering machines.

Now you can stay in touch—even when you're away from your radio.

With Yaesu's 2-meter FT-212RH and 70-cm FT-712RH, an optional, internal digital voice recorder serves as a convenient answering machine for you and your friends. And that's just the beginning!

## High performance mobiles.

The FT-212RH features wideband receive coverage of 138-174 MHz (144-148 MHz Tx), while the FT-712RH covers 430-450 MHz. An oversize amber display includes an innovative photo-sensor which increases the display brightness during the day. The function buttons are arranged in a chromatic musical scale—ideal for visually-impaired operators. You get 45 watts output on 2 meters, 35 watts on 70 cm.

An autodialer DTMF microphone with 10 memories, each ready to store telephone numbers up to 22 digits long.

And, like our FT-211RH Series mobiles, you'll enjoy surprisingly simple controls, yet highly sophisticated microprocessor-based flexibility. Including 18 memories that store frequency, offset, PL tone, and PL mode (CTCSS unit optional). Band or memory scanning. Offset tuning from any memory channel. Memory channel lockout for scanning. High-low power switch.

All in an amazingly small package, shown actual size below.

## Digital voice recorder option.

Only Yaesu brings you the advanced technology found in our digital voice recorder option.

You can store messages or your call sign—in your own voice, not a synthesized replica—or give your friends a private code for leaving messages on your radio. All they need is a DTMF microphone! Then you can play back your messages either in-person, or remotely by using another radio with a DTMF microphone. And you've always got security because you can command your radio to respond only to in-person playback requests.

## Visit your Yaesu dealer today.

And test drive Yaesu's FT-212RH and FT-712RH mobiles. The only radios with the power to keep you in touch. Always.

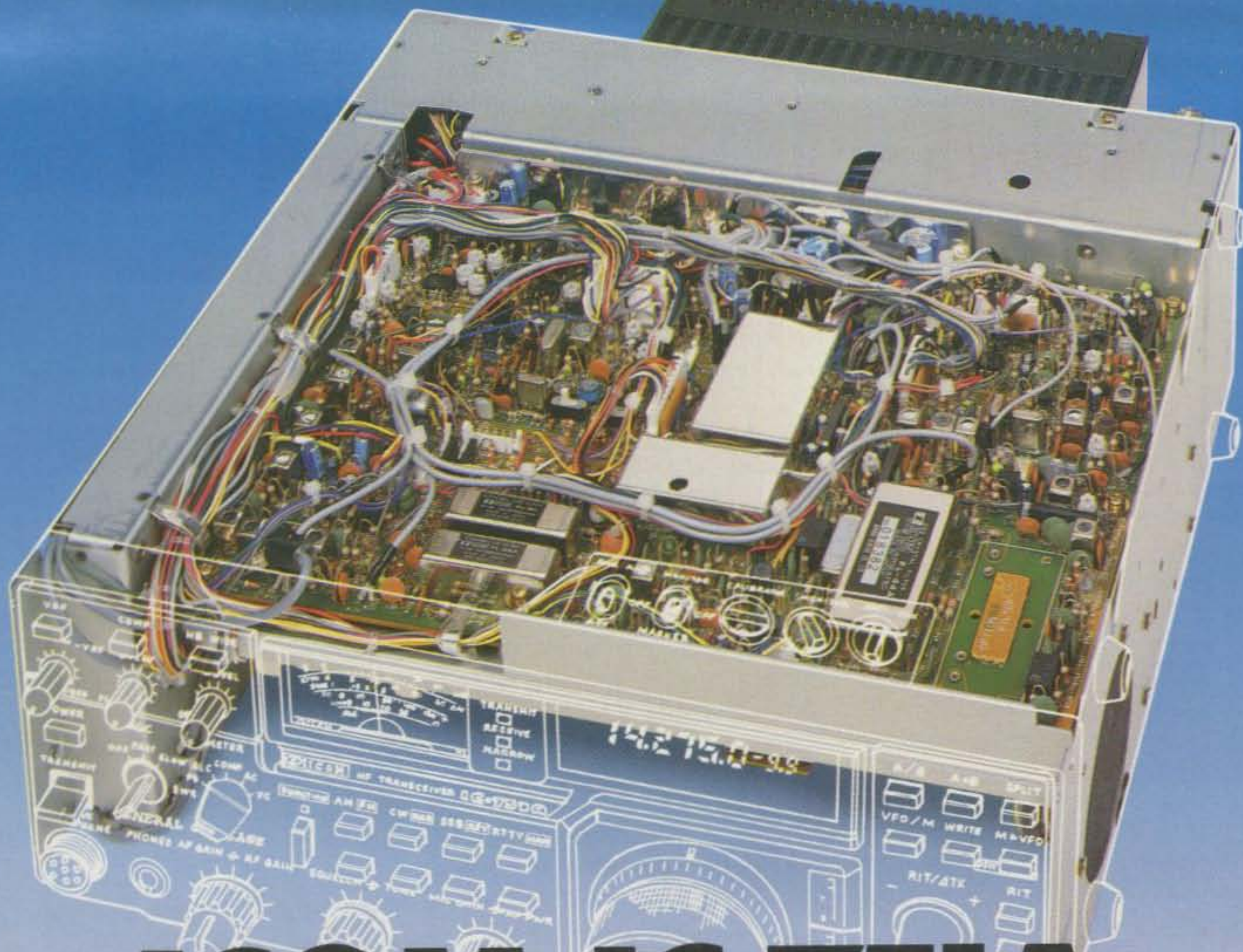
# YAESU

CIRCLE 122 ON READER SERVICE CARD



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# ICOM IC-751A

## "IT'S WHAT'S INSIDE THAT COUNTS!"

- All HF Band Transceiver / General Coverage Receiver
- Advanced Circuit Designs
- All Modes Built-in USB, LSB, FM, AM, CW, RTTY
- Superb Frequency Stability
- Continuous Duty Operation
- Crystal Clear Signal Quality

**Midsize Masterpiece!** The deluxe IC-751A includes more high performance features and professional circuitry per cubic inch than any other HF transceiver. Its smooth-as-silk operation and long-term reliability produce the ideal contesting, DX'ing, mobiling and portable rig. Owning an IC-751A truly means "Going First Class!"

**Unsurpassed Quality and Reliability.** Quality and Reliability is important to you and it's important to ICOM. ICOM now covers you and your investment with its exclusive



one year warranty. There's more! The IC-751A's receiver boasts 105dB dynamic range for superb listening. The 100% duty cycle transmitter defies abuse and delivers 100 watts of exceptionally stable and clean RF output. Reliability. Quality. One year warranty. That's ICOM.

**All Bands, All Modes Included.** Operates 160 through 10 meters, it's easily modified for MARS operation, plus it includes general coverage reception from 100kHz to 30MHz. No compromise, no comparison!

**32 Tunable Memories.** Store both frequency and mode information. Use them to quick-access your favorite spots or as 32 preferred frequency-remembering VFOs.

### A Modern Amateur's Delight!

Special attractions include an electronic keyer, semi or full break-in rated to 40 WPM, panel selectable 500Hz/FL-32A CW filter, and volume control-tracking sidetone. SSB transmissions are enhanced with an RF speech processor and tone control to produce sparkling clear audio. PLUS there's a new rubberized tuning knob for velvet-smooth tuning and a full line of accessories and filters.

**RF Power Control.** Varies output independent of mic gain, ALC and speech processor action. Enjoy maximum "talk power" at any drive level!

To see the IC-751A, contact your local ICOM dealer.

 **ICOM**  
First in Communications

CIRCLE 27 ON READER SERVICE CARD

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