

ICD 08241

# Amateur Radio

SERVING AMATEUR RADIO SINCE 1945

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# CQ

## Is There Youth in the Future for Amateur Radio?

Report on ARRL's  
"No Code" Committee

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Our Readers Comment  
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THE RADIO AMATEUR'S JOURNAL





# KENWOOD

...pacesetter in Amateur Radio

All New  
Dual Bander!

## Two in the Hand!

### TH-75A

#### 2m/70cm Dual Band HT

The new TH-75A Dual Band HT from Kenwood is here now! Many of the award-winning features in our dual band mobile transceivers are designed into one hand-held package.

- **Dual Watch** function allows you to monitor both bands at the same time.
- **1.5 watts on 2 meters and 70cm: 5 watts when operated on 12 VDC (or PB-8 battery pack).**
- **Large dual multi-function LCD display.**
- **10 memory channels** for each band stores frequency, CTCSS, repeater offset, frequency step information, and reverse. A lithium battery backs up memories. Two memories for "odd split" operation.
- **Selectable full duplex operation.**
- **Extended receiver range:** 141-163.995 and 438-449.995 MHz; transmit on Amateur band only. (Modifiable for MARS and CAP. Permits required. Specifications guaranteed on Amateur bands only.)
- **Uses the same accessories as the TH-25AT (except soft cases).**
- **Volume and balance controls, plus separate squelch controls on top panel.**
- **Super easy-to-use!** For example, to recall memory channel, just push the channel number!
- **CTCSS encode/decode built-in!**
- **Automatic Band Change (ABC).** Automatically switches between main and sub band when signal is present.
- **Automatic offset selection on 2 meters.**
- **Tone alert system for quiet monitoring.** When CTCSS decode is on, the tone alert will function only when a signal with the proper tone is received.
- **Four ways to scan,** including **dual memory scan**, with time operated or carrier operated scan stop modes, and priority alert.
- **Automatic battery saver circuit extends battery life.**



• **Supplied accessories:** Dual band rubber-flex antenna, PB-6 battery pack, wall charger, belt hook, wrist strap, water resistant dust caps.

#### Optional Accessories

• **PB-5** 7.2 V, 200 mAh NiCd pack for 1.5 W output • **PB-6** 7.2 V, 600 mAh NiCd pack  
• **PB-7** 7.2 V, 1100 mAh NiCd pack • **PB-8** 12 V, 600 mAh NiCd for 5 W output • **PB-9** 7.2 V, 600 mAh NiCd with built-in charger • **BC-10** Compact charger • **BC-11** Rapid charger

• **BT-6** 6-cell AA battery case • **DC-1/PG-2V** DC adapter • **HMC-2** Headset with VOX and PTT • **SC-22 and SC-23** Soft case  
• **SMC-30/31** Speaker mics. • **WR-1** Water resistant bag.

## KENWOOD

KENWOOD U.S.A. CORPORATION  
COMMUNICATIONS & TEST EQUIPMENT GROUP  
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Specifications and prices subject to change without notice or obligation.  
Complete service manuals are available for all Kenwood transceivers and most accessories.



# KENWOOD

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All-mode  
tri-bander!

## Warp Drive!



## TS-790A

### Satellite Transceiver

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

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

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

#### Optional Accessories:

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

## KENWOOD

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2201 E. Dominguez St., Long Beach, CA 90810  
P.O. Box 22745, Long Beach, CA 90801-5745



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



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**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!”

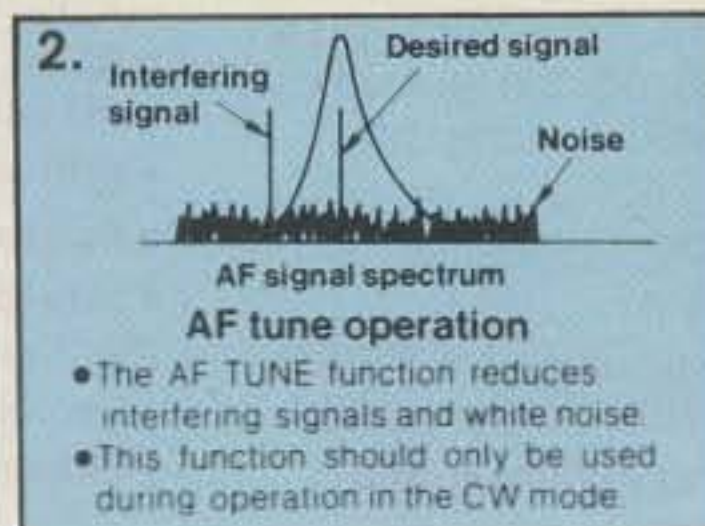
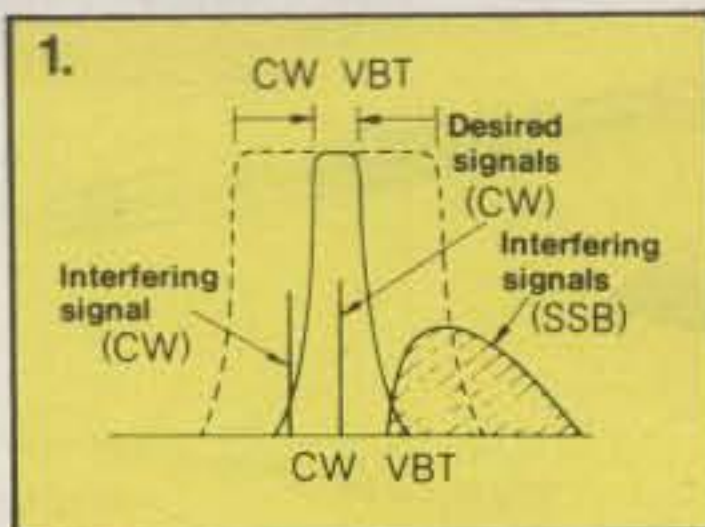
- **100% duty cycle transmitter.** Kenwood specifies transmit duty cycle **time**. The TS-940S is guaranteed to operate at full power output for periods **exceeding one hour**. (14.250 MHz, CW, 110 watts.) Perfect for RTTY, SSTV, and other long-duration modes.
- **First with a full one-year limited warranty.**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

#### Optional accessories:

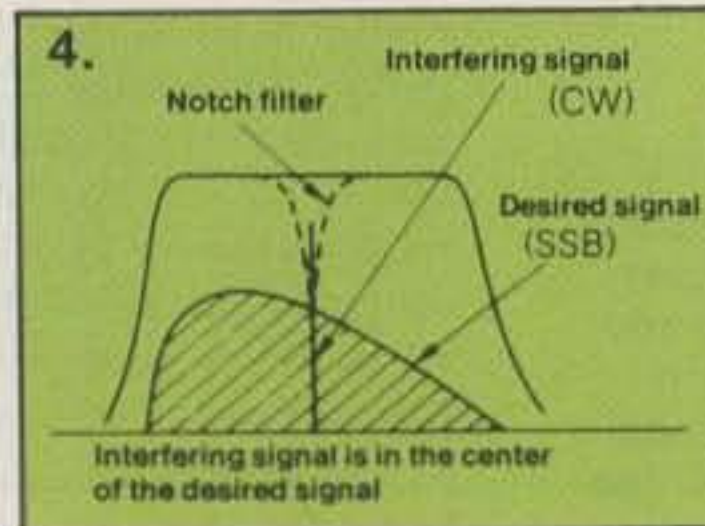
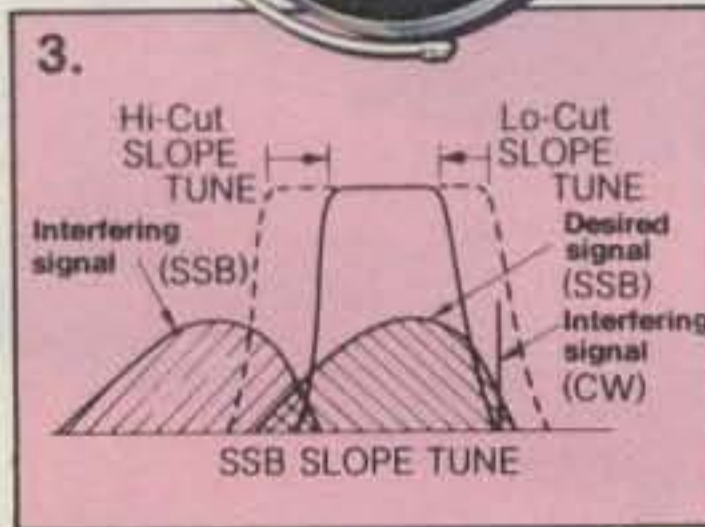
- AT-940 full range (160-10m) automatic antenna tuner
- SP-940 external speaker with audio filtering
- YG-455C-1 (500 Hz), YG-455CN-1 (250 Hz), YK-88C-1 (500 Hz) CW filters
- YK-88A-1 (6 kHz) AM filter
- VS-1 voice synthesizer
- SO-1 temperature compensated

- 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.

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# The Radio Amateur's Journal

**ON THE COVER:** Amateur radio needs many more young people in its ranks in order to survive. These two young people, Jason Kester, KB7EXL and Erik Wilson, KB7EXI, (shown examining a 220 MHz HT) represent our future. Photo by Larry Mulvehill, WB2ZPI.



JUNE 1989

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# Zero Bias

AN EDITORIAL

I've been trying to figure out the analogy of licensing elements lately, and I'm still a bit puzzled. It seems as though some of you equate Morse Code with the degree of difficulty in the written part of the exam. Some people would be willing to "concede" to a code-free entry-level test only if the written part were made harder and more difficult than the present Novice exam. How does one begin to weigh the degree of difficulty in the written part with code speed in WPM? Is there something magical that occurs to an individual who takes a Novice exam with 5 WPM Morse Code as opposed to an individual who could score the same exact score on the written part and fail the CW portion? If that person takes a harder written exam than the Novice, will that magic moment happen for him, too?

On the other hand, no one really defined what they mean by harder or more difficult. Harder technically or more comprehensive on rules and regulations? I'm sure they didn't actually mean having an individual memorize more technical data that they really couldn't use or even comprehend. It must mean, of course, a thorough understanding of rules and regulations governing amateur radio. That would be more to the point, having a meaningful examination on things the applicant must know and for which he or she is responsible.

Probably, though, some people would throw common sense out the window and opt for a harder technical exam just to see "how serious" the individual is. Well, we could save some time and expense by granting certain things as "givens." If we grant that a person with a basic BS degree in one of the electronic sciences knows a lot more than most of us, then we can just give this individual a CW test and start him or her off as a General class amateur. Remember that you can just about fail the element on rules and regulations and still pass on theory alone. A Master's degree could equate to an Advanced, and who would deny a PhD an Extra?

I'm sorry if it seems as though I'm nit-picking, but it seems that some people would still like to mix apples and oranges. It's also reassuring to know that coming up with harder and harder exams can be mistaken for sadistic fun, especially if you don't have to take the exam. I am reminded of a New York State license that I hold. I sat for an exam and passed a test. The license is good for one year and is renewable once for another year. To continue holding that license, I must retest at the end of the second year with the current license exam. Sounds interesting, doesn't it? I'm sure we'd all like to retest

periodically to hold our current amateur radio license with whatever is the current exam. What happened to all the stuff on tubes?

## The ARRL "No-Code" Committee

The committee met earlier this year and presented their report to the ARRL Board at the beginning of April at the Kansas City Hamfest. Ed Juge, W5TOO, a member of that committee, fills us in on the committee and the actual report in this month's issue. It's interesting reading. It's not perfect, and it begs the point, but at long last the League is seeing the problem and trying to come up with solutions. I think in their own way they're trying to lead in this instance and not typically react to a situation. The experience is a new and positive one for them, and we appreciate what they're trying to do not only on our behalf but for all future amateurs.

## Travels With CQ

We've been remiss lately with our food reviews, and some of you have taken me to task at hamfests. First let me safely say that NO concession-stand food should be eaten. The soft drinks are okay, but the food at all of these events should be passed on. Bring food from home, eat before you come, or go out to a fast-food restaurant in the neighborhood.

In the last month or two we've been to Cincinnati, Charlotte, and Kansas City, and this week's trip will take us to Orlando. I've seen a lot of fellow AARP members and median-age-plus amateurs. A lot of you voice your concerns about what is happening in amateur radio today, saying that something has to be done and done quickly. Speaking of quickly, a quick look around most convention halls and for that matter most club meetings will tell you more about the state of amateur radio than my words. It won't be long before club meetings will be strictly senior-citizen outings and the QCWA only for the "kids."

Although we may be dying off, we haven't yet lain down and stopped breathing. We're all part of the process, each and every one of us. We have to help support those clubs and organizations who are out there giving license courses and exams. Those who can should help teach a course or two. Even if you say you can't teach, you can help a new licensee get on the air and help him or her develop good operating habits and procedures. Don't let that new licensee fall by the wayside through indifference.

The Charlotte Hamfest provided two interesting points. The first was a plaque

located on a corner of the convention center. The plaque was put up by the historical society and says that this was the sight of the Confederate Navy yard. Where's the water? Downtown Charlotte is pretty far inland, and it makes you wonder how they got the ships to water and makes you think that perhaps placing the Navy yard there might have cost the South the war. The second and more up-to-date delight was a restaurant to which Wayne and Lola Carroll (QSLs by W4MPY) took us. Wayne kept saying, "Try the shrimp cocktail; you'll like the sauce." That should have been a hint, but we all ordered it anyway. This stuff had to be just about the hottest cocktail sauce created by man. It is good, even though it sears your sinuses. The place is called The Ranch House, and it's just outside of Charlotte.

Kansas City was interesting in that people came by to ask me if the food had improved from last year. No way! It's still the same old stuff shaped like food. However, Chuck Miller, WA0KUH, who runs the hamfest, came by the booth on Saturday afternoon and tossed two large packages (for Arnie and me) at me saying, "I don't want to hear you #%\$@&¢\$\*% about the food here again." It looked like two packages you would bring home from the butcher shop, taped brown paper weighing a pound or two each. It turned out to be sandwiches from a famous local restaurant called Bryants. Each package contained two sandwiches, one barbecued beef and the other barbecued ham. Each sandwich was over 3 inches thick with meat and covered in sauce. It looked like a haunch of ox with sauce, and it really was delicious. Thanks, Chuck.

Dayton is still a couple of weeks away as this is being written, and it's the big topic of conversation around here. They've added a new building, which means that there will be lots more to see this year (and a few less parking spots). You have to go there with a wish list and a list of things you're specifically looking for. There's so much stuff to look at that it's easy to get sensory overload, and you need some means of keeping on track. This year we have sort of an edge on some of the bigger items. Dick and Cathy plan to drive out, so we can always load up their car for the return trip. With any luck there will be 30,000 people excited about amateur radio. It's still an exciting hobby for a lot of us, and that's the point we have to get across to new people.

Get out there and have some fun. Support your local hamfest, and if you see us there, come by and say hello.

73, Alan, K2EEK



# The Morse Machine™

## The Ultimate Keyer from AEA



The Morse Machine has all the features you've been asking for in a high performance keyer like 2-99 WPM speed selection and over 8,000 characters of memory that can be stored in 20 memories. The 20 memories are soft partitioned so that your stored messages may be as short or long as you like. Memory can be expanded to hold up to 36,000 characters. Of course, all memory is backed up by an internal lithium battery so that once a message is loaded, it will stay there until you write over it.

Whether you're an expert or a novice, The Morse Machine has three ways to help you improve your code:

- A proficiency trainer, the same as the one used in the MorseMatic, allows random code group practice with steadily increasing speed.
- A random word generator that randomly generates 4-letter words for a more realistic practice session.
- Dr. QSO (tm) QSO simulator based on our program for the Commodore 64 computer. You can call other stations, answer a CQ, or just sit back and listen to realistic QSOs very much like those you would hear on-the-air.

The Morse Machine is a full featured keyer for the serious contester, with automatic serial

number insertion and incrementing in any memory message. You can use the front panel knob to adjust your sending speed or enter a precise speed with the keypad, toggling between the two at any time. Exchanges can be speeded up by having parts of your message sent at a higher speed. You can also add remote switches for 4 of the memories so that you can instantly send your responses or call CQ.

A computer can be interfaced to The Morse Machine through its RS-232 compatible I/O. Any front panel function may be programmed by the computer. This makes loading memories as simple as typing them in from your keyboard. The Morse Machine can display your random code, or Dr. QSO practice sessions on the computer screen.

The Morse Machine can be programmed to be an automatic beacon. This can be used to automatically repeat a Morse (or RS-232 ASCII) message at a programmed interval of 1 to 999 seconds.

See your AEA dealer today for a demonstration of The Morse Machine or contact:

**Advanced Electronic Applications, Inc.**

P.O. Box C-2160 Lynnwood, WA 98036  
206-775-7373



# Announcing

•**LARC VE Exams** - The Laurel ARC of Laurel, Maryland provides VE exams for all license classes on the fourth Saturday of each month (except December). No fee is charged. Preregistration is required by calling Maryland Radio Center at 301-725-1212. MRC is located at 8576 Laureldale Drive, Laurel, MD 20707.

•**Little Big Horn Amateur Radio Organization** - This organization of Native American radio operators and others who have an interest in Native American culture and history has been formed and includes members from coast to coast. Two code nets are conducted weekly. For more information, contact M. McDaniel, W6FGE, 940 Temple St., San Diego, CA 92106 (619-222-3912).

•**AA Amateur Radio Group** - A licensed amateur radio group made up of members of Alcoholics Anonymous has been formed to enhance fellowship among members who may have difficulty attending regular AA meetings. For more information, contact the group coordinator of HAAM Radio, ARS N8KDW, 4121 S. Fulton Place, Royal Oak, MI 48072 (313-549-5275).

•**The following Special Events will take place during June:**

**GB2RBC**, from Royal Balmoral Castle, Crathie, Aberdeenshire, Scotland; the Scottish Tourist Board Radio Amateur Expedition Group; June 24-25. For more info contact the Scottish Tourist Board Expedition Group, P.O. Box 59, Hamilton, Scotland ML3 6QB.

**One-land**, from Milford, CT; the amateurs from Milford, CT; 1200Z June 10 to 200Z June 11; lower third of the General band 80-15, 10 meter operation in mid-portion of Novice phone band, 2 meters via 146.925 repeater. For QSL send SASE to P.O. Box 1639, Milford, CT 06460.

**WB2JKJ**, from New York City, NY; Radio Club of Junior High School 22 NYC; June 26 from 1100-2000Z; 7.238 and 21.395 MHz. For QSL send your

QSL to The Crew at 22, P.O. Box 1052, New York, NY 10002.

**KV2W**, Keuka Lake, Hammondsport, NY; Keuka Lake ARA; May 29 from 1500-2430Z; phone and CW in the lower 20 kHz of the 40 through 10 meter General class bands, plus Novice phone 28.3-28.5 MHz. For certificate send QSL and SASE to James White, KV2W, P.O. Box 391, Hammondsport, NY 14840.

**WA3WGN**, from Johnstown, PA; Conemaugh Valley ARC; June 3; lower General phone bands of 20 and 40 meters, Novice phone portion of the 10 meter band. For QSL send No. 10 SASE to The Conemaugh Valley ARC, 194 Barron Ave., Johnstown, PA 15906.

**Three-land**, from Prince Georges Worldfest, Prince Georges County, MD; Prince Georges Amateur Radio Emergency Service; 1500Z June 17 to 0200Z June 18 (no frequencies given). For QSL send your QSL and SASE to PG-ARES, PG OEP, 7911 Anchor St., Landover, MD 20785.

**AB4LN**, from Dade City, FL; East Pasco Amateur Society; June 9-11 beginning at 10 AM each day; phone operation 10 MHz up inside the General/10 meter Novice phone band, RTTY in accordance with the band plan. For certificate send No. 10 SASE (9 x 11 for unfolded) and your QSL to EPARS Centennial, AB4LN, P.O. Box 942, Dade City, FL 34297-0942.

**W7LA**, from Pasco, WA; June 24-25; 25 kHz up from bottom of General band SSB and CW. QSL for No. 10 SASE to KE7PB via Callbook.

**W8ZX**, from New Philadelphia, OH; Tusco ARC; June 10-11 starting at 1700Z June 10; 28.400, 21.340, 14.300, 7.265, 3.945, packet on 145.050, and 2 meter repeater on 146.730. For QSL send SASE to W8ZX, P.O. Box 725, New Philadelphia, OH 44663.

**K080**, from Madison, OH; Wireless Institute of Northern Ohio; June 3 from 2300-0300Z on 7235 and 14235 kHz, and June 4 from 1500-1900Z on 14235

and 21310 kHz. For certificate send No. 10 SASE to K080—WINO Weekend, 10418 Briar Hill, Kirtland, OH 44094.

**W8VM**, from North Olmsted, OH; Westpark Ra-dios; 0000Z June 3 until 1500Z June 4; lower portions of the General 80-n-10 meter phone, Novice portions of the CW bands and Novice 10 meter phone. Send QSL and SASE to W8VN, c/o Glenn Williams, 513 Kenilworth Rd., Bay Village, OH 44140.

**W9EFU**, from Madison, IN; Clifty ARS; 1500-2100Z June 11; 25 kHz up from the bottom of the Novice bands. QSL with No. 10 SASE to Clifty ARS, P.O. Box 452, Madison, IN 47250.

**W9OFR**, from Lockport, IL; Joliet ARS; June 17-18 from 1400-2200Z; phone 7265, 14265, 21365, 28365, and 146.52 MHz FM. For certificate send No. 10 SASE to W9RCJ, 317 E. Second St., Lockport, IL 60441.

**W8HPW/9 or NQ8B/9**, from Indianapolis, IN; Nazarene Amateur Radio Fellowship; June 22-27; 7.275, 14.305, 21.385, 28.383. For QSL send QSL and SASE to K9HCT, 1130 Willowdale Ave., Elkhart, IN 46514.

**W8VQN**, from Scottsbluff, NE; Tri-City Radio Amateur Club; June 2-4; SSB 3.920, 7.240, 14.250, 21.300, 28.400, 52.50; CW 3.725, 7.125, 14.125, 21.120, 28.130. For QSL and large certificate send SASE to P.O. Box 925, Scottsbluff, NE 69363-0925.

**P29CEH**, from top of Mt. Wilhelm, Papua New Guinea; Eastern Highlands ARC; 2300Z June 2 to 2300Z June 3; 14.195, 14.305, 144.01, 144.10 MHz. For QSL send your QSL (or detailed reception report for SWLs) to Eastern Highlands ARC, P.O. Box 789, Goroka, Eastern Highlands Province, Papua New Guinea.

**VE1PEI or VE1CFB**, from Summerside, Prince Edward Island; Prince Edward Island ARA; June 23-25; all bands. All contacts will be QSLed via the Bureau upon receipt of QSL.

(continued on page 60)

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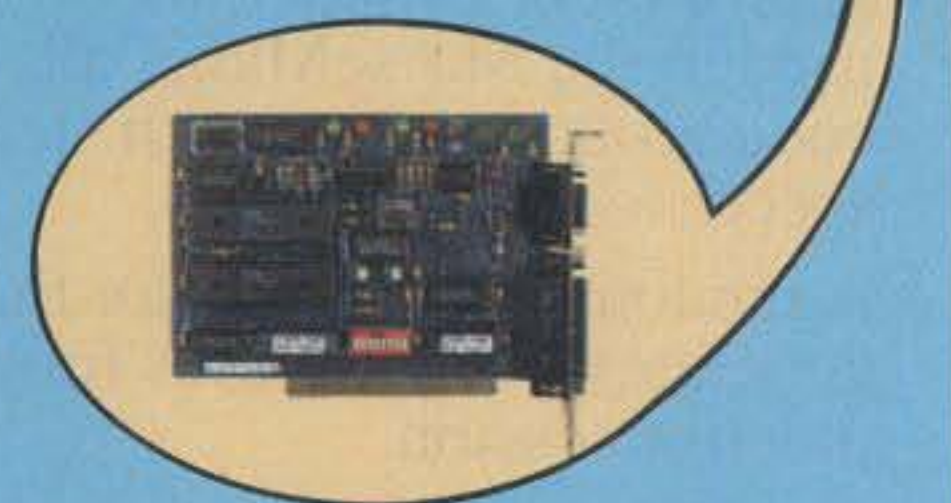
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## Our Readers Say

### Soviet Rag-Chewers Please Respond

Editor, CQ:

Many thanks for N3CBW's informative article on ham radio activity in the Soviet Union. (*Glasnost, Perestroika, and QSLs*" by H.B. Mutter, N3CBW, March 1989 issue).

Another hobby of mine is the study of the Russian language and the various cultures of the Soviet Union. What a wonderful thing it would be, I thought, to be able to chat with Soviet amateurs, and perhaps get in a little language practice over the air. So far I have been disappointed.

While I have had numerous contacts with Soviet hams, they have all been of the "hello—signal report—73" variety. I hope Soviet amateurs get a little piece of glasnost for them-

selves and can take the time for some plain old ham radio rag-chewing.

Charles Zusman, WE2R  
Teaneck, NJ

### The 10 Meter—Novice Portion?

Editor, CQ:

I feel that as a ham of somewhat good standing of 30 years I am qualified to comment on the letter from KB6LZW in the April issue.

The attitude that is reflected in Mr. Murphy's letter I hope is not that of the overall ham community. "Novice Portion" of the 10 meter band, this band is allotted to all classes of license holders to use, and should not be called a "Novice Portion." I do not condone any of the poor manners on 10 meters or on any of the

other bands, but as anyone can tell there is a large amount of unlicensed operation on the low end of the 10 meter CW and phone band, just as there is the unlawful, unlicensed high power DX operation going on in the 27 MHz band.

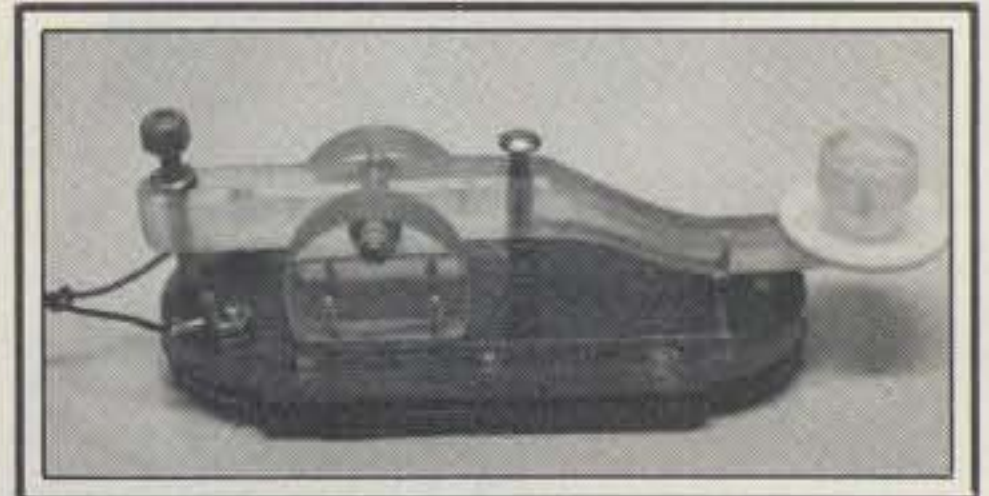
I feel that we should all pull in the same direction for the betterment of ham radio and stop thinking of band portions of the 10 meter band as the "Novice Portion," but as the low end of the 10 meter band where the Novices are allowed to operate. This is a privilege for their class of license. There is too much dissension about phone privileges for the Novices. Please don't add to it with an attitude of "That is my band, or that is my frequency." Ham radio is for everyone to enjoy!

Ted Jenson, KE6WF/9,  
Spooner, WI

### A Key Do-It-Yourselfer

Editor, CQ:

Congratulations to Dave, K4TWJ, on his article in the February issue "More Keys Revisited." I found it most interesting.



Being somewhat of a do-it-yourselfer, I made my key out of some scrap plastic and added some lead under the rubber base pad to give it a little weight. Thought you might like to see a picture of it.

J. Robertson, C6AER  
Nassau, Bahamas

### More on the Coax Line Stretcher

Editor, CQ:

The Coax Line Stretcher (CLS) described by W4UW in the April 1989 issue of CQ is a very useful device, utilizing a novel construction technique. I would like to make the following points in reference to it:

1. The same performance can be achieved by using fewer switches and less coax. A binary arrangement of coax line lengths of 2, 4, 8, 16, and 32 feet, with 5 associated switches, will provide selection of every 2 foot increment from 2 to 62 feet.

2. The lowest frequency at which the CLS provides its full available range of impedances is not stated. An electrical half wavelength of coax is required for this. Assuming a velocity factor of 0.66, 62 feet of coax will provide this coverage down to 5.24 MHz.

3. The principal function of the CLS is to provide switchable selection of many of the infinite number of impedances which produce a given VSWR. Ideally, use of the CLS should not change the VSWR. The fact that it does, as shown by W4UW's results, suggests that "antenna" current is flowing on the outside of the coax. In this case, the use of the CLS can have a secondary function of detuning the resonance which causes this current.

Tony Berg, W1OT  
Stow, MA



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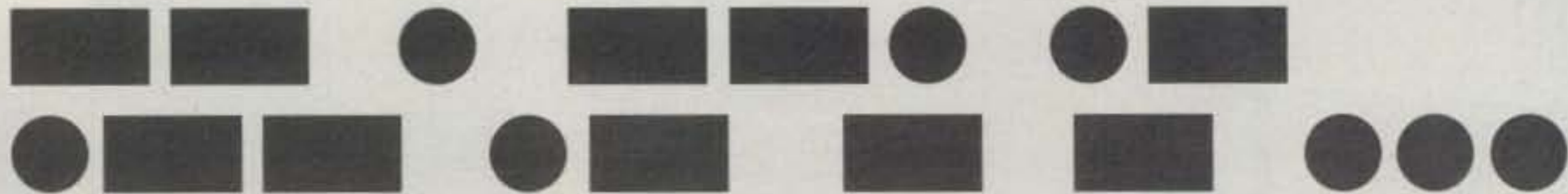
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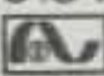
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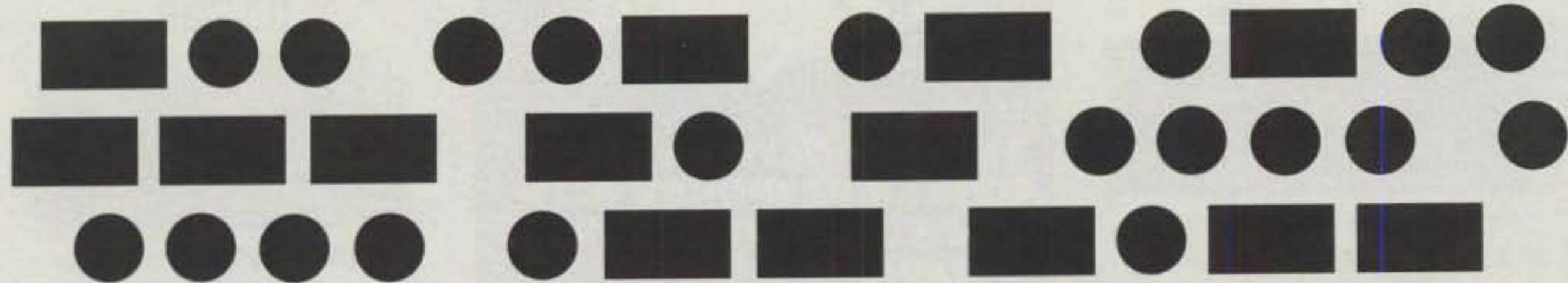
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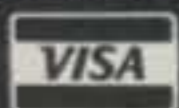
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***We've all waited to see the recommendations put forward by the ARRL's "No-Code" committee. We need speculate no more as W5TOO, a committee member, gives us his report on the committee and their findings.***

## The ARRL "No-Code" Committee

BY ED JUGE\*, W5TOO

**T**he FCC decision in 1988 to convert 2 MHz of the 220 MHz amateur band to commercial service angered, shocked, and dismayed many amateurs, despite the fact that several years ago the FCC had sent the message "Use it or lose it." The 220 decision, while certainly not a death blow to amateur radio, is the most dangerous of precedents. It sends signals to powerful commercial interests that our bands are "available" if sufficient pressure is brought to bear. It should signal us that amateur radio is in mortal danger unless we act decisively and swiftly. Can we protect ourselves? Our greatest strength is in numbers—numbers of trained operators available to furnish volunteer communications in time of need; numbers of young people who because of amateur radio's influence choose to pursue a career in the sciences.

We must get amateur radio growing again. The service is "graying" with our average age now in excess of 50 years. Without substantial growth in the service by the inclusion of younger hams, our ranks will soon shrink as older hams die off.

We have assumed that "ownership" of our bands is inherent, that we are invincible. The folly of such complacency is proven by 220.

Once amateur radio was a major force in encouraging young people to pursue the sciences. Today an insignificant percentage of new amateurs are under age 20. The United States is losing its technology leadership at an alarming rate. Often in math and science testing U.S. students rank dead last, or close to it. As a nation our need for competent young scientists has never been more critical. Amateur radio may not be the cause of the problem, but never in our history have we contributed less to the solution.

\*2000 Thousand Oaks Drive, Burleson, TX 76028



ARRL "No-Code" committee meeting, March 10-11. Standing (left to right) are Thomas B. J. Atkins, VE3CDM; Leland Smith, W5KL; George S. Wilson III, W4OYI; C. Mike Lamb, N7ML; Ed Juge, W5TOO; and Rod Stafford, KB7ZV. Kneeling left to right are Ken Kopp, K0PP; John M. Crovelli, W2GD; and David Sumner, K1ZZ.

Would-be hams often argue that amateur licensing requirements are not "in tune" with today's advancing technologies. Bright young people—students, engineers, programmers, computer hobbyists . . . computer-literate, technically adept, and creative—would like to join and contribute to amateur radio. They are willing to prove their competence in the areas of regulations and technical knowledge, but they are unwilling to submit to what they view as a non-relevant, outmoded, and unreasonable requirement—the Morse code. Ray Kowalski, formerly bureau chief of the FCC, responsible for the Amateur Radio Service, referred to the code requirement as "hazing."

Concern is growing rapidly. Every amateur publication has offered an editorial opinion. There is general agreement that substantial growth is the key to retaining our frequencies. What may be "just a hobby" to some, is by definition "a service." We exist because we provide benefits to the public. Quite simply, if we cease to provide them, "we're history."

The question of a code-free VHF/UHF amateur license, raised in the early 1980s by the FCC itself, is once again receiving serious consideration. In 1983 no-code was killed by violent opposition from the ARRL and the amateur community. At that time responses were highly emotional. Today there has been a dis-



tinct change in attitude. Yes, there still are concerns, but comments received by the committee were generally reasoned and thoughtful. Present licensees fear what licensing changes might do to amateur radio as we know it. However, the 220 MHz loss represented little short of "a baseball bat applied to the base of our collective skulls." It assured us that amateur radio is going to change. The question now is how. And do we initiate changes our way or wait for powerful commercial interests to pressure the FCC to make those changes—their way.

The news media recently reported a proposal that our government literally sell portions of radio spectrum to help balance the budget! It was estimated that a couple of MHz in the 900 MHz range could bring in several *billion* dollars. Incredible, but absolutely true! Relate that to our frequency spectrum, and you get some idea of the magnitude of the threat we are facing. It is clear that the time has come for concerned amateurs to set aside personal interests and take aggressive action to preserve our future. We cannot maintain the *status quo*! So what's it going to be?

### ARRL Forms Study Committee

Early in January 1989 I received a call from Dave Sumner, K1ZZ, Executive Vice-President of the ARRL. He asked me to serve on an ad-hoc committee to study the issues and make a recommendation to the ARRL Board of Directors in the matter of a code-free amateur radio license. I accepted.

On January 7 committee Chairman George S. Wilson, W4OYI, a Vice-President of the League, and a lawyer in Owensboro, Kentucky wrote. His letter introduced the other committee members.

- **John M. Crovelli, W2GD**, of Milford, New Jersey. John is an active amateur, a serious contester and DXer, and a management consultant who works with high-tech industry.

- **Kenneth G. Kopp, KØPP**, of Anaconda, Montana. Ken has been licensed since 1951, served until quite recently as ARRL Section Manager for Montana, and works for the Montana power company.

- **C. Mike Lamb, N7ML**, Snohomish, Washington, co-founder of Advanced Electronic Applications, and an avid experimenter in weak-signal modes of communication.

- **Rod Stafford, KB6ZV**, of San Jose, California, ARRL Pacific Division Director, and by profession a judge.

- **Ed Juge, W5T00**, Burleson, Texas, licensed for 38 years, spent 11 years in the amateur radio business. He is now responsible for media relations/PR for Tandy Corporation/Radio Shack.

The following served as "consultants" to the committee, and participated at all stages.

- **Larry E. Price, W4RA**, President of the American Radio Relay League, Newington, Connecticut.

- **David Sumner, K1ZZ**, Executive Vice-President of the American Radio Relay League in Newington, Connecticut.

- **Leland Smith, W5KL**, retired, of Jasper, Arkansas. Leland is well known as President of the Quarter Century Wireless Association.

- **Thomas B.J. Atkins, VE3CDM**, of Willowdale, Ontario. Tom is President of the Canadian Radio Relay League.

It is worth noting that all but two committee members and advisors are Extra class licensees, and that most prefer CW to any other mode.

### Comments Received From All Sides

Almost immediately stacks of correspondence began to fill our mailboxes. Background material provided by the League included FCC PR Docket 83-28 (the FCC's 1983 no-code proposal), the ARRL response and related editorial; recent editorials from *CQ*, *Ham Radio*, *QST*, and other publications; material from the *W5YI Report*; letters from individual amateurs and amateur organizations including TAPR and AMSAT; data on the existing and proposed Canadian no-code initiatives; and stacks of electronic mail "threads" on the subject from INTERNET.

The ARRL surveyed major IARU countries who have no-code licenses, asking for details and evaluations of their experiences. The results were furnished to the committee.

From Fred Maia, W5YI, publisher of the *W5YI Report* and a leading proponent of immediate no-code action, came copies of his magazine columns and *W5YI Reports* dealing with the subject; correspondence from Ray Kowalski; and more.

From the amateur radio community at large, each of us received numerous letters voicing concerns, objections, and suggestions and encouragement, all of which were to receive our serious consideration. From *CQ* magazine came preliminary results of their poll showing 60% in favor of no-code and 40% opposed.

Needless to say, each of us received comments from local amateurs, and listened intently to discussions on repeaters and at club meetings. The input was tremendous and greatly appreciated, and the consensus gleaned from this material was the basis for most of our recommendations.

On February 3 at the Miami Hamboree several members of the ARRL committee attended and observed (but did not participate in) no-code discussions at two amateur radio industry meetings. Ray Kowalski, now a communications attorney in private practice in Washington, D.C., gave the group his perspective as a former FCC bureau chief. I didn't take notes, but the messages were clear and simple:

Additional amateur bands are at growing risk, and our best defense is growth. Under ITC regulations code is required for operation below 30 MHz, but the FCC is ready and willing to enact no-code above 30 MHz.

Fred Maia, who has hired Kowalski to formulate a petition to the FCC for a no-code license, agreed in the interest of a unified effort to put his action on hold until the League's study is complete and action taken.

Maia and *73 Magazine* publisher Wayne Green spoke of the need for growth in our ranks and the need to return to fulfilling our role of interesting youngsters in scientific careers. Both support the no-code license concept.

### The Committee Meets

On March 10 and 11, 1989 the ARRL no-code committee met in New Harmony, Indiana. Comments were received right up until the day of the meeting. This article won't be point-by-point "minutes" of the meeting, but rather my view of the committee's approach to the issues, and reasoning that resulted in our recommendations. In practice, we jumped back and forth among subjects, as many were tightly interrelated. This report will attempt to group together comments on each subject, rather than follow exact chronological order.

The committee met Friday evening for dinner and moved to our meeting room, where we began discussions. We viewed two videotapes. One (courtesy of W5YI) was of Barry Goldwater, K7UGA, being interviewed by former NBC newsman Roy Neal, K6DUE, in which Barry expressed a need for aggressive action and his very strong support for a no-code license. The other tape was of a recent network television report on the problems of hi-tech competitiveness and education in America.

We debated the no-code issues and discussed the current sentiment in our respective parts of the country. All committee members reported a shift in no-code sentiment in recent weeks from "whether" to "how." The meeting adjourned at 11:30 PM.

Following an 8:00 AM breakfast on Saturday, we began an all-day meeting. Relatively early on all agreed that some type of codeless, VHF/UHF license should be recommended to the ARRL Board. The task of the day, then, was to decide on a structure. Two goals were primary—to serve the best interests of amateur radio, and to address the major concerns of present amateurs.

### Major Amateur Community Concerns Identified

We listed those concerns as expressed to us. Many had been voiced in a variety



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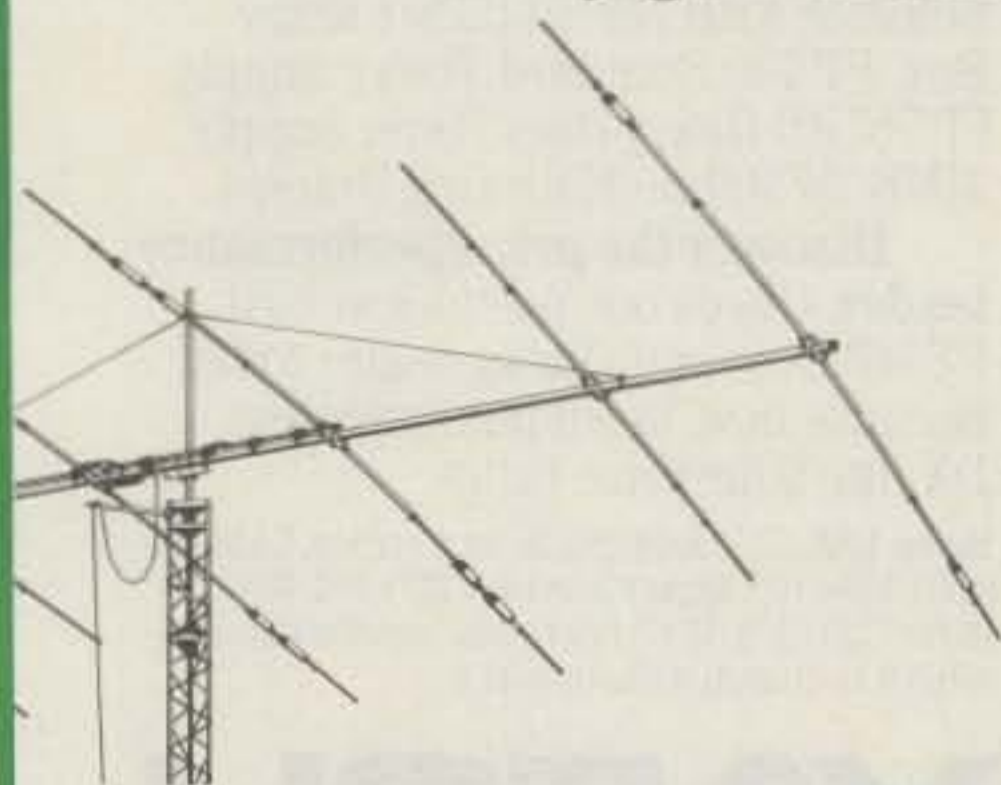


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of ways and at varying emotional levels, but they fell into five categories.

1. Current amateurs should lose no privileges.

2. There must not be another CB debacle on our bands.

3. Overcrowding already crowded bands should be avoided.

4. Qualifying for a license must require sufficient commitment to encourage respect for the license and operating practices that will be a credit to the service.

5. We should not damage (much less "kill") Morse code. (This concern was not officially listed, but was voiced strongly by all committee members.)

## What Have Others Done?

We reviewed the experiences of other countries offering a code-free license. Tom Atkins briefed us on the present and proposed Canadian license scheme, as well as that of the United Kingdom. We discussed the results of the survey of other no-code countries.

Dave Sumner advised that the League estimates growth in new licensees—with a no-code license—of about 12% if we work at recruiting. That is roughly equal to the growth rate of the early-to-mid 1970s. It was agreed that even with a substantial recruiting effort, we will not see the flood of new people some seem to fear. We all love amateur radio. That's why we're in it. But the sad fact is, in the eyes of a public accustomed to supersonic jet travel and intercontinental long-distance calls, amateur radio has lost its magic. As one industry spokesman said at the Miami Hamfest, "If you stood at the entrance to the World's Fair and handed out blank Extra class tickets, maybe one one-hundredth of one percent would ever be used."

## Operating Privileges

From there, the discussion turned to specifics of the license, requirements, privileges, etc.

We received suggestions of limiting privileges to 1296 MHz . . . to 902 MHz . . . to 220 and above, and 50 MHz and up. There were strong objections to including the already crowded (in many areas) 2 meter FM frequencies, and concerns about weak-signal bands (satellite and EME).

In many areas of the country little or no activity exists above 2 meters. Restricting operations to 902 or 1296 appears to be desirable in order to populate those bands. However, it was felt that those barren bands would provide no incentive to anyone to work for the new license. Second, new licensees would face substantial expense for radios they might never use again after upgrading. (There are no 902 and 1296 rigs on the used market in most areas.) Next, and perhaps the overriding concern, is that we would almost surely create a "Citizen's Band

ghetto" by isolating these licensees from experienced amateurs from whom they will learn proper operating procedures.

The committee felt strongly that "role models" are crucial to producing quality amateurs. Any group "culture," including CB, is a result of a desire to belong, or "fit in." New ham licensees will make an equivalent effort to fit into our culture—to look and sound like amateur operators—by following the example set by experienced amateurs.

Lack of discipline went a long way toward killing Citizen's Band popularity. This is certainly a dangerous possibility none of us want to befall amateur radio.

It was suggested that as many as half of the current active amateurs may have started on CB. (Our growth has not been higher in recent history than during the CB craze.) Most are competent, productive amateurs who are a credit to our service and sound no different from any other amateurs. Role models are essential to assuring the same results from new no-code licensees.

In too many areas even 220 falls into the "little or no activity" category, and the "role model" requirement could not be satisfied. For this reason we ruled out "220 and up." We believe as population of the bands grows, there will be an upward migration, which will help protect higher bands. But initially, active bands must be available for the license to have any appeal.

Six meters is the one band available to code-free licensees where they can taste long-distance communications. It was felt that most 6 meter operators will welcome additional activity on that band. As it turns out, 6 meters may just be the major "plum" in our offering, which could encourage new blood to join our ranks and to upgrade to HF capability.

Next we faced the issue of 2 meters, which could have been the real drawing card for this license. Arguments for allowing 2 meter FM were compelling;

- Tremendous nationwide activity.
- The availability of inexpensive used gear.
- Most hams are on 2 meters now and could encourage spouses, children, relatives, and friends to join them. (It's not much incentive to say, "You really ought to get this license, but, well, no, you won't be able to talk to me.")
- And there could be no closer contact with "role models."

As powerful as the arguments were for including 2 meters, there were equally as strong reasons not to. If 2 meters was not so crowded in many metropolitan areas, every committee member would have been heartily in favor of including full privileges on this most popular band. It would have been a strong incentive. However, we bowed to the concerns about overcrowding.

If enough amateurs feel the need for

role models outweighs concerns of overcrowding—or if they feel it's worth a bit more crowding to bring friends and relatives into 2 meter FM—the committee believes they will make those feelings known when the FCC requests comments.

On 2 meters we recommend only digital privileges restricted to the 144.9–145.1 MHz range. We hope the knowledge that "all it takes is 5 WPM" will be a strong incentive to upgrade. Digital operation on 2 should also be a major incentive for those computer types believed to have a significant interest in amateur radio.

Of course, there are no privileges below 50 MHz.

## Licensing Requirements

The committee feels strongly that amateur tests should logically relate to the operating privileges conferred. The test should not be easy. It should require a level of commitment that will encourage respect for the license and good operating practices. For that reason we did not envision an "entry level" vehicle, but rather a "full-fledged" renewable license for those who start with no real desire to operate on HF and who feel CW has no relevance to their operations.

We decided to recommend a written examination including elements 2 (Novice) and 3A (present Technician). We have recommended—in the spirit of this not being an entry-level license—that tests be administered by a full VE team, and that no credit be given for having previously passed element 2 before Novice examiners. Passing the tests should require 75% correct on both elements (scored separately). In effect, this makes the passing of the new codeless license examination somewhat more demanding than even the present Technician exams.

## The License/Call Letters

The committee discussed a logical name for this license. We went through a number of possibilities. As he had done several times throughout the day, Chairman George Wilson suggested the KISS principle (Keep It Simple, Stupid), and we settled on a recommendation to re-name the present Technician class to "Technician Plus" (plus code), and call the new license "Technician." Existing Technicians would, of course, become Technician Plus holders.

George stated that the FCC has the capability in place to issue a distinctive call-sign for a new class of license. Apparently, in conjunction with their 1983 no-code proposal they made provisions to issue unique 2 × 3 calls. We recommend unique calls.

In the late afternoon we discussed the wording of our formal recommendation to the ARRL and looked back to be sure we had adequately covered the five major concerns originally identified. We also



looked at the proposal in terms of upgrade incentives and paths.

## Summary of the Committee's Recommendations

1. That the present Technician class be renamed "Technician Plus" (plus code), and that a new, code-free license be created and named "Technician." (Existing Technicians become Technicians Plus.)

2. That new Technicians be issued distinctive call letters.

3. That the present Technician written exam (element 3A), which is currently being revised to correct shortcomings, and Novice (element 2) be required and be administered by a full VE team. Credit for passing of element 2 before two Generals or better would not be given.

4. That upgrade from Technician to Technician Plus require only element 1A, the 5 WPM code test, also administered through the VE program.

5. That the Technician licensee have all privileges above 30 MHz, with the ex-

ception of 2 meters, where only digital operation between 144.9 and 145.1 MHz be allowed.

6. That no existing licensee would lose any privileges.

7. That no change be made in Morse code requirement for Novice, Technician Plus, or any license holders with any HF privileges.

## Other Matters Discussed

During our sessions only two arguments against a no-code license were rejected out of hand: "I had to, so you have to," and "CW makes good hams." The first is emotional rather than rational, while the latter argument fails quickly if one listens for only a short time to some of our HF phone bands. In discussing Morse code in general, all agreed that it is a proud tradition in amateur radio. While newer modes have limited the code's usefulness to commercial services, every committee member would oppose any attempt to remove CW from the amateur bands.

Chairman Wilson commented that CW still represents one way in which people who speak different languages can communicate at least minimally using Q-signals, and that there is still value in being able to receive and react to a distress signal. However, since few CW distress signals are likely on the VHF and UHF bands, he continued, a Morse test is probably not a defensible requirement for licensing on those bands. Present Technician and Novice licensees confer HF privileges, and should, of course, continue to require a code test.

It was agreed a 50% dropout rate in amateur code classes is not uncommon. Students have no commitment, so it's easy to decide, "This just isn't worth the trouble." This proposed new codeless Technician license will, candidly, hook 'em! Once licensed, the commitment will be orders of magnitude greater, and we expect a significant level of upgrading. However, there are those whose entire range of interests will be satisfied by the new license, and for them we have tried to craft a meaningful, "full-fledged" amateur radio license.

The committee feels that the ARRL and the amateur community need to sell amateur radio. The general public hardly knows we exist. If the recommended license is adopted, we can NOT expect an automatic flood of new licensees.

Some have called "no-code" a plot by the amateur industry to sell more equipment. No committee member had been contacted by any member of the industry prior to the meeting. Yes, more amateurs would generate more sales. However, more sales would encourage more research and development and more sophisticated equipment. And since quantity production reduces cost, it's very possible that equipment prices could decrease as unit sales increase.

The committee believes it has assembled a proposal which will serve the best interests of the future of amateur radio, while addressing the concerns of existing amateurs. We encourage all licensed amateurs to join in the effort to publicize and promote amateur radio in their own communities. We especially encourage increased public-service activity of all kinds.

We encourage clubs everywhere to "adopt" local schools and offer to help set up ham clubs within the schools, to encourage participation by the younger people who are the lifeblood of our service.

Only through an active effort do we believe amateur radio can grow and protect our frequency allocations as they exist today. We've enjoyed this great service and hobby for many years. It's time to put personal considerations aside. It's time to give something back to amateur radio, to ensure that it will be around for future generations to enjoy as well.

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**Want to have twice the fun in half the time? Well, K4ABT explains how to get things really moving on 10 meter packet.**

## Full Speed Ahead For HF Packet

BY BUCK ROGERS\*, K4ABT

**P**acket DX and 2400 DPSK may soon become your ticket to HF packet operation. Without having to modify your transceiver, you can accommodate this new manner of packet radio communications.

Here is where the final touch to "rare DX" makes its debut. Packet radio offers the combined ideas of "automatic logging" and error-free flow of data. The latter is in reference to the buffer capture of every byte of packet data that is received by your station whether in a contest environment or in the Saturday afternoon pile-ups.

While we find a lot of fun and excitement on the 40 and 20 meter packet frequencies, there is not a lot to be said for the slow 300 bauds that we are allowed to use there. This doesn't include the ever increasing number of users on 20 meters on the "channel 19" of 20 meter packet at 14.103 MHz. So be it. I left that environment over a year ago. From time to time I will visit 14.105 MHz, but I stay clear of . . . 103. There are enough BBSes on 20 meters to handle every piece of NTS traffic three times over.

This month I want to make some of you aware of the "world above 28 MHz." Recently, while talking with Johnny Johnston at the Washington, D.C. office of the FCC, the conversation led to a discussion about the attributes of 28 MHz and above. The texture of our conversation was that many of us in amateur radio view the frequencies above 28 MHz as though they were part of the VHF region. I can't argue with this feeling, since I've considered 10 meters to be related to VHF for over 40 years.

Glynn, WB4RHO, and I were operating 1200 and 2400 BPS on 10 meters in 1985. At the time we enlisted the help of another friend in Edmond, Oklahoma to use as a digipeater. This was an on again, off again operation since the 10 meter band

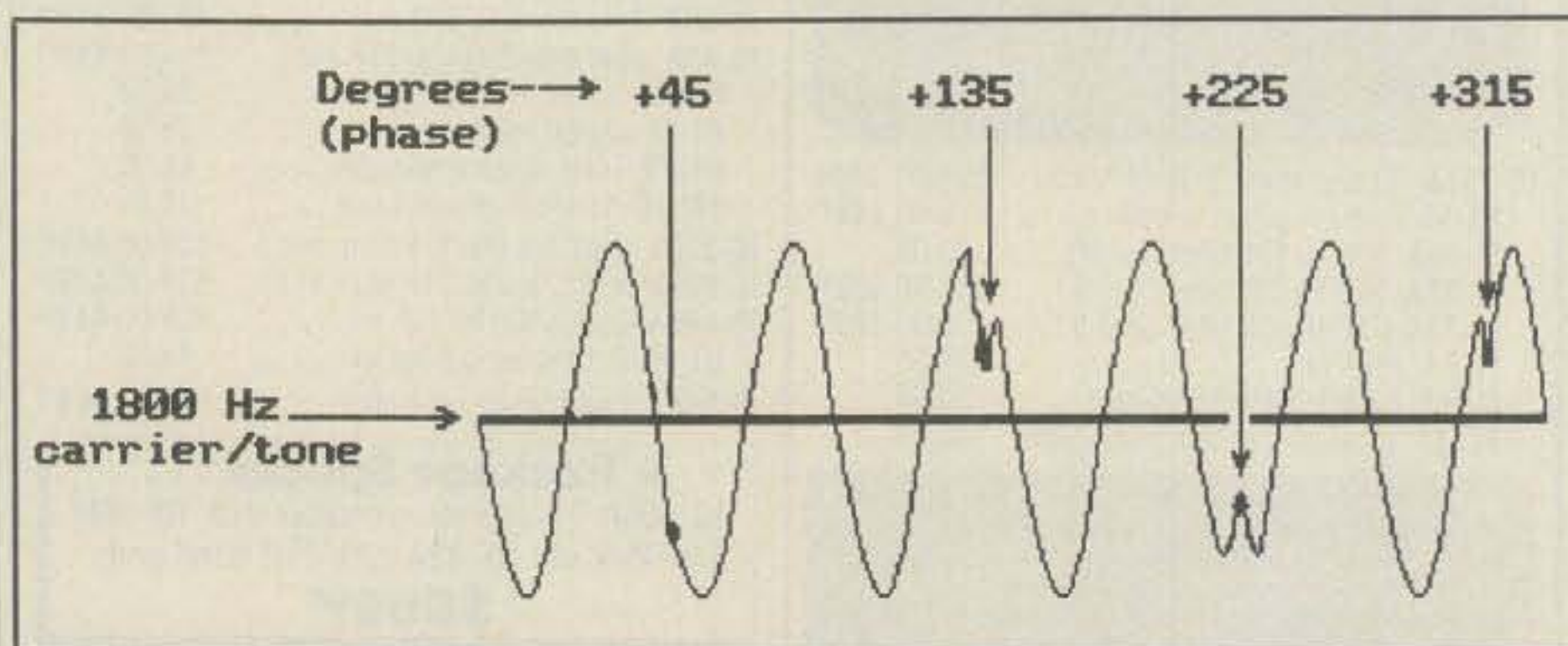


Fig. 1- A simplified illustration showing the relationship between the modulating phase and the 1800 Hz carrier/tone.

was just beginning to show signs of daily mid-afternoon openings between the midwest and the east coast.

There is some activity lower in the 10 meter band around 28.103 MHz at 300 bauds, but our interests were in the higher baudrates and the use of Phase Shift Keying (PSK).

The latest 10 meter frequency for 1200 baud operation is around 28.195 LSB. Several nodes and digipeaters are available to access on 28.195 MHz LSB. To name a few, try a connect to AZSE in southeast Arizona, to COLO in Colorado, to NATCAP in Washington, D.C., to OHIO near Cleveland, OH, and the list goes on. The best move is to go to 28.195 LSB and connect to one of the nodes and pull a nodes list. From this point you can access the nation from 10 meters via nodes. While you are in this wonder-world of packet, you will notice many node names from outside the United States appearing in these lists. Just a word of caution: **Observe the third-party rules.**

The second portion of this article deals with the speed of the HF packet signal above 28 MHz. When operating HF packet it is a good bet that we are using our single sideband (SSB) transceiver or one of the new 10 to 30 watt single banders that are being introduced by several new

transceiver manufacturers and a few of the not-so-new OEM vendors of amateur gear. The one shortcoming to these little mono-banders, is the low output power of 10 or 25 watts. I use an ICOM IC-735 running about 80 watts output, and I find that this is closer to the power level needed to hit the 10 meter, 1200 and 2400 BPS stations. Fifty watts is just the ticket for 10 meter packet operation, and many of the new full-featured 10 meter transceivers are beginning to appear with power levels in this range.

### Speed Adds To The Fun

By using 2400 differential phase shift keying (DPSK) we can move almost twice the amount of data in the same amount of time that we would normally use for 1200 baud. The reason lies in the way each type of modulation is applied. The difference between the two types of packet modulation, besides one delivering 1200 bits per second (BPS) and the other delivering 2400 BPS, is the ease with which the 2400 BPS signal is handled within the SSB transceiver.

The SSB transceiver struggles to pass the 2200 Hz signal through the narrow audio bandpass networks within its sideband generation stages, while the 2400 BPS signal uses only an 1800 Hz tone for

\*506 Pheasant Ridge Drive, Warner Robins, GA 31088



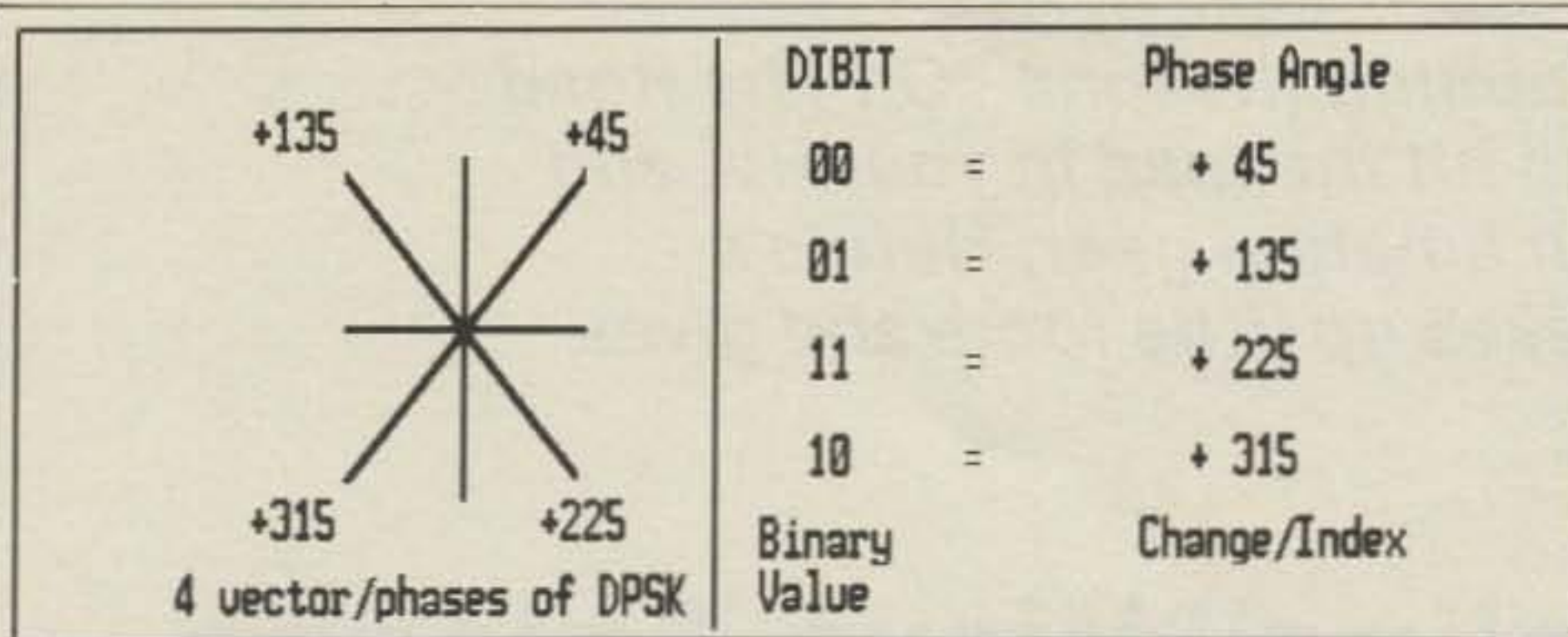


Fig. 2- Simplified dibit to phase to binary relationship.

phase shift keying. This 1800 Hz tone passes freely through the audio bandpass of our SSB transceivers.

First we should define the difference in these two signals in simple terms. 1200 BPS consists of a 1200 Hertz (mark) tone and a 2200 Hertz (space) tone. The frequency of the two tones is shifted in frequency by 1000 Hertz. This is where the difference in operation comes into play. The 2400 DPSK uses only an 1800 Hertz tone. The 1800 Hz DPSK signal passes through the narrow IF bandpass of our SSB transceiver much easier than the 2200 Hertz tone of the frequency shift keyed (FSK) signal. When we try to pass the 1200 baud FSK signal through the narrow bandpass, and sharply filtered stages, we discover that many tries are required to get the data through.

Some 1200 baud HF packet users are changing the shift from 1000 Hertz to 800 Hertz in an effort to circumvent the problem. This may or may not improve the situation, since the problem lies in another area. The upper 2200 Hertz tone of the FSK tone pair is part of the problem. Another problem exists because some TNCs will not capture the new shift between the mark and space tones.

### Try It; You'll Like (Love) It

For over three years now Bob, WD4MNT; Glynn, WB4RHO; Larry, KF4JF; David, WD4JKH; Ed, KB4KIN; Al, WD4DKA; Ed, K4ORT; Mike, N4NAU; Larry, N4TOS; and I have been beta-testing 2400 DPSK gear. We've concluded without any reservation that 2400 BPS DPSK is a dependable mode and speedier to use. Not only is the mode good, but the signal seems to be easier to detect from the noisy conditions that sometimes cause retries with conventional 1200 baud FSK packet.

When using 2400 BPS in HF applications, we are passing only an 1800 Hz tone. This makes it easy to pass within our SSB transceivers IF and AF, narrow bandpass stages. As long as the transceiver passes a decent audio signal through it, the TNCs can take care of the encoding and decoding of the dibits to

and from the DPSK modem.

**Yes! These speeds are legal on frequencies above 28 MHz.**

There are several manufacturers of the DIBIT Phase Shift Keying (DPSK) 2400 BPS modems that can be added to your TNC. Most of them are designed and built around the EXAR "XR-2123" PSK Modulator/Demodulator IC. Others are designed around the Motorola MC6172/6173 DPSK modem system. If you would like to try your hand at designing your own, you can obtain the "Application Notes" which apply to the EXAR XR-2123 from EXAR Corporation, 750 Palomar Avenue, Sunnyvale, CA 94086. Motorola application notes may be obtained by writing to Motorola Literature Distribution, P.O. Box 20912, Phoenix, AZ 85036. When writing to these manufacturers, be specific about the devices for which you wish to obtain information.

A similar method of DPSK that is in use today was introduced to amateur packet radio by Kantronics some time ago. Kantronics supplies a ready-to-install modem for their packet products, model KM-2400. They also manufacture the model TNC-2400 for the TAPR-II and clones. The TNC-2400 model has successfully been installed into some models of the Heath, AEA, PAC-COMM, and all of the MFJ TNCs including the MFJ-1278 Multi-Mode Data Controller.

Digital Radio Systems Inc. (DRSI) and MFJ Enterprises Inc. have now developed their own versions of this modem and provide easy-to-install instructions to accommodate their line of TNCs.

Now that we have looked at all the great benefits of HF and 2400 DPSK, let's look at the background of 2400 DPSK.

The primary advantage of 2400 DPSK is the effective use of the narrow bandwidth of our amateur radio channels (300 to 3000 Hertz approximately). If we look at the DPSK signal in the 1200 baud mode, we see that an 1800 Hertz tone/carrier is modulated at a 1200 Hz rate. At this point only two phase shift states are used to modulate or encode each bit of data or baud transition.

By increasing the encoding to four phase states, two bits of data can be en-

coded on each baud transition, resulting in twice the data rate within the same spectrum or bandwidth. Here is how we obtain 2400 bits per second DPSK with a 1200 baud clock.

Although the clock rate continues to be 1200 baud, the bits per second increases to twice the speed and so does the data flow. Fig. 1 shows the modulation phase relation to the 1800 Hertz tone. The format shown is that used in the United States, sometimes referred to as option "B." Option "A" is the scheme that is used by the European community and referred to as the CCITT format. In either format, 2 bits of data in the 2400 BPS mode is called a "dibit." The dibit and its relation to the format in which it is used is illustrated in fig. 2.

This should give the packeteer a well-rounded feeling to begin operating HF packet at 1200 baud and a better understanding of 2400 BPS "differential phase shift keying." I feel this will soon become a means whereby we will be able to open greater speeds for traffic handling at all frequencies, including the VHF bands.

I am not implying that this will take the place of the 9600 and 56 KB backbone systems. I'm only pointing out that it will in the long run enable us to relieve the congestion on the throughput channels that lead to and from the high-speed backbones.

Happy (speedier) packeting!



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## The "Traveling" Wave Antenna For 160 Meters (And Then Some)

BY HAROLD P. MORGAN\*, WD0P

**A**mateur radio and RVing go together like peanut butter and jelly. There are many hundreds of amateurs who regularly take to the roads with their rigs, operating mobile or stationary from their parking spots wherever they stop. In traveling the "snowbird" areas of Texas, Arizona, and southern California, I've marveled at the number of amateur antennas bristling from various campgrounds and RV parks just like so many porcupine quills. And, like at home, the antenna effectiveness is the key to successful operation.

Many of these RV amateur antennas take the form of some sort of  $\frac{1}{4}$ -wave vertical using the skin of the vehicle as a very effective ground plane. Some are longer, 25 feet or more, trap designs. Others include the short loaded mobile whips which can also be used on the move. The most common configuration appears to be the multi-band trap variety which can be raised and lowered by any number of ingenious methods. Several manufacturers offer units rugged enough for this kind of use. Only one, however, the Butternut, makes provision for the 160 meter band, and users with whom I have chatted complain that while fairly effective, the bandwidth is extremely narrow.

I have been using a very effective, easily transported 160 meter antenna (fig. 1) which can be set up in approximately one-half hour, but reduces down to a compact bundle of mast pipe and a small box containing the rolled-up coax, guy rope, anchors, and antenna.

The heart of this system is the inductively loaded  $\frac{1}{2}$ -wave radiator (fig. 2). This 4-bander incorporates 80 meter and 160 meter resonators and a separate parallel element for 20 meters. It can be tuned for



Fig. 1 - WD0P's portable 20, 40, 80, and 160 meter setup draws lots of attention from sightseers.

natural resonance on the 20, 40, 80, and 160 meter bands with 1.5 to 1 SWR plus bandwidth on 160 and 80 meters of 45 to 55 kHz. Use a high-quality transmatch with sufficient range for 160 meters, and you can operate the full bandwidth on both 80 and 160 plus all of the 10, 12, 15, and 30 meter bands. I have used both RG8X and full-size RG8 and have had no problems with losses on these bands with either coax.

Only 60 feet long, this antenna was originally designed by Bill Fanckboner, W9INN, for use as a quarter-wave tower or ground-fed sloper (fig. 3). Truly effective tower feeding requires the presence of beam antennas or other structures for top loading. In normal ground-fed operation a radial system would be called for to

deliver really good performance. But with the availability of the very large area of metallic skin found on the average RV, the bottom-fed sloping radiator can be used quite effectively in exactly the same fashion many RVers use their  $\frac{1}{4}$ -wave verticals.

Any convenient support structure, such as a tree limb approximately 25 to 30 feet above ground, can be used to secure the far end of the sloper. Simply toss the weighted end of a nylon cord over the limb and you're in business. But for those of us who often park our RVs where there are no nearby trees, a simple support (fig. 4) can be constructed from four sections of 5 foot (1.5 meter) long, heavy-duty TV mast from the local electronic supply outfit, topped off with a 5 foot (1.5 meter) sec-

\*RR 4, V-42, Lake Lotawana, MO 64063



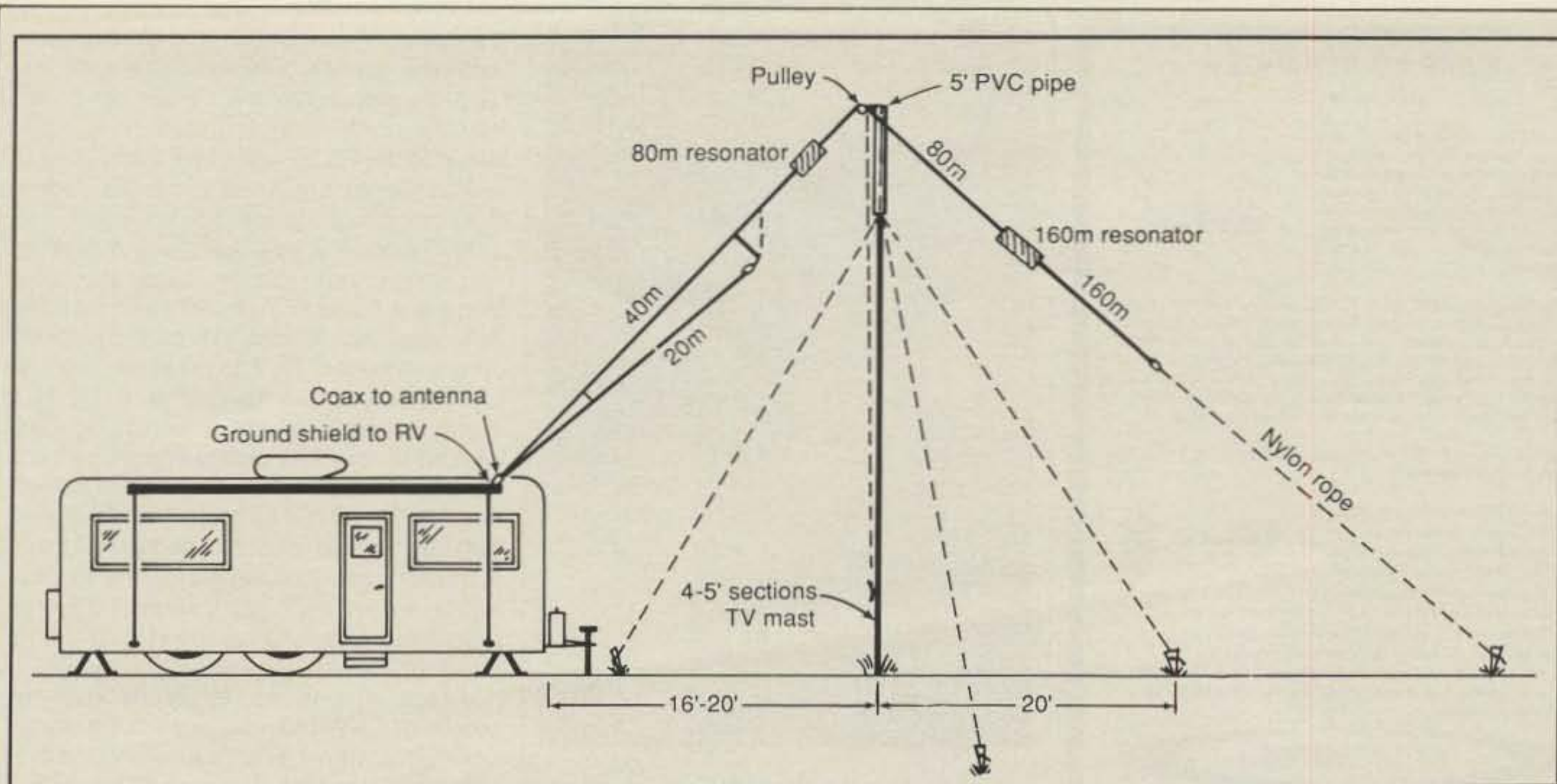


Fig. 2- A general overview of the antenna and its support system.

tion of PVC rigid pipe from your hardware store. If you obtain PVC pipe with the correct inside diameter, it will just slip over the crimped end of the TV mast and no additional fastener will be necessary. A small pulley attached to the top end of the PVC section will allow use of nylon cord to

raise your antenna to the operating position.

This mast should be erected approximately 15 to 20 feet (4.6 to 6.1 meters) away from your RV. I ask a friend or my XYL to hold down the bottom end while I walk the mast up to a vertical position. I

carry with me a 2 foot (61 cm) long section of conduit which I pound part way into the ground to serve as a base anchor. Diameter of the short conduit is small enough to slip inside the bottom section of mast. For most situations one set of three nylon cord guy-lines fastened just

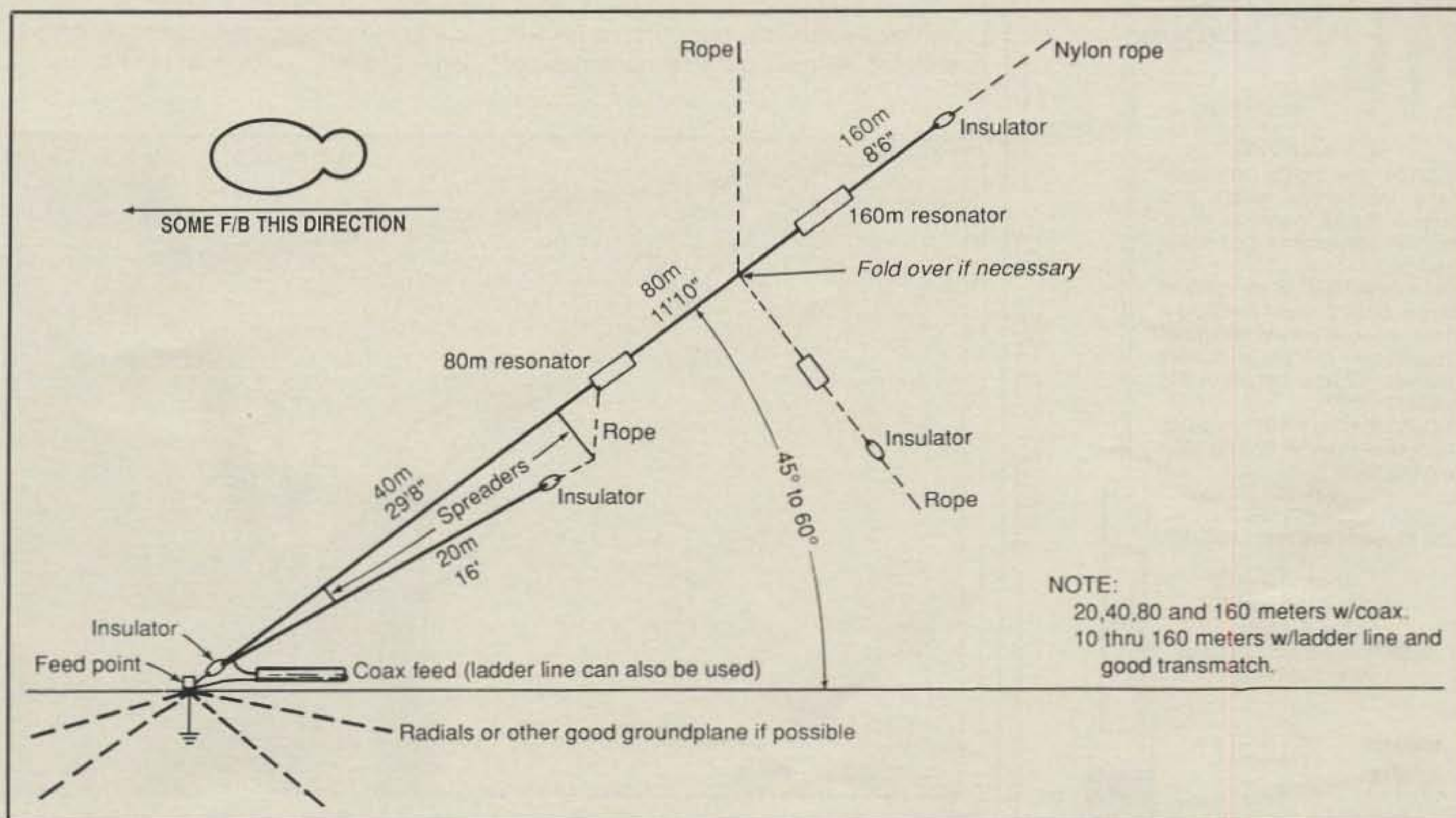


Fig. 3- This four-band sloper can be used on all amateur bands with a good wide-range transmatch. Short lengths of coax used in RV situations do not create enough loss to be a significant problem.



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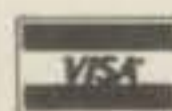

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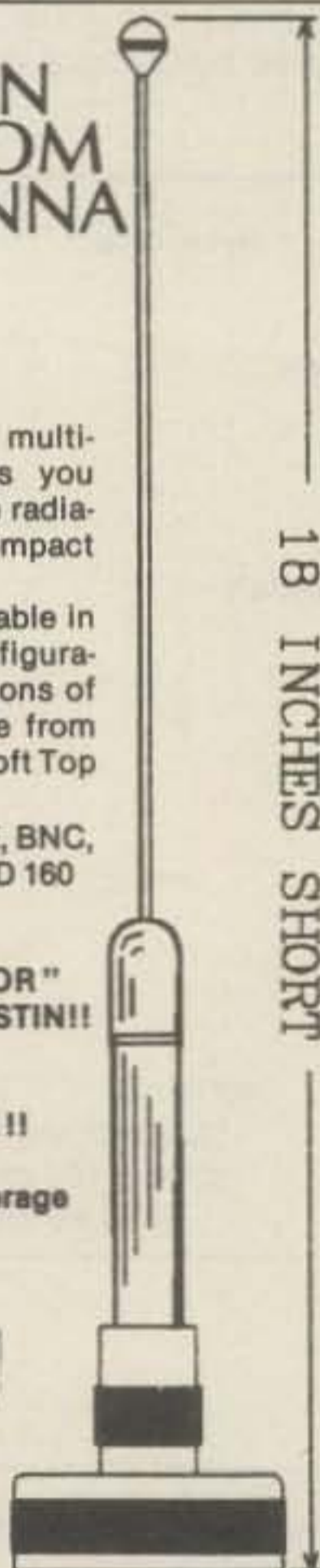
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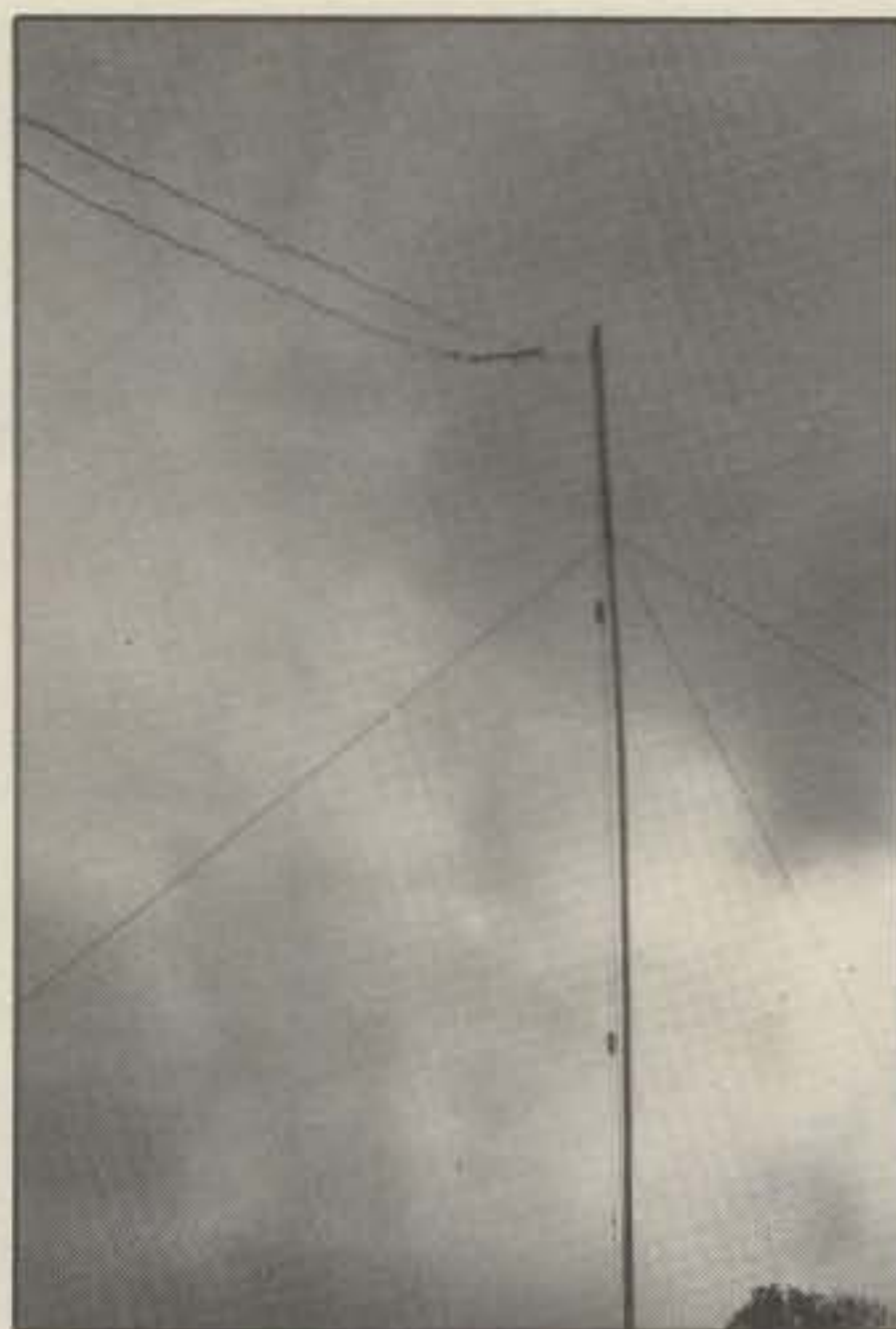


Fig. 4- A 5 foot section of PVC at the top of the mast keeps metal, which might detune the antenna, away from the antenna.

below the top PVC section is sufficient. My guy anchors are a set of three screw-in doggie anchors placed about 20 feet (6.1 meters) away from the base of the mast and arranged at 120 degree intervals around it. This setup has successfully endured 40 mph winds.

There could be a number of ways to attach the antenna to your RV. I use an "S" hook (fig. 5) to hang the feedpoint end of

the sloper on any convenient bracket, usually the awning bracket. The antenna feed is soldered to the center pin of an SO-239 connector. I ground the coax shield to the RV by way of a 6 inch (15 cm) length of coax braid and two extra-strong stiff-sprunged alligator clips.

For those of you who would like to homebrew your sloper, resonator coil forms are made of 1½ inch (3.75 cm) rigid PVC pipe with 6 inch (15 cm) outer circumference (fig. 6). The 80 meter form is 6½ inches (16.25 cm) long, and the 160 meter form is 9 inches (22.5 cm) long. Coil wire is number 18 insulated hookup stock close-wound 60 turns on the 80 meter unit (fig. 3) and 108 turns on the 160 meter version. The spreaders used to hold the 20 meter element away from the main antenna are made from ½ inch (1.25 cm) rigid PVC. One is 6 inches (15 cm) long and the other is 12 inches (30 cm) long.

These resonators easily handle the output of 1 KW from my solid-state transceiver and amplifier without suffering any damage. However, if you would feel more comfortable with heavier-duty units, I suggest you contact W9INN (W9INN Antennas, P.O. Box 393, Mt. Prospect, IL 60056) and order a set of his low-loss resonators. Also, if you prefer not to brew your own, you can order the complete tuned antenna from Bill.

To tune this sloper, adjust the length of the 40 meter element for resonance first, then the 80 meter and 160 meter sections, in that order. The 80 and 160 meter sections will interact, so check the SWR on both after each adjustment. The 20 meter element, if used, can be resonated independently from the others, as its

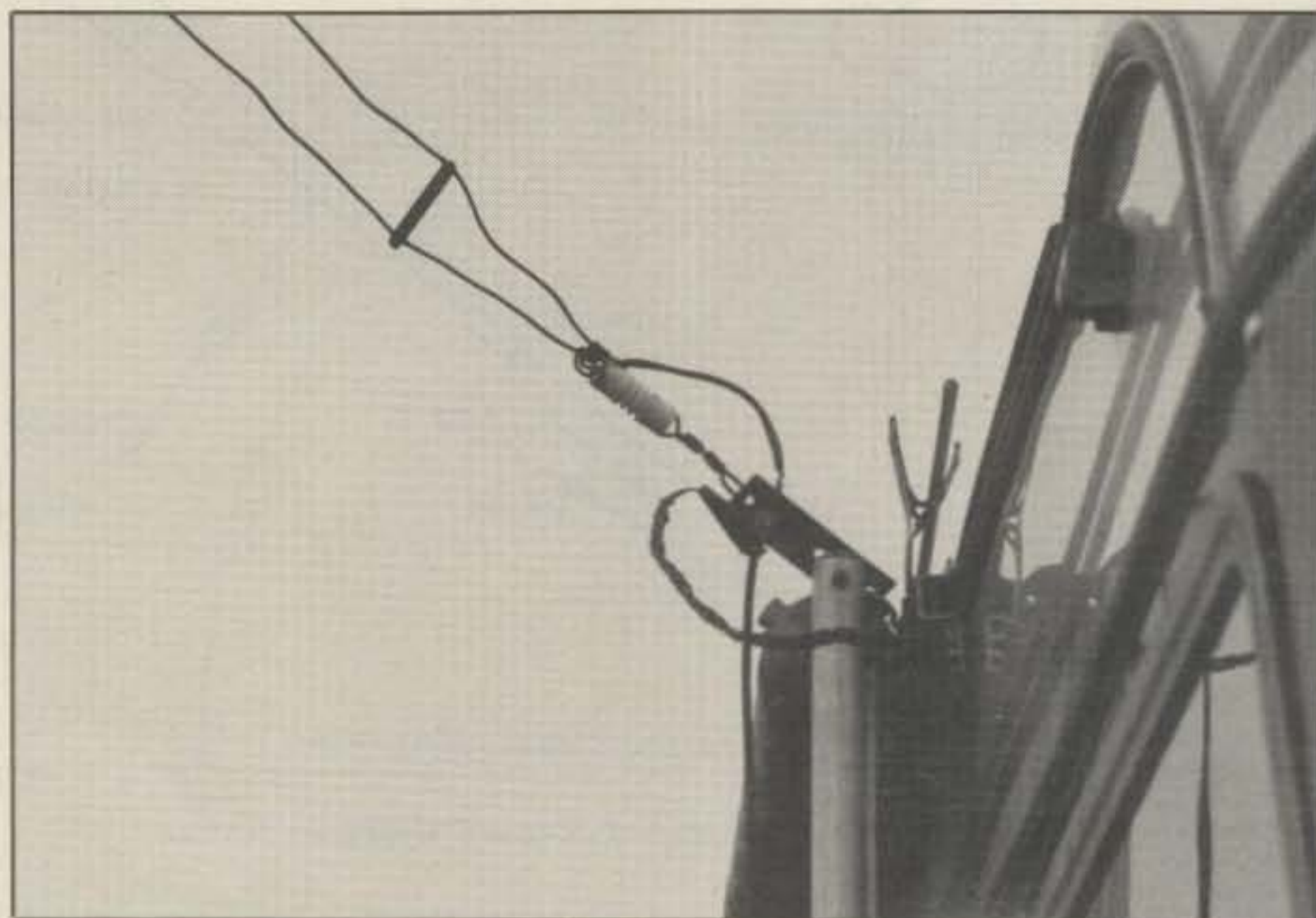


Fig. 5- An SO-239 on a small aluminum plate provides a connection at the feedpoint. A ground strap made of a length of coax shield with spring-clips on each end is attached from shield to RV metal skin to assure good RF conduction.



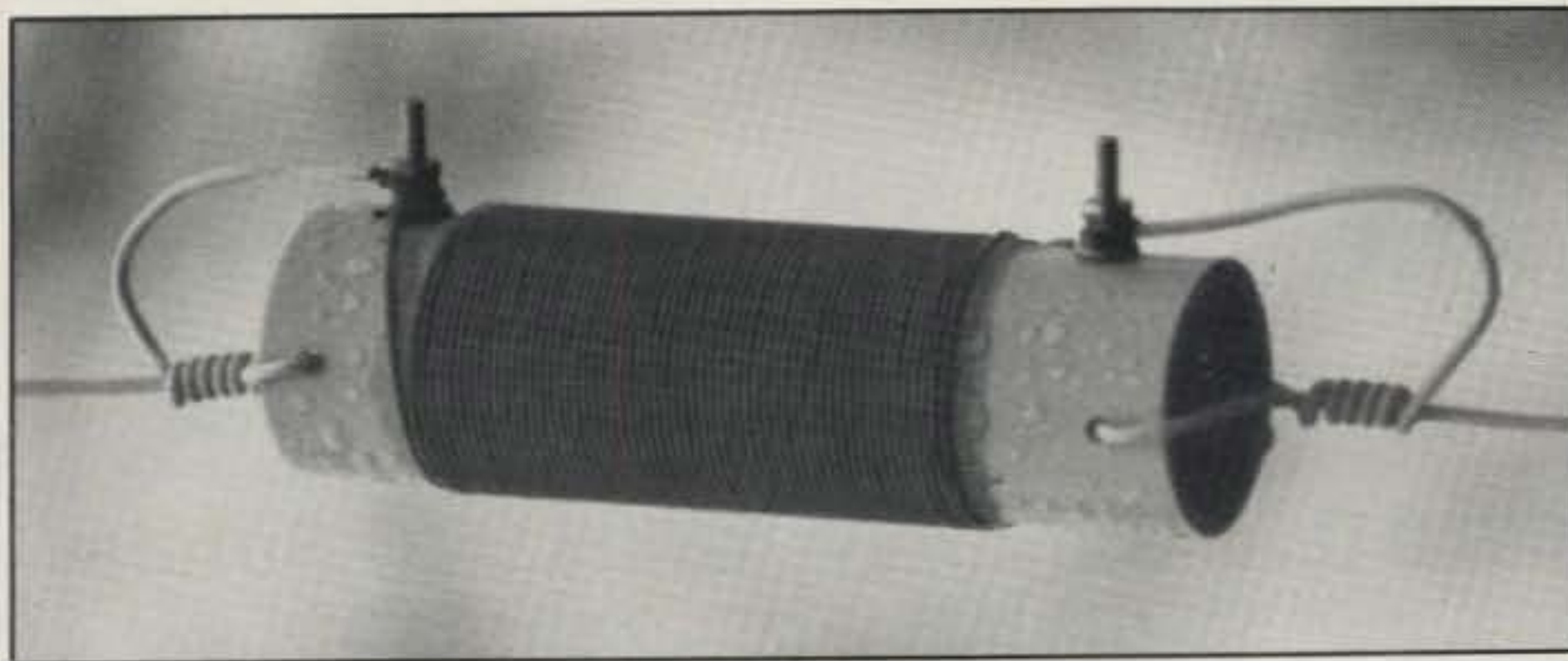


Fig. 6- Resonator coils are wound on PVC forms (see specs in text).

length will have little or no effect on the other bands.

Obviously, it is less than 60 feet from the top of the RV to the top of the mast. But the leftover end of the antenna can be tied off "inverted-V" fashion to any convenient structure around your campsite. I use another doggie anchor. Be sure to keep the end and the resonators at least 4 feet (1.2 meters) away from foliage or metal objects.

The 1.5 to 1 SWR bandwidth of this antenna will cover all of the 20 meter band, at least all of the 40 meter phone band (maybe more), about 50 kHz on 80 meters, and slightly less than that on 160 meters. I use my Heath SA-2060 transmatch to effectively tune all of the HF bands from 10 through 160 meters with gratifying results.

In the short time I had this antenna in operation barefoot on 160 meters at my Yuma, Arizona winter quarters, I was able to work numerous stations in northern and southern California, Arizona, Colorado, New Mexico, and Wisconsin.

From my home in Missouri I've worked 13 states and 2 Canadian provinces with reports of 55 to 59+10. Usually the other stations were using amplifiers and their signals were no more than one S-unit higher than mine. This antenna was also a stalwart performer on all the other bands.

When I'm ready to move on, the mast and antenna pack into a 5 foot (1.5 meter) long, easy-to-handle bundle and a small box which fits easily into any extra nook or cranny I can find around the RV (fig. 7).

Other types of ground systems would work very well with this antenna. You might want to use another kind of RV, such as a van, or you might want to use a more traditional ground radial system. However, our 33 foot long motor home offers about 800 square feet of metal surface, providing a very effective collector of return currents, and I'm trying not to waste that capability.

If you're an RVer and would like to work 160 meters, you'll be amazed how well this baby will work for you. **CQ**



Fig. 7- The portable antenna and mast break down into a 5 foot long bundle and a small box for travel.

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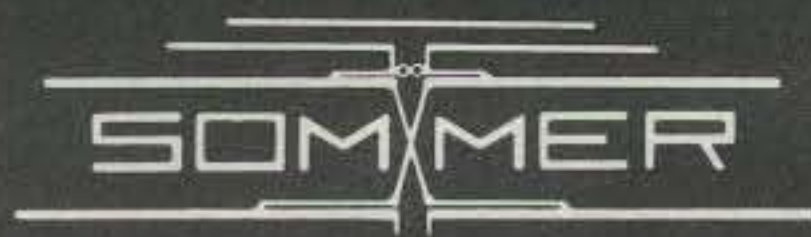
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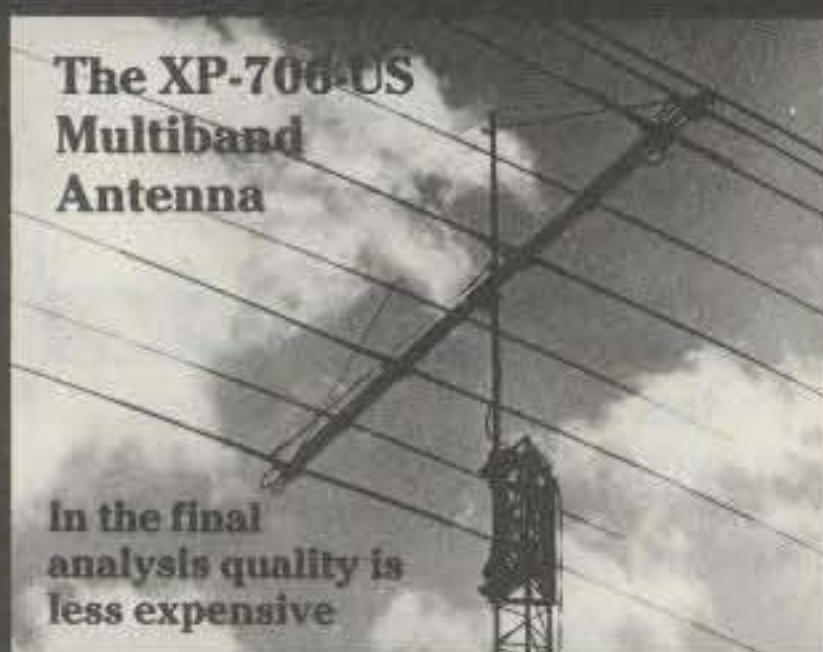


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## Announcing:

# The 1989 CQ World-Wide RTTY DX Contest

## 0000 UTC Saturday - 2400 UTC Sunday September 23-24, 1989

**Objective:** For amateurs around the world to contact other amateurs in as many CQ zones and countries as possible using the digital modes.

**Contest Period:** 0000 UTC September 23, 1989 to 2400 UTC September 24, 1989. The total contest period is 48 hours, but no more than 30 hours of operation are permitted for single operator stations. The 18 hours of OFF time can be taken any time during the contest period, but OFF periods may NOT be less than 3 hours. All ON and OFF periods must be clearly noted in the log and summary sheets.

**Note 1:** Multi-Operator stations may operate the full 48 hours.

**Note 2:** A Single Operator MAY operate more than 30 hours, but only the FIRST 30 hours of operating will count toward the official score.

**Operator Class:** A. Single Operator. B. Multi-Operator, Single Transmitter (ALL BAND ENTRY ONLY).

**Entry Categories:** A. All Band. B. Single Band.

**Modes:** Contacts can be made using Baudot, AMTOR (FEC/ARQ), ASCII, and AX. 25. (NO digipeated QSOs allowed.)

**Bands:** 80, 40, 20, 15, and 10 meters.

**Valid Contacts:** A given station may be contacted only ONCE per band regardless of the digital mode employed. Additional contacts are allowed with the same station on each of the other bands as well.

**Exchange:** Stations within the 48 Continental United States and the 13 Canadian areas must transmit RST, state, or VE area and CQ zone number. All other stations must transmit RST and CQ zone number.

**Countries:** The ARRL and WAE DX Country lists will be used. Note: USA and Canada count as countries.

**QSO Points:** One (1) QSO point for contacts within your own country. Two (2) QSO points for contacts outside your own country but within your own continent. Three (3) QSO points for contacts outside your own continent.

**Multiplier Points:** One (1) multiplier point for each U.S. state (48) and Canadian area (13) contact on each band. One (1)

multiplier point for each DX country in the ARRL DXCC and WAE lists on each band. NOTE that KL7 and KH6 are country multipliers ONLY, and not state multipliers. One (1) multiplier point for each CQ zone worked on each band. A maximum of 40 per band.

**Note:** Canadian areas are VO1, VO2, VE1 N.B., VE1 N.S., VE1 P.E.I., VE2, VE3, VE4, VE5, VE6, VE7, VE8 N.W.T., VY Yukon.

**Final Score:** Total QSO points times the total multipliers equals the total claimed score.

**Contest Entries:** All entries must include a SEPARATE log for EACH BAND, a DUPE sheet for EACH BAND, a MULTIPLIER check list for EACH BAND, and an OVERALL summary sheet. All logs MUST show date, time, callsign of the station worked, RST exchanged, state or Canadian area (where applicable), CQ zone, and points claimed per contact.

**Note:** Standard CQ World-Wide DX Contest sheets are appropriate for use in this contest.

**Disqualifications:** Operating in an un-sportsmanlike manner, manipulating scores or times to achieve a score advantage, or failure to omit duplicate contacts which would reduce the overall score more than 2% are grounds for disqualification. Decisions of the Contest Committee are final.

**Awards:** Plaques will be awarded to the first-place finishers in each of the operator classes. Certificates will be awarded to second and third place. Certificates will be awarded to the first-place finishers in each of the U.S. and VE call areas. Certificates will be awarded to the first-place finishers in each DX country.

**Logs and Entry Forms:** Standard CQ contest log and summary forms should be used. Sample log forms and summary sheets are available from CQ. Please include an SASE or appropriate postage (stamps or IRCs).

**Deadline:** All entries must be post-marked NO LATER than December 1, 1989. An extension may be given if requested. Logs should be mailed to CQ RTTY CONTEST, Roy Gould, KT1N, P.O. Box DX, Stow, MA 01775 USA.

Please send all reader inquiries directly.

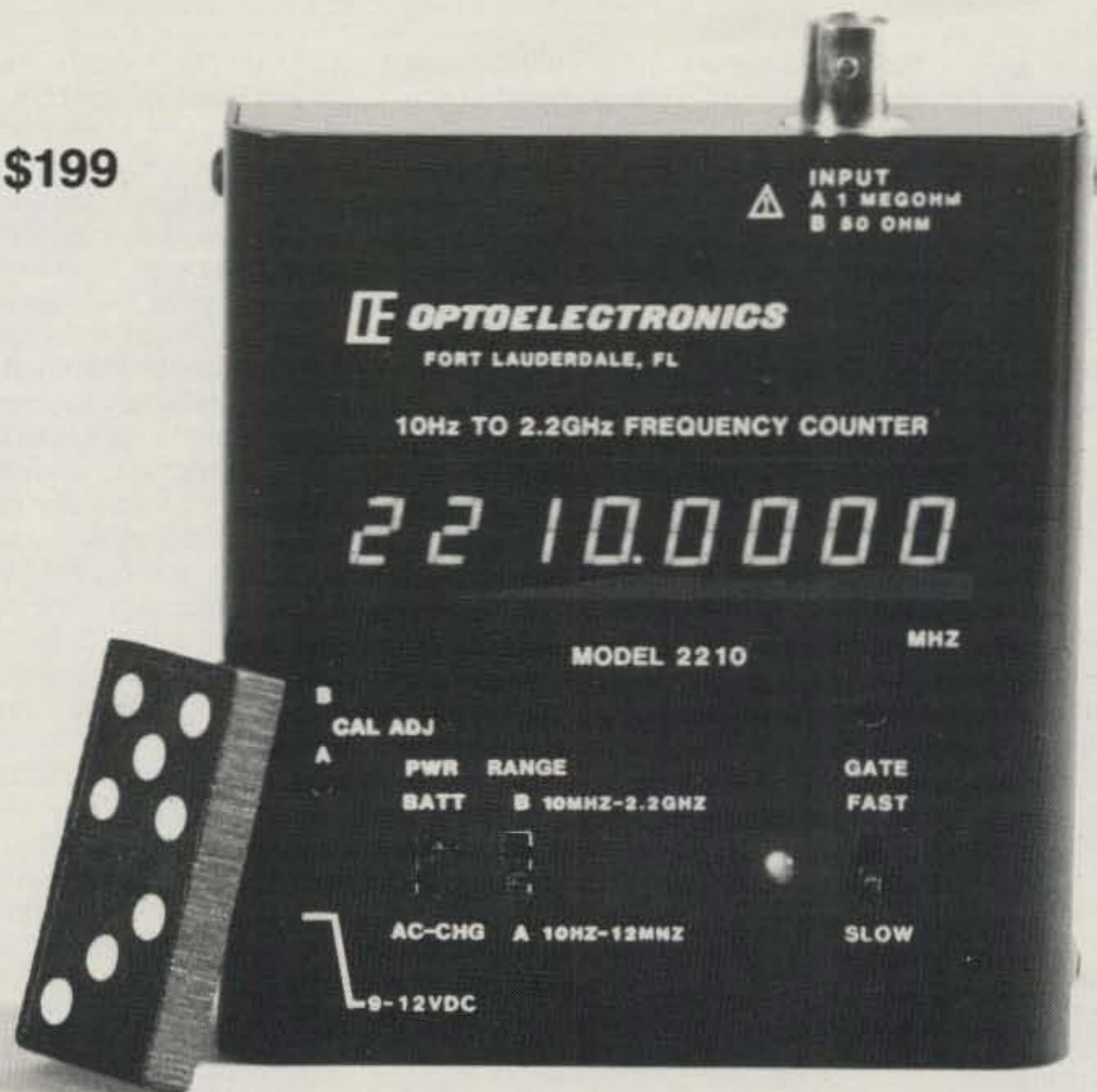


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**"It's all happening on 10 meters," according to KB2FDJ, who says Novice Enhancement works best on this band, where Novices are molded into veteran ops.**

## A Novice in The Promised Land

BY BILL KUSHNER\*, KB2FDJ

**W**ay back in the mid 1970s, after almost 30 years of being a radio hobbyist (SWLing, CBing, and scanning—all the "ings," you might say.) I decided to take the plunge and join the elitists of radio. I took the test and received my first ham license. Back then I was known as WN2MDU. Now I was "hamming"—another "ing," you see.

In those days the Novice ticket was a good bit different from what it is now. I was limited to an output of only 75 watts, had to rely on CW only, crystal controlled, and the ticket was only valid for a few years. But amateur radio was everything I had always dreamed it would be.

Unfortunately, life pulled some of its shenanigans on me and I had to drop out of the hobby, but not before I had reached some degree of proficiency and success.

Twelve or thirteen years passed, and things settled down. The bug bit, and once again I became a ham. But lo and behold, things had changed. Something called "Novice Enhancement" had come about. Amateur radio operators were now deeply immersed in RTTY, packet radio, and most astonishing of all, Novices now had phone privileges. Sure the mainstay of Novices was still CW, but now we could talk—I mean with our voice . . . you know, *talk*.

Then I discovered a band called "10 meters." Well, now my old Heathkit HW-16 would never do, but then again, I wasn't ready, willing, or able to plunk down nearly two grand for a new radio. Even a good used rig would cost \$800, maybe \$900. What a bummer! But then I guess the great patron saint of hams looked down upon me with pity and created a hamfest to be held in an open field not too far away. So with a couple of hundred bucks clutched in my sweaty little hand I was "off a huntin'."

I couldn't believe it. Where did all these people come from? It was mobbed. There I was running around like a loony amidst tubes and wires, broken-down remnants of towers, antennas, radios of every type, and then . . . there she was. (No offense to the YLs out there.) There she was gleaming as though she had just come off the assembly line. A Swan 270. Wow! Wasn't that a famous name back in the seventies? Be cool now, I told myself. So I lowered my eyelids halfway—you know, real casual like—and sauntered over to the table where a guy, belly bulging out of a somewhat sweaty T-shirt, Yankee cap perched on his head, had a twinkle in his eye as he sensed a live one.

Well, we went back and forth for a while until we finally agreed that he would take every last penny I had. I really shouldn't hold anything back from you, so I'll tell you that the rig cost me \$150 which I hasten to add I didn't think was bad at all. Anyway, with visions of QSOs with Japan in my head I lugged this 25 pound beauty back to my car, chuckling over my shrewd deal, and headed home.

I plugged in the old Swan, hooked up my 10 meter vertical, turned on the radio, and it didn't work. Well, don't laugh. You knew this was going to happen all along, didn't you? But before you gloat, let me tell you it wasn't all that bad, because it did make some noise—a nice, rasping hiss. I whipped out the manual the guy had given me and turned to the tuning-up procedure. Aha! All I had to do was dip the dip, drop the carrier balance, load up the loader, dip the tune, but not more than 30 seconds or I'd blow the final, so modulate the freem and boop de boop . . . I had no idea what they were talking about.

Anyway, it took awhile before the old Swan and I came to an agreement. Before long I learned to properly load up the plate and "dip the dip." Hi, hi! The old girl began to show its stuff.

My first contact out of the continental United States was Puerto Rico. I told that amateur he was my first DX contact and he laughed. "If I'm your first DX contact," he said, "then you have a long way to

go." Humph, I thought. As far as I'm concerned Puerto Rico is DX.

He was right, of course. As the weeks became months, 10 meters started to come alive. Every day was a new adventure, a new accomplishment. Contacts were made with far-away stateside stations—Nevada, Nebraska, New Mexico, and the coveted California coast. Islands in the Caribbean that I had never heard of came in, and finally the big hop across the Atlantic and Europe was at my beck and call. My Swan was a wonder of wonders as it took my voice, my very personality, and whizzed it off at the speed of light to visit one on one my fellow earthly inhabitants. From a ham in the hills of Honduras to the heart of the Soviet Union they were all out there waiting to share a common bond—the passionate bond of amateur radio. If only the world could listen in as hams transcend political, ideological, and national differences and share warmth, friendliness, and understanding with one another. The sincerity of "73."

Ah! But what of Novice Enhancement?

We Novices aren't simply luxuriating in our newly acquired privileges. The thrill of DX phone will be short lived. We are at the mercy of the sunspot cycle, for it is just that, a cycle. The amateur fraternity has allowed us to taste of the golden apple, and we will never be the same again. The 10 meter band will peak and then begin its downward slide. All too soon the friends we've made will move to other bands, and we will be left with practically nothing but QRN. So there is only one thing to do—upgrade! And that we will. I predict as the sunspots begin to wane an army of Novices will seek a higher grade of license and new ones will come to take their place. Yes, Novice Enhancement works. And where does it work best? That's right! Ten meters.

Here is where higher-grade amateurs can find the fire and enthusiasm of old. This is the battleground where Novices are molded into veteran operators. Where old-timers snap the newcomers into shape. "Oops! Sorry about that. I get it. You don't enter an ongoing QSO by

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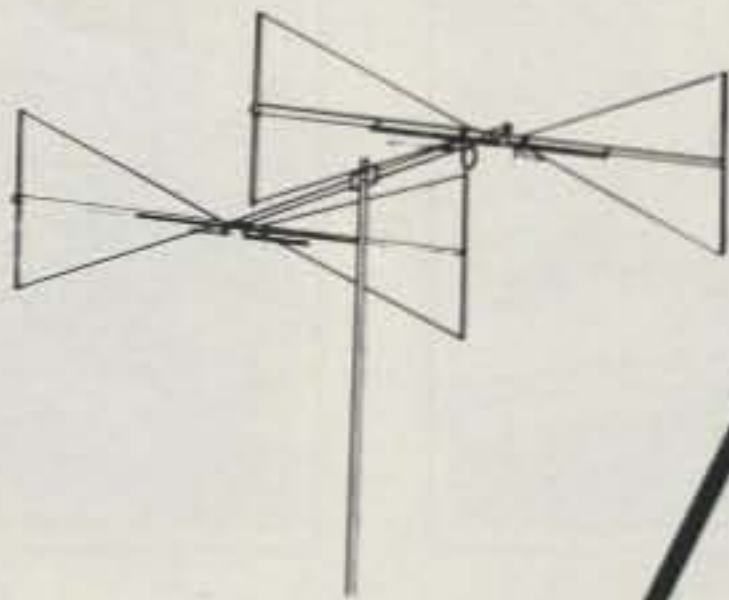
calling break/break. Okay . . . sorry . . . won't do it again." And then there is the war of the pile-up. Most of the time it's whoever has the bestest with the mostest who gets through. Sometimes an operator will work districts—that's a little better. "Only stations with a 2 in their call . . . go ahead . . . QRZed?" But best of all the operator who works a list. Here is where the "little guns" can compete with the "big guns." It's all happening on 10 meters. The Novice, squeezed in between 28.300 and 28.500 and loving every minute of it.

And what do we encounter on 10 meters? We encounter pile-ups where only a true 5-9 signal or the voice of a YL gets through, or a squabble between ops over who was on frequency first and who should QSY. How about people who don't realize that tuning up a few kHz away from a busy frequency will hardly reduce their signal strength? Then there are 5-9 signal reports that require three repeats to get the call and QTH right, and best of all a friendliness and enthusiasm that make it all so very worthwhile.

So here we are, Novices who have gained entry into the promised land of HF phone. You higher-grade hams be kind. We look at you in awe of your knowledge and experience. We seek your guidance and support. For if this is our promised land, we wonder what lies beyond. Only the General knows.



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"Kuni," JH1QDB, first-place Asia, single op.



Ragnar Otterstad, OZ8RO, first-place Denmark.

# Results of the 1988 CQ World-Wide RTTY DX Contest

BY ROY GOULD\*, KT1N

**T**he conditions were excellent, the activity fantastic, and as a result the scores were way up from 1987's contest. For example, the winning score of 1987 would not even have put you in the top ten in 1988's contest! Scores basically doubled. There were just about the same number of entries as in 1987—290 compared to 298 for the inaugural event.

The 1988 contest was once again co-sponsored by the *RTTY Journal*, and I would like to thank Dale, W6IWO, of the *Journal* for all his help and support. Also a big thanks to George, KB2VO, who put together a great program to help compile and sort the results. It certainly made things go a great deal easier this year.

Logs from 62 countries were received, and 86 different countries appeared in the logs! Not a bad weekend to help finish off your RTTY DXCC.

The Russian entries went from 3 in 1987 to 15 entries in 1988. Dima, UT5RP, worked very hard to get the word out about the contest throughout the Soviet Union. The result was increased activity, including three separate DXpeditions to three Russian Republics that had never been on RTTY before.

\*P.O. Box DX, Stow, MA 01775

Dave, J52US, put out a great effort and made a lot of people happy with a new one. EA8AKQ was able to put in more time and take Africa, though. Raul, HK1LDG, held on to South America, JH1QDB took the honors for Asia, and KX6OI banged away at the keys to take Oceania, making many a happy DXer along the way.

We even had a mobile entry—K1CGJ/M. He dropped by recently to show me the setup in his van. So for those who thought he was maritime, no, he was in his van. However, he was parked, I hope.

## Scoring and Logs

Once again many of you did not taking the USA and Canada as multipliers, so you will note that many of the scores have been changed to reflect this. Also many of the DX stations seemed to be unfamiliar with the rules and failed to take States and Canadian Provinces as multipliers. Hopefully, as the rules get wider distribution this will fix itself. I will make a major effort to get log forms and rules to many clubs and associations throughout the world this summer. You all can help by sending along a log sheet and a copy of the rules when you send off an RTTY QSL card to a DX station.

It also seems that the term *dupe sheet* is not understood worldwide. It is something we Americans evidently coined. A dupe sheet is an alphanumerical sort of the contacts you have worked in the contest. You can either computer "dupe" the log or do it by paper. Either way I need to see a duplicate check sheet for each band. I said last year such a sheet was required for 50 QSOs and over, but I could really live with it for bands with 100 QSOs. I have found I can read through about 100 calls and spot dupes.

And please use separate log sheets for each band and include an overall summary sheet.

## Single Operators

A real battle took place for the world top spot, and when it was over Piero, IK5CKL, edged out Barry, W3FV, for the honors. Piero's 85 additional QSOs were enough to put him ahead of Barry. Not far behind were OK2FD and TI2OY.

Barry took first-place USA and North America as he did last year, and OK2FD took first-place Europe. The top Canadian scorer was VE6CB/3.

## Single Bands

The single-band entries seemed to draw more attention in 1988. The only





The ops at AT0J, third-place world, multi-op. From left to right are VU2NTA, VU2JX, VU2RUM, and VU2LBW.

band we did not receive an entry for was 40 meters. A good effort was made by CE6EZ on 10 meters with 402 QSOs, by HC5EA with 353 QSOs on 20 meters, and by VE6ZX with 374 on 15 meters. HB9DCQ made 90 QSOs on 80 meters, many of them Stateside.

### Multi-Operators

Well, the gang from the Association DX-EX went back to San Cristobal Island in the Galapagos and smashed their own record of 1987. This time they did it without the help of any guest ops from the States. They only made 66 more QSOs than in 1987, but worked many more zones and countries for a score of 1,771,798. John, TG9VT, and Jules, W2JGR, gave it their best from TG9VT but came in second again. The one-point QSO difference is too much to overcome. They ended up with 1047 QSOs. Rumor has it that John is going to try this year as a single op!

The gang from India put in a great effort as AT0J, which confused many a Stateside op who couldn't believe they had not worked Kansas! They had 794 contacts for a final score of 814,212 for third place in the world. Stateside came next with Hal, WA7EGA, and the gang from Spokane operating WA7EGA for fourth place world, with the crew from UZ9CWA coming in fifth not far behind.



W2JGR gloats at having worked a new multiplier at TG9VT. (Photo by TG9VT)

### PLAQUE WINNERS

**WORLD SINGLE OPERATOR:** Advanced Electronic Applications, Inc. (AEA). Won by: **Piero Giacomelli, IK5CKL.**

**WORLD MULTI-OPERATOR:** Advanced Electronic Applications, Inc. (AEA). Won by: **Assoc DX-EX, Ecuador, HD8EX.**

**TOP SCORE NORTH AMERICA:** HAL Communications Corp. Won by: **Barry Gardner, W3FV.**

**TOP SCORE SOUTH AMERICA:** Association DX-EX, Ecuador, S.A. Won by: **Raul Gonzalez F., HK1LDG.**

**TOP SCORE ASIA:** Don Busick, K5AAD. Won by: **Kunihiko Fujii, JH1QDB.**

**TOP SCORE EUROPE:** HAL Communications Corp. Won by: **Karel Karmasin, OK2FD.**

**TOP SCORE OCEANIA:** The RTTY Journal. Won by: **Terry Gerdes, KX60I.**

**TOP SCORE AFRICA:** George Hitz, W1DA, and Roy Gould, KT1N. Won by: **Juan Jose Laguna Jimenez, EA8AKQ.**

### Summary

Once again many thanks for your notes and support. All the certificates are in the mail. As the interest grows each year, there are opportunities to sponsor plaques in various categories. Perhaps your local club or a group of contest participants would like to sponsor a plaque. If you are interested, drop me a note. See you in the next one September 23-24, 1989.

73, Roy, KT1N

### RTTY Chatter de USA and Canada

Biggest thrill was working AT0J, a new one on any mode . . . AA4JN. Only equipment failure was the shack air conditioner; the shack was as hot as the bands . . . AA5AU. My first time, very tired now, hi hi . . . HI3ADI. Nice to get FT5ZB . . . K0BJ. I didn't know RTTY mobile was so rare! . . . K1CGJ/M. Could have been more activity on 80 and 40 . . . K6WZ. 37 countries on 10 including VU, J52, FT5, KX6; great condx; this contest is a real winner; keep it going . . . K9KA. I will try this agn . . . K9OSH. A bit overwhelming when the flux goes to 202 on your first contest attempt . . . KA3JFI. Great contest . . . KA5YSY. Getting to old for 16 hours at the keys . . . KB2VO.

Fun contest; 15 was great . . . KB4QZH. Thank goodness for buffers! How abt a roundtable after the test? Let's pick a freq and compare . . . KC2FD (ed.: How abt 14.089?) Nice to see so many Russian countries . . . KD4OM. I think NJ0M got me agn; wait til next year . . . KE0KB (Yep, he did.). Next year maybe from a DX spot . . . KF5YE. Sure glad WA7EGA was multi-op . . . KG5EG. Better score than last year, but missed a bunch . . . KI4MI. Had lots of RFI, but after buying 10 pounds of ferrite beads, all okay . . . KT1O. Super contest; can't wait til next year . . . ops. at N0FMR. Three-hour rule lousy; did not know abt it; cost me 40K points . . . N4CC.

Outstanding 10 big surprise . . . N6GG. 30 watts not enuff to crack a pile-up . . . NA2Q. Finally crossed the 200 mark; nice to see the Soviets on . . . NJ0M. Destroyed three power

xfmrs . . . NO2T. C64 logging program bombed, agn . . . NT0V. I thought AT0J was in Kansas til I saw India on the screen. Tnx CQ for great contest. When does the chirping in ur ears stop? . . . NX8J. Surprised by lack of stations on 80 . . . VE3JPC. Realized 10 was open, so put a dipole up in the rain for 26 more multipliers . . . VE6CB/3. Biggest thrill was working 6W6JX off the back of the quad . . . VE6JX. Full effort next year . . . VE7DTA. My first contact in the contest was my first ever on RTTY! . . . VE7HDX.

Amp blew up 5 hours into it. Had to rebuild . . . ops at W0NA. Running JAs on 10 RTTY is a new experience . . . W2FG. So much activity! . . . W3FV. Barry, W3FV, and you, Roy, got me interested in RTTY agn at Dayton. THANKS! . . . W3GU. Pleasure to participate in world-famous contest . . . W4/DL1BFZ. How abt a low-power multiplier? . . . W6/G0AZT. I can remember when it took one page to score an RTTY contest . . . W6JOX. Six new countries . . . W7MI. Look out next year; the line noise is fixed . . . ops at W8DN. Biggest challenge was trying to figure out what an "AT0" was . . . WA3FIZ. I really enjoyed this . . . WB5HBR. Worked three new ones . . . WB8YJF. Antenna was a mobile whip; melted two of them . . . WB9B. Thrust bearing stuck; had to climb tower many, many times . . . WF5E.

### RTTY Chatter de DX

I was amazed at what 50 watts and a dipole can do . . . 9Y4DG. Biggest thrill was working N4CC on 40 . . . ops at AT0J. Nice contest, tnx . . . AT0S. Improved my score by six times from last year . . . CE6EZ. First contest ever . . . CP6IH. Worked my 37th and 38th zone for WAZ RTTY . . . DF3CB. Perhaps the first time a DU station was in an RTTY contest? . . . DU9LMT. See you next year . . . F6BVB. Plan to give it a good blast next year . . . G0ARF. Lot learned for next year . . . ops at G0CWC/A. Non-stop action, great condx, make this the RTTY Contest of the year . . . G4SKA. Biggest thrill was working VS6UP then realizing he wasn't in Canada! . . . GW0ANA.



OK3CNJ at the keys of OK3KII, multi-op effort.



## TOP SCORES

WORLD—ALL BAND		WORLD—14 MHz	
IK5CKL	535,920	HC5EA	145,935
W3FV	520,884	4M5RY	107,994
OK2FD	489,940	EA8RA	104,451
TI2OY	483,164	NJ0M	102,674
HK1LDG	449,294	UA9YE	85,280
W2FG	421,174		
JH1QDB	358,561	WORLD—21 MHz	
DJ6QT	351,708	VE6ZX	95,893
SM5FUG	330,630	JA3EVZ	39,897
N6GG	329,256	KB4QZH	33,259
		EA8IY	30,600
		NX8J	18,323
USA—ALL BAND		WORLD—28 MHz	
W3FV	520,884	CE6EZ	143,748
W2FG	421,174	DJ3IW	34,726
N6GG	329,256	HC1DK	30,680
WB5HBR	278,460	JA4OYI	26,149
W8DN	268,074	JR1JV	21,087
CANADA—ALL BAND		MULTI-OP	
VE6CB/3	220,651	HD8EX	1,771,798
VE2JR	64,468	TG9VT	1,069,362
VE3JPC	55,536	AT0J	814,212
VE7BTO	19,838	WA7EGA	714,528
VE7DTA	19,251	UZ9CWA	646,814
WORLD—3.5 MHz			
HB9DCQ	6,120		
Y26EH	663		

Will soon be the most popular RTTY contest, like other CQ WW's... **HA5CP**. Glad to give HB0 to the gang... **HB0/HB9NL**. Biggest thrill was looking for US and Canada on 80... **HB9DCQ**. Got my RTTY gear two weeks before the contest. Working rare ones on RTTY is easy; no pile-ups!... **HB9FMF**. Never boring; busy with two keyboards—one for logging,

one for operating... **HK1LDG**. Almost 10 times my last year's score... **HK4BHA**. Big contest. I am a runner and my trainer is mad at me... **IK5CKL**. Didn't have as much time as I liked, but I hope I put a dent in the demand for J52 on RTTY... **J52US**. Worked VO1 on the long path... **JA3EVZ**. I wish to operate more than 30 hrs. How about 36?... **JH1QDB** (ed.: Wow!)

Next year more time... **OE3HCS**. Looked for my last zone on RTTY, but BY8 was not active... **OK1MP**. Where was US on 80 and 40?... **OK2FD**. First RTTY Contest ever. Now I can go back and read the manual... **OZ8AE**. By accident my first RTTY Contest... **OZ8RO**. Worked six new countries. SP3SUN is my son; he is 18. I am 42... **SP3BGD**. Glad to give the boys a new one on RTTY... **ops at UW3TT/UJ1J**. Sri only limited operating time... **VK2BQS**. I have been in SARTG, ANARTS, and BARTG, but never did I expect the activity in this one!... **VK2EBP**. I should have made a more serious effort... **VS6UP**. My biggest thrill was being DX. See you next year... **WH6I**.

Next time, extra points for those who type with two fingers... **YB1BG**. Just one new one. It's difficult... **YB5QZ**. Lost my station on the first day... **YC8TR**. Biggest thrill was working HD8EX on three bands and discovering it was Galapagos and not Ecuador... **ZC4JA**. Great contest. Had a sick Yagi; SWR changed with each QSO... **ZL2AKI**.

## Station Operators, Multis

**KT1N**: KT1N, KA1MWP, N1FTD, NE1G, AB1X, WB1AEL. **KA3DSX** & KA3HNM. **N0FMR**: N0HCL, WA0IGY, KB0BSP, WB0MDF. **WB3FIZ**: KA3GIK & Chris, 5 years old. **WA7EGA**: WB7RBJ, NG7P, KE7PL, WS7I. **W8DN**: N9AG & N8BJQ. **W0NA**: W0AR, W0YR, N9BA. **VE7ZZZ**: VE7ARS, VE7SK, VE7EME, VE7SSS, VE7AV. **AT0J**: VU2JX, VU2NTA,



Andy, SP6AOI, second-place Poland, single operator.

VU2LBW and VU2RUM. **EA6MR**: EA6MR, EA6MQ, EA6YP. **G0CWC/A**: G4OJJ, G0CCD & Radio Club G0CWC. **HD8EX**: HC5K, HC2FG, HC8VB, HC8GR, HC8FR, HC5T, HC2DZ, HC2CG. **JH7ZZO**: JH7AJD, JH7LVK, JG7DEQ. **LA3T**: LA2ZAA, LA5WBA, LA7SP, LA7QM. **LR1V**: LU1VD, LU1VIP, LU1VK. **LZ2KIM**: LZ2MP & others. **LZ1KSP**: Savi, Val, Georgi, Vasil. **LZ5Z**: The Students Radio Club members.

**OK1KSL**: OK1AQ & OK1AHG. **OK10FK**: OK1FAG, OK1FAL, OK1-32-897, OK1-17-419, OK1-30-844. **OK3KII**: OK3CNJ, OK3TYY. **OK3KSK**: OK3CPA & OK3CRY. **OK3RJB**: OK3TCL, OK3TCN, OK3CPG and OK3TFV. **SP1PBW**: SP1BZZ & others. **SP3PLD**: SP3IBM, SP3NYS, SP3SBB, SP3SBQ. **SP9KJM**: SP9RCN SP9-4130-KA. **TG9VT**: TG9VT, W2JGR, TG9AWS. **UD/UZ3PWX**: UA3PW, RA3PW, RW3PW, UD6DX. **UL0P/UZ9FWA**: RV9FQ, UA9FBV, UV9FM, RA9FLW. **UZ3AYR**: UA3DQF, UA3-170-481 & UA3-170-1044. **UZ3DWH**: UA3DNW, UA3-142-610, UA3DVB, UV3DR. **UZ9CZM**: RA9CPQ, RA9CFB, RA9CLK. **UZ9CWA**: UA9CR, UA9CBC, UV9CAF. **YU4EZC**: YU4XE, YU4OR, YU4ZE, YU4ZC.

Number groups after call letters denote following: Final Score, (AB = All Band, B = Multi-op), Number of QSOs, Points, Zones, Countries, and State/VE Provinces. Winners are listed in boldface.

### SINGLE OPERATOR NORTH AMERICA

CALL	UNITED STATES						
	SCORE	CL	QSOs	POINTS	ZONES	COUNTRIES	US/VE
<b>W1AX</b>	<b>125,652</b>	<b>AB</b>	<b>226</b>	<b>566</b>	<b>65</b>	<b>115</b>	<b>42</b>
K1CGJ/M	20,468	AB	91	172	40	41	38
NC1B	11,175	AB	58	149	31	44	0
W1IHN	9,717	AB	51	123	30	38	11
<b>KT10</b>	<b>3,885</b>	<b>14</b>	<b>46</b>	<b>105</b>	<b>10</b>	<b>15</b>	<b>12</b>
<b>W2FG</b>	<b>421,174</b>	<b>AB</b>	<b>534</b>	<b>1,261</b>	<b>79</b>	<b>164</b>	<b>91</b>
NO2T	120,528	AB	247	558	56	90	70
<b>KC2FD</b>	<b>72,162</b>	<b>14</b>	<b>283</b>	<b>633</b>	<b>24</b>	<b>53</b>	<b>37</b>
<b>W2FCR</b>	<b>8,580</b>	<b>21</b>	<b>53</b>	<b>143</b>	<b>21</b>	<b>32</b>	<b>7</b>
KD2XN	8,520	14	61	142	16	29	15
NA2Q	1,716	AB	24	44	14	14	11
W2KHQ	630	14	15	30	7	8	6
<b>W3FV</b>	<b>520,884</b>	<b>AB</b>	<b>532</b>	<b>1,404</b>	<b>89</b>	<b>188</b>	<b>94</b>
W3GU	128,681	AB	250	593	58	103	56
W3KV	122,683	AB	214	587	64	104	41
N3UN	106,368	AB	217	554	67	94	31
<b>KA3JFI</b>	<b>11,001</b>	<b>28</b>	<b>76</b>	<b>193</b>	<b>18</b>	<b>30</b>	<b>9</b>
<b>KB2VO/4</b>	<b>194,790</b>	<b>AB</b>	<b>357</b>	<b>755</b>	<b>63</b>	<b>115</b>	<b>80</b>
AB0Y/4	108,108	AB	242	546	48	100	50
WA4SSB	71,012	AB	234	433	43	55	66
AA4JN	64,619	AB	191	361	47	65	67
KI4MI	55,110	AB	150	334	48	78	39
<b>KB4QZH</b>	<b>33,259</b>	<b>21</b>	<b>162</b>	<b>421</b>	<b>20</b>	<b>43</b>	<b>16</b>
WA4F	19,402	AB	95	178	36	42	31
KD4OM	18,236	AB	78	194	30	45	19
<b>W4/DL1BFZ</b>	<b>16,428</b>	<b>14</b>	<b>138</b>	<b>222</b>	<b>15</b>	<b>23</b>	<b>36</b>

<b>WB5HBR</b>	<b>278,460</b>	<b>AB</b>	<b>472</b>	<b>1,020</b>	<b>65</b>	<b>117</b>	<b>91</b>
AA5AU	254,448	AB	398	837	77	128	99
KG5EG	166,618	AB	369	734	54	85	88
KA5YSY	125,640	AB	289	698	47	89	44
<b>WF5E</b>	<b>79,110</b>	<b>14</b>	<b>311</b>	<b>586</b>	<b>29</b>	<b>61</b>	<b>45</b>
KF5YE	76,635	14	263	655	26	64	27
N15M	26,781	AB	84	237	46	67	0
<b>KE5BK</b>	<b>5,568</b>	<b>21</b>	<b>49</b>	<b>116</b>	<b>11</b>	<b>25</b>	<b>12</b>
<b>N6GG</b>	<b>329,256</b>	<b>AB</b>	<b>432</b>	<b>1,076</b>	<b>75</b>	<b>126</b>	<b>105</b>
K6EID	137,598	AB	276	646	61	99	53
W6JOX	77,220	AB	199	396	54	67	74
W6IWO	38,634	AB	140	282	41	54	42
WA6FIT	28,930	AB	114	263	36	52	22
<b>W6/G0AZT</b>	<b>22,176</b>	<b>14</b>	<b>152</b>	<b>252</b>	<b>23</b>	<b>29</b>	<b>36</b>
W6CN	19,908	14	113	237	18	34	32
<b>NQ6C</b>	<b>13,504</b>	<b>21</b>	<b>105</b>	<b>211</b>	<b>16</b>	<b>24</b>	<b>24</b>
<b>W7MI</b>	<b>103,032</b>	<b>AB</b>	<b>217</b>	<b>477</b>	<b>64</b>	<b>89</b>	<b>63</b>
KE7NF	94,672	AB	288	488	42	57	95
<b>WG7Y</b>	<b>21,420</b>	<b>14</b>	<b>160</b>	<b>255</b>	<b>20</b>	<b>26</b>	<b>38</b>
K9JNB/7	3,036	AB	28	69	15	22	7
KI7T	1,974	AB	30	42	15	10	22
W7WHY	920	AB	19	40	11	12	0
<b>W8LNK</b>	<b>37,752</b>	<b>AB</b>	<b>130</b>	<b>264</b>	<b>41</b>	<b>59</b>	<b>43</b>
W8JAQ	28,380	AB	101	258	33	63	14
K8CV	22,330	AB	102	203	28	46	36
WB8YJF	20,400	AB	88	240	33	43	9
<b>NX8J</b>	<b>18,323</b>	<b>21</b>	<b>109</b>	<b>251</b>	<b>22</b>	<b>38</b>	<b>13</b>
<b>K9KA</b>	<b>250,274</b>	<b>AB</b>	<b>360</b>	<b>866</b>	<b>78</b>	<b>145</b>	<b>66</b>
N4CC/9	246,512	AB	381	868	75	138	71
WB9B	11,424	AB	82	119	22	19	55
K9OSH	5,130	AB	38	90	25	23	9
W9CD	2,226	AB	23	53	17	19	6





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DU9LMT says he will be back next year.



HB9DCQ getting ready to dupe the log.

NTØV	210,372	AB	396	746	69	105	108
K6WZ/Ø	199,928	AB	372	746	93	78	97
NJØM	102,674	14	358	718	29	69	45
KEØKB	81,528	14	337	632	27	57	45
KØBJ	39,485	AB	132	265	45	59	45
KB6IC/Ø	25,250	AB	143	250	21	39	41
NGØX	19,186	AB	94	181	33	38	35
KØOST	12,012	AB	76	156	20	27	30
WBØCHS	7,276	AB	55	107	21	29	18
ALASKA							
KL7XD	94,395	AB	251	609	45	59	51
CANADA							
VE2JR	64,468	AB	167	454	39	74	29
VE6CB/3	220,651	AB	345	947	59	115	59
VE3JPC	55,536	AB	142	356	52	66	38
VE3UR	26,400	14	111	300	27	44	17
VE3JAN	14,690	14	89	226	15	31	19
VE6ZX	95,893	21	374	931	20	45	38
VE7BTØ	19,838	AB	89	218	29	31	31
VE7DTA	19,251	AB	84	207	30	31	32
VE7VP	14,186	AB	64	173	32	34	16
VE7HDX	4,608	AB	34	96	20	27	1
VE7BDQ	2,795	AB	28	65	15	10	18
COSTA RICA							
TI2ØY	483,164	AB	701	1,738	54	118	106
DOMINICAN REPUBLIC							
HI3ADI	263,750	AB	498	1,250	48	91	72
GUATEMALA							
TG9SØ	7,738	AB	49	106	26	25	22
PANAMA							
HP1AC	49,680	AB	160	368	37	41	57
HP1KZ	6,048	14	57	126	12	16	20
AFRICA							
CANARY ISLANDS							
EA8AKØ	217,425	AB	334	1,115	47	81	67
EA8RA	104,451	14	315	941	25	46	40
EA8IY	30,600	21	168	510	20	40	Ø
EA8AZM	6,210	AB	46	138	13	16	16
EA8BOI	1,144	14	18	52	7	10	5
GUINEA-BISSAU							
J52US	96,280	AB	222	664	33	53	59
ASIA							
ASIATIC USSR							
UW9CY	207,584	AB	367	998	52	104	52
UA9YE	85,280	14	291	820	24	43	37
CYPRUS							
5B4MD	23,814	14	205	486	17	32	Ø

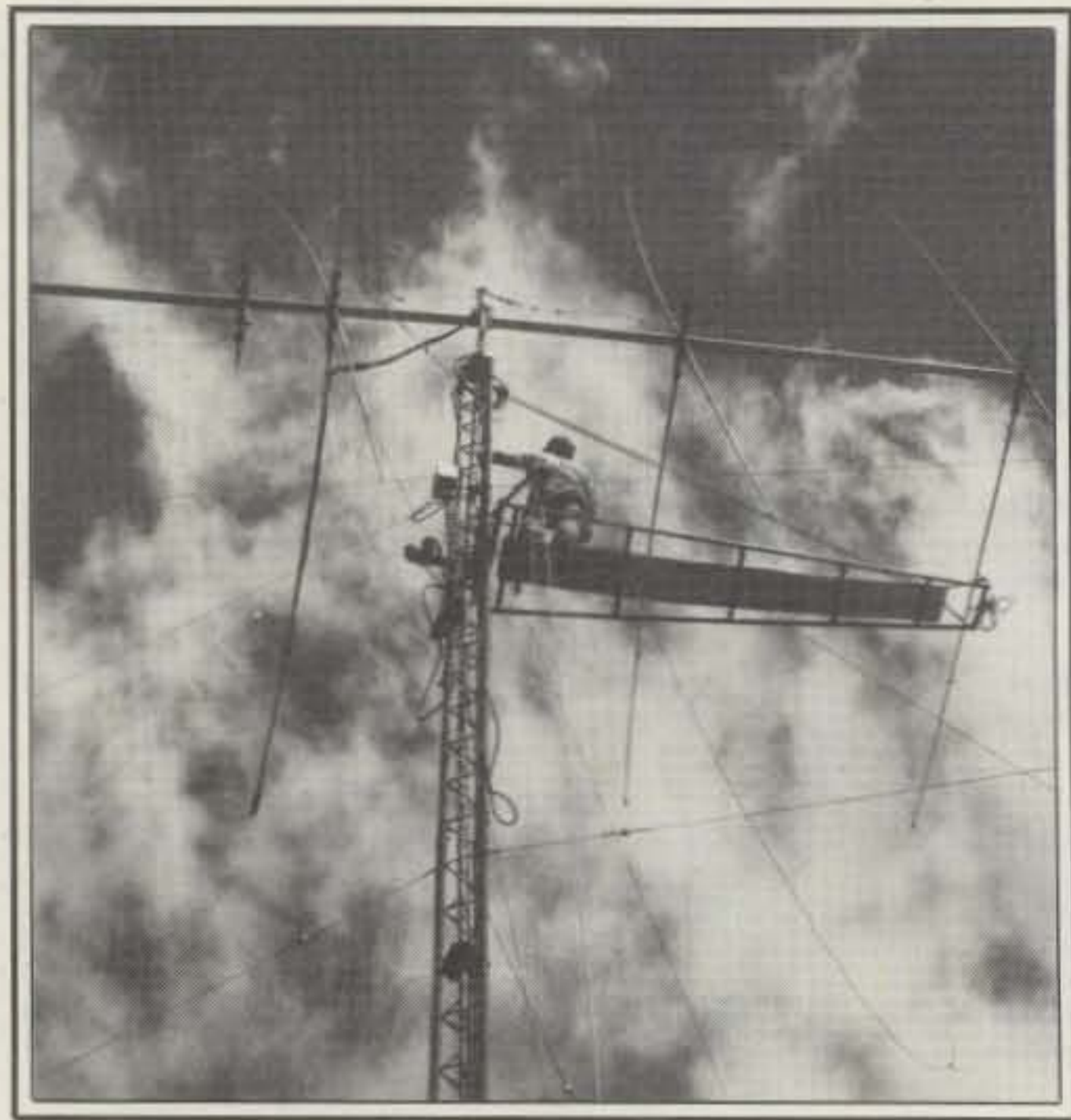
HONG KONG							
VS6UP	218,276	AB	425	1108	54	108	35
INDIA							
AT8	94,024	AB	213	584	49	96	16
ISRAEL							
4X6KA	143,298	AB	293	838	43	94	34
JAPAN							
JH1ØDB	358,561	AB	441	1,267	71	138	74
JR2CFD	231,043	AB	313	899	69	129	59
JA1BWA	211,255	AB	292	835	70	117	66
JA1DFQ	86,154	AB	180	498	51	75	47
JA7AB	62,745	AB	158	445	56	85	Ø
JA3EVZ	39,897	21	139	403	28	42	29
JA2LA	38,354	AB	106	302	50	61	16
JA2NNF	37,592	AB	106	296	46	61	20
JA6WW	35,160	AB	105	293	40	59	21
JA4ØYI	26,149	28	119	331	23	46	10
JL1ARF	25,752	AB	83	232	33	62	16
JR1IJV	21,087	28	104	297	19	32	20
JA8RUZ	7,332	14	63	188	10	25	4
JA7KM	4,387	28	37	107	13	18	10
JA1EUL	4,048	AB	31	92	16	19	9
JA4FCC	972	AB	13	36	12	13	2
JR1AVY	897	28	14	39	9	9	5
JL2XUN	216	21	8	24	3	6	Ø
KIRGHIZIA							
UM9MWA	64,285	AB	204	559	34	62	19
SOV. BASE CYPRUS							
ZC4JA	207,172	AB	376	1,057	53	108	35
TADZHIKISTAN							
UW3TT/UJ1J	43,945	AB	200	517	26	49	10
EUROPE							
AUSTRIA							
OE3HCS	3,440	AB	31	86	18	19	3
OE1WWL	1,225	28	18	49	11	13	1
BULGARIA							
LZ1KAA	91,428	14	314	802	23	52	39
LZ1XX	6,612	AB	53	114	17	23	18
CZECHOSLOVAKIA							
OK2FD	489,940	AB	537	1,441	85	165	90
OK1MP	14,784	14	67	176	27	48	9
DENMARK							
OZ8RO	17,836	AB	69	182	40	56	2
OZ8AE	3,825	AB	27	75	22	24	5
EAST GERMANY							
Y79XN	72,027	AB	181	477	46	69	36
Y51XJ	13,869	AB	89	207	24	43	Ø
Y24MB	9,568	AB	75	184	19	33	Ø
Y26EH	663	3.5	20	39	4	13	Ø



<b>ENGLAND</b>							<b>SWITZERLAND</b>														
G4SKA	140,958	AB	298	738	49	85	57	HB9HK	97,495	AB	227	629	38	57	60						
G0ARF	87,318	AB	205	539	50	73	39	HB9FMF	19,548	AB	71	181	39	50	19						
G4MKO	59,160	AB	130	408	44	60	41	HB9DCQ	6,120	3.5	90	180	6	26	2						
G4UZN	28,438	AB	91	241	38	62	18	HB9FMF	1,400	21	18	50	9	8	11						
<b>EUROPEAN USSR</b>							<b>UKRAINE</b>														
UA3AKR	85,920	AB	251	537	45	100	15	UB0JZ	173,900	AB	387	925	48	106	34						
UA3TN	54,540	AB	176	404	42	83	10	UB0QO	64,774	AB	181	466	41	74	24						
RA4LM	22,410	AB	109	270	24	54	5	<b>WALES</b>													
RA3VR	99	21	4	11	3	3	3	GW0ANA	48,988	AB	132	331	49	77	22						
<b>FINLAND</b>							<b>WEST GERMANY</b>														
OH2LU	237,783	AB	340	871	73	147	53	DJ6QT	351,708	AB	416	1,106	78	157	83						
OH2BDN	50,958	AB	226	447	29	57	28	DJ6JC	273,870	AB	406	1,074	70	112	73						
OH9SV	47,601	AB	159	387	34	57	32	DF3CB	180,960	AB	258	696	81	121	58						
<b>FRANCE</b>							<b>YUGOSLAVIA</b>														
F68VB	80,791	AB	178	467	52	81	40	YU3EA	232,305	AB	340	911	71	184	0						
FF6KRJ	6,090	AB	37	105	23	24	11	YU3MJ	13,986	14	94	222	18	45	0						
<b>HUNGARY</b>							<b>OCEANIA</b>														
HA6PX	118,978	AB	247	589	63	113	26	<b>AUSTRALIA</b>													
HA5CP	77,805	AB	175	455	57	88	26	VK2EG	23,144	AB	89	263	36	40	12						
HA8XF	76,735	AB	197	515	44	68	37	VK2EBP	12,540	14	67	190	19	32	15						
HA1WD	58,855	AB	146	395	49	65	35	VK2BQS	9,620	14	63	185	16	24	12						
HA0IV	11,304	AB	63	157	29	36	7	<b>HAWAII</b>													
HA5AEZ	7,638	28	46	134	21	25	11	WH6I	7,869	AB	71	183	9	7	27						
HA6NA	5,500	AB	45	110	15	24	11	<b>INDONESIA</b>													
<b>ITALY</b>							<b>NEW ZEALAND</b>														
IK5CKL	535,920	AB	607	1,680	73	139	107	ZL2AKI	54,900	AB	154	450	36	47	39						
I0VHL	142,410	AB	301	705	51	99	52	<b>THE PHILIPPINES</b>													
I00KHP	84,150	AB	192	495	48	78	44	DU9LMT	984	AB	16	41	11	13	0						
I3MIQ	58,164	AB	165	444	41	68	22	<b>SOUTH AMERICA</b>													
I2FKW	31,980	14	160	390	18	40	24	<b>ARGENTINA</b>													
I4IBR	29,812	AB	94	257	40	53	23	L7D	118,335	AB	265	735	39	64	58						
I1VTX	1,740	14	20	60	10	16	3	<b>BOLIVIA</b>													
<b>LIECHTENSTEIN</b>							<b>BRAZIL</b>														
HB0HB9NL	114,390	AB	232	615	52	90	44	PY4DA	63,756	AB	170	483	36	55	41						
<b>LUXEMBOURG</b>							<b>CHILE</b>														
LX2EL	41,584	AB	131	368	31	38	44	CE6EZ	143,748	28	402	1,188	23	57	41						
<b>MOLDAVIA</b>							<b>COLOMBIA</b>														
U050K	14,280	AB	90	210	21	39	8	HK1LDG	449,294	AB	547	1,622	70	104	103						
<b>NETHERLANDS</b>							<b>ECUADOR</b>														
PA3DBS	172,788	AB	305	847	53	80	71	HC5EA	145,935	14	353	1,035	30	69	42						
PA0SOL	10,020	AB	68	167	22	28	10	HC1DK	30,680	28	163	472	12	26	27						
PA0YN	8,905	AB	55	137	23	35	7	<b>PERU</b>													
<b>POLAND</b>							<b>TRINIDAD</b>														
SP9BCH	95,284	AB	226	574	43	91	32	9Y4DG	268,320	AB	365	1,032	55	113	92						
SP6AOI	46,917	AB	154	401	35	51	31														
SP3SUN	31,648	14	149	368	20	46	20														
SP4KM	23,387	AB	88	257	30	37	24														
SP3BGD	10,675	14	64	175	21	26	14														
SP9AUV	6,336	14	64	144	10	29	5														
SP6EY	5,850	28	42	117	18	26	6														
SP3XR	1,288	14	23	56	7	15	1														
SP3IBM	42	28	3	7	3	3	0														
<b>PORTUGAL</b>							<b>ARGENTINA</b>														
CT1CKP	5,350	AB	45	107	18	28	4	L7D	118,335	AB	265	735	39	64	58						
<b>ROMANIA</b>							<b>BOLIVIA</b>														
Y03AMC	6,660	14	110	180	16	21	0	CP6IH	59,136	AB	156	448	38	65	29						
Y06JN	4,264	14	68	104	12	29	0	<b>BRAZIL</b>													
Y02CMI	455	21	15	35	5	8	0	PY4DA	63,756	AB	170	483	36	55	41						
<b>SPAIN</b>							<b>CHILE</b>														
EA5KFI	216,756	AB	329	892	60	107	76	PY2LS	4,346	AB	30	82	23	21	9						
EA1AW	36,771	AB	115	309	38	48	33	<b>COLOMBIA</b>													
EC3C8D	7,245	14	66	161	12	21	12	HK1LDG	449,294	AB	547	1,622	70	104	103						
EA1YW	2,822	21	32	83	8	13	13	HK4BHA	98,106	AB	204	591	53	84	29						
EA3FIM	2,485	AB	31	71	12	19	4	HK4EGW	5,994	AB	39	111	21	15	18						
<b>SWEDEN</b>							<b>ECUADOR</b>														
SM5FUG	330,630	AB	393	1,070	87	140	82	HC5EA	145,935	14	353	1,035	30	69	42						
SM4AAY	74,752	AB	242	584	36	59	33	HC1DK	30,680	28	163	472	12	26	27						
SM0HTO	40,425	14	143	385	31	64	10	<b>PERU</b>													
SM7BGE	6,655	AB	53	121	23	29	3	OA4BR	9,063	14	60	171	16	19	18						
SM6CJY	2,379	AB	23	61	15	20	4	<b>TRINIDAD</b>													
SM0AJU	2,352	14	29	56	16	21	5	9Y4DG	268,320	AB	365	1,032	55	113	92						
SM5PPS	2,277	AB	35	69	14	19	0														



URUGUAY						
CX5AE	34,279	14	145	413	19	37 27
VENEZUELA						
4M5RY	107,994	14	299	878	23	63 37
MULTI-OPERATOR NORTH AMERICA						
UNITED STATES						
WA7EGA	714,528	B	889	1,654	92	168 172
WB3FIZ	451,350	B	520	1,275	81	167 106
W8DN	268,074	B	434	954	71	133 77
WBNA	179,860	B	459	782	69	83 78
KT1N	178,068	B	334	836	59	121 33
N0FMR	28,251	B	131	219	37	42 50
KA3DSX	2,204	B	25	58	15	14 9
CANADA						
VE7ZZZ	333,735	B	496	1,171	64	81 140
GUATEMALA						
TG9VT	1,069,362	B	1,047	2,583	87	178 149
AFRICA						
BALEARIC ISLANDS						
EA6MR	284,919	B	485	1,301	47	88 84
ASIA						
ASIATIC USSR						
UZ9CWA	646,814	B	688	1,966	80	178 71
UZ9CZM	1,485	B	18	45	17	16 0
AZERBAIJAN						
UD/UZ3PWX	264,992	B	489	1,352	45	108 43
INDIA						
AT0J	814,212	B	794	2,268	87	187 85



Repairing the broken quad during the contest at TG9VT.  
(Photo by W2JGR)

JAPAN						
JH7ZZO	83,631	B	161	457	59	82 42
KAZAKHSTAN						
UL0P/UZ9FWA	543,170	B	736	1,873	71	166 53
EUROPE						
BULGARIA						
LZ2KIM	629,048	B	676	1,673	78	196 102
LZ1KSP	537,138	B	620	1,566	84	181 78
LZ5Z	497,240	B	600	1,604	81	143 86
CZECHOSLOVAKIA						
OK3RJB	200,836	B	318	851	64	111 61
OK1OFK	92,901	B	205	537	55	77 41
OK1KSL	55,522	B	142	391	49	64 29
OK3KII	44,974	B	157	398	31	65 17
OK3KSK	1,302	B	16	42	13	14 4
ENGLAND						
G0CWC/A	52,164	B	175	414	36	60 30
KALININGRAD						
UZ3AYR	323,076	B	518	1,308	59	131 57
UZ3DWH	175,026	B	371	941	44	92 50
NORWAY						
LA3T	120,139	B	246	629	56	92 43
POLAND						
SP1PBW	91,182	B	198	546	51	66 50
SP3PLD	23,500	B	95	235	33	52 15
SP9KJM	10,653	B	75	159	20	44 3
YUGOSLAVIA						
YU4E2C	45,384	B	138	372	28	49 45
SOUTH AMERICA						
ARGENTINA						
LR1V	157,400	B	307	787	42	90 68
GALAPAGOS ISLANDS						
HD8EX	1,771,798	B	1,288	3,794	96	195 176

**CHECK LOGS:** Our thanks to the following stations who sent in check logs: KP4BJD, LZ1DB, LA7SP, LA4ND, SM5APS, W4UW, OD5NG, F11ADB, WA6IEL, KL7VZ, DE0GMH, F11ADT, SM6APB, and EC4CTB.

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**144 MHz Amplifiers**  
**B-1016-G** 10W in = 160W out  
**B-3016-G** 30W in = 160W out  
**B-215-G** 2W in = 150W out

# 1-6

13.8 vDC

**220 MHz Amplifiers**  
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**C-3012-G** 30W in = 120W out  
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Picture this . . . You know your station . . . You are at home with your gear . . . all the knobs, switches, meters . . . QSY's are no big deal, you could do them in your sleep (and you probably have!).

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**120% ICAS duty cycle . . . air-cooled . . . fan hood available . . .**

**Active cooling kit available for 100% key-down duty cycle**

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**7** **30W in - 300W out**  
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 440 watts (DC) 68% efficiency

**8** **30W in - 600W out**  
 24v DC

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**10** **50W in - 1,500W out**  
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# No Code—Our Readers Say

Over 200 readers have responded to Zero Bias, Washington Readout, and the CQ survey on a code-free entry-level license in the last few months. Here is a representative sample of their thoughts. In order to have more readers' opinions represented, some letters have been shortened. The publisher of CQ assumes no responsibility for statements made herein by correspondents.

## Emergencies

I have just finished reading Fred Maia's column and must say that I concur with him 100%. If anything, he is being conservative on his estimation of the needs of Morse code in the amateur radio service. If you doubt this statement, please consider the following: When Jamaica was struck by Hurricane Gilbert and sent an urgent request to the ARRL for communications equipment, it is my understanding that not one straight key, not one keyer, not one piece of any type of code equipment was sent to handle the emergency down there. Similar situations occurred when Mt. St. Helens blew its top here in Washington State in 1980; the immediate emergency communications were all voice operations . . . and much of those were on the VHF frequencies and nets up and down the coast. Once the emergency cooled down a bit, the good old health and welfare CW nets were able to handle the slower traffic requirements. From what I have been able to read about the earthquake in Mexico and volcanic-induced mud slides that devastated those rural areas in Colombia, much of the immediate emergency activities occurred on VHF nets and certainly were not transmitted via CW.

I am an Extra class amateur radio operator. I enjoy CW for ragchewing and DXing, but certainly not for handling emergencies. A recent review of my log shows that one-third of my contacts on HF are with Morse code.

I am having a heck of a time getting my 14-year-old daughter and my 10-year-old son, both of whom are A and B students, excited about code. Jenny would have had her Novice license when she was 10. I worked through several Novice manuals with her and also several code tapes. The theory was a breeze; the code was sheer boredom! She hated it and could not see why she should have to learn it. For the type of communications she wants to do (mainly repeater operation), it really isn't necessary. My son loves computers and he likes soldering and building things, but he really isn't interested in code. What do I tell him?

Dale W. Avery, KC7MM  
Spokane, WA

When I was 14 years old, the only obstacle between me and the allure of wireless communications was a Morse code and radio theory exam. I asked my dad, a great chemist but non-ham, "Why the tests?" He said, "Use of a valuable international resource such as the radio spectrum is a great privilege. You should demonstrate knowledge of electronics and regulations in order to intelligently help out in times of crisis and to be sure your equipment doesn't interfere with other vital radio services."

"Okay," I said. "But why the code test?" He unhesitatingly said, "Mastery of the code could save your life or others. If all else fails, you could send a message if you could find some way to key your transmitter!" That's all it took to send me off committed to study both code and theory as equal qualifications of persons worthy of the title of communications artist.

Steven C. Affens, K3SA  
Olney, MD

If we were to have codeless licenses for VHF operation, we would definitely have more people entering ham radio, but they wouldn't know Morse

code. To me that is a big drawback. If I am injured while hunting and the only way I can get a message out is to send Morse using the touch-tone pad, the last thing I need to hear is, "Sorry old man, I don't know Morse."

D. MacLeod, WB0YNS  
Colorado Springs, CO

While I enjoy CW myself, I cannot favor forcing it on everyone. To me a good CW contact is like a pleasant horseback ride on a Sunday afternoon . . . But, if I can move a piece of traffic faster on voice or packet, I would no sooner use CW for that purpose than I would ride a horse on the New Jersey Turnpike.

Phillip E. Galasso, K2PG  
Iselin, NJ

Being an old timer who learned American Morse on the railroad at the age of 11, got licensed in 1935 when still in high school, and has been a devoted CW operator ever since, I nevertheless have concluded that it is time to eliminate the CW requirement for all licensing privileges except the CW mode.

The code is not difficult to learn if one is interested in learning it, but it is largely a deterrent to amateur licensing because of this lack of interest. It does not guarantee that an amateur will be able to render any public service in that mode. In fact, many amateurs do not have the CW skill they had when licensed because they have gone exclusively to other modes of operation. Also, most, if not all, emergency communications will be in some mode other than CW.

George W. Gulbranson, W6WID  
San Diego, CA

## Use It Or Lose It

Many hams are concerned that a code-free license for operation above 30 MHz would create some form of radio Armageddon. I believe this is quite unlikely. We are much more likely to have crowded and abused bands if we lose large portions of spectrum due to insufficient use. If we didn't learn from the 220 MHz reallocation, we may expect a similar lesson in the future—perhaps on 440 or 900 MHz. How much spectrum must we lose before we pull our heads out of the sand? If we bring new hams in code-free, we can be assured of VHF/UHF spectrum for the future without putting too much demand on the HF bands.

Matthew C. Rush, N7LYH  
Bothell, WA

I work for the Department of Defense. Right now I am primarily in management, but my expertise is in various types of communication modes both conventional and modern/more advanced modes.

I strongly believe that the amateur service must grow to survive and the only way to grow is to attract new, young people. The requirement for code is stopping this growth because it keeps away many young people. I have personally witnessed this situation several times. Entry level should be available for VHF with no code requirements. I also feel that the new no-code hams should be allowed to use at least the present Novice voice portion of 10 meters to give them the experience and thrill of working worldwide DX contacts. Imagine being able to tell prospective hams that they can go to Radio Shack, buy a 10 meter transceiver, put up a simple dipole, and be able to talk to the world. I believe we would get a few takers on that one. I am probably getting ahead of myself, and I guess we should get the no-code VHF/UHF first, then get 10 meters. I could easily convince one or two of my three children to become hams (and even my wife might try), if they did not have to take a code test.

Emory J. Haines, KD3DQ  
Severn, MD

Being in the two-way radio business myself, I know how bad other services want our frequencies. The ARRL needs to wake up and realize that this is the only way amateur radio is going to grow in this age.

I have been in electronics and communications all my life (now 48). I had a Novice license back in 1957 (KN4VBZ), but at that time it was only good for one year and was not renewable. So when it ran out, I was not licensed again until 1986. I am into SSB and ATV (fast scan). To me, Morse code is totally outdated. If we are going to require code to anyone seeking to enter amateur radio, why don't we also require some of the more advanced technologies like spark gap transmitters or cat whisker knowledge? Both of these came several years after Morse code, which was originally sent over wires before the days of radio.

The fact is today's young people couldn't care less about Morse code and, therefore, couldn't care less about amateur radio. It is not that they can't learn it, it is that they don't want to. Amateur radio needs some new blood. The ironic part of it all is that all those old men who won't bend an inch on doing away with the code requirement haven't had a CW QSO in years. They are all down on 75 meters talking about their aches and pains. If you really want to turn off a prospective young ham, let him listen to that for a while.

Charles R. Solomon, KB4TPI  
Pulaski, TN

I've read many comments in amateur magazines, both by editors and writers, about the current lack of growth of the number of U.S. amateurs. But who needs growth? We don't need more amateurs, we need more of a better class of amateurs, and I am speaking from the technical and ethical standpoints.

Captain Paul H. Lee, USN (ret), N6PL  
Rockledge, FL

If we do not change our attitudes in this respect, ham radio in the U.S. will go the way of the dinosaurs—a fond, but sadly sterile memory. And I'd like to add three letters before the word "change," namely PDQ, since we most certainly do not have much time left to rectify the situation! The 220 MHz band happening should be a very serious lesson.

John Schmidt, WA6PGA  
Lompoc, CA

I'm writing in response to all of the articles on "no code" requirement. In my opinion there should be a code requirement in all cases. Some say the code test is too narrow of a filter. I believe on the other hand the written test is too wide of a filter. Anyone can memorize the questions and answers—garbage in, garbage out. Some say if we don't increase our numbers then we will lose more spectrum. (1) Even if we increase our number to one million, that's still less than one-half of one percent of the U.S. population and no competition for back-slapping lobbyist and corrupt politicians, and (2) I'd rather have minimum spectrum and people who are dedicated to the hobby than mega-frequency allotment and chaos. And one last comment (before I run out of wind!): I would like to see (and this applies to all ham magazines) an opposing editorial or article for the promotion of the code requirement!

James S. Smith, KA6MLE  
Morro Bay, CA

I hope people are happy about the 220 MHz loss. We do not have enough people on the VHF/UHF bands to effectively show need for more band space. So we're just going to sit around and let it happen? HA! No way! We need a no-code license now. One that is not a freebee to get. Why not let a class of operators learn electronics—especially digital theory, operating procedures, rules and regulations—everything "we had to learn" except Morse code!

Nicholas L. De Carlo, KA7VLH  
Park Rapids, MN



■ I'd rather have the guy down the block calling his wife on 220 than have UPS making another million or two on frequencies that once were mine (ours). I think it is vitally important for the common man to have access to the radio spectrum, and an easily obtainable license with many operating options is just "the ticket" needed.

*Lee A. Crocker, MD, W9OY  
Downers Grove, IL*

■ Times have changed since 1959. Ham radio does not have the same attraction as 25 years ago. In 1989 there are so many electronic hobby choices that a person may pursue. This is especially evident when one considers the number of people interested in computers.

In the interest of keeping our present amateur bands, we must use them or lose them. Reluctantly, I've changed my mind and am now convinced that eliminating the code requirement for those privileges above 30 MHz would influence more people to become hams. Maybe the greater use of these frequencies will help forestall the loss of these ham bands.

*Ken Alexander, KC9OG  
Indianapolis, IN*

## CW? No Problem

■ I still feel that 5 wpm is achievable by anyone willing to make an "investment" or basic effort. I question "no code" as the panacea for growth—afraid that radio has lost its mystique and that amateur radio is a declining hobby that will find its own level of interest, just like model airplanes, railroads, stamps, etc.

*R. Voss, KB1HC  
Chelmsford, MA*

■ I have had 30 years experience in communications (landline, RTTY, military radio operations, state highway patrol communications) and have "First Phone." But I got blown up three times in Viet Nam, so I am tone deaf. I have passed written Novice through Advanced, but I am stuck at Tech because of not being able to hear code above 8 wpm. Something needs to be done.

*Ed Pfeifer, N0JHS  
Hot Springs, SD*

■ My interest in amateur radio stems from my disgust with CB. I am willing to study and do what it takes to get my Novice license and move forward with Tech and General licenses. In time, I do not plan to use Morse code, and quite frankly, I am having a tough time with it. But I don't plan on giving up because of it. Is code a necessity for Novice? No! An added endorsement for Novice, yes! I've still got a lot to learn, but Amateur Radio has certainly caught my ears.

*Ronald Good  
Indian River Shores, FL*

■ I have been trying to learn the code for more than a year. I have tried various approaches, but to no avail.

I really would like to have a ham license, and I am not against code. However, some people do have audio perception problems and really can't learn the code. So it would be nice to have some no-code privileges. I am a teacher with a Master's Degree.

*Herb Pasteur  
St. Charles, IL*

■ I can only conclude that W5YI is attempting to establish a "cry baby" category of amateur radio license. I could say more, but I think I have really covered the entire subject.

*Robert R. Brown, NM7M  
Anacortes, WA*

■ I believe that I am one of thousands of individuals who could qualify for an amateur radio operator's license, were it not for Morse code. In the past I've taken many tests, passing the written 100% but unable to master the code. Some of us do not have the "ear" for code. It's unfair to us.

*M. Tracey  
New York, NY*

■ I have been acquainted with a number of amateur operators. They said they had little use for the code, so they go right to voice and digital after they get their tickets. And that is where they stay.

I am almost 50, and I have never been able to copy more than 2 or 3 wpm. I gave up on it.

*Richard Hoyt  
Arkadelphia, AR*

## CW Keeps The Riff-Raff Out

■ Do you realize that this will open the door to all the undesirable types now on the Citizen's Band? I am sure this is not what we want. Even the great FCC has lost all control over the CB blasters with their super power and foul mouths. I have yet to hear [CB] communication that has any value or meaning. Even the police monitors and REACT have given up. Do we want that sort on our 6, 10, and 2 meter bands? I don't think so.

*Wilbur T. Golson, W5CD  
Baton Rouge, LA*

■ My best friend never got a ham license because of the code. He was sharp in electronics. I went to him many times with various pieces of equipment. He always found the trouble and a way to fix it. He would have made an excellent ham, but it's too late now. He passed away.

Both my son and son-in-law would be interested in ham radio if they could get started without the code. And I have three grandsons who would be interested, too.

Thank you for whatever you can do for us.

*Galen H. Burger, WA8RT  
Baltic, OH*

■ The code and/or theory tests keep the CBers out of the ham bands. That alone is justification for the code and/or theory tests.

*R. F. Dickinson  
Menlo Park, CA*

■ Morse code is why I became a ham. Don't lower the testing standards any more. Ham radio is becoming a mess already due to the so-called modern testing. Ham radio is getting like CB. I am starting to feel very degraded due to this testing. Give the testing back to the FCC.

*Charles E. Curtis, KA8OFF  
New Lebanon, OH*

■ I am 56 years of age. I have wanted to participate in amateur radio since my early years. However, I seem to have some kind of mental block against Morse code. I have tried three different times in the past to realize my dream. However, the code requirement has always been my downfall. I am now in my fourth effort at Novice class. I've spent somewhere between \$150 and \$200 for study courses, both aural and visual. So far the courses' main function has been to help the authors financially!

I wholeheartedly agree that the amateur radio service is desperately in need of restructuring, or else it will eventually shrivel and die completely without new blood. Young people need a service geared towards the computer age and enhanced electronics. I've had many youngsters sympathize with my inability to learn Morse and assure me that they would never try for an amateur license because of the code requirement. Personally, I think code has its place, and let those who enjoy it, use it, but give the ones who don't share their enthusiasm a break. My interests lie completely in voice communication, packet radio, and exploring all the possibilities of the marriage of computers and radio. Besides, if I want to read out code as I hear it, I can program my computer to translate on screen or printer by converting the code to written words.

*Bill Nelson  
Cheyenne, WY*

■ CB is the black sheep you and others bad mouth! Listen closely to 75 at night, and then listen to 11 meter SSB. There's not much difference that I can see.

*Clark Ackison, KC4DEB  
Madison, NC*

■ I have had the desire to be an amateur for 30 years and have studied intermittently for the examinations. I am now studying code for almost 12 months off and on. I know the Morse code alphabet, but my ear is still not "trained" to read the code at a passing rate.

I feel comfortable with the written exam and am sure that I could pass it. I have been a law-abiding citizen all of my adult life. I obey traffic laws while driving and would certainly obey the FCC rules being on the air.

*Walter B. Crowl, DVM  
Twenty-nine Palms, CA*

## CW—Love It Or Hate It

■ I feel that I must comment on the alleged restructuring of amateur radio. Even if the letter will be trashed, it will, at least, have been sent. I am not too pleased with the no-code idea being the way to increase the numbers of amateurs. I believe this would be detrimental to all of us who use CW as the major mode of communications, because after a few years these new "no-coders" will want the same spectrum use as the Novices and Techs.

*Robert Peura, K8FN  
Troy, OH*

■ Son of a gun, I certainly wish I were able to write like you who composed the editorial in the February issue of CQ, of which I'm a faithful subscriber. You're so infinitely correct, so totally logical, so completely reasonable, so patently obvious, entirely right-on, etc. It makes one wonder what in blazes keeps those fanatical CW-forever and -wherever, 'til-death-do-us-part Morse code chaps beeping away in the wilderness. Although harboring no illusions as to the outcome of such endeavors, I've done my part in the past, but nobody listens to common sense.

Before you jump to the easily reached conclusion that I detest CW, let me hasten to unequivocally add that I do not hate Morse code. It is not my favorite modus operandi (AMTOR is), but I have an auto keyer ready to go at any time as well as an old but oh-so-good Swiss Army telegraph key hooked up and QRV by the flick of a switch on my TS-830S. So much for that.

*John G. Schmidt, WA6PGA/HB9CDP  
Lompoc, CA*

■ As you can see from my survey card, I'm in favor of a no-code license. Based on the experiences with no-code in Japan and other nations, we have a sufficient amount of empirical evidence about what is likely to happen with the establishment of a no-code license. I don't feel that it would foreshadow the demise of ham radio.

Am I against code? No. For me, it's a viable and pleasurable mode. I can copy 18-20 wpm.

*Mark McCarty, KA2UIC  
Howell, NJ*

■ You might note how the "Brits" do it. G hams cannot operate CW until they pass a CW test (a real one of sending and receiving). That makes CW something for hams to want to learn so they can get onto the CW portions of the HF bands.

I love CW. You don't get many people to love something by forcing them to do it.

*Ron Wilhelmy, W16B  
Rancho Santa Fe, CA*

■ I'm 64 now, and code is still my first love. After 10 years on Novice bands, most of my contacts are with Extra, Advanced, and General but not Novices. And I don't want to forget Technicians. Some of these Technicians work a lot of code.

But most upgrade real soon to voice and never come back. Novice bands are worked by Extra, Advanced, General, and Technician operators. They have helped to keep CW alive. I don't like to see our frequencies go. But PACs [Political Action Committees] and corporations have the money. FCC has a job to do. If you don't take care, we're going to lose the rest of 223-225 MHz plus the 440 section. Let's get on the ball and go the way Canada, Japan, and France went. What can we do? The PACs and corporations will get it all. Numbers are what count, and we have less numbers every day. Cellular phone is taking



our place in the street. CW is dead. It's all over but the funeral.

We have to move on. Younger people don't care about code.

*Cliff Limerick, KA3BWS  
Maryville, TN*

■ My age is 73, and I have been licensed since 1962. I dearly love ham radio and will do my best to preserve and protect it from insidious attempts to dilute it or chop it up.

Yes, I am one of the old timers and have worked diligently to entice newcomers into our ranks and have succeeded quite a few times. As to old hams, everyone recognizes that they are a source of knowledge and hints and kinks prior to setting up a station and getting on the air.

Anyway, I feel that a no-code license structure is the way to go. The code requirement is the largest stumbling block that there is to increasing the number of potential hams. We have heard innumerable times that the damned code is useless. I happen to believe that even though I had to "get" the code to get my ticket.

*Jack Golden, KK2W  
Portville, NY*

■ I have been a licensed ham for 51 years now and almost all of it has been on CW. I grew up with that mode and am very comfortable with it, but I do agree that ham radio falls short of "turning on" young people today. Being forced to learn the Morse code is a large part of the problem.

I have been a ham since I was a teenager, and I have seen some tremendous changes in the equipment we use and the ways we use it. It was great fun when I started the hobby, and it is great fun now! There are now so many truly fabulous ways to use amateur radio. So many modes and so much really fine equipment is offered now.

Many of us are inclined to look back to earlier times with nostalgia—but the "good old days" are with us right now! Let's hope we can open up one of the best of all hobbies to thousands and thousands of others who will enjoy it as much as we do.

*Ken Kurtz, W4KMC  
Melbourne, FL*

■ I am one of the old timers (W4AV, 1929) and am now 75 years of age. I well recall the old days of homemade rigs and the urgent need for code. Both are no longer important.

*Wilbur T. Golson, W5CD  
Baton Rouge, LA*

■ I would like to see the Morse code requirement reduced across the entire amateur radio spectrum, not just for the entry-level licensing requirements.

The code is good to have, but it is becoming almost impossible to find someone to send code to you. They all seem to be on the higher bands and do not have time for the Novices and Technicians. I know because I have been struggling with the General class code for three years.

*James Griffin  
Macon, GA*

■ A good look at lowering the copy speed in all frequency bands should be looked into—not just VHF. The same case can be made for no-code or lower speed code across the entire amateur band as for above 30 MHz.

*Tom Stenger, KA5OML  
San Antonio, TX*

■ I think your cause is just. I like CW. I never expected to do anything else. I like it. As I listen on 30 meters, there are a few stations on the few kHz allotted. Now as I listen on 18 MHz, they are three deep in the phone portion with plenty of room in the CW end. All the Novices are in the phone portion on 10 meters. They struggled through 5 wpm. That is as far as most of them will learn CW. I further believe 5 wpm is all that should be required for any amateur license.

The Canadian system is good for openers. I believe we can do better.

*D. Wayne Pascoe, W7TZ  
Hoquiam, WA*

## No Pain, No Gain

■ People tend to value things in proportion to the effort they have to expend to achieve them. Compare the prestige attached to an Olympic gold medal to one handed out by your local high school, for example.

Amateur radio is not the "fraternity" here in the U.S. it once was because once, when you got a ticket, it represented an achievement. Not so now. Easy licenses, like Novice and Tech, are held to be of little value compared to a Class "B" license of my youth. If you want an extreme example, consider CB.

It makes more sense to me today to make it harder to get a license, since the bands are more valuable today than ever and there are more people to become operators than there were in 1941.

*Bill Eckels, W8ZNH  
Big Rapids, MI*

■ Having a lack of CW knowledge in the state of emergency can prove disastrous. The no-code proposal, if passed, will let flocks of hams into the VHF and UHF ranks. This may be nice for a while, but then it will be proposed into the HF ranks. Pretty soon, CW itself will be a memory of the "obsolete language" of ham radio. Eliminating the code test makes a mockery out of all the hams who have studied so hard to join the elite ranks of amateur radio in the first place.

*John Muhr, KT0F  
Littleton, CO*

■ An old General class operator in the Washington, DC area was on his soap box the other day letting everyone in listening distance know "there's no gain without pain" in getting a license. The riff-raff would invade the ham bands just like CB without a code exam. In the following sentence, however, he admitted he hadn't used CW in years. The problem here is obvious.

*Charley Jackson  
Clifton, VA*

■ I feel that I have some insight as to why amateur radio is not growing in this country. Nobody knows it exists! I am 34 years old, and I don't live in a cave, but I knew little about ham radio until last year. When I tried to learn about ham radio, I found precious little information available. There was nothing in the local bookstores on the subject nor in the local library. I had to go to the main downtown Phoenix library before I finally found anything, and most of the books there were ancient (could that be why I am pro code? HI HI). There is only one store in the metro area that deals exclusively in ham radio equipment. I could not agree more that we need growth, but I think that it would be more effective to raise public awareness of amateur radio than to drop the Morse code requirement. I feel that if people really want the license, they will learn the code.

*Glenn Osborne, N7LMP  
Phoenix, AZ*

■ Just a note to say that I support your efforts on this matter. I personally don't think it goes far enough. I believe that code requirements should be dropped or cut back from the present requirements. Morse code is only being used to keep people out and to make them "pay their dues." It's time to bring this to a halt. Thanks for all that you are trying to do.

*Bob Tomlinson, N5FXD  
Saginaw, TX*

■ There is a mentality out there among the hams that someone is taking something horrible away from the troupes! Rather, if they stopped shouting about the "rowdies" that will take over our frequencies, they just might find out that something new can be added without hurting ham radio. The ideas put forth by Fred Maia, W5YI, are very worthwhile and can help build ham radio as a hobby in a very meaningful way.

The hams who are saying "No Way" are very selfish and ultimately are really saying (when you can get them to admit it), "I did the code, so you should have to also." They will expend so much time fighting about the new idea that we will be sinking the hobby and they will never realize it is sinking! What a pity.

*Morten Eriksen, KA2UIJ  
Wading River, NY*

## Changed Their Mind

■ I find it interesting that Mr. Maia has already assumed that the result of the CQ survey will agree with his viewpoint. "These responses will be used (to show) that a change is indeed needed." Based on my observations, I would be extremely skeptical of any response showing a turnaround from the 20-25 to 1 opposition to "no code" licensing in just five years.

*John McMichael, KO0D  
Littleton, CO*

■ The last time this came up, I wasn't a ham radio operator. I was studying code to get my license. It took me a year to learn the code and pass the Novice test. Before I received my ticket, I wrote the FCC voicing my view on a no-code license. I was against it. For the first five years I was not active. Then I wanted to upgrade. So I studied the code and moved up to Advanced. I believed this was my goal in ham radio. But within one week after passing the Advanced test, I decided to go for Extra. Seven weeks later I passed the Extra test. I went beyond what I ever believed I could do.

So what is my point? I have had a change of mind. I see that we need to look at our hobby with a different point of view. I think that Canada has taken a great step in upgrading our sport. Packet is the wave of the future. It's like being in business: If you don't keep up with the competition, you are no longer in business. Change is hard, but change we need—to stay alive.

*George McDonald, N7ETN  
Joseph, OR*

■ A few months ago I was dead set against a no-code license. I must admit it was mostly for "traditional" and "I had to learn it, everyone else should" reasons. In the last couple of months, however, I have completely changed my thinking. I do agree that we must increase our ranks so that amateur radio can survive. About the only reasonable way to do that is with a no-code license.

*Randy Kaeding, K8TMK  
Stevensville, MI*

■ Being an aficionado of beloved CW, I always felt that amateur radio stood for Morse code. If one takes the initials CW and turns them upside down MC emerges—Morse code. And like W5YI, I too am a member of the Society of Wireless Pioneers organization. Thus, it is difficult to imagine amateur radio without an entry code requirement. However, I guess the time is here.

*James E. McNally, KA1LJO  
Florence, MA*

■ As a licensed amateur since 1976 and dedicated CW operator (by choice), I have reluctantly accepted the merits of a code-free VHF/UHF entry-level license. After much thought, I realize it is probably the best way to attract young people to our hobby.

*Hans J. Miller, KB4BI  
Jacksonville, NC*

## A Money Grab?

■ BIG DOLLARS is the reason behind this, and you know it. I don't know of any earth-shaking high-tech development that has come out of the Asian area. Most of their improvements are made on someone else's original idea.

*Jack Watt, W8HYQ  
Ontonagon, MI*

■ I was somewhat amused by your inquiries sent to the members of the amateur community, "The response to a license of this type was immediate—particularly from industry." Now there's a surprise! What a marketing question! "Dear Mr. ICOM: What would you say to creating 10,000 new amateurs, most of whom will be buying new radios?"

"Dear Mr. Maia: After careful consideration we have decided that we would like to sell a few thousand radios to those new ham operators." Boy, you could knock me over with a feather!

Yes, the time is right for proceeding into the future with a no-code license. But let's not do it to fill spectrum. Let's not do it to sell radios. Let's not do it to heat the ether without contributing to the amateur





Rob, WA3QLS



Kurt, KA3OQR



Paul, WA3QPX

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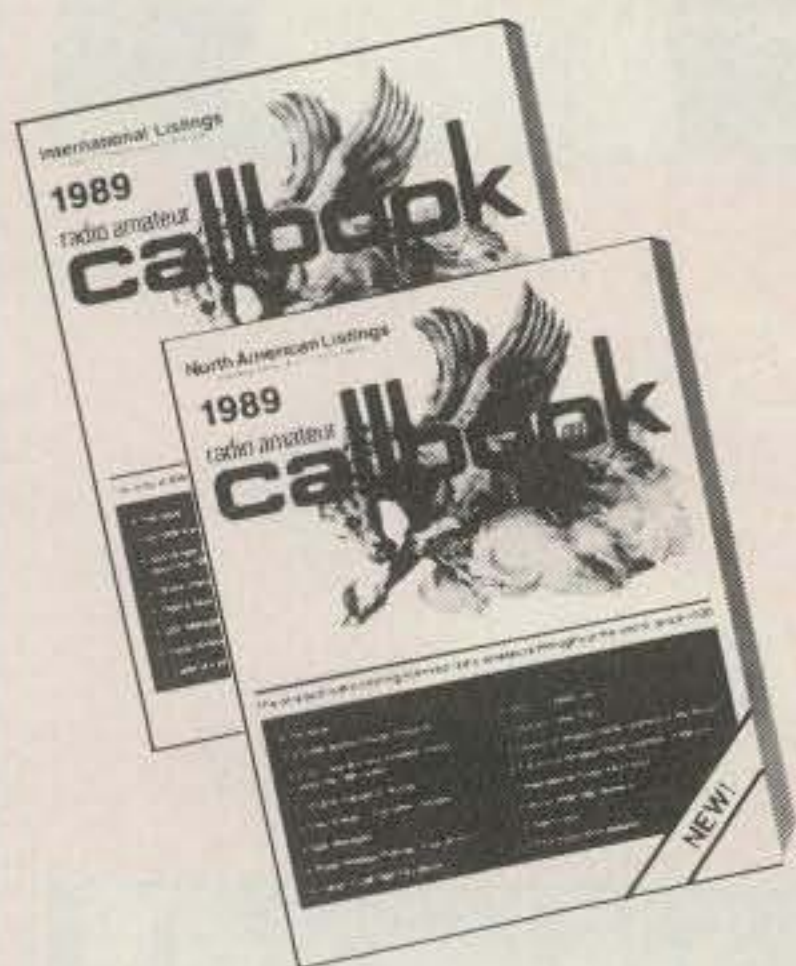
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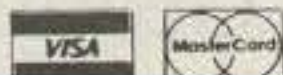
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community and society as a whole. Above all, let's do it thoughtfully and carefully. There will be no going back.

*Pete Pollock, NA1G  
Concord, MA*

■ For many years, as a former manufacturer and supplier of ham equipment, I was accused of having a monetary axe to grind whenever I spoke in favor of adding a "hi tech/no code" license class to our existing structure. Now that I have departed from the commercial aspects of ham radio, I feel qualified to address this subject more objectively. And my feelings have not changed. It has been much too long in coming.

Most of the reasons and justifications for the enhancement have been presented in the past and repeated recently. The one that I consider to be of overwhelming importance is the simple fact that our ranks are suffering by the exclusion of thousands of sharp and talented young potential hams who would bring more to the hobby than their inability to pass a code test would ever detract. In the course of many professional years in commercial, consumer, and defense electronics, I had contact with hundreds of highly skilled technicians and engineers who had serious interest in becoming hams but who chose other avenues to vent their enthusiasm. Each was certainly capable of learning the code; each felt his or her time would be better spent learning a more usable subject. Almost without exception they would have contributed more to the art than most of those hams that I QSO on a daily basis... most of whom are categorically opposed to the establishment of a code-free license—for the classic reason of "I had to do it." In fact, a large percentage of them could no longer pass the current 5 wpm requirements for today's entry-level license.

*Ed Clegg, W3LOY  
Lancaster, PA*

■ Your comments in the Zero Bias editorial were very attractive to those who stand to profit from a no-code license, I'm sure. I have no respect for people who make a living thanks to amateur radio supporting any concept that would put more dollars in their pockets. The fact is if there was a no-code license and it put another 100,000 or so on the amateur bands, CQ and others in the amateur radio industry would make a few more bucks off amateur radio. Is this so bad? No, but not saying that you support it because CQ would make a lot more money one way or another is calling the "I learned CW" hams stupid.

*Gary, N4MRF  
Apoka, FL*

■ I am in full agreement with you on your feelings regarding the Morse code requirement for amateur radio. Of course, I'm now suspect of desiring to rake in millions should the code requirement be lifted. Last month's *Electronics* showed the entire ham market at 34 million. Video disks had a 44 million market... and they were discontinued three years ago.

*John Martin, WB2VTN  
Electron Processing Inc.  
Medford, NY*

### Fair Survey

■ Thank you for at least trying to not stack the vote for or against "no code."

*Bob Cashdollar, NR8U  
Newark, OH*

### CW Not Outmoded

■ I do not agree that Morse code is an obsolete mode. It is valuable at HF frequencies and is also used extensively on VHF for weak-signal communications. Inability to use it would put even operators who extensively use VHF at a disadvantage.

*Greer W. Craig, MD, AA5HN  
El Paso, TX*

### Real Hams Copy CW

■ That's it! I've had it! For the second month in a row your magazine is trying to sway hams into thinking that a no-code license is the only logical way to enter the future of amateur radio. If this continues, I may have to cancel my subscription. Both you and Fred

Maia, W5YI, seem to think that it is about time that we had a class of license for which knowledge of Morse code would not be a prerequisite. Apparently neither of you is very active. Being an active ham I have noticed that since something as apparently innocuous as Novice Enhancement has taken effect the quality of 10 meters has grossly deteriorated.

*Rocco Lovascio, N2EXZ  
Brooklyn, NY*

■ As a long-time subscriber to your fine magazine, I find it bothers me some to read month after month how bad we in amateur radio need a no-code license. BULL! I say if a person don't want to put in a little hard work to learn the code, let them look around for a more suitable and easier hobby.

*T. R. Plunkett, N5EUY  
Amory, MS*

■ Wanted: Amateurs who say "NO TO ANY NO-CODE ENTRY EXAMS." Write the FCC and voice your valued opinion.

*Mark Bills, NY0E  
Mystic, IA*

■ I would like to know what the heck is going on with you guys who think you're going to save ham radio. To start off with, there is nothing wrong with ham radio, so stop trying to force your pills down its throat.

Did it ever occur to you that our younger generation just does not care about ham radio? Now we have Barry Goldwater saying that amateur radio will just "go away" if we don't grow. Giving amateur radio licenses away is not going to help a darn thing.

*Mike Suits, KM4KO  
Gloucester Pt., VA*

■ "Lord, if I can't keep up... please don't let me drag my feet."

I have "Elmered" several people onto the ham bands. Without exception, I have been asked, "If I intend to use 6 meters or higher frequencies, why do I have to learn this \*!&! code?" The only answer I was able to give with clear conscience was because the FCC requires it. Too long we have been lagging behind such countries as Japan and now Canada.

A no-code 6-meter-and-above license does not pose a threat to any HF operations. Once a new amateur starts associating with an operator with a higher class license who is working on his DXCC and WAS, the newly licensed amateur realizes what he is missing. Then he too will want to obtain a higher class license. The way to do that will still be by developing CW skills. So the very thing CW enthusiasts fear will be the doom of CW may be its salvation.

*Edgar Mills, N4IYX  
Bowling Green, KY*

■ Did Morse make me a better ham? Possibly. With so much effort invested, every precaution was taken to avoid a "pink ticket." Did it make me a better operator? No. In the 34 years of operating I have probably logged less than 48 hours of CW time. Did it make me a more avid ham? No, my special interest is building and testing antennas. Do I still read Morse? Yes, and I have spent hours teaching it to beginners.

Amateur radio has many avenues of pursuit and means something different to each of us. Goodness knows that there are young brains out there who have much to contribute to the state of the art. Some digital genius may compress speech with a verbal short and make more room on the phone bands. Wouldn't it be great to say it happened first on ham radio? If we can bring these people in by offering a codeless license, let us do so.

Amateur radio is a varietal stepping stone to many sciences. For the good of our country, and the continuance of our good life and a supply of home-grown engineers for our industries, may future generations take an active interest.

*Dick Brittin, W9JBM  
Homewood, IL*

■ I believe that a no-code license will help our hobby to grow, act as a springboard for people who want to get into HF hamming, help reduce the possibility of future VHF spectrum grabbing, and help us to present a new and dynamic face to amateur radio to attract the next generation of hams.

*Dale Gaudier, N4REE  
Dunwoody, GA*

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- P400-T Regency 40 channel SSB CB Base.....\$174.95
- PR100-T Regency visor mount radar detector.....\$54.95
- PR110-T Regency "Passport" size radar detector...\$114.95
- PR120-T Regency "micro" size radar detector....\$144.95
- MP5100XL-T Regency 40 Ch. marine transceiver...\$139.95
- MP5510XL-T Regency 60 Ch. marine transceiver...\$159.95
- MP6000XL-T Regency 60 Ch. marine transceiver...\$209.95
- MP2000XL-T Regency handheld marine trans....\$189.95

## Regency® RH256B-T

List price \$799.95/CE price \$299.95/SPECIAL 16 Channel • 25 Watt Transceiver • Priority The Regency RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A 60 Watt VHF 150-162 MHz version called the RH606B-T is available for \$429.95. A UHF 15 watt, 16 channel version of this radio called the RU156B-T is also available and covers 450-482 MHz. but the cost is \$454.95.

### ★★★ Uniden CB Radios ★★★

The Uniden line of Citizens Band Radio transceivers is styled to compliment other mobile audio equipment. Uniden CB radios are so reliable that they have a two year limited warranty. From the feature packed PRO 810E to the 310E handheld, there is no better Citizens Band radio on the market today.

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## Bearcat® 200XLT-T

List price \$509.95/CE price \$254.95/SPECIAL 12-Band, 200 Channel • 800 MHz. Handheld Search • Limit • Hold • Priority • Lockout Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz. The Bearcat 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 10 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz band and 100 channels, order the BC 100XLT-T for only \$189.95. Includes antenna, carrying case with belt loop, ni-cad battery pack, AC adapter and earphone. Order your scanner now.

## Bearcat® 800XLT-T

List price \$549.95/CE price \$259.95/SPECIAL 12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC Bands: 29-54, 118-174, 406-512, 806-912 MHz. The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9 1/4" x 4 1/2" x 12 1/2". If you do not need the 800 MHz band, a similar model called the BC 210XLT-T is available for \$178.95.

## Bearcat® 145XL-T

List price \$189.95/CE price \$94.95/SPECIAL 10-Band, 16 Channel • No-crystal scanner Priority control • Weather search • AC/DC Bands: 29-54, 136-174, 406-512 MHz. The Bearcat 145XL is a 16 channel, programmable scanner covering ten frequency bands. The unit features a built-in delay function that adds a three second delay on all channels to prevent missed transmissions. A mobile version called the BC560XLT-T featuring priority, weather search, channel lockout and more is available for \$94.95. CEI's package price includes mobile mounting bracket and mobile power cord.

## President® HR2510-T

List price \$499.95/CE price \$239.95/SPECIAL 10 Meter Mobile Transceiver • Digital VFO Full Band Coverage • All-Mode Operation Backlit liquid crystal display • Auto Squelch RIT • Preprogrammed 10 KHz. Channels Frequency Coverage: 28.0000 MHz to 29.6999 MHz. The President HR2510 Mobile 10 Meter Transceiver made by Uniden, has everything you need for amateur radio communications. Up to 25 Watt PEP USB/LSB and 25 Watt CW mode. Noise Blanking. PA mode. Digital VFO. Built-in S/RF/MOD/SWR meter. Channel switch on the microphone, and much more! The HR2510 lets you operate AM, FM, USB, LSB or CW. The digitally synthesized frequency control gives you maximum stability and you may choose either pre-programmed 10 KHz. channel steps, or use the built-in VFO for steps down to 100 Hz. There's also RIT (Receiver Incremental Tuning) to give you perfectly tuned signals. With receive scanning, you can scan 50 channels in any one of four band segments to find out where the action is. Order your HR2510 from CEI today.

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List price \$599.95/CE price \$299.95/SPECIAL 10 Meter Mobile Transceiver • New Features Delivery for this new product is scheduled for June, 1989. The new President HR2600 Mobile 10 Meter Transceiver is similar to the Uniden HR2510 but now has repeater offsets (100 KHz.) and CTCSS encode.



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800 MHz.  
mobile scanner  
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  - BC70XLT-T Bearcat 20 channel scanner.....\$159.95
  - BC175XLT-T Bearcat 16 channel scanner.....\$156.95
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  - BP55-T Regency 16 amp reg. power supply.....\$179.95
  - BP205-T Ni-Cad batt. pack for BC200/BC100XLT...\$49.95
  - B8-T 1.2 V AA Ni-Cad batteries (set of eight).....\$17.95
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  - RFD1-T Great Lakes Frequency Directory.....\$14.95
  - RFD2-T New England Frequency Directory.....\$14.95
  - RFD3-T Mid Atlantic Frequency Directory.....\$14.95
  - RFD4-T Southeast Frequency Directory.....\$14.95
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  - ASD-T Airplane Scanner Directory.....\$14.95
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  - TSG-T "Top Secret" Registry of U.S. Govt. Freq.....\$14.95
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  - CBH-T Big CB Handbook/AM/FM/Freeband.....\$14.95
  - TIC-T Techniques for Intercepting Communications...\$14.95
  - RRF-T Railroad frequency directory.....\$14.95
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  - CIET-T Covert Intelligence, Elect. Eavesdropping...\$14.95
  - MFF-T Midwest Federal Frequency directory.....\$14.95
  - A60-T Magnet mount mobile scanner antenna.....\$35.95
  - A70-T Base station scanner antenna.....\$35.95
  - A1300-T 25 MHz.-1.3 GHz Discone antenna.....\$109.95
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# CQ REVIEWS:

## The Realistic HTX-100 10 Meter SSB/CW Transceiver

BY LEW McCOY\*, W1ICP

**W**ith the opening of a phone portion of the 10 meter band to the Novice and Technician class licensees it was almost inevitable that we would see the advent of single-band, 10 meter transceivers. The Radio Shack Realistic HTX-100 is just such a rig—and I might add, a very good one.

The HTX-100 has many nice features. It is essentially a low-power rig with two power levels—5 or 25 watts output power. As any amateur with any experience on 10 meters knows, this is a band where power isn't really needed. It is more than possible—in fact, it is easy—to work the world with 25 watts and even a fair antenna. During the coming few years, with the sunspot cycle at its height, there is very little power absorption of one's signal on this band, as far as skip is concerned. I, for one, feel that 25 watts is more than adequate for 10 meter operation.

The HTX-100 covers the entire 10 meter band from 28,000 to 29,700 MHz.

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

There are two modes of operation available, either single sideband (upper sideband only) or CW. Fig. 1 shows the front-panel controls. The frequency indicator is an LED readout which, in addition to showing the frequency to which you are tuned, also displays the mode in use plus the memory channel, if the memory is used. There are 10 memory channels available for storage of most used frequencies, but more on this feature in a moment. At the right on the front are four controls: RIT (Receiver Incremental Tuning) control; the RF gain control, which is also a pull-out switch for low-power setting; a Squelch control; and last, the Power and Volume control.

To the left of the LED frequency readout is the memory channel indicator and to its left is a bar-type LED power output indicator when transmitting and a signal-strength indicator. This bar indicator consists of five lights. The first is 3 "S" units, then 5, 7, 9, and "OVER," this last indicating that the received signal is stronger than S9. I tested the S-meter against one I have which is calibrated fairly accurately

and found that the HTX-100 indicator compared favorably with the accurate one.

To the left of the signal-strength indicator is a frequency lock switch (to hold a frequency setting in place), then the Noise Blanker switch, and next to it the TX/RX switch. Just below the LED frequency indicator is the main tuning knob. The tuning rate is in steps of tenths of kilohertz. I found this a fast enough rate, and if one desires to move across the band quickly, there is a 500 kHz switch which will jump the receiver in 500 kHz steps. In addition, there is a switch labeled **Step**. This moves a cursor which is directly below the frequency readout numbers. You push the Step switch to place the cursor under the desired number you wish to increase or decrease and then turn the main tuning knob accordingly. Also, the microphone has two buttons for incrementing the frequency. This is, of course, very handy when operating mobile.

There are ten memory channels available and they are extremely easy to set and use. In my own operating habits I find that memory channels are an excellent

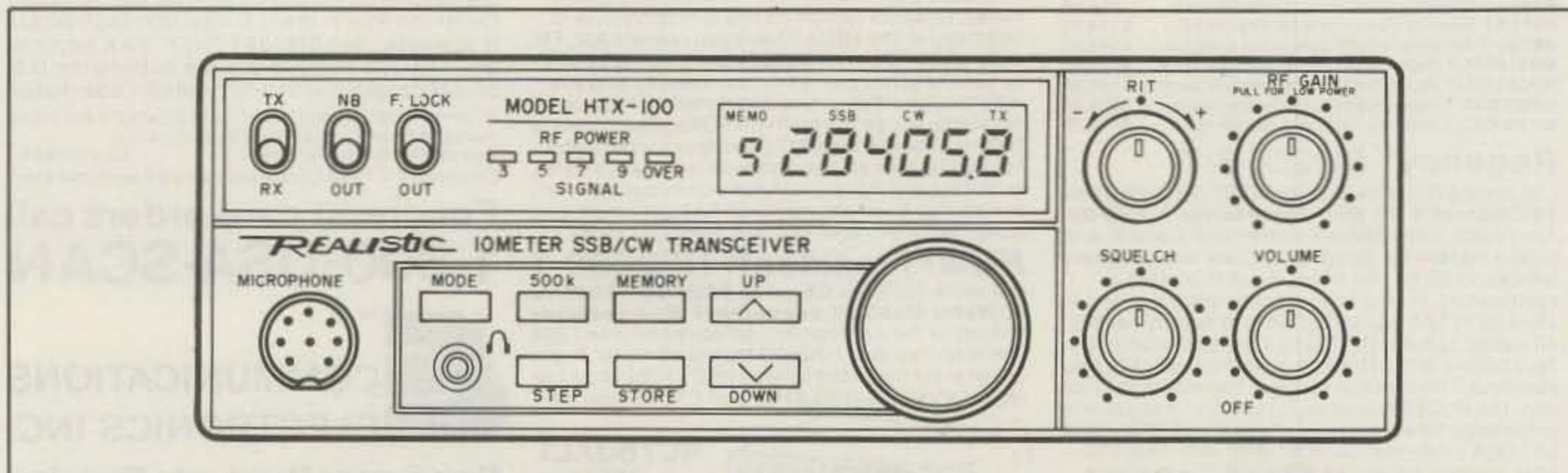


Fig. 1—Front-panel controls of the Realistic HTX-100.



## SPECIFICATIONS

### GENERAL

Frequency Range	28.0000-29.6999 MHz
Speaker	8Ω, 5W
Operating Modes	SSB, CW
Display	Backlit LCD
Display Items	Frequency, Memory Mode, TX
Size	2 7/16" x 7 9/32" x 7 7/8" (HWD)
Weight	4 lbs, 3 oz
Power Source	13.8V DC +15/-20%, Negative Ground

### TRANSMITTER

Frequency Stability	±300 Hz Nominal, at 25°C, 5 Minutes after Power on
RF Output Power	CW 25W Nominal (QRP5W) SSB 25W PEP Nominal (QRP5WPEP)
Spurious Harmonic Emissions	-50 dB Nominal, CW, SSB Modes
Carrier Suppression	-55 dB Nominal, SSB Mode
Unwanted Sideband Suppression	-50 dB Nominal, SSB Mode
Power Consumption	SSB 0.8A Nominal, No Modulation CW 0.8A Nominal, Break Period
Microphone Input	1 mV Nominal for 10W PEP output, SSB

### RECEIVER

Sensitivity for 10 dB S/N	CW/SSB 0.25 μV Nominal
Adjacent Channel Selectivity	70 dB Nominal (10 kHz Spacing)
Max. Audio Output	3W Nominal
RF Gain Range	55 dB Nominal
RIT Range	±1.5 kHz Nominal
"S" Meter Sensitivity at S-9	100 μV Nominal
Image Rejection Ratio	65 dB Nominal
Power Consumption, No Signal	500 mA Nominal
Power Consumption, Max Audio	1000 mA Nominal

Table I—Specifications of the HTX-100.

feature. For example, if I am chasing DX and find that a station I wish to call is in QSO, I may tune away and then not remember the frequency. With the HTX-100, all I need do is press the Memory button and then press the Store button. The frequency is recalled by simply returning to the channel where I stored the frequency.

I tested the transceiver under mobile conditions, primarily to check out the built-in noise blanker. I found the blanker to be excellent, killing just about any noise I encountered.

The instruction manual is very detailed as to use of the transceiver but has no service information with the exception of the circuit diagrams. However, unless you have a powerful magnifying glass, the circuit diagrams are much too condensed to read. For this reason they are not reproduced in this article. However, I would be remiss if I didn't point out that Radio Shack has a warranty on the transceiver for one year from the date of purchase which states that they will repair the unit, parts and labor included. The warranty states that the unit should be brought with proof of purchase to any Radio Shack store. Frankly, in this day and age I would be hard put to complain about that. There certainly are plenty of Radio Shack stores around the country.

In addition to the controls I described, there is a headphone jack on the front panel. On the rear panel is the power plug jack—a power cord is provided—and an

external speaker jack, an SO-239 coax fitting for antenna, and a key jack. Included with the unit is a mounting bracket and hardware for mobile installation, mike holder, and microphone.

I found the audio quality from the speaker to be excellent, and all the reports I received were of very good transmitted audio. I had someone else operate the unit while I listened and would agree that the transmitted audio was outstanding. During one of the DX contests I operated with a Cushcraft R4A vertical from my RV when in Mexico (XE2VHT) and worked over 75 countries using the 25 watts. My conclusion is that this is really a "neat" little transceiver and I would award it very high marks.

Rated receiver sensitivity for 10 dB S/N is 0.25 μV nominal, and my checks showed the unit I had to be slightly better than that figure. Incremental tuning is plus or minus 1.5 kHz, and selectivity is rated at 70 dB down for 10 kHz signal spacing.

For the transmitter, power consumption is listed as slightly less than 1 ampere for SSB or CW, no modulation. I found a 2 amp supply more than adequate to run the unit. Table I shows the general specs of the transceiver.

The listed price is \$259.00. The HTX-100 is made and marketed by Radio Shack, a division of Tandy Corporation, Fort Worth, TX 76102.

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Plus you get Easy Mail™, 20 LED Tuning Indicator, exclusive new packet collision prevention, one free eprom upgrade, 32K RAM, KISS, dual radio ports, true DCD, random code generator, parallel printer port, lithium battery backup, AC power supply, one year unconditional guarantee and more.

All you need to join the fun is an MFJ-1278, your rig and any computer with an RS-232 or TTL serial port and terminal program.

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Order MFJ-1282 (disk)/MFJ-1283 (tape) for C-64/128/VIC-20; MFJ-1284 for IBM or compatible; MFJ-1287 for Macintosh, \$24.95 each.

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## New technology prevents collisions: gets packet through faster

Now packets can get through much faster and more reliably with fewer retrys!

MFJ's new Anti-Collision technology virtually eliminates retrys due to collisions.

This new technology prevents packet stations from transmitting at the same time -- the cause of collisions -- by producing random transmit delays automatically.

An MFJ exclusive: MFJ-1278 is the only multi-mode to have this new technology.

## Packet Radio is Made Easy

New book by Buck Rogers, K4ABT

New book by CQ Magazine Packet Radio Editor Buck Rogers, K4ABT, gets you on Packet fast and easy.

Buck holds your hand from the time you take your new packet radio controller out of the box until you're on the air.

He tells you in his easy-to-understand style what packet is and how to get the most out of it.

Buck shows you how to successfully interconnect your transceiver, computer and packet radio controller.

He includes wiring diagrams for popular transceivers and computers and tells you how to properly configure your computer and packet radio controller.

By following Buck's smooth instructions your packet station will work the first time you turn it on.

He discusses packet commands, shows what they mean and how to use them.

In a short evening of relaxed, easy

messages for each other 24 hours a day.

In MFJ's new WeFAX mode you can print full fledged weather maps to screen or printer and save to disk using an IBM compatible or Macintosh computer with an MFJ Starter Pack.

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reading, you'll learn enough to impress the "experts" and get on-the-air fast.

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Here's how to use your MFJ-1278 to send pictures to your ham buddies:

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# CQ Showcase

## Ashton ITC Software Program

*Aries-1™*, developed by Ashton ITC, is a multi-function software program which integrates today's amateur radio equipment with an electronic logbook (database). The program ties together multi-mode terminal units, computer-capable transceivers, and a real-time logging function. *Aries-1* allows for simultaneous display of the TU's input/output on the same screen with the logbook and transceiver status. Frequency and mode are also automatically entered into the log when using a compatible transceiver. Other data such as station ID, city, state or country, name, etc., may be entered directly into the log from data received through a terminal. Although designed for everyday use, *Aries-1* supports a Contest Mode that allows for fast contest exchanges and instantaneous duping. *Aries-1* searches and prints log data by band, mode, country, etc.

Transceivers (with appropriate interfaces) currently supported are Kenwood models: TS-940S, 440S, 140S, 680S, 711A, and 811A and ICOM models IC-735, 761, 781, 275, 375, 475, and 575. Terminal Units currently supported include the AEA PK-232, Heathkit HK-232, and Kantronics KAM. The program is

available on 5¼ or 3½ inch disks and runs on IBM compatibles with at least 256K of memory. Two serial ports are required to activate all features; mouse control is optional. It can be run as a standalone program or as a TSR. The user price is \$89.95 plus shipping and handling. For further details, contact Ashton ITC, P.O. Box 1067, Vestal, NY 13851 or circle number 105 on the reader service card.

## ACE/AOR Scanner

AOR Ltd. has announced the AR-2515 scanner which features 2000 channels, broad coverage, and high-speed scanning. The unit also has a built-in interface to a computer's RS232 port for programming, unattended control, and frequency activity logging. The radio is designed for either tabletop or underdash use and measures 3½"H x 5½"W x 7⅞"D and weighs 2 lbs. 10 oz. Frequency coverage of the receiver allows it to pull in distant shortwave broadcasts from all over the world, in addition to being able to listen to super-high-frequency microwave broadcasts, plus everything in between, maker says.

The receiver is capable of scanning 62 banks of 32 frequencies each. An addi-

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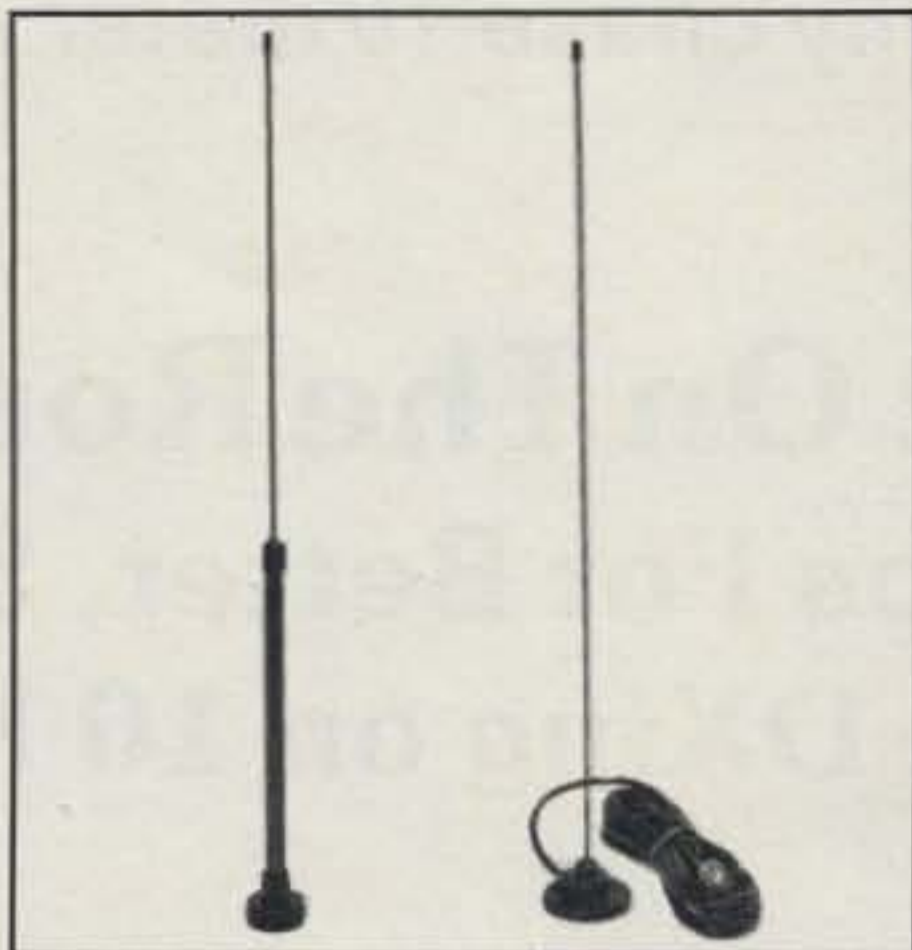




tional 16 memory locations are set aside for beginning and ending search limit frequency pairs. A built-in RS232 interface device allows the radio to be controlled or programmed by any computer with a standard serial port. Suggested retail price of the AR-2515 is \$695. Present owners of the AR-2002 can have their units upgraded to the AR-2515 for \$250. For more information, contact ACE Communications, Monitor Division, 10707 east 106th St., Indianapolis, IN 46256, or circle number 106 on the reader service card.

### Valor Antennas

Valor's Model PAQM "communications extender" mobile VHF antenna provides mini quarter-wave reception. This 2 meter unit is easily installed with a 2 inch magnetic mount, 12 feet of cable, and a



BNC connector, which are supplied. The unit can be modified to 220 or 450 MHz. The PA270 model two plus two is a dual-band antenna that covers it all, horizon to horizon, maker says. The antenna is pre-tuned 1/4-wave on 2 meters (144-148 MHz, VHF) and 1/2-wave on UHF (440-450 MHz). The unit includes silver-plated spring-loaded contact and will work on scanner radio UHF/VHF bands.

For more information, contact Valor Enterprises, Inc., 185 W. Hamilton St., West Milton, OH 45383, or circle number 108 on the reader service card.

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***K5JRN provides us with some tips on how to safely and successfully chase 10 meter DX from the mobile.***

## **Cycle 22: On The Road Again**

### **10 Tips For Better, Safer Mobile DXing on 10 Meters**

BY SI DUNN\*, K5JRN

**N**ow that sunspot Cycle 22 has turned sharply upward, the 10 meter band is red hot, and low-powered mobile stations are racking up impressive numbers of contacts with distant countries. Drawn by the excitement of enhanced propagation and the availability of reasonably priced rigs, the army of wheeled 10 meter DXers is swelling rapidly.

For example, the Novice/Technician phone band, from 28.300 to 28.500 MHz, now resounds with exotic callsigns virtually every day. And new amateurs with transmitters running as little as a watt are enjoying the fun.

You may be ready to join the ranks as well, using a mobile rig in your car while you commute to and from work. You may be planning to use a compact, multi-mode, multiband transceiver; a converted citizens band (CB) transceiver; or one of the new monoband 10 meter transceivers such as the Uniden HR2510, Radio Shack HTX-100, or Ranger AR 3500.

You may already have some experience with mobile operations on 220 FM or 2 meter FM. But if you have never worked 10 meter single-sideband (SSB) and chased international DX while driving, get ready for a challenge that will demand some preparation and common sense.

The ten tips presented below are based on several months of steady experience behind the wheel as a long-haul commuter and avid 10 meter DX chasser. Five days a week I drive 40 miles to work and 40 miles home over rural highways that pass through sparsely inhabited countryside. My Uniden transceiver runs just 25 watts PEP, and my antenna is a slightly

shortened, magnet-mount, citizens-band whip that I bought on sale at an auto-parts store. Thanks to Cycle 22, this combination has proven good enough for many DX contacts across the oceans and many pleasant long-distance conversations.

Having 10 meter capabilities in the car also provides an extra tool for personal safety and a limited degree of public-service capability when I happen across a traffic accident. (VHF or UHF FM repeaters work much better in this role, however. It's tough to get a station in Sardinia to place an urgent telephone call to a highway-patrol office in Texas.)

#### **Ten Tips For 10 Meters**

**Tip 1:** Driving a car is risky business. Having an amateur radio station to play with while you steer compounds the risks to yourself, your passengers, and other motorists. Take a good look at your driving habits and driving history and be sure you can stay alert to the road and other drivers while you chase DX.

**Tip 2:** Mount your radio securely in your vehicle, preferably with the mobile mount designed for the rig. And be sure that all controls are accessible without having to lean over too far or reach through the steering wheel. A distressing number of amateurs simply lay their rigs on the passenger seat or try to lash the radios down with seat belts. Remember basic physics. In a wreck or sudden stop, a loose rig will continue forward and splatter against the dash or windshield—if you're lucky. If you're not so lucky and get into a roll-over crash, a loose rig may take off your head or kill a passenger.

**Tip 3:** Okay, enough gore. On to the amateur radio part. Once you install your rig, try to obtain the best possible match between the feedline and the antenna.

Ten meters is a big band by high-frequency standards. Cart your SWR bridge out to the driveway and prune your mobile whip carefully for an SWR of 2:1 or less in the portion of the band you expect to use most often. A shortened whip, such as a chopped-down, center-loaded CB special, will have a usable frequency range that is narrower than that of a standard quarter-wave whip.

**Tip 4:** Unless you have a photographic memory, you will need to write down times, callsigns, signal reports, locations, names, QSL information, and other details while you drive. This can be tricky and dangerous if not done carefully. A notebook fastened to the dash is one possibility. Another possibility is a small notebook clipped or strapped to your leg (a la World War II's "knee key"). I scribble on a spiral notebook that rests on the passenger seat while I steer with my left hand. I decipher my notes and fill out my DX log after I reach my destination. A portable tape recorder can also capture QSOs for your log. Each time you make a contact, however, you must remember to call out the time and frequency—loud enough to override the road noise.

**Tip 5:** If possible, leave your radio turned off until you reach an open stretch of road. Your full attention is needed when driving through residential areas, school zones, and crowded intersections at rush hour. Hooking up with a new country does you, and the reputation of amateur radio, no good if you simultaneously rear-end a school bus.

**Tip 6:** Don't waste your breath calling "CQ DX." Ten meters is awash with signals, many running high power into high-gain antenna systems. Answer DX stations' CQ calls or simply tune and listen for DX stations in contact with other stations. Then jump in after they sign. If your

\*1916 Parkside, Denton, TX 76201



first few calls are not answered, keep trying. While you are waiting and listening, write down essential details such as the DX operator's name, QTH, frequency, and QSL information.

**Tip 7:** Never be afraid to wade into DX pile-ups with a mobile rig. When conditions are right on 10 meters, your signal will be copyable many thousands of miles away. At times the skip may shift and briefly give you a very strong signal path to the DX station. When that happens, your 25 watts may stand out stronger than the kilowatt stations that are also calling. I have heard stations running less than 1 watt cut through howling pile-ups and snare some excellent DX catches on 10. Many DXers also stand by for low-powered stations.

**Tip 8:** Be patient and be careful. Chase only the stations that you can hear clearly. No matter how badly you may want a particular country, if the DX station's signal is only S2, the signal from your mobile station and short antenna probably will be unintelligible. Also, as you strain to hear a weak signal, you will lessen your concentration on your driving. If you miss a rare one today, keep in mind that the fun on 10 is just beginning. Plenty of time is left to enjoy Cycle 22.

**Tip 9:** be a traveling ambassador for the growth of amateur radio, without being a crashing bore about it. Give your friends and co-workers an occasional demonstration of what amateur radio can do from a car. For example, work Italy while taking the gang out for pizza. But don't forget to stress the public-service, personal-safety, entertainment, and international goodwill aspects of amateur radio as well. And keep the demo short and sweet. Don't expect a car full of co-workers to share your enjoyment of squawks and heterodynes for an entire lunch hour.

**Tip 10:** Stay in touch with the rest of the world, too, while you drive. Periodically turn off your rig, turn on the "real" car radio, listen to some news and music, and admire the passing countryside. Think about the fragility and wonder of life on this planet and how lucky you are that you can send your voice and thoughts to distant continents in a flash. Once you are home again, savor your lengthening list of countries worked. Then try to give a little something back to the world. Send a check to an earthquake relief fund. Make a donation to an agency that is trying to fight hunger overseas. Give an old but useful rig to missionary radio amateurs.

If nothing else, each time you log a new one, go to your encyclopedias and learn something about the history, geography, culture, and languages behind that booming voice from afar that happily told you: "Your signal is 5 by 9 here, beautiful copy. Good luck and happy mobile DXing!"

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 • 100% Duty Cycle  
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**New All Mode Base Transceiver**  
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Model	Cont. Amps	ICS Amps	Price
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RS7A	5	7	59
RS12A	9	12	79
RS20A	16	20	99
RS20M	16	20	119
RS35A	25	35	159
RS35M	25	35	179
RS50A	37	50	229
RS50M	37	50	249

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- micro design covers 140-163 MHz
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**AL80A**  
 LIST  
 AL80A ..... \$985.00 ATR15 ..... 380.00  
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**30W in = 170W out**  
**LIST \$299.00**

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2-217	2M	2-170W	\$299.00
2-117	2M	10-170W	\$299.00
2-417	2M	45-170W	\$299.00
3-22	220	2-20W	\$112.00
3-211	220	2-110W	\$299.00
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 General Coverage HF Transceiver  
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 New HF Transceiver, Ham Band Optimized for Reduced Phase Noise and Dynamic Range, Dual VFO's, Scannable Memories & More.

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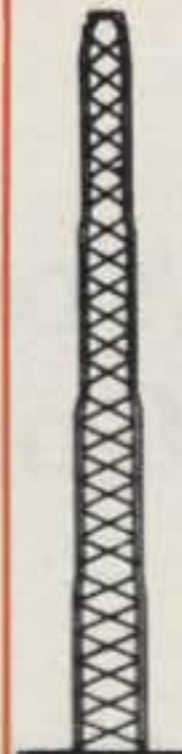
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All Models Shipped  
Factory Direct—  
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Check these features:  
• All steel construction  
• Hot dip galvanized after  
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• Complete with base and  
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• Totally self-supporting—  
no guys needed

Model	Height	Load	Sale Price
HG37SS	37 ft	9 sq ft	\$CALL
HG52SS	52 ft	9 sq ft	\$CALL
HG54HD	54 ft	16 sq ft	\$CALL
HG70HD	70 ft	16 sq ft	\$CALL

Masts—Thrust Bearings—  
Other Accessories Available  
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- All Steel Construction—  
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- Totally Free Standing—No  
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- America's Best Tower Buy—  
Compare Save \$
- Complete With Base and  
Rotor Plate
- In Stock Now—  
Fast Delivery

Model	Height	Ant Load*	Weight	Delivered Price*
HBX40	40 ft	10 sq ft	228	\$419
HBX48	48 ft	10 sq ft	303	\$539
HBX56	56 ft	10 sq ft	385	\$629
HDBX40	40 ft	18 sq ft	281	\$519
HDBX48	48 ft	18 sq ft	363	\$619

\*Your Total Delivered Price Anywhere in Con-  
tinental 48 States. Antenna Load Based on 70 MPH  
Wind.

## ROHN Guyed Tower Packages

• World Famous Rohn  
Quality and Dependability  
• Rugged high wind survival—  
provides safe installation  
• Multi purpose towers  
satisfy a wide range of needs  
• Complete packages  
include: guy hardware,  
turnbuckles, guy assemblies,  
w/torq bars, concrete base,  
rotor plate and top section  
per manufacturers specs.  
Packages shown below are  
rated for wind zone "B" (86  
mph wind). Zone "C" (100  
mph wind) design prices slightly  
higher. All tower packages shipped  
freight collect from our Plano, TX  
warehouse, in stock for prompt  
delivery.

	Model 25G	Model 45G	Model 55G
50'	\$769	\$1379	\$1779
60'	849	1539	1989
70'	1029	1719	2199
80'	1099	2019	2559
90'	1169	2169	2759
100'	1399	2349	2969
110'	1489	2719	3159
120'	1559	2879	3399



These rugged crankup  
towers and masts now avail-  
able from Texas Towers!  
Check these features:  
✓ All steel construction  
✓ Hot dipped galvanized  
✓ Totally self-supporting—  
✓ No guys needed  
Coax arms, Thrustbearings  
Masts, Motor drives, Re-  
mote controls, Hinged  
bases, Rotor bases, & Raising  
fixtures also in stock.

CALL FOR SALE PRICES!

Model	Min.Ht.	Max.Ht.	Ant Load*	Sale price
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MA550 mast	22'	50'	10 sq ft	999
TX438	22'	38'	18 sq ft	919
TX455	22'	55'	18 sq ft	1385
TX472	23'	72'	18 sq ft	2279
HDX555	22'	55'	30 sq ft	2079
HDX572	23'	72'	30 sq ft	3559

Note—US Towers Shipped Freight Collect From  
Visalia, CA Factory

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

### RG-213U

• RG-213/U—95% Bare Copper Shield  
• Mil-Spec Non-contaminating Jacket for longer  
life than R8B cables  
• Our RG-213/U uses virgin materials.  
• Guaranteed Highest Quality!

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• Non-contaminating Vinyl Jacket Foam Dielectric

### 9086

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Lowest Loss  
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1/2" Alum. w/poly Jacket ..... \$ .79/ft.  
1/2" LDF4-50 Andrew Helix® ..... \$1.99/ft.  
3/8" LDF5-50 Andrew Helix® ..... \$4.99/ft.  
select connectors below  
Helix® is a Registered Trademark of the Andrew Corp.

Cable Type	Imped.	10MHz	30MHz	150MHz	450MHz
RG-213/U	50	.6	.9	2.3	5.2
R8B	52	.8	1.2	3.5	5.8
9086	50	.4	.64	1.7	3.1
1/2" Alum	50	.3	.5	1.2	2.2
1/2" Helix	50	.2	.4	.9	1.6
3/8" Helix	50	.1	.2	.5	.9

### HELIX® CONNECTORS

Cable Type	UHF FML	UHF MALE	N FML	N MALE
1/2" Helix®	\$29	\$29	\$29	\$29
3/8" Helix®	\$55	\$55	\$55	\$55

### COAX CONNECTORS

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

### ANTENNA WIRE & ACCESSORIES

Stranded Copper 14ga	\$ .10/ft.
1/4 mile 18ga copper-clad steel wire	\$30
Dog bone end insulator	\$ .79 ea.

### Van Gardon

1:1 Balun	\$15	Center Insulator	\$8
Dipole Kits	D80 \$31.95/D40 \$28.95		
Short Dipole Kits	SD80 \$35.95/SD40 \$33.95		
All-band Dipole w/ladder line	\$29.95		
G5RV all band antenna	\$49.95		

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

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A3 3-el Tribander  
A4S 4-el Tribander Beam w/S.S. Hdwre.  
A743 & A744, 30/40 mtr KIT for the A3 & A4.  
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AP8 80-10 mtr Vertical  
AV5 80-10 mtr Vertical  
D40 40 mtr Dipole  
40-2CD 2-el 40 mtr Beam  
A50-5 5-el 6 mtr Beam  
215 WB NEW 15-el 2 mtr Beam  
230 WB NEW 30-el 2 mtr Beam  
4218 XL 18-el 2 mtr Beam  
3219 19-el 2 mtr Beam  
424B 24-el 432 MHz Beam  
ARX2B 2 mtr Vertical

### hy-gain

Discoverer 2-el 40-mtr Beam  
Discoverer 3-el Conversion KIT  
EXPLORER-14 SUPER-SPECIAL  
QK710 30/40 mtr. Add-On-Kit  
V2S 2-mtr Base Vertical  
V4S 440MHz Base Vertical  
TH5MK2S Broad Band 5-el Triband Beam.  
TH7DXS 7-el Triband Beam  
TH3JRS 3-el Triband Beam  
205BAS 5-el 20-mtr Beam  
155BAS 5-el 15-mtr Beam  
105BAS 5-el 10-mtr Beam  
204BAS 4-el 20-mtr Beam  
64BS 4-el 6-mtr Beam  
12 AV0 20-10 mtr vertical  
14 AV0 40-10 mtr vertical  
18 AVT/WB 80-10mtr Vertical  
18HTS 80-10 mtr Hy-Tower Vertical  
23BS 3-el 2 mtr Beam  
25BS 5-el 2 mtr Beam  
28BS 8-el 2 mtr Beam  
214BS 14-el 2-mtr Beam  
2BDQ 80/40 mtr Trap Dipole  
5BDQ 80-10 mtr Trap Dipole  
BN86 80-10 mtr KW Balun W/Coax Seal

### HUSTLER

6BTU 80-10 mtr Vert \$149 5BTU 80-10 mtr Vert \$129  
4RTV 40-10 mtr Vert \$99 G7-144 2-mtr Base \$129  
G6-144B 2-mtr Base \$89

Mobile Resonators	10m	15m	20m	40m	75m
400W Standard	\$16	\$17	\$19	\$22	\$26
2KW Super	\$20	\$22	\$25	\$29	\$39

Bumper Mounts - Springs - Folding Masts in Stock!

### BUTTERNUT ELECTRONICS CO

HF6VX 80-10m Vertical \$149 Delivered

- Full Legal Power
- Highest Q Tuning Circuits

HF2V 80-40m Vertical \$139 Delivered

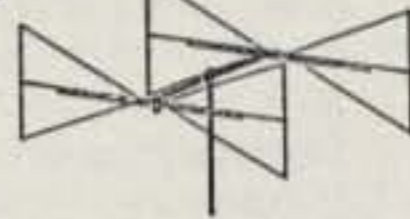
- Full Legal Power
- Automatic Band Switching

### Accessories:

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STR II Stub-Tuned Radials	\$35
TBR160 160m Coil Kit	\$55
30m Add-on Kit	\$35
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FREE UPS on ACCESSORIES when  
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### HF5B "Butterfly" 20-10m Compact Beam \$229.95



- Unique Design
- Turns w/TV Rotor
- Reduces Size
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- Element Length 12.5 Feet

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KT34A 4-el Broad Band Triband Beam	\$399.95
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Telex CD 45II (8.5 sq ft rating)	\$Call
Telex HAM 4 (15 sq ft rating)	\$Call
Telex Tailtwister (20 sq ft rating)	\$Call
Telex HDR300 Heavy Duty (25 sq ft rating)	\$Call

### ROTOR CABLE

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### ROHN GUYED TOWER SECTIONS

10 FT. STACKED SECTIONS	20G	45G	55G
	\$49.50	\$139.50	\$179.50
	\$59.50	\$179.50	

ALL ACCESSORIES IN STOCK—CALL

### ROHN FOLDOVER TOWERS

Model	Height	Ant. Load*	Price
FK2548	48 ft.	15.4 sq. ft.	
FK2558	58 ft.	13.3 sq. ft.	
FK2568	68 ft.	11.7 sq. ft.	
FK4544	44 ft.	34.8 sq. ft.	
FK4554	54 ft.	29.1 sq. ft.	
FK4564	64 ft.	28.4 sq. ft.	

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

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

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3/16 EHS Guywire (3990 lb rating)	\$ .15/ft
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1/2 x 12EE (1/2" x 12" Eye & Eye Turnbuckle)	\$12.95
1/2 x 12EJ (1/2" x 12" Eye & Jaw Turnbuckle)	\$13.95
5/8 x 12EJ (5/8" x 12" Eye & Jaw Turnbuckle)	\$16.95
3/16" Preformed Guy Grip	\$2.49
1/4" Preformed Guy Grip	\$2.99
6" Diam - 4 ft Long Earth Screw Anchor	\$17.95
500 D Guy insulator (5/32" or 3/16" Cable)	\$1.69
502 Guy insulator (1/4" Cable)	\$2.99
5/8" Diam - 8 ft Copper Clad Ground Rod	\$12.95

### PHILLYSTRAN GUY CABLE

HPTG2100 Guy Cable (2100 lb rating)	\$ .32/ft
HPTG4000 Guy Cable (4000 lb rating)	\$ .52/ft
HPTG6700 Guy Cable (6700 lb rating)	\$ .72/ft
9901LD Cable End (for 2100/4000 cable)	\$9.95
9902LD Cable End (for 6700 cable)	\$11.95
Socketfast Potting Compound (does 6-8 ends)	\$16.95

### GALVANIZED STEEL MASTS

Heavy Duty Steel Masts 2 in OD - Galvanized Finish	Length	5 FT	10 FT	15 FT	20 FT
12 in Wall	\$29	\$49	\$69	\$89	
18 in Wall	\$49	\$89	\$129	\$149	
25 in Wall	\$69	\$129	\$189	\$249	

ORDER TOLL FREE 1-800-272-3467

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DIRECT!!!**

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TELREX  
ANTENNAS  
ANTENNA SYSTEMS**

**"INVEST" in a Telrex antenna!**  
Why gamble with shoddy antenna construction when Telrex makes available a professionally designed quality product.



Antennas that last **"Decades"**  
(not months)



Some of the WORLD'S finest.		CALL FOR PRICES
TB4EC 10, 15, 20 Mtr.		
TB5ES 10, 15, 20 Mtr.		
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TB6EM 10, 15, 20 Mtr.		
20M326 3 elem. 20 Mtr.		
20M536 5 elem. 20 Mtr.		
20M646 6 elem. 20 Mtr.		
15M532 5 elem. 15 Mtr.		
15M845 8 elem. 15 Mtr.		
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10M636 6 elem. 10 Mtr.		
2MVS814, 2 Mtr. phased		
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For data on the complete line of Telrex antennas phone (anytime) and leave your call sign, or write.

Phone: 201-775-7252  
Write: **Telrex** P.O. Box 879  
Asbury Park, N.J. 07712

**Announcing:**

**The 1989 CQ World-Wide  
VHF WPX Contest**

**Starts: 0000 UTC Saturday, July 15, 1989  
Ends: 2400 UTC Sunday, July 16, 1989**

- Contest Period:** 48 hours for all stations, single or multi-operator. Operate any portion of the contest period you wish.
- Objectives:** The objectives of this contest are for amateurs around the world to contact as many amateurs as possible in the allotted 48-hour period, to promote VHF/UHF activity, and to allow VHFers the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF prefixes for award credit.
- Bands:** The 50, 70, 144, 220, 432, 902, and 1296 MHz bands may be used, as authorized by local law and license class.
- Type of Competition:** 1. Single operator—(a) all band; (b) single band; (c) all band, low power; (d) single band, low power. 2. Multi-operator—(a) all band; (b) single band. 3. Portable (with temporary power source only). 4. FM only. The "portable" category is for single or multi-operator stations. Low power is defined as 30 watts PEP output or less. Stations may select one category of competition only. All transmitters must be located within a 500 meter diameter, or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitters.
- Exchange:** Callsign and "Maidenhead" locator grid square (4 digits, e.g., FN20). Signal reports are optional and need not be included in the log entry.
- Scoring:** One point per QSO on 50, 70, and 144 MHz; 2 points per QSO on 220 and 432 MHz; 4 points per QSO on 902 and 1296 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times the total number of prefixes (PX) worked. This differs from the scoring for the CQ HF WW WPX Contest, where a prefix counts only once regardless of band.  
Example: W1XX works stations as follows:  
37 QSO's and 12 PX's on 50 MHz  
45 QSO's and 18 PX's on 144 MHz  
26 QSO's and 10 PX's on 220 MHz  
38 QSO's and 11 PX's on 432 MHz  
6 QSO's and 3 PX's on 1296 MHz  
W1XX's total score is: 234 QSO points × 54 PX's = 12636.
- Multipliers:** The multiplier is the number of prefixes worked, additive on a band-to-band basis. A prefix is considered to be the three let-

ter/number combination which forms the first part of an amateur radio callsign (N1, W2, WB3, K4, AA6, WD8, 4X4, DL7, G3, IT9, NP2, PY7, VK4, Y32, Y33, KT4, JE3, etc.). **A station in a call area different from that indicated by his callsign is required to sign portable.** This applies even for home stations (e.g., WB2OTK has a licensed station location in SC, but is required to sign /4 for contest purposes only. In all cases, the portable prefix is the multiplier. **Example:** NV6O/2 counts as NV2; KT2B/VE3 counts as VE3; KR2Q/C6A counts as C6A; 4X4FN/W2 counts as W2. **Special-event, commemorative, and other unique prefix stations are encouraged to participate.** A station who changes location during the course of the contest is free to contact as many other stations as he wishes; however, the moving station counts as only one QSO and PX **unless he changes call areas** during the course of operations, in which case his prefix changes by definition, thus becoming a new QSO and PX.  
**Example:** K2SMN operates from the NJ/PA border; he may be counted as K2SMN for one QSO and one PX (K2) by all those he contacts from NJ. He may be counted as K2SMN/3 for one QSO and one PX (K3) by all those he contacts from PA, including stations previously worked from NJ. Changing "grid squares" does not justify a new contact.  
**VIII. Awards:** Engraved trophies will be awarded to the top-scoring stations in each category and major geographic area where competition is indicated. Parchment certificates suitable for framing will be awarded to the top-scoring stations in each category and minor geographic area where competition is indicated. Certificates may also be awarded to other top-scoring stations who show outstanding contest effort. Major geographic areas include North America, Europe, and Japan as of this writing, but may be extended to include other areas as justified by competitive entries. Minor geographic areas include states (U.S.), provinces (Canada), countries (Europe), and call areas (Japan), and may also be extended to include other subdivisions as justified by competitive entries.  
**Logs must be postmarked no later than August 31, 1989 to be eligible for awards.** Logs should be mailed to the CQ VHF WPX Contest, CQ Magazine, 76 N. Broadway, Hicksville, NY 11801.



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## Announcing (from p. 6)

**8J1YES**, from Yokohama Exotic Showcase, for Minato Mirai 21; JARL; 0100-1130Z from now until October 1; 1.9, 3.5, 7, 10, 14, 21, 28, 50, 144, 430, 1200 MHz, all modes; output power 10-500 watts. Contact Japan Amateur Radio League, 14-2, Sugamo 1-chome, Toshima-ku, Tokyo 170, Japan.

**8J6APX**, for Asian-Pacific Exposition, Fukuoka '89; JARL; from now until Sept. 3 from 0030-1130Z; 3.5, 7, 14, 21, 28, 50 MHz on CW, SSB, packet; output power 10-500 watts. Contact Japan Amateur Radio League, 14-2, Sugamo 1-chome, Toshima-ku, Tokyo 170, Japan.

**The following hamfests, etc., are slated for June:**

May 21, **KARS Hamfest**, Will County Fairgrounds, Peotone, IL. Contact Kankakee Area Radio Society, R. 1 Box 361, Chebanse, IL 60922, or call Frank, KA9PWW, 815-932-6703 after 7 PM.

June 2-4, **Seaside/Pacific Ham Convention**, Seaside Convention Center, Seaside, OR. Contact SEAPAC Ham Convention, P.O. Box 219142, Portland, OR 97221.

June 2-5, **Chaverim International Convention**, the Ra-leigh, Catskill Mountains, NY. Contact Sonny Gutin,

WB2DXB, 42 Arrowwood Court, Deptford, NJ 08096, or call 609-853-7889.

June 3, **Hosstraders Hamfest**, fairgrounds, Deerfield, NH. Contact WA1IVB, RFD Box 57, West Baldwin, ME 04091 (SASE).

June 3, **Eastern Illinois ARC Hamfest/Craft Show**, Martinsville Fairgrounds, Martinsville, IL. Contact Mike Bumpus, N9GIK, RR 2, West Union, IL 62477 (217-279-3840).

June 3, **Athens Radio Club Hamfest**, Athens Technical School, Athens, GA. Contact Don Bullard, WA4IML at 404-742-7261 (after 6 PM EST).

June 3-4, **Apple City ARC Hamfest**, Rocky Reach Dam, Wenatchee, WA. Contact Bob Lathrop, 919 N. Woodward Drive, Wenatchee, WA 98801.

June 4, **Hall of Science ARC Hamfest**, NY Hall of Science parking lot, Flushing Meadow Park, LI, NY. Contact Steve Greenbaum, WB2KDG, 718-898-5599 evenings.

June 4, **Breeze Shooters Hamfest**, White Swan Amusement Park, PA Rt. 60 near Greater Pittsburgh International Airport. Contact John Colbert, K3SDL, 1851 Highland Ave., Irwin, PA 15642 (412-863-5167).

June 4, **Chelsea ARC Swap 'n Shop**, Chelsea Fairgrounds, Chelsea, MI. Contact Robert Schantz, 416 Wilkinson St., Chelsea, MI 48118 (313-475-1795).

June 4, **Lancaster, NY Hamfest**, Depew Grove, De-

pew, NY. Contact Nick, WA2CJJ, 5645 Genesee St., Lancaster, NY 14086 (716-681-6410).

June 4, **Ole Virginia Hams ARC Hamfest/Computer Show**, Manassas, VA. Contact Ole Virginia Hams ARC, P.O. Box 1255, Manassas, VA 22110, or call Jim, WD4OJY, 703-369-3940.

June 10, **Central Ontario Amateur Radio Fleamarket**, Bingeman Park, Kitchener, Ontario, Canada. Contact Ray Jennings, VE3CZE, 61 Ottawa Crescent, Guelph, Ontario, Canada N1E 2A8 (519-822-8342).

June 10, **CMARA Hamfest**, Midland Community Center, Midland, MI. Contact CMARA Hamfest, P.O. Box 67, Midland, MI 48640 (517-631-9228).

June 10, **Forsyth ARC Hamfest and Computer Electronics Fair**, Dixie Classic Fairgrounds, Winston-Salem, NC. Contact Jim Rodgers, N1DRI, P.O. Box 11361, Winston-Salem, NC 27166 (919-760-2493).

June 10, **Superfest 'XI'**, Larimer County Fairgrounds, Loveland, CO. Contact No. Colorado ARC.

June 10, **Pine State ARC Hamfest**, Hammond Street Camp Ground near I95, Bangor, ME. Contact Ed Richardson, NQ1L, 207-825-4417. (VE exams to be given. Contact Bill Sullivan, K1AG, 207-947-0336.)

June 11, **Egyptianfest**, Egyptian ARC clubhouse, Granite City, IL. Contact Egyptian ARC, P.O. Box 562, Granite City, IL 62040 (618-931-1177 Thursday evenings).

June 11, **Six Meter Club of Chicago Hamfest**, Santa Fe Park, Willow Springs, IL. Contact Mike Corbett, K9ENZ, 606 South Fenton Ave., Romeoville, IL 60441.

June 11, **Goodyear ARC Hamfest and Family Picnic**, Wingfoot Lake Park, near Akron, Ohio. Contact William F. Dunn, W8IFM, 4730 Nottingham Lane, Stow, OH 44224 (216-673-8502).

June 11, **Ham-O-Rama 89**, Erlanger Kentucky Lions Park, KY. Contact N4OEB, NKARC, P.O. Box 1062, Covington, KY 41012, or call 606-331-3258.

June 12, **Penn Central Hamfest**, Winfield Fireman's Fairgrounds, PA. Contact Jerry Williamson, WA3SXQ, 10 Old Farm Lane, Milton, PA 17847 (717-742-3027).

June 16-17, **Amateur Fair '89**, Aldrich Arena, Maplewood, MN. Contact Amateur Fair '89, P.O. Box 290131, Brooklyn Center, MN 55429, or call 612-653-9999.

June 16-17, **1989 ARRL Georgia State Convention**, Heritage House Motel & Convention Center, Albany, GA. Contact Albany ARC, P.O. Box 1205, Albany, GA 31702 (912-883-7910).

June 16-18, **Central Alberta Radio League Annual Picnic**, Burbank Campsite, Alberta, Canada. Contact P. Fitzgerald, VE6QT, 403-746-2621.

June 17, **Skyline ARC Hamfest and Fleamarket**, Cortland County Fairgrounds, Cortland, NY. Contact Skyline ARC, P.O. Box 5241, Cortland, NY 13045, or call 607-844-4831 evenings.

June 17, **Straits Area ARC Swap & Shop**, 4H Building on the fairgrounds, Petosky, MI. Contact Irene, N8HBT, 616-539-8986.

June 17, **Independent Repeater Assn. Hamfest**, National Guard Armory, Grand Rapids, MI. Contact Independent Repeater Assn., 562 92nd St. SE, Byron Center, MI 49315 (616-455-3915).

June 17, **Raritan Valley Radio Club Hamfest**, Columbia Park, Dunellen, NJ. Contact Dave, KA2TSM, 201-763-4849.

June 18, **Santa Maria Radio Swapfest**, Union Oil Co. New Love Picnic Grounds, south of Santa Marie, CA. Contact Hank Korczak, W6PME, 917 West Anthony Way, Lompoc, CA 93436 (805-736-1761).

June 18, **1989 Monroe Hamfest**, Monroe County Fairgrounds, Monroe, MI. Contact Larry Lindner, KB8AIZ, 2001 Ida-Maybee Rd., Monroe, MI 48161 (313-587-3663).

June 18, **Frederick ARC Hamfest**, Frederick County Fairgrounds, Frederick, MD. Contact Dave Durkovic, N3BKD, 7128 Limestone Lane, Middletown, MD 21769.

June 18, **Central Wisconsin Radio Amateurs Hamfest**, University Student Center, University of Wisconsin Stevens Point campus, Stevens Point, WI. Contact Art Wysocki, N9BCA, 3356 April Lane, Stevens Point, WI 54481 (715-344-2984).

June 18-24, **Rep. Dominicana First Amateur Radio Operators World Meeting**, Santo Domingo. Contact Hector Marrero Sanjurjo, HI8HMS, Hecmon Tours, S.A., Calle Emiliano Tejera No. 102, Santo Domingo, Rep. Dominicana.

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V-660	60MHz	D.T., 2mV sens, Delayed Sweep, CRT Readout	\$1,195	\$1,025	\$170
V-1065	100MHz	D.T., 2mV sens, Delayed Sweep, CRT Readout, Cursor Meas	\$1,895	\$1,670	\$225
V-1100A	100MHz	Q.T., 1mV sens, Delayed Sweep, CRT Readout, DVM, Counter	\$2,295	\$2,045	\$250
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## "HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

### The MFJ-931 Artificial Ground

I have conducted amateur radio licensing courses since 1948. I have always offered to check out new station installations for students and ex-students. Many of them accepted my offer, providing me with exposure to several thousand stations. Almost without exception, the least effective part of these stations has been the ground system. Station grounds are usually poor to nonexistent. The need for an effective ground is masked by the fact that one can achieve excellent communication results with no ground. However, there is no doubt that station performance and safety are improved by establishing a suitable AC/RF and DC ground system. The September through November 1978 issues of *CQ* contain my in-depth article about amateur radio station grounding. That article is still a popular handout to students. If you want a composite reprint of that 1978 article, send your request to my California address (45527 Third Street East, Lancaster, CA 93535-1802.) Please enclose a large (9 by 12 inches) self-addressed envelope with triple postage (65¢) attached.

My favorite station ground is a 100 foot length of 10-gauge stainless steel wire secured to the ground with 6 inch pegs spaced about 4 inches apart. I recently moved to a location in the Mojave Desert. I will install my preferred ground system, but that will take time. Therefore, I decided to try an MFJ-931 artificial ground. I had seen it advertised in magazines, and I had read about this approach in Bill Orr's (W6SAI) books.

Experimentation has disclosed that the MFJ-931 is a useful addition to a station. It is beneficial when used with, or without, an external RF station ground.

The unit measures 7½" x 3½" x 7". The photo shows the front-panel controls. The rear panel has two clearly marked connections. One connection is marked "To Transmitter or Antenna Tuner Chassis Ground." This connector is attached to the appropriate equipment ground using the shortest possible wire. Position the MFJ-931 where the interconnecting wire/braid length will be very short. If an end-fed antenna (such as a random wire) is used, the station ground should be at

the antenna tuner; otherwise, it should be at the transmitter/transceiver. The other rear-panel connector is labeled "To Counterpoise Wire or Ground Connection Wire." Fig. 1 shows MFJ-931 station connections. One must be careful to not reverse these connections.

#### Counterpoise Wires

These ground wires should be no more than one-quarter wavelength long. I cut mine to be resonant at the top end of each band, which proved to be satisfactory. The lengths I used (for the indicated upper band limits) are 58 (4 MHz), 32 (7.3 MHz), 23 (10.15 MHz), 16 (14.35 MHz), 12 (18.168 MHz), 10 (21.45 MHz), 9 (24.99 MHz), and 7 (29.7 MHz) feet. As an example, the 15 meter band is 21.0–21.45 megaHertz, and the listed 10 foot length is less than ¼ wave long at the upper end of that band.

I found that the unit worked okay with all eight ground leads left connected as I operated on various bands. The close proximity of the bundled leads causes mutual inductance, but it was not sufficient to prevent each lead from being resonated. If you experience difficulty resonating a ground lead, while operating near the upper frequency end of a band, trim that wire a few inches at a time until it is a length that functions well. I have not



Front panel of the MFJ-931 artificial ground.

encountered this problem in any installation so far. If you operate just one band, you just need a ground radial for that band. As expected, the MFJ-931 is more effective on the lower frequency bands (160 through 20 meters) than on the higher frequency bands (17 meters and up). In fact, the ground for your home's electrical power can result in little (or no) RF current indication at the MFJ-931 on 10 meters, whereas RF current is usually high when operating on a low-frequency band. The sensitivity control (meter deflection) can usually be left at half scale (12 o'clock position) when tuning up to operate below 14 MHz, whereas it will probably have to be fully clockwise (maximum) when on 10 meters.

When using this type of a resonant

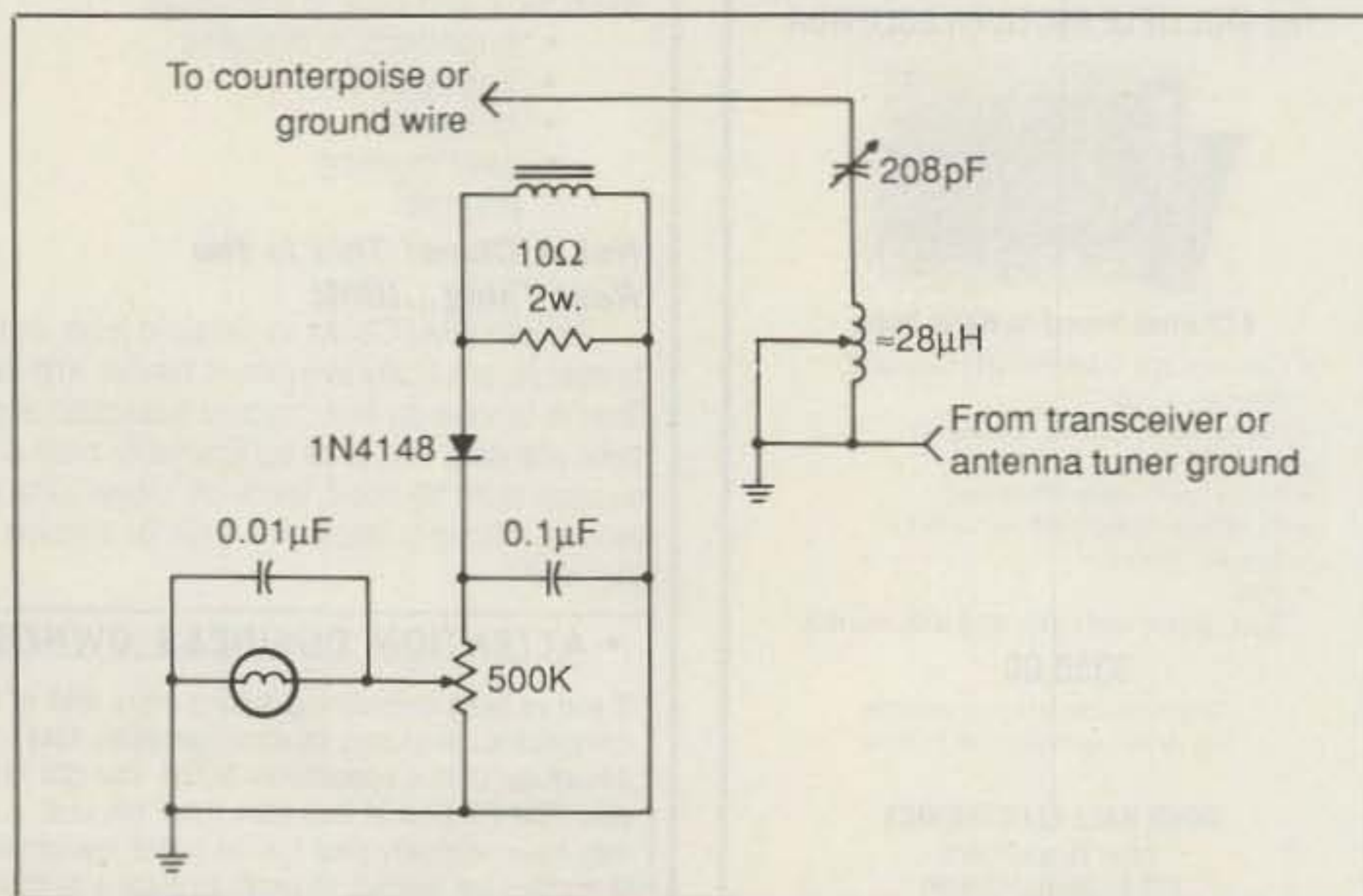


Fig. 1—Station interconnections.

45527 Third Street East, Lancaster, CA  
93535-1802



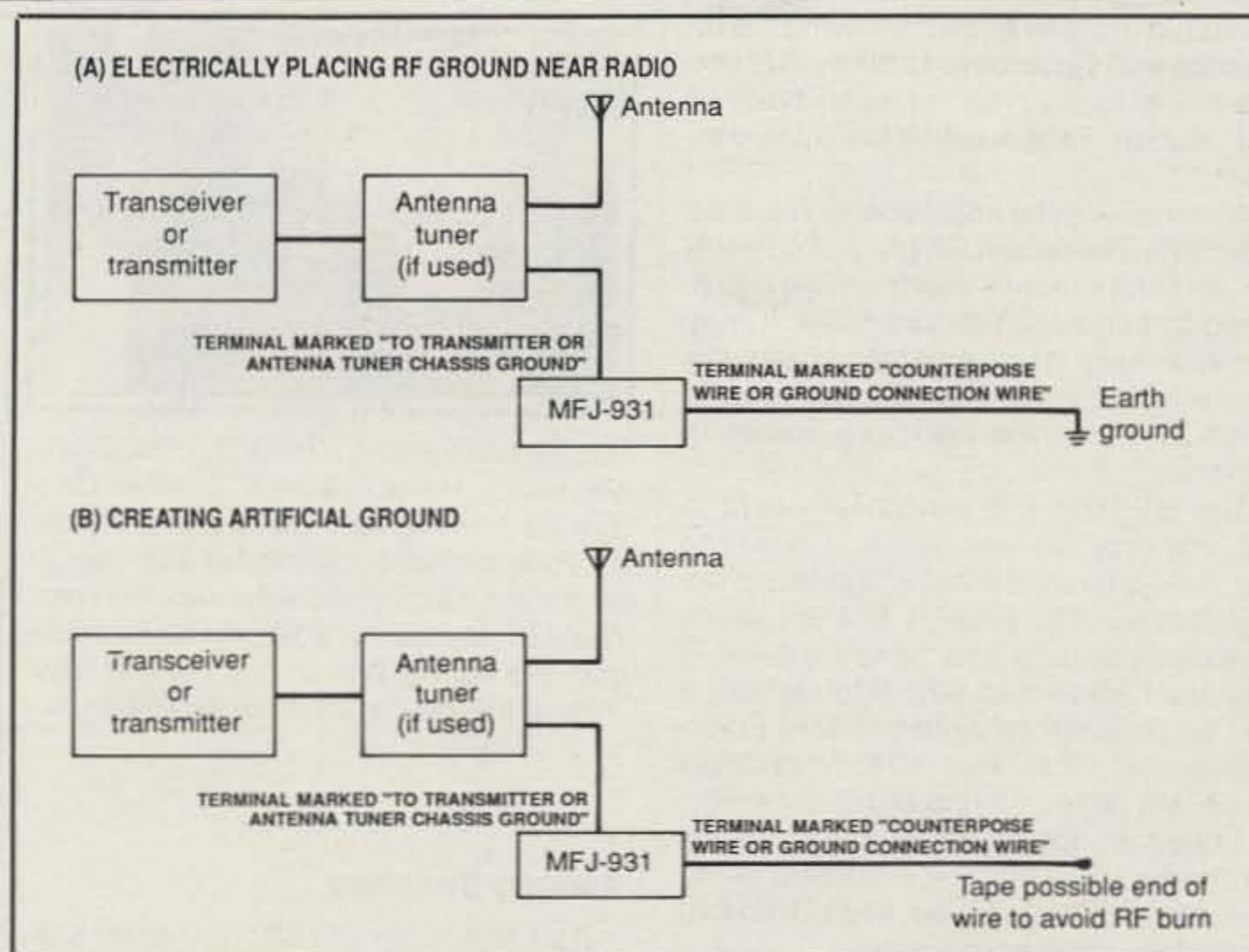


Fig. 2— Schematic of the MFJ-931.

ground system, dangerously high voltages can exist at the far end of such wire(s). It is imperative that insulated wire be used and that the far end of each wire be taped to prevent the possibility of any-

one (particularly children and pets) receiving an RF burn/shock. If possible, locate the end of each radial wire where it is relatively inaccessible.

Do not coil radial wires. Spread them

out as much as your location permits. I tried using a coil of wire on a good magnetic core, but it was not as effective as having wires spread out. In some station installations we experienced RF interference due to radials being parallel (and in close proximity) to telephone wiring, cable TV wiring, AC house power wiring, etc. These problems were easily eliminated by repositioning the radials.

### External Ground Enhancement

The MFJ-931 can be connected between the ground point (chassis) and the external (often remote) station ground. It cancels the reactance of the ground lead, effectively connecting the external station ground to the ground stud of the equipment. This feature makes the unit useful, even if you have an excellent external RF station ground.

We found it satisfactory to leave the bundle of radials attached in parallel with the lead to the external station ground.

The MFJ-931 does not provide a DC station ground, but a DC ground is required.

### Operation

The MFJ-931 is easy to use. Fig. 2 shows the schematic. In most cases, the meter (RF current) deflection is suitable with the front panel **Sensitivity** control set at its mid-range point. If the meter read-

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ing is too high (almost pegging the meter), reduce sensitivity as desired. If the meter reading is too low, increase sensitivity. An easy way to resonate the ground circuit is to leave the **Capacitance** adjusted to the mid-scale point, while determining which step position of the **Inductance** provides the highest RF current indication on the MFJ-931 meter. These adjustments are made in the code (A1A) mode.

Set **Inductance** to **A**, close the keying circuit, and note the MFJ-931 meter reading. Open the keying circuit, move the **Inductance** switch to **B**, close the keying circuit, and observe the meter reading. Keep repeating this procedure (steps **C** through **L**, if necessary) until you determine the optimum position of the **Inductance** switch. With the **Inductance** switch set to the position that produces the highest RF ground-current meter reading, close the keying circuit and adjust the **Capacitance** control to obtain maximum meter indication. This last adjustment is usually broad, so just leave the control in the center of the apparent tuned range. It is

advisable to make a chart showing the **Inductance** and **Capacitance** settings that you determine to be best for each band at your station. These values are quite constant.

After making the adjustments required to achieve maximum RF ground current, the antenna tuner (if used) should be retuned to achieve minimum SWR. It may be necessary to alternately adjust the MFJ-931 and the antenna tuner several times to obtain the optimum operating condition.

The MFJ-931 is a welcome benefit to the majority of amateurs, since the ground systems of most stations are unsatisfactory. The price is \$84.95, which includes shipping and handling fees. If you want additional MFJ information, it can be obtained by writing to MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (phone 601-323-5869).

I often wondered what "MFJ" stands for. I now know that the president of the company is Martin F. Jue, K5FLU, so that eliminates another mystery!



Here is Lee Petsch, KB0DZB, of McCook, Nebraska. He operates a Ten-Tec Century 21 transceiver. Lee worked almost 40 code contacts during his first month on the air. His first contact was with me, W6DDB. Lee was a radioman aboard submarines during WW II. It is nice to have him active on the amateur radio bands.

## Awards Directory

Ted Melinosky (K1BV) publishes a directory which provides information about the requirements you must meet to achieve each of more than 1,000 operating awards. If you want details about this directory, send your request to The K1BV Awards Directory, 525 Foster Street, South Windsor, CT 06074-2934. As always, your SASE would be appreciated. As an award manager (Ten American Districts), I know first hand that Ted checks to determine whether or not award information remains correct.

## Amateur Radio Log Database

If you are interested in obtaining a complete logging and QSL program for any MS-DOS computer, you should request a data sheet from Don Greenbaum, WB2DND, 250 Standish Street, Duxbury, MA 02332. Don's program handles contest, master, and regular logging requirements. Program updates are available at a low cost. Again, an SASE is appreciated.

## Printed Aids

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

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UG255 SO239 to BNC plug adapter, Amphenol.....	3.55
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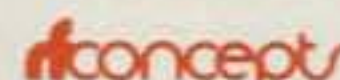
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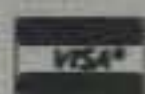
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## NEWS OF CERTIFICATE AND AWARD COLLECTING

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

**Vincent M. Robel, Jr., NB8R  
USA-CA All Counties #581, All SSB,  
9-3-88**

"I was born December 1, 1932 in Saginaw County, Michigan and have been a lifelong resident of the state. My amateur radio career started in 1960 when I received my Technician license, with the call WA8JHC. My on-the-air activities were interrupted five years later in 1965 when my license lapsed. I resumed my amateur radio career in September 1980 with a General class license and the call N8CCG. At that time I was stationed with the Naval Reserves at the 9th Naval District, MARS Radio Station, repairing teletype equipment. A friend, Ken Rugaber, KC9QV, had suggested that I rejoin the amateur ranks. I moved up to an Advanced license in March 1982 with the call KC8TR and to Extra class in July 1983 with my present call.

"I spent my working career as a telephone company employee, starting with Michigan Bell in 1953 as a Cable Splicer. In 1968 I transferred from cable splicing to Data and Teletype Installation and Repair, and in 1978 I became Teletype and Data Installation and Repair Supervisor. When the telephone companies split up, I also 'split' and retired in December 1983 at age 51, with 30 years of service.

"County hunting started for me on March 10, 1984, and 138,672,000 seconds later (4.5 years) I completed USA-CA All Counties #581. My thanks go to Stu, W2PDM, for that 'last one,' Livingston, Missouri, which he gave me on August 5, 1983. I especially appreciate the pictures Stu took and sent to me to document that special and exciting event.

"Along with my telephone career, I also did military duty in the Naval Reserve, enlisting in April, 1950 and serving on active duty in Japan beginning in October 1951. I was discharged in November 1953, enlisted again in 1963, and completed 20 years of service in 1980.

"I have been married 32½ years and have two sons, four daughters, and seven grandchildren. I enjoy retirement, and wonder how I had time to work all those years, with all the things I enjoy doing now.

"My wife and I do some traveling and find the mobile rig helpful for getting directions, passing time on long stretches,



Vince Robel, NB8R, surrounded by his FB station in Michigan.

and seeing all kinds of countryside views while looking for those county lines to run. Our six children gave my wife and me an all-expense-paid vacation to Maui, Hawaii for our anniversary. I discovered it is possible to survive without my radios for ten days, but just barely.

"I do not plan to go around the second time, but will be on the air to help others. Thanks to all who helped me.—73, Vince, NB8R."

### USA-CA Special Honor Roll

Carl Durnavich, WA9PQY  
USA-CA All Counties #609, Mixed, 2-23-89

Bill Smith, W7GHT  
USA-CA All Counties #185, 5-25-78  
Endorsed All CW, 2-16-89

### USA-CA Honor Roll

3000		1000	
WA9PQY	640	KA7OAI	1056
		K9UA	1057
		K8LOJ	1058
		WA9PQY	1059
2500		500	
K6YK	714	LZ2RS	2311
WA9PQY	715	KA7OAI	2312
		YV1CP	2313
		KA9ZRW	2314
		AL7HG	2315
		OZ1BOD	2316
2000		SM3BNV	2317
K6YK	780	WA9PQY	2318
DL3DD	781		
WA9PQY	782		
1500			
KA7OAI	868		
K9UA	869		
WA9PQY	870		

The total number of counties for credit for the United States of America County Award is 3076. The basic award fee for subscribers to CQ is \$4.00. For nonsubscribers it is \$10.00. Initial application must be submitted in the USA-CA Record Book, which may be obtained from CQ Communications, 76 North Broadway, Hicksville, NY 11801, 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 an SASE to Dorothy Johnson, WB9RCY, USA-CA Custodian, 333 South Lincoln Avenue, Mundelein, IL 60060. U.S.A. DX stations must include extra postage for airmail reply.

### Awards Issued

Carl Durnavich, WA9PQY, made a clean sweep of it by claiming USA-CA All Counties #609, USA-CA 3000 #640, USA-CA 2500 #715, USA-CA 2000 #782, USA-CA 1500 #870, USA-CA 1000 #1059, and USA-CA 500 #2318. USA-CA 500 through USA-CA 1000 qualified for endorsements as All 20 Meters, All 40 Meters, and All 75/80 Meters, each being the number one three-band endorsement. USA-CA 2000 was endorsed All 20 and All 40 Meters; and USA-CA 2500, USA-CA 3000, and USA-CA All Counties were all Mixed.

Bill Smith, W7GHT, updated his USA-CA All Counties #185 dated 5-25-78 by qualifying for an All CW endorsement, 2-16-89.

John W. Lee, K6YK, filed his good application for USA-CA 2500 #714 and USA-CA 2000 #780, Mixed dated 2-2-89.

Dr. Leopold Pomp, DL3DD, updated his good record and received USA-CA 2000 #781, All CW (#2 to DL-land), dated 2-14-89.

Alan E. Koch, KA7OAI, made a good entry into the ranks of USA-CA certificate holders by claiming USA-CA 1500 #868, USA-CA 1000 #1056, and USA-CA 500 #2312, All SSB Mobiles, dated 2-2-89.

Richard W. Mencil, K9UA (ex-K9TSY), filed his application for USA-CA 1500 #869 and USA-CA 1000 #1057, Mixed, dated 2-2-89.

Ray Tordiff, K8LQJ, received USA-CA 1000 #1058, Mixed, dated 2-6-89. Ray also updated his USA-CA 500 #1978, 1-6-84, by adding an All 2 x CW endorsement, dated 2-6-89.

USA-CA 500 certificates went to: Ruman Stefanov, LZ2RS, USA-CA 500 #2311, Mixed, 2-1-89.

Alan E. Koch, KA7OAI, USA-CA 500 #2312, All SSB Mobiles, 2-2-89.

Cedric J. Puchalski, J. YV1CP, USA-CA 500 #2313, All SSB, 2-3-89.

Larry Hickman, KA9ZRW, USA-CA 500 #2314, All Novice Bands, Mixed, 2-6-89.

Dave Kaiser, AL7HG, USA-CA 500 #2315, Mixed, 2-9-89.

Knud E. Anderson, OZ1BOD, USA-CA 500 #2316, All 2 x SSB, 2-9-89.

Bengt Eurenus, SM3BNV, USA-CA 500 #2317, Mixed, 2-15-89.

Carl Durnavich, WA9PQY, USA-CA 500 #2318, All 20M, All 40M, and All 75/80M.

### Awards Available

**UP1BZZ Pennant.** This pennant is available to any radio amateur who has had contacts with at least five different call-

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The UP1BZZ pennant available from Roger Burt, N4ZC.

signs used by club station UP1BZZ. There are no mode, time, or band limitations.

The pennant is double-sided, multi-colored, 5 3/4" x 9" silk fabric. To apply, send application (no QSLs; log data only) and \$6 US or 15 IRCs to: Roger Burt, N4ZC, Rt. 1, Box 246, Mt. Holly, NC 28120, U.S.A.

Past callsigns used: UP2KCZ until 1970; UP50B 1972; U2USP 1977; RG6A 1980; RG6G 1980, 82; UK2BAS until 1984; UP1BZZ since 1984; UK2BAS/U6G 1982; U2PSN 1984; UP4A 1988; UP7A 1985, 87; UP8A 1988; UP9A 1986; EO2PPP 1987, 88; R2PZ 1985; LY2ZZ 1988, 89.

Any new callsigns, if used in the future, will be acknowledged, too.

**TTI Award.** There have been some minor changes in the TTI Award sponsored by the Radio Club of Costa Rica.

The TTI Award is available to licensed amateurs and SWLs. Contacts after September 29, 1953 are valid, any mode, any band. The award is offered in three classes:

Class 1—QSOs with 7 of the 8 different Costa Rican call areas.

Class 2—QSOs with 6 different call areas.

Class 3—QSOs with 5 different call areas.

Stations with special prefixes such as TI1 and TE1 or others will be classified ac-



TTI Award sponsored by the Radio Club of Costa Rica.

ording to their QTH of operation. The same rule applies for club stations using the prefixes TI0 or TE0.

The eight different call areas of Costa Rica use the following prefixes. The TE prefix is mainly a contest prefix on HF.

TI2 or TE2—province of San Jose.

TI3 or TE3—province of Cartage.

TI4 or TE4—province of Heredia.

TI5 or TE5—province of Alajuela.

TI6 or TE6—province of Limon.

TI7 or TE7—province of Guanacaste.

TI8 or TE8—province of Puntarenas.

TI9 or TE9—Isla del Coco.

One missing call area can be replaced by the joker, TI0RC, or other special calls used by the official radio station of the Radio Club of Costa Rica.

Send log extract verified by awards manager or two licensed amateurs together with the handling fee of 10 IRCs or \$5.00 US (or equivalent in other currency) to Bengt Hallden, Awards Manager of



The 3ZN Diploma offered by the Liga Colombiana de Radioaficionados, Bogota.

RCCR, Box 9, San Joaquin de Flores 3007, Costa Rica.

**3ZN Award.** The 3ZN Award is offered by the Liga Colombiana de Radioaficionados—Bogota, for 20 confirmed contacts with HJ3 stations (Zone 3 Novices). All non-HK (HJ) stations need only ten confirmed contacts. Send log (do not send QSLs) with \$2.00 US or 4 IRCs for handling and postage to Contest and Diplomas Manager, HK3NTI, P.O. Box # 584, Bogota, Columbia, S.A.

**Bartolomeu Dias Diploma.** The South African Radio League announces a celebration of the 500th anniversary of the arrival of Bartolomeu Dias in the Cape. The Rede Dos Emissores Portugueses (REP) and the Johannesburg Branch of the South African Radio League (SARL) have established a very special award in observance of the anniversary. The award is available to all radio amateurs and short-wave listeners.

To qualify, DX stations must have made 5 contacts with stations in Portugal (CT) and 5 contacts with stations in South Africa (ZS). South African stations must have made 20 contacts with stations in



Bartolomeu Dias Diploma offered by the Rede Dos Emissores Portugueses and the Johannesburg branch of the South African Radio League.

South Africa (ZS) and 5 contacts with stations in Portugal (CT).

The award is available for contacts made in the following modes: CW, SSB, RTTY, or Mixed, etc. To apply, send a certified copy of the logbook to the Awards Manager, Johannesburg Branch (SARL), P.O. Box 2327, Johannesburg 2000, Republic of South Africa. The cost for the award for DX stations is US \$5.00 or 10 IRCs. For ZS stations, the cost is R5.00.

Only contacts made between 1 January, 1988 and 30 June, 1989 will be eligible. No award applications will be considered after 31 December, 1990.

A point of interest is that the map on the diploma is an exact copy of the original map made by Bartolomeu Dias in 1502. Notice how closely it resembles modern maps.

**South Dakota Centennial Wagon Train.** The following news release was received from R. L. Cory, W0YMB.

From May 10, 1989 to September 4, 1989 South Dakota amateurs will be operating a special events station from a wagon train traveling in South Dakota. For the State's Centennial Celebration there will be an eastern section and a western section. McCrossen Boys ranch will furnish a covered wagon for the eastern section to be used as a radio wagon. Burghardt Amateur Supply of Watertown will furnish radio equipment for this wagon, and the Sioux Falls Radio Club will install it. There will be HF equipment for special events contacts and 2 meter equipment for local and emergency contacts. The eastern section will cover 1764 miles and the western section will cover



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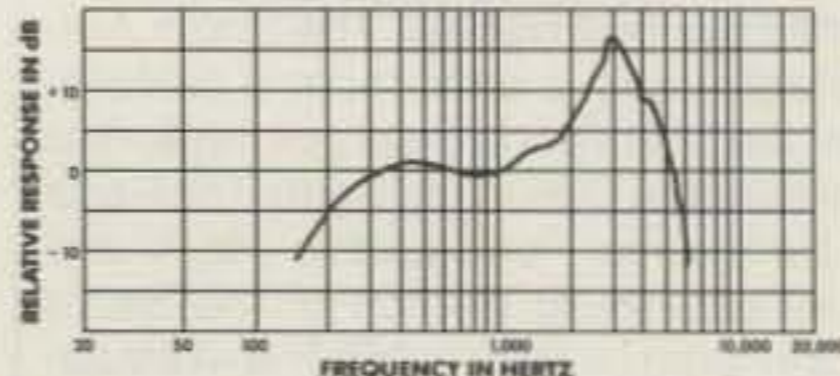
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South Dakota Centennial Wagon Train routes from May 10 to September 4, 1989.

800 miles. There will also be many horse-back riders accompanying the wagon train.

The Centennial Wagon Train Committee will have Centennial Wagon Train QSL cards printed. Amateur radio clubs will put radio operators on the wagon train as it goes through their areas.

The eastern section wagon train will leave from Elkpoint, South Dakota on May 10, 1989 and arrive at the State Fair Grounds at Huron on September 4 during the South Dakota State Fair. The western section will leave Phillip, South Dakota on June 4, 1989 and arrive at Fort Pierre on August 14. The Black Hills Amateur Radio Club is working on arrangements to equip a wagon with radio in the western division.

Instead of an ordinary QSL card you will get one from the South Dakota Centennial Covered Wagon Train to help celebrate their 100th birthday. This event will also be a bonanza for county hunters as the South Dakota Centennial Covered Wagon Train travels throughout the state. QSL South Dakota Centennial Wagon Train, P.O. Box 91, Sioux Falls, SD 57101, USA, with an SASE.

### Notes

Word was recently received from Van, WB7UZO, Four Corners Award Gold Seal Manager, that the #1 and #2 gold seals were issued on 17 February 1989. They went to David Davidson, KA8TBW, and his son Travis, KA8ZGO, of Niles, Michigan. The Four Corners Award is earned by making contact with designated amateur stations in the four corners of the 48 continental United States. Readers may recall that when this award was presented in the September 1988 edition of this column, the designated station for the Southeast Corner was inactive. Van reports that K4VGD is now back as the designated station for the Southeast Corner, and is continuing to work with the award.

See you again in July.

73, Dorothy, WB9RCY





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## A LOOK AT THE WORLD AROUND US

### WARC Bands Update

**B**efore delving into this month's subject, I want to thank everyone for your continuing letters of encouragement and support for this column. I recognize and share your enthusiasm for classic rigs, and more views will be presented in future columns. If I am a mite slow in answering your requests, understand that I must check each rig's on-the-air performance before announcing it fit for modern-day use. You trust my judgment in many areas, and I respect your confidence. This column's space must also be shared with other popular topics. This month's feature exemplifies that statement. It is not classics, keys, or satellites, but I believe you will find it interesting.

The last of three HF WARC bands, 17 meters, was opened for operation by U.S. amateurs on January 31, 1989. We now have a total of nine bands for HF communications, and thanks to good sunspot Cycle 22 activity, they are all doing great. If you have been lax in on-the-air operations lately, you are missing a treat. DX conditions are outstanding, mobiling is increasing noticeably in popularity, and our new WARC bands assure plenty of elbow room for everyone. Remember our last sunspot cycle's boom around 1978 when counts hit 200 and you could log a page of DX QSOs during an afternoon's operation? Similar good times are here again, and we now have even more bands to enjoy the fun. All amateurs holding a General or higher class license can participate in WARC-band fun. String up one or two new wire antennas and join us. New pursuits always rekindle enthusiasm.

The WARC bands of 12, 17, and 30 meters are ideal retreats from busy and more crowded bands such as 40 and 20 meters. Contest activity is miniscule, and weekday action is light. More stations appear on the air during weekends than at any other time. Many of those operators are trying a new band for the first time or checking out a new antenna. Barefoot transceivers and simple wire antennas comprise most 12 meter setups. Higher power signals are becoming more common on 17, and 30 meters continues to be a QRP haven. DXing is a popular and productive interest on 12. Working all states is the present trend on 17, and operating

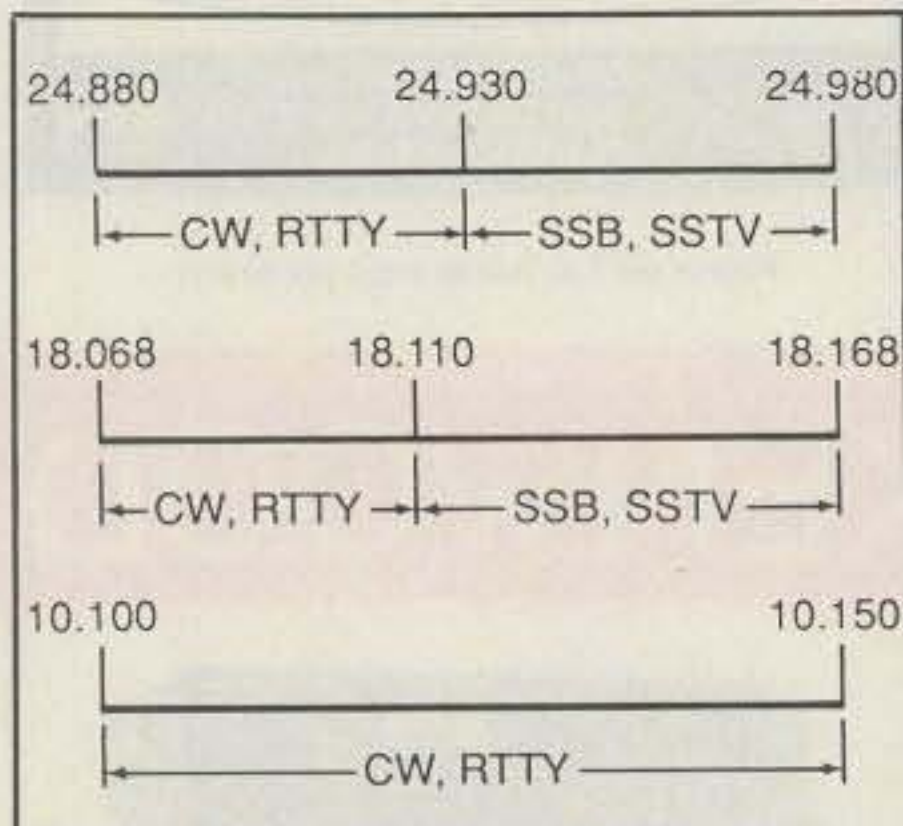


Fig. 1 - Current frequency and mode allocations for the HF WARC bands.

CW with basic-style rigs is always in vogue on 30 meters. If you like friendly QSOs rather than brief signal-report and QTH exchanges, you will like WARC-band operating. If you prefer more excitement, consider WARCing from a rare state like West Virginia or Delaware or a nearby country like Newfoundland or Mexico. Other possibilities are limited only by your imagination!

As additional getting-started inspiration, let's take a closer look at what's happening on each WARC band and what you need to join the fun. We'll then overview some antenna ideas and rig notes of interest. Refer to fig. 1 for mode and frequency allocations as we continue.

#### 12 Meters

This 24.880 to 24.980 MHz range is divided equally, with CW and RTTY operations in its lower 50 kHz and SSB activity in the upper 50 kHz range. Band propagation is more akin to 10 than 15 meters, with a unique difference. Twelve meters seems to open slightly later and close slightly earlier than 10 meters. Maybe we simply need more 12 meter activity to energize the ionosphere. Time will tell. Understand too that conclusions drawn before we go through a full 11-year sunspot cycle are subject to change.

Twelve meters is usually open from mid-morning until dusk. European skip is best during the AM. South American areas roll in from noon until 4 or 5 PM your local time, and South Pacific areas appear as the band starts closing. The best DXing success is on CW. Stateside SSB

QSOs are prominent any time 12 is open. Since activity is light and more operators listen than transmit, calling CQ on this relatively quiet band is often beneficial for kicking off action.

Most 12 meter operators are using new-style transceivers such as Kenwood's TS-440, ICOM's IC-735, and Yaesu's FT-757. Small rigs seem to be increasingly popular. Possibly folks are tired of wrestling with big transceivers. Multi-band wire antennas and verticals are also popular 12 meter antennas. Your small home or mobile transceiver and Butternut antenna will make a fine setup for 12. Thus far, only a few stations have been noted running multi-element log periodics and kilowatt amplifiers. If that trend gains foothold, it can quickly destroy the beauty of 12. Do we honestly need 1,000 watts to contact foreign stations running only 100 watts? As I always say, the operator, not the rig, makes the difference!

Mobiles on 12 meters are almost nonexistent. If you enjoy being the first kid on the block with a new toy, get rolling on 12 mobile. Operate CW and you should definitely shake up the troops! A 13 inch "stinger" replacing a Hustler RM-10's tip rod works quite well on 12 meters. The SWR is roughly 1.7 to 1. A shunt 50 or 100 pFd capacitor or antenna tuner will reduce that SWR. If an RM-10's "stock resonator" is extended right to its tip, 12 meter operation results in a 1.8 to 1 SWR. Ham Stick, or WD4BUM mobile whips for 12 meters also work great, and they do not require modifications.

#### 17 Meters

This new band extends from 18.068 to 18.168 MHz, with CW and printed-mode communications in the lower 42 kHz and SSB in the upper 58 kHz range. Propagation on 17 seems quite unique. Although future Cycle 22 changes could prove me wrong, 17 meters seems like a cross between 15 and 40 meters. The DXing times and range are similar to 20, but you can also work stations between 500 and 1,000 miles from your QTH—stations you normally skip over on 20 or 15 meters.

DX activity has been lighter on 17 than on 12 meters thus far, but some good "rarities" appear on an eclectic basis. Listen around dawn for Europe and a couple of hours after sunset for the South Pacific. Expect competition if you chase SSB

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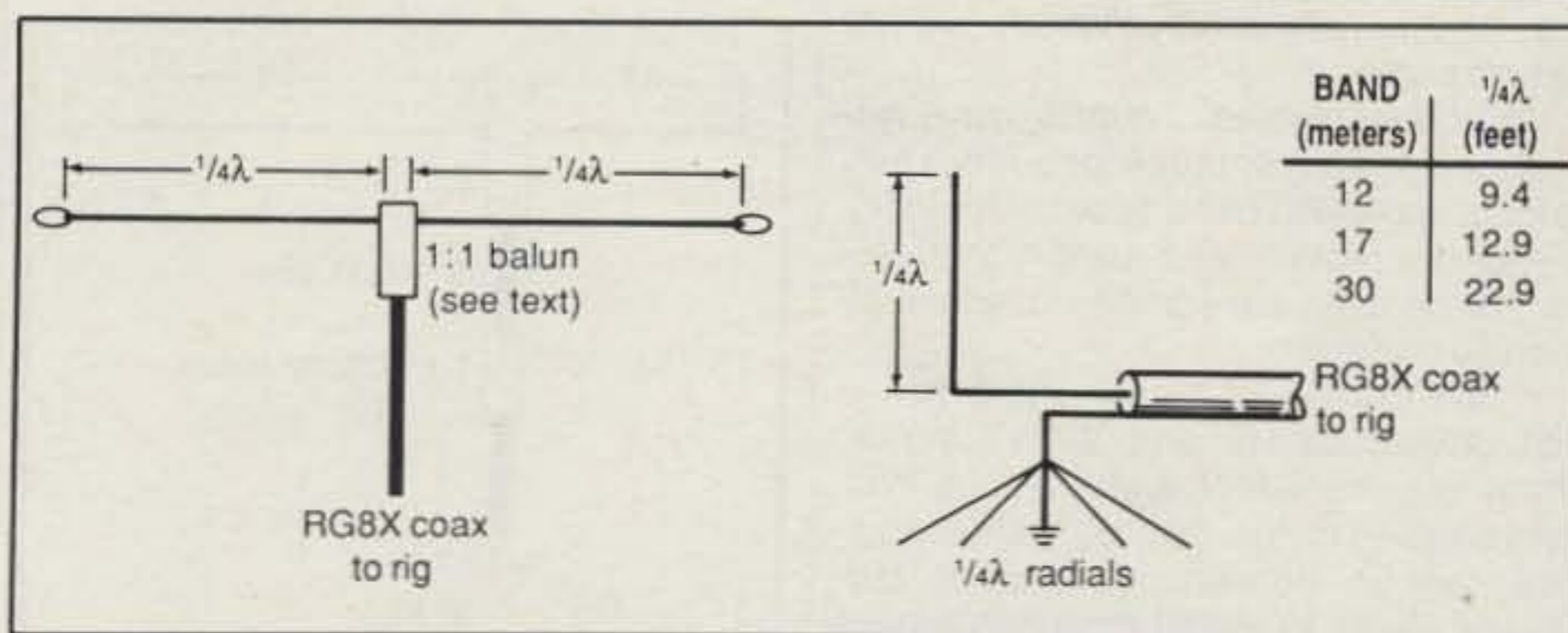


Fig. 2- Dipole and vertical antenna dimensions for WARC-band operations.

DX on this band during weekends, and expect better results if you DX 17 meters CW during weekdays. Your barefoot transceiver and a gain antenna will make a good setup on 17.

Some operators have found their 20 meter switched linear amplifiers will tune-up on 17, so the average power level used on this band is rising. Before declaring your amplifier ready for 17 meter use, however, I heartily suggest close internal study. That suggestion carries double weight if your amplifier's large (and expensive!) tubes are not clearly visible. They may be running excessively hot because of high antenna loading caused by exciter underdriving or impedance mismatching between the tubes and tank circuit. An amplifier's (20 meter) tuned input is usually narrowbanded, and reflects a very high SWR to your transceiver at 18.1 MHz. Solid-state rigs, in turn, reduce their RF output in a self-protecting manner. Do not load your amplifier heavily to compensate for low drive; retune the (amplifier's) input coil or use a tuner between your transceiver and amplifier. If you experience TVI at that point, check with Jim Thompson at The Radio Works (Box 6159, Portsmouth, VA 23703, telephone 804-484-0140). This company produces a clever new balun that installs between

your transceiver and linear and minimizes TVI.

Technically speaking, a new tap for 17 meters should be added to your linear amplifier's tank circuit. This step will match the tubes to their load. That tap will be between the tank coil's 20 and 15 meter tap positions. Use your trusty noise bridge to determine exact tap location, or check with its manufacturer—preferably before you degrade tube efficiency.

Mobiling on 17 meters is increasing in popularity every day. Some folks are using Hustler RM-10 resonators with 39 3/4 inch tip rods for resonating on 18.1 MHz, while others are simply retapping the coil on their big-signal Texas Bugcatchers. John, KA0ZFX, uses a TS-440 and Bugcatcher on his truck, and he consistently has one of the best signals on this band.

### 30 Meters

It is difficult to limit my high enthusiasm for this band, but I will strive to be unbiased. This CW- and RTTY-only band extends from 10.100 to 10.150 MHz, and its U.S. power limit is 250 watts. Your barefoot transceiver and a 30 meter dipole will put out a "big-time" signal on 30! I usually run 10 to 50 watts on 30 and work every station I call—even mobile! A good 30 meter mobile antenna, incidentally, is the WD4BUM "Ham Stick." It performs like a full-size vertical and has very low wind resistance. Thirty meters is an ideal combination of 40 and 20 meter propagation, activity is light, and operators are very congenial. Even DX pileups are more casual than "hair, teeth, and eyeballs" in nature.

Thirty meters is usually open for state-side QSOs around the clock. A minor "slump" is occasionally noticeable around noon and between 2 and 4 AM. South Pacific areas usually roll in around dawn, and European signals come through well between dusk and midnight. European signals also appear briefly during early afternoon, and they are occasionally followed by extended propagation to India and long path to Australia. When was the last time you worked a VK

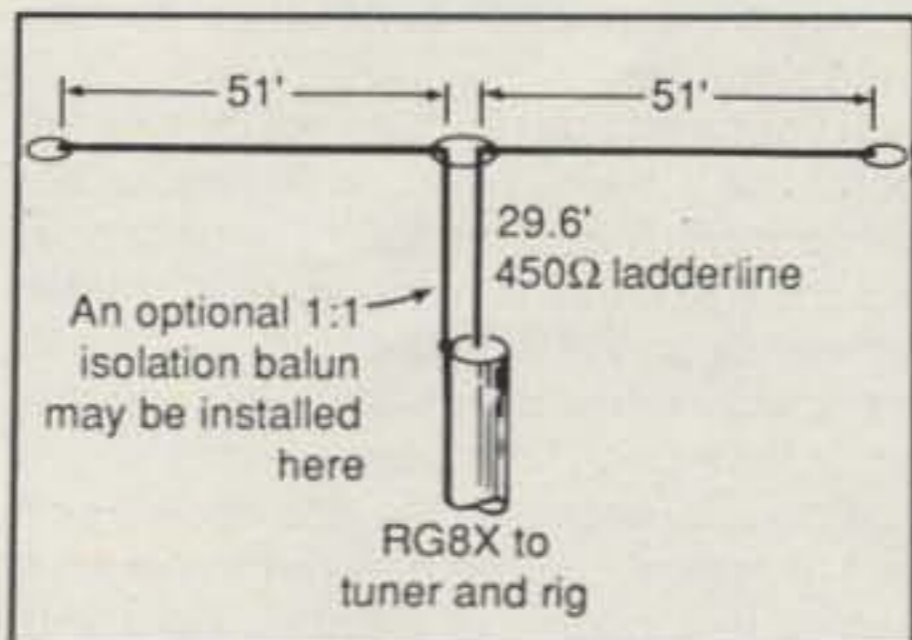


Fig. 3- The classic G5RV multiband antenna. This skywire works 80 through 10 meters, including all WARC bands. A coax-output tuner is required with this antenna.

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long path while running 50 watts to a dipole? That delight does not happen every day on 30 meters, but it does occur at least four weeks per year.

Using old-time gear and very low power is also popular on 30 meters. In fact, VK5GI was setting up his Halliscratchers S-38 receiver and 6L6 transmitter ready for operation on 10.106 MHz as this column was being written. My 1930-style transmitters for 30 meters featured in March "World of Ideas" also now have several DX QSOs to their credit.

Thirty meters can be a "sleeper band"; it may be open, but everyone is listening rather than transmitting. You call CQ, get a QSO rolling, and the band starts hopping with action. Use the aeronautical weather station on 10.051 MHz and commercial RTTY stations around 10.125 MHz as "beacons." If their signals are S8 or better, 30 is open but sleeping.

## Antennas

Getting started in WARC-band action usually begins by putting up a new antenna, but rest assured your efforts will be repaid tenfold. Connecting an old skywire with weathered radiators, corroded connections, and aged coax to a new transceiver is comparable to putting four bald tires on a new Cadillac. You may reach

your destination, but it definitely will not be first class!

If standard dipoles or quarterwave verticals are your preference, check our pre-calculated WARC-band dimensions in fig. 2. I heartily recommend using a good balun. The benefits are significant, especially on 30 meters.

If you must install only one antenna that covers all HF and WARC bands, check out the G5RV and Carolina Windom outlined in figs. 3 and 4. These radiators can be home-assembled or purchased ready to install from companies such as The Radio Works. I suggest using preassembled versions, as homebrewing usually cuts corners and sacrifices performance. A basic antenna tuner must be used with the G5RV and Carolina Windom. My ICOM 761's built-in tuner handles both antennas beautifully. An MFJ tuner is used with my "basic" rigs. The G5RV works well, but the Carolina Windom beat it hands down.

I first learned about the Carolina Windom while QSOing its designer, Jim Wilkie, WY4R, on 30 meters. It was 10 dB stronger than his dipole! Before I could home-assemble one from Jim's on-the-air description, The Radio Works announced preassembled models. (I work slowly. Must be all this writing.) I thus installed a Radio Works' Carolina Windom in the exact same spot and with the same

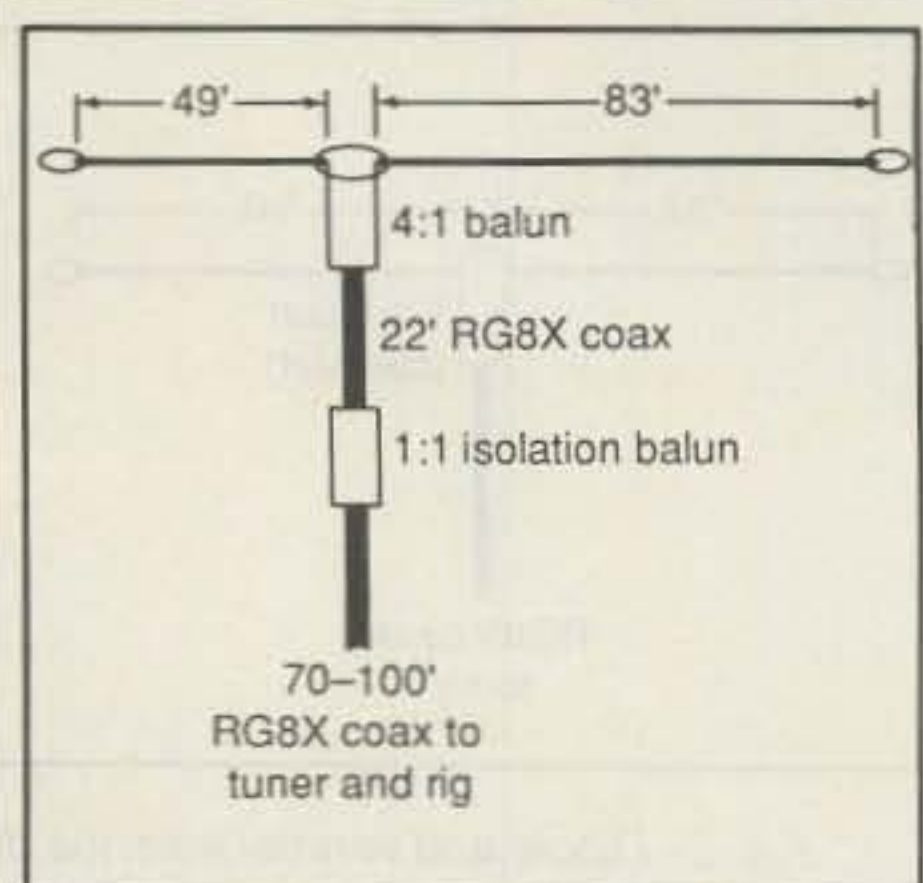


Fig. 4- The new and increasingly popular Carolina Windom. The antenna works 80 through 10 meters, including all WARC bands, and it exhibits a surprising amount of signal gain.

wire angles previously used with my G5RV. The improvement was amazing! This antenna really gets out! Using it with a no-tune-up rig and auto tuner on 40, 30, 20, 17, 15, 12, and 10 is delightful. Half the time I use it for both stateside and DX QSOs rather than switching over to my beam simply because it is so multiband-convenient. The Carolina Windom, incidentally, exhibits good signal gain on all upper HF bands.

## WARCing Older Transceivers

Adding WARC-band coverage to pre-TS-830/FT-107/IC-720 transceivers is usually complex. Check with their manufacturers. The TS-830 and 530 are WARC-enabled by cutting diodes right below the bandswitch. Details are in your manual. Be careful, as they are difficult to see and reach. Cutting a blue wire inside the IC-720 enables its WARC bands. Call ICOM's service hotline at 206-454-7619 for additional guidance. Yaesu service at 213-404-4884 is your best guide to WARCing the FT-101 and FT-901 series transceivers. Remember also that no one knows a transceiver better than its own manufacturer.

If your transceiver does not deliver full output on a WARC band, recheck your antenna's SWR and feedpoint impedance. A common pitfall is using 80 or 40 meter antennas on WARC bands; they seem to work okay when in actuality they are losers. Use a good antenna!

Enough, enough! We are once again out of space. I will be back with more fun topics in a couple of months. Bear with me. I am wrapping up a new mobile handbook and developing some "first time in ham radio" goodies you will love. They are all fun, but there are only 24 hours in a day!

73, Dave, K4TWJ

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<p><b>MODEL RM-35M</b></p>	<p><b>19" X 5 1/4" RACK MOUNT POWER SUPPLIES</b></p> <table border="1"> <thead> <tr> <th>MODEL</th> <th>Continuous Duty (Amps)</th> <th>ICS* (Amps)</th> <th>Size (IN) H x W x D</th> <th>Shipping WL (lbs.)</th> </tr> </thead> <tbody> <tr> <td>RM12A</td> <td>9</td> <td>12</td> <td>5 1/4 x 19 x 8 1/4</td> <td>16</td> </tr> <tr> <td>RM-35A</td> <td>25</td> <td>35</td> <td>5 1/4 x 19 x 12 1/2</td> <td>38</td> </tr> <tr> <td>RM-50A</td> <td>37</td> <td>50</td> <td>5 1/4 x 19 x 12 1/2</td> <td>50</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Separate Volt and Amp Meters</li> </ul> <table border="1"> <tbody> <tr> <td>RM-35 M</td> <td>25</td> <td>35</td> <td>5 1/4 x 19 x 12 1/2</td> <td>38</td> </tr> <tr> <td>RM-50 M</td> <td>37</td> <td>50</td> <td>5 1/4 x 19 x 12 1/2</td> <td>50</td> </tr> </tbody> </table>	MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping WL (lbs.)	RM12A	9	12	5 1/4 x 19 x 8 1/4	16	RM-35A	25	35	5 1/4 x 19 x 12 1/2	38	RM-50A	37	50	5 1/4 x 19 x 12 1/2	50	RM-35 M	25	35	5 1/4 x 19 x 12 1/2	38	RM-50 M	37	50	5 1/4 x 19 x 12 1/2	50											
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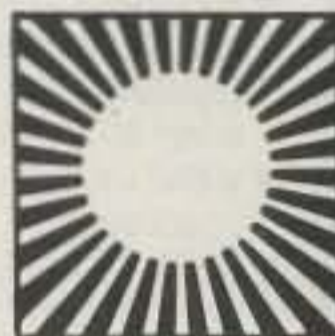
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*The AL-80A will provide a signal output that is within 1/2 "S" unit of the signal output of the most expensive amplifier on the market—and at much lower cost.*

The Ameritron AL-80A combines the economical 3-500Z with a heavy duty tank circuit to achieve nearly 70% efficiency from 160 to 15 meters. It has wide frequency coverage for MARS and other authorized services. Typical drive is 85 watts to give over 1000 watts PEP SSB and 850 watts CW RF output. A new Pi-L output circuit for 80 and 160 gives full band coverage and exceptionally smooth tuning.

Size: 15½"D. x 14"W. x 8"H. Wgt. 52 lbs.



## AL-1200 LINEAR AMPLIFIER

3CX1200 TUBE

Full legal output with 100 watts drive.

## AL-1500 LINEAR AMPLIFIER

8877 TUBE

Full legal output with 65 watts drive.

The cooling system in both amplifiers keeps the tube safely below the manufacturers ratings even when operating at 1500 watts output with a steady carrier. The filament supply has inrush current limiting to insure maximum tube life.

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## AL-84 LINEAR AMPLIFIER

The Ameritron AL-84 is an economical amplifier using four 6MJ6 tubes to develop 400 watts output on CW and 600 watts PEP on SSB from 160 through 15 meters. Drive required is 70 w typical, 100 w max. The passive input network presents a low SWR input to the exciter. Power input is 900 watts. The AL-84 is an excellent back-up, portable or beginner's amplifier.

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Five outputs are selected from a heavy duty antenna switch allowing the rapid choice of three coaxial lines, one single terminal feed or a balanced output. An internal balun provides 1:1 or 4:1 ratios (user selectable) on the balanced output terminals.

A peak reading wattmeter and SWR bridge is standard in the ATR-15. It accurately reads envelope powers up to 2KW.

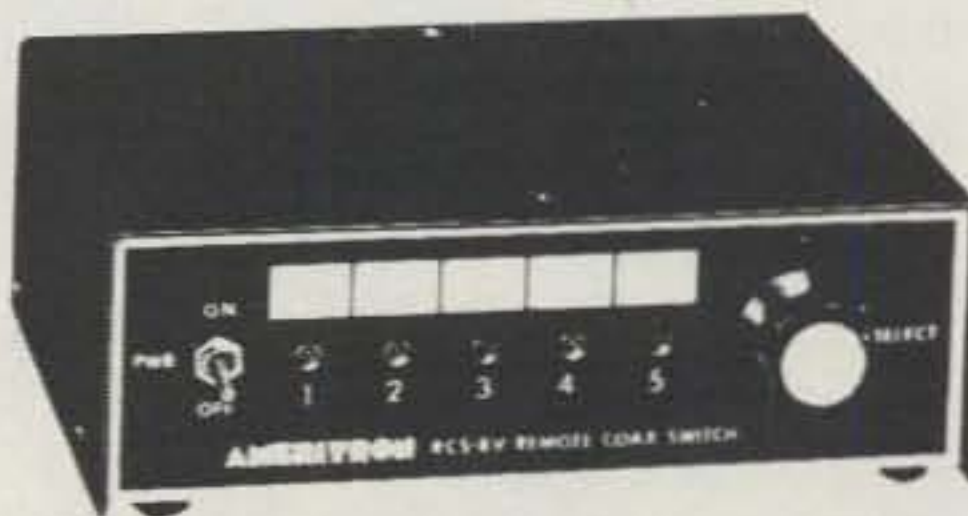
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# Contest Calendar

a monthly feature by  
FRANK ANZALONE, W1WY

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

This month John Dorr, K1AR, hosts our Contest Calendar Column. As many of you know, Frank has been a bit under the weather and is taking a break from his heavy schedule. John has been one of our "overworked" Contest Committee men for many years in spite of his young age, and he is an avid and accomplished contester and DXer. If you have any information on contests or material that should appear in this column, please send it to John at his home QTH: 2 Baldwin St., Windham, NH 03087. —K2EEK

This year's contest season has proven to be nothing short of spectacular as new records were set in many long-standing categories. As the results continue to come in, there seems to be no limit to the amount of activity and interest in contesting around the world. Beyond the obvious rise in solar activity, what is causing this dramatic increase?

Let's begin the analysis by providing some of the facts. In the 1988 CQ WW SSB Contest eight claimed scores for USA single operators broke the old record. Furthermore, four world single operator entries claimed scores of over 10 million points! The same has proven true for the 1989 ARRL DX Contest. United States single operators were commonly exceeding 2500 QSOs in this year's SSB portion. The trend has continued into the CQ WPX SSB Contest, yielding USA multi-multi scores in excess of 7200 QSOs and USA single operator scores with 3100-plus QSOs.

Another way of analyzing the data is by looking at QSO distributions by country. In recent years there has been a dramatic increase in European activity. This is especially true for Western Europe on SSB and Eastern Europe on CW. During the same period Japanese activity has remained relatively constant (especially when compared to the previous sunspot high). Many East Coast USA stations' logs have been very competitive with little content from Japan. Of course, exceptions do occur (witness the 1989 CQ WPX Contest which had tremendous JA activity), but the trend seems to support a growing number of European participants with much smaller growth from Asia.

Despite all the analysis, one can conclude that improved propagation is gen-

### Calendar of Events

May 27	ARCI QRP CW Sprint
<b>May 27-28</b>	<b>CQ WW WPX CW Contest</b>
May 27-28	UBA SWL CW Trophy
June 3	YLRL Novice/Tech Day
June 3-4	RSGB Field Day
June 3-5	ANARTS RTTY Contest
June 10-11	So. American CW Contest
June 10-12	ARRL VHF QSO Party
June 17-18	All Asian Phone Contest
June 17-18	SMIRK (6M) Party
June 17-18	RCV Valencia Contest
June 24-25	ARRL Field Day
July 1	Canada Day Contest
July 1-2	Colorado 6 Meter Net
July 1-2	Venezuela Phone Contest
July 8-9	IARU HF World Champ.
July 9	ARCI QRP CW Sprint
<b>July 15-16</b>	<b>CQ WW WPX VHF Contest</b>
July 15-16	AGCW-DL QRP CW Contest
July 29-30	Florida QSO Party
July 29-30	Venezuela CW Contest
Aug. 5	YLRL YL/OM SSB Sprint
Aug. 5-6	ARRL UHF Contest
Aug. 13	ARCI QRP SSB Sprint
Aug. 26-27	All Asian CW Contest
Sept. 6-8	YLRL "Howdy" Days
<b>Sept. 23-24</b>	<b>CQ WW DX RTTY Contest</b>
Sept. 23-24	Classic Homebrew Exchange
Oct. 7-8	Pennsylvania QSO Party
<b>Oct. 28-29</b>	<b>CQ WW DX Phone Contest</b>
<b>Nov. 25-26</b>	<b>CQ WW DX CW Contest</b>

erally causing more interest in contesting. While there is certainly some merit in that logic, the 1989 ARRL CW DX Contest experienced particularly poor conditions, yet the trend continued with high QSO totals and new records (although the relative increases were somewhat reduced when compared to SSB). The fact is that there are more participants in contesting around the world than ever before. This is evidenced by the dramatic increase in contest logs being received by contest sponsors around the world.

Another factor to consider is the recent climb in numbers of super-stations being developed. Not only are contesters in the United States building big stations, but the trend is occurring around the world. The Soviet Union, for example, has tremendous club stations with rotary 80 meter Yagis and stacked 40 meter arrays. There is also a growing number of "remote" contest sites such as P40V, PJ1B, and Martti Laine, OH2BH's efforts in the Canary Islands (EA8). This super-station phenomenon has resulted in its own "mini-contest" as station owners compete to make their super-stations breed activity as they tend to be infectious. They are usually the first station a

casual participant will work and combined with good conditions, contribute to that station staying on the bands and working others.

The increase in so-called "contest technology" is another aspect to consider. While the United States tends to lead the technological pack in contesting technological progress, impressive advancements have come from around the world. Recent accomplishments in packet radio spotting networks, antenna design/switching, state-of-the-art transceiver applications, and computer contest logging are just a few examples.

Perhaps even more critical to growth in contesting is the improved communication vehicles we have developed in sharing information. These include dedicated contest publications, club newsletters, and even "on-the-air" QSOs. I hope fellow contesters view this column as one of those vehicles to communicate ideas and suggestions that will benefit our mutual passion for contests.

### 1989 CQ WW Trophy Program

In recent years the CQ WW Contest Committee has been making major strides in delivering awards on time and in person where possible (e.g., Dayton Hamvention). We are pleased to announce the creation of a second-place trophy category for the major categories in the CQ World-Wide Contest. These trophies are designed to recognize the tremendous efforts of our participants who finish second in the standings. I'm sure many of you have experienced that disappointing feeling of finishing in second place even though you broke the category record (and even placed second in your country as well!). Beginning with the 1989 CQ WW Contest, the following six new categories will be available:

2nd Place Single Operator/World—SSB & CW  
2nd Place Single Operator/USA—SSB & CW  
2nd Place Multi-Single/World—SSB & CW  
2nd Place Multi-Single/USA—SSB & CW  
2nd Place Multi-Multi/World—SSB & CW  
2nd Place Multi-Multi/USA—SSB & CW

In support of the new categories, I am accepting requests for donors on a "first-come, first-served" basis. If you are interested in donating one of these trophies, please contact me at my home address.

While we're on the subject, there has been a concerted effort in recent months to clean up the outstanding requests for undelivered trophies from previous years. I believe I have a complete list, although it may have some omissions. To be sure,

c/o CQ magazine



please send me your request (even if it was previously submitted) so that we can clear up this subject once and for all.

## June Contest Calendar

June always stands out as the month which provides a premier operating activity for U.S. and Canadian amateurs—ARRL Field Day (DX stations can participate, but are not eligible for listing in the final results). Field Day provides an excellent opportunity to test the waters in contest-style operating whether you are at home or in the "field." If you have never operated this one, you've missed out on one of amateur radio's best events.

We have done our best to include your contest in this month's column, but there may be some omissions for which we apologize. To ensure your contest is covered in the future, please be sure to send your rules/details to my home address. The deadline for the September issue is July 1, 1989.

## Future Contest Calendars

As contest operators we own both the admiration and scorn of our fellow amateurs, depending on their perspective. As such, we have little opportunity to share our views and values with our fellow amateurs except when "on the air" or through mediums like this one. Over the next few months you can look forward to a variety of topics ranging from ethical and operating-style issues to practical advice and experience from myself and others. My goal for this column is to not only reflect personal views, but those of all contest operators, sharing our mutual belief that contest operating is not just a benefit to amateur radio, but in fact is a necessity.

73, John, K1AR

## RSGB National Field Day

1500 to 1500Z Sat.–Sun., June 3–4

Activity for this CW-only Field Day is not confined to Great Britain. You will also hear some portable activity out of Germany and Switzerland.

Although overseas stations are not directly eligible, they are invited to participate and submit a report of the stations worked.

A certificate will be awarded to the overseas station in each continent that shows the most contacts. Send your logs to: RSGB HF Contest Committee, P.O. Box 73, Lichfield, Staffs., WS13 6UJ England.

## ARRL VHF Contest

1800–0300Z Sat.–Mon., June 10–12

Action will be found on the 50, 144, 220, and 420 MHz bands, and even higher up in the spectrum.

The scoring varies with the different

bands used, and there are certain requirements and restrictions in the rules. Working WAS on 6 meters is a possibility. Complete rules will be found in the May issue of *QST*.

I strongly recommend that you write to ARRL Headquarters for official forms. Include an SASE with your request to: ARRL VHF Contest, 225 Main St., Newington, CT 06111.

## South American CW Contest

1500Z Sat. to 1500Z Sun., June 10–11

Sponsored by *Electronica Popular* magazine of Brazil, and supervised by the Grupo Argentino de CW of Buenos Aires, this is an annual affair the second weekend of June.

It's still a CW contest only, but you can work stations in other continents as well as South America. Use all 6 bands, 1.8 through 28 MHz.

**Classes:** Single operator both single and all band, multi-operator, single transmitter, all band only and SWL.

**Exchange:** RST plus a QSO number starting with 001.

**Points:** Contacts with stations in own country zero points but okay for multiplier credit. Other countries but same continent, 2 points. Countries in other continents, 4 points. Contacts with South American stations, 8 points. (For stations outside of S.A.)

**Multiplier:** Different countries (DXCC list) plus the different South American prefixes worked on each band.

**Final Score:** Total QSO points times the sum total multipliers from each band.

**Awards:** Certificates to the three top-scoring stations in each country in each class.

Use a separate log sheet for each band and a summary sheet showing the scoring and other essential information. Include an SAE and one IRC for a copy of results.

Logs must be received no later than August 31st and go to: WWSA Contest Committee, P.O. Box 18003, 20772 Rio de Janeiro, RJ, Brasil.

## SMIRK (6 Meter) QSO Party

0000Z Sat. to 2400Z Sun., June 17–18

This is the 14th annual QSO party sponsored by the Six Meter International Radio Klub (SMIRK). The party is open to all, members and non-members, but it seems to be geared for membership participation.

Cross-band contacts are not permitted and competition is for single-operator only. Operation, of course, is confined to the 6 meter band.

**Exchange:** SMIRK number and grid square.

**Scoring:** Two points for each SMIRK contact; 1 point with non-members. Multiplier total QSO points by number of differ-

ent grid squares worked.

**Awards:** Certificates for winning scores in each ARRL section, foreign state, province, prefecture, United Kingdom shire/county/region, and country.

The new official log forms must be used. A large SASE to KA0NNO will get you detailed information and the new log forms.

It is strongly recommended that all contacts between stations in the contiguous 48 states take place above 50.125. Only contacts with stations outside the 48 states should take place below 50.125. This will help eliminate QRM to overseas stations.

Send your entries no later than July 6th to: Lisa Lowell, KA0NNO, P.O. Box 547, Hugo, CO 80821.

## RCV Valencia Contest

1600Z Sat. to 2200Z Sun., June 17–18

This activity organized by the Valencia branch of the Radio Club Venezolano is a yearly celebration of the "Carabobo Battle" of independence of Venezuela which took place on June 24, 1821. Participation in this contest has now been expanded to include Latin America and Caribbean Islands.

**Bands:** 20, 40, and 80 meters SSB.

**Categories:** Single operator, both single and all band.

**Exchange:** RS and QSO number starting with 001.

**Points:** Two points for contacts on 40 and 80, 4 points on 20 meters. Own country, zero points but counts as a multiplier.

**Multiplier:** One for each country plus each YV call area worked (9) counted once only.

**Final Score:** Total QSO points times the sum of the multiplier.

**Awards:** Medals to winners in each category and each band for Central America, South America, Caribbean area, and Bolivarian countries. There is a wide assortment of trophies for YV stations (minimum of 30 QSOs).

Check your log for dupes, etc. Non-YV stations are requested to include 10 IRCs to cover mailing costs of any possible awards.

Mailing deadline for logs is August 30th to: Radio Club Venezolano, P.O. Box 510, ZP 2001 Valencia, Venezuela.

## All Asian DX Contest

Phone: June 17–18 C.W.: Aug. 26–27  
0000Z Sat. to 2400Z Sun.

This is the 30th year of this activity sponsored by the JARL. The exchange is between Asian countries and the rest of the world.

**Classifications:** Single operator, both single and all band. Multi-operator, both single and multi-transmitter, all band only (one signal per band only).



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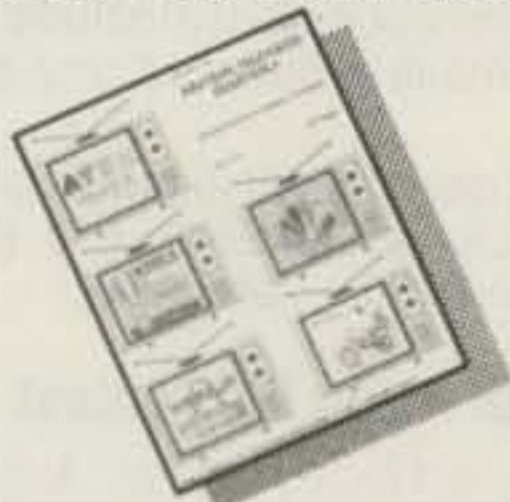
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Club stations are classified as multi-operator and each operator will give his age in the exchange.

**Exchange:** For OM's—RS(T) plus age of operator. For YL's—RS(T) and 00.

**Scoring:** 3 points for contacts on 160; 2 points for contacts on 80; 1 point on all other bands. (KA contacts do not count.)

**Multiplier:** For Asians the multiplier is determined by the number of different countries worked on each band (DXCC list). For non-Asians it is determined by the number of different Asian prefixes worked on each band (CQ WPX list).

**Final Score:** Total QSO points from all bands times the sum of the multiplier from each band.

Keep in mind that non-Asians use Asian prefixes as their multiplier, not countries.

**Note:** JD1 stations on Ogasawara (Bonin and Volcano) are in Asia, and JD1 stations on Minamitori Shima (Marcus) are in Oceania.

**Awards:** Certificates to the top scorers, both phone and CW, in each country and each U.S. call area. In each class, both single band and all band, up to the fifth rank, depending on the number of returns. Medals to the all-band continental leaders, both single and multi-operator.

**Logs:** Keep all times in GMT. Use a separate column for the country or prefix multiplier, and fill in only the first time it is worked. Use a separate log for each band. Include a summary sheet showing the scoring and other information, and a signed declaration that all rules and regulations have been observed.

There is a strict disqualification clause for taking credit for duplicate contacts in excess of 2% of the total on each band, as well as other infractions.

Logs must be received no later than Sept. 30th for the Phone section, and Nov. 30th for the CW section. They go to: JARL Contest Committee, P.O. Box 377, Tokyo Central, Japan.

**Asian Country List:** A4; A5; A6; A7; A9; AP; BV; BY; CR9; EP; HL/HM; HS; HZ/7Z; JA-JR; JD1; JT; JY; OD; S2; TA; UA/UK/UV/UW9-0; UD6; UK6C, D, K; UF6/UK6F, O, Q, V; UG/UK6G; UH8/UK8H; UI8/UK8A, G, I, L, O, T, Z; UJ8/UK8J, R; UL7/UK7; UM8/UK8M, N; VS6; VS9M/8Q; VU; VU (Andaman & Nicobar); VU (Laccadive); XU; XV/3W; XW; XZ; YA; YI; YK; ZC4/5B4; IS (Spratly); 4S; 4W; 4X/4Z; 70 (S. Yemen); 70 (Kamaran); 8Z4; 9K; 9M2; 9N; 9V; (Abu Ail).

### ARRL Field Day

1800-2100Z Sat.-Sun., June 24-25

Without a doubt this activity generates more stateside participation in manpower than any other amateur radio activity. It is mostly a club-organized activity, and requires that the coordinator be knowledgeable about what is required.

Entries are separated into many classes. Rules and requirements are quite extensive and will be found in the May issue of QST. It is advisable that you read them thoroughly.

Official log forms are a must. Direct your request with a large SASE to the ARRL, ARRL Field Day, 225 Main St., Newington, CT 06111.

### Canada Day Contest

0000 to 2400Z Saturday, July 1

Sponsored by the Canadian Amateur Radio Federation, this contest is open to all amateurs. Everyone works everyone on both sides of the border.

**Classes:** Single operator—All Band, CW, SSB, and both modes. Single band, CW/SSB. Multi-operator—Single transmitter and multi-transmitter, all band only.

**Exchange:** Name, RS(T), QSO no., province, territory, state, or country. Multi-multi stations use separate QSO no. for each band.

**Scoring:** 10 points for each Canadian contact, 4 points for contacts with stations outside of Canada, and 20 points can be claimed for working each official station using the VCA or TCA suffix.

**Multiplier:** Each Canadian province/territory worked on each band and mode.

**Frequencies:** 1825/75, 3525/3775, 7075/70/155, 14025/150, 21025/250, 28025/500.

**Awards:** Certificates to winning stations in each class, in each province/territory, DX country, and each US call area. Trophies for top scorers, all band, CW, SSB, and both modes. Single band 14 and 7 MHz. And multi-single and multi-multi stations.

Include a summary sheet with your entry showing the scoring, etc., and the usual signed declaration that all rules and regulations have been observed.

Mailing deadline is July 30th to: CARF Contest, Att: John Clarke, VE1CCM, 16 Keefe Ave., Sydney, Nova Scotia, B1R 2C7 Canada.

### Colorado 6 Meter Net Activity

1400Z Sat. to 0300Z Sun., July 1-2

All stations interested in making contacts on 50 MHz are invited to join this activity.

**Exchange:** Call, name, grid square, and S.I.N. number if any.

**Scoring:** Contacts with S.I.N. members count 3 points, with non-members 2 points. Multiply QSO points by number of states worked.

**Awards:** Certificates to first- and second-place winners. All entries will receive results of the scoring. A large SASE would be appreciated.

Mailing deadline is July 31st to: Richard C. Johnk, N0AKI, 8529 Fenton St., Arvada, CO 80003.



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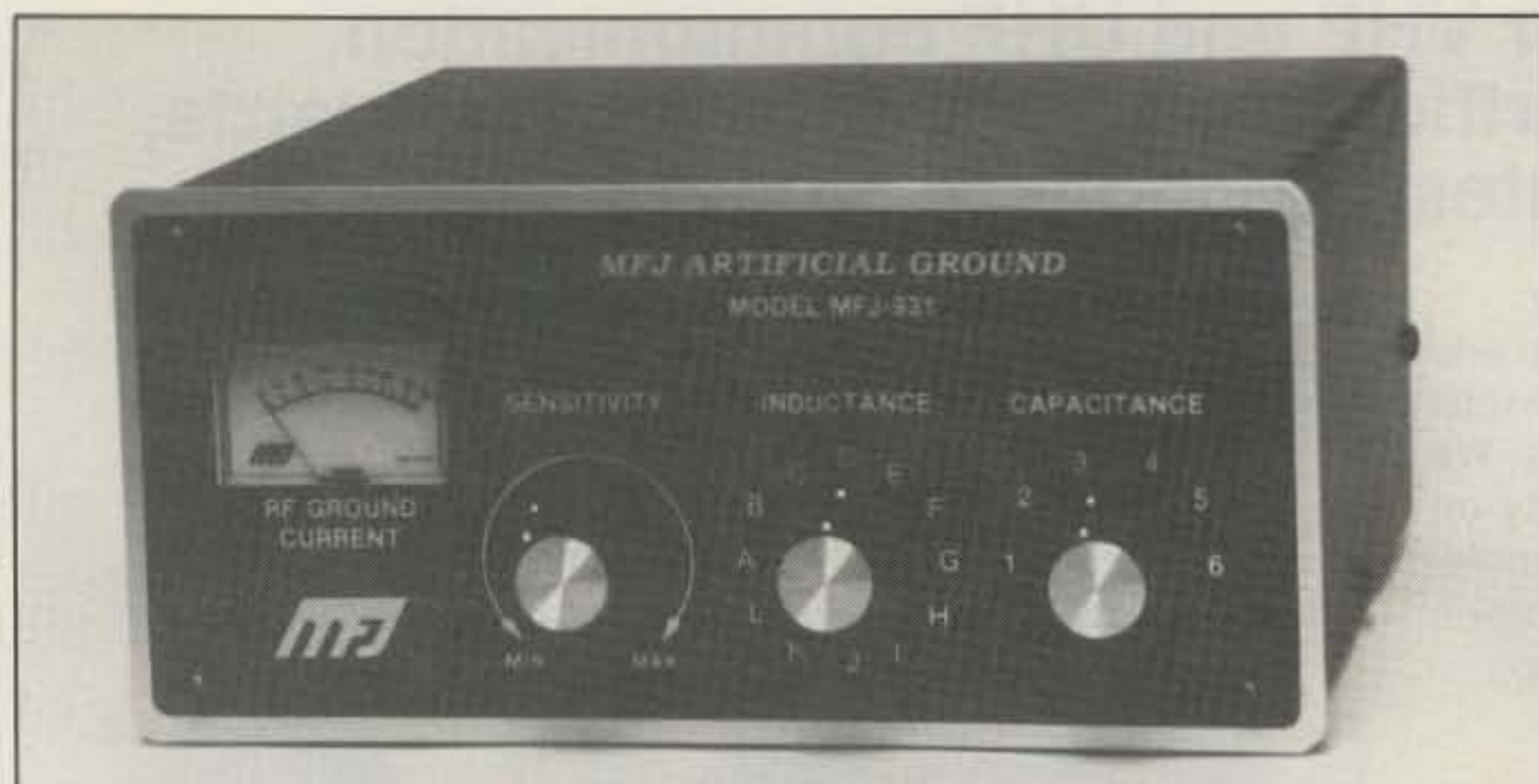
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## Radio Frequency Interference (RFI)



The MFJ-931 artificial ground. (See the text for details.)

**T**his month we discuss the symptoms, cause, and cure for one of amateur radio's oldest enemies—radio frequency interference. RFI can take its toll on the hobby of packet radio as well. For the record, this may be one of those articles you should place in the easy-to-get-to portion of your "Packet User's Notebook."

In the hobby of packet radio there is no place for RFI. Some facets of amateur radio can tolerate some effects of RFI, but packet radio seems to have its own type of adverse reaction to the presence of RFI.

The nature of digital communications is in the rise and fall times of some types of digital data. Other modulation techniques besides FSK are now being used to increase the speeds of digital data through the airwaves. Soon we will see the results as the base-rectified RFI begins to appear along with some of these newer digital modulating techniques such as Minimum Shift Keying (MSK) and Quadrature Phase Shift Keying (QPSK).

This month's "Packet User's Notebook" will explore the reasons why your packets may not be printing on other packet stations' screens, or why the incoming packets may not be printing on your screen. The reason may be the fault of something other than incorrect terminal parameters.

506 Pheasant Ridge Drive, Warner Robins, GA 31088

### Hum versus RFI

It could very well be that you have hum and even distorted audio caused by (1) poor power-supply regulation or (2) radio frequency interference. We will not quibble about the reasons why, but we will delve into the ways in which we can eliminate this worrisome culprit or at best subdue some of the troubles that are caused by RFI.

A good ground is "worth its salt" in the HF and VHF packet station. However, the ground is not the total answer. Use the ground(s) as you need to, but remember this: "A ground loses its effectiveness if its length exceeds an eighth of a wavelength of the frequency that you are using." If you happen to be using the 10 meter band, this works out to be just over 4 feet in length, and after that the ground wire-length becomes a radiator.

In effect, a ground loop is created, and the problems related to RFI also begin. As we go up in frequency to the VHF spectrum, we see that the wavelength gets shorter and so does the effective length of our grounds. At VHF we must be extremely careful with the ground wire lengths (distance between the driven ground-rod and the equipment), because a 20 inch length of ground wire can become a radiator or even an "absorption pick-up loop" at our favorite packet frequency.

To circumvent the problem in the HF packet frequencies I use an "artificial ground" model MFJ-931 (see photo). This will remove the worry of having a long

wire from the cold-water or ground rod to the equipment. The artificial ground lets me tune the reactance out of the long ground wire, and makes the ground rod appear to be very close to the HF equipment.

By observing the amount of ground current on the built-in RF ground current meter of the MFJ-931, I can eliminate almost all the stray RF which might be radiating along the ground wire. The artificial ground will send the stray RF to ground or otherwise present a resonant or quick DC path to any RF which may appear on the ground-wire connected to the equipment. Thus, the RF is dumped off before it ever has a chance to get to the system ground. The instructions supplied with the artificial ground are easy to follow.

### RFI At VHF Has A Different Personality

As technology increases, so does everything else, except the age-old problem of RFI. There have been numerous times when I've chased the ugly vermin around my computer room, *a la* radio room, only to discover the RFI culprit would appear somewhere else.

The last time I found myself in the wake of the noise and hum on my signal (both transmit and receive) I decided then and there to get rid of this dreaded nuisance once and for all. It didn't take long for me to discover that a good ground was only part of the cure. It took time, but at length we prevailed, or at least I've had a contented packet life in recent months.

### Beginning The Cleanup

One of my many encounters with RFI was in the early days of VHF packet. We all were beginning a new endeavor, and as many of you will recall, the TNC (sometimes called the "pad") was not inside a metal box nor was there a lot of trace bypassing as it is nowadays. At best, it was a couple of homebrew printed circuit boards sitting on two strips of wood.

If I had the power amplifier on, when I pressed the enter key to ship a packet to a connected station all chaos would break loose. Having had a couple of connected stations tell me they couldn't print all of my packets because there seemed to be a roughness to my signal, or that I had some hum on the carrier, I began looking for the source of the aggravation.

Note: An indicator of possible RFI prob-



# Regain Control

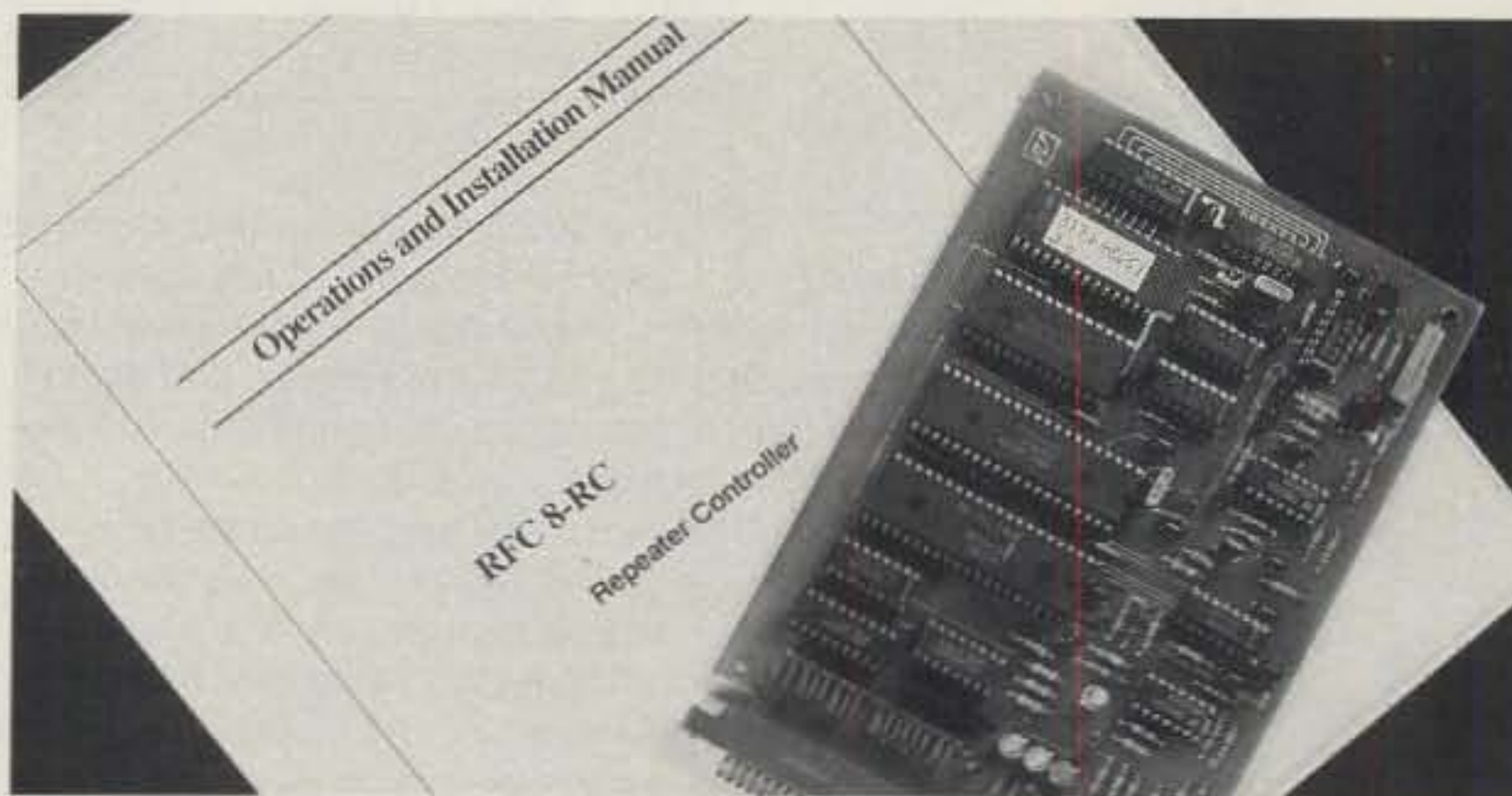
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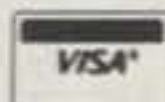
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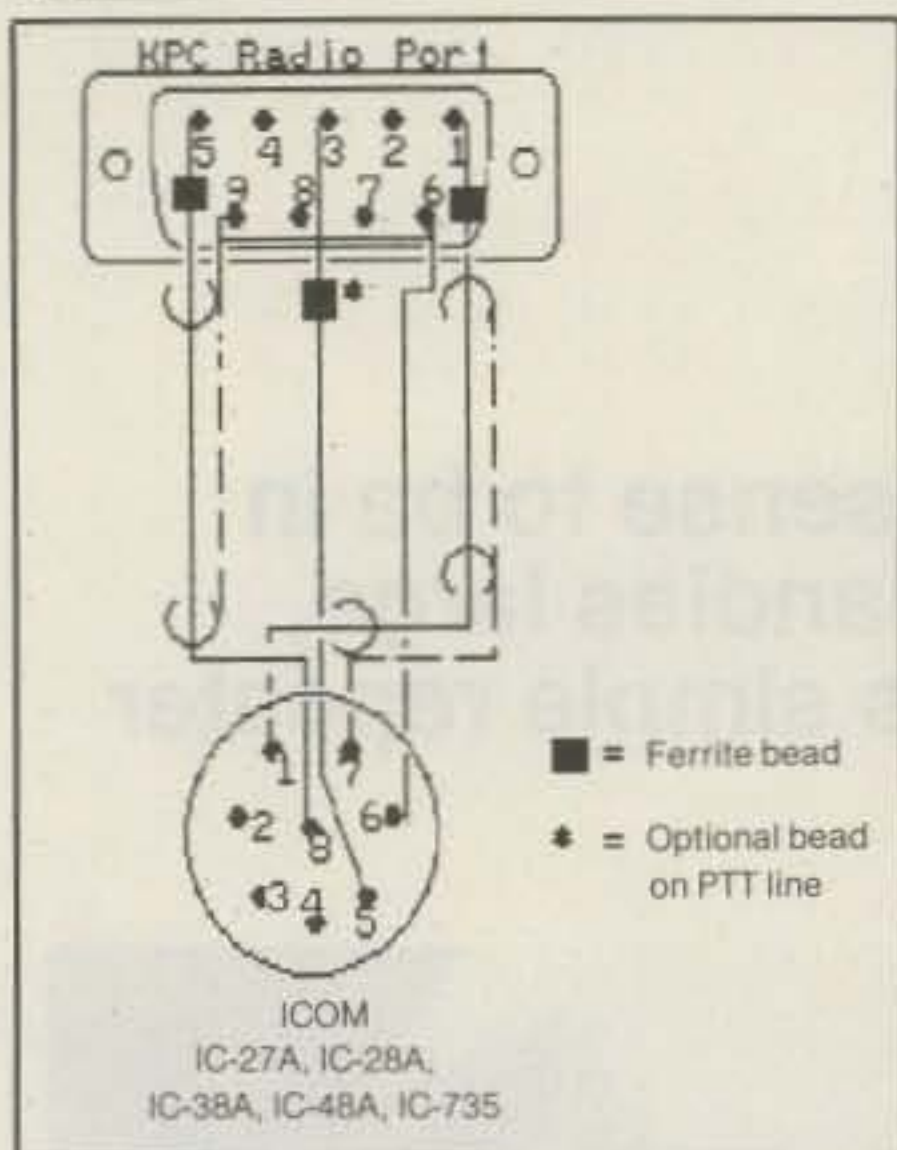


Fig. 1- To stop RFI from becoming a base-rectified DC component within the transceiver or the TNC, ferrite beads were placed on the AFSK mic audio lead at the TNC.

lems can be noted by a large number of "TRIES" even though the signal strength of both stations, connected direct, is good and the modulation is optimum!

As many of us have done in the past, I misread the description of the symptom that was given to me by the connected station, and began the search for my problem by looking at the ripple from my power supply. The power would be a clean power source as could be seen with a scope, and in the absence of the scope, I would use a digital volt/ohmmeter and watch the I/R drop during the transition from the load to no load (transmit to receive) condition. If the voltage was no more than a few millivolt (100 or so, but no more than 200) change in the meter movement, I would let it pass and go on to some other possible cause of the trouble.

RFI gives no clue as to where it will appear, whether in the transmit or the receive portion of our packet station. If the reports indicate the presence of RFI in the transmit audio, then I head for the TNC end of the interface cable that connects the TNC to the transceiver. The first thing I do to stop RFI from becoming a base-rectified DC component within the transceiver or the TNC is to place ferrite beads on the AFSK mic audio lead at the TNC (see fig. 1). The Amidon FB 73-1801 works well in this application.

Another means to subdue RFI is to place a .01 uFd 25 volt capacitor from mic input to ground. I avoid this latter step if I can because some of the audio frequencies are also bypassed to ground. In addition, most TNC manufacturers now install the correct bypass capacitors inside the TNC. To add extra bypassing external to the TNC could radically change

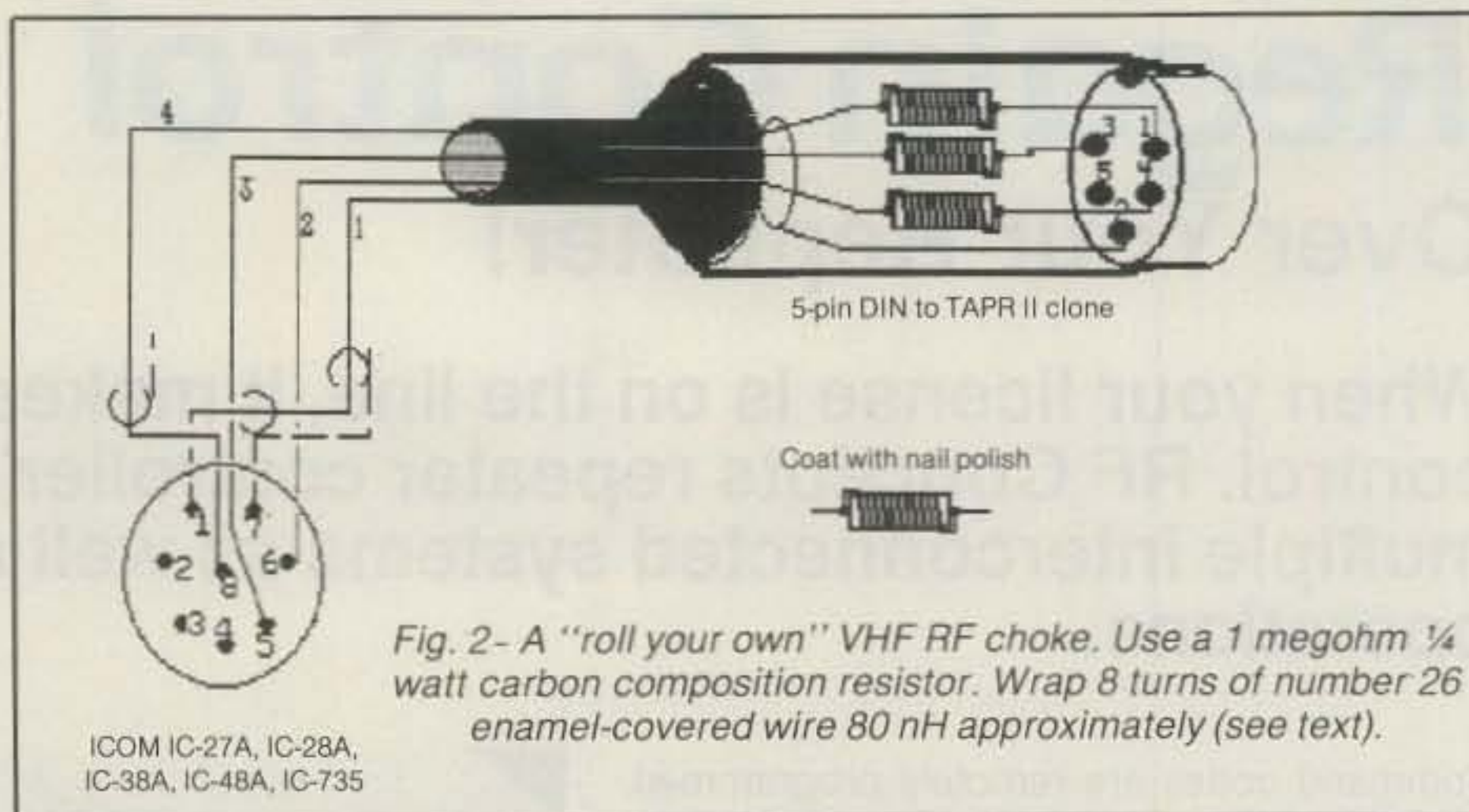


Fig. 2- A "roll your own" VHF RF choke. Use a 1 megohm 1/4 watt carbon composition resistor. Wrap 8 turns of number 26 enamel-covered wire 80 nH approximately (see text).

the audio equalization and compound the problem instead of improve it.

Many times the receive line is fed to the same connector, and while I'm inside the connector shell I may as well protect the receive lines from RFI as much as I can. I will add the same type ferrite bead to the receive wire as was used on the transmit audio line. To heck with it! I'll go a bit further and place one on the PTT wire, which in 85 percent of the cases will be inside this shell.

If you don't have access to the ferrite beads I have mentioned here, then look at fig. 2 and "roll your own" VHF RF choke. The 1 megohm composition 1/4 watt resistors which I used were small enough to fit inside the 5-pin DIN or the DB-9 connector shells. The resistors were just the right size to hold about 8 turns of #26 enamel-coated wire. This is enough inductance to form an 80 nH RF choke. Solder the ends of the wire to the resistor

leads as close to the body of the resistor as possible. Then install the newly formed RF chokes in series with the leads to and from the transmit and receive audio leads. The inclusion of the PTT line is optional and space dependent.

When you have completed the additions that we talked about so far, you may want to add a few ounces of prevention, or as the case may be, "some more cure." There are some relatively new devices on the market now which are appropriately called "Snap-On RF Chokes" (see fig. 3). These chokes can be added very quickly and easily to any cable size up to a half inch in diameter. There is no cutting or soldering to be done. Follow the easy installation instructions and you can almost see the problems go away. In fact, if you are using one of the home computers as a terminal (e.g., the TRS-80 Color Computer or the Commodore C64), you are already aware of the kind of RFI

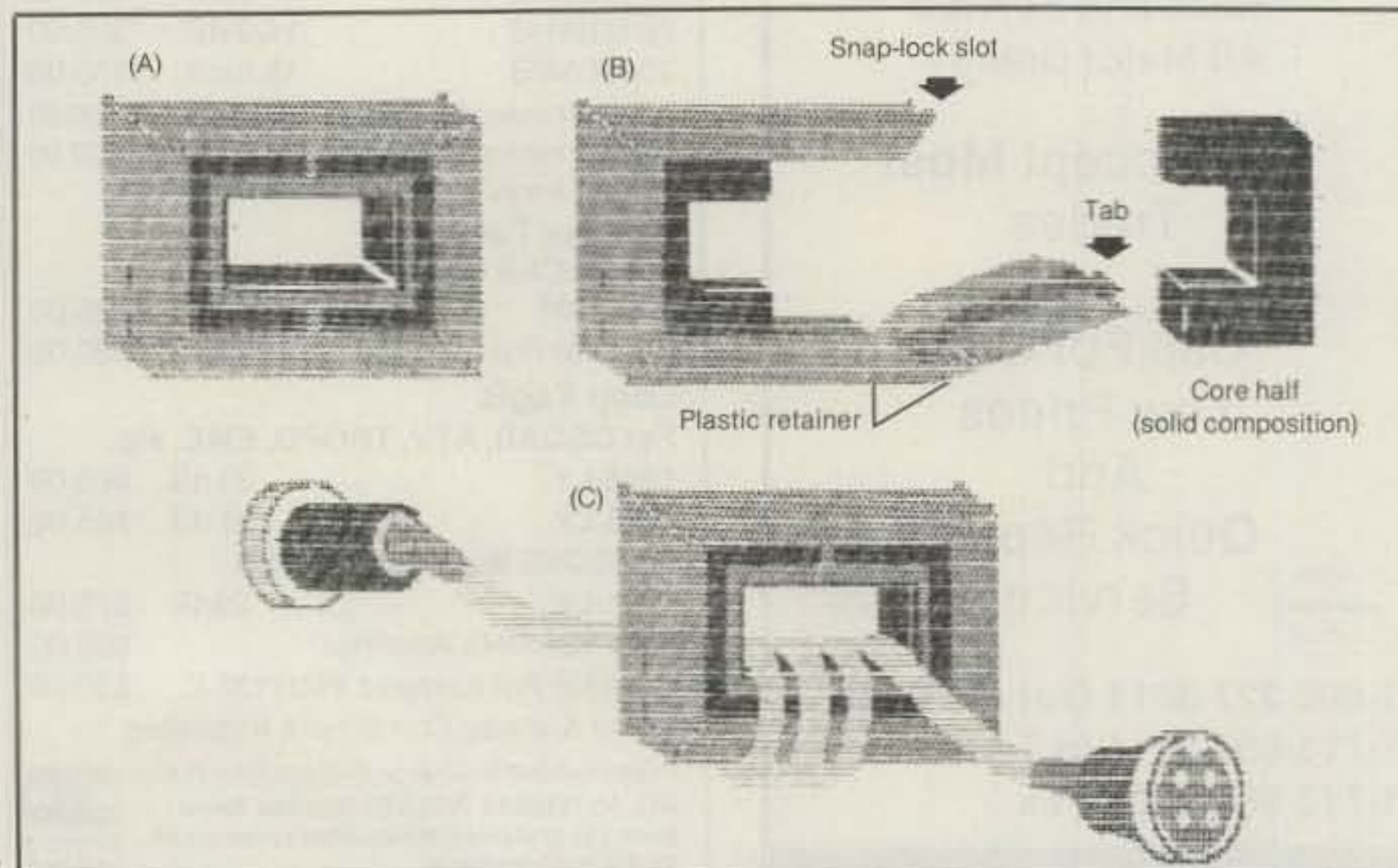
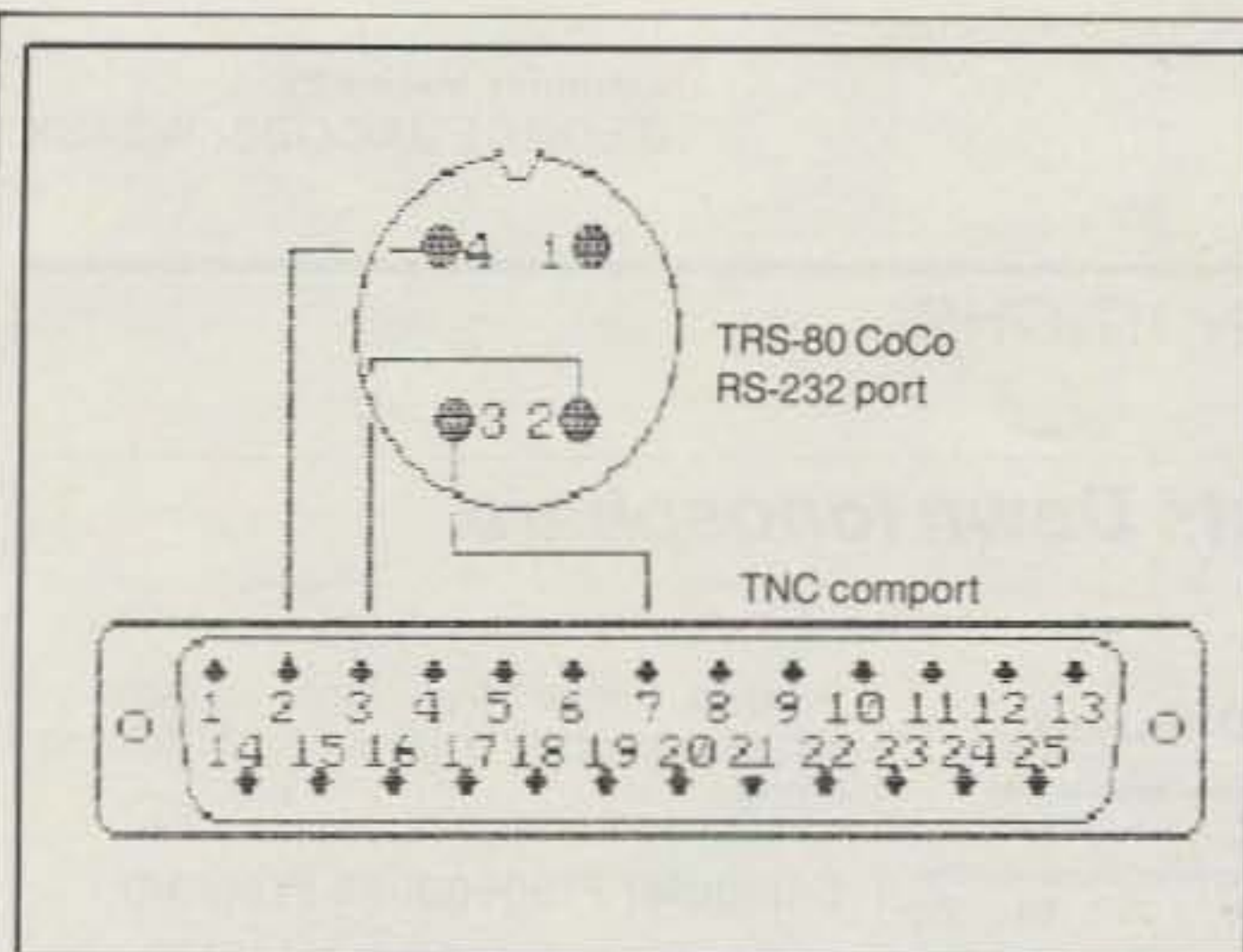
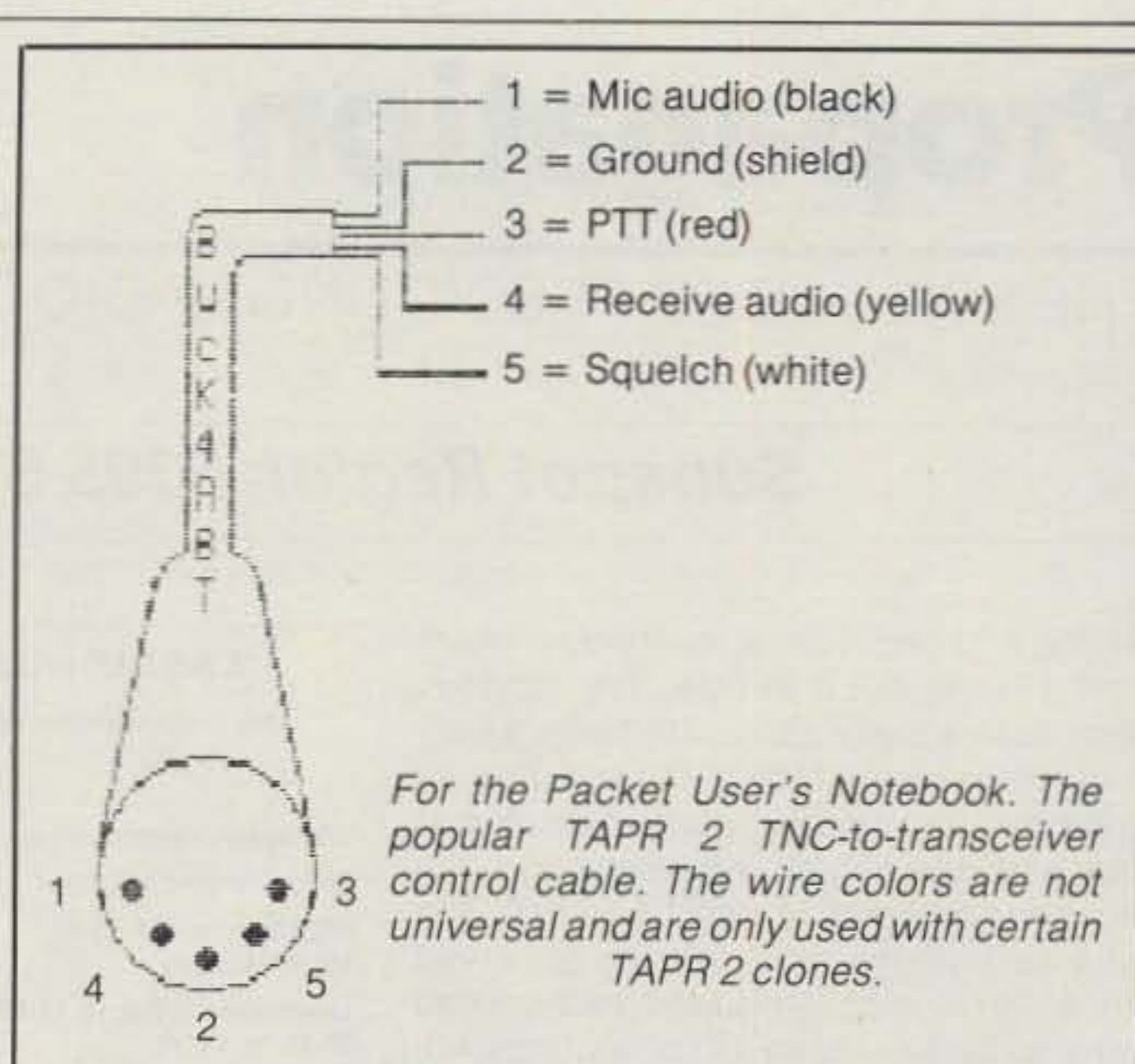


Fig. 3- The Snap-On RF Choke—(A) combined, (B) open, (C) configured. Additional turns and/or additional devices may be added for more suppression and attenuation of unwanted RFI.





For the Packet User's Notebook. TRS-80 Color Computer to TAPR 2 TNC. Note: Software handshaking is used when using only pins 2, 3, and 7 of the TNC.



For the Packet User's Notebook. The popular TAPR 2 TNC-to-transceiver control cable. The wire colors are not universal and are only used with certain TAPR 2 clones.

which causes the ripple and other picture distortion to your TV/monitors. We can use the Snap-On RF Choke to eliminate most, if not all, the RFI in the video by winding several turns of the computer-to-TV interface cable through the Snap-On Choke. It may take more than one of these Snap-On ferrite chokes to make the job complete, but the end result was well worth the effort for me. The Snap-On Chokes are model MFJ-701 and are listed at \$14.95 for a package of four. As it turns out, they must have known what we needed, because in the final cleanup I had used one on the radio-to-TNC cable, one on the terminal-to-TNC/RS-232 cable, and two on the CoCo-to-TV interface cable.

If the station has a problem with the telephone lines or vice-versa, try this little quick-cure. Fig. 4 is a method I've used with pleasing results. The .1 mFd 600 volt capacitor is placed directly across the telephone line. In a few instances I have added a 2.5 mH RF choke in series with each side of the phone line. The RF choke should have wire size suitable to sustain the current contained in the line when ringing current is present.

Finally, we get around to the metal oxide varistor (MOV). This device can cover

a multitude of crimes, some of which are in the RFI category. First and foremost is the ability of the MOV to chop noise and impulse-induced spikes from the power lines. Metal oxide varistors have been used in my computer room for four years, and I can attest to the product usefulness as a protective device. The MOV does more than reduce spikes and line noise. Its intended use is to shunt the line in the event of a power surge and pop the fuse, thus protecting the equipment up ahead. They work! The response time is measured in nanoseconds, and sometimes the MOVs don't recover. If they don't recover or they are shattered, so goes the way that your equipment could have gone. The price is minimal by comparison.

The science and theory of these little buggers makes for some good reading, but I won't go into it here. They can be purchased in the form of an AC plug adapter or as an add-on unit which appears very much like a large ceramic capacitor. The latter can be installed inside the equipment and represents a small price to pay for the kind of insurance they provide. The MOV can be found at most electronic supply stores and in some hardware stores.

**When installing any device inside your equipment, be sure all power is removed and use caution!**

With a few components and a little time you can have a better packet signal on the air. This will make your hobby more enjoyable to you and to the connected station(s). Happy packeting!

73, de BucK4ABT

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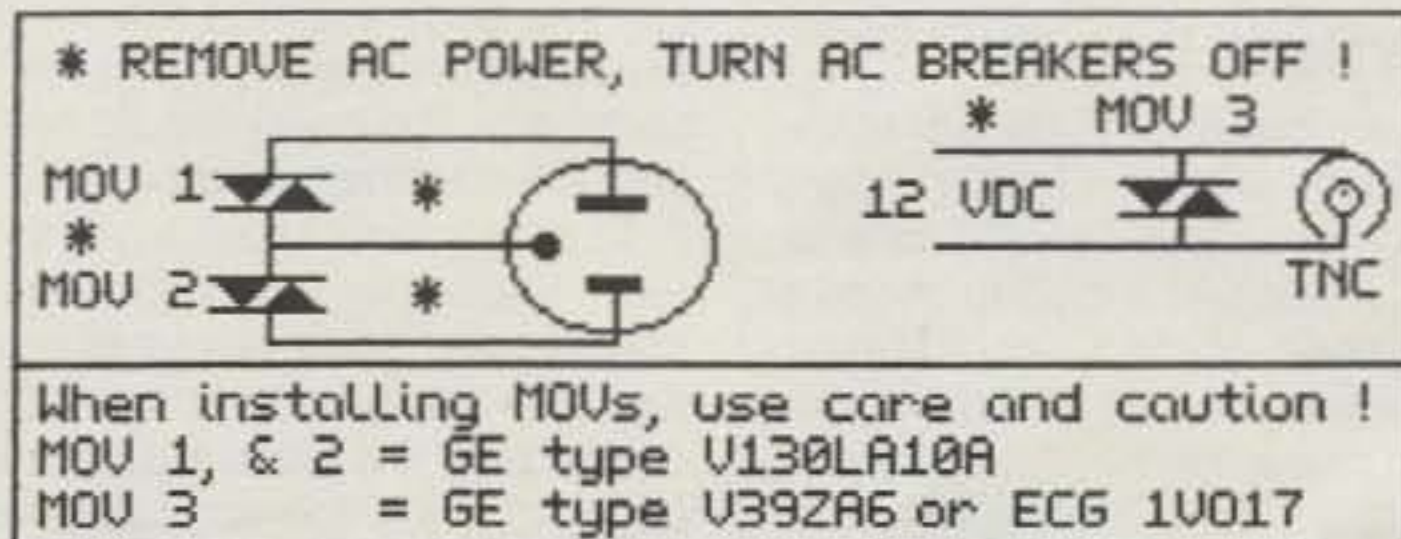


Fig.4- A "quick cure" to a problem with interference from telephone lines (see text).



## THE SCIENCE OF PREDICTING RADIO CONDITIONS

### Sunspot Region 5395 Shuts Down Ionosphere

It may sound like a carry-over April Fool's story, but it is true. Tremendous solar flare activity associated with a sunspot region on the face of the sun officially dubbed *Region 5395* caused an almost total blackout of high-frequency communications between March 13 and 15. The flare activity, the most intense observed since 1978, also produced widespread auroral displays seen as far south as Arizona and Colorado. It was also reported to have played havoc with satellite communications.

At the time this column was being written, data was still coming in for what may have been one of the largest solar flares ever recorded. The highlights of this event will be briefly covered here this month, with a special and more complete report planned for next month, including some exclusive pictures of the flare-out.

It all began when sunspot region 5395 rotated on the solar disk into view of the earth on March 6, and quickly produced an X-15 classification solar flare at 1354 UTC. This was the most intense solar flare of the present sunspot cycle, and the first X-15 level flare to be observed since July 11, 1978. The major spot from where the flare broke out was estimated to be approximately 36 times the size of the earth! Radiation from this flare, traveling at the speed of light, reached the ionosphere in 8 minutes, causing a Sudden Ionospheric Disturbance, or *SID*, which almost completely disrupted high-frequency communications in the daylight portion of the world for several hours on March 6.

Sunspot region 5395 was responsible for several dozen major flares before it passed out of sight of the earth on March 18. The one that did the most damage appears to have occurred on March 12th. Radiation from this flare caused one of the most intense geomagnetic storms ever recorded. Magnetic measuring instruments around the world went off scale, as the K-index rose to 9 and the A-index approached or exceeded 200 on March 13th and 14th. Widespread auroral displays were reported on both dates. On March 13th and 14th the ionosphere disappeared as far as high-frequency communications were concerned. Many

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#### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for June 1989

Propagation Index . . . . .	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 1, 7, 13-14	A	A	B	C
High Normal: 6, 8, 11-12, 15-16, 24-25, 29	A	B	C	C-D
Low Normal: 2-3, 5, 10, 17-18, 21-23, 26, 28, 30	A-B	B-C	C-D	D-E
Below Normal: 4, 9, 20, 27	B-C	C-D	D-E	E
Disturbed: 19	C-E	D-E	E	E

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

#### HOW TO USE THIS FORECAST

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

a radio amateur probably wondered if his receiver had gone bad, since the bands sounded absolutely dead for a long period of time.

Conditions began to pick up slowly on March 15th, but it wasn't until March 20th that the band really returned to normal. We plan to have a more complete report in next month's column.

#### Sunspot Cycle 22 Progress

The present sunspot cycle continues to climb towards what may be a record-setting maximum. The Royal Observatory of Belgium reports a median monthly sunspot number of 165 for February 1989. This results in a 12-month running smoothed sunspot number of 114 centered on August 1988. A smoothed sunspot number of approximately 174 is forecast for June 1989.

The 10.7 cm solar flux level rose accordingly during February 1989. The Al-

gonquin Radio Observatory in Ottawa, Ontario reported a level of 224 for the month.

#### Computer Propagation Program

In this column for October 1988 several computer propagation programs were reviewed. One that received special attention was the Base(2) product MUF-MAP™, which maps out MUF coverage on a world map. MUF-MAP is only available, however, for use with IBM-PC and clone computers. Randy Stegemeyer, W7HR, now informs me that a similar program by another manufacturer has been available for quite some time for the Apple Macintosh computer. This is the MacTrak® program, also known as Satellite Helper® as well as DX Helper®.

These programs also map out the MUF on a world map projection. MacTrak® was reviewed in the August 1988 issue of *CQ* (p. 64), and DX Helper® was reviewed in March 1989 (p. 61). Additional information and pricing for these programs can be obtained directly from MacTrak® Software, P.O. Box 1590, Port Orchard, WA 98366, or refer to their ad on page 118 of the April 1989 issue of *CQ*.

#### June Forecast

The exceptionally high level of solar activity expected during June should produce some pleasant surprises on the shortwave bands, particularly on 10, 15, and 20 meters.

Although normally dead for DX during the summer months, expect considerable DX on the 10 meter band this June and throughout the summer months of 1989. True, there will be fewer east-west openings than took place during the winter and spring months, but there should be plenty of good openings to more southerly and tropical areas. DX conditions are expected to be best during the late afternoon, and the band should remain open until shortly after sundown.

Look for some nice surprises on 15 meters. Expect the band to open for DX shortly after sunrise and to remain open well into the evening hours. This should be the best DX band during the hours of daylight, with openings possible to just about all areas of the world. Peak conditions should occur during the late afternoon hours, and to many parts of the world expect the band to remain open to



midnight! It's been a long time since 15 meters was a *nighttime* DX band, but expect it to be this June and during the summer months as well.

What's the surprise on 20 meters? Well, while this band is often thought of as *the* daytime DX band, this June it will provide the best in *nighttime* DX. While the band will open for DX shortly after sunrise, conditions are expected to be spotty until the late afternoon. Then, like a switch being thrown on, the band should come to life, with signal levels becoming louder and louder as sundown approaches. Expect conditions to peak an hour or two after sundown, and to remain excellent to most parts of the world to midnight and beyond. From sundown to well past midnight you are likely to hear DX signals on 20 meters like you haven't heard in nearly 20 years!

Fewer hours of darkness and an expected sharp seasonal increase in static levels will mask any improvement in 40, 80, and 160 meter DX propagation conditions. Yet some excellent openings can be expected this month on 40 meters to many parts of the world during the hours of darkness. The band won't sound as good as it did during the spring months, but signals often will be exceptionally strong. DX openings to many areas of the world are forecast for 80 meters this June, during the hours of darkness, but signals will often be weak and noisy. Not much DX is expected on 160 meters until the fall, but an occasional opening may be possible during the hours of darkness, with chances best just before sunrise on the *eastern* terminal of a path.

Expect plenty of *short-skip* openings on the shortwave bands this month. For distances less than 250 miles try 40 and 80 meters during the day and 80 and 160 meters at night. For openings between 250 and 750 miles, 40 meters should be best during the day with 20 meters a close second. Try 80 meters at night, with 40 meters a second choice. *Twenty* meters should be best for daytime openings between 750 and 1300 miles, with 40 meters best at night, backed up by 80 meters. Between distances of 1300 and 2300 miles use 20 meters during the day, with 15 as a second choice, with 40 meters expected to be best for this distance range at night. Frequent *short-skip* openings resulting from an expected seasonal increase in sporadic-E ionization should also be possible on 10 and 15 meters, over distances ranging between approximately 450 and 1300 miles. As its name implies, sporadic-E ionization can occur at any time, but it is usually most prevalent between 10 a.m. and 2 p.m. and again between 6 and 10 p.m. local daylight time.

This month's *CQ* Propagation Charts contain DX predictions for the period June 15 through August 15, 1989. Short-Skip Charts for June for openings be-

#### HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An \* indicates the best time to listen for 160 meter openings.

3. The *propagation index* is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

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

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

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate *daylight* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

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

#### June 15 to August 15, 1989 Time Zone: EDT EASTERN USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Central Europe & North Africa	16-18 (1)	08-09 (1) 09-12 (2) 12-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	09-15 (1) 15-16 (2) 16-18 (3) 18-00 (4) 00-03 (3) 03-05 (2) 05-07 (3) 07-09 (2)	20-21 (1) 21-22 (2) 22-23 (3) 23-01 (4) 01-02 (3) 02-03 (2) 03-04 (1) 21-22 (1)* 22-23 (2)* 23-00 (3)* 00-01 (2)* 01-02 (1)*
Northern Europe & USSR	15-17 (1)	11-15 (1) 15-18 (2) 18-19 (1)	09-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-01 (3) 01-03 (2) 03-06 (1) 06-09 (2)	21-22 (1) 22-23 (2) 23-00 (3) 00-01 (2) 01-02 (1) 22-01 (1)*
Eastern Mediterranean & Middle East	16-18 (1)	11-13 (1) 13-17 (2) 17-18 (3) 18-19 (4) 19-20 (3) 20-21 (2) 21-22 (1)	12-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-01 (3) 01-03 (2) 03-06 (1) 06-08 (2) 08-09 (1)	20-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Western Africa	11-13 (1) 15-17 (1) 17-19 (2) 19-21 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-23 (4) 23-03 (3) 03-04 (2) 04-05 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-03 (4) 03-04 (3) 04-05 (2) 05-07 (1)	20-22 (1) 22-00 (2) 00-02 (1) 22-00 (1)*
Eastern & Central Africa	17-19 (1)	09-12 (1) 12-14 (2) 14-17 (3) 17-19 (4) 19-22 (3) 22-23 (2) 23-00 (1)	14-16 (1) 16-18 (2) 18-20 (3) 20-00 (4) 00-02 (3) 02-03 (2) 03-05 (1)	21-00 (1)



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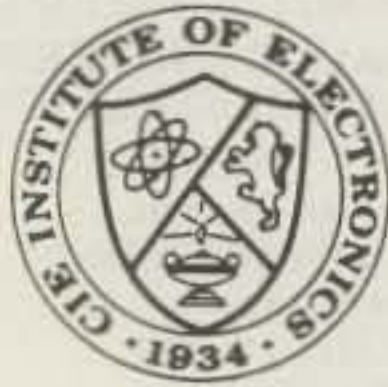
CIRCLE 93 ON READER SERVICE CARD

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Central & South Asia	NIL	09-10 (1) 10-12 (2) 12-13 (1) 17-19 (1) 19-22 (2) 22-23 (1)	17-20 (1) 20-23 (2) 23-03 (1) 03-06 (2) 06-08 (1)	19-21 (1) 04-06 (1)
Southeast Asia	NIL	10-14 (1) 14-16 (2) 16-19 (1) 19-21 (2) 21-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-19 (1) 19-21 (2) 21-23 (1) 23-02 (2) 02-03 (1)	04-06 (1)
Far East	NIL	09-10 (1) 10-12 (2) 12-18 (1) 18-20 (2) 20-22 (1)	06-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 18-21 (1) 21-23 (2) 23-02 (3) 02-04 (2) 04-06 (1)	04-06 (1)
South Pacific & New Zealand	16-18 (1) 18-20 (2) 20-22 (1)	09-11 (1) 14-16 (1) 16-18 (2) 18-19 (3) 19-21 (4) 21-22 (3) 22-00 (2) 00-01 (1)	18-20 (1) 20-23 (2) 23-01 (3) 01-04 (4) 04-05 (3) 05-06 (2) 06-09 (3) 09-10 (2) 10-12 (1)	01-03 (1) 03-05 (2) 05-06 (3) 06-07 (2) 07-08 (1) 04-06 (1)*
Australasia	18-19 (1) 19-21 (2) 21-22 (1)	10-12 (1) 17-18 (1) 18-20 (2) 20-22 (3) 22-23 (2) 23-00 (1)	21-23 (1) 23-01 (2) 01-03 (3) 03-05 (4) 05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1) 16-18 (1)	03-04 (1) 04-06 (2) 06-07 (1) 04-06 (1)*
Caribbean, Central America & Northern Countries of South America	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	08-09 (2) 09-12 (4) 12-14 (3) 14-21 (4) 21-01 (3) 01-03 (2) 03-08 (1)	06-07 (3) 07-10 (4) 10-11 (3) 11-15 (2) 15-17 (3) 17-03 (4) 03-05 (3) 05-06 (2)	19-20 (1) 20-21 (2) 21-23 (3) 23-03 (4) 03-04 (3) 04-05 (2) 05-06 (1) 22-23 (1)* 23-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	10-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-21 (2) 21-22 (1)	07-08 (1) 08-11 (2) 11-15 (1) 15-16 (2) 16-17 (3) 17-23 (4) 23-01 (3) 01-02 (2) 02-03 (1)	10-16 (1) 16-18 (2) 18-19 (3) 19-02 (4) 02-04 (3) 04-07 (2) 07-09 (3) 09-10 (2)	20-21 (1) 21-22 (2) 22-02 (3) 02-04 (2) 04-05 (1) 22-03 (1)*
McMurdo Sound, Antarctica	15-17 (1)	16-18 (1) 18-21 (2) 21-22 (1)	17-19 (1) 19-22 (2) 22-03 (3) 03-05 (2) 05-06 (1) 07-09 (1)	02-05 (1)

### Time Zones: CDT & MDT (24-Hour Time) CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Southern Europe & North Africa	NIL	11-15 (1) 15-17 (2) 17-18 (3) 18-19 (2) 19-20 (1) 23-01 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-18 (3) 18-22 (4) 22-02 (3) 02-03 (2) 03-05 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-00 (1)*
Northern & Central Europe & European USSR	Nil	10-15 (1) 15-17 (2) 17-18 (1)	02-06 (1) 06-09 (2) 09-15 (1) 15-18 (2) 18-19 (3) 19-21 (4) 21-00 (3) 00-02 (2)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Eastern Mediterranean & Middle East	15-17 (1)	11-16 (1) 16-17 (2) 17-19 (3) 19-20 (2) 20-21 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-00 (2) 00-02 (1) 07-09 (1)	21-23 (1)

Western Africa	10-12 (1) 15-16 (1) 16-18 (2) 18-20 (1)	10-12 (1) 12-15 (2) 15-17 (3) 17-21 (4) 21-00 (3) 00-02 (2) 02-03 (1)	14-15 (1) 15-16 (2) 16-18 (3) 18-00 (4) 00-02 (3) 02-04 (2) 04-06 (1)	20-00 (1) 22-00 (1)*
Eastern & Central Africa	16-18 (1)	10-14 (1) 14-16 (2) 16-17 (3) 17-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	15-17 (1) 17-18 (2) 18-19 (3) 19-22 (4) 22-00 (3) 00-02 (2) 02-04 (1)	21-23 (1)
Southern Africa	09-12 (1)	08-10 (1) 10-11 (2) 11-12 (4) 12-13 (3) 13-14 (2) 14-15 (1) 00-02 (1)	23-00 (1) 00-02 (3) 02-04 (2) 04-06 (1) 12-14 (1) 14-15 (2) 15-17 (3) 17-18 (2) 18-19 (1)	21-22 (1) 22-00 (2) 00-01 (1) 22-00 (1)*
Central & South Asia	NIL	09-11 (1) 11-12 (2) 12-13 (1) 15-18 (1) 18-21 (2) 21-23 (1)	17-19 (1) 19-22 (2) 22-02 (1) 02-06 (2) 06-08 (3) 08-09 (2) 09-10 (1)	19-21 (1) 05-07 (1)
Southeast Asia	NIL	10-11 (1) 11-14 (2) 14-19 (1) 19-22 (2) 22-00 (1)	07-09 (2) 09-11 (1) 16-18 (1) 18-20 (2) 20-23 (1) 23-00 (2) 00-01 (3) 11-02 (2) 02-03 (1)	03-05 (1)
Far East	NIL	09-11 (1) 13-15 (1) 17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-12 (1) 20-22 (1) 22-00 (2) 00-03 (3) 03-04 (2) 04-05 (1)	04-05 (1) 05-06 (2) 06-07 (1) 04-06 (1)*
South Pacific & New Zealand	14-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	13-16 (1) 16-18 (2) 18-20 (3) 20-22 (4) 22-23 (3) 23-00 (2) 00-01 (1)	17-19 (1) 19-23 (2) 23-02 (4) 02-05 (3) 05-07 (2) 07-09 (4) 09-10 (3) 10-11 (2) 11-13 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-08 (1) 01-04 (1)* 04-06 (2)* 06-07 (1)*
Australasia	16-17 (1) 17-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	14-15 (1) 15-17 (2) 17-19 (1) 19-20 (2) 20-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	22-00 (1) 00-01 (2) 01-04 (4) 04-05 (3) 05-07 (2) 07-09 (4) 09-11 (2) 11-12 (1)	01-03 (1) 03-07 (2) 07-08 (1) 03-06 (1)*
Caribbean Central America & Northern Countries of South America	10-12 (1) 12-14 (2) 14-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	08-09 (2) 09-10 (3) 10-12 (4) 12-14 (3) 14-19 (4) 19-23 (3) 23-01 (2) 01-08 (1)	03-05 (2) 05-07 (3) 07-09 (4) 09-11 (3) 11-15 (2) 15-17 (3) 17-01 (4) 01-03 (3)	19-20 (1) 20-21 (3) 21-23 (4) 23-00 (3) 00-03 (2) 03-05 (3) 05-06 (1) 20-22 (1)* 22-04 (2)* 04-05 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	07-08 (1) 08-10 (2) 10-14 (1) 14-15 (2) 15-16 (3) 16-22 (4) 22-00 (3) 00-01 (2) 01-02 (1)	10-15 (1) 15-17 (2) 17-18 (3) 18-01 (4) 01-03 (3) 03-07 (2) 07-09 (3) 09-10 (2)	20-21 (1) 21-22 (2) 22-02 (3) 02-03 (2) 03-05 (1) 20-03 (1)*
McMurdo Sound, Antarctica	15-18 (1)	14-16 (1) 16-17 (2) 17-18 (3) 18-19 (2) 19-21 (1)	17-19 (1) 19-22 (2) 22-02 (3) 02-04 (2) 04-07 (1) 07-09 (2) 09-10 (1)	02-06 (1)

### Time Zones PDT (24-Hour Time) WESTERN USA TO:

	10 Meters	15 Meters	20 Meters	40/80 Meters
Western & Southern Europe & North Africa	NIL	08-09 (1) 09-11 (2) 11-15 (1) 15-17 (2) 17-18 (1) 21-23 (1)	23-01 (3) 01-06 (1) 06-08 (2) 08-14 (1) 14-16 (2) 16-21 (3) 21-23 (2)	20-23 (1)



Central & Northern Europe & European USSR	NIL	07-09 (1) 13-14 (1) 14-16 (2) 16-17 (1)	13-15 (1) 15-19 (2) 19-00 (3) 00-01 (2) 01-06 (1) 06-08 (2) 08-10 (1)	20-22 (1)
Eastern Mediteranean & Middle East	NIL	07-09 (1) 11-15 (1) 15-17 (2) 17-18 (1) 22-00 (1)	13-16 (1) 16-20 (2) 20-22 (3) 22-00 (2) 00-02 (1) 06-08 (1)	20-21 (1)
Western & Central Africa	09-14 (1) 14-16 (2) 16-18 (1)	07-11 (1) 11-13 (2) 13-17 (3) 17-19 (2) 19-21 (1)	13-15 (1) 15-17 (2) 17-19 (3) 19-22 (4) 22-00 (3) 00-04 (2) 04-08 (1)	20-22 (1)
Eastern Africa	NIL	09-14 (1) 14-16 (2) 16-17 (3) 17-18 (2) 18-19 (1) 00-02 (1)	15-17 (1) 17-19 (2) 19-22 (3) 22-00 (2) 00-02 (1)	NIL
Southern Africa	09-12 (1)	08-10 (1) 10-11 (2) 11-12 (3) 12-14 (2) 14-15 (1)	14-15 (1) 15-17 (2) 17-18 (1) 22-23 (1) 23-00 (2) 00-02 (3) 02-03 (2) 03-06 (1) 06-08 (2) 08-10 (1)	20-23 (1)
Central & South Asia	NIL	08-10 (1) 10-12 (2) 12-14 (1) 17-19 (1) 19-22 (2) 22-23 (1)	05-07 (2) 07-09 (3) 09-10 (2) 10-11 (1)	05-07 (1) 19-20 (1)
Southeast Asia	11-15 (1)	08-09 (1) 09-11 (3) 11-13 (2) 13-16 (1) 20-22 (1) 22-00 (2) 00-02 (1)	23-01 (1) 01-03 (2) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	03-07 (1)
Far East	14-16 (1)	09-10 (1) 10-12 (2) 12-15 (1) 15-17 (2) 17-19 (3) 19-21 (2) 21-23 (1)	19-21 (1) 21-23 (2) 23-01 (3) 01-04 (4) 04-06 (3) 06-07 (2) 07-09 (3) 09-11 (2) 11-14 (1)	01-02 (1) 02-03 (2) 03-05 (3) 05-06 (2) 06-07 (1) 03-05 (1)*
South Pacific & New Zealand	12-14 (1) 14-16 (2) 16-18 (3) 18-20 (4) 20-21 (2) 21-22 (1)	11-13 (1) 13-15 (2) 15-18 (3) 18-21 (4) 21-22 (3) 22-23 (2) 23-01 (1)	17-19 (1) 19-21 (2) 21-03 (4) 03-05 (3) 05-07 (2) 07-09 (3) 09-11 (2) 11-13 (1)	22-23 (1) 23-01 (2) 01-06 (3) 06-07 (2) 07-08 (1) 23-02 (1)* 02-05 (2)* 05-06 (1)*
Australasia	14-17 (1) 17-19 (2) 19-21 (3) 21-22 (2) 22-23 (1)	07-09 (1) 13-17 (1) 17-19 (2) 19-22 (3) 22-00 (4) 00-01 (3) 01-02 (2) 02-03 (1)	20-22 (1) 22-00 (2) 00-05 (4) 05-07 (3) 07-09 (4) 09-10 (2) 10-13 (1) 13-15 (2) 15-17 (1)	22-00 (1) 00-01 (2) 01-05 (3) 05-06 (2) 06-08 (1) 01-04 (1)*
Caribbean Central America & Northern Countries of South America	09-11 (1) 11-12 (2) 12-14 (3) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	08-09 (2) 09-10 (3) 10-12 (4) 12-14 (3) 14-19 (4) 19-21 (3) 21-00 (2) 00-08 (1)	08-11 (3) 11-15 (2) 15-17 (3) 17-01 (4) 01-04 (3) 04-05 (2) 05-06 (3) 06-08 (4)	19-21 (1) 21-22 (2) 22-00 (3) 00-03 (2) 03-04 (3) 04-05 (2) 05-06 (1) 21-23 (1)* 23-03 (2)* 03-04 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	09-12 (1) 12-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	06-07 (1) 07-09 (2) 09-13 (1) 13-15 (2) 15-16 (3) 16-23 (4) 23-00 (3) 00-01 (2) 01-02 (1)	09-15 (1) 15-17 (2) 17-18 (3) 18-01 (4) 01-03 (3) 03-06 (2) 06-08 (3) 08-09 (2)	20-21 (1) 21-22 (2) 00-02 (1) 02-03 (3) 03-04 (2) 04-05 (1) 02-04 (1)*
McMurdo Sound, Antarctica	17-19 (1)	14-16 (1) 16-17 (2) 17-19 (3) 19-21 (2) 21-22 (1)	16-18 (1) 18-19 (2) 19-02 (3) 02-04 (2) 04-06 (1) 06-08 (2) 08-10 (1)	00-23 (1) 23-01 (2) 01-04 (1) 04-06 (2) 06-07 (1)

\* Indicates best time for eighty meter openings. Openings on 160 meters are also likely to occur during those times when 80 meter openings are shown with a propagation index of (2), or higher.

tween 50 and 2300 miles and from Hawaii and Alaska appeared in last month's column.

## VHF Ionospheric Openings

Sporadic-E ionization is also expected to result in some fairly frequent 6 meter short-skip openings over a range from 1000 to 1400 miles. During intense and widespread sporadic-E ionization, two-hop openings well beyond 1300 miles may also be possible at times. An occasional sporadic-E opening on 2 meters can occur, particularly when ionization is very intense, over distances between approximately 1200 and 1400 miles.

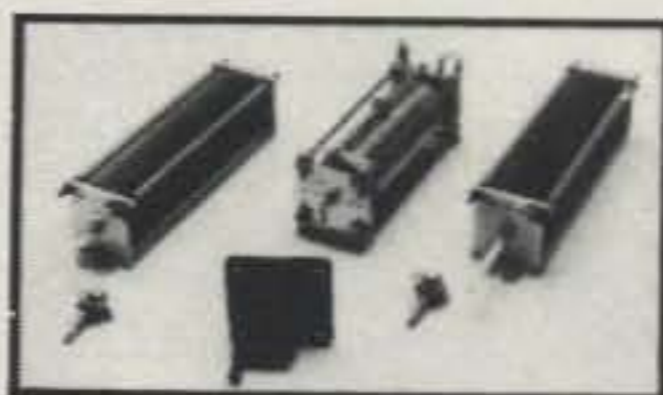
Two minor meteor showers are expected during June, the *Herculids* and *Scorpiids*. They may produce enough me-

teor ionization between June 3rd and 5th to permit some meteor-type openings on the VHF bands.

There is usually a seasonal decline in TE propagation during the summer months, but some 6 meter openings may still be possible during June. TE openings must cross the geomagnetic equator at or near a right angle, and the best time for such openings is between 8 and 11 p.m. local daylight time. Conditions favor openings deep into South America from the Central American and Caribbean areas in this hemisphere, as well as from the southern tier states in the USA. Openings can, however, extend at times into more northern states as well. Similar north-south TE openings are possible in other areas of the world.

73, George, W3ASK

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CIRCLE 65 ON READER SERVICE CARD





### FCC Receives "No-Code" Petition!

**T**he Space Coast Amateur Technical Group, of Melbourne, Florida, has filed a formal petition for rule making with the FCC requesting a class of amateur radio license which does not require proficiency in the International Morse code. The petition was filed for the group by William E. Newkirk, WB9IVR, who works in the technical documentation department of nearby Collins/Rockwell International.

The group, which is made up of technical people employed at the Kennedy Space Center, Harris and Collins/Rockwell International, and students at nearby Florida Institute of Technology petitioned the FCC to create a new class of license to be known as the Apprentice class. It also provides for the grandfathering and eventual elimination of the current Novice class license. The new license class will not offer any privileges below 30 MHz.

The group says the goals of the new amateur radio license are to:

1. "... minimally disrupt the existing license structure to avoid disenfranchising current licensees;
2. "... avoid isolating the newcomer from the mainstream of amateur radio operators and operations while maintaining the incentive to upgrade;
3. "... provide attractive privileges for the newcomer so he or she will use their license once it has been issued;
4. "... have a minimum testing burden on the examiner and candidate;
5. "... conform to international treaties regarding amateur licensing requirements; and
6. "... form new base privileges for all higher classes of license."

#### Description of the New License

Newkirk said he selected the name "Apprentice" by consulting the thesaurus of a popular word-processing program to find a replacement for the word novice. "The dictionary defines an apprentice as one who is learning by practical experience under skilled workers of a trade, art, or calling," he said.

There are some novel features to the Space Coast petition for rule making. Li-

cencees in the code-free Apprentice class are limited to one 10-year term. An Apprentice licensee may, however, re-test prior to the conclusion of the license term to continue his/her Apprentice status.

Element 2, the present Novice written examination, will become the prerequisite for the Apprentice class and will deal primarily with operations, rules, and regulations above 30 MHz. "It is expected that it will be necessary to expand the Element 2 exam from 30 to 50 questions to make a more comprehensive examination," the petition reads.

The new Apprentice license will have the following privileges:

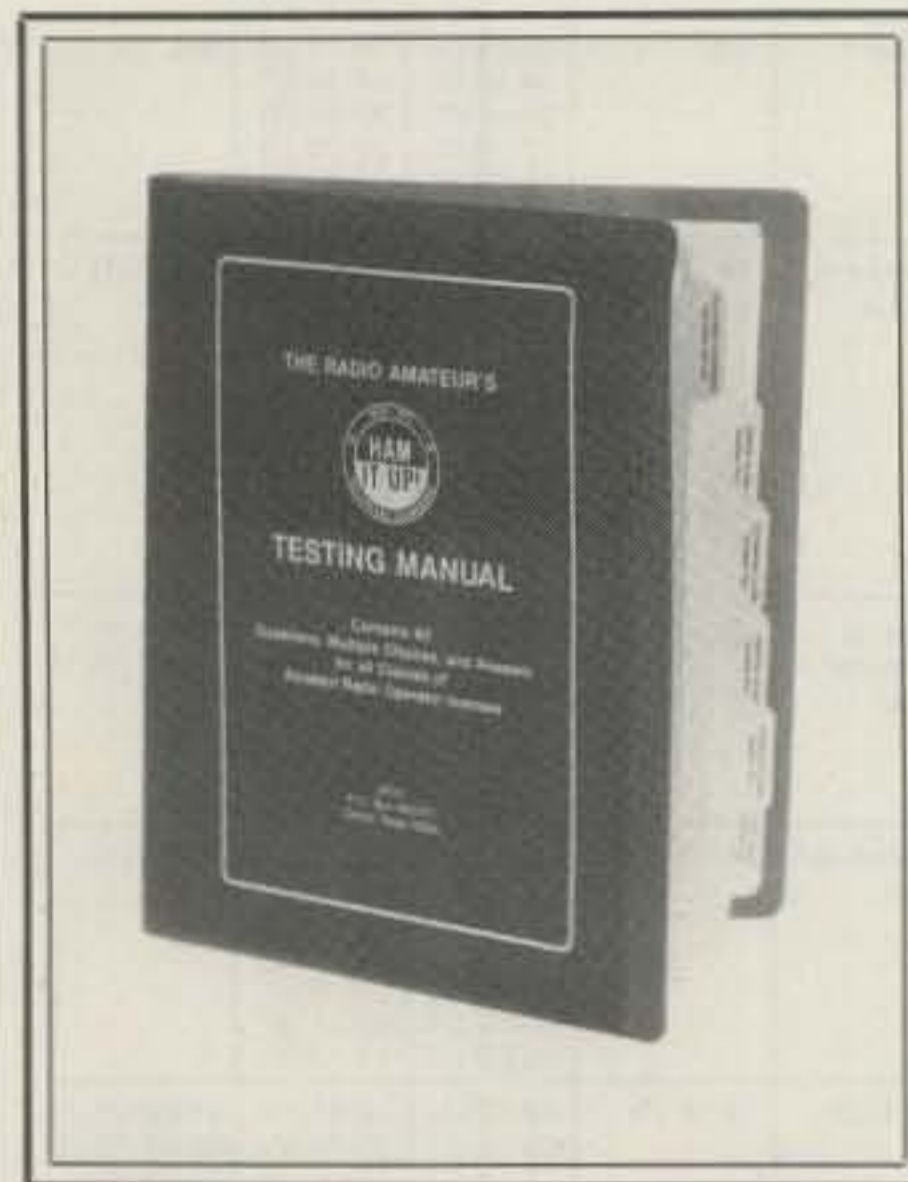
1. All frequencies and emission modes assigned to the U.S. Amateur Radio Service above 30 MHz.
2. 1500 watt peak envelope power output power limitations.
3. Group D (two-letter prefix followed by the radio district numeral and a three-letter suffix) will be issued to the Apprentice licensees.
4. Examiner requirements will be the same as for the current Novice license (i.e., two unrelated examiners over age 18 holding current General or higher class licenses.)

#### Impact on Other Licenses

The Technician and higher license grades are not affected. The Space Coast ATG said that the Novice class license will no longer be issued or renewed when the Apprentice license is made available. Novices will acquire the same privileges as the Technician license for the term of their license. Novice class licensees renewing their license will be issued the Apprentice license (which will carry only Apprentice privileges and not continue Novice privileges. Thus, a Novice who does not upgrade to the Technician level before his/her Novice license expires would lose his HF privileges.)

Novices upgrading to Technician will only be required to take the Element 3A test. Apprentice class amateurs upgrading to the Technician class would have to pass the five word-per-minute Element 1(A) code test in addition to the Element 3(A) written exam.

In conclusion, the Space Coast Amateur Technical Group adds: "There is an argument that various no-code licenses



*W5YI-VEC Testing teams that test on a periodic basis are sent complete examination instructions and all question pools.*

have been proposed before and have been unmercifully slaughtered by the amateur community. These proposals have been ill-timed, improperly presented, or lacked understanding of the amateur service. We believe that the time is right for a license that takes advantage of all internationally agreed upon rules regarding code requirements to be made available in the United States.

"Morse code operations were once the only way to make radio communication possible. It is now just a facet of an entire spectrum of possible methods of radio communications. It is no longer in keeping with the basis and purpose of the Amateur Radio Service to stress one facet of radio communications over all others. Knowledge of code doesn't eliminate rules violations or uncourteous operations.

"If the Commission and the amateur community are concerned that a 'flood' of Apprentices would make the service less viable, one solution would be to reduce the term of the license (currently suggested at ten years) to five or two. In this way, someone interested in amateur radio could see what the service is about,

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



and if he/she's really interested, will seek to upgrade on his/her own."

## Scanner Labeling Rules Terminated

After two years of consideration, the FCC has made up its mind about what to do about scanners that can receive radio transmissions that are protected by the Electronic Communications Privacy Act of 1986 (ECPA).

Regency Electronics had filed a petition asking the FCC to amend Part 15 of its rules to require an advisory label on scanners that would caution: "Improper use of this device may violate the provisions of the Electronic Privacy Act of 1986 through intentional unauthorized interception of protected radio communications." Regency stated that requiring labeling would help educate the public that certain uses of scanners could be illegal in light of the ECPA. Intentional monitoring of protected frequencies—particularly 800 MHz cellular phone conversations—carries stiff penalties. Strangely, cordless phone calls are exempt!

The FCC said that while ECPA placed no direct obligation on the Commission, the Senate Report that accompanied the ECPA indicates that labeling might be an acceptable method of fostering compliance with the law. The Commission tentatively concluded that a label appeared to be the simplest and least burdensome method of advising general radio receiver and scanner users of ECPA prohibitions. The FCC issued an NPRM along these lines.

The Notice, which did not propose specific wording for the label, addressed the possibility of "blocking" frequencies which carry protected communications. The Commission noted, however, that this approach may not be practical because common spectrum in many cases is used for both protected and unprotected communications.

Comments on the NPRM were received primarily from two factions—cellular telephone interests and those engaged in recreational monitoring of the radio spectrum. Both opposed scanner labeling, but for different reasons.

The Cellular Telecommunications Industry Association (CTIA) argued that such warning labels would not only allow, but call attention to, scanners which could pick up the protected 800 MHz cellular bands while shielding manufacturers from liability for privacy violations. Cellular commenters believe that manufacturers should be prohibited from marketing devices capable of receiving communications protected by the ECPA. They support a requirement that certain frequencies be blocked.

While most manufacturers market either scanners or cellular phones, Radio Shack sells both. They thus saw fit to eliminate the 800 MHz cellular channels from their Realistic PRO-2004 scanner by

adding a diode. How to snip out the D-513 diode and restore the missing 800 MHz channels has been well covered in many publications.

Scanner users (represented by SCAN, the Scanner Association of North America, headed up by amateur Bob Hanson, W9AIF; and ANARC, the Association of North American Radio Clubs) said a clear explanation should be contained in the owners manual or elsewhere defining "protected communications." SCAN went on to explain that without such an explanation, the label may merely serve to disturb the owner or might convey the "wholly unwarranted and highly objectionable impression that the mere possession of a scanner is a violation of the ECPA."

In its final ruling on the matter, the FCC said they now do not believe that technically blocking frequencies is a desirable approach. "As pointed out in the NPRM, although the ECPA prohibits interception of certain classes of communications, the frequencies on which these communications are transmitted can be used for unprotected transmissions as well. In addition, the ECPA does not prohibit the manufacture and sale of scanners or any receiver based solely on the ability to receive specific frequencies."

On the labeling matter, the FCC said they agreed with some commenters that, in some instances, "... a warning label, by calling attention to a prohibited activity, might encourage it. We are also persuaded that given the complexities of the ECPA, it is impractical for a single label to provide sufficient information to properly advise users of the legal requirements. Furthermore, we note from the comments in this proceeding that some manufacturers are voluntarily taking steps to comply with the intent of the ECPA either by informing users of ECPA provisions ... or by redesigning equipment to omit certain frequencies."

"In view of the above considerations," the FCC said, "we believe that regulatory action is not necessary at this time. Therefore the proposed labeling requirement is not being adopted."

## New Novice and Technician Question Pools

The VEC Question Pool Committee (QPC) has released the new Element 2 (Novice) and Element 3A (Technician) question pools to the public. The QPC is an elected committee chosen from active Volunteer Examiner Coordinators. There are 18 different VEC organizations. Basically, a VEC manages the testing function for the government. They approve and provide the needed examination materials to their examiners, and then approve and forward the successful applications to the FCC for license issuance.

The top six of these VECs handle over 90% of all upgrade tests administered. The ARRL and W5YI groups together account for over 75%, with the League accounting for the most. Your author heads up the second largest VEC organization, and being a member of the Question Pool Committee (QPC), has first-hand knowledge of how the question-pool system operates.

The primary role of the QPC is to develop the written amateur radio operator license examinations. The FCC used to do this when they administered the amateur radio operator examinations, but test development is now totally handled by the combined efforts of specific Volunteer Examiner Coordinators. The QPC revises the examination syllabus and actual test questions on a three-year cycle.

The new Novice/Technician questions must be used verbatim in all examinations administered after October 31, 1989. The FCC allows a six-month question pool implementation period during which either the new or old question pools may be used. Theoretically, the new Novice pools could be used as early as May 1. Most Novice-level VEs (and all Technician examining teams), however, will be using the previous question sets until November 1, 1989. This eliminates the confusion on the part of the applicant as to which license preparation material to study.

Volunteer examiners are not permitted to change the wording of any question. The QPC supplies the examiners with suggested multiple choices and the correct answer for every question in each pool. The collective VECs have taken the position that the multiple choices provided by the QPC are part of the question set, and encourages every VE to accept and use those answers. We do this to discourage applicants from "shopping" for easier answer formats. The rules, however, provide that the VE is solely responsible for the answers, and it is possible (although improbable) that some examiners could use different written question/answer formats.

The Novice and Technician question sets will be modified again in 1992. The revision process consists of soliciting and reviewing suggested changes and new questions from the amateur community. Amateurs who have already passed a written examination are eligible to submit suggestions for that written test element. The QPC is now evaluating material for the General and Advanced class pools which are due to be revised next year.

The new Novice and Technician question pools follow the same format as the previous pools, but be aware that there are about 20% more questions. The new Novice question set now has 372 questions, versus 302 on the previous version. The revised Technician pool has 326



questions compared to the previous 288. There will still be the same number of questions selected for the actual examination, however (30 questions on the Novice exam and 25 on the Technician). You must answer 22 correctly to pass the Element-2/Novice written test and 19 correct to pass the Tech.

Although the VECs revise all written questions sets, the Novice and Technician written examinations are actually administered under two different volunteer testing programs. The older Novice testing procedure requires two examiners who hold a current General class ticket, while the newer VEC system requires three senior-level VEs. While it is legally permissible for Advanced class examiners to test for the Technician class, the W5YI-VEC program only accredits Extra class examiners, since only they can administer all of the written examinations and any of the telegraphy tests above the Novice level. Examiners for the Novice license do not have to be approved (ac-

credited) by a VEC.

We have prepared a 16-page booklet entitled "How to Administer Novice Examinations in the Amateur Radio Service" which is available without charge. (Please enclose a large self-addressed, stamped envelope with 45 cents postage.) This booklet explains everything you need to know about administering the entry-level examinations including:

- How to Conduct the Exam
- VE Qualifications
- Filling out the Form 610 Application
- Designing/Administering the Written Test
- Designing/Administering the Telegraphy Test
- Grading the Examinations
- What to Mail, What to Save

The Novice examination booklet is prepared as a public service. We felt it appropriate to issue instructions on how the VEC-developed question pools are to be used by the VE. The new Technician pool

is, of course, used in the VEC System, and its use is covered by specific instructions that each VEC issues to their examiners.

The W5YI-VEC Testing Instructions consist of five question pools and a VE Manual (see photo). The manual covers everything that an Extra-class-level examiner needs to know to conduct Technician through Extra class examinations, including:

- Who Does What—VE and VEC Functions
- Preparing VEs and How to Select the Questions
- Administering VEs and Mechanics of Testing
- Examination Grading
- Handling the Form 610
- Instant Upgrade & Examination Credit
- What to Send to the VEC
- Expense Reimbursement
- §Part 97 Rules Applying to Testing
- Samples of Properly Completed Forms

The W5YI-VEC program differs from some of the other VEC System programs in that we allow the VE team to design both the written and telegraphy examinations. We do, however, provide properly prepared examinations which most VE teams seem to prefer. We also share the test fees with the VE team. This provides the team with funds to reimburse expenses associated with the testing function. Unless conducting a single examination session, we do not require that testing teams notify the VEC Office prior to their test session. A public announcement must be made by the VE team of their test session beforehand, however. This allows the team the flexibility of testing applicants whenever the need arises.

We authorize two types of test sessions. One is to an accredited VE team that wishes to conduct a single examination session. These teams are immediately sent the needed instructions, forms, and testing materials when we are notified of their test date. Volunteer Examiner teams on our Automatic Distribution Program (ADP) are routinely forwarded new forms, instructions, question pools, manuals, etc., as they become available without requesting them. Most of our testing teams are on the ADP program, and it is these teams which may hold examinations without prior authority, since they have all of the needed materials on hand.

Write to us for a VE application if you are an Extra class amateur and would like to participate in the upgrade examining function. (W5YI-VEC; P.O. Box 565101, Dallas, TX 75356). You will feel that certain satisfaction which comes when you help the Amateur Radio Service to grow. There is no cost to become a W5YI-VEC examiner. At present we have nearly 6,000 accredited VEs. Nearly one third of all upgrade examinations administered in the U.S. are conducted at W5YI accredited sessions and the amount is growing.

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## NEWS OF COMMUNICATION AROUND THE WORLD

Soon we'll sing in merry chorus  
In the watches of the night.  
For we'll tune the bands for DX,  
'Til the pale dawn brings the light . . . .

It was some weeks back when the thought came that perhaps there were more things changing in DXing than we might have been noticing. We even got to wondering if the state of the art in DXing might have marched passed us while we were thinking of other things. We did mention the possibility to the Old Timer on one of his downhill runs only to learn again that he was already far ahead of us. We are never sure if it is just that he has been around so long (he even remembers hearing 5WS from England in the 1922 Transatlantic Tests) or if it's that he has had more time to think about and note the changes in DXing. We at times do find ourselves still wondering.

Here it is the middle of the year. The long days of the solstice are at hand, and the sunspot cycle is headed nowhere but straight up. On this particular day the Old Timer was reading magazines and talking as though it was 1935 all over again. When we finally caught him heading down the hill, he hardly paused to discuss his thinking. Seeing him hustling down the hill to Marin Electronics on the main street of the village, we almost wondered if he was experiencing again the days of his long-gone youth. But this stop he was talking about some latter-day items, things like chips and integrated circuits and boards and such. He did not talk long. He was on a mission, but he promised to stop on the way back. Before he rushed off, he advised, "Read that letter from G4LXN in the February RSGB magazine. It might get you to do some real thinking."

We found the magazine. G4LXN was talking of going QRT. He had come to the conclusion that he was not satisfied with the state of amateur radio. That he, like a lot of his contemporaries, had become almost solely an "appliance operator," and that the days of being able to do any work on your own gear were but a memory. Not only was G4LXN irate about having to haul his gear to a shop to have it fixed, something which he thought he should have been able to do himself, but he was also indignant about the lack of interest in amateur radio on the part of his three grown sons. "Boring," was the description given in their appraisal of amateur radio. And there had to be more interesting things to which they could devote their attention and interest. It did get us to thinking. We also waited for the Old Timer to come back up the hill. Something was stirring him and we had to know what it was. It was the letter from G4LXN.

When he showed again, he was in no hurry to rush on back up the hill. He put the paper



Vassilis, SV5TS, proudly boasts that he heads up a five-ham family, and that could very well be the only five-ham family in Greece. (Photo via K2MGA)

sack he was carrying on the bench under the oak tree and sat to catch his breath. We waited. When something stirs up the Old Timer, it usually is worth waiting to hear.

"You read the article?" he questioned us, but the tone of his voice said that he assumed we had. "How long has it been since you heard someone using the term 'appliance operator'?" We had to admit that it had been a long time, possibly a quarter century or more ago. It had been a derisive term used back when SSB was attaining popularity, but we had to admit that we had not heard it lately.

"You know that I have often said the DXers are possibly more internationalists than many realize. And there have been times when I have mentioned that the foreign publications can give any DXer valuable insight and information. I have read the RSGB publication for years and have long considered that Pat Hawker, G3VA, is outstanding in his writing on technical topics. But it was that letter from G4LXN that got me thinking about my own activities over the years. I will admit that it dawned on me that my technical level is based more on the WW II post-war years, maybe up to the sixties, than on anything else. I suspect that I am not alone. I got to thinking of DXers I know, many right up there at the top, who have upgraded their stations but downgraded their expertise through reluctance to tinker with gear that carries an increasingly higher price tag. It is safer to take it to the local electronic mechanic than to figure out things for yourself. Maybe you have thought of this already. Perhaps you have even noted a reluctance in some areas to learn about the changes that have come. Some seem to think that if you have a station that will do what you wish, why bother to think of learning anything new. Have you noted any of this?"

Actually we had, but tried to not think about it. It is readily noted that most DXers live for the "now" DXing and that their thinking is concentrated mainly on the present. Possibly we might even be included in that group. We had not heard anyone called an "appliance operator" for some years, but it can be easily understood why. Few are builders or repairers these days. We were beginning to think that G4LXN

and the Old Timer might be singing out of the same psalm book.

"What about it?" we asked. "Isn't that the way things are? Most DXers tinker with their antennas and feedlines and the various accessories. But how many really know how their gear works and what all those chips and circuits and boards and other strange things are and how they work? And how do you figure out things when something is wrong? Once we could check the tubes and the capacitors and look for damaged or failed components. And if there was nothing obvious, often by tracing down the circuits and doing some deductive analysis you could narrow the possibilities. But what is the chance of anyone doing that now? And how about test equipment? And how about all those other things that we don't understand? Who can fix something when they don't know anything about it or possibly not even understand it? Have you thought about that?"

Apparently the Old Timer had. He picked up the paper bag from the bench and opened it for our examination. Son of a gun! There were little packages reading "I/C—" on them, something that we suspect was some kind of a circuit board, and a lot of small things in plastic envelopes that looked a bit familiar but of which we were not sure. The Old Timer was headed somewhere, and we wondered where it might be. We had to know more. To listen was to learn that things had not changed overnight, that the Old Timer had been thinking about this for some time. It was just that he had not been talking about things . . . yet.

"You know that we have talked about how packet radio has come on in the last couple of years," the Old Timer started in, "and how so many of the Old Timers have resisted it fiercely, actually showing antagonism when it is mentioned on the bands. But like a lot of other things over the years, when something not only endures but thrives, one has to give it more than a passing scathing remark. You will remember that I have mentioned packet radio a couple of times in the last year. What you did not know was that when I first got to thinking about it, I went to a class at the community college, a Saturday morning class." The Old Timer paused to gather his thoughts, and we were quick to ask, "A class on operating computers?" We got a quick shake of the head.

"No," the Old Timer continued. "It was a class on how to build your own computer for \$600. I was skeptical, but I had to see what was going on. And that is just what the instructor did. In the course of three hours he introduced the class to computers, told us how they worked, and as he talked he assembled a computer right in the class from readily available components. I think he said it was an AT clone. I did not recognize the brand name then, but I later learned that it was a generic term for a certain model. I also tend to believe that his price tag was a bit low, but not excessively so. But I saw the inside of a computer, saw one assembled right before my eyes, and then saw the whole thing working. What do you think of that?"

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## The WPX Program

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1386	IK1EFR	1389	DL4MCF
1387	IK5EXV		

### SSB

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2052	HG9R		

### CW

2562	WB5MTV	2566	W8EAO
2563	WE2L	2567	KA5TQF
2564	I0PJO	2568	W3BBL
2565	OK1DCE	2569	IK2FMI

### WPX

243	KA0YXI	244	KA5TQF
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### Endorsements

Mixed: 450 VE3NUP, KB7M, KA5TQF, DL4MCF. 500 VE3NUP, KB7M, KA5TQF, DL4MCF. 550 VE3NUP, KA5TQF, DL4MCF. 600 IK8CNT, VE3NUP, KA5TQF, DL4MCF. 650 IK8CNT, VE3NUP, KA6SWI, KA5TQF, DL4MCF. 700 IK8CNT, VE3NUP, AB5C, W3FDU, DL4MCF. 750 IK8CNT, VE3NUP, AB5C, TF5BW, IK2BHX. 800 VE3NUP, W4WKQ, TF5BW. 850 VE3NUP. 900 VE3NUP. 950 VE3NUP. 1000 VE3NUP. 1050 VE3NUP. 1100 VE3NUP, WD9IC. 1150 VE3NUP. 1250 K7CU. 1350 I1ZEU. 1400 WE2L, I1ZEU. 1450 I6SF. 1500 W4UW. 1650 I1EEW.

SSB: 350 VE3NUP, N4JED, KA5TQF. 400 VE3NUP, VE6SH, WB4FOT, KA5TQF. 450 VE3NUP, K8YVI, WB4FOT, KA5TQF. 500 VE3NUP. 550 VE3NUP, G4KDV. 600 VE3NUP, G4KDV. 650 VE3NUP, IV3VCG, IK7DBB, YV1CP, NG9L. 700 VE3NUP, IV3VCG, IK7DBB, K3ZPG, YV1CP, NG9L. 750 VE3NUP, IK7DBB, TF5BW, YV1CP, W4WKQ. 800 VE3NUP, TF5BW, YV1CU. 850 VE3NUP, IK8GCS, W9IAL, YV1CP, I8LEL. 900 VE3NUP, IK8GCS, YV1CP, I8LEL. 950 VE3NUP, I8LEL. 1000 VE3NUP, I8LEL. 1050 VE3NUP, I8LEL. 1100 VE3NUP, I8LEL. 1300 PP2ZDD. 1500 I1EEW. 1550 W3ARK. 1600 W3ARK. 2150 WD8MGQ. 2200 WD8MGQ. 2550 K2POA. 2600 K2POA. 2650 K2POA. 2800 ZL3NS.

CW: 350 I0PJO, KA5TQF, W4WKQ, W3BBL, IK2FMI. 400 WB4FOT, VE3OMM, W3BBL, IK2FMI. 450 WB4FOT, W3BBL, IK2FMI. 500 W4DGX, DF1SD, K7CU, KK0V, W3BBL, VS6UW, IK2FMI. 550

DF1SD, KK0V, VE2PT, W3BBL, I1EEW, IK2FMI. 600 W9IAL, DF1SD, VE2PT, W3BBL, IK2FMI. 650 DF1SD, KJ8M, IK2FMI. 700 KJ8M. 950 G3VQO, NF5Z. 2500 WA2HZR. 2550 WA2HZR. 2600 WA2HZR. 2700 W8RSW. 2750 W8RSW. 2800 W8RSW. 2850 W8RSW. 2900 W8RSW.

10 Meters: DF1SD  
15 Meters: YV1CP, YU7DR, DL4MCF  
20 Meters: YV1CP, VE3OMM, YU7DR, KA5TQF, DL4MCF, VS6UW  
40 Meters: K2POA, KS3F  
80 Meters: IK8CNT, K2POA, OZ4RS  
160 Meters: PY2DBU, DF1SD

Asia: G4MVA, YV1CP, W3FDU, IK2ILH, VE1ACK, DL2MCF  
Africa: YU7DRE  
No. America: N0ISL, G4MVA, YV1CP, YU7DR, KA5TQF  
So. America: JA7FFN, DF1SD  
Europe: IK8CNT, YV1CP, VE3OMM, IK2ILH, DL4MCF  
Oceania: IK8CNT, KA5TQF

Award of Excellence: DJ4XA, IT9TOH

Award of Excellence with 160 Meter Endorsement: DJ4XA, IT9TOH

Award of Excellence Plaque Holders: VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YLW4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, W8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DE0DXM, DK4SY, UR2\*\*, AB90, FM5WD, I2DMK, W4BOY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, H18LC, KA5W, K0JN, W4VQ, KF20, K3UA, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TOH, W8ILC.

Award of Excellence Plaque Holders with 160 Meter Endorsement: W1JR, W6OUL, W4BOY, W5UR, N4NO, W8RSW, N4KE, I2UIY, W8ILC, W1BWS, NN4Q, G4GUE, LU3YLW4, I4EAT, VE7WJ, W9NUF, N4NX, VK9NS, DE0DXM, VE7IG, K9BG, AB90, FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, W3ARK, H18LC, KA5W, UR2\*\*, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF20, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TOH.

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.

We had to admit that it was interesting. We had seen computers before, but frankly they had been somewhat in the category of our latest gear. They worked if you pushed the right buttons or threw the right switches. We operated them, but just don't ask us to even attempt to explain just how things worked. It did what we wanted it to do, and we were content not to ask for more. But we had considered computers as being even more complex than amateur gear, and here the Old Timer was telling us that things might be something else. We had to know more.

"So what are you going to do now?" we asked. "Are you thinking of building your own rig? We were really not serious in putting the question to the Old Timer, but we also knew that if he made up his mind to do something, he always had a plan. We wanted to know more about any possible plans, and we were right. He did have a plan. He was out to move his technical knowledge up a bit closer to the decade of the eighties.

"If you remember from G4LXN's letter," the Old Timer continued, "while he was objecting to dependence on the pretty little gray/black boxes, he did say he intended to maintain his amateur license in the hope that one day he will be able to construct his entire station. It did seem that he might be objecting to being an ap-

pliance operator and was determined to acquire his own knowledge of present-day construction, circuits, and other current techniques even though it might mean literally starting from scratch. Wasn't that your understanding?"

It was. And we were also understanding a bit more about the enduring belief that DXers enjoy eternal youth. After thinking over things a bit, we doubted whether it was actually eternal youth. Possibly it was more memory than fact. We also understood the feeling of G4LXN that he was becoming the captive of his "appliances" rather than their master.

"So what's the game plan for the future?" we asked the Old Timer. "Are you getting ready to build some gear to replace the ICOMs?" The Old Timer laughed at our question. "Hardly," he said. "But I am getting acquainted with some of the modern components. And I started off by finding some simple building projects and putting them together. Along the way I am finding that I understand things a bit better, some of the components are losing their mystery, and I am again enjoying seeing the things that I built myself work. Once you start looking there is a lot of stuff in your file of magazines that is within your current level of expertise. And there are any number of books available which will get you



In the last CQ WW DX Phone Test ZX0F was heard from Fernando de Noronha. Here is the crew that put the station on the air. From the left are: Junior, PY5ALP; Jim, PY5ZBA; Tom, PY5TT; Oms, PY5EG; Vasco, PY0FG; Don, PY6ZBU; Vani, PY5VM; and Maia, PY5CA. Here they are in front of the contest operating location. ZX0F QSLs to PY5EG.

started and which are written for initial levels. You might even find yourself reading advertisements again. Remember how you once read every one of them and picked up a lot of information along the way?"

The Old Timer was right. We once had read every single line in every magazine and every catalog and learned a lot along the way. And we started to wonder how it would be to again approach the operating position with some confidence that we were not treading in a booby-trapped area where unexplainable things might and sometimes do happen.

"But how about test gear?" we asked. "Don't all of these things take special test gear? What do you do when you don't have all those expensive items?" We should have known that the Old Timer had already leaped over this hazard that might bar any thinking about things beyond.

"I wondered the same thing," the Old Timer conceded, "and I still am curious about some of the test gear I have seen advertised. But a year or so back I stopped by to see a DXing friend of mine who runs an office-machine repair shop. You know how office machines and even typewriters have a lot of electronics in them these days. But there on the bench were the working parts of a computer, memory boards and all. I had to ask about his test gear. You might be surprised to know that he told me that the majority of his testing for possible problems was done with a volt/ohmmeter. I will admit that I did not fully understand his explanations. I would suspect that more test equipment and some hands-on experience might be useful and needed, but that volt/ohmmeter certainly was what he was using. Maybe I will learn more along the way."

It has been a bit more than a week since the Old Timer stopped to talk, and somewhat regretfully I must say that we have seen him headed down to the village a couple of times but at a high trot. Something is moving him.

We suspect that it was the G4LXN letter, and we have been thinking about it ourselves. Are the remembered days of our youth joyful because of the things we did and are now joyful only in memory? Is it conceivable that DXing may have reached a point in our lives where we are crystallized in our thinking and curiosity? We are not sure. Maybe the Old Timer has already learned the answers.



## The WAZ Program

### 15 Meter Phone

268 ..... N6DX 269 ..... K3UA

### 20 Meter Phone

722 ..... VE3NUP 727 ..... WB2OJL  
 723 ..... JA6TMU 728 ..... N2ESD  
 724 ..... IK2AHR 729 ..... WQ6B  
 725 ..... XE1VIC 730 ..... WF7B  
 726 ..... IN3ANE

### 10 Meter CW

63 ..... K0KES

### 15 Meter CW

137 ..... KF7E 140 ..... VE1ACK  
 138 ..... W0JLC 141 ..... K0KES  
 139 ..... K5OTI 142 ..... JE1DXC

### 20 Meter CW

319 ..... JA4DEN 321 ..... K4PR  
 320 ..... K0QQ

### 40 Meter CW

96 ..... W5ODD 98 ..... WK6E  
 97 ..... N6OC

### 80 Meter CW

20 ..... SM0AJU

### All Band WAZ

#### SSB

3296 ..... W3KRB 3303 ..... PA3EKK  
 3297 ..... SM5CKA 3304 ..... I3MKH  
 3298 ..... KD8KX 3305 ..... WB2OJL  
 3299 ..... FM4DN 3306 ..... AA4DO  
 3300 ..... WB8RNY 3307 ..... K9QFR  
 3301 ..... KG6JW 3308 ..... JL3JTD  
 3302 ..... K9ZYG

#### Phone/CW

6476 ..... VE3NUP 6487 ..... OZ1KAO  
 6477 ..... KA6A 6488 ..... JO1XDA  
 6478 ..... N4GKX 6489 ..... DF4QP  
 6479 ..... K1DCI 6490 ..... DK2PS  
 6480 ..... VE6EJ 6491 ..... VE3GQ  
 6481 ..... PA3ENH 6492 ..... W7JEN  
 6482 ..... WB2OJL 6493 ..... K1ZZI  
 6483 ..... WB2TUJ 6494 ..... JR2PAU  
 6484 ..... K9QFR 6495 ..... VU2TTC  
 6485 ..... AA4TV 6496 ..... YU1PJ  
 6486 ..... SM3OAU

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (65 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Leo Haijman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all C.Q. awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

We have decided that in the morning we will head up the hill to check out things. We will make an early start because we are sure that the Old Timer will be heading down to the village for more components, and the thought is that we might want to go with him—looking for something simple to start on, of course.

Perhaps it is as the Old Timer has often said: "You can learn most anything out of a book." We are thinking that it is time to test that truism. We might also be looking to see where the state of the art has gone.

### 18 MHz Band Open

This band will become exclusively amateur on July 1st of this year, but at the end of January the FCC opened the band for amateur operation with a caution that amateur operations must not cause harmful interference to U.S.



A lot of DXers start out as SWLers and never escape the lure of DXing. Here is Siegfried Bill, HB9DLE, who once was HE9GPE but now is a full-bore DXer. He has the antennas to prove it, running a cloud of monobanders on 10, 15, and 20. He also likes philately and new DXCC counters.

Government and Foreign Fixed Service operations.

Generals, Advanced, and Extra class started using the band on January 31st. A1A is allowed for the whole band, Digital F1B for direct printing, telemetry, telecommand and computer communication is allowed below 18.110 MHz. Analog emissions such as FAX, SSTV, and phone may be used from 18.110 MHz up. Normal power limitations apply.

### Zones 23 and 24 Defined

In the fall of 1986 a study was begun by CQ aimed at clearing up the ambiguity in the boundary line separating CQ Zone 23 and Zone 24. The original boundary line dated back to the origins of the WAZ program in the 1930s and followed Chinese provincial boundaries at that time—at least that's what we presume. The printed definitions of the Zone 23/24 territories were fairly vague, but since both Zone 23 and Zone 24 could be worked without a mainland China contact, and since BY amateur operation didn't exist from 1949 until the early 80s, the exact position of the Zone 23/24 boundary within China was of little consequence.

When amateur radio operation from mainland China—The People's Republic of China—was again authorized in 1982, the precise definition of the boundary became a matter of increasing concern. Hence the 1986 study. The aim of the study was to clearly define the portion of the PRC that lay in Zone 23 and Zone 24 in terms of the current political provincial boundaries, as well as to try to adhere as closely as possible to the original 1930s WAZ map boundary, vague as it was. On July 1, 1987 the new definitions of Zone 23 and 24 were announced.

While apparently changing the Zone 23/24 boundary slightly, the new definition does so in such a way as to be as consistent as possible with the historical WAZ boundary while embracing the current political subdivisions within The People's Republic of China. The definition has the added benefit of having no significant effect whatsoever on the "workability" of Zone 23 or Zone 24.

Zone 23 and Zone 24 are now officially designated as follows:

Zone 23. Central Zone of Asia: Mongolia JT1, Tanna Tuva UA0Y, People's Republic of China, BY3G-L (Inner Mongolia), BY9A-F (Ningsia or Ningxia), BY9G-L (Tsinghai or

Qinghai), BY9T-Z (Kansu or Gansu), BY0A-M (Xinjian Uygur Zizhiqu), BY0N-Z (Xizang Zizhiqu or Tibet).

Zone 24. Eastern Zone of Asia: BV, CR9, VS6, BY1, BY2, BY3A-F (Trianjin or Tientsin), BY3M-S (Hebei or Hopeh), BY3T-Z (Shanxi or Shansi), BY4, BY5, BY6, BY7, BY8, BY9M-S (Shensi or Shaanxi).

### MINIPROP

One of the matters frequently encountered among the more mature DXers is a reluctance to consider how things are changing. Gather the elders together and you will have a majority and more blasting computers and packet radio. Most of them hold such latter-day aberrations at arm's length, most seldom realizing that they might be missing something. Somehow it almost seems like the time when SSB was rising but there were staunch and fiery defenders of the good old AM phone mode. And though they were staunch and fiery to the end, they could not stop SSB and the benefits it brought. Most times when we see some new software aimed at amateurs, we think of the venerables.

W6EL has released version 3.0 of MINIPROP which puts much help for the DXer available at the touch of a key. On one floppy disk there are computations for MUF on each band and the predicted signal level and an atlas listing all the DXCC countries plus 350 geographical locations. In addition, the program will print a customized beam-heading list for your QTH, the grayline, sunrise/sunset times at either end, and more. You need but enter the current solar flux or sunspot conditions and the date and location of the DX you are looking for and MINIPROP will turn out a lot of helpful information and advice.

If you are a mature DXer with a big country total and a secure place for posterity, you still could be missing something by ignoring the advantages that some of the younger DXers know and are using. And if you need more information, drop a line to W6EL, 11058 Queensland St., Los Angeles, CA 90034. Sheldon has been around more than enough years to qualify as a mature DXer. And along the way he learned of things that can help you.

### New Countries

It does seem that any Deserving DXer will find very little time for relaxing in the next year or so. All this is the result of the changes in the DXCC rules and some enterprising DXers.

One of the new ones promised during recent months was Banaba Island in the Kiribati Group. Once known as Ocean Island, this one was figured to be a new country under the new criteria. Jim Smith, VK9NS, was aiming to put it on the air a month or so back and operate for two weeks or so.

Frederic Reef has also been studied for a new one, and some were even gathering the gear and plane tickets as spring came on with the good intentions of bringing up another one for a DXCC counter. If you wonder where Frederick Reef might be, the atlas shows such an island at about 21° south and 154° east, off the east coast of Australia. It is almost directly east of the town of Mackay on the coast of Australia. As VKs are mentioned in the planning, this would seem to be the right place.

The Australs, or Tubuai Islands, are directly south of Tahiti. Rapa is one of the larger islands in the group. There has been a report that





Elsie Oberdoester, W3ICQ, looked long for a FH-Mayotte QSO, but when she worked one and the QSL came, FH8CB also sent a photo. Here is FH8CB at his operating position. In Mayotte since 1975, he is in communication work. Note the suffix that Elsie uses. There seems to be a message therein. Also in the W3ICQ family are a couple of more DXers—OM W3FWD and junior op W3HCO.

some French DXers were looking at this possibility earlier this spring, and something may have already developed by the time you read this. If you get out your maps to study these possibilities, do not worry too much as to how or under what section of the criteria they may qualify. There are dedicated types who are devoting a good part of their waking hours to figuring out things for every Deserving DXer. Just save your strength and be ready when the good word comes that they are about to show on the air.

It should be pointed out that you will need a source of late DX information on these developing new countries. Unfortunately, the publishing schedules for magazines limit their response times, so a DX bulletin will definitely be a necessity. You will also have to contend with the fact of life that few DXpeditions, and especially those aiming for a new country, will announce their plans very far in advance of the great day. If you need an explanation of the obvious, it is because of the possibility of someone getting there first so as to be on hand to greet the early-planners but late-comers. And do not think that has never happened.

For regular and late information on these new countries, as well as other rare DX coming on the air, think of *Inside DX* (436 North Geneva Street, Ithaca, NY 14850), *QRZ DX* (Box 832205, Richardson, TX 75083), *The DX Bulletin* (Box 50, Fulton, CA 95439), or *The Long Island DX Bulletin* (Box 173, Huntington, 11743-0173). Overseas DXers should check for local sources. Though some may rail at the artificiality of DX nets, some of these will be your best source for late and last-minute information. Check with Jim Smith, VK9NS, on his 0600Z net on 20, listen to the W7PHO Memorial Hour, and gather information on other nets, especially the times and frequencies. Check W6TI's DX broadcasts on 14002 kHz at 0200Z on Monday. Listen for everything and ignore nothing.

It is definitely possible that the next year will bring DXers new countries and at the same time some exceptional band conditions that will be remembered and talked about for years to come. Fifteen and 10 meters at times will be absolutely unbelievable, with conditions possibly even better than those of the late 1950s when Cycle 19 was peaking. Some are promis-

## 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.

### MIXED

3659	YU2AA	2122	N6CW	1652	N6JM	1311	YU2TY	986	G4SDJ
3519	F9RM	2102	YU7DX	1650	IS0LYN	1254	N8BJQ	950	F1HWB
3181	K2VV	2060	PA0SNG	1639	N6AW	1214	A18S	947	YU2GIJ
2931	W2NC	2046	W9NUF	1638	K8LJG	1205	K5DB	933	I2EAY
2794	K6JG	2001	K0BLT	1601	KL7AF	1203	YU1GR	899	K1BAZ/DV1
2750	VE3XN	1999	K5UR	1601	SM0AJU	1195	JA6GWU	884	WA4WIN
2655	YU2TW	1964	DJ4XA	1538	IT9TOH	1189	K7CU	869	ISZTC
2616	W4BOY	1931	IN3ANE	1524	K2POF	1173	KC8CC	859	OE1KJW
2561	K6XP	1929	K9BG	1509	W6OUL	1146	A16Z	841	W9IAL
2511	N4NO	1916	PY4OD	1483	W4UW	1143	I0AOF	830	YU1PJ
2499	W9DWQ	1907	YU7SF	1480	HA8XX	1142	DF6EX	802	W5ASP
2480	N4MM	1882	W0SFU	1472	NN4Q	1141	WD9IIC	773	YU3PG
2464	N6JV	1843	SM3EVR	1468	DK5ADU	1140	NE6I	773	KS3L
2348	WA8YTM	1841	I2MOP	1435	YU1SZ	1129	JA1WJ	750	K18B
2280	EA2IA	1836	HA0DU	1418	YU2CO	1107	YU7DR	750	KC7EM
2278	PY1APS	1829	4X4FU	1416	K2OLG	1105	W9IL	748	IK2BHX
2252	N9AF	1810	IT9ODS	1415	N2AIF	1102	KS0Z	747	YU7RU
2251	I2PJA	1802	KF2O	1403	AB9O	1096	G4OBK	742	K5IC
2202	YU1AB	1758	KA5W	1400	AC2J	1095	PY2DBU	729	W4WKQ
2161	YU7BPO	1743	SM6DHU	1398	WE2L	1081	K3UA	719	KY3V
2134	N2AC	1736	YT3AA	1350	SM6CST	1034	5H3RB	696	N3KR
2132	I8YRK	1722	YU2NA	1342	YT7WW	1008	W0JIE	678	RB5MP
2131	I6SF	1695	N5TV	1334	WB8ZRL	999	SP5AA	642	JE2GMO
2128	SM7TV	1654	I1EEW	1334	W7CB	998	NV9S	618	IK2ECN

### SSB

3444	F9RM	1738	WF4V	1291	IT9TOH	1035	W0ULU	794	NE6I
3118	I0ZV	1725	ZP5JCY	1290	PY4OD	1023	CT1AHU	787	KC2FC
2746	K2VV	1701	K5UR	1277	EA4KK	1021	WA2FKF	783	K3UA
2697	ZL3NS	1675	EA2IA	1273	W2NC	993	KS0Z	780	IK2DUU
2569	K2POA	1615	W3ARK	1258	CT1BY	985	XE1XF	757	KB0C
2505	K6JG	1609	W9NUF	1255	WE2L	983	G4SDJ	757	IK7DBB
2440	CT1UA	1583	WA4QMO	1253	KL7AF	981	DK5WQ	746	IK0EIM
2300	I0AMU	1556	CT1FL	1231	SM6DHU	960	HK6BER	745	A16Z
2264	K6XP	1528	KF2O	1227	IK5ACO	950	F1HWB	731	W5ILR
2256	VE1YX	1515	DJ4XA	1218	SM0AJU	947	I2WZX	711	VO1AW
2250	I2PJA	1506	G4CHP	1200	AB9O	938	PY4OY	699	I7UNX
2247	N4MM	1496	I1EEW	1196	N6FX	911	W6OUL	698	YU2SMN
2208	WD8MGO	1480	G4CPJ	1194	I2EOW	909	YB3CEV	683	YC7DF
2182	W8YDB	1435	W4UW	1176	N2AC	908	N2AIF	675	DJ0AF
2092	I4ZSQ	1433	EABAKN	1163	NN4Q	902	K3IXD	674	KB4HU
2033	CT4NH	1417	KC8YM	1158	PY4VX	902	IK8GCS	666	G4OBK
1991	W4BOY	1405	I8KCI	1141	KC8CC	860	WN5BBS	661	K0PVI
1913	OZ5EV	1404	CT4UW	1114	I8WYD	859	K8ZU	657	W5AWT
1906	N4NO	1394	AC2J	1110	LUBESO	854	KK5P	650	WM5G
1865	WA8YTM	1390	ISZJK	1104	KD9OT	832	I3ZSX	641	CT1CIR
1862	I8YRK	1386	KA5W	1102	AG2K	827	LU1VK	636	LU1DWN
1846	I2MOP	1371	N5TV	1093	KE6KT	805	IT9ONV	635	EA7DHK
1816	W9DWQ	1353	YU2NA	1083	I8LEL	803	G4KHF	618	CT1DIZ
1805	I4CSP	1341	HA8XX	1082	WB8ZRL	803	IT9JKY	613	NM5Y
1802	PA0SNG	1317	K5RPC	1067	I2TZK	801	N6CGB	607	K5HT
1755	NJ0C	1310	EA3AQC	1050	K8LJG	797	NK2H	600	IT9CUE

### CW

2748	K2VV	1714	WA8YTM	1188	KF2O	1033	I2IWM	823	KQ3S
2688	W2NC	1673	N4MM	1162	VE1ACK	1024	NN4Q	799	EA5AR
2543	WA2HZR	1639	PY4OD	1147	W1WAI	1019	HA5LZ	798	G4OBK
2442	N6JV	1612	VO1AW	1146	N2AIF	1015	LA9XG	790	NE6I
2299	ON4OX	1596	4X4FU	1144	F6HKD	1006	KN7K	763	OE1KJW
2191	N4NO	1583	K5UR	1143	SM0AJU	1000	DL2HBX	761	WB8ZRL
2158	VE7CNE	1582	W9NUF	1138	W9PWW	988	OK1GZ	750	W0JIE
2128	W3ARK	1538	DJ4XA	1138	I2UIY	970	G4FAM	749	G4MVA
2083	K6JG	1425	KA7T	1134	EA7OH	956	G3VQO	726	K1BAZ/DV1
2074	W9DWQ	1409	IT9VDO	1134	K8LJG	943	I8YRK	708	JA2GCW
2025	W4BOY	1398	N5TV	1106	IT9TOH	919	A16Z	708	G4UOL
2021	G2GM	1398	I2DMK	1097	AK2H	915	SM5DAC	701	KA1CLV
1923	K6XP	1300	N6FX	1095	DJ1YH	903	G4SSH	684	W5AWT
1900	N2AC	1261	SM6DHU	1085	W6OUL	868	K3UA	667	YU3PG
1900	YU7SF	1221	SM6CST	1079	YU2NA	861	HA8XX	657	AC5K
1867	I6SF	1219	K2POF	1069	T14SU	849	CT1LN	642	IS0FIC
1809	EA2IA	1212	I7PXV	1055	YU2CO	846	OZ5UR	639	KU0S
1779	OZ5EV	1200	KL7AF	1051	OH3TO	837	YU2GIJ	611	WE2P
1757	I1YRL	1198	KA5W	1051	YU3NA	835	I2EAY	609	W9IAL
1731	LZ1XL								

ing that we will be enjoying some of the "really" Great Days of DXing! It might be prudent to plan for them so you will be ready. Always keep in mind the words of the Hero of Mafeking: Be Prepared! Every true-blue DXer is always prepared!

### ARRL Board

Last month there was mention about the move to automate the DXCC process, the ARRL Board voting to spend \$50,000 to accomplish this noble endeavor. As most of the records have been entered by hand over the



## 5 Band WAZ

As of March 1, 1989, 213 stations have attained the 200 zone level.

New recipients of 5 Band WAZ with all 200 Zones worked:

OH3TO	Finland
5B4TI	Cyprus (second time 200 zones)
ZS5MY	South Africa
F6EXV	France
DF3GY	West Germany
JA4MRL	Japan

The top 13 contenders for 5 Band WAZ are:

1. N4WW, 199	8. SV1ADG, 199
2. SP9PT, 199	9. HG19HB, 199
3. K6YRA, 199	10. K2UU, 199
4. K8EJ, 199	11. W2YY, 198
5. K9GX, 199	12. W7UR, 198
6. AA4V, 199	13. KB0U, 198
7. SP6JCY, 199	

537 Stations have attained the 150 Zone level, as of March 1, 1989.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (65 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Leo Haijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants should include sufficient postage for safe return of their QSL cards. The processing fee for all CQ awards is \$4.00 for subscribers and \$10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest CQ mailing label with your application.

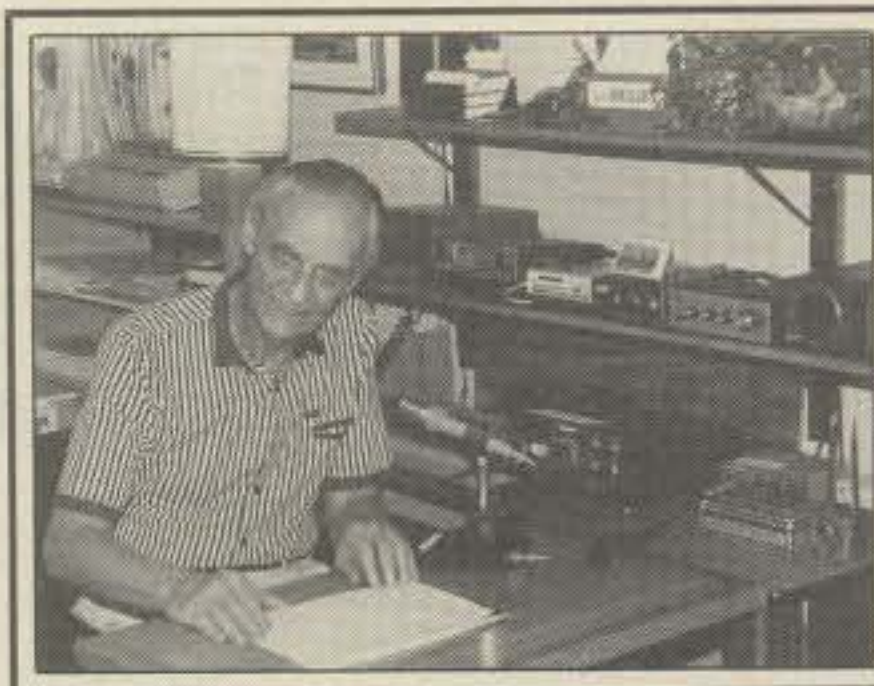
years, converting the records to a computerized system will take a lot of work. However, as the record keeping has always been a labor intensive process, the ultimate result will take less labor and be a far better system of record keeping in the DXCC program.

One interesting item is the move by a board committee to take a look at how contest logs are checked. If you think that this is nothing but a straightforward process, you might note that there is a report that one club was declared the top competitor in the Unlimited Club Class competition in an ARRL contest, but it was later found that a 3,000,000 point entry from another club had been overlooked in the tabulation. An error like that could make a big difference. The Committee will look into the "methodology used for contest checking."

A proposal to increase the DXAC annual operating fund from \$500 to \$1000 per annum was voted down after some parliamentary maneuvering. However, it should be noted that the board did allow an additional \$236 for 1987/88 expenses.

A resolution to petition the FCC to allow packet radio on 10 meters above 28.3 MHz was adopted. This is currently allowed in Canada and other countries. A motion to make officer reports, director reports, committee reports, proposals, motions, and election results of officers and committees was initially bounced around and ended up being amended to cover only the Standing Committees of the Board, the Ad Hoc and Advisory Committees, and was then passed. QST from time to time will print a list of those countries that maintain incoming QSL bureaus but restrict the forwarding of QSL cards only to members of that country's national radio organization.

One interesting resolution adopted is to have the Volunteer Resources Committee develop criteria so that the chairman of each Ad-



Here is a DXer who got started at a more mature level but has been burning the bands ever since to make up for the years he was not DXing. This is HK5JPS, Bert Wartenberg. Born in Honduras, Bert has been in Colombia for the last half-century and was first licensed in 1985. He immediately moved up to full amateur amateur privileges, accumulated some 225 DXCC counters, and is active on RTTY, AMTOR, ASCII, and packet radio. He regularly checks in with the Halo Net, the Intercontinental Net, and the morning get-together of the W2MIG fraternity. Fluent in English, Spanish, German, and French, he is relatively low-powered, running a TS-130-SE with some 100 watts PEP. His tower is 45 feet tall and supports a 4-element beam for the VHF frequencies. The key element is Bert's enthusiasm for DXing. Listen for him. (W4IBB/HK5 photo)

visory Committee can evaluate the participation level of each appointee to his respective committee. The report is that on some committees the participation by certain members is just about nonexistent, there being no comment, discussion, nor suggestions coming from them during their tenure on the committee.

A motion was adopted to ask the IARU at the Orlando meeting to bring Region II's policy on awards on the 10 MHz band into conformity with Region I and III's. If this is done, the ARRL will accept 10 MHz contacts for WAS and DXCC but not for 5BDXCC.

A new chairman was named for the DXAC, K5UR moving up from vice-chairman. John Kanode, N4MM, the Roanoke Division Director, will be the board liaison, and Gay Milius, a former director and long-time DXer, was named to fill the position vacated by W4FRU as the Roanoke Division representative on the DXAC.

If you read the minutes of the board meeting in the March issue of QST, it might be noted that Mike Riley, KX1B, who prepared the report is supposed to be leaving the ARRL to take over the communication work for the American Red Cross.

### Publications

At the start of the year Chod Harris, who publishes *The DX Bulletin*, began a new monthly magazine named, naturally, *The DX Magazine*. The March issue marks the third month of publication, and it is a magazine directed at and for the Deserving DXer. If you are intrigued about the possibility of developing your already impressive DX knowledge and insight, drop a line to the magazine at 3201 Franz Valley Road, Santa Rosa, CA 95404.

From time to time we get queries on how to obtain a copy of the *DX Is* book, this being published back around 1981 in limited numbers by

Charles and James Allen. It was a selection of excerpts from *The West Coast DX Bulletin*, which ceased publication in 1979 but apparently is remembered by some older DXers and has been heard of by some newer DX types. It might be a bit difficult to understand why the queries come after all these years should you have no acquaintance with the WCDXB. But the bulletin and *DX Is* are still being quoted, not only in stateside publications, but also overseas in Italian, Japanese, and Finnish amateur publications, to name a few. But when those queries came, we had to admit that we had lost track of the Allen family.

Recently in the club bulletin of the Alamo Amigos we found the call of Charles Allen, W5DV, and a note to him brought the information that he still has some copies on hand and will ship one postpaid for \$7.50. The address for Charles Allen is 1000 No. Walnut Avenue, #202, New Braunfels, TX 78130. It might be noted that DXers could never be sure what they were getting with each issue of the WCDXB. Each issue was ten pages, and some subscribers claimed it took a week to extract all the DX information.

There is one member of the DX Hall of Fame who is not an amateur but has had a significant impact on DXing. This is Geoff Watts, who early on was named to the Hall of Fame for his long work gathering DX information for DXers. His *DX News Sheet* was outstanding in its coverage as well as its brevity. The weekly DX information was all put on one side of a legal-size sheet of paper. After decades of work Geoff had to relinquish the DX bulletin, but he has continued working on items needed by DXers. He has a recent edition of his "DX Zone Guide," which lists all the DXCC countries in each CQ WAZ Zone and in each ITU Zone. A prefix-country-zone guide is available, as are a DXCC countries guide and a USSR Oblast guide with maps. Each of these guides is available for \$3.00 and is worth it. You can also send six IRCs in lieu of coin. Requests go to Geoff Watts, 62 Belmore Road, Norwich NR7 OPU, England.

It might be noted that a printout of your Honor Roll file can be obtained for each mode. It takes \$3.00 and a legal-size envelope with two rates of first-class postage (45 cents) for the return of each mode file. Direct you queries straight to K6ZDL.

### Some Short DX Notes

The CW portion of the CQ World-Wide WPX Test will be given the last weekend in May, the 27th and 28th. Frank Anzalone, W1WY, looks for every DXer and WPXer to go full bore in this one. Monday is a national holiday and you can then enjoy the rest of the Deserving.

The annual Northwest DX Convention will be hosted this year by the Western Washington DX Club and will be held at the Renton Holiday Inn just over the hill from Seattle. The dates will be over the last weekend in July, the 28th to the 30th. For the latest word write or call Morris Shepherd, W7LVI.

A note recently came from Sana'a in North Yemen asking about the planned efforts of the Lynx DX Group to operate from that rare spot. The writer is with the U.S. State Department, holds an Extra class license, and had been waiting alertly for things to open. He also wanted more information. He noted that there is a reluctance to ask about local operating privileges, the government being a bit sensi-



## CQ DX Awards Program

### SSB

1668	N8FUM	1672	EA7DHK
1669	WV6N	1673	EA7DHF
1670	DF6EX	1674	EA8BML
1671	TI2QP	1675	YU1PJ

### CW

742	KD8V	745	YU1PJ
743	WV6N	746	N7JB
744	DF6EX		

### SSB Endorsements

320	K3FL/321	275	W6MFC/295
310	ZL3NS/319	275	ZL1BOQ/291
310	YU1AB/318	275	KF5AR/285
310	K9MM/318	275	I4CSP/283
310	W8JXM/316	275	I8WYD/278
310	N4KG/316	275	DF6EX/278
310	W4UNP/312	250	VE3NUP/261
300	K4CX/309	150	EA7DHK/180
300	KD8V/304	28 MHz	DF6EX
300	KA3HXO/300	28 MHz	KE6KT
275	KE4VU/296		

### CW Endorsements

320	K4CEB/320	275	K4CX/292
310	K9MM/319	275	F3TH/275
310	N4KG/315	250	DF6EX/264
275	KD8V/296		

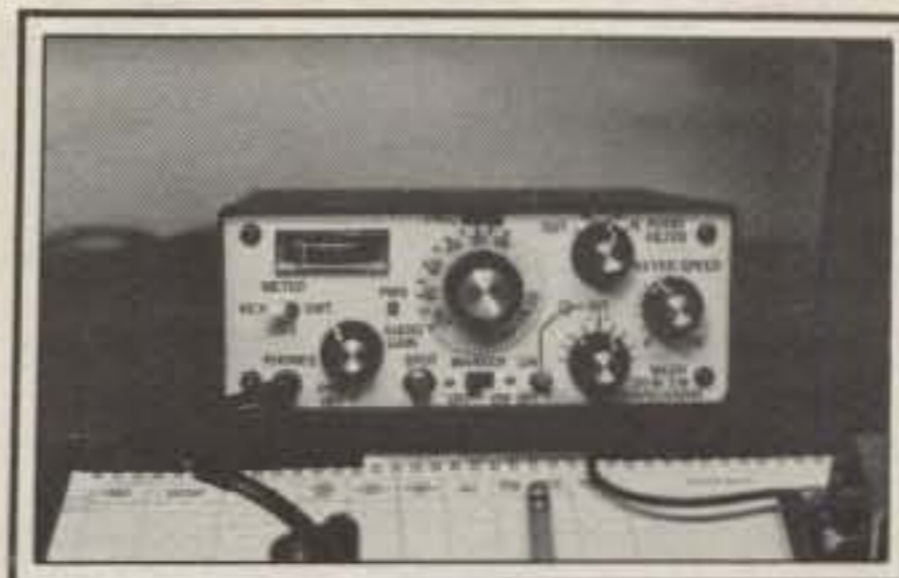
Total number of active countries is 320. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

tive about radio equipment. Do you think we moved to help him with information?

YJ8JS, ex-YJ8NJS, has been planning a DX-pedition to the Banks and Torres Islands north of the New Hebrides. The planning was for a May effort with possible special call signs YJ1BK and YJ1TR to be used. Definitely it was to be a YJ1 prefix.

UA0YT is not RV0YF, but Vlad can still be QSLed via Box 88. RT0U's QSL route is via UT4UWV, R.C. Polytechnic, Box 391-B, 25056 Kiev, Ukraine, USSR. And if you are looking for ways to catch some new prefixes for WPX, check the 3905 Century Club which meets daily from 0000 to 0400Z to exchange tips and information and to answer questions about the awards that the club offers. You might also catch them at 7233 kHz for a late-night session at 0400Z. And in accordance with its title, there is also a meeting on 3903 kHz daily at 0200Z. KQ0S will supply more information if needed.

Professor Minekazu Sugiyama, JA2NQG, who operated from Ponape in late February and early March, is planning to be out again in September to the Eastern Caroline Islands and will try to promote 6 meter DXing on stops during his travels. Last time out Mine signed KC6MS from the E.C.I. While traveling in September he plans to operate from Saipan signing AH0F, from Guam, from Truk, from the Marshall Islands, from Tuvalu where he has applied for a T22NQ callsign, or from Lord Howe where he will sign VK9LS. Last time out he operated on nine bands from 160 to 10 meters including the WARC bands. A CW operator, he worked 70 countries and 4000 QSOs. QSLs go to 591 Ninomiya, Ninomiya, Kanagawa, 259-01, Japan. Should you think that JA2NQG's plans for 6 meter operation might be a bit optimistic, listen on the 2 meter alert-



*Is basement homebrewing dead? W6ZH doesn't think so. When planning a trip to the Far Pacific, including some DXing along the way, Pete decided to build his own traveling gear. Here is the result—state of the art for the traveling DXer.*

ing box and be surprised at the DX being reported on 6. I2DEX was due to arrive in Angola a month back and was hoping to sign D2ONU until September.

A bit earlier there was some mention on building, maybe even repairing, one's own gear. A year back when W6ZH started planning for a trip to the far Pacific, he decided to build his own travel gear. The result was a QRP rig for 20 and tuning 14.0 to 14.1 MHz with 10 watts output. The project was started on March 22nd and was finished August 21st. The rig was based on a K1BQT design and was used from VK3/VK6/VK7/Lord Howe/Norfolk Island and from ZL. Fifty-seven countries were worked, most of the operating time being while waiting to dine.

Every year there is a special call operation from the Normandy Beaches where the battles were fought in June 1944. They usually sign a special call with JUN as the suffix. Listen for them in the week before June 6th. They will be on all bands but mostly on 20 meters. Andre Morio, F5AM, from St. Lo in the Carentan Peninsula is always the big mover as well as the QSL route. Listen for them.

A group of amateurs out of England will be in the Madeira Islands for two weeks starting the end of May and running to June 13th. The plan is to have several stations operating simultaneously covering 80-10 meters. Calls will probably be /CT3 and QSLs should go to the home call QTH.

Some new operators are in Somalia. F6FYD was due there a month or so back on a six month tour and was hoping for a T5 call. Also due was GW3KYN on an 18 month tour, and he will join F6FYD. GW3YKN is ex-5Z4GM.

Also in the same area of the world, SU1ACC was aiming for some operations from several Middle Eastern stops, these including possible YI/JY/4W operations. SU1ACC is a member of the Arab Cooperation Council and hoped to obtain callsigns with the ACC suffix.

One of the REF Departments, that being Les Nouvelles DX, back a month or so announced that no cards coming from QSL Manager F6FNU would be accepted for any REF Awards. Apparently the French department was not happy with the way F6FNU handled his duties, this including slow response, no response, and charging for QSLs. It might be noted that all is not lost. Newington is reported as still accepting F6FNU-handled QSLs for DXCC credit.

Those looking for DX information on a daily basis should write down the Heard Island Net run by VK9NS at 14222 kHz at 0600Z and the

PY2PE Net at 14250 kHz from 2230Z. Collect the information on the time and frequencies of all DX nets. Often you will be paid in kind with late information on when and where the action is or is about to show.

For those Deserving DXers who are long in hope of an Albanian QSO but short in fulfillment, it is again time for grasping straws. There is still the report of the British amateur currently in Greece who is attempting to line up an operation from an uninhabited Albanian island in the Adriatic Sea. Permission from the Albanian authorities has been sought. Even the callsign ZA1SV has been asked for. Some say that things are stirring in that part of the world, while others say that finding a good-humored and accommodating Albanian official might be more difficult than getting that ZA QSL in your eager hand. But never give up hope and keep in mind that longevity is a definite asset in your quest for that ZA counter.

There are a number of stations out of the Marshalls, and one of the active ones is KX6DX, who is often found on 10 meters these days, sometimes around 28.030 MHz or 28.530 MHz after 0530Z. Also active is KX6HE, who also shows on 10 CW around 28.035 MHz after 2115Z and on 15. KX6BU likes 21340 kHz from 0100Z.

JT1BG has been showing under the guidance of an MC, this one appearing around 14200 kHz or a bit lower from 0130Z. UA9YAB has been directing the traffic. DL2VK is in Kenya and may have a 5Z4 call by now. He was trying.

Kirsti Smith, VK9NL, and Lila, WA4ZEL, were reported as aiming for a Svalbard operation for two weeks in June. Kirsti is the XYL of Jim Smith, VK9NS, the well-known DX generator, and we may have listed VK9NL's call wrong recently.

Every DXer is sure that DXing is miserable at his QTH but always superb at some others he can name. All one need do for proof is to note the needed country list of the European DX Foundation. The top five most needed ones are Albania, Bouvet, Yemen, Burma, and Afghanistan. As one might have heard on the 2 meter box, "Who doesn't need them?" DXing is universal; misery is personal.

In the Cayman Amateur Radio Society bulletin ZF8SB advertises a beach cottage all set with rig and quad. He even says that if the bands are dead you can scuba out the front door. The Cayman bulletin reports a problem familiar to all clubs—slow dues payment with only 19 members paying out of the 33 on the rolls. If you are even thinking of heading out this fall or winter to the warm DX climes, you might want to check with the Cayman Amateur Radio Society at Box 1029, Grand Cayman, BWI. They welcome the Deserving types.

By now every DXer should be aware that the current DX season is very unusual. Do not wait for someone to tell you where the DX is. It is everywhere. Years from now you will still be remembering the DX conditions you will encounter this fall. Cycle 22 is probably headed for where no recorded cycle has ever gone before. DXers always need and deserve the good things, and Cycle 22 is bringing them.

And as it often happens, we come to the end of things.

73, Cass, WA6AUD

## DX Ten Years Back

In June 1979 KH6LW was on from Kure. N2KK and K5CO were planning operations in



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CIRCLE 56 ON READER SERVICE CARD



Down in the Alamo country, the home of the Alamo DX Amigos, they still remember Davy Crockett and the great days of DXing. They also are looking for greater days to come. Each year they recognize the "Best DXer," and this year it was Larry, N5HB, who received the Bruce Woodward, W5OSJ plaque. John Shean, K5DB, made the award.

the Indian Ocean and East Africa areas. There were even rumors that there would be activity from 7O Yemen, VS9K Kamaran, 8Z4 Neutral Zone, and other interesting DXCC countries. Kiribati was about to go independent and already there was mention of "Banaba" Island, which has the highest point in the new country at 265 feet above sea level.

Wayne Warden was back in W9-land after finishing his FW0WW operation at Wallis Island where he acquired some interesting contacts for his log, working B64U, RG8U in the Belden Congo which QSLed via C0AX and FR0ZE which QSLed via C0LD. With all the then recent changes in prefix assignments plus some innovative work by the FCC, it was a time to work them now and worry later.

3Y6CD was on from El Diablo on Bouvet. Many were anxious to work him, while few believed that it was anyone but "South Atlantic Slim."

The DXAC was working on a Procedures and Guideline for DX Operating and a preliminary draft had been released. They were covering everything, even DX nets and lists. They were very meticulous in their advice on these two latter items.

Manihiki and Niue and Wake Island were promised for July 1979, as were St. Martin, Turks and Caicos, and St. Lucia. New England DXers were planning their annual Scrodfest while the Northwest DX Meeting was scheduled for early August in Vancouver, British Columbia. Revilla Gigedo was offered by a crew out of Mexico City the same time another crew out of Guadalajara was promoting Benito Juarez Island. Seems that the latter were saying that that was the new name for Revilla Gigedo. Same DXCC country, different names.

Okino Torishima was on, and SM0AGD was on from Laos signing /XW8. Erik was reported as a bit bruised after falling through a window trying to get an antenna flying.

Cycle 21 was peaking and DXers were dancing in the bands enjoying some of the "Great Days of DXing." But even then some of the hilarious DX types were finding something to gripe about.

Aland Islands was heard with OH3TV, OH2PQ, OH2BP, and W1LJ on from Brando Is-

land signing /OH0. W1LJ was planning to move on to San Marino for some July action.

There was talk of a possible Heard Island operation. The last activity had been in 1970 and the VK0 country was number 5 on the Desperation List, having moved up in the previous year to displace Bouvet, Spratly, and the 8Z Neutral Zone. Sable Island was on the first week in June. Tom Wong, VE7BC, was in China working on the authorities to allow amateur operation from BY-land. Tom was hopeful and was successful. Marconi may have brought you amateur radio, but Tom Wong brought you China. Absolutely!

### QSL Information

All of the following was compiled with a lot of help from Bob Truhlar.

AP2TN to W8QFR	ZK3YY to 5W1GP
CR5CQK to CT1CQK	ZV5A to PY5EG
DU3/KE9A to WB9YXY	3DA00B to 3D6DB
DU7/N7ET to N7ET	3X1SG to ON7PV
EA8AB to EA5BS	9G1DS to JA9IDS
EM1AA to UZ1AMV	9J2EF to DJ0XL
FG/K2BS/FS to W2GHK	A25/EA5GGV to Thor Rasmus-
FM5DN to W3DJZ	sen, LA7BX, Box 440, N-301
F0581/P to FD6HSI	Skien, Norway
F05WD to W3HNK	DU3-KE9A to Bob Johnson,
HK7/SM5HV to SM Buro	WB9YXY, Box 113, Endeav-
FY4EP to FD1LXZ	or, WI 53930
HL5BDS to HL1ASS	FY5FC to B.P. 6005, Cayenne,
HL9RH to K13V	93706 French Guiana
HL9EP to K0VZR	LP2U to Box 166, 6300-Santa
JB/W5PWG to W5PWG	Rosa, PPA, Argentine
JD1/JA2NQG to JA2NQG	LP5UL to Box 166, 6300-Santa
JW5NW to LA5NM	Rosa, PPA, Argentine
JW7FD to LA5NM	OY9A to H. Solborg, FR655NES,
KC6SI to JA7HMZ	Faroe Islands via Denmark
KC6VW to JA6BSM	P29CG to Ed Varga, 121 Tilton
KH8/DK1CE to DJ9ZB	Park Dr., DeKalb, IL 60115
KH8/DL5UF to DL5UF	P43WLP to P.O. Box 2035, San
KX6OR to AD1S	Nicholas, Aruba
LJ3K to LA2QCA	PY5EG to P.O. Box 57, 80.001,
LU1EZK to LU6EF	Curitiba, PR, Brasil
LU1ZC to LU1ONZ	RT0U to UT4UWV, R.C. Poly-
LY2Z0 to UP1BZO	technic, Box 391.3, Kiev 56,
PJ9J to W1AX	Ukraine, USSR
P29CG to WB9SVK	RV0YF to Vladimir Maymistov,
RA0BB to UP1BZO	Box 176, Kyzyl, Tuva, 667000
RT0U to UT4UWDV	USSR
SP9BEY to SP9CXX	TU20Q to Box 3023, Abidjan
SV1RP/SV2 to SV1RP	01, Ivory Coast, Africa
T78U to I2ZGC	UIZA to P.O. Box 1087, Mur-
TG9ASA to JA2BDR	mansk, USSR
TL8RLA to NV7J	UA0YA to Box 176, Tuva,
TY9CR to DJ8CR	667000 USSR
TY6JC to DJ6JC	ZY8SW to NATAL DX GROUP,
TY9SI to DJ6SI	C.P.385, 59001 Natal, RN,
TY88YL to DL6KCD	Brasil
UA0YT to RV0YF	5N0/OK1AEK to P.O.B. 1009,
V29C to W2GBX	Lagos, Nigeria
VU7APR to W2XP	9J2AL to A.R. Goozner, Lusa-
XQ3DPD to CE3DPD	ka-USAID, State Department,
YJ8JS to N4EVS	Washington, D.C. 20523
YN/SM0IG to SM0CKR	



If you do not recognize this nice lady, you are not yet a true-blue DXer. This is Ellen White, W1YL, long an ARRL officer at Newington, and since retiring, the keeper of the DX corner in QST. The White's family name for many is synonymous with DXing. OM Bob White, W1CW, was the long-time DXCC protector and ran the DX Desk at the ARRL for many years.



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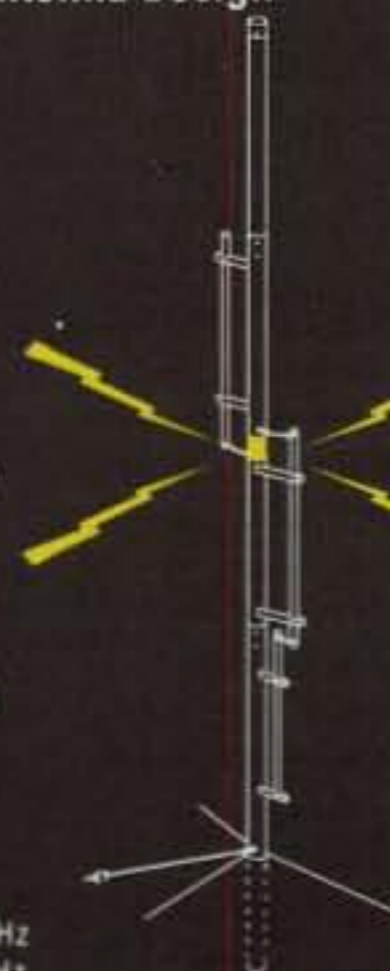
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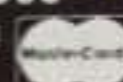
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A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

## Random Headings—Part I

Last time we got together, we finished up our two-part coverage of new books, catalogs, and newsletters for the hamshack, including Ed Noll, W3FQJ's new book, *Easy-Up Antennas for Radio Listeners and Hams*. Also in last month's column was a discussion of several unusual commercial antenna designs, as well as some software suitable for hamshack use. This month we'll set our sights on some "random headings," the first of which is the radiotelescope disaster at Green Bank, West Virginia. Following that, we'll hit on some more antenna topics, scan some new hamshack software, and save enough room for some "short bursts."

### A Very Bad Day at Green Bank

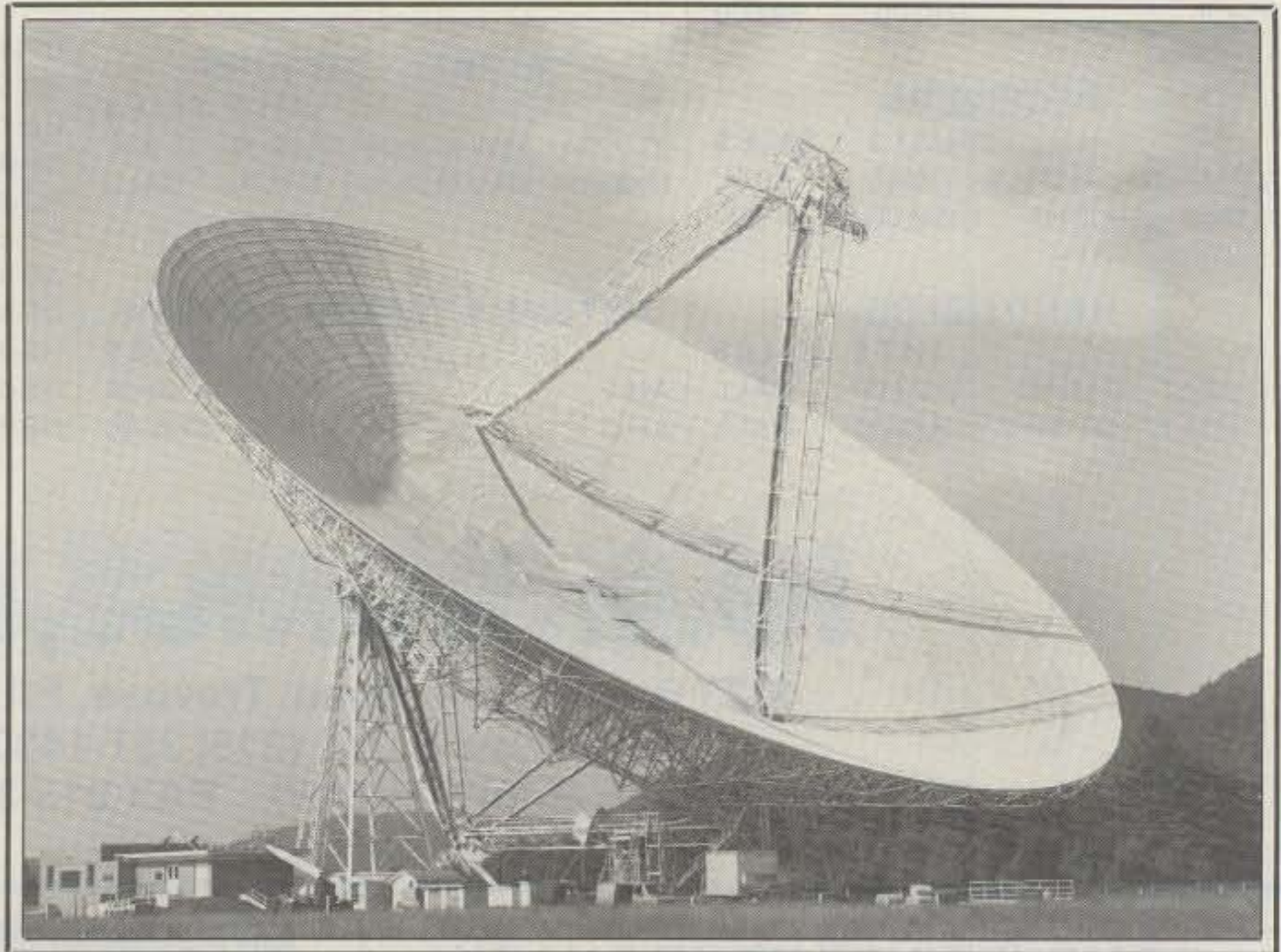
You've all probably heard of the structural disaster last fall at the National Radio Astronomy Observatory (NRAO) site at Green Bank, West Virginia, as reported by the national wire services. The accompanying "before" and "after" photos tell the tragic tale better than words could ever do.

We thought CQ readers would be interested in a little more detailed information about what happened, and about the radiotelescope dishes themselves, which lie in the so-called radio "quiet zone" in which the site is legally protected from most forms of interference—including that caused by radio amateurs. Thanks to information supplied by the Observatory's Information Services office, we're better able to fill in some of the blanks.

At around 10 PM last November 15 the 300 foot diameter radiotelescope dish at the Observatory's Green Bank, West Virginia facility collapsed. Fortunately, no one was injured in the collapse, but the disaster sent reverberations throughout the scientific community, as the loss affects a long list of research proposals and projects aimed at picking up the faint super-DX radio signals emitted naturally by objects throughout the universe.

The Green Bank telescope was one of the most powerful in the world, and is said to be capable of listening to stellar objects billions of light years away. Presently an investigation is underway to determine the cause of the collapse. Some published wire service stories have confused the design of the 300 foot telescope with that of its sister instrument, the 140 foot telescope also located at Green Bank, drawing the conclusion that a common design was used for both telescopes and that the design was deficient for the larger telescope that collapsed. According to the observatory, the two are of different design and they serve different needs. The smaller telescope was not affected by the loss of its larger sister.

The 300 foot telescope was one of the most powerful in the world, and it was the single



Before: Here's the 300 foot radiotelescope dish at the National Radio Observatory's Green Bank, West Virginia site, taken prior to its collapse last November 15th. The telescope, supported by a steel backup structure on two 87 foot tall steel towers, had an area of 78,000 square feet, or 1.8 acres. (Photo courtesy National Radio Astronomy Observatory)

largest instrument in the United States, with the capability to survey the entire northern sky. Since it was built in 1962, more than 1000 astronomers have used it to study galaxies, quasars, stars, pulsars, the sun, and the planets. The most complete and detailed surveys of cosmic radio sources to date were made by it.

One of the most famous discoveries of the telescope was that the gas in a galaxy such as our own Milky Way could occupy a much larger volume than the stars, and could even form a bridge through intergalactic space to connect with another galaxy. The telescope also discovered that at the heart of an exploded star, the Crab nebula, was a very young pulsating radio source or "pulsar." This finding showed that the hitherto mysterious pulsars were in fact a natural product of the endpoint of stellar evolution.

At the time of its collapse, the 300 foot telescope was just completing a project to map the northern sky in search of quasars and other sources of extraterrestrial radio waves, and it was soon to begin studying the magnetic field in the Milky Way. The instrument's loss leaves a major gap in our capability to probe deep space.

The telescope was located in a sparsely populated area shielded by mountains from most forms of radio interference, enabling the

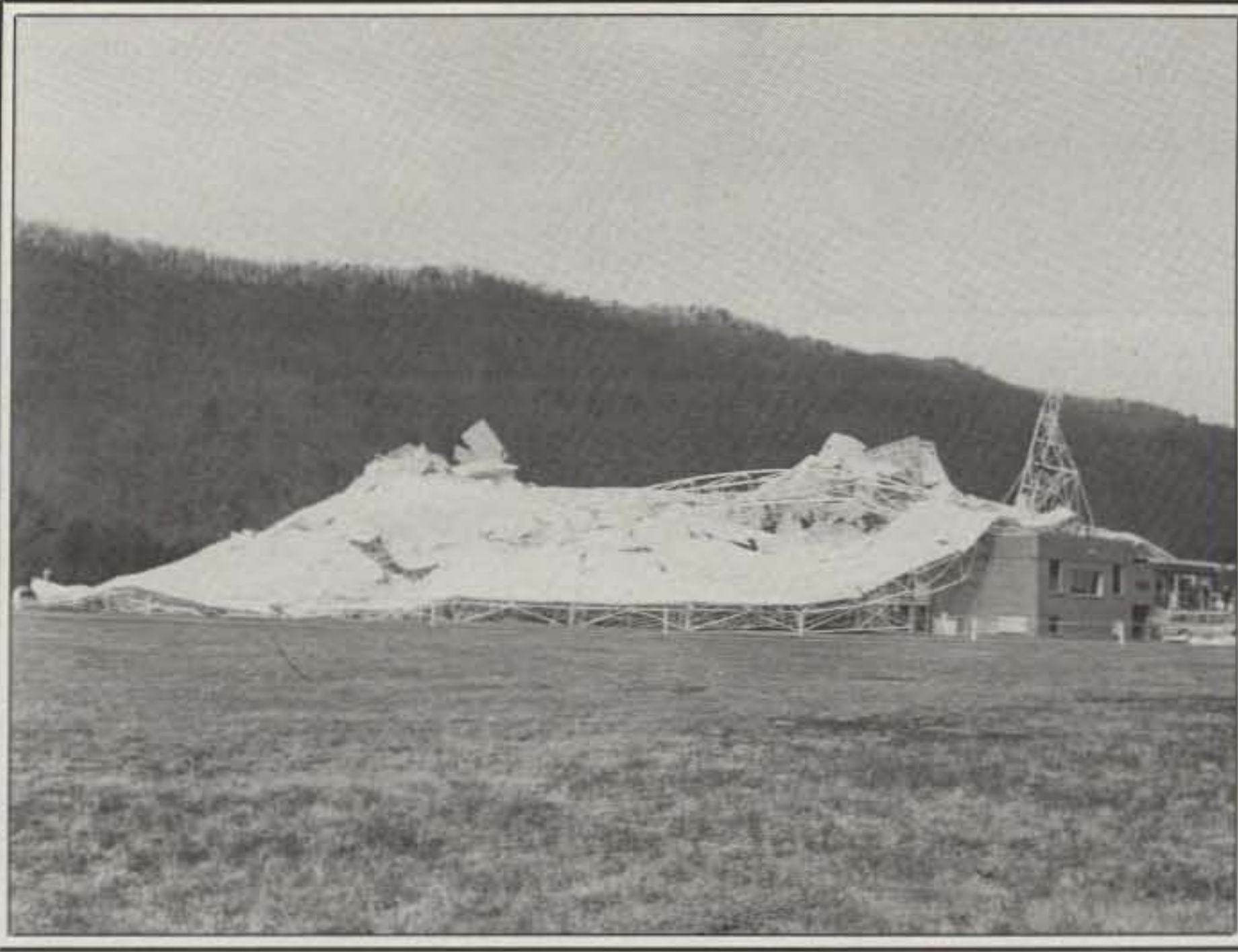
telescope to pick up the faint radio signals emitted naturally by extraterrestrial objects. First used in September 1962, it was built at a cost of about \$900,000; a more accurate \$500,000 surface was put on in 1970.

The dish was a parabolic-shaped bowl 300 feet in diameter with an aluminum mesh surface supported by a steel backup structure on two 87 foot tall steel towers. The telescope had an area of 78,000 square feet (about 1.8 acres), and its moving weight was about 500 tons. The surface of the telescope reflected radio waves and focused them to a point 225 feet above ground, where they were intercepted and sent down cables to the control building. The dish was controlled by computers and a telescope operator located in the control building. (If you're interested, there's a detailed description of the construction project in the February 1963 issue of *Sky and Telescope*.)

The telescope was operated 24 hours a day, 365 days a year, except for a regular 8 hour maintenance period each week, a few longer maintenance periods scheduled throughout the year for upgrading equipment, and holidays. The instrument was open for use by any qualified scientist. In a typical year about 50 astronomers from all over the U.S. and abroad used the 300 foot telescope for projects that ranged from study of relatively nearby clouds

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After: Same site, same 78,000 square foot structure after last November's accident. All that remained of the 300 foot radiotelescope's framework and parabolic reflector was a twisted pile of steel girders and aluminum mesh. Many important research projects will be affected by the telescope's demise, including the Gamma Ray Observatory scheduled to be launched by NASA in 1990 from the space shuttle. The telescope was going to be used to monitor 100 of the brightest pulsars in conjunction with gamma-ray observations. (Photo courtesy National Radio Astronomy Observatory)

of interstellar gas to the study of quasars. In its almost 27 year lifetime, 1036 astronomers, including 252 students, used the 300 foot telescope.

Although the loss of the 300 foot instrument was a major scientific loss, it was only one of five telescopes operated by the NRAO. The others include the 140 foot telescope at Green Bank, already mentioned; the 12 m., millimeter-wave telescope on Kitt Peak near Tucson, Arizona; the Very Large Array instrument, an array of 27 antennas, each 25 m. in diameter, located west of Socorro, New Mexico; and the Very Long Baseline Array, an under-construction array of 10 antennas, each 25 m. in diameter, located at several sites across the globe, including Hawaii, the Virgin Islands, and the continental United States.

Incidentally, if you're interested in learning more about radio astronomy and the antennas used in this fascinating field, one of the classics is Dr. John Kraus, W8JK's *Radio Astronomy*, now in its second edition. All of the basics of the first edition are retained, but with new material on contemporary topics such as holographic measurements, low-noise FET amplifiers, interstellar molecular clouds, comets, pulsars, and several other topics. The 710-page book includes hundreds of illustrations, worked-out examples and problems, and references for the user. It is \$39.95, available from Cygnus-Quasar Books, P.O. Box 85, Powell, OH 43065; shipping is \$2.50.

### THE ANT FARM Antennas

A couple of months ago we received a flyer from this Pennsylvania firm which offers several one-stop antenna kits for radio amateurs and SWLs.

Their flyer shows four antennas that are offered for sale. They include a 102 foot, centered G5RV (160-10 meters, MW 30 MHz on receiving); the 51 foot Skyraider (80-10 meters, MW 30 MHz on receiving); the end-fed, 102 foot Super Sky Raider (160-10 meters, LF 30 MHz on receiving); and the 210 foot Hammer (160-10 meters, LF 30 MHz on receiving).

All of the antennas feature 14-gauge hard-drawn copper wire, stainless steel hardware, and weatherproof construction. The kits are furnished fully assembled with all materials included. Postpaid prices range from \$45.95 to \$75, depending on model.

For more information, contact THE ANT FARM, RD 1, Box 181A, Kunkletown, PA 18058.

### New Kilo-Tec Catalog

Kilo-Tec, a longtime supplier of antennas and antenna accessories, shows several new items in their latest catalog, including a line of high-power variable capacitors, roller inductors, and other antenna tuner and transmitter output components, as well as a high-power antenna tuning unit.

Both the new capacitors and roller inductors are imported from the U.K. The TC-500 is a 500 pF variable, and the TC-250 is a 250 pF variable; both have 7.8 KV breakdown ratings; the 50216B is a 7000 volt, 135 pF per section, split stator capacitor. The 27 microHenry RC-26 "Roller Coaster" inductor is intended for use in high-power antenna tuners and transmitter output stages; it's rated at 1 KW. A 3 KW, 24 microHenry inductor, the KT-RI24 is also available.

Another Kilo-Tec import is the TM-1000 antenna tuner, manufactured in the U.K. by G4JEV. It's based on the classic "Ultimate

Transmatch" design, and is intended for use from 1.8 to 30 MHz. It's rated at 1000 watts PEP and handles load impedances of 50-500 ohms. The unit makes use of one of the "roller coaster" type variable inductors. An internally-mounted 4:1 balun is available as an accessory to enable the unit to be used with open-wire feeders.

Other Kilo-Tec products include a variety of custom antennas covering 160-2 meters; antenna wire, hardware, connectors, and cable; coax weather boots; openwire and twinlead feeders; transmatch parts; and several other antenna tuners. For more information, contact Kilo-Tec, P.O. Box 1001, Oakview, CA 93022.

### Electron Processing Products

A recent catalog from this New York firm showed several new products. One is the SUPER VAK-TENNA, an active (preamplified) antenna designed for SWL and scanner frequencies, 500 kHz to 800 MHz. The antenna is designed especially for the user living in an apartment building or who is "on the road" a good deal.

The antenna proper is a 38 inch telescoping whip (collapsible to 14 inches) with two powerful suction cups for mounting. Included with the antenna is 15 feet of coax allowing connection to the power unit, which includes a 115 VAC wall transformer and female BNC jack for connection to the receiver's antenna input. The antenna is priced at about \$150. For those needing more than 1 inch clearance from the window, a suction-cup spacer kit that sells for \$3.00 holds the unit 2 inches from the glass. An unamplified VAK-TENNA covering 30-500 MHz is priced at about \$30.

Another interesting device which the firm sells is the MRA-3 Multiple Receiver Adapter, a 500 kHz to 800 MHz amplified splitter for the SWL and scanner buff. The adapter connects up to three receivers to one antenna; an internal amplifier is included. It's priced at about \$70. Also available are several preamps variously covering 300 kHz to 1000 MHz, as well as a rather unique suction-cup window-mounted mobile radio speaker.

For more information and a catalog, contact John Martin, WB2VTN, at Electron Processing, Inc., P.O. Box 708, Medford, NY 11763.

### Cable and Connector Selection Guide

Nemal Electronics, a longtime supplier of cable products for the amateur community, has announced its *1988/89 Cable and Connector Selection Guide*, which makes a very handy workshop reference, whatever your cable and connector needs may be. The new guide lists a variety of RF transmission lines, connectors, cable assemblies, wire, shrink tubing, fiber optics, and accessories. The new guide shows more than 175 new products since the last edition. Included are not only amateur products, but products for broadcast and CATV use, triaxial cables, highly specialized and unusual connectors, and telephone cable. Particularly useful is the guide's four pages of comprehensive charts of coaxial cable specifications.

The new guide is available from Hilda H. Manten, Sales Administrator, at Nemal Electronics International, Inc., 12240 N. E. 14th Ave., N. Miami, FL 33161.

### Surplus Goodies from Nebraska

With his catchy motto of "where the hard to find parts are found and on hand," Bob Grinnell, WD0FDE, of Surplus Sales of Nebraska



has a number of goodies listed in his catalog that are of interest to antenna builders and parts scroungers alike. The latest catalog is chock-full of antenna tuner parts, trimmer capacitors, vacuum relays, "doorknob" transmitting ceramic capacitors, plated finger stock, connectors, RF switching relays, and other goodies.

Catalog Supplement 5A includes a schematic diagram of a unique remote antenna switching system based on their RNF-100 RF switching relay. The plan is to allow the builder to add as many or as few antenna positions as are necessary for his particular installation. The design provides a "failsafe" in the event relay coil voltage is lost, by routing the feedline into a 50 ohm load; antennas not in use are safely grounded.

The \$10 RNF-100 relay is a 12 volt DPDT RF type which has 10 amp contacts; it can comfortably switch several thousand watts, depending on circuit impedance. Internal wiring can be done with regular buss wire or with 50 ohm teflon RG-142 coax. You provide the enclosure, although Bob's firm can supply the relay, connectors, cable, switches, and hardware.

For a catalog, contact Bob Grinnell, WD0FDE, at Surplus Sales of Nebraska, 1315 Jones St., Omaha, NE 68102.

## Software Snapshot

**YO Yagi Optimizer Software.** Wouldn't it be nice to do much of your antenna "trial and error" work on your computer? This type of experimentation is done every day in business and industry, and it's called modeling or simulation. With the right software, antenna modeling is something that can be done by amateurs and can save you a lot of work. In last September's column we described Brian Beezley, K6STI's MN Antenna Analysis software for the IBM PC. Brian found that he became completely exasperated trying to model even simple antennas using the standard MININEC antenna analysis program. He decided to do something about it by designing an easier-to-use set of programs based on the original government product. Brian's resulting MN antenna analysis package has as its heart the main MN analysis program. Associated with it are the MNPLOT plotting program and an antenna library, which contains plot data files for all of the antennas in the library. This month we're pleased to report on Bob's latest creation, YO, the Yagi Optimizer, also designed for the IBM PC.

The new YO program automatically computer-optimizes Yagi antenna arrays for maximum forward gain, best pattern, and minimum SWR. The analysis algorithm features high accuracy for forward gain and overall pattern, and good accuracy for front/back (F/B) and input impedance.

YO is a complete Yagi design package, and it includes models for matching networks, element tapering, element-to-boom mounting plates, frequency scaling, and taper scaling. These features are accessible in the program from an easy-to-use user interface which features pop-up windows, annotated graphics, interruptible computation loops, consistent program response, and overall intuitive operation. Comprehensive documentation, which you print out using your own printer, is included on disk.

The program plots antenna radiation patterns at the central design frequency and at the band edges on your screen during the opti-

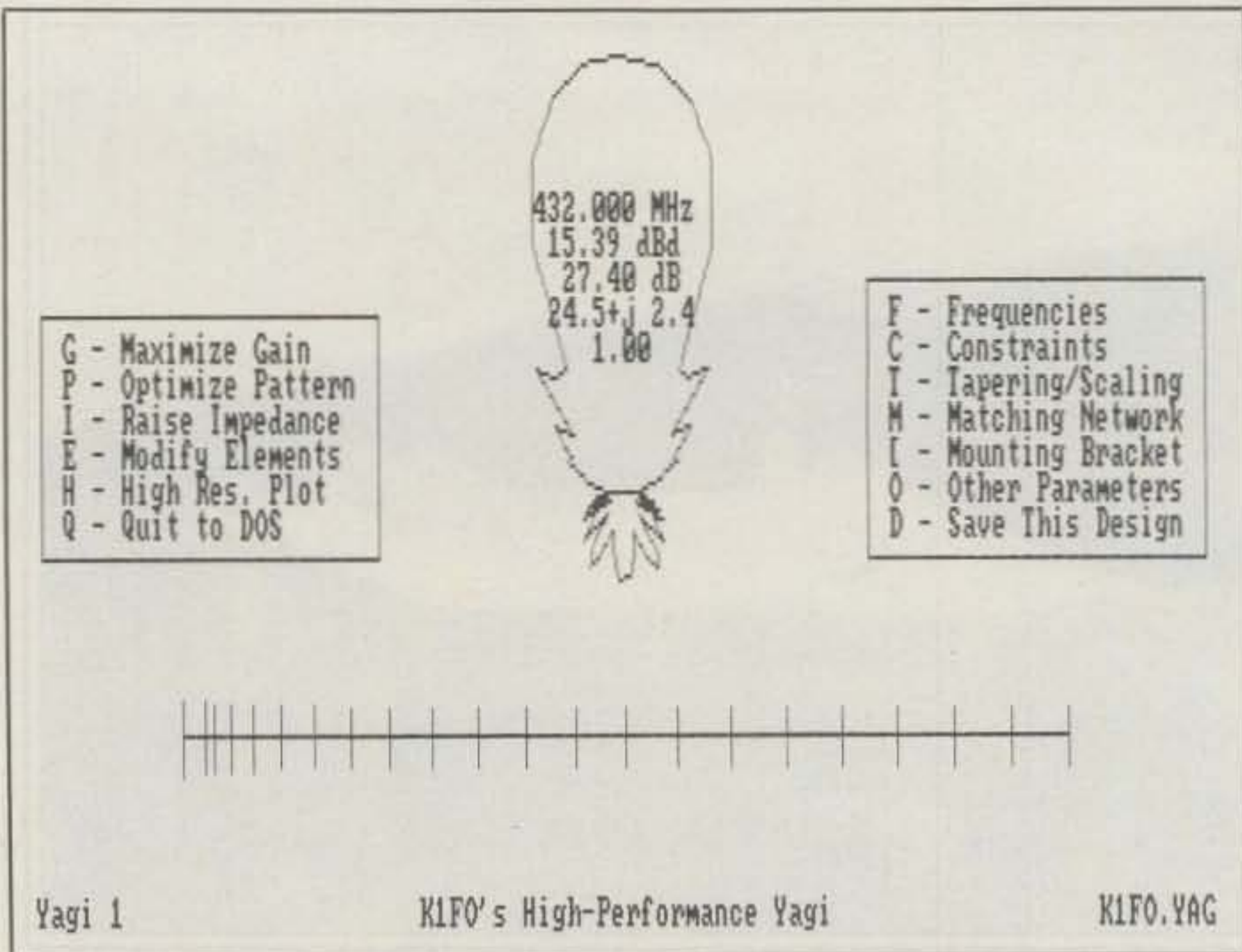


Fig. 1 - Shown here is a "screen dump" of one of K6STI's YO Yagi Optimizer software program's screens, showing menu selection options. Here a K1FO high-performance Yagi has been selected for optimization.

mization process. The three simultaneous plots are updated continuously as the optimization proceeds, allowing you to check the performance of the antenna at a glance. In addition, the program draws a picture of the antenna, and you can see it change shape as the element spacings and lengths vary during optimization. You also may use a high-resolution plotting program to view the antenna patterns in several formats, and to directly compare the plots of two Yagis using a special built-in plot comparison feature.

YO can work alone, or it can be used in conjunction with the MN general-purpose antenna analysis program we covered last September. YO will read MN antenna files, thereby making it convenient to optimize a Yagi previously analyzed with MN. Also, YO will write MN antenna files, making it easy to use MN to verify a YO design or to add to it a realistic ground model. Importantly, MN has the ability to combine several Yagis into one model so that you may investigate the interaction among nearby antennas. According to Brian, the Yagi model used in the YO software is significantly more complex than the well-known W2PV model.

A particularly nice feature is that YO contains models for several common matching networks. These include broadband transformer, and gamma, T, hairpin, and beta matches. YO determines the best spot in the band to adjust the match for unity SWR, in order to minimize the maximum value of SWR over the band. Another nice plus is the inclusion of about 50 Yagi designs on the program disk; many of the antennas are commercial designs, and you may use YO to investigate manufacturers' antenna performance claims. These library designs make useful starting points for new designs you might try, as well.

The YO package is \$90. It is furnished on a standard 5.25 inch diskette, and includes the main YO program, a plotting program, the Yagi

library, and several documentation text files. The program requires at least 384K memory, DOS 2.0 or later, and either a CGA, EGA, or Hercules graphics card. Contact Brian Beezley, K6STI, 507 1/2 Taylor St., Vista, CA 92084.

Fig. 1 is a sample screen dump part way through the process of optimizing a 432 MHz K1FO high-performance Yagi. Fig. 2 is a directory listing showing the included Yagi library files.

**Amateur Radio Operating System (ARS).** That's the ambitious name given by Ron Stange, WA4PYF, to his new modular software system for the IBM PC and compatibles. The ARS software is offered in what Ron describes as "functional modules"—after you purchase the base module, you need only obtain those particular modules that support your particular field of interest.

The ARS Base Module supports auto-logging of all your contacts on any of eight bands and using six different operating modes; multiple log files are supported. The display, correcting, and printing of log files is done automatically. Besides log-related activities, the module provides for detailed QSO contact recording, editing, and printing for United States and Canadian contacts. The QSO information that is recorded includes call, date, time, band, mode, name, and QSL sent/received data. The data is summarized for the Worked All States (WAS) and Worked All VE (WAVE) awards.

Several other supporting modules are available. The Foreign/DX Module extends QSO contact data recording, editing, printing, and summarizing to all amateur radio countries. A country "Quickchek" is added to the auto-logging function: when you hear a station on the air, a keystroke has the Quickchek function display your need for the country or callsign entered. In addition, DXCC and Worked All Europe (WAE) contacts are tallied, summarized, and displayed on the screen or printed out.



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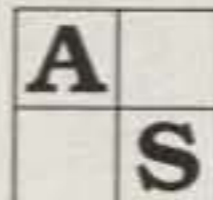
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D-30	30	46'	28.95
D-20	20	33'	27.95
D-15	15	22'	26.95
D-10	10'	16'	25.95
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SD-80	80/75	90'	35.95
SD-40	40	45'	33.95
Parallel dipoles			
PD-8010	80,40,20,10/15	130'	43.95
PD-4010	40,20,10/15	66'	37.95
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PD-4020	40,20/15	66'	33.95
Dipole shorteners-only same as included in SD models			
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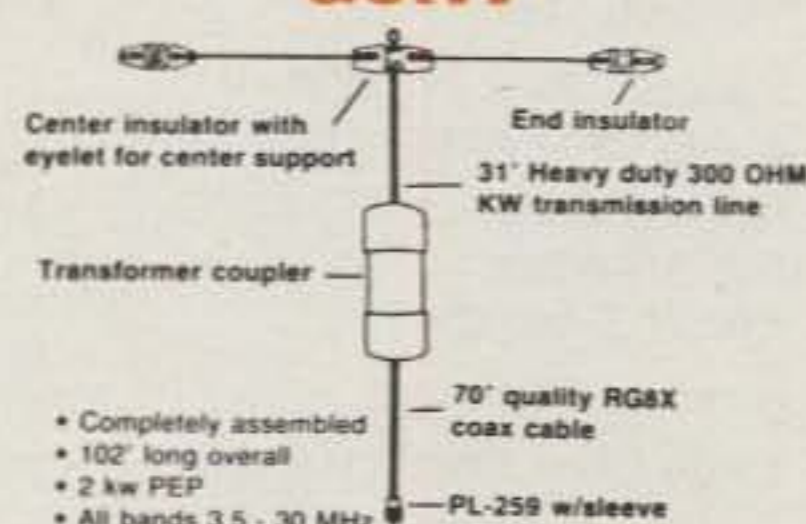
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MODEL	BANDS	LENGTH	PRICE
SLA-I	160,80,40	60'	\$49.95
SLA-II	80,40	40'	44.95
SLA-III	80,40,20,10	27'	69.95

## DIPOLES

MODEL	BANDS	LENGTH	PRICE
Half-sized dipoles			
HSD-160	160	130'	\$49.95
HSD-80	80	68'	46.95
HSD-40	40	34'	44.95
Loaded dipoles - using coils			
LD-I	80,40	80'	\$59.95
LD-II	160,80,40	122'	79.95
LD-III	80,40,20,10	53'	89.95
LD-IV	160,80	164'	69.95
LD-V	160,40	115'	64.95
LD-VI	80,40	78'	59.95
Trap dipoles			
TD-2010-2	20,15,10	28'	\$49.95
TD-2010-4	20,15,10	25'	64.95
TD-4010-2	40,20,15,10	57'	54.95
TD-4010-4	40,20,15,10	48'	74.95
TD-8010-2	80,40,20,15,10	106'	59.95
TD-8010-4	80,40,20,15,10	99'	79.95
TD-8010-6	80,40,20,15,10	84'	99.95
TD-16080-2	160,80	210'	71.95
TD-16010-8	160,80,40,20,15,10	148'	129.95

Suffix number indicates number of traps

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TV-2010-1 20,15,10 15' \$39.95

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TV-8010-3 80,40,20,15,10 44' 67.95

TV-16010-4 160,80,40,20,15,10 75' 79.95

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Dipole shorteners-only, same as included in HSD models

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PL-259 .75

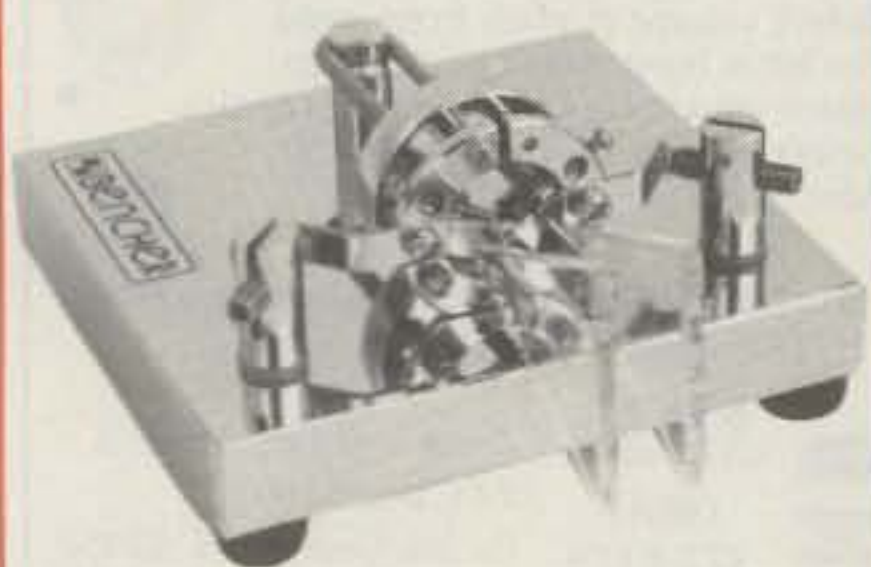
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### Yagi Files in the Current Directory

10-4CD	204CW	CUSH112	K1FO	LONG7	N6BU615	OUT	WIL520
105GAIN	204SSB	DL1BU710	K1FO-OPT	LONG8	N6BU620	PV4	
10WB	2EL	HG105BA	K6JY0610	N2FB415	N6BUPAT	WIHQ506	
12-4CD	412GAIN	HG106B	K6NA415	N2FB610	N6ND510	W1JR	
144PAT	50ELEM	HG155B	K6NA610	N2FB615	NBS122	W2PV810	
20-3CD	710PAT	HG205B	LONG5	N2FB620	NBS506	W6SAI320	
20-4CD	ANOMALY	HG515	LONG6	N6BU340	NICE4	WIL515	

Enter Yagi Filename: █

Fig. 2- Another "screen dump" of the YO program, showing the 50 antenna files that are supplied with the program in its "Yagi library." Many of these represent commercial designs which you may evaluate and modify.

Two other modules presently are available. One is the Contest Manager Module, a control module that interfaces with individual contest modules. It is offered with any available contest module of your choice. Ron anticipates that a large number of contest modules will ultimately be offered. All contest modules support auto-logging, dupe searching, and scoring summaries.

Also available is the QSL Printer Module. This module enhances auto-logging by enabling you to mark the QSO in progress, or any log entry, to be printed later by the QSL Printer. The module software scans the selected log file for marked entries. When it finds one, it prints out the QSL card and marks that entry to show that a card was sent. If you should miss some contacts, you can go back and select them manually.

The ARS Base Module is priced at \$39.95 and includes a 50-page printed manual; the other modules are \$15.95. A "DX Chaser's Special" consisting of the Base and Foreign/DX Modules is priced at \$49.95. A demo disk is available for \$10 that is creditable to a future order. For further information on the ARS, contact Ron Stange, WA4PYF, at Fundamental Services, 1546 Peaceful Lane N., Clearwater, FL 34616.

**Satellite Tracking for the IBM PC and C-64.** This month we'd like to bring to your attention two products, one a combined hardware/software package for the IBM PC, the other a software-only package for the Commodore 64.

The Kansas City Tracker is a combined hardware/software package that connects between your rotor controller and an IBM XT, AT, or clone. It controls your antenna array by enabling your PC to track any satellite or orbital body. The Kansas City Tuner is a companion product that is used in satellite work to provide automatic doppler-shift compensation. It connects to your computer-compatible radio through its RS-232C serial control port to update receive and/or transmit frequencies once a second. The Tuner can be used in digital or analog modes, and it is compatible with many recent rigs, including the Yaesu 726 and 736, as well as the ICOM 271/471, 275/475, and R-7000.

The Tracker and Tuner packages consist of a printed circuit card that plugs into an avail-

able card slot on your PC and several "Terminate and Stay Resident" (TSR) programs, including a TSR rotor control program and a TSR "pop-up" status program.

The Tracker software uses the card to interface to your antenna rotor controller and provide computer control of an azimuth-only or dual-rotor (elevation and azimuth) antenna system. The package can be connected directly to a Yaesu/Kenwood 5400/5600 rotor controller, or to any other rotor using an optional accessory rotor interface. The Tuner software uses the card to interface your radio to tune out doppler shift during satellite passes.

The Tracker and Tuner are interesting in that they don't use your computer's COMM ports or hardware interrupts. In effect, the software runs in your PC's "spare time," so to speak, thereby letting you run other programs at the same time. The fact that the rotor driver and status programs are of the TSR type—programs that attach themselves to DOS and then "disappear"—allows you to run other DOS programs while your antenna tracks its target under computer control. This feature is especially useful for satellite and land digital work, as telecommunications software programs (such as the popular shareware product ProComm) can be run while your PC aims your rotors at the same time.

The ability to control antenna rotors "in the background" is also quite useful for net, DX, and contest work. For example, the DX or contest operator can run a DX logging program and display it on his monitor's screen while his rotor is being moved. He can pull down the status window, request a change of the antenna position, and return to his logging program and contest work while the antenna rotates.

The Tracker and Tuner are compatible with AMSAT's QUIKTRAK 3.2 software and with Silicon Solutions' GRAFTRAK 2.0. These programs can be used to load the Tracker's tables with more than 50 satellite passes.

The basic Kansas City Tracker is priced at about \$170. The Tuner adds about \$80, and various extra-cost hardware and software options also are available. A product information sheet is available from L. L. Grace Communications Products, 41 Acadia Drive, Voorhees, NJ 08043.

In contrast, SATCOMM-64 is a software-



only program for the Commodore 64 that helps the operator determine when the satellite of interest is accessible, and where to aim the antenna. During satellite transits, the program provides key data at intervals of one minute or more. The user may select screen-only reports for quick searches, or a detailed printed report may be generated so that the computer is available during actual satellite passes.

SATCOMM-64 has a 12-option master menu for quick activity selection, and the program can store information for up to 15 different satellites. The program can rapidly confirm W1AW reference orbits; a single entry of the time bracket during which you are available will enable you to generate a printed report of up to 31 days of access time (during the specified time bracket) for any satellite. A similar time entry can also be used to produce a report for any desired day of the access times, for up to three different satellites.

Other useful program features include an easily-changed satellite menu; choice of screen-only or screen and printed reports; and user-definable default settings. Special features include automatic switchover from Standard to Daylight time and vice-versa, and easily handling of the annual "rollover period" during which the previous year's Keplerian data elements have not yet been updated. A number of printed reports can be generated.

SATCOMM-64 comes equipped to cover all of the present OSCAR satellites plus visible satellites such as Kvant, MIR, and Salyut-7, as well as weather and research satellites including GOES/WEFAX, NOAA, and Meteor. The user may replace any of these satellites with new choices.

The program is compatible with the Commodore 64/128, 1541 disk drive, and 1525-compatible printer. Price class is \$16. For more information, contact Strategic Marketing Resources, Inc., P.O. Box 2183, Ellisville, MO 63011.

### Short Bursts

**Morse Code Coin.** Several years ago, when "user supported software" was all the rage for the Commodore Vic-20 and 64 computers, we mentioned Bill Munch's startup, Public Domain, Inc., as being an excellent source of public domain/software for these pioneering personal computers.

Unfortunately, Bill's operation is a thing of the past, as he puts it, "user written software having gone the way of buggy whips and spark gap transmitters." But he now has a new product that's rather unique, and he sent me a sample for perusal.

It's a "Morse Code coin," a numismatic novelty but also a potential learning tool for the code beginner. It's a two-sided solid brass coin that essentially translates Morse, and as such can be carried in one's pocket for some "anytime, anywhere" code practice.

The send side has all the letters of the alphabet on it, along with the Morse Code characters. To send, you simply pick out the letter you want to send and note the Morse character equivalent. However, to receive using this type of arrangement would be quite difficult since you would have to search through all of the dots and dashes to find the letter. Because of this, the receive side of the coin is laid out in a branching diagrammatic fashion.

To receive, when you hear the code character being sent, you begin at a certain point on the coin, following the dots and dashes through

to find the letter. If it starts with a dash, the letter will be found on the right side of the coin's face; if it starts with a dot, it will be on the left side. As the code character changes from dots to dashes, or from dashes to dots, you turn a corner on the coin's surface; otherwise, you keep going straight to find what character was sent. It's much simpler to actually *do* this than to follow this convoluted explanation—in effect, you're just following a kind of logic tree to find what Morse character was sent.

Bill offers the brass Morse Code coins for \$5.95 postpaid, from MBB, P.O. Box 160, West Milton, OH 45383. A Troy ounce silver coin is also available for \$19.95.

**TI-99/4A Computer Deal.** This Texas Instruments computer was one of the more popular early-80s personal computers, a technically excellent PC that unfortunately lost the marketing wars to models such as the Commodore 64 and various Ataris. There are, however, many thousands of these machines still in operation today, a number of them proudly resid-

ing in ham shacks. But how do you get such an "orphan machine" fixed?

Turns out that as far as the TI-99/4A goes, it's quite easy, since the machine is still supported by Texas Instruments, which is very much in business. If you have a problem with your unit, the "repair" actually takes the form of an outright exchange. It's exchanged by simply returning the unit, along with \$30.50 plus postage, to Texas Instruments, Attn: Parts Department, 2305 North University, Lubbock, TX 79415. (Just to be sure, I'd suggest calling before committing my machine to UPS. The number there is 806-741-2265 or 2268.)

### Wrapping It Up

That's about all for this time, folks. Next month we'll have more Antennas & Accessories articles of timely interest. See you then.

*Overheard:* Unfortunately, we don't always see things as they *really* are. Instead, we usually see things as we are.

73, Karl, W8FX

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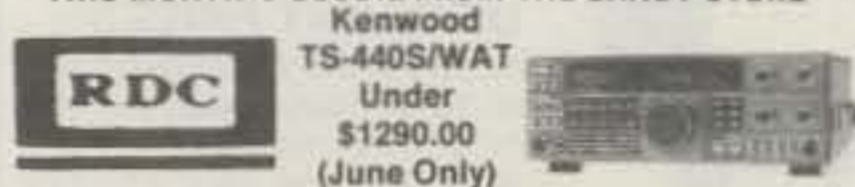
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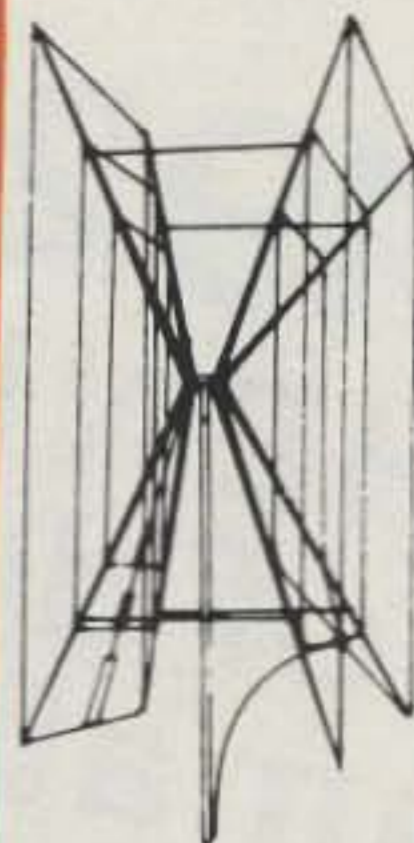
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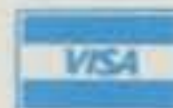
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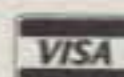
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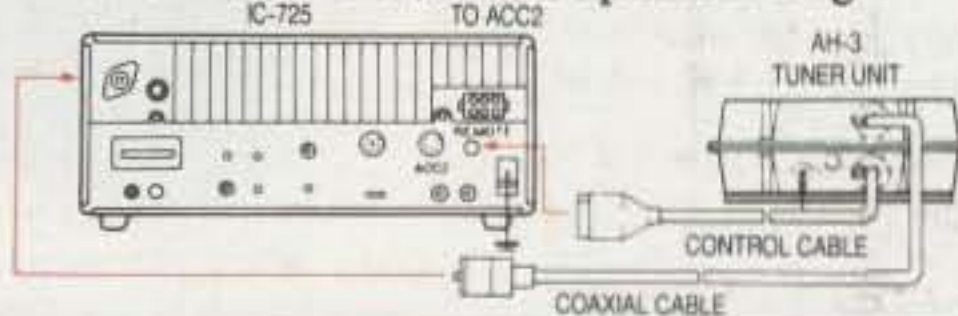
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