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Amateur Radio

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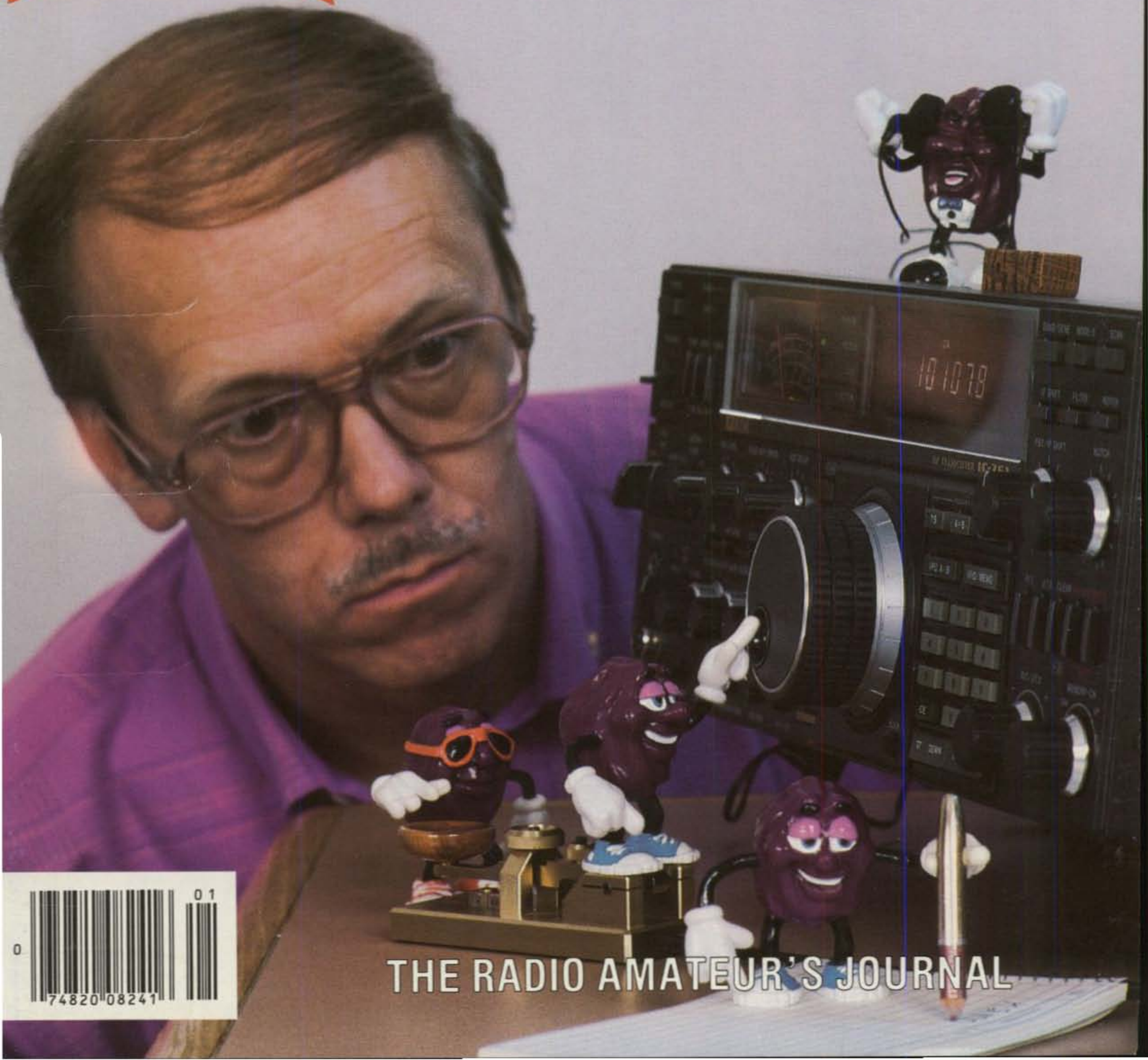
K4TWJ Checks On California Raisin® Multi-Op Team During CQ WW DX CW Contest



THE RADIO AMATEUR'S JOURNAL

KENWOOD

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THE FIRST 144/220 MHz Dual Bander!

Double Take!

ACTUAL SIZE FRONT PANEL

TM-621A/721A

144/220 and 144/450 MHz FM Dual Banders

Once again, Kenwood brings you another Dual Bander First! The TM-621A is the first 144/220 MHz FM Dual Bander. The Kenwood TM-621A and TM-721A (144/450 MHz) re-defines the original Kenwood "Dual Bander" concept. The wide range of innovative features includes a dual channel watch function, selectable full duplex operation, 30 memory channels, extended frequency coverage, large multi-color dual digital LCD displays, programmable scanning, and more!

- **Extended receiver range** (138.000-173.995 MHz) on 2 m; 70 cm coverage is 438.000-449.995 MHz; 1-1/4 m coverage is 215-229.995 MHz. (Specifications guaranteed on Amateur bands only. Two meter transmit range is 144-148 MHz. Modifiable for MARS/CAP. Permits required.)
- **Separate frequency display for "main" and "sub-band."**
- **Call channel function.** A special memory channel for each band stores frequency, offset, and sub-tone of your favorite channel. Simply press the CALL key, and your favorite channel is selected!
- **30 multi-function memory channels.** 14 memory channels and one call channel for each band store frequency, repeater offset, CTCSS, and reverse. Channels "A" and "b" establish upper and lower limits for programmable band scan. Channels "C" and "d" store transmit and receive frequencies independently for "odd splits."
- **45 Watts on 2 m, 35 watts on 70 cm. 25 watts on 1-1/4 m.** Approx. 5 watts low power.
- **Automatic Band Change (A.B.C.)** Automatically changes between main and sub-band when a signal is present.
- **Dual watch function allows VHF and UHF receive simultaneously.**
- **Programmable memory and band scanning, with memory channel lock-out and priority watch function.**
- **Balance control and separate squelch controls for each band.**
- **Dual antenna ports.**
- **TM-621A has auto offset.**
- **Full duplex operation.**
- **CTCSS encode/decode selectable from front panel** or UP/DWN keys on microphone. (Encode built-in, optional TSU-6 needed for decode.)
- **Each function key has a unique tone for positive feedback.**
- **Illuminated front panel controls and keys.**
- **16 key DTMF mic. included.**
- **Handset/remote control option (RC-10).**
- **Frequency (dial) lock.**
- **Supplied accessories:** 16-key DTMF hand mic., mounting bracket, DC cable.

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

TM-721A shown with optional RC-10.

Optional Accessories:
• **RC-10** Multi-function handset/remote controller • **PS-430** Power supply • **TSU-6** CTCSS decode unit • **SW-100B** Compact SWR/power/volt meter • **SW-200B** Deluxe SWR/power meter • **SWT-1** 2 m antenna tuner • **SWT-2** 70 cm antenna tuner • **SP-40** Compact mobile speaker • **SP-50B** Deluxe mobile speaker • **PG-2N** DC cable • **PG-3B** DC line noise filter • **MC-60A, MC-80, MC-85** Base station mics. • **MA-4000** Dual band 2 m/70 cm mobile antenna (mount not supplied) • **MB-11** Mobile bracket • **MC-43S** UP/DWN hand mic. • **MC-48B** 16-key DTMF hand mic.

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NEW!

Affordable DX-ing!

TS-140S

HF transceiver with general coverage receiver.

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

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

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

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

Optional Accessories:

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

TS-680S

All-mode multi-bander

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

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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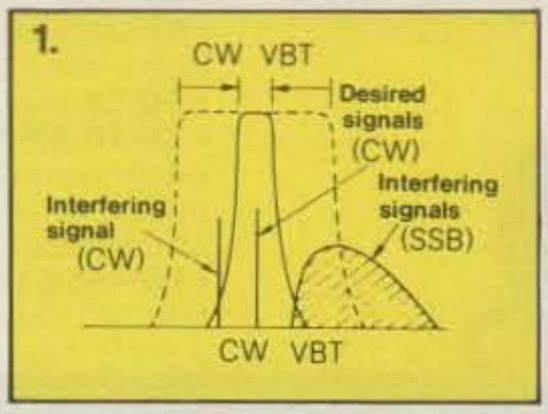
DX-cellence!

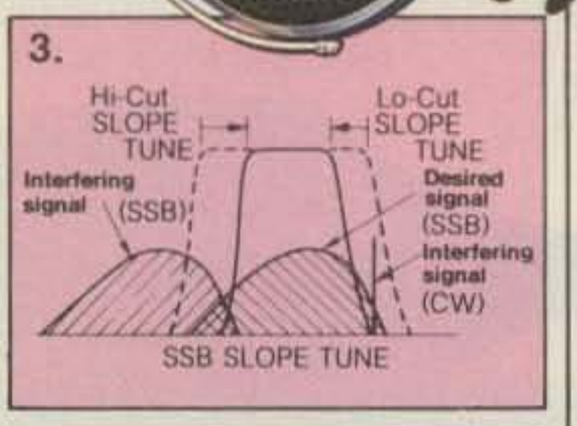
#1 Rated HF!

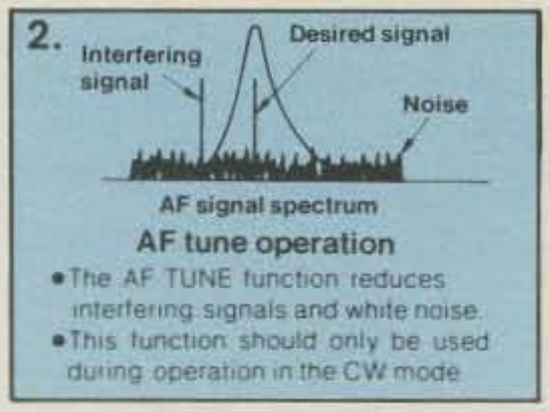
TS-940S
Competition class HF transceiver

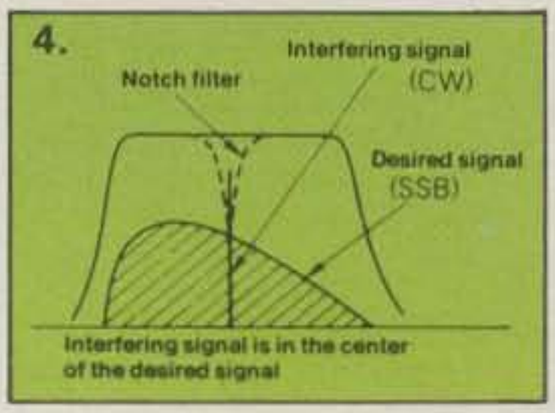
TS-940S—the standard of performance by which all other transceivers are judged. Pushing the state-of-the-art in HF transceiver design and construction, no one has been able to match the TS-940S in performance, value and reliability. The product reviews glow with superlatives, and the field-proven performance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









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.

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.

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Offices: 76 North Broadway, Hicksville, NY 11801. Telephone: 516 681-2922. FAX (516) 681-2926. CQ (ISSN 0007-893X) is published monthly by CQ Communications Inc. Second Class postage paid at Hicksville, NY and additional offices. Subscription prices: Domestic—one year $19.95, two years $38.00, three years $57.00; Canada/Mexico—one year $22.00, two years $42.00, three years $63.00; Foreign—one year $24.00, two years $46.00, three years $69.00; Foreign Air Mail—one year $77.00, two years $152.00, three years $228.00.

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

The Radio Amateur's Journal

ON THE COVER: Multi-op on the grapevine! Dave Ingram, K4TWJ, introduces the famous California Raisins® to amateur radio. Photo by Larry Mulvehill, WB2ZPI.

JANUARY 1989 **VOL. 45, NO. 1**

FEATURES

DEPARTMENTS

Zero Bias

AN EDITORIAL

It's a new year and it's filled with opportunities. One of the opportunities at which we should be looking is how to lower the median age of American amateurs. By entering 1989 we've also in effect increased the median age one year, making that famous median-age amateur somewhere over 51 years old.

On one level 1988 was not a great year for selling amateur radio. People wrote that Novice Enhancement was not working and that the number of new amateurs was actually slipping. On the surface that may be what it looked like, but you really don't need either feasibility studies or management consultants to explain what phenomenon took place. Instead of dropping out of the hobby, Novices started to become Technicians, and both Novices and Technicians became active on the air. The bleeding stopped. In point of fact, 1988 was a very good year for amateur radio in that more of us who are licensed became active in some phase of the hobby instead of leaving it.

Did Novice Enhancement bring in the great numbers? No. How could it when it really wasn't marketed as something about which we all felt positive. Some of us still have that conservative bent that wants to keep everything the way it was. Almost all of the exposure to Novice Enhancement went to Novices and Technicians who immediately jumped on the bandwagon. With regard to newcomers and introducing new people to amateur radio, I'm afraid that we've all dropped the ball somewhere along the line.

In 1988 at each of the approximately 20 hamfests *CQ* attended we had no trouble giving away 50 to 100 *Archie Amateur Radio Comic Books* to kids. Kids were there; all you had to do was lower your line of sight a bit. Granted, we've all agreed by now that the comic book is not a panacea for attracting kids, but I think we should at least try to give them out. For some reason our national organization does not bring them to hamfests even though they warehouse them for everyone. They even provided substantial funding to make the project possible. I know that if I can get a batch of them in my suitcase when I travel, then so can someone from Newington. They can even ship them ahead. Even at the Boxboro Convention, about a 1½ hour drive from Newington, they couldn't manage to get some comic books for their exhibit, let alone bring copies of *QST*. For about a year now I have been trying to goad them into bringing some to each hamfest, and I guess what they are really trying to say is that they have no intention of doing it. Perhaps I am better off getting angry over that belief than starting to believe that they are truly inept. Well, they are going to have to do something with them soon, when the new *Handbooks* come into the warehouse and they need the room.

If the "tried and true" methods of traditional recruitment have failed, then perhaps it is time to look at another approach. In this month's "Washington Readout" column Fred Maia, W5YI, sets forth a proposal for a code-free license. There has been an organization formed to look into petitioning the FCC on behalf of a no-code license. The idea has a great deal of merit, especially in light of Canada now joining the ranks of countries with a no-code license. It's about time we took our heads out of the sand and joined the rest of the world. It was reported in the November 9th edition of the "Long Island DX Bulletin" that even the Russians are looking into easing their regulations in the hopes of increasing their amateur population.

I don't think that anyone would dispute our need for more, and especially younger, amateurs. Recently I spoke to an ARRL official and broached the proposal in Fred's column. His first response was that the membership would fight it. A little later he said that perhaps the time wasn't right just yet, maybe in another five years. And still a bit later he said he would have to see what the Executive Board decides, and that's how he would vote. I simply replied that maybe it's time for the ARRL to lead rather than follow, simply because it's the right thing to do.

We're heading into some interesting times. Bill Pasternak, WA6ITF, in the November 11th issue of "Westlink Report" presents FCC figures showing that the biggest growth in amateur radio is among Technicians—about 9% in 1988. Bill goes on to extrapolate the figures to the turn of the century when Technicians and Novices (the majority being Technicians) will comprise a simple majority of licensed amateurs. Right now their total is about 42 to 43% of licensed amateurs. Bill's logic is that if the ARRL is not responsive to their needs or any newcomers' needs, then they can and will form a political block (and perhaps an organization) of their own. While I can't see that happening exactly the way Bill describes, I can see where he comes up with that theory. I don't think it's anything for the ARRL to worry about at this time unless their penetration into that part of the amateur population is mighty slim.

It is probably analogous to say that we are at a point in time similar to the early 1950s when the Novice license came into being. At that time having a simple test and phone privileges was tantamount to ruining the hobby and letting in the riffraff. Well, most of us are here today via the Novice route and survived those days. Think about it, and think about what would have happened if the conservatives of that day had kept things the way they were. We'd probably be at a point where the median age for an amateur would be 65 or 66.

While we may marvel at what today's amateur knows or doesn't know technically, the fact is that with the advent of the solid-state transceiver and its concomitant bells and whistles, no one (no matter what they say they know) seems to be doing their own repairs. There is even a scarcity of modification articles. When tubes were in vogue, a good part of the amateur press was taken up with modification articles. Now what you see seems quite simple in comparison. Regardless of the class of license, times have changed, and where we are depends on whether we are good test-takers.

Those who argue the loudest on the state of technical knowledge need only look at their own operating position to see how much of their station is homebrew and/or designed by them.

So, it's 1989 and things are changing. The sunspot numbers are going up and amateur activity is increasing. It's far from doom and gloom, but the angst of change is with us. Let's not get bogged down in the emotionality of amateur radio and what we think it means. It has been in a state of change since the first day there was the first amateur looking for a second amateur. These will be the good old days for someone else's tomorrow.

The 1988 Winners

It's been very hard to come up with an overall winner in the hamfest food contest. The criteria for this unofficial contest is simple: The food must be available to all who attend—namely commercial vendor food. I had to sift through countless notes, and unfortunately discount marvelous meals I've had as a guest of someone or great little luncheon packages supplied by a really caring hamfest committee. The best supplied lunch by far was in the exhibitor lounge at the Miami Hamfest. As a group, they do more for the exhibitor than any other group in the country.

The best hamfest food in 1988 was the Atlanta Hamfest's buffet luncheon. They also featured (in another area) the more traditional fare of greasedogs, mystery-meat burgers, and nachos. The hamfest itself would have to rank near the bottom of the list as I explained in my editorial of the time. Runner-up would have to be the various food stands at the Shelby Hamfest which not only had terrific barbeque, but also the most courteous food vendors.

Of all the airlines we flew on in 1988 I would say that the most consistent and best was Piedmont. They've come a long way in the last few years. Second, and a close second, was Delta. While airline food is a standard joke, Piedmont and Delta serve some pretty good meals, and their mystery soups are often quite tasty (even if I don't know what they are).

The Dayton Hamfest is in a category by itself, as nothing exists that can compare with that experience. However, the biggest surprise to me was the spirited turnout for the Portland event. That one had a lot going for it, with the exception of food. They had no provision for exhibitor food nor were there sufficient facilities to feed all those attending. Even the local fast-food places were jammed with customers. I guess no one expected the turnout to be as large.

So with Miami a month away, we await the start of our 1989 hamfest season. We'll be keeping notes and testing throughout the year to come up with a 1989 winner. Maybe we'll add a "Pits Award" for the worst food. This year why not come out and try the food yourself. You might even find a hamfest right nearby.

73, Alan, K2EEK

Say You Saw It In CQ

Others May Try to Imitate, But...

Only One Can Be The Best

Morse Code - Baudot - ASCII - AMTOR - Packet - Facsimile - Navtex

Amateur Net Price $319.95

It's a lesson you learn very early in life. Many can be good, some may be better, but only one can be the best. The PK-232 is the best multi-mode data controller you can buy.

1 Versatility

The PK-232 should be listed in the amateur radio dictionary under the word Versatile. One data controller that can transmit and receive in six digital modes, and can be used with almost every computer or data terminal. You can even monitor Navtex, the new marine weather and navigational system. Don't forget two radio ports for both VHF and HF, and a no compromise VHF/HF/CW internal modem with an eight pole bandpass filter followed by a limiter discriminator with automatic threshold control.

The internal decoding program (SIAM[tm]) feature can even identify different types of signals for you, including some simple types of RTTY encryption. The only software your computer needs is a terminal program.

PC Pakratt Packet TX/RX Display

Facsimile Screen Display

2 Software Support

While you can use most modem or communications programs with the PK-232, AEA has two very special packages available exclusively for the PK-232....PC Pakratt with Fax for IBM PC and compatible computers, and Com Pakratt with Fax for the Commodore 64 and 128.

Each package includes a terminal program with split screen display, QSO buffer, disk storage of received data, and printer operation, and a second program for transmission/reception and screen display of facsimile signals. The IBM programs are on 5-1/4" disk and the Commodore programs are plug-in ROM cartridges.

3 Proven Winner

No matter what computer or terminal you plan to use, the PK-232 is the best choice for a multi-mode data controller. Over 20,000 amateurs around the world have on-air tested the PK-232 for you. They, along with most major U.S. amateur magazines, have reviewed the PK-232 and found it to be a good value and excellent addition to the ham station.

No other multi-mode controller offers the features and performance of the PK-232. Don't be fooled by imitations. Ask your friends, or call the local amateur radio store. We're confident the PK-232 reputation will convince you that it's time to order your very own PK-232.

Call an authorized AEA dealer today. You deserve the best you can buy, you deserve the PK- 232.

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AEA Brings you the Breakthrough!

Announcing

• **KAØTMW From Duluth, Minnesota** - KAØTMW will operate from the Beargrease Sled Dog Trail in Duluth, Minnesota. The Beargrease Amateur Coalition will be on the air on January 12-16 from 1400–0200Z each day in the lower portions of the General 80–10 meter bands phone and CW. For QSL send QSL and SASE to Loren Kuhnly, KAØTMW, 4702 Lavaque Bypass, Duluth, MN 55811.

• **MMRA Fleamarket** - The Minuteman Repeater Association will hold a fleamarket on January 14 from 10 AM to 3 PM at the Westborough Senior High School, Westborough, Massachusetts. Tables $10 in advance, $13 at the door. Admission $2.00. Talk-in on MMRA's 146.01/.61 MHz repeater. For reservations contact Scott Bullock, KA1CLX, 26 Willis St., Apt. 21, Framingham, MA 01701 (508-872-4961).

• **Midwinter Swapfest, Milwaukee, Wisconsin** - The 17th Annual Midwinter Swapfest will be held on January 14 at the Waukesha Co. Expo Center Forum from 8 AM to 3 PM. Admission $2.00 in advance, $3.00 at door. Tables (4 ft.) $3.00 in advance, $4.00 at door (electrical outlet $5.00 as available). Advance deadline January 2. Dealers welcome. Amateur exams given; write for details. Sponsored by the West Allis Radio Amateur Club. For tickets or information write: WARAC Swapfest, P.O. Box 1072, Milwaukee, WI 53201 (SASE).

• **Richmond, Virginia Frostfest** - The Richmond Frostfest Winter Amateur Radio and Computer Show will be held on January 15 from 8:30 to 3:30 at the Virginia State Fairgrounds, Richmond, Virginia. Tickets $4.00 in advance, $5.00 at the door. General table spaces $8.00. Commercial spaces $15.00 first space, $10.00 each additional. Talk-in on 146.88 and 145.43. ARRL/VEC exams given on January 14. (Contact Ron Bolton, WU4G, Route 4, Box 455, Glen Allen, VA 23060 by January 4. No walk-ins.) For more information, contact Mark Huff, 804-747-0227 evenings 7–10.

• **Hall of Science, WB2JSM Anniversary Special Event** - The Hall of Science Amateur Radio Club will issue a commemorative certificate to anyone working HOSARC club station WB2JSM on January 16th in celebration of their 17th anniversary. SSB operation 14.335 and 21.365. CW operation 14.065 and 21.135. All frequencies are ±15 kHz due to QRM from 1500 to 2100 UTC. QSL with a large SASE (50 cents or 2 IRCs) to HOSARC QSL Manager, Arnie Schiffman, WB2YXB, 81-22 250th Street, Bellrose, NY 11426.

• **Citrus County Hamfest, Crystal River, Florida** - The Sky High ARC will sponsor the Ninth Annual Citrus County Hamfest on January 28 at the National Guard Armory in Crystal River, Florida. Talk-in on 146.355/955. Door prizes, grand prize, packet radio forum. Doors open at 7 AM for exhibitors, public at 9 AM. Admission $3.00 until January 14th (send SASE for mail return) and $4.00 thereafter. XYLs free with OM. Swap tables are $5 not including admission. Contact Bob Gordon, W1KUL, (904) 628-5045, or write to SHARC Hamfest, 5334 S. Forest Terr., Homosassa, FL 32646 for tickets, tables, or further information.

• **Wheaton, Illinois Hamfest** - This event will take place on January 29 from 8 AM to 3 PM at The Odeum, Villa Park, Illinois. Hourly drawings plus grand prize. Tickets $4.00 in advance, $5.00 at the door. For more information call 312-629-8006. Talk-in on 146.01/61.

• **The Scottish Tourist Board (Radio Amateur) Expedition Group** - This group has been formed and will be active in 1989. Purpose of the group is to activate amateur radio stations from locations in Scotland that are unusual, historic, or pertain to Scotland in any aspect; and to make the public more aware of the hobby of amateur radio (all stations will be open to the public). Members of this group will be taken from all over Scotland. A full list of events will be available in February 1989 on receipt of return postage. A post office box address will also be available in the new year. For more information contact GM3MTH (Paddy).

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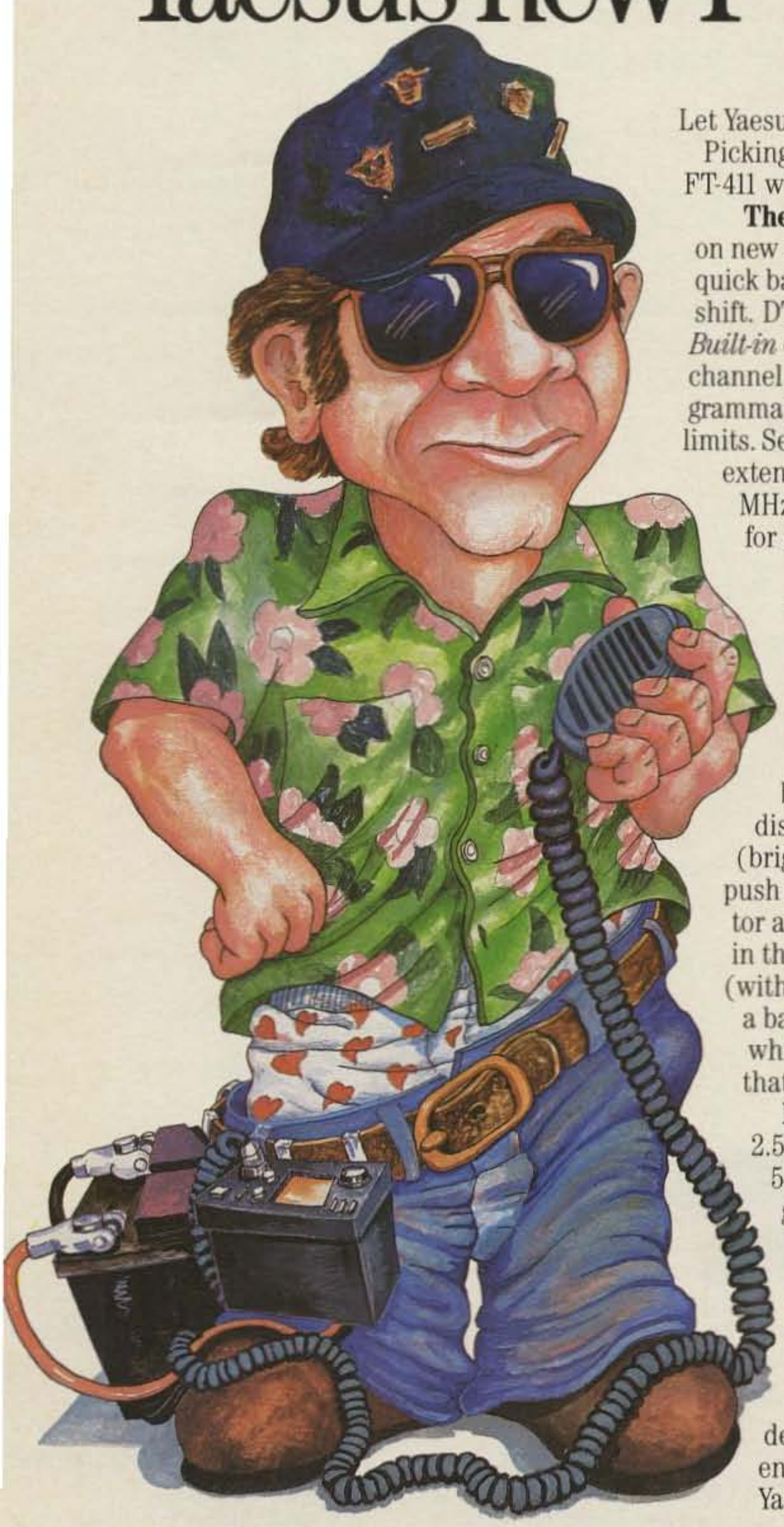

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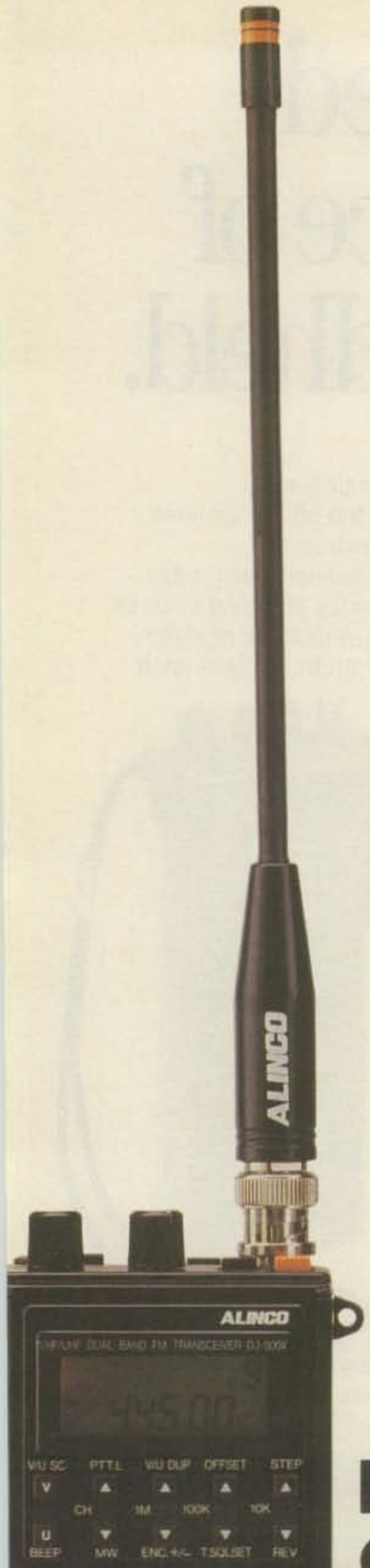

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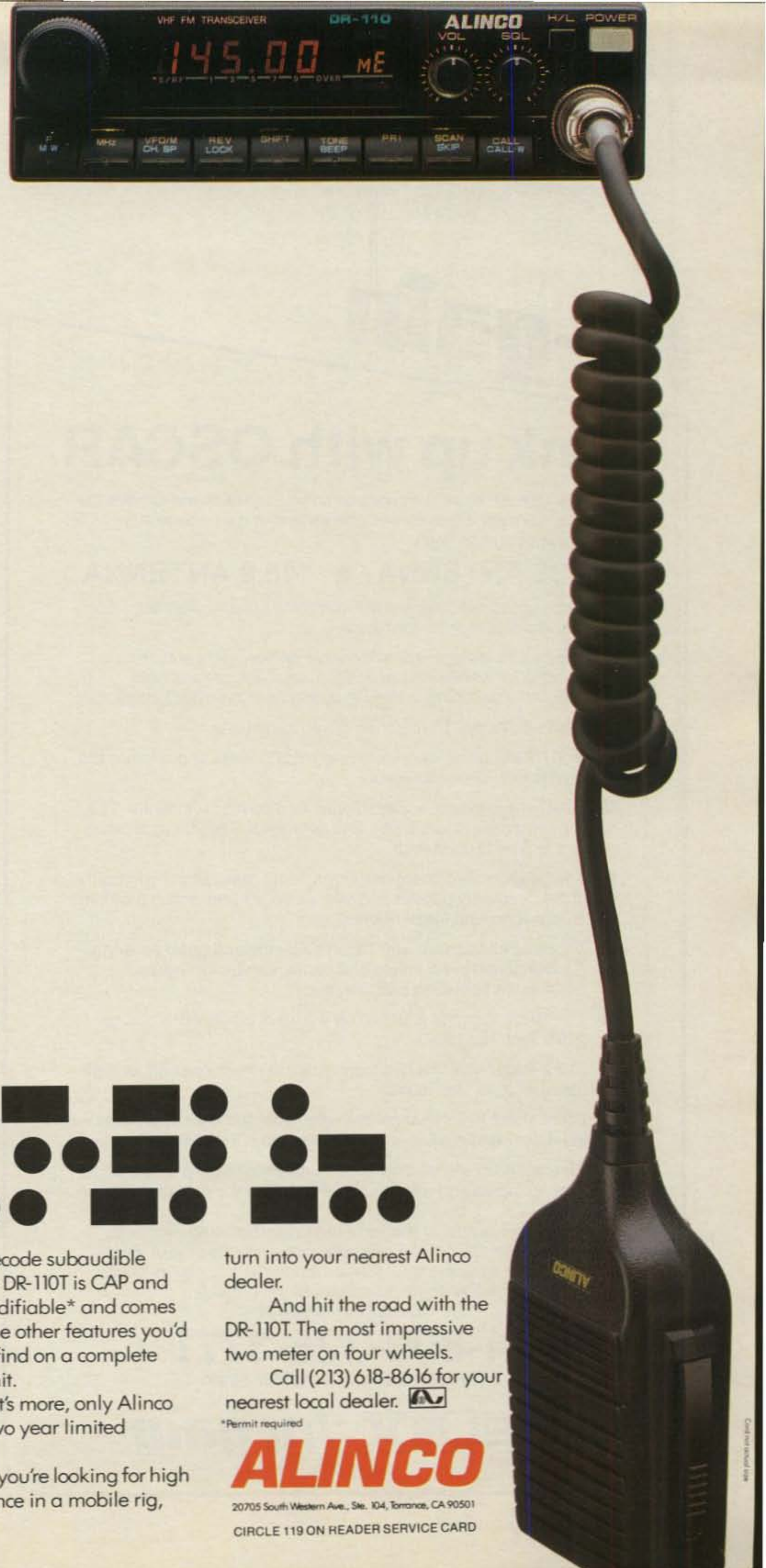

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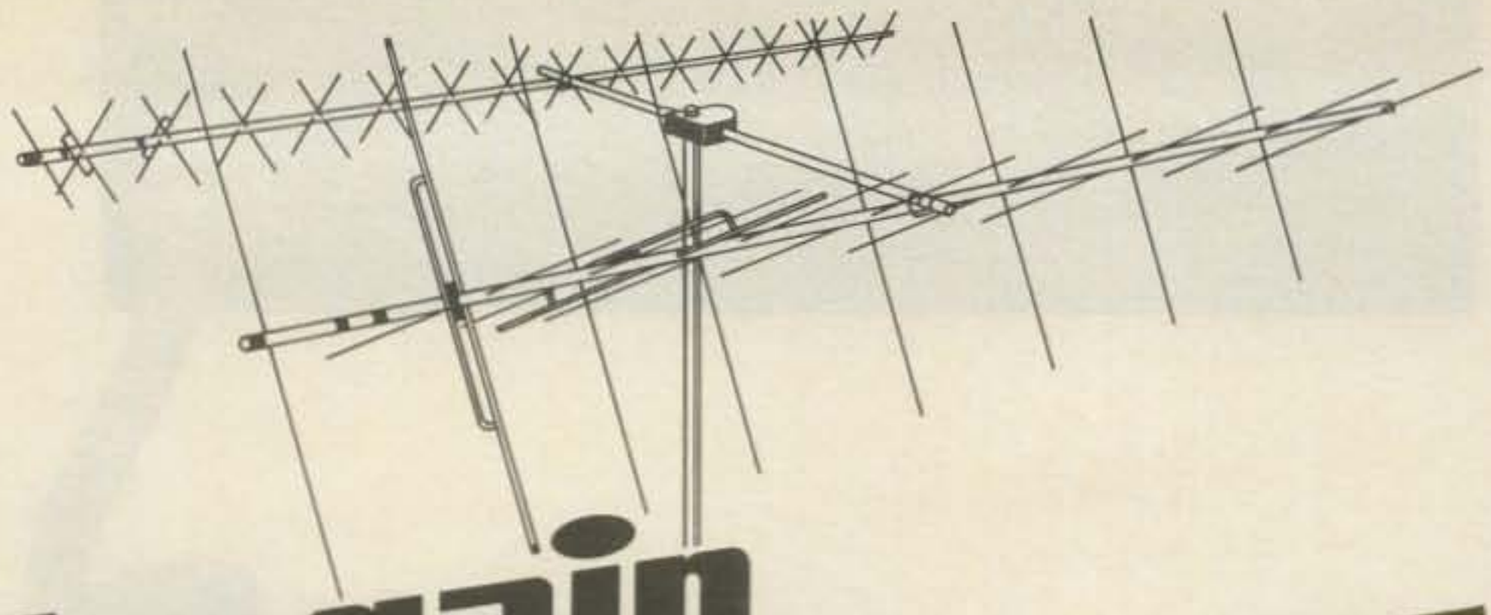

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Our Readers Say

A Special Breed

Editor, *CQ*:

I just finished Annie Hughes' article "What's It All About and Why?" in the September 1988 issue of *CQ*. I'm just a very new ham—studying 13 wpm—and some of your articles go over my head. But Annie's gave me a big laugh. It sounded so familiar, but hams are a special breed, and it's a privilege to struggle to become one.

Beverly Cave, KBØBRN
Moose Lake, MN

Special Leg Effects?

Editor, *CQ*:

Just returning from two weeks vacation and going through the stack to burn in the office, I spotted one of the favorites called *CQ*. My first reaction was good reading for the evening, and then something else hit me.

Perhaps it was with intent. Perhaps it is the way the folks in California do things. Perhaps *CQ* was sending the letter A with a short and a long. Perhaps Larry Mulvehill was taking photographic license and using special leg effects.

Whatever it is, Catherin, KB6KE, has one long leg and one short one on her shorts. The right leg does not appear to be rolled up, so my guess is (since it is not an April issue) that Larry was trying to establish a relationship with the license plate.

All the above just says yes, I do read each issue, and that we continue to remind those distributors who advertise that we have co-op funds for them. Keep up the good work.

Ron Stier, W9ICZ
Belden Wire and Cable
Richmond, IN

Comes With The Territory

Editor, *CQ*:

I've just been reading through the *CQ* World-Wide DX SSB scores (October 1988 issue), and once again the Easterners have scored well. I guess this just comes with the territory in which they live. However, I also see that, as evidenced by your cover photo, we Westerners score well in other contests. This just comes with the territory. . . .

Jeff Geller, N6RVZ
North Hollywood, CA

Corrections Department

In our December 1988 issue, on page 36, K4TWJ in his exhuberance over the ICOM 781 review remarked that the phase noise was totally eliminated. The laws of physics notwithstanding, perhaps a better description should have been substantially reduced as to be imperceptable. —K2EEK

Also in December, author Henry Hill ("Hunting The Rare One," page 40) had his call listed as WA3CUC, whereas it is WA3CVC.

We not only goofed once, we goofed twice in the "On The Cover" blurb for the October 1988 cover of *CQ*. Phil Kester's callsign is W**N**7Q (not WB7Q as reported) and he and his family live in the state of Washington (not California). Our apologies, Phil.

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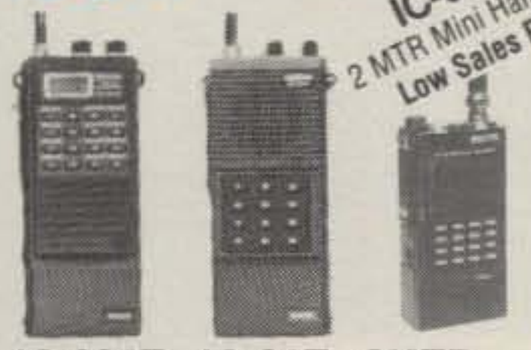

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NN3SI
Amateur Radio at the Smithsonian

BY FRANCES NOSE McKENNEY*

Only a ham would notice it. Most visitors to Washington, D.C. stand on the Mall awed by the surrounding view of the Capitol, the Washington Monument, the art galleries and museums. But a ham would undoubtedly ignore everything and stare at the rooftop of the Smithsonian's National Museum of American History.

Perched on the museum's roof, overlooking the Mall entrance, are several antennas: a seven-element KLM log periodic, an OSCAR/2 meter antenna, two verticals (for 10–40 meters and 10–75 meters), and dipoles for 40 and 80 meters. From this unlikely antenna location 500 feet of coax snake through the museum and end up at NN3SI, the Smithsonian's amateur radio shack.

NN3SI has demonstrated amateur radio for museum visitors since 1976, when it was licensed as a special events station for the museum's bicentennial "Nation of Nations" exhibit. In the station's early days museum specialist Elliott Sivowitch, K3RJA, was just about the only active amateur at the Smithsonian. But Ray Hutt, AA4SI, soon joined Sivowitch in getting NN3SI on the air. Today, though he works in another Smithsonian department, Hutt continues to co-manage NN3SI with Sivowitch.

*6624 Bestwicke Road, Burke, VA 22015

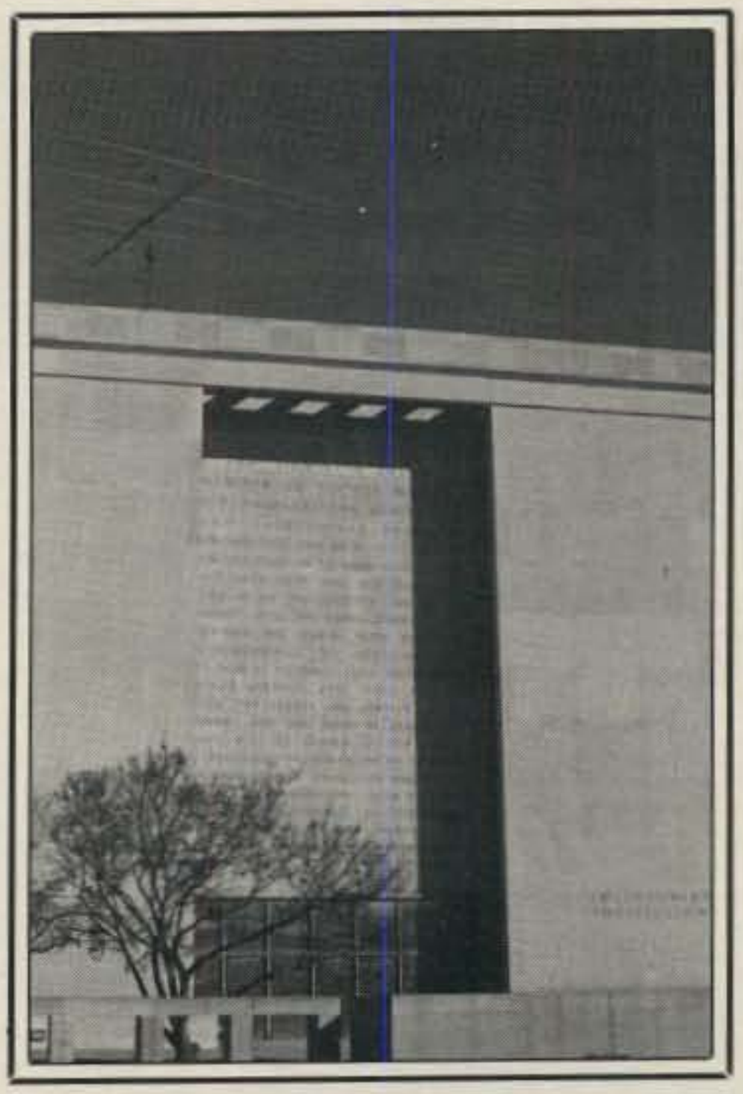
Volunteer Operators

The two station managers don't spend their work days operating from the Smithsonian. They leave NN3SI's day-to-day operation to volunteers John Swafford, W4HU; Dexter Anderson, W4KM; Ray Zettler, W3GY; Joe Fincutter, W3IK; Fred Bardsley, WD4DHW; Walter Lawrence, W4RNB; John O'Malley, KC3UU; Marc Fink, WA3QWA; and Hugh Turnbull, W3ABC. Because these operators man the station seven days a week, NN3SI has the distinction of being one of the few "live" exhibits in the Smithsonian.

On Tuesdays and Thursdays the volunteers move over and let amateur visitors, who've made an appointment ahead of time, get on the air from NN3SI's console.

"Many people feel it's a prestigious operation," says Sivowitch, "so we try to accommodate them." Foreign amateurs need a reciprocal permit to do this.

Foreign or American, each year some 600 amateur operators visit NN3SI, which is located in the telephone and tel-



The KLM log periodic peeks over the Mall entrance of the Smithsonian's National Museum of American History. (Unless otherwise noted, all photos by Michael McKenney.)

Volunteer operator Dexter Anderson, W4KM, at one of NN3SI's two consoles.

Hours of Operation

NN3SI is on the air Monday from noon to 3 PM and Tuesday through Friday from 10 AM to 5 PM. Sunday hours alternate between 10 AM to 1 PM and 10 AM to 5 PM. Saturday hours vary.

Some Other Museum Amateur Radio Stations

- W2AN, Antique Wireless Association, in Holcomb, New York.
- WB2JSM, Hall of Science of the City of New York in Flushing, New York.
- VE3JW, the National Museum of Science and Technology in Ottawa, Canada.
- GB2SM, the Science Museum in London, England.
- SKØTM, Museum of Telecommunications in Stockholm, Sweden.
- LA2TM, Norwegian Science and Industry Museum in Oslo, Norway.

egraph exhibit on the museum's first floor. In 1983, the last time the Smithsonian studied the figures, amateurs from 45 states and 11 foreign countries signed the visitor's book at NN3SI. In the summer as many of 10 amateurs a day come by, notes volunteer operator Swafford.

While most foreign operators come from Europe, he reports that a large number of Japanese and Australians have also visited NN3SI's booth. Perhaps the station's most unusual visitors have been the Chinese Radio Sports Group, BY1PK, who recently signed in with Beijing as their QTH. The majority of NN3SI's visitors are non-hams, of course. Take the group of high school students who crowded around the station one day while Swafford was on duty. For their benefit, he casually searched the band, listening for a "typical" QSO that would illustrate the excitement of amateur radio.

"A big, deep voice" caught his attention, Swafford remembers, so he tuned it in. It was King Hussein of Jordan, JY1.

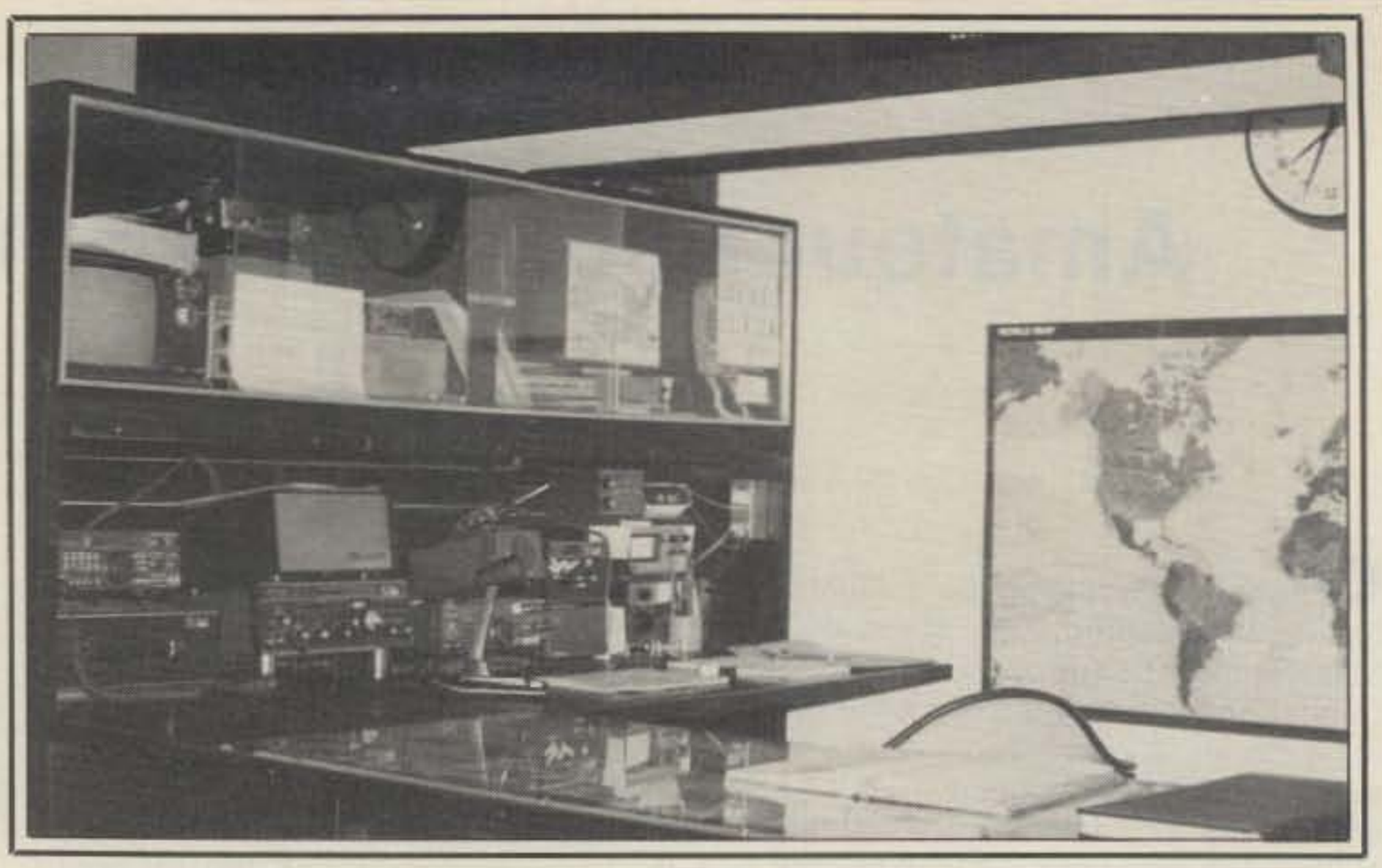
As the students eavesdropped, the other party in this conversation said, "I am looking out the window at the Gulf of Aqaba."

"He was a shuttle astronaut talking to King Hussein," explains Swafford.

"The kids were wide-eyed," Swafford continues, "until some kid in the back said, 'I thought King Hussein was in the States.'" It seems Swafford has tuned in a play-back of a recording made of the 1983 QSO between Hussein and astronaut Owen Garriott, W5LFL, on the space shuttle *Columbia*. And the kid was right. Hussein was actually in Denver for surgery. "But I sure had them going for a while," chuckles Swafford.

"This museum was a focal point for inaugural activities," he recalls. "It was an emotional time," he adds, "because the American hostages in Iran were released, and people all over the country wanted to express their feelings of happiness and relief."

Sivowitch describes that night: "We had four operators all dressed in tuxedos." ("Can you believe that?" laughs Swafford.) "We announced the frequency in advance on 75 meter phone. You wouldn't believe the pileups. As the band opened, we had a corridor opening north into New Jersey and Canada. It was the first time I ever remember working hams by city. I would call 'QRZ Syracuse,' and 30 hams would come back. 'QRZ Watertown,' and ten fellows came back."



Equipment at NN3SI includes Kenwood and Drake transceivers and a Robot slow-scan TV receiver.

CQ From Reagan's Inaugural

Over the past 12 years NN3SI's operators have collected many such stories about demonstrating their hobby at one of the nation's most conspicuous amateur radio shacks.

"By virtue of being here," says Sivowitch, "we're connected to everything. We can do so many things."

The 1981 Reagan inaugural, in particular, stands out in his memory.

Museum visitor Ron Foster, KL7FBO, of Warren, Rhode Island chats with volunteer operator Dexter Anderson, W4KM.

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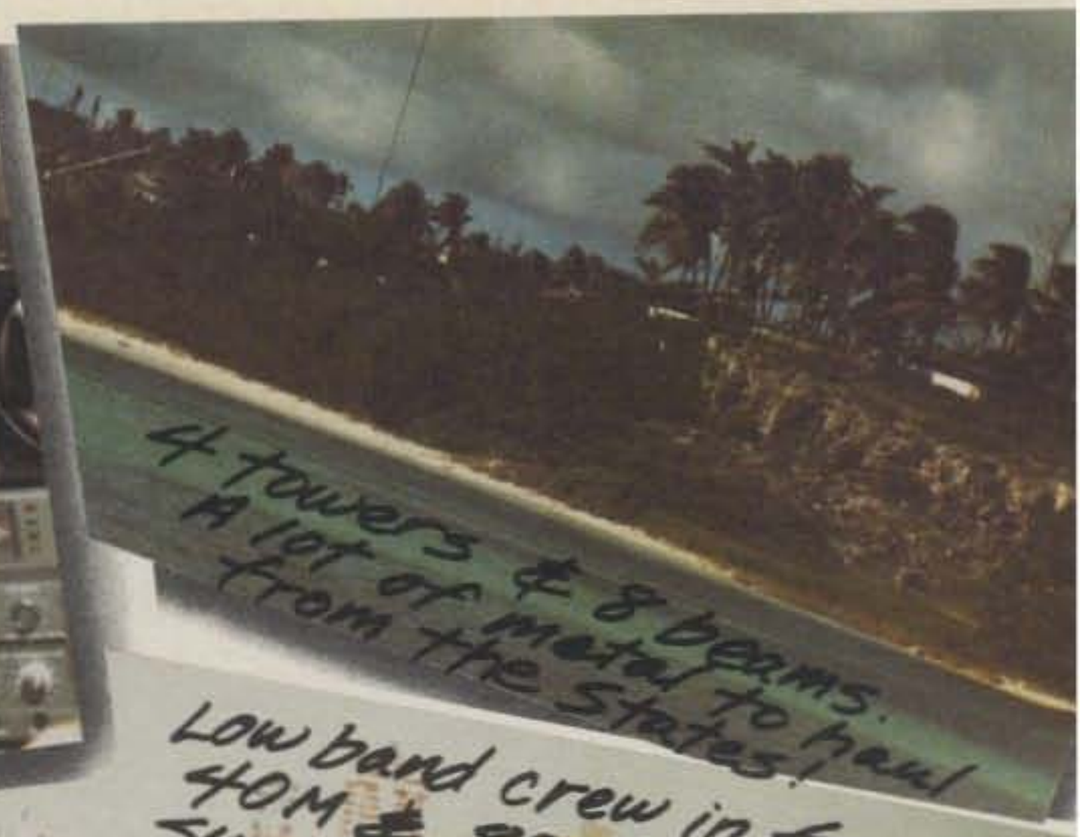

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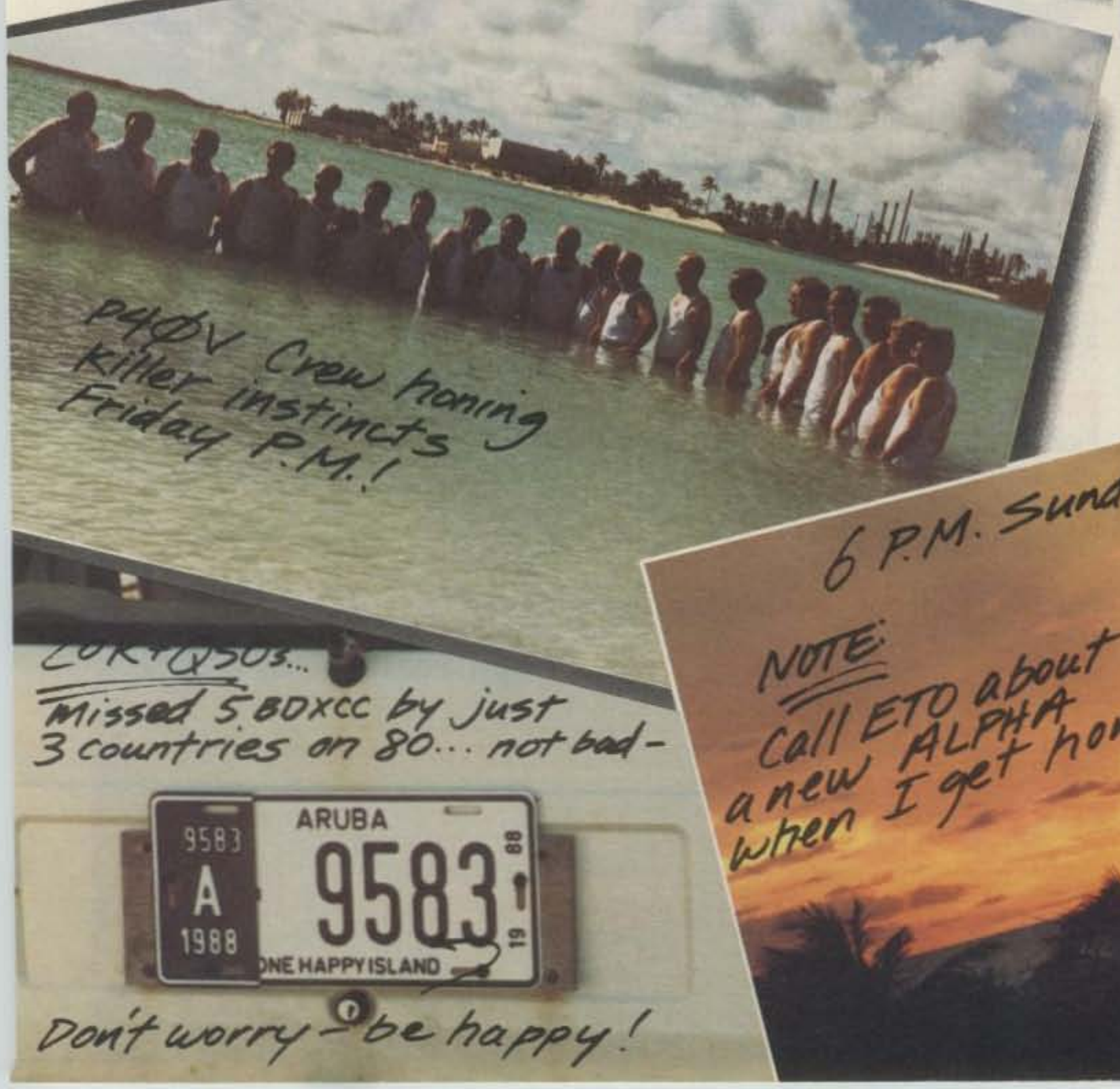
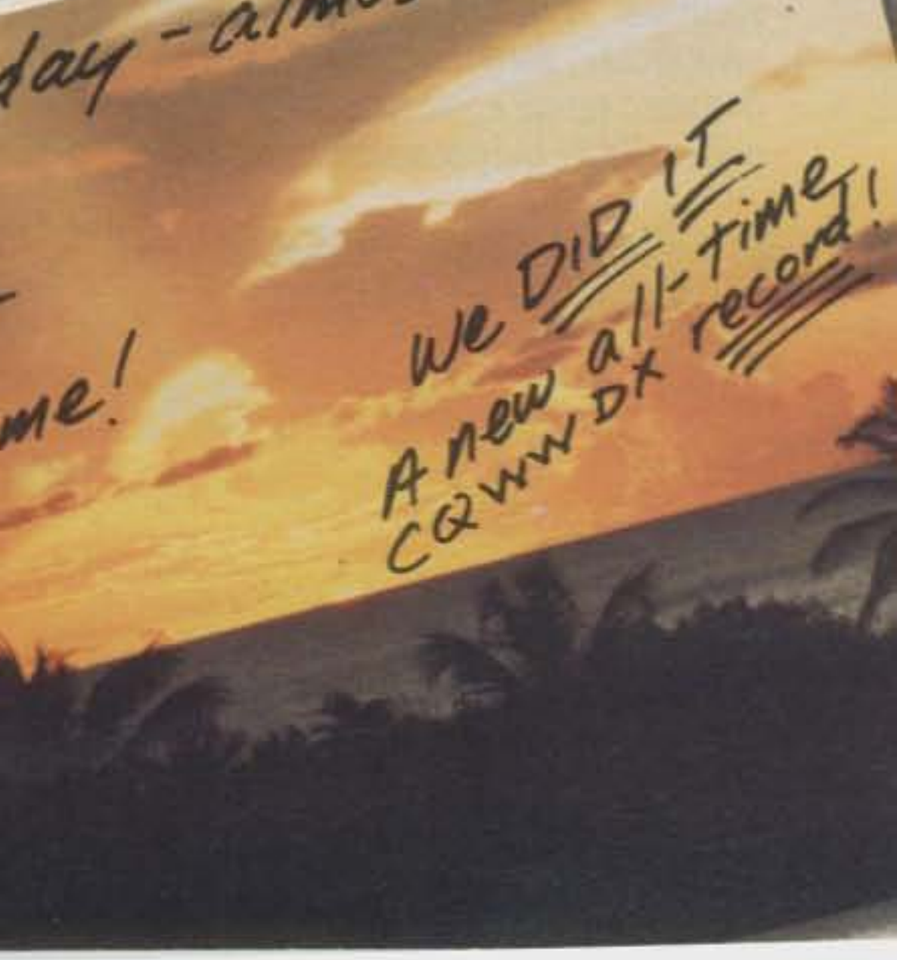




20K+QSOs...

Missed 5 BDXCC by just
3 countries on 80... not bad-

Don't worry - be happy!

6 P.M. Sunday - almost over.

NOTE:
Call ETO about
a new ALPHA
when I get home!

We DID IT
A new all-time
CQWW DX record!

ETO/ORD

PAPA FORTY VICTOR

ETO generally doesn't loan amplifiers. But how could I resist the challenge of P40V's attempt to break the all-time world record score set in the 1981 CQ WW DX contest?

(And how else could a guy who hadn't worked a serious contest in years get invited to go?)

MURPHY WORKS THE CARIBBEAN

The freight forwarder mis-delivered all our ALPHA amps, ICOM transceivers, and towers to Curacao. Eight missing Cushcraft beams were discovered in a Miami warehouse just three days before zero hour. And we were getting pretty edgy when late Thursday afternoon arrived before our P40 operator licenses.

FIFTY MILLION POINTS!

But things finally came together. All bands were on the air by 2359Z Friday and 48 hours later a new all-time record was in the log — 50,000,000-plus points! 20,000+ QSO's . . . multiplier over 900 . . . and only three 80M countries short of a 48 hour 5BDXCC!

"Not a single equipment failure in the whole contest! says Carl, AI6V/P4OV. "AMAZING!"

Would you buy "GRATIFYING," Carl? We don't expect failures.

73,

Dick Ehrhorn

Dick Ehrhorn,
W4ETO

"By virtue of being here we're connected to everything." Station managers Elliott Sivowitch, K3RJA (left), and Ray Hutt, AA4SI, prepare for one of the special events in which NN3SI has participated—the 1987 celebration of the Constitution's bicentennial. Volunteer operator John Swafford, W4HU, is at the far right. (Photo courtesy of the Smithsonian Institution, The National Museum of American History.)

When he finally went home at 1:30 AM that night, Sivowitch says he turned on his own equipment "and people were still calling the station."

Station Equipment

NN3SI runs Kenwood TS520, 440, and TS711 transceivers, a Ten-Tec Triton 4, a Drake TR7 transceiver, and Robot black-and-white slow-scan receiving equipment.

In display cases surrounding the station sit a Gonset Communicator III, Johnson Viking Adventurer, two Heathkit transceivers, and a code practice "instructograph" circa 1940. Many amateurs are surprised that the museum doesn't display more historical items.

Sivowitch explains that he simply doesn't have much room to give to antique amateur equipment. "Because of the space crunch," he says, "most of the stuff [on display] is operational." Like the Collins KWM-2A is the display case which one visitor eyed and quipped, "You know you're getting old when your first equipment is in a museum!"

Half a Mile from the White House

"The station generally operates 100 to 125 watts output," Sivowitch says, and its antenna is on the museum's roof 85 feet above the Mall. Swafford points out that the "coax run to the antenna is unusually long, so some signal is lost." But, counters Sivowitch, "At HF frequencies, the losses are not sufficient to be a problem."

Antennas, equipment, and power output aside, how about location?

Sivowitch has found nothing unusual about NN3SI's location, half a mile from the White House. "In 12 years of operation," he notes, "we've had only minor problems." For example, it seems that even the Smithsonian has grappled with RFI, in this case in the public-address system of an auditorium across the street. And as usual, shielding cured this annoyance.

Says volunteer operator Dexter Anderson, in summing up NN3SI's performance, "We don't do too badly." As evidence he points to log entries for a QSO with the Falklands and is particularly proud of recently contacting Swaziland. The DXCC award hanging on the wall also attests to NN3SI's efficacy.

Future Plans

Sivowitch reports that the Smithsonian may give NN3SI space in an upcoming exhibit on the "Information Revolution."

"That will give us a chance to get into the more exotic things, like packet radio," he says.

Sivowitch also wants to upgrade the station's black-and-white slow-scan receiving equipment to color and add SSTV transmitting capabilities because "it has more visual impact."

A museum specialist since 1961 and an amateur operator for 37 years, Sivowitch knows the challenge of interpreting amateur radio for visitors. For example, he says, OSCAR demonstrations can be exciting, but they're difficult to explain to non-hams, particularly because the antenna is located six stories above them and they can't see it tracking the satellite.

For demonstrating amateur radio at the Smithsonian, then, "The old standbys of Morse code and SSB are very hard to beat," Sivowitch concludes. CQ

CIRCLE 23 ON READER SERVICE CARD

CQ REVIEWS:

The Digital Radio System PC*Packet Adapter

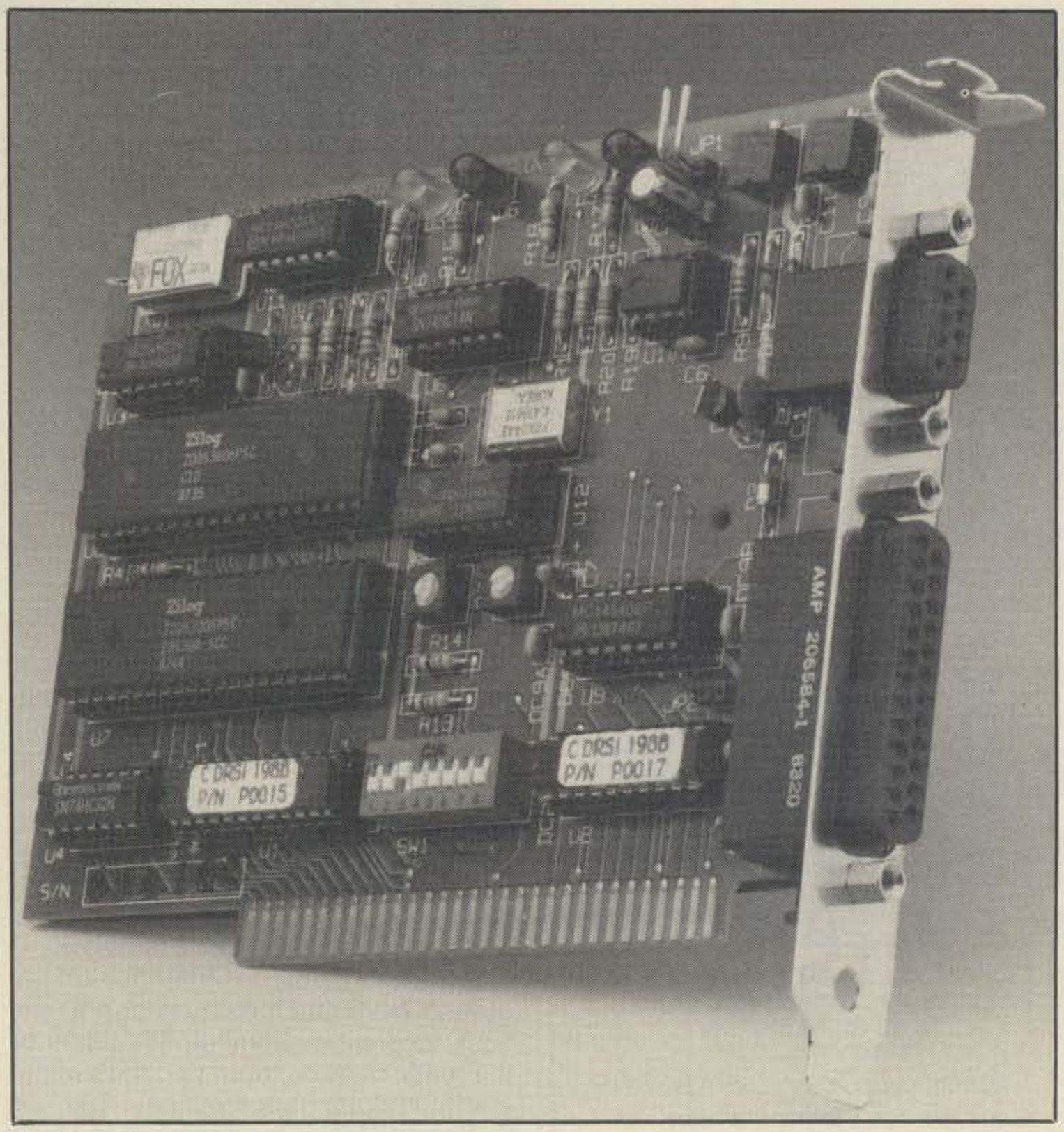
BY LEW McCOY*, W1ICP

I have been playing with packet radio almost since its inception. I was also very involved early on with desk-top computing, as I wrote the reviews for *QST* on units such as the Southwest Technical 6800 system, the early Heath computers, and so on. It wasn't hard to predict at the time that computers and microprocssors were going to change amateur radio. Packet radio is an excellent example of that change. Of course, computers and packet make an ideal marriage of technologies.

Until recently most of the packet terminal node controllers (TNCs) have been devices that, while dependent on the computer, have been separate units. At the last Dayton Hamfest, Digital Radio Systems, Inc. (DRSI) displayed a computer plug-in TNC board designed for the IBM computers and all their clones. I was fascinated with the idea of a plug-in TNC. Andy Demartini, KC2FF, the head honcho of DRSI, and I had a long chat at Dayton, the upshot being that I got one of his units to try and also to review. In addition to the plug-in TNC, DRSI also makes an HF modem, but more about that later.

I had been using an Epson clone until recently, when I switched to a different type (one that had a larger mother board with space for more plug-in boards). The only problem I had is that my clone computer is at one end of the house (my bedroom) and the shack is at the other end, some 70 feet away. I ran a four-conductor shielded cable from the shack to the computer but was not convinced that the system would work. I was prepared to increase signal levels, but found I didn't need to. Both transmission and reception to and from the DRSI TNC was excellent across the 70 feet of cable.

After completing the cable and plugging in the board, I ran the disk files called for and the software immediately impressed me. I happen to have a color monitor, and the software will use the color if it is available—nothing like going first class! The packet adapter uses pop-up menu boxes plus "HELP" boxes for every item. This type of software is very convenient to use, and I like it very much.



*This is the plug-in PC*Packet Adapter shown almost actual size. The switch at the lower center is used to change the interrupts.*

A general menu which is brought up with ALT/M was the first to come up. I next went to ALT/C for the connect action and another box came up asking which port (VHF or HF), the station I wish to connect to, via other stations or whatever, and so on. I asked for a connect to myself via our NET/ROM station, and suddenly the audio in the computer came on with some audible tone alerts and the screen showed a connection. I then ran a series of sensitivity tests and found that everything worked just as well as or better than the other packet system (C64 and TNC) back in the shack. About that time I felt I should sit down and go through all of the instructions and information that came with the DRSI unit.

Digital Radio provides plenty of help, and if you are new to packet, you are going to appreciate it. Their manual is detailed and excellent, plus there is considerable additional information in the .Doc files on the disk.

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

Say You Saw It In CQ

First let me state that the board (about 4″ × 4″) is very well made and has two connectors on the rear. The PC*Packet Adapter provides a complete 1200 baud, full-duplex modem in a single chip. The modem can send and receive simultaneously 1200 baud data using the Bell 202 tone set. The modem is terminated at P1, a DB-9 female connector which is one of the two connectors mounted on the rear of the board.

To download or upload a file, you hit the Page Down or Page Up keys to invoke the saving functions, a binary file (YAPP) download or upload. As far as a buffer is concerned, you have the entire open computer memory available.

When you bring up THS, the main operating program, you are provided with three basic screens—one for receive, another for transmit, and a status line near the bottom of the screen. The status line is in play at all times and lists the following: **NSENT--:**, **UNACK--:**, **RETRY--:**, **DISCONNECTED--:**, (And Time). The disconnect or connect status shows the current link state plus information transfer (the time is a real-time clock, once it is set). This opening window presents information about the (hardware) state of the communications port, and informs you about the efforts of THS to contact the TNC. THS follows the guidelines of KB5MU's *WA8DED Host Mode Guide* for the initial contact to the TNC.

In the configuration file the F1 through F10 keys can be configured with your station information files, or whatever you might call them. These can be sent by merely depressing the proper "F" key. The configuration file can also be set up to change the colors of all the windows and text to suit your desires.

I mentioned some of window keys earlier, and but in order for this review to be complete, it is best if all are listed. The following is taken from the DRSI instructions.

Commands

The following special keys are used to control THS (and the TNC) in dialog mode:

ALT/P	TNC Parameter Setup Menu
ALT/T	THS Parameter Setup Menu
ALT/C	Connect Menu
ALT/D	Disconnect
ALT/U	Unattended Parameter Menu
ALT/V	View DOS Directory
ALT/L	Logging (capture) ON/OFF
ALT/S	Send an ASCII file
ALT/R	Review Received Text
ALT/F	Review Function Key Setup
PgUP	Binary File Upload (YAPP)
PgDN	Binary File Download (YAPP)
<IN>	Toggle Status Line Display
<ESC>	Immediate Command Entry
<CTRL/ESC>	Command Entry, Channel 0
ALT/X	Exit THS
ALT/P	TNC Parameter Setup Menu

In the ALT/P the TNC Parameter Window is shown and THS reads first the value of all the parameters. You next may alter one or more parameters (use the up- and down-arrow keys to navigate), and press F10 when you are ready to apply the changes. THS sets all parameters and rereads them. You leave the TNC Parameter Setup by pressing **ESC.** Reading and writing the parameters is done concurrently with other activities, of course. For your assistance, a one-line explanatory text is presented for each parameter. If you need further help, you may press F1 to get a more detailed help information.

By pressing **PgUp** or **PgDn** you start a binary file transfer using the YAPP protocol specifications (by Jeff Jacobson, WA7MBL). THS is compatible with all programs which have "YAPP" implemented. Furthermore, the hostmode of the WA8DED software permits a better control in case of difficulties. For example, a disconnect during a file transfer is immediately recognized and the transfer is stopped without sending the remainder of the file out UNPROTO. Also, you can abort (cancel) transfers by ALT/A.

THS uses the following timeout parameters. (1) The sender will try to trigger the receiver (Send-Init) six times in intervals of 20 seconds before timing out. (2) The receive time-out (waiting for a YAPP packet) is 120 seconds. You are able to modify the TNC or THS parameters during ongoing YAPP transfers; the THS help window (call it with an arrow-key, for example) will show you which keys have effect during YAPP transfers:

ALT/P	TNC Parameter Setup Menu
ALT/T	THS Parameter Setup Menu
ALT/D	Disconnect
ALT/A	Cancel Transfer
<INS>	Toggle Status Line Display
<ESC>	Immediate Command Entry

Comments

If you have an IBM computer or clone, then I cannot say too much about this system. It is really excellent and offers a great many features not found in other units. The company also makes an HF*MODEM to work in conjunction with this system, and I hope to review the HF*MODEM soon. The PC*Packet Adapter lists for $139.95 and is made by Digital Radio Systems, Inc., 2065 Range Road, Clearwater, Florida 34625 (1-800-999-0204). CQ

```
UMMMMMMMMMMMMMMMMMMMM TNC Parameters MMMMMMMMMMMMMMMMMMM8
3                                                        3
3 XMITOK          1    ---- Port 0 -----   ---- Port 1 ----- 3
3 MONITOR       IUS    DIGIPEAT      1     DIGIPEAT      1 3
3 VALIDATE        0    PERSIST      64     PERSIST      64 3
3 AX25LVL         2    SLOTTIME     10     SLOTTIME     10 3
3 MYCALL       W1ICP   FRACK         4     FRACK         4 3
3                      MAXFRAME      4     MAXFRAME      1 3
3  <F1>  HELP          RETRY        10     RETRY        10 3
3  <ESC> EXIT          RESPTIME    100     RESPTIME    100 3
3  <F10> SET PARAM     IDLETIME  18000     IDLETIME  18000 3
3                      TXDELAY      40     TXDELAY      30 3
3                      HBAUD         2     HBAUD         1 3
3                                                        3
TMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM>
```

Fig. 1– This is a screen dump showing the ALT/P (parameters) and the status line that provides conditions of the link at any given instant.

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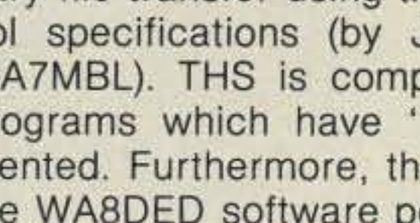

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CIRCLE 149 ON READER SERVICE CARD

Here's an idea on how to use some of those parts lying around in the basement. You know, the ones that are too good to throw out (and nobody else besides you would buy them).

How To Build Two Simple Antenna Tuners

BY JOSEPH M. PLESICH*, W8DYF

In my 34 years as an amateur I have admired and respected many of the great radio amateurs. This list has included notables such as Doug De Maw, W1FB; Vic Clark, W4KFC; Katashi Nose, KH6IJ; Bill Orr, W6SAI; and others. However, no list would be complete without Lew McCoy, W1ICP, inventor of the Transmatch and the Monimatch.

I'm sure Lew won't remember me (he meets so many amateurs at hamfests), but I first met him at the Jackson's Mill State Radio Convention about 20 years ago, and I still have an *ARRL Antenna Book* that he autographed for me. I won't part with it. This year I was able to have a few words with him at the Dayton Hamvention. Besides being a fine gentleman with a warm personality and an excellent sense of humor, he has that great ability to write amateur radio fun projects and to simplify the complex so that even I can understand it.

Over the years, I have cut out and saved many of his articles. The following two tuners are a result of his articles and encouragement to build something, to learn, and just to have fun in amateur radio.

The first tuner consists of just a coil and capacitor. They are mounted on a piece of wood big enough to hold them (see fig. 1 and photo 1). I have used this tuner to load successfully a long wire on 160 meters. If you have an 80 or 40 meter dipole, you can tie the ends together and feed it as sort of a top-loaded vertical. I wanted this tuner primarily for 160 meters, but it also works on 80 meters. For some of the other bands you might want to try a smaller coil and capacitor. Don't write to me and ask me the values for the coil and capacitor. I don't know what they are. I just used a coil and capacitor that I found in my junk box. Like all items in amateur junk boxes, I picked them up someplace, sometime, at some hamfest for a good price in case I might want to use them someday.

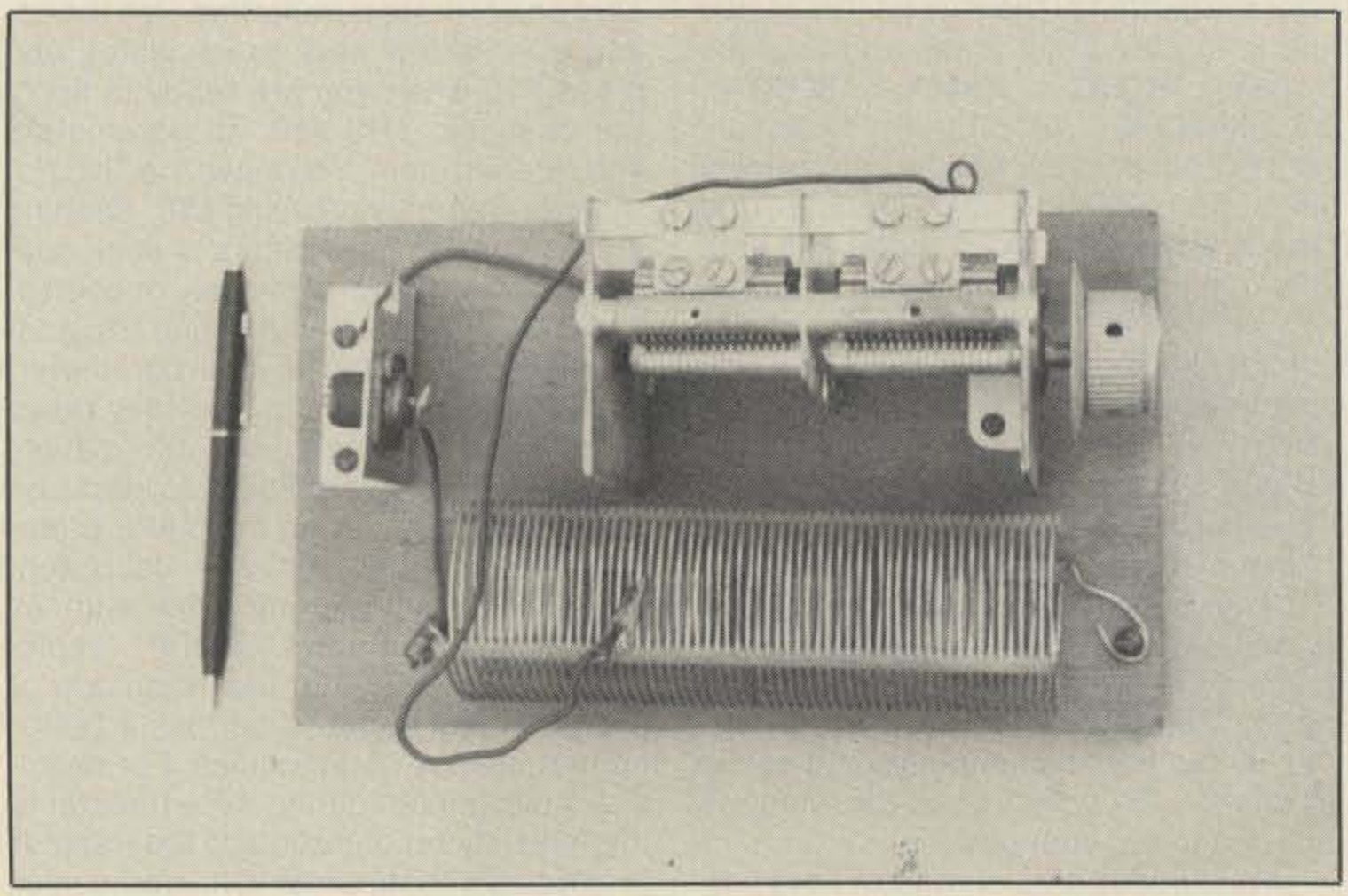

Photo 1– The simple coil/capacitor antenna tuner, which can be used with a long-wire antenna.

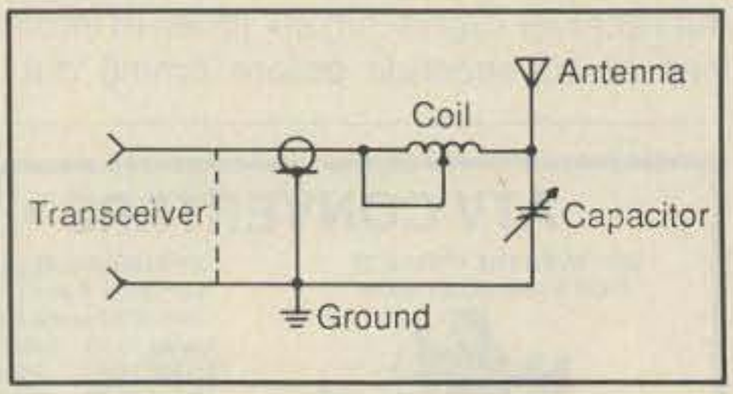

Fig. 1– The circuit for a long-wire antenna tuner.

The second tuner was built as a result of Lew's article in the September 1986 issue of *CQ*. This tuner has two capacitors, a coil, and a homebrew balun (see fig. 2 and photo 2). Again, don't ask me the values of the capacitors and the coil. I don't know. I just used what I found.

The coil is 18 turns and about 2 inches in diameter. The two capacitors are different because I didn't have two the same size. A piece of printed circuit board is screwed to the rear edge of the board to serve as a common ground. Notice the two coax connectors are soldered to this PC board using a heavy piece of stiff copper wire. The coil and capacitors are held to the wood board with wood screws. (It does look like a bread board, doesn't it?)

One thing I didn't have in the junk box and had to buy was a toroid core. It is a T-200 core, and I bought it from Radiokit, Inc. when I was in Dayton. For high power Lew recommends using three of them. I never use more than 100 watts, so one was sufficient for me. Before winding the

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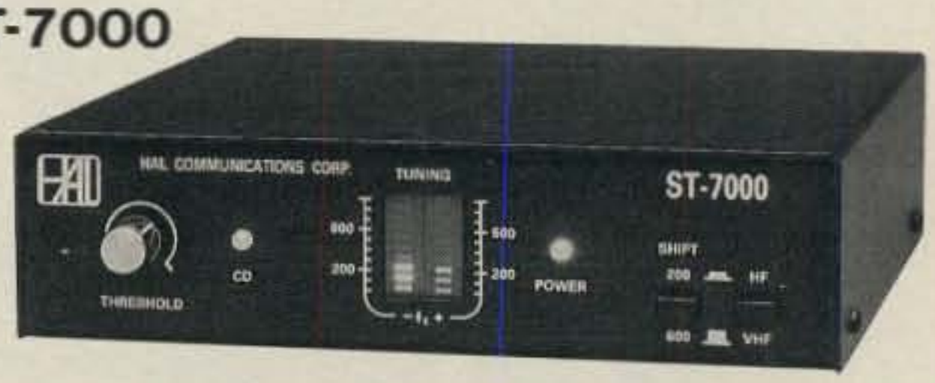

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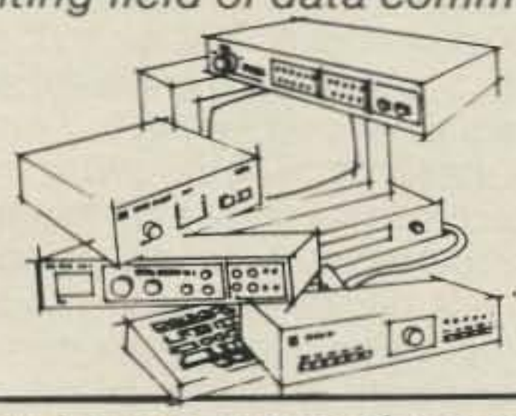

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CIRCLE 138 ON READER SERVICE CARD

wire on the core, I wound black electrical tape on it, mainly to protect the core. I accomplished this by first winding the tape on a 1 inch piece of stick from an ice cream bar (after properly disposing of the ice cream, of course!) I then had a kind of "bobbin" that I could pass through the hole in the toroid. Next I used some zip cord. It looked to have about no. 16 or 18 wire, and I wound 12 turns of this on the toroid. Two of the wires were then soldered together and to the PC board. The other two wires float free (see fig. 3 and photos 2 and 3). I cut out a circular piece of cardboard, put a long wood screw through the center of it, and used it to hold the balun to the board.

Looking down at the tuner, I connected the output of my rig to the coax connector on the left, and my antenna to the connector on the right. I have three wire antennas: a coax-fed sloper, a 160 meter dipole, and a 40 meter loop. The dipole and the loop are fed with 300 ohm twinlead.

The coax for the sloper went right into the connector. On the loop and dipole I put alligator clips on the twin lead. To load these balanced feed antennas, I remove the alligator clip from the coax connector on the antenna tuner and connect it to one of the floating wires on the balun. Then I connect one of the ends of the twinlead to each side of the balun. I didn't have to put an SWR meter in the line, because my rig has one built in. Keep your rig in low power, try different taps on the coil, and turn the capacitors for the lowest SWR. Notice that I indented every other turn on the coil so that I connect the alligator clip without shorting out adjacent turns. I just pushed them in with a screwdriver blade.

After fooling around with this tuner for a while, I found it to work as well as my $100-plus commercial tuner. It certainly is not as pretty, but there is considerable difference in cost. However, I really get a kick out of watching the SWR come down to zilch with something put together. I am sure that those of you who are so inclined can put this tuner in a box with a few switches and make it look as nice as a store-bought unit. The purpose of this project, though, was to present a simple, cheap, useful, and fun project that could be completed in a few hours, particularly for the newer amateur who may not have much money left after purchasing a transceiver.

This is just the kind of thing Lew McCoy has been doing for years. Lew, this is dedicated to you. May you be around for another 100 years or so writing fun amateur radio articles. CQ

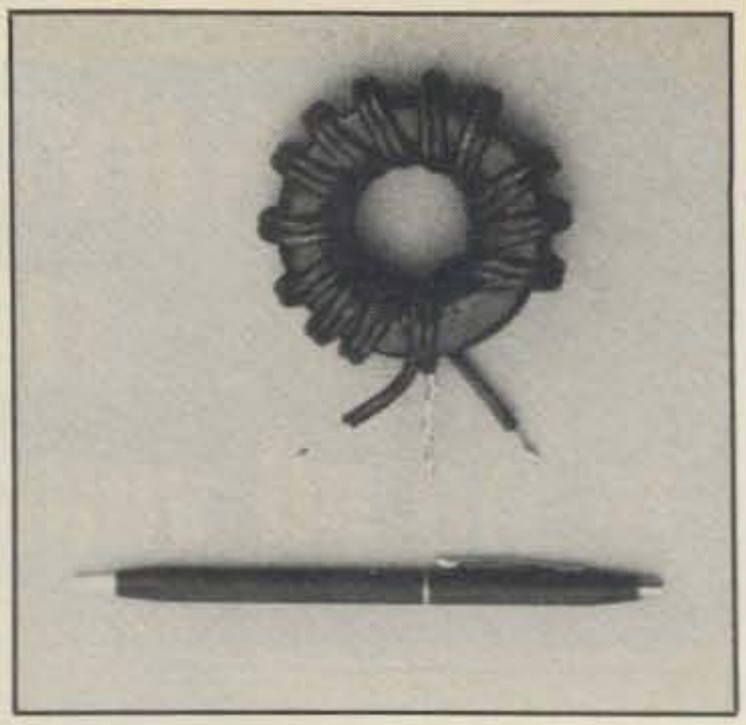

Photo 3– The 4 to 1 balun as shown in fig. 3. The pen is shown as a size reference point.

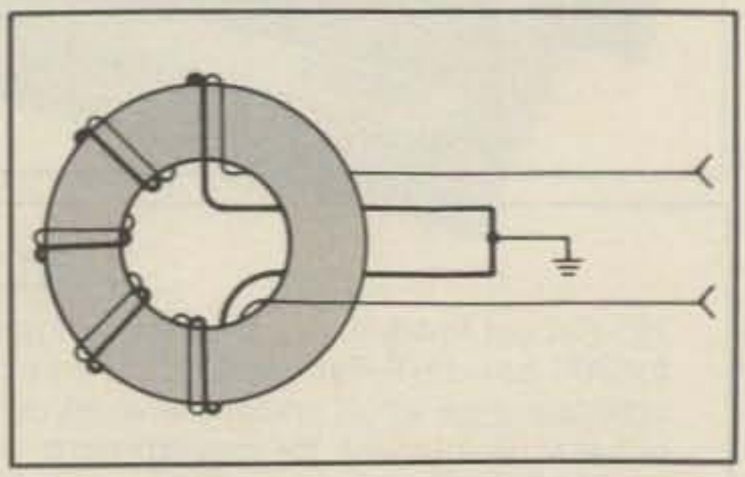

Fig. 3– How to wind a 4 to 1 balun.

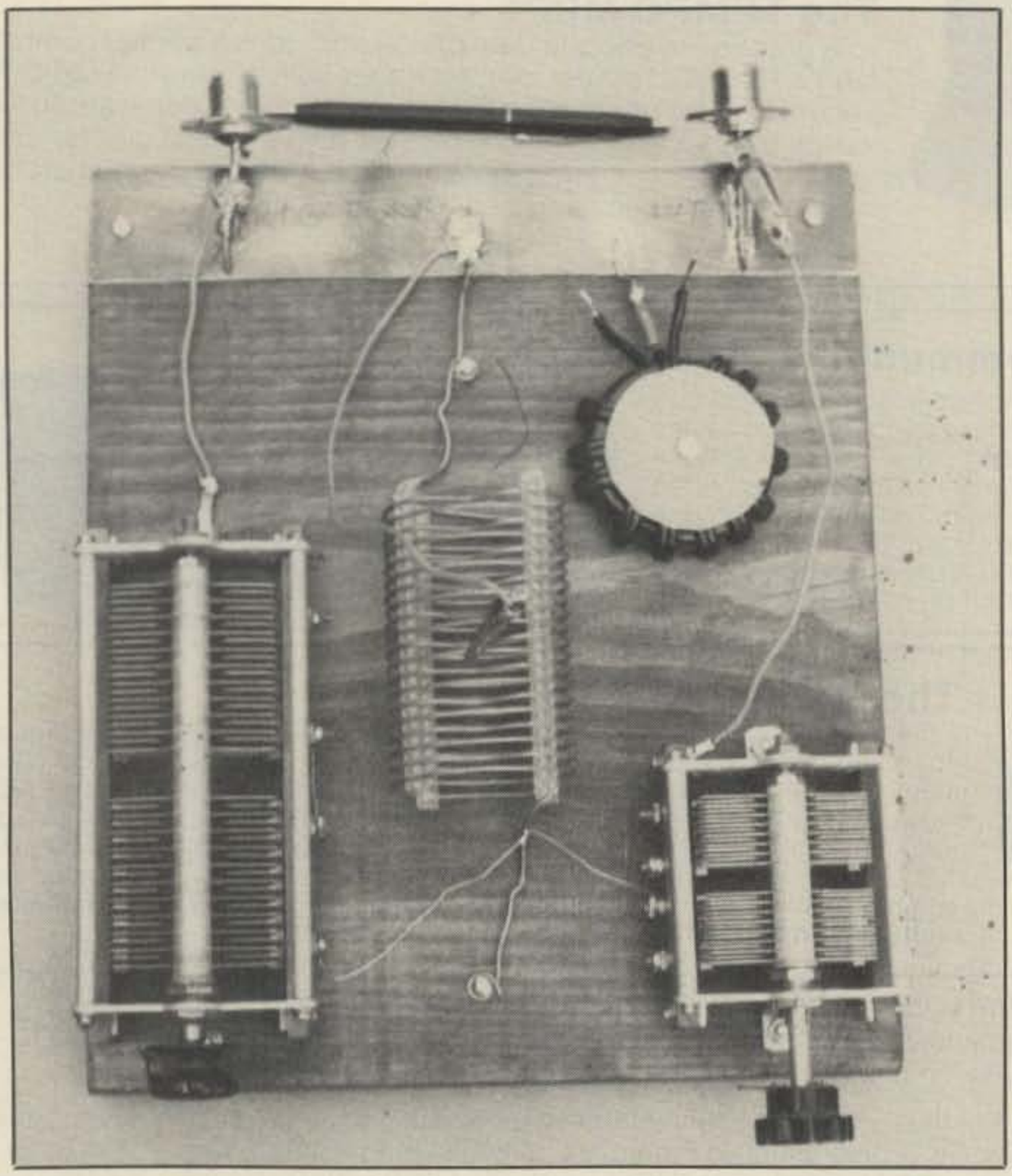

Photo 2– This version features two capacitors and a 4 to 1 balun.

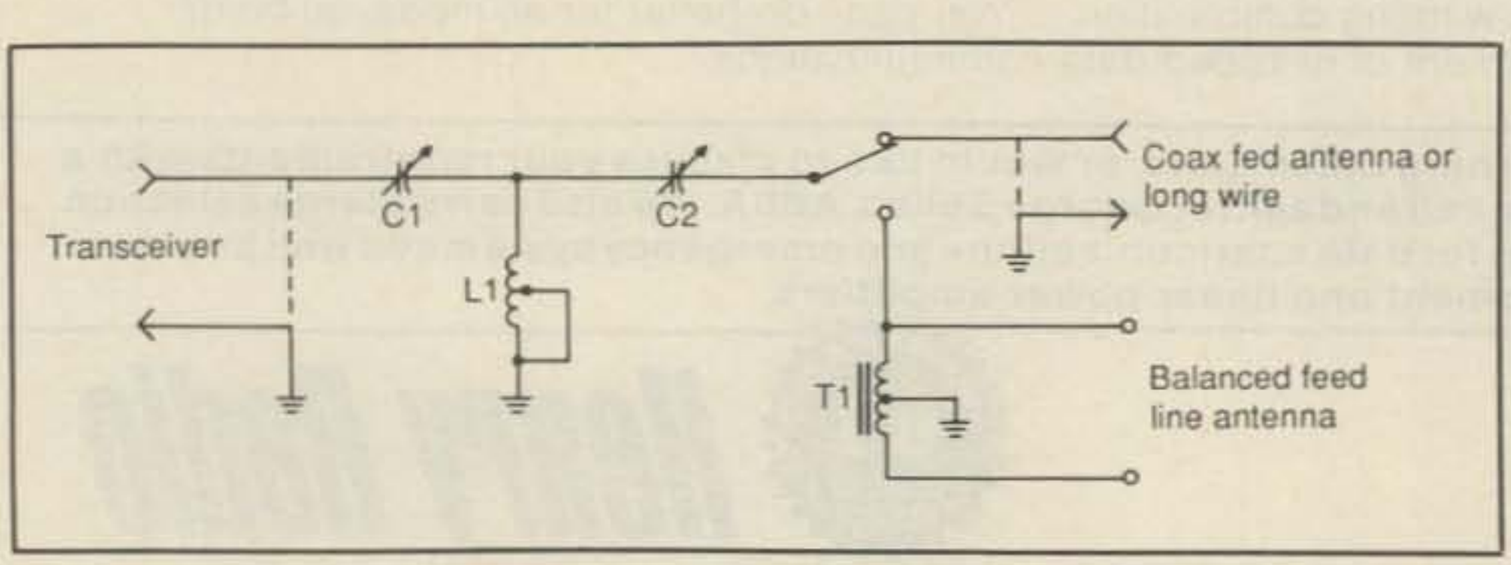

Fig. 2– A simple transmatch.

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EX-310	Voice synthesizer.....	59.00	

IC-751A	9-band xcvr/.1-30 MHz rcvr	1699.00	**1469**
PS-35	Internal power supply	219.00	**199.95**
FL-32A	500 Hz CW filter (1st IF)....	69.00	
FL-63A	250 Hz CW filter (1st IF)....	59.00	
FL-52A	500 Hz CW filter (2nd IF)...	115.00	**109.95**
FL-53A	250 Hz CW filter (2nd IF)...	115.00	**109.95**
FL-33	AM filter.....	49.00	
FL-70	2.8 kHz wide SSB filter	59.00	
RC-10	External frequency controller	49.00	

IC-735	HF transceiver/SW rcvr/mic	1099.00	**949.95**
PS-55	External power supply.....	219.00	**199.95**
AT-150	Automatic antenna tuner ...	445.00	**369.95**
FL-32A	500 Hz CW filter	69.00	
EX-243	Electronic keyer unit	64.50	
UT-30	Tone encoder	18.50	

Other Accessories	Regular	SALE
IC-2KL 160-15m solid state amp w/ps	1999.00	**1699**
PS-15 20A external power supply.....	175.00	**159.95**
PS-30 Systems p/s w/cord, 6-pin plug	349.00	**319.95**
MB Mobile mount, 735/751A/761A...	25.99	
SP-3 External speaker	65.00	
SP-7 Small external speaker	51.99	
CR-64 High stab. ref. xtal for 751A....	79.00	
PP-1 Speaker/patch.....	179.00	**164.95**
SM-6 Desk microphone	47.95	
SM-8 Desk mic - two cables, Scan.....	89.00	
SM-10 Compressor/graph EQ, 8 pin mic	149.00	**139.95**
AT-100 100W 8-band auto. antenna tuner	445.00	**389.95**
AT-500 500W 9-band auto. antenna tuner	589.00	**519.95**
AH-2 8-band tuner w/mount & whip	659.00	**589.95**
AH-2A Antenna tuner system, only	519.00	**449.95**
GC-5 World clock	91.95	**79.95**

VHF/UHF base multi-modes	Regular	SALE
IC-275A 25W 2m FM/SSB/CW w/ps	1299.00	**1069**
IC-275H 100W 2m FM/SSB/CW	1399.00	**1129**
IC-375A 25W 220 FM/SSB/CW (c/o)	1399.00	**899.95**
IC-475A 25W 440 FM/SSB/CW w/ps	1399.00	**1099**
IC-475H 75W 440 FM/SSB/CW.....	1599.00	**1289**
IC-575A 25W 6/10m xcvr w/ps	1399.00	**1129**
IC-575H 100W 6/10m xcvr.....	1699.00	**1499**
IC-471H 75W 430-450MHz base (c/o)	1399.00	**989.95**
PS-35 Internal power supply	219.00	**199.95**
AG-35 Mast mounted preamp	99.95	
AG-35 (Purchased with IC-471H)	99.95	**9.95**
SM-6 Desk microphone	47.95	
EX-310 Voice synthesizer	59.00	
TS-32 CommSpec encode/decoder....	59.95	
UT-15 Encoder/decoder interface...	34.00	
UT-15S UT-15S w/TS-32 installed.....	96.00	

VHF/UHF/1.2 GHz Mobiles	Regular	SALE
IC-37A 25w 220 FM/TTP mic... (c/o)	499.00	**349.95**
IC-47A 25w 440 FM/TTP mic... (c/o)	549.00	**399.95**
PS-45 Compact 8A power supply ...	145.00	**134.95**
UT-16/EX-388 Voice synthesizer ...	34.99	
SP-10 Slim-line external speaker ...	35.99	
IC-28A 25W 2m FM, **TTP** mic	469.00	**409.95**
IC-28H 45W 2m FM, **TTP** mic	499.00	**439.95**
IC-38A 25W 220 FM, **TTP** mic	489.00	**349.95**
IC-48A 25W 440-450 FM, regular mic	459.00	**369.95**
IC-48A 25W 440-450 FM, **TTP** mic....	509.00	**449.95**
HM-14 Extra TTP microphone	59.00	
UT-28 Digital code squelch	39.50	
UT-29 Tone squelch decoder	46.00	
HM-16 Speaker/microphone	34.00	
IC-228A 25W 2m FM/TTP scan mic...	509.00	**449.95**
IC-228H 45W 2m FM/TTP scan mic...	539.00	**479.95**
UT-40 Pocket beep function	45.00	
IC-900A Transceiver controller.....	639.00	**569.95**

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UX-29A	2m 25W band unit.....	299.00	**269.95**
UX-29H	2m 45W band unit.....	349.00	**319.95**
UX-39A	220MHz 25W band unit....	349.00	**289.95**
UX-49A	440MHz 25W band unit....	349.00	**319.95**
UX-59A	6m 10W unit	349.00	**319.95**
UX-129A	1.2GHz 10W band unit ...	549.00	**499.95**
IC-1200A	10W 1.2GHz FM Mobile.....	699.00	**549.95**
IC-3200A	25W 2m/440 FM/TTP (c/o)	695.00	**499.95**
UT-23	Voice synthesizer.....	34.99	
IC-3210A	25w 2m/440 FM/TTP	739.00	**649.95**
AH-32	2m/440 Dual Band antenna ...	39.00	
AHB-32	Trunk-lip mount	35.00	
Larsen PO-K	Roof mount	20.00	
Larsen PO-TLM	Trunk-lip mount	22.00	
Larsen PO-MM	Magnetic mount	22.00	
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RP-2210	220MHz 25W repeater	1649.00	**1469**
RP-3010	440MHz 10W FM repeater...	1299.00	**1149**

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Hand-helds	Regular	SALE
IC-2A 2-meters.....	289.00	**259.95**
IC-2AT with TTP.....	319.00	**279.95**
IC-3AT 220/TTP (c/o)	349.00	**269.95**
IC-4AT 440 MHz, TTP	349.00	**299.95**
IC-02AT/High Power	409.00	**349.95**
IC-03AT for 220 MHz	449.00	**289.95**
IC-04AT for 440 MHz	449.00	**389.95**
IC-u2AT for 2m w/TTP	329.00	**289.95**
IC-u4AT 440 MHz, TTP	369.00	**299.95**
IC-2GAT for 2m, TTP	429.00	**379.95**
IC-4GAT 440MHz, TTP	449.00	**399.95**
IC-32AT 2m/440MHz	629.00	**559.95**

IC-u2A for 2m **w/o TTP**
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IC-12AT	1W 1.2GHz FM HT/batt/cgr/TTP	473.00	**369.95**
IC-12GAT	Dlx 1/7W 1.2GHz FM HT/TTP	529.00	**469.95**

Aircraft band handhelds	Regular	SALE
A-2 5W PEP synth. aircraft HT.....	525.00	**479.95**
A-20 Synth. aircraft HT w/VOR.....	625.00	**569.95**

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

Accessories for IC and IC-O series	Regular
BP-2 425mah/7.2V Nicad Pak - use BC35....	49.00
BP-3 Extra Std. 250 mah/8.4V Nicad Pak	39.50
BP-4 Alkaline battery case	16.00
BP-5 425mah/10.8V Nicad Pak - use BC35	65.00
CA-5 5/8-wave telescoping 2m antenna	19.95
CP-1 Cig. lighter plug/cord for BP3 or Dlx....	13.65
CP-10 Battery separation cable w/clip	22.50
DC-1 DC operation pak for standard models	24.50
MB-16D Mobile mtg. bkt for all HTs.....	25.99
LC-2AT Leather case for standard models.....	54.50
RB-1 Vinyl waterproof radio bag.....	35.95
HM-9 Speaker microphone.....	47.00
HS-10 Boom microphone/headset	24.50
HS-10SA Vox unit for HS-10 & Deluxe only	24.50
HS-10SB PTT unit for HS-10.....	24.50
SS-32SMP Commspec 32-tone encoder	27.95

For other HT Accessories not listed please CALL

Receivers	Regular	SALE
R-71A 100kHz to 30MHz receiver.....	$999.00	**869.95**
RC-11 Infrared remote controller....	70.99	
FL-32A 500 Hz CW filter	69.00	
FL-63A 250 Hz CW filter (1st IF)	59.00	
FL-44A SSB filter (2nd IF).....	178.00	**159.95**
EX-257 FM unit.....	49.00	
EX-310 Voice synthesizer	59.00	
CR-64 High stability oscillator xtal	79.00	
SP-3 External speaker.....	65.00	
CK-70 (EX-299) 12V DC option.....	12.99	
MB-12 Mobile mount	25.99	
R-7000 25MHz to 2GHz scan rcvr	1199.00	**1049**
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EX-310 Voice synthesizer	59.00	
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Before you QSY off to that great shack in the sky, there may be a few loose ends to tidy up. KE6F presents some pretty good arguments for getting our act together.

Organizing The Toy Box

BY ROBERT M. MILLER*, KE6F

Woody Allen once said, "I don't want to be immortalized because of my writing; I want to be immortalized by staying alive." And while most of us would prefer Allen's second wish, even his first proposition is an unlikely outcome for the majority of us. Final recognition for many of us will most likely be a one-line entry of Gothic print in *QST*'s Silent Keys. Gravity settles all questions in the end.

But let's suspend this idle talk of the grim reaper. Let's instead dwell on the bright side of our lives and specifically our collection of toys, junk that many of us have been carting around the country for the last 20 years.

A demographic study of the radio amateur population would most likely show that hams are pretty much like other people when compared by the usual social bench marks. There are, however, a few kinks in the psyche of this population that deserve closer inspection. Most amateurs are keepers of antiquity (pack rats). A great many amateurs are thrifty (cheapskates). The neat and tidy appearance of many ham shacks suggests that their owners are both meticulous and orderly. Don't you believe it! One must examine the amateur's garage or basement or out-buildings to truly assess his organizational skills. Amateurs who display, in the public eye, the organizational skills of a Donald Trump are usually disorganized and rely purely on foggy and sometimes romantic memories to keep track of their amateur-radio-related possessions (they are dreamers).

The world needs protectors for its historical artifacts. Frugality is an admirable trait in most cultures, and a romantic attachment with icons of the past is accepted in many societies. The problem is one of magnitude and degree. Where will I store the junk? Does the stuff have any intrinsic value, and if I'm run over by the proverbial buffalo herd, will the XYL' know how to dispose of it?

*9655 Appalachian Drive, Sacramento, CA 95827

NR	Item Name	Current Value/date	Located	Cat.
1	Super Duper Snooper	000/8-8-88	Shack	1
2	XYX Amplifier	000/8-8-88	Shack	1
3	Ant Farm (Inactive)	000/8-8-88	Shack	1
4	Whatzit Mk 111	000/8-8-88	Shack	1
5	Whozit MK IV	000/8-8-88	Shack	1
6	Hallicrafters SX-28 (sold)	$50/8-8-88	Fam. Rm.	3
7	Electrovoice 664 mike	$30/8-8-88	Shack	1
8	Drake R4A (new tubes)	$120/8-8-88	Bdrm	1
9	ARC-2 (rare)	$20/8-8-88	Garage	3
10	Parts (lot 1) Linear Amp Proj.	$100/8-8-88	Garage	4
11	Qume Terminal Phosph. Burns	$75/8-8-88	Shack	1
12	BC 221 Freq Meter wo/Manual	$15/8-8-88	Fam. Rm.	1
13	AN/GRC-19 Army Radio set	$125/8-8-88	Patio	2
14	AN/GRC-9 Army Radio	$40/8-8-88	Garage	2
15	AN/GRC-9 Army Radio	$25/8-8-88	Garage	3
16	BC 610 transmitter	$75/8-8-88	Bedrm	2
17	DX 60B transmitter/HG-10 VFO	$60/8-8-88	Shack	1
18	H.P. 523 frequency/counter	$25/8-8-88	Garage	3
19	H.P. 140 scope	$50/8-8-88	Garage	2
20	2 KW linear, 4-400's	$125/8-8-88	Shack	2
21	Parts (lot 2) 2 meter KW	$150/8-8-88	Garage	4
22	1 MG 4 cyl. engine with burned valves and number three piston blown	$10/8-8-88	Fam. Rm.	3
23	S-100 computer	$100/8-8-88	Shack	1
24	Printer, DEC LA-36	$75/8-8-88	Fam. Rm.	1
25	BC 221 Freq Meter w/Book	$20/8-8-88	Shack	1
26	Printer, Tandy DWP 220	$150/8-8-88	Fam. Rm.	1
27	Drake TR-4 radio and AC/PS	$125/8-8-88	Fam. Rm.	1
28	Galaxy 5 radio and AC/PS	$60/8-8-88	Garage	3
29	Two Meter Rig GE Pre-Prog	$5/8-8-88	Shack	2
30	Heath HW-12 radio and AC/PS	$50/8-8-88	Garage	1
31	Heath HW-32 radio	$30/8-8-88	Garage	3
32	Heath HW-22 radio and DC/PS	$60/8-8-88	Truck	1
33	H.P. Digital Multimeter	$50/8-8-88	Shack	2
34	SSB exciter (homemade)	$10/8-8-88	Garage	3
35	....			

Table I– Example of the list format used in preparing option 2.

Since the laws dealing with how estates are handled vary greatly from state to state, you should contact your attorney to discuss the mechanics of a last will and testament. This article was written to aid the amateur in developing a simple inventory control system, a system that will help him maintain conscious control over his toy box while he still possesses his mortal coil and to help his bereaved spouse in the event he goes QRT ahead of schedule.

The first option open to all of us is to do nothing at all with regard to our prized toys. Things eventually will sort themselves out. Do you really care if ole Beer and Pizza Breath Rasputin comes to your widow in her time of need and helps her through her financial dilemma by giving her $50 for your shiny round-emblem KWM2A? She vaguely remembers you paying $400 for the radio, but since you had owned it for a while, she accepts good ole Rasputin's handsome offer. Remember, amateurs are thrifty and ole Rasputin will satisfy the tenants of supply and demand next Sunday afternoon when he sells your old radio for $500 on the local 40 meter swap net. Pretty good, huh? Ole Rasputin even bettered your in-

Say You Saw It In CQ

vestment by $100. The $5 he made on every dime he paid your sobbing widow should make you think, too.

If the amateur's survivor is in good financial shape and merely wants to get rid of the junk, then the first option is almost acceptable. The only advice to offer in this situation is to ensure that whoever liberates the gear from your widow is clearly directed to take "ALL" of it. There is nothing sadder than seeing the feeding frenzy that occurs at estate sales. The premium gear disappears in a heart beat while the widow is left with 14 tons of scrap aluminum and transformer iron. Therefore, even option one mandates that a list of material be compiled and posted somewhere in your highly organized file system. Your log book is the best journal to record your list of valuable toys. The disposal instructions and perhaps the list may also belong in your will.[2]

If you decide to take a little more care with your amateur radio estate, then perhaps the steps outlined in option two may suit your needs more closely. This inventory scheme can also be useful in the event of robbery or fire loss.

The first step in preparing option two is to categorize your possessions into four groups:

1. Functional commercially built units.
2. Functional homemade or surplus units.
3. Nonfunctional units kept for nostalgic or material parts value.
4. Construction materials.

The second step is to prepare the lists. The format should be simple but concise. The first three groups can easily be adapted to the same format. The fourth category, construction parts, should be grouped as lots. The header at the top of the inventory should denote the following topics: name of the unit, estimated value of the unit and audit date, where the unit is located in the house, and which of the four categories the unit or materials fit into.

A reference to the ham ads and the magazines that publish them should be annotated on your lists. Current price estimates should be accurate and reasonable.

The compiling of the list may also serve to illustrate to your XYL that there is real value in what she may unknowingly call junk. But you may have to perform some very fancy footwork while you jump and dance trying to explain how you paid for all these treasures out of your modest allowance. It may also occur to the Chairman of the Board that you don't need three computers and four SSB transceivers to pursue your hobby. Inventories can have their bleak moments.

Although my sample list illustrates my weakness for military surplus string collecting, it also gives me the opportunity to reflect on whether I will ever have the time to even brush the dust off the junk, let alone work on or operate it.

Inventory lists can be an epiphany of sorts which may even provide you with the motivation to sell off your excess junk so you and the wife can take an exciting vacation in some far-off exotic land like Barstow, California.

You might even convince your XYL that your junk collecting was, during the last 20 years, a brilliant financial maneuver on your part to shelter excess income from the evil tax collector. But don't push your luck on your financial management *virtu* if the wife has been the keeper of the checkbook and pays the monthly charge cards.

The reasoning which suggests that women will never understand financial matters applicable to high technology is fallacious. The pragmatic handling of household finances by the female of the species is usually all that prevents many amateurs from going to debtor's prison.

Option three was alluded to in option two. But to fully implement option three, you will require nerves of steel, the tenacity of a Pit Bull Terrier, and the clinical skills of a research scientist. Yes, my fellow amateurs, option three is the moment of truth.

The lists have been prepared with the greatest of care. The equipment has been tagged with little green paper circle dots on which you have carefully scribed the inventory identification numbers. You are about to apply a major tenant of the "Scientific Method" to the process, "The Law of the Minimums," which in this case says, "What are the absolute minimum requirements for a specific organism or mechanism to live or operate in a specific environment?" You are the organism and your toys are the mechanism.

If you have found that after 25 years of hamming your major activities consist of checking into one net per month and listening to the 40 meter swap net on Sunday afternoons, then "The Law of the Minimums" may suggest that almost

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every item on your list is excess baggage and is not required for either biological or operational survival.

If the electrical gadgets in your toy box supply some psychological need, then option three could be damaging to your mental health. I for one am a strong believer in mental health. Therefore, option three could place me in harm's way. The image of my wife wiping the drool from my mouth as I lay, rigid, in a post-option-three catatonic state is too horrific to visualize.

Compromise is usually the best course of action. Option two provides us with a feeling of economy in our actions while fulfilling our unconscious desires to hoard possessions and mitigate a basic human failing—greed. I will never be able to restore 23 ARC 5's, yet I cannot part with them.

If you are bothered by the thought of a small, parasitic faction of our hobby carting off your treasured estate to the swap meets, then why not counter these greedy actions and give the equipment to people trying to enter the hobby[3]. The HT-37 and SX-111 that have been sitting underneath the wife's sewing machine for 8 years aren't worth what it would cost to ship them across town, but a youngster on a limited budget could put them to good use.[4]

Those who take the time to organize their toy box will find that it only takes one afternoon to make up the lists, one agonizing hour to determine the destiny of the junk, and a week of Sundays to pack up the stuff for export to the swap meets, amateur radio clubs, and homes of unsuspecting parents. The wife and I may have to defer our plans to visit beautiful Barstow, but I made enough money on the sale of my 23 ARC 5's to finance an exciting weekend at the annual Garlic Festival in Gilroy, California.

Footnotes

1. Female participation in the amateur radio hobby is still a very small percentage of the total population. This is unfortunate. Gender-specific references in this article reflect this demographic statistic.

2. A legal professional should be consulted when writing or altering any legal instrument such as a will.

3. Federal tax reforms may have negated any advantage in donating the equipment to charities or other tax-exempt institutions. Consult your tax preparer regarding tax deductions.

4. It is a good idea to clear with their parents any gifts made to minor children. Equipment that uses lethal voltages to operate, like vacuum-tube equipment, should have warning stickers affixed to the case. Parents should also be warned of any hazardous voltages that may be present in equipment. CQ

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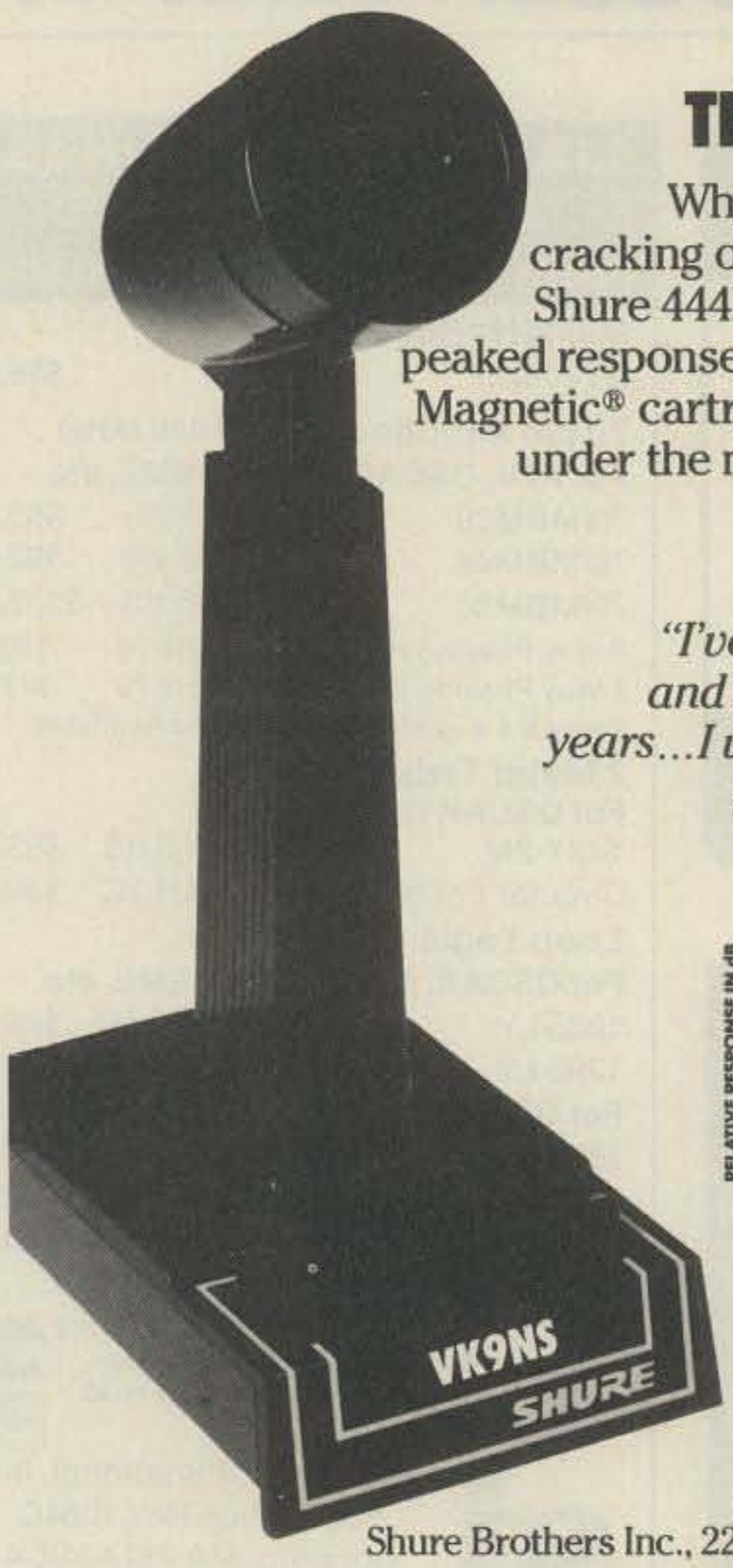

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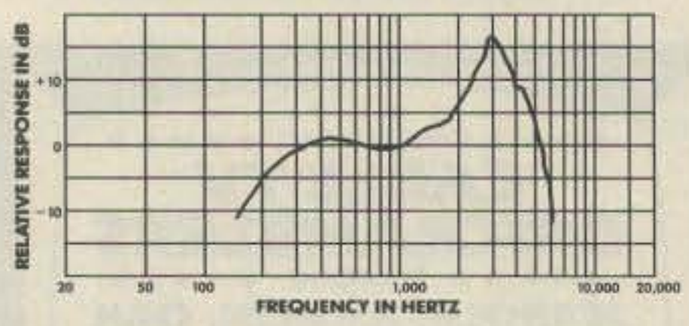

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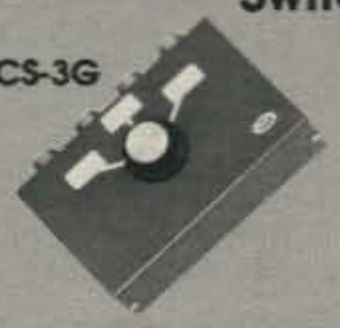

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Using a bit of improvisation applied to a classic antenna design, W4FA comes up with a very simple but effective wire-type beam.

A Broomhandle Beam For 10 Meters

BY JOHN J. SCHULTZ*, W4FA/SV0DX

Put together two old broomhandles, less than $5.00 worth of 450 ohm ladder line, and you can have a 10 meter beam that will provide a few dB of forward gain, have 10–15 dB of front-to-back ratio, have a reasonably wide bandwidth, and can be fed directly with a coaxial transmission line. Right?

The general answer is yes, as long as you take the time to understand the antenna to be described and construct it reasonably carefully rather than just lashing it together too hastily and hoping that sprinkling it with some magic antenna dust will then make it work.

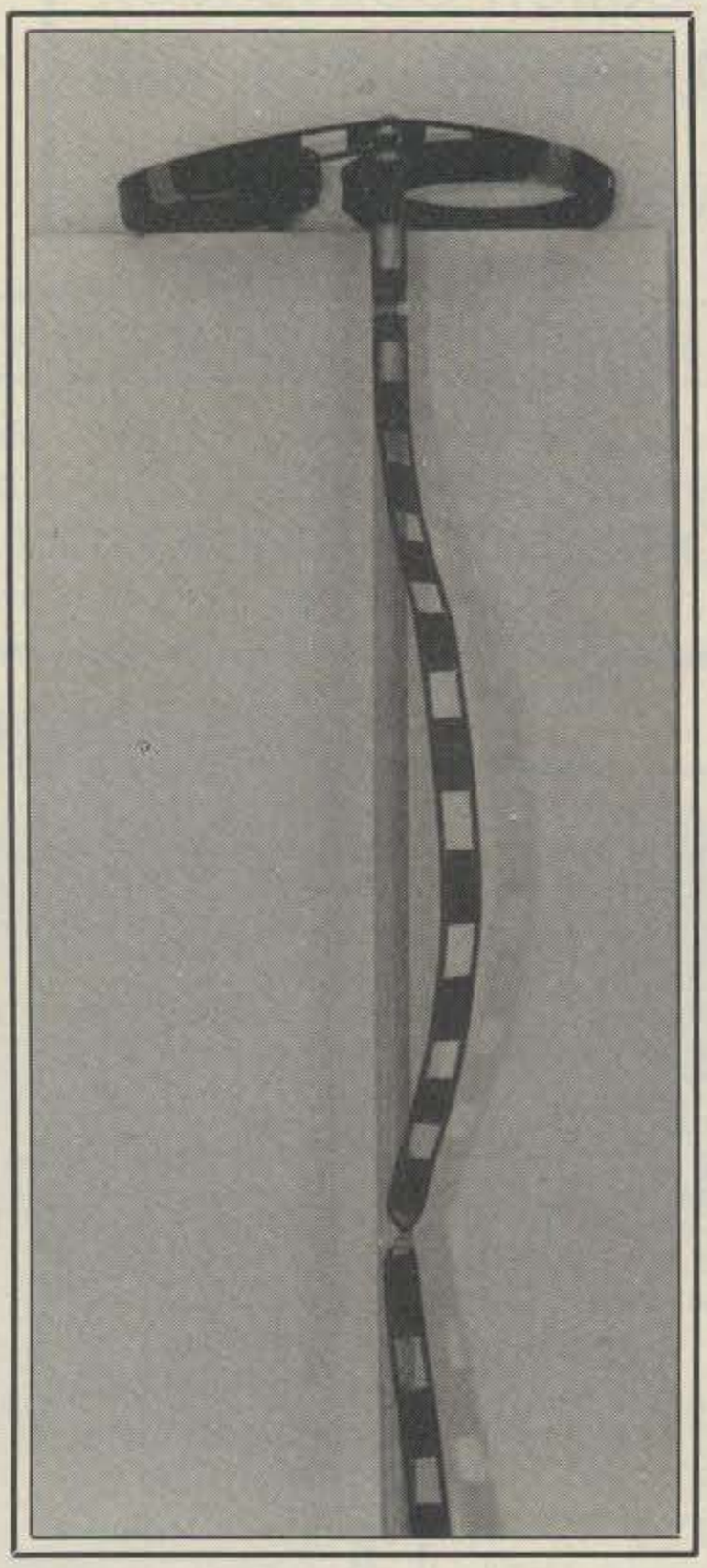
The Broomhandle Beam evolved out of a very simple need. It was desired to have a temporary, inexpensive 10 meter 2-element beam available, the boom of which could be fastened at *one end only* to a solid support such as an antenna mast or even a building wall. Of course, this meant that the beam would be fixed and not rotatable. The two elements were to be made from wire for economy, and to be lightweight as well as simple. The elements were to be formed in inverted-V fashion with their ends tied down to whatever supports were available. The general idea is illustrated in fig. 1. Although the Broomhandle Beam as it evolved thoroughly satisfied its original requirements, it is not difficult to see as you study the design of the antenna how it can be adapted to form a portable antenna or even a compact rotary antenna with a turning radius less than that of a conventional 2-element beam.

The Design Problem

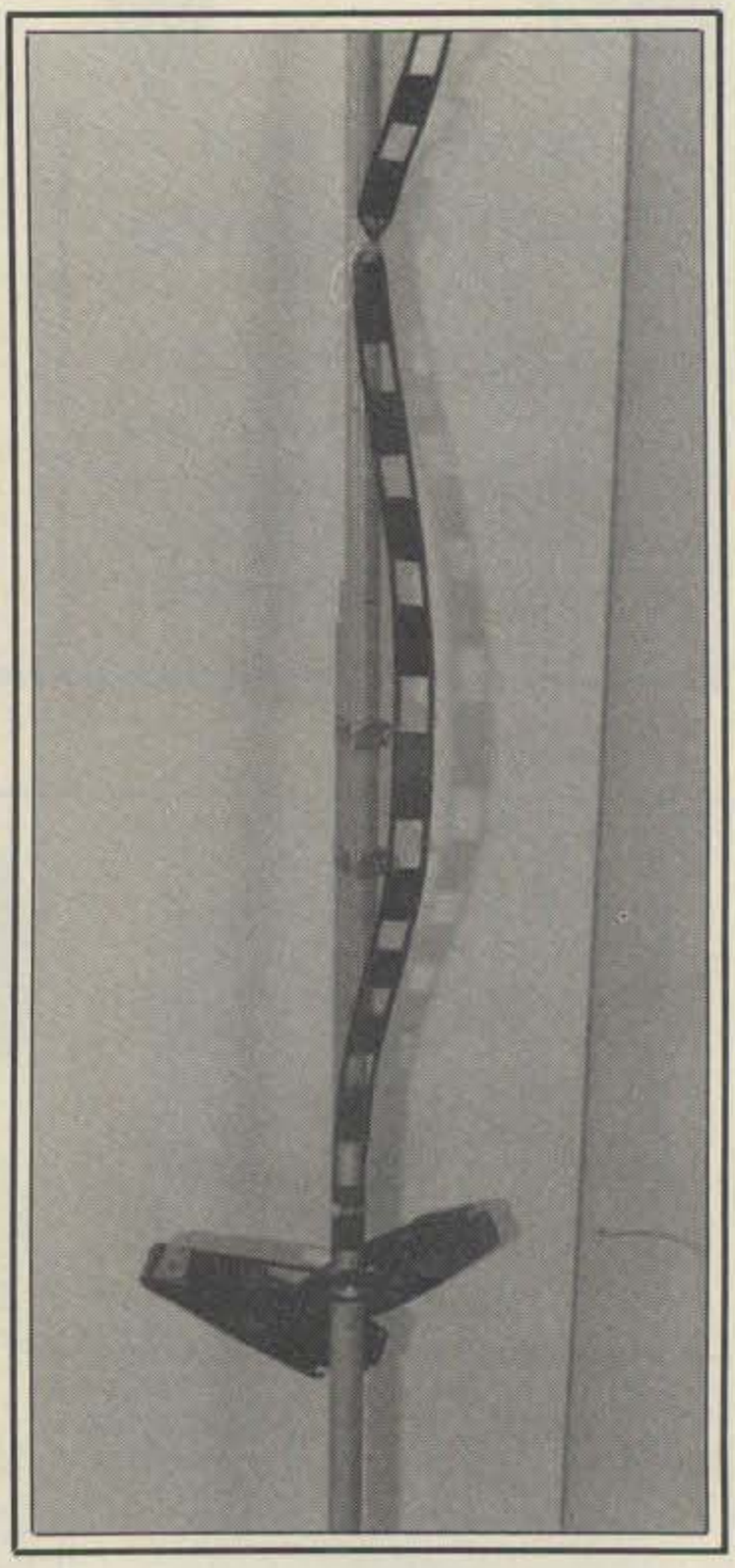
The mechanical and electrical properties desired for the antenna were just described. Finding an antenna form that would satisfy those needs required a bit of research. Since the antenna would be supported at one end only, a close-spaced beam, even on 10 meters, was pretty much dictated. The next step was to evaluate whether a phase type of beam with both elements driven should be tried or a parasitic beam design used.

Using a 2-element parasitic beam design is always tempting because such designs look so simple on paper. In reality, however, the story is a bit different. Parasitic beam designs work great if you are able to tune the antenna "in place" for optimum performance, or if you *exactly* duplicate a given, proven design and the antenna is erected in a reasonably clear space. In the assembly instructions for their products commercial beam manufacturers always emphasize the need to measure the element lengths, element spacing on a boom, etc., very carefully if you are to duplicate the performance designed into their products. A parasitic beam can easily turn into nothing more than a dipole-equivalent antenna if it is not tuned or dimensioned fairly exactly.

In view of the foregoing, the temporary nature of the desired antenna, and the fact that I



I couldn't photograph indoors the entire length of the broomhandle beam. This is the outer end of the boom with the driven element (coiled up) at the end of the boom and the phasing line going vertically along the boom.



This photograph is the bottom extension of the boom shown in the first photograph. The driven reflector element (coiled up) is shown at the bottom. The two broomsticks used for the boom are shown being secured together by worm clamps.

*c/o CQ magazine

Say You Saw It In CQ

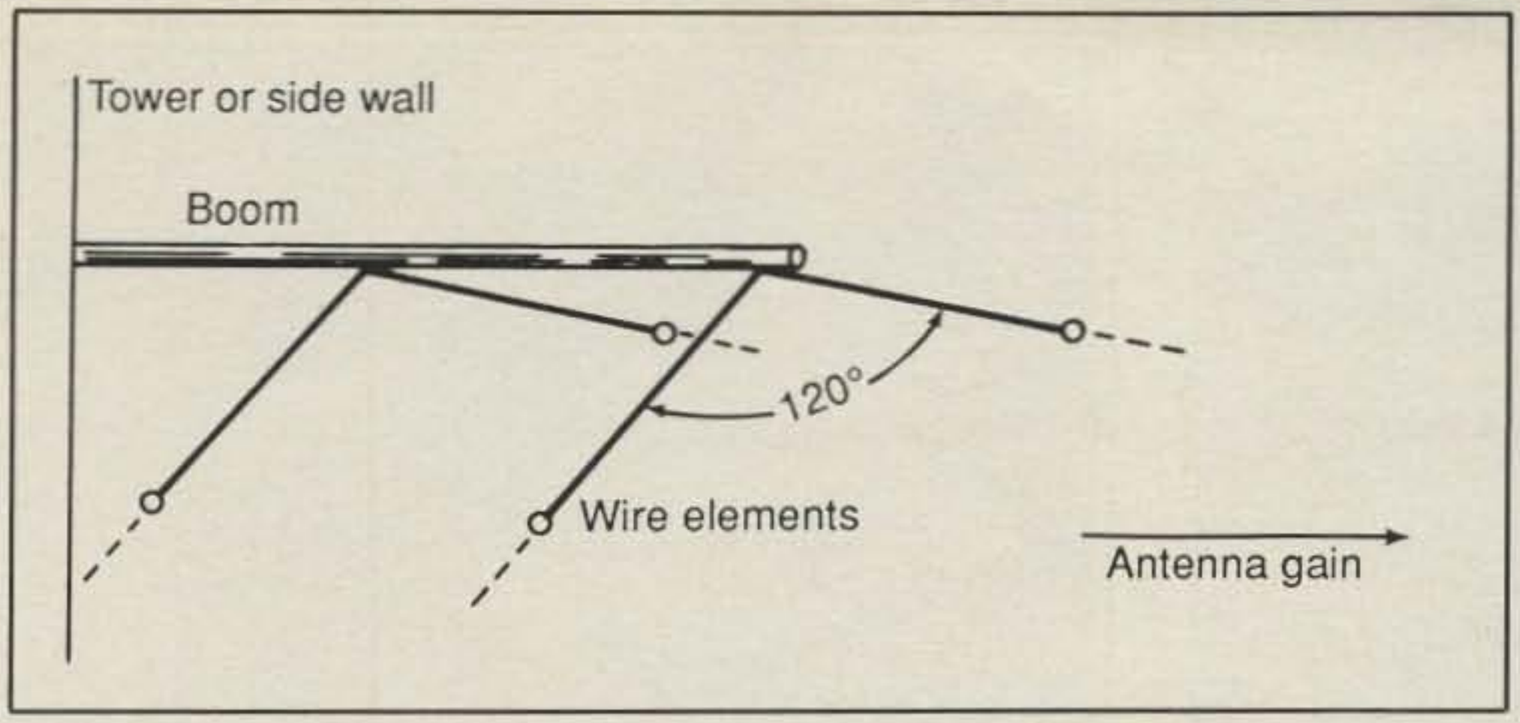


Fig. 1– The basic idea of the antenna was to have available a simple two-element beam constructed of wire for the elements and the boom of which could be fastened at one end only to a support.

certainly did not want to spend hours "pruning up" a parasitic wire-type beam, I decided to explore the possibilities of using a beam design where both elements would be driven. Such designs are inherently more tolerant of slight dimensional errors in their construction and the effect of nearby metallic objects. The tradeoff is a very slight bit more constructional complexity, which amounts to nothing more than a phasing line between the two elements, and a bit less forward gain. The latter, in reality, is a moot point, since the difference of ½ to 1 dB of forward gain between the two designs is far overshadowed by the advantages of having a basic beam antenna available that functions without undue fuss.

The "ZL Special"

It's funny how many modern antenna manuals still mention wire antenna designs such as the "Lazy H" which are far too huge for the average amateur to consider, while the same manuals neglect to mention simple, compact designs such as the "ZL Special." I suppose it's because antenna designs such as the "ZL Special" aren't really spectacular antenna designs that would appeal to amateurs who have enough available real estate to construct large wire-type antennas. However, in spite of that I think we are missing out on many good antenna ideas when we neglect some of the more simple wire-type designs. We are also missing out on some good savings when you can obtain a few dB of forward gain from an antenna system at a cost of $10 or less.

The "ZL Special" is credited to ZL3MH and is somewhat similar to the famous W8JK designs except that the "ZL Special" is essentially a unidirectional beam while the W8JK design forms a bidirectional beam. Over the years many amateurs have experimented with the original ZL3MH design in order to squeeze out of the design a bit more gain and/or front-to-back ratio. Fig. 2 represents the best consensus of opinion I could find among my antenna notes as to how the antenna should be dimensioned if it is to be constructed from transmitting-type twinlead. Since many "ZL Specials" have been constructed with apparent success using slightly different dimensions, I would not overly stress the exact dimensioning of the antenna. The only dimension difference that you have to keep in mind is that concerning the *physical separation* between the driven element and the phased reflector element (122/F as shown in fig. 2) and the *physical*

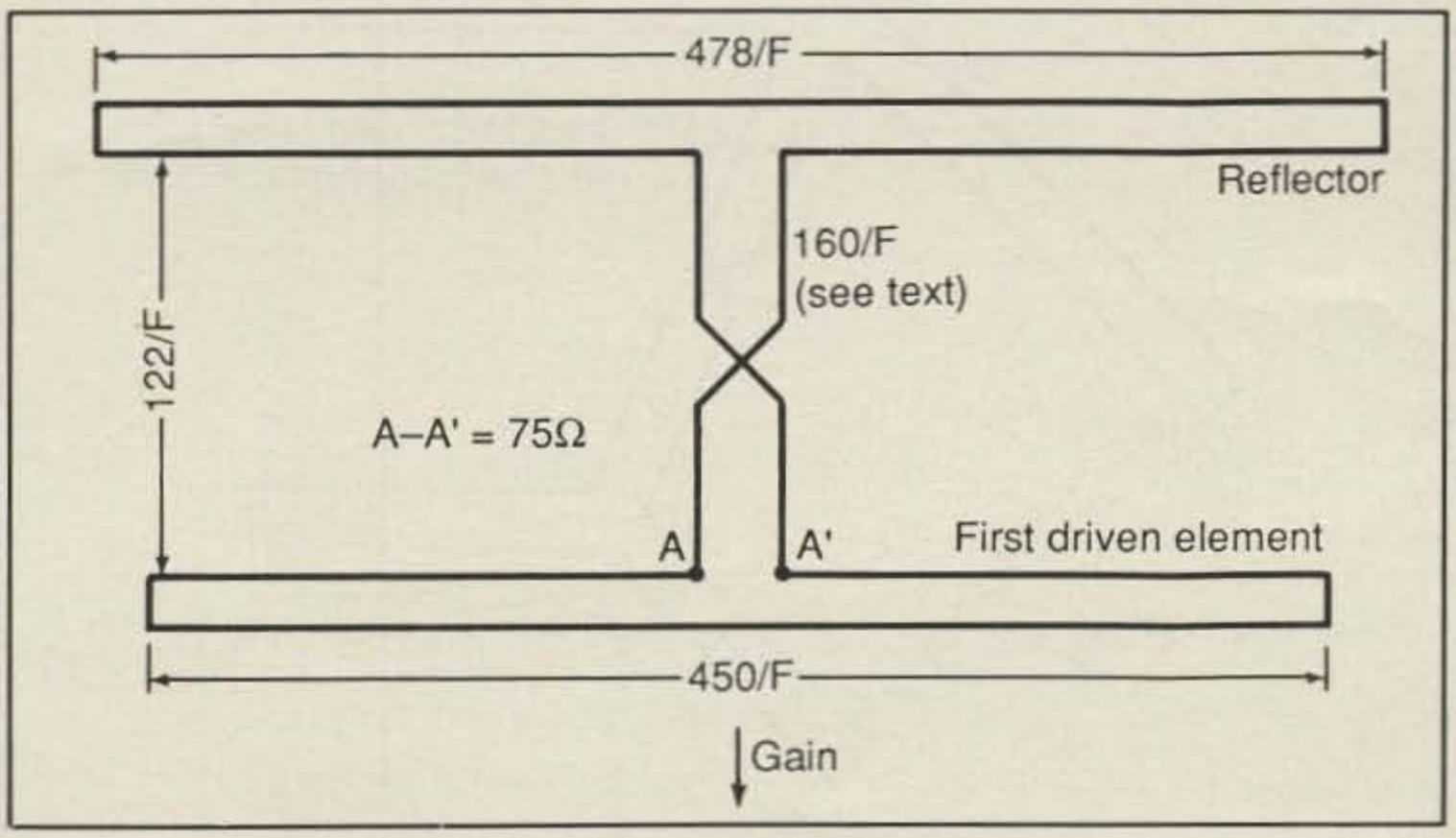
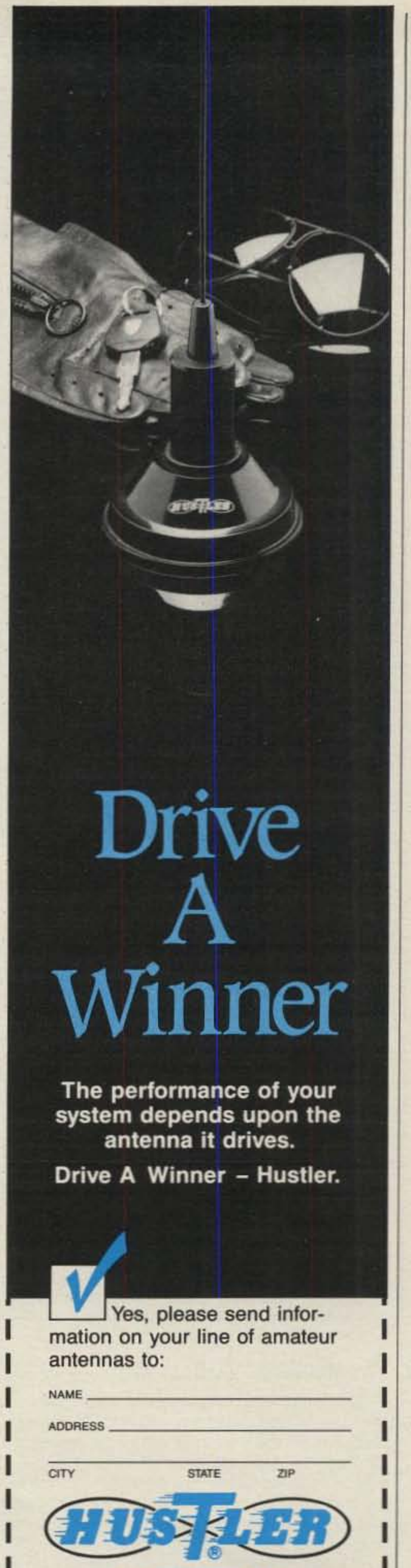


Fig. 2– These were the most often used length and spacing formulas I could find for the "ZL Special" if it were to be constructed from twinlead. The lengths are in feet when F is in MHz.



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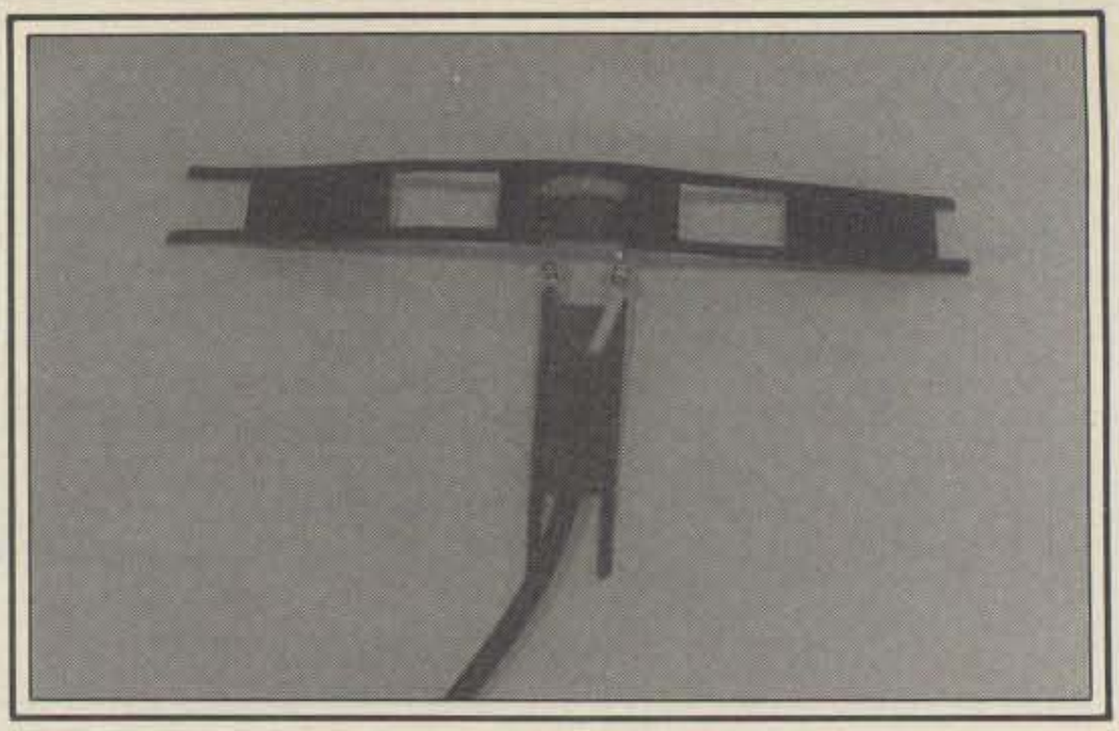
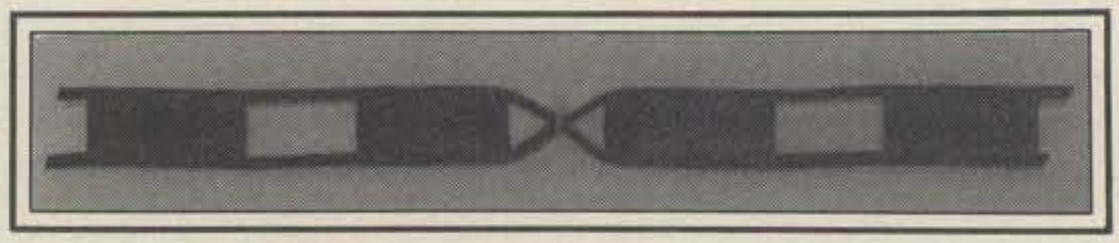


This mock-up shows how the phasing line and coaxial feedline are connected to the driven element. The ladder line used for the driven element is cut on one side in the middle to connect to the phasing line and the coaxial cable. The driven element is held to the boom by a cable tie plus a small wood screw below the cable tie shown. Actually, any sturdy method of securing the line can be used. A simple taped installation will suffice for very temporary periods.



The twist in the phasing line between the two elements of the antenna. It can be placed at any point in the phasing line, but it has to be there! If 450 ohm ladder line is used, a small cable tie at the twist point will ensure that the twist point stays in place.

length of the phasing line between the elements (160/F as shown in fig. 2). The physical length of the phasing line, as determined by the 160/F formula, must then be multiplied by the velocity factor of the type of transmission line used for the phasing line. This will vary from about 0.82 for ordinary 300 ohm TV twinlead to 0.95 for 450 ladder-type TV twinlead. The lengths of the reflector and driven elements and the separation between them are calculated according to the formulas shown in fig. 2 without regard to the velocity factor of the twinlead used. The practical example of the antenna actually constructed, as described shortly, should make all of the foregoing a bit clearer.

The radiation direction of the antenna is as shown in fig. 2. The feedpoint impedance is roughly 75 ohms. The forward-gain figures claimed for the antenna have varied from 4 dBi to 7 dBi and the front-to-back ratio from 15 dB to 20 dB.

The Modified "ZL Special"

The antenna form shown in fig. 2 is based on the idea that the driven and reflector elements were both in the horizontal plane. Of course, I desired the antenna form shown in fig. 1, where each leg of the two elements comprising the beam were not 180 degrees apart but were rather about 120 degrees apart. My own estimation, based on some experience with paralleled dipole anennas, was that the 120-degree angle would do two things: it would lower the feedpoint impedance closer to 50 ohms, and the increased capacitive effect between the legs of each element would lower the resonant frequency of the antenna. The lowering of the feedpoint impedance closer to 50 ohms was, of course, very desirable if the antenna was to be fed with 52 ohm coaxial cable. The lowering of the resonant frequency required a bit of guesswork as to how to dimension the antenna to compensate for that effect.

A Practical Design

Fig. 3 shows the dimensions for the 10 meter beam I finally constructed. The antenna is

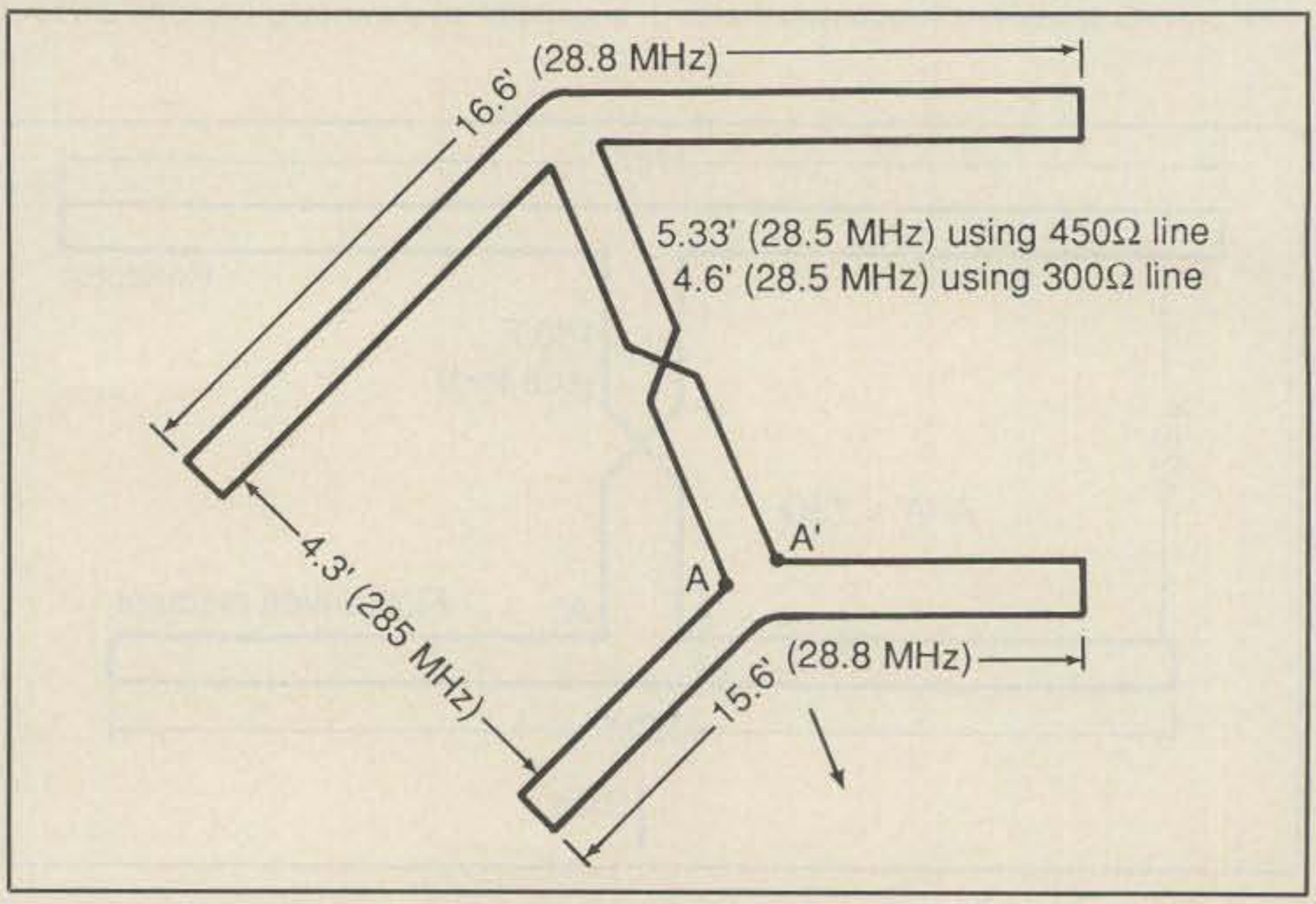


Fig. 3– The dimensions chosen for the 10 meter Broomhandle Beam. The reasons for the different frequency notations next to some of the lengths are covered in the text.

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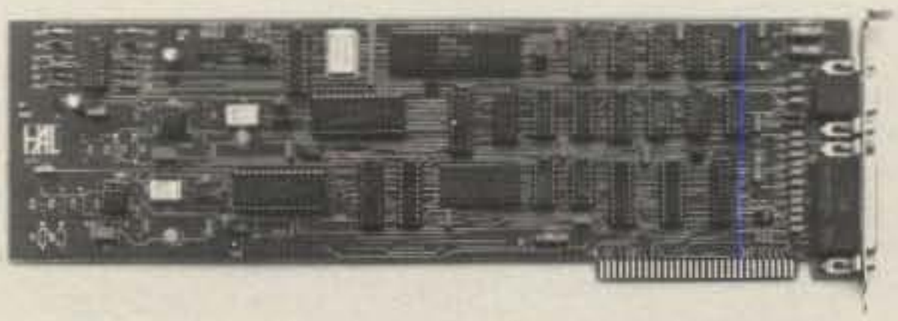

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designed for a center frequency of 28.5 MHz, and I followed the dimensional formulas shown in fig. 2 except, for the reasons just stated, to calculate the driven and reflector element lengths on the basis of 28.8 MHz. The physical spacing between the elements and the physical length of the phasing line between the elements was calculated on the basis of 28.5 MHz. The phasing line length was calculated on the basis of using 450 ohm ladder line (velocity factor of 0.95). That type of line in fact was used to construct the entire antenna, since it is sturdy, readily available, and reasonably economical (about 10¢ per foot).

Construction

The photographs pretty much clarify the constructional details of the antenna. Two broomhandles were overlapped by a foot or so and held together by two worm clamps. The driven element was cut slightly longer than necessary (a few inches) out of 450 line and fastened to the end of the boom at the approximate center of the line such that a full block of insulating material remained between the two wires of the line. A detail photograph shows how the line was fastened, how it was cut to solder in the phasing line, and how the coaxial transmission line was connected. Then from the boom each side of the element was carefully measured, cut, and the ends of the line soldered together.

Measuring backwards on the boom for spacing for the driven reflector element, it was attached in the same manner as the driven element. Then the phasing line between the elements was installed, taking care to twist it once and hold it onto the boom with plastic cable ties. Since the length of the phasing line is physically longer than the spacing between the elements, it does hump up somewhat, but that is not of any electrical significance.

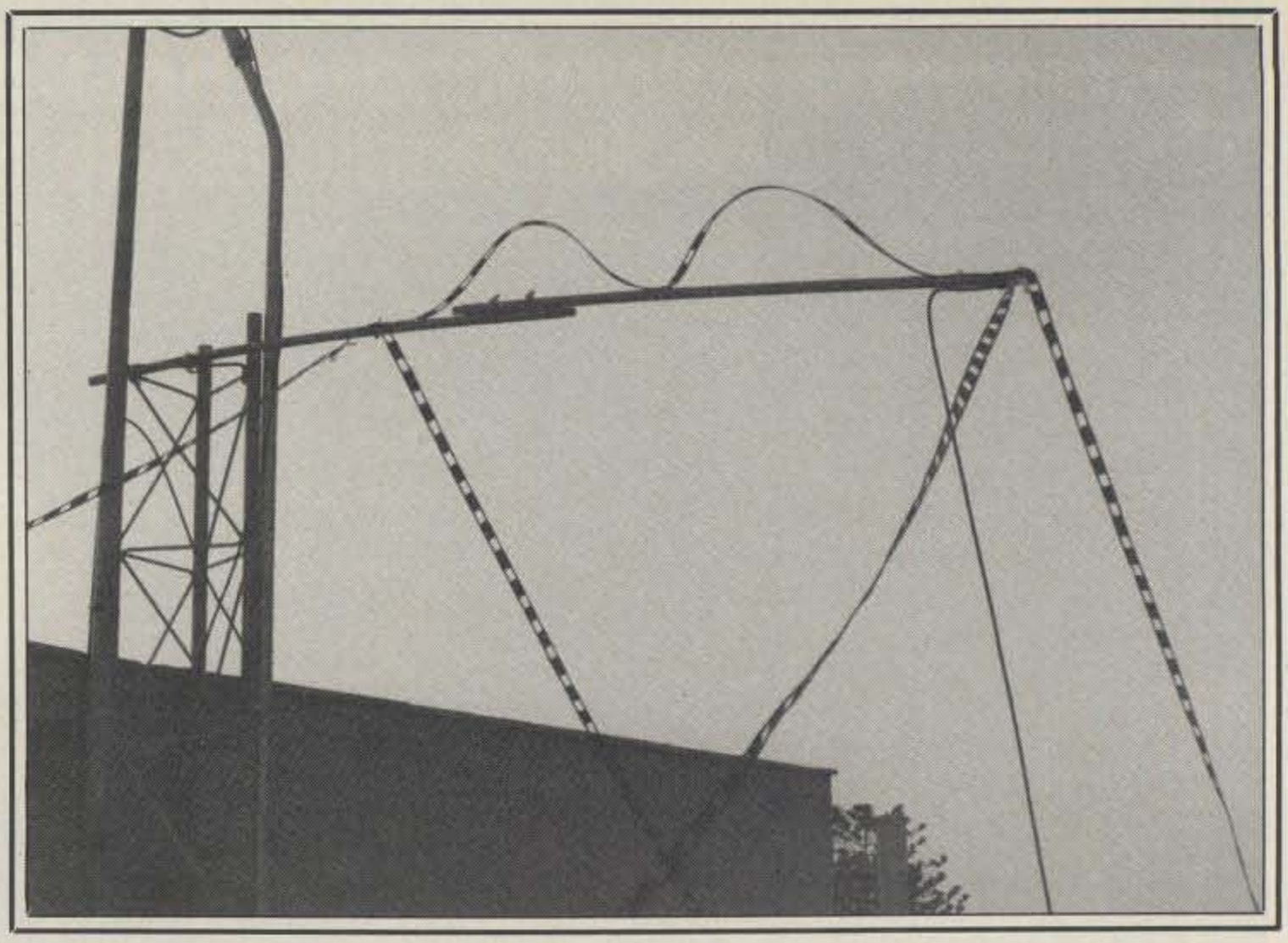
No balun was used, although if desired you could use any form of 1:1 balun at the feedpoint. A simple coaxial line balun valid for one band only would probably be the most economical approach.

The use of 450 ohm ladder line for construction is again highly recommended since it is inexpensive and very easy to handle. Three-hundred ohm TV line can be used, but then you have to be very careful that it does not get all twisted up, especially when installing the phasing line between the elements.

Installation and Test

The beam was installed on the side of a tower section by fastening the broomhandle beam end to the tower section using two worm clamps. The ends of the antenna elements were tied down to available supports via lengths of small nylon rope. The nylon rope formed the insulators at the ends of the elements. The only care taken was to keep the element ends spaced correctly and to maintain approximately the 120-degree angle shown in fig. 1.

The first thing I did after installation was to check the antenna's SWR response. I was very surprised to get the response shown in fig. 4. Obviously, I miscalculated a bit and the antenna's SWR curve dipped a bit lower in frequency than I had expected. However, it hardly mattered in view of the extremely broad SWR response. The antenna would clearly work with almost any solid-state transceiver over the entire extent of 10 meters without using an antenna tuner.



Here is the beam as attached (left side) to a section of a tower structure. The driven element is on the right and the RG-8X feedline droops down from it. The phasing line, with two humps because of its length, runs along the boom between the two elements of the beam.

Power tests showed that the antenna could easily handle a KW as constructed, although I would use caution in not using the antenna at more than a few hundred watts of output power if it were constructed from 300 ohm TV line.

Results

Considering the simple construction nature and cost of the Broomhandle Beam, I was extremely satisfied with the results obtained. It was absolutely clear as I switched between the beam and a reference dipole antenna, and as I listened among stations on the beam coming in from different directions, that the beam did indeed have significant front-to-back and front-to-side ratio and that it did provide useful forward gain. I easily worked stations in the Far East, the direction to which the beam was oriented, that I couldn't contact using just the dipole antenna, at least not on the first call.

I hesitate to put "numbers" to the results I obtained with the beam, since it was simply installed and truly calibrated reference antennas were not available. However, I would feel very comfortable estimating that the beam has about 4 dB of forward gain and about 15 dB of front-to-back and front-to-side ratio. I think that's a pretty darn good bargain for $5.00 worth of wire, two broomhandles, and a few worm clamps! CQ

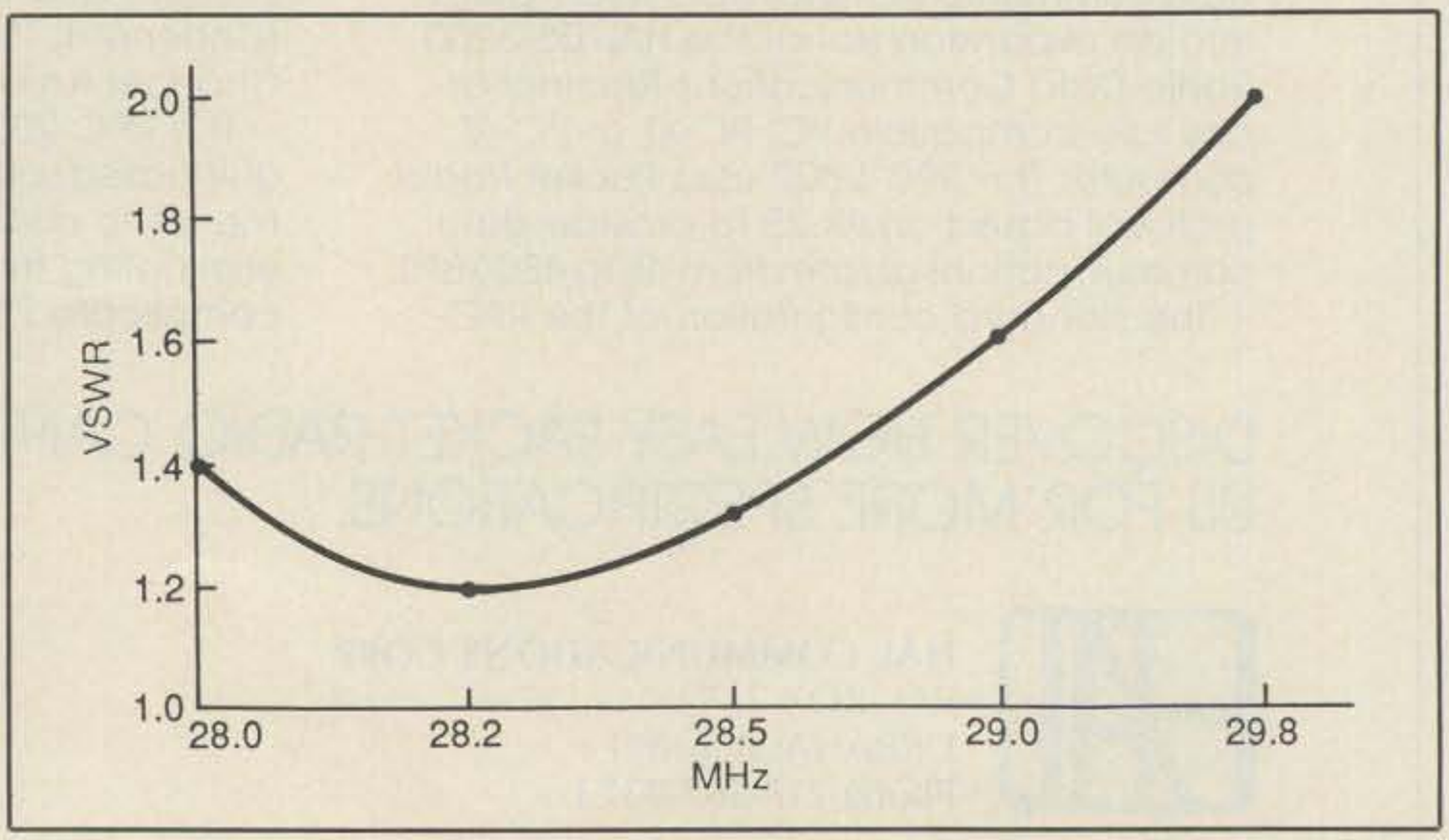


Fig. 4– The SWR curve for the beam. It dipped a bit lower in frequency than I had hoped, but still the SWR response must be considered very satisfactory.

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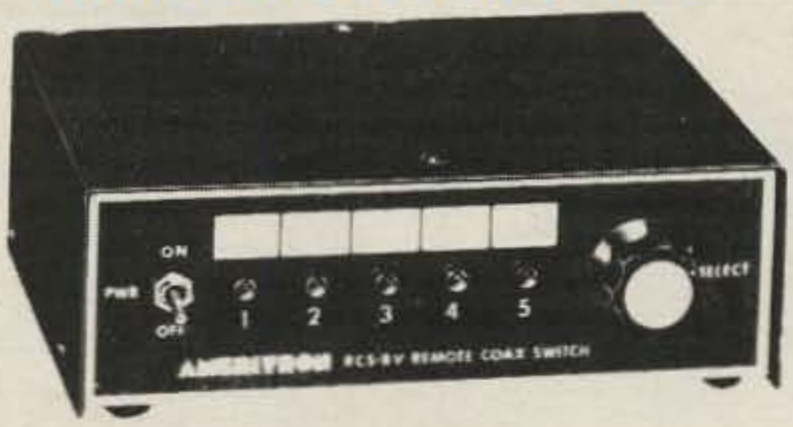

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"QSL For Sure"

BY CHARLES STOKES*, N5GFX

I'm sure most of you by now are aware that our hobby of amateur radio has many facets. The list is too numerous to print here. There is just no conceivable way that any one amateur could become proficient in all the many specialities. It would dare say drain the wallet and test the strength of one's marriage. Therefore, most of us choose just a couple of avenues to be comfortable with and become proficient in.

My niche became HF-CW-DX-QRP and, God forbid, County Hunting al la *CQ* magazine. "How simple!" I exclaimed. With just 500 counties confirmed I'll be off and running with my first *CQ* County Hunter's certificate. Easy! Piece of cake! But thereafter it will get harder to get those endorsements—1000, 1500, etc., until all 3079 counties are confirmed. And, of course, there are specialized endorsements for CW, phone, band, etc.

So I was ready. Forms, rules, pens, and pencils. Shown below is a typical QSO with County Hunting injected—at first.

N5GFX: BK R ES FB HARRY BT VY NICE TO MEET U BT WHATS UR COUNTY ?? BK

Harry: BK MY COUNTY IS POLK POLK BK

N5GFX: BK GREAT HARRY BT I NEED POLK TU BT CAN U QSL ?? BK

Harry: BK C C BT BE MY PLEASURE CHAS BT GLAD TO CONFIRM POLK BT QSL FER SURE BK

And so the QSO continued with the normal chit-chat, and my QSL was zipped off to faithful Harry that very same day. Sitting back in my chair I thought how easy that was, especially for a rare county like Polk.

Weeks passed and turned into months with no reply from Harry. So, off with a reminder card and this time an SASE. Maybe Harry had fallen onto hard times and couldn't afford a stamp. I restarted Harry's clock. Still weeks passed by. I needed a new trick. Maybe poor old Harry didn't have any QSL cards. Or maybe Harry was a SK. Being hopeful the latter was not true, I dashed over to the local candy store to purchase blank, generic QSLs. I thought this should do it. All Harry had to do was fill in the blanks. In the mail it went with another SASE (just in case). Six days later my SASE and the filled out generic card from Harry arrived! Care to count the cost of Polk County? If only I had known. Well, at least I was a little smarter.

At first my hit ratio was about 60 percent. I thought, "Surely I don't have to treat this County Hunting biz like DXCC with green stamps?" After all, these were American amateurs we were talking about here, folks. More thought and I refined my QSL request.

N5GFX: BK GREAT ES TU BT NEED WALKER BT CAN U QSL ?? BK

Harry: BK YES YES BE GLAD TO BK

N5GFX: BK TU HARRY BT DO U NEED SASE SASE ?? BK

Harry: BK NO NO WILL QSL WHEN URS CUMS BK

Now that I had pinned down Harry a little better my hit ratio was up to 80 percent. But still there were 20 percent of those Harrys out there who just would not confirm even with the generic QSL and the SASE. Another strange puzzlement: Sometimes Harry replied using the furnished SASE, stuck in his personal QSL (which was great), but apparently threw away the generic card. Rather odd.

A few weeks ago I had a real heart stopper. On came the new county of Franklin, and the QSO with OM Tom went like this:

N5GFX: BK GREAT TOM ES TU BT NEED FRANKLIN CAN U QSL ?? BK

Tom: BK NO NO BT DONT HV ANY QSLS BT SRI BK

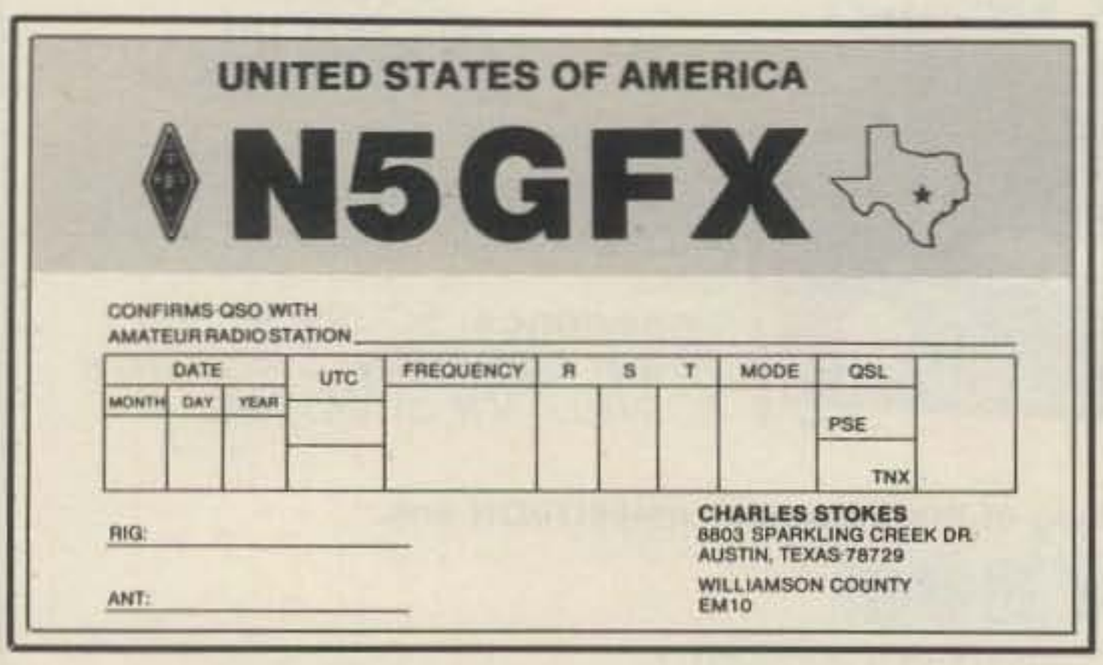
I was in shock! My fist was trembling, and my heart was pounding. This guy spoke the truth. "Don't be sorry, Tom," I thought.

N5GFX: BK R R IVE GOT BLANK U FILL IN QSLS BT OK ?? BK

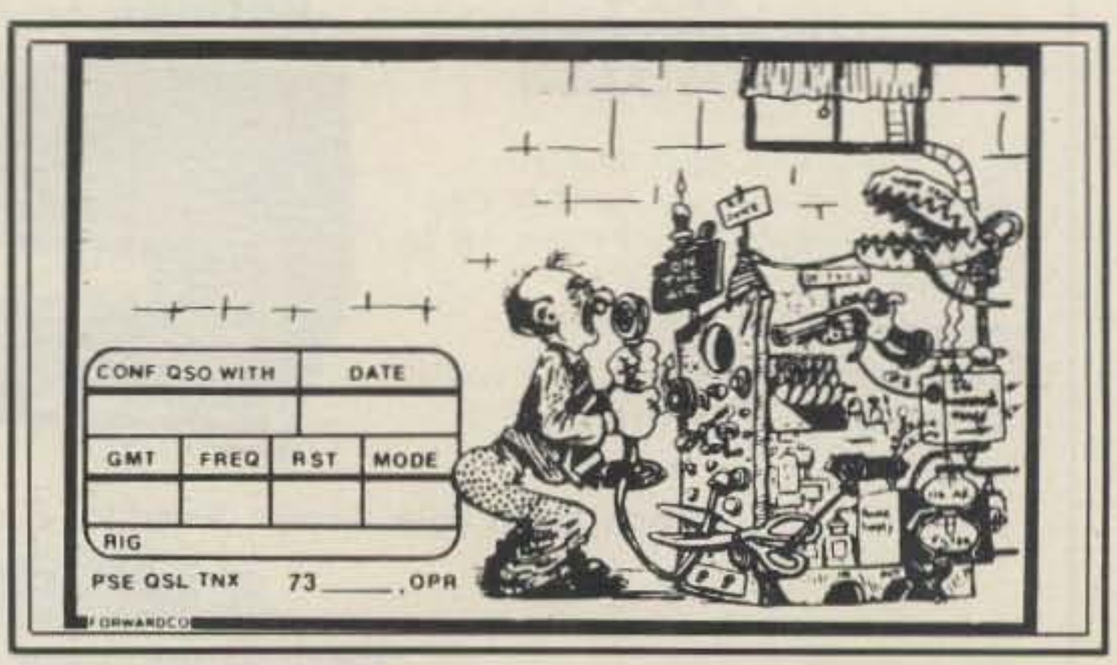
Tom: BK OK SEND IT BE GLAD TO REPLY BK

*8803 Sparkling Creek Drive, Austin, TX 78729

The generic cards used in this article are available from Van Gordon Engineering, Box 21305, South Euclid, OH 44121.



The author's regular QSL card.



A generic QSL card that the author has used successfully.

N5GFX: BK OK TOM TU BT I ALSO HV SASE BT DO U NEED ?? BK
Tom: BK NO TNX CHAS BUT I CAN HANDLE STAMP HI HI BK
N5GFX: BK DE N5GFX TU TOM FER TELLING THE TRUTH BT THE FIRST TIME HI HI

And on we went with a fun QSO, plus I had Franklin confirmed in one week.

The really sad part of this commentary (here comes the hate mail) is that I've been able to characterize this typical Harry. Are you ready?

1. He usually has a 1 × 3 call with a W or K prefix.
2. He is usually over 60 and retired.
3. For some reason he just can't come to grips with telling the truth about sending a QSL, or *not* sending one, that is.

I'm afraid that when old Harry has a QSO with young Novice Billy, Tommy, Karen, or Julie and says he will QSL and doesn't, he is sending a strong silent message to those amateurs—*frustration*. We all are aware that some of the older and/or retired amateurs may be on fixed incomes and the cost of QSLs and postage is just something that is not in the budget. That is a fact that we all may have to consider some day.

So, if you are a Harry, please understand the message for the sake of the new amateurs and the hobby itself: *Tell the truth—the first time.* CQ

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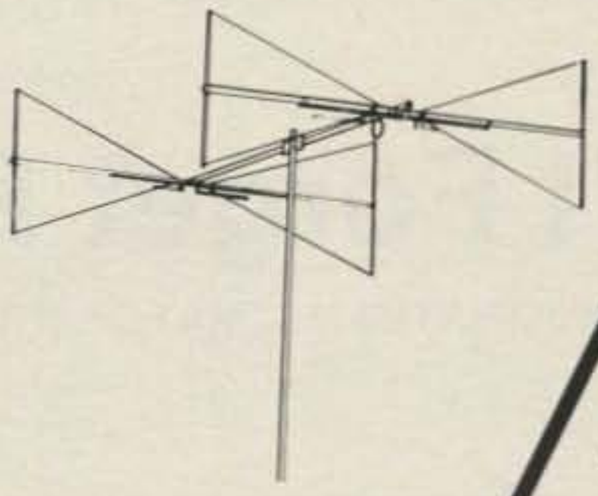

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CIRCLE 165 ON READER SERVICE CARD

If you're running packet with one of those newer multimode units, you've probably got a switch position marked RTTY. No, it's not the next stage of digital communications, but it's one stage you ought to try.

Don't Forget RTTY

BY JONATHAN L. MAYO*, KR3T

Amateur radio digital communications has undergone something of a renaissance over the past decade. This revitalization and expansion of digital modes can be directly attributed to advances in integrated circuit technology as well as the spread of personal computers. Equipment which used to consume large amounts of space and require frequent maintenance has shrunk to where it will often easily fit into a briefcase. Digital communications has gone from one of the most mechanical and noisiest modes (remember the Teletype®?) to one of the most electronic and quietest.

Ten years ago, when an amateur radio operator mentioned digital communications, he most probably was referring to radioteletype (RTTY). Modes such as AMTOR, ASCII, and packet did not yet exist in amateur radio. Needless to say, things certainly have changed. Today digital communications encompasses a multitude of modes and possible variations. I'll briefly review the major digital modes in the next section, but first let's refresh ourselves about a mode that has received little press recently—RTTY.

Conveniently overlooking CW, it can be said that RTTY is the grandfather of all modern forms of digital communications. RTTY has been modified, improved, and some even say replaced by other modes, but RTTY is still with us in its original form. Despite all the technological advances made in the past decade, it is not easy, nor sometimes possible, to distinguish an RTTY signal generated by a modern multimode interface from an old-time Terminal Unit (TU) connected via a current loop to a mechanical teletype.

Although I had an RTTY station set up in my shack several years before I got involved with packet radio, I have not operated RTTY much at all over the past few years. Packet, with all of its technological sophistication and rapid growth, has garnered a lot of attention. Today there are estimated to be over 30,000 packet stations in operation. Packet radio has rekindled an enthusiasm in digital communications among radio amateurs. The introduction of multimode units such as the AEA PK-232 and Kantronics' KAM has added fuel to the fire by including six or more digital modes in one case at a price equivalent to two single-mode units.

More and more people, it seems, are rediscovering RTTY. RTTY is a comparatively simple mode ideally suited for the HF operating environment. This article is an up-to-date look at RTTY, describing current equipment and operating practices. As you soon will see, RTTY isn't what it used to be. But first let's review the major modes of digital communication used in amateur radio.

*3908 Short Hill Drive, Allentown, PA 18104

The digital communications station at KR3T. I currently have two separate RTTY stations—a TRS-80 Color Computer with a Kantronics Interface II and a TRS-80 Model IV with a Kantronics KAM.

Modes of Digital Communication

Morse code is one of the oldest forms of digital communications. It contains most characters needed for communications. With the advent of computerized units Morse code can automatically be sent and copied. However, the slightest bit of interference or imperfect sending can reduce the decoder's ability to accurately copy code.

Baudot RTTY (**R**adio **T**ele**TY**pe) uses a form of digital coding known as the Baudot (or Murray) code. In the Baudot code each character is made up of five levels (commonly called the mark and space elements). However, there are only 32 possible combinations using a five-level code. Therefore, the Baudot code includes two different character sets—figures and letters. The character sets are alternated as needed.

ASCII RTTY was first legalized in 1980 by the FCC for amateur use in the United States in response to the wide proliferation of computer equipment which uses the seven-element ASCII code. ASCII's primary advantages over Baudot RTTY are its speed (ASCII is usually sent much

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CIRCLE 91 ON READER SERVICE CARD

The Kantronics Interface II is representative of the older single-mode RTTY units.

faster than Baudot) and its 128 possible characters. In operation ASCII RTTY is very similar to Baudot RTTY except for the coding used.

AMTOR (**AM**ateur **T**eletype **O**ver **R**adio) was first legalized for amateur use in 1983. AMTOR uses a special coding in which there is a constant ratio of mark and space elements. If the received characters do not have the proper ratio, they are presumed erroneous. Because of this error checking AMTOR is much more reliable than standard Baudot or ASCII RTTY.

Packet is the most advanced form of digital communications available to radio amateurs. The primary advantages of packet radio are speed, networking, error checking, and efficient use of frequency space. Packet radio operates using a standard digital communications networking technique known as Carrier-Sense Multiple Access with Collision Detection (CSMA/CD). Put simply, this means that a packet station will not transmit when the frequency is busy. It will wait until the frequency is clear and then transmit a short burst (frame) of information. Because packet transmissions are very short, many packet stations can be on the same frequency without interfering with each other. A line of text that takes 30 seconds to type can be transmitted in a fraction of a second.

RTTY Basics

Any RTTY station must have three basic components: a terminal, a Terminal Unit (TU), and a transceiver. The terminal converts characters into digital codes and vice versa. The Terminal Unit converts digital signals into analog tones and vice versa. And finally, the transceiver transmits and receives the analog tones.

When transmitting, characters typed on the keyboard of a terminal are converted into digital codes which are sent to the Terminal Unit. In the Terminal Unit, the digital codes are converted to analog signals which are sent to the transmitter. The transmitter then transmits the analog signals.

At the receiving end the receiver receives the analog signals and sends them to the Terminal Unit where they are converted back into digital codes. The digital codes are then sent to a display, printer, or other device. Either way, digital codes, analog signals, and conversions are involved.

There are two standardized digital codes in use in RTTY: Baudot (Murray) and ASCII—American Standard Code for Information Interchange. The Baudot code is the most common in terms of use. The Baudot code is a five-level code, and ASCII is a seven-level code. Allow me to explain what that means.

In the binary system there are only two states, represented by 0 and 1. The binary system is used extensively in digital communications. The two states can be represented by two different voltages, currents, or frequencies. In order to represent more than two different conditions using the binary system, bits must be combined to increase the number of possible conditions.

For example, one bit (**B**inary dig**IT**, a 0 or 1) is sufficient to indicate if a light is on or off. However, to represent more complex concepts such as the number system or alphabet, several bits are combined. If two bits are used, four different conditions can be indicated. Since the alphabet has 26 different characters, five bits must be combined for a total of 32 different possible characters.

The most common digital code in use in RTTY is the Baudot code, a five-level code. Each character is represented by a digital code five bits long. However, there are only 32 possible combinations using a five-level code. Therefore, the Baudot code includes two different character sets—figures and letters. The character sets are alternated as needed. The ASCII code is a seven-level code. Using seven bits, there are a total of 128 possible combinations. This eliminates the need for two different character sets.

Once these binary combinations are generated (whether by a mechanical teletype, microcomputer, or some other device) they are sent to a modem (**MO**dulator **DEM**odulator), often called a Terminal Unit. This device generates (modulates) tones (frequencies) which correspond to the state of each bit for transmission over an analog medium, such as a radio link. The two tones are given special names. The tone corresponding to the binary 1 is called the mark, and the tone corresponding to the binary 0 is called the space. This terminology dates back to the early days of telegraphy when an automatic receiving device would lower a pen on a strip chart when a signal was present, making a mark; of course, when there was no signal the pen would not touch the strip of paper and a space would result. These tones are then transmitted by a radio transmitter to the receiver(s), where the tones are converted back into digital signals (demodulated) by another modem.

Forms of frequency modulation include FSK (Frequency Shift Keying) and AFSK (Audio Frequency Shift Keying). The difference between the two has to do with the method used to transmit the generated signal. FSK is classified as direct modulation, and AFSK is classified as indirect modulation. In direct modulation the transmitter carrier frequency is shifted up and down to transmit the analog signal. In indirect modulation the transmitter's carrier remains stable while an external signal is superimposed upon the carrier. It is the external signal which is the modulation carrier, not the transmitter's carrier.

AFSK is usually easier to implement with modern transceivers, as all signal generation can be done externally of the transmitter. The audio signal can simply be fed into the transceiver's mic input. Since most transceivers do not include direct FSK ports, some modification is usually necessary to directly implement FSK. Regardless of whether the transmitter is AFSK or FSK controlled, the transmitted signal is the same.

The AEA PK-232 is representative of the current state-of-the-art multimode digital communications units. (Photo courtesy AEA)

Say You Saw It In CQ

In RTTY there are several standard speeds at which the digital signals are sent: 45, 50, 75, and 100 baud. A baud is usually the same as the number of bits sent per second. Forty-five baud is the most popular speed in use. ASCII RTTY is often sent at 110 or 300 baud.

Another RTTY variable is the shift. An audio frequency of 2125 Hz is traditionally used for the mark tone. The frequency of the space tone is dependent on the shift. The most common shift in use is 170 Hz, with a resulting space tone of 2295 Hz. Other common shifts are 425 Hz and 850 Hz. These are often used by commercial RTTY stations outside of the amateur bands. In conclusion, most HF amateur RTTY activity uses a 170 Hz shift and a 45 baud transmission speed.

Equipment

RTTY stations vary a great deal from user to user, so I'll simply mention a few currently available RTTY units. Most of the available units offer several digital modes in addition to RTTY, but all are capable of operating RTTY at several different shifts and speeds. Contact the manufacturers for more information on particular units. Also, look for older units such as the Kantronics Interface II and the AEA CP-1 at hamfests and in the classifieds in amateur radio magazines.

AEA's PK-232 is a multimode unit that operates Morse code, Baudot and ASCII RTTY, AMTOR, packet, and facsimile. The Kantronics KAM (Kantronics All Mode) is a similar unit offering the same modes. Both sell for around $300. I have had the opportunity to use both units and was pleased with the performance of each. Another multimode unit is the MFJ-1278. The 1278 operates Morse code (with a built-in memory keyer), Baudot and ASCII RTTY, packet, facsimile, and Slow Scan TV. The MFJ-1278 sells for around $250.

MFJ also offers three other RTTY units. The MFJ-1224 operates Morse code, Baudot and ASCII RTTY, and AMTOR; it sells for about $100. The MFJ-1229, billed as a "deluxe" computer interface, operates the same modes as the 1224 but sells for about $180 and includes a built-in tuning indicator. Finally, the MFJ-1225 is a receive-only unit that will decode Morse code, Baudot and ASCII RTTY, and AMTOR. The 1225 sells for about $70.

Of course, there are other units available. This section is meant to serve as a brief rundown of representative popular RTTY units. Be sure to shop carefully and compare features when buying an RTTY interface.

Operation

RTTY operation occurs on many HF amateur bands. Try tuning around 14.070 MHz to 14.100 MHz and 7.070 to 7.100 MHz. On 80 meters look around 3.660 MHz to 3.700 MHz. If you are using an SSB transmitter wired for AFSK, select the lower sideband for RTTY operation. Also, unless your transmitter is rated for continuous operation, reduce the power by 50% when transmitting often.

Conclusion

While RTTY is a comparatively old mode, it has continued to hold its own during the development and growth of other digital modes. This is testament to RTTY popularity and dependability. RTTY is an excellent HF digital mode. Even if you are a devoted packet, CW, or AMTOR operator, you certainly should give RTTY a try. And if you're not yet equipped for digital communications, I strongly urge you to do so. RTTY provides an excellent starting point. It is a lot of fun and allows you to experiment with the future of radio communications.

If you have any questions or comments, please write to me and enclose an SASE if you would like a reply. Alternately, you can reach me on CompuServe (User ID: 72276, 2276). CQ

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CIRCLE 90 ON READER SERVICE CARD

CQ REVIEWS:

The Optoelectronics 1300 H/A Frequency Counter

BY LEW McCOY*, W1ICP

Frequency counters have come a long, long way in recent years. I can remember building one that used small neon lamps for indicators, but at that it was the size of a small transceiver. The Optoelectronics Model 1300 H/A frequency counter is truly an amazing device, even in today's large market of amazing devices.

The 1300 is a handheld counter with 1 MHz to 1.3 GHz coverage with an accuracy of plus or minus one part per million. It weighs only 9 ounces and is powered with nickel-cadmium batteries (charger is included). The display consists of eight LED digits approximately ⅓ inch in height. The case is black aluminum and measures 3.9″ × 3.5″ × 1″.

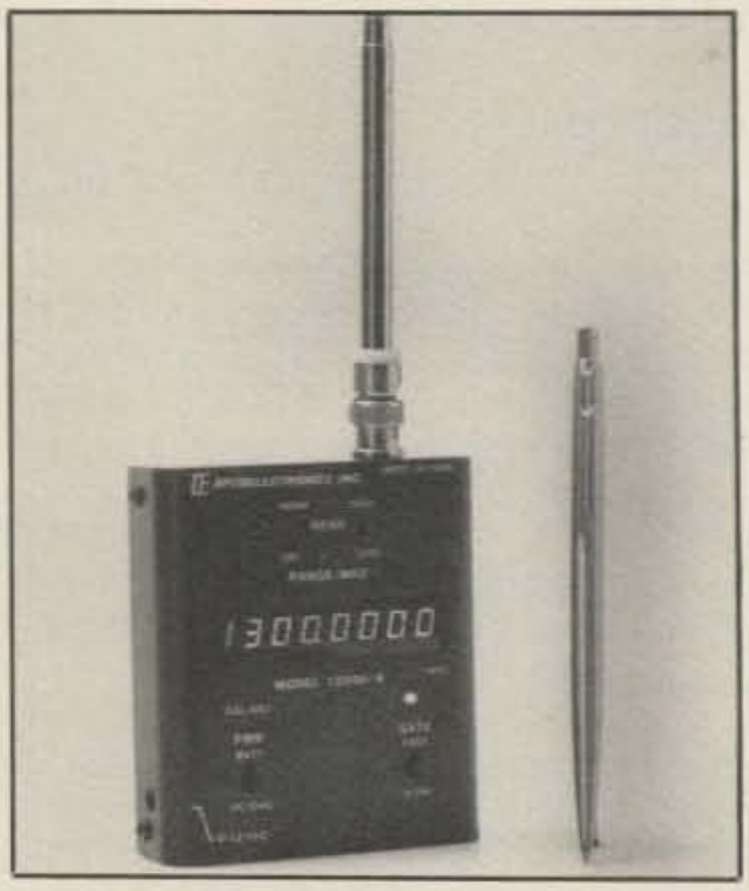
I had no sooner unpacked my 1300 when I was running around the house checking my wireless telephone, computers, plus the radio equipment in the shack. Fig. 1 is a chart that shows typical sensitivity for various pieces of gear. I found that I could lock on to my 2 meter rig from over 60 feet away and the same with my 450 MHz handheld using only 1 watt.

One use for the frequency counter, aside from its normal function of checking frequencies or troubleshooting, is to detect bugs or listening devices. I understand that some government agencies have been known to use the Model 1300 with great success in detecting bugs. I found one unusual use in that I suspected a neighbor of causing Channel 2 TVI from CB operation, which he denied. The counter quickly showed his transmitting frequency as I walked by his house!

The rated or typical sensitivity is shown in the graph in fig. 2. Normally you would not expect high sensitivity in a hand-held counter, particularly one as low-cost as the Model 1300. If you should look at test instruments in your electronic catalogs, a sensitivity rating of 10 millivolts is considered good (and such test instruments cost many dollars). The 1300 H/A uses a miniature surface-mount wide-band amplifier with great effectiveness. Note in the graph that typically sensitivity is well below 1 millivolt from 27 to 450 MHz.

There is a front-panel switch that can be used to place the counter in a **Norm** or **High** sensitivity position. Another switch is used to switch to two frequency ranges. The first is from 10 to 500 MHz with optimum sensitivity, and the second takes you to 1300 MHz (this overlaps down to 20 MHz). There are two gate positions. The first is **Slow**, 2.5 seconds sample time, which displays 100 Hz resolution. The second is **Fast**, 0.25 seconds, and the resolution is 1000 Hz.

The unit is supplied with a carrying case, plus charger and a telescoping an-



The Optoelectronics Model 1300 H/A frequency counter.

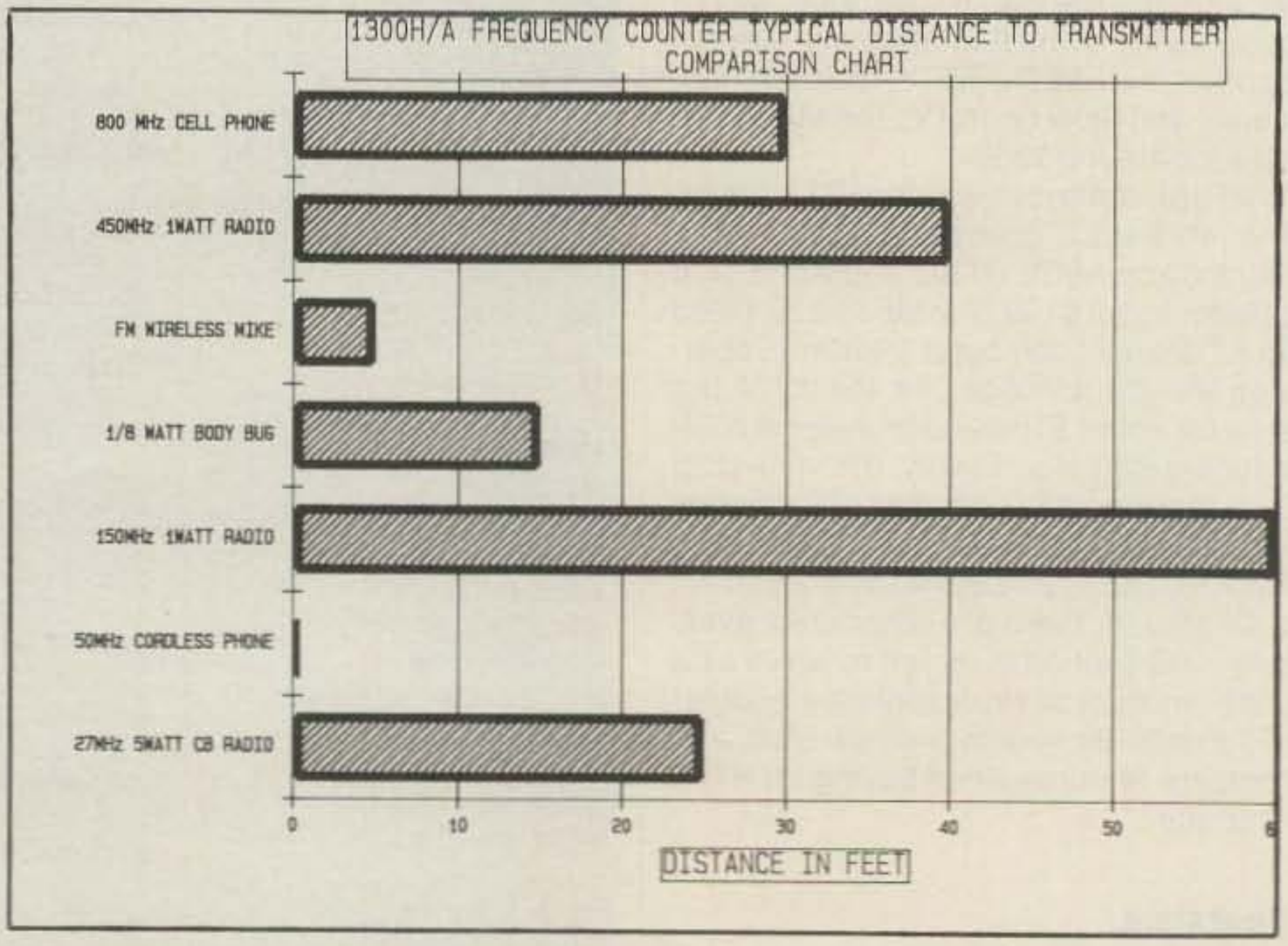


Fig. 1– This graph shows the average detection and locking range for various types of transmitters. I tested all but the "body bug" and found that my unit exceeded these specs.

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

Say You Saw It In CQ

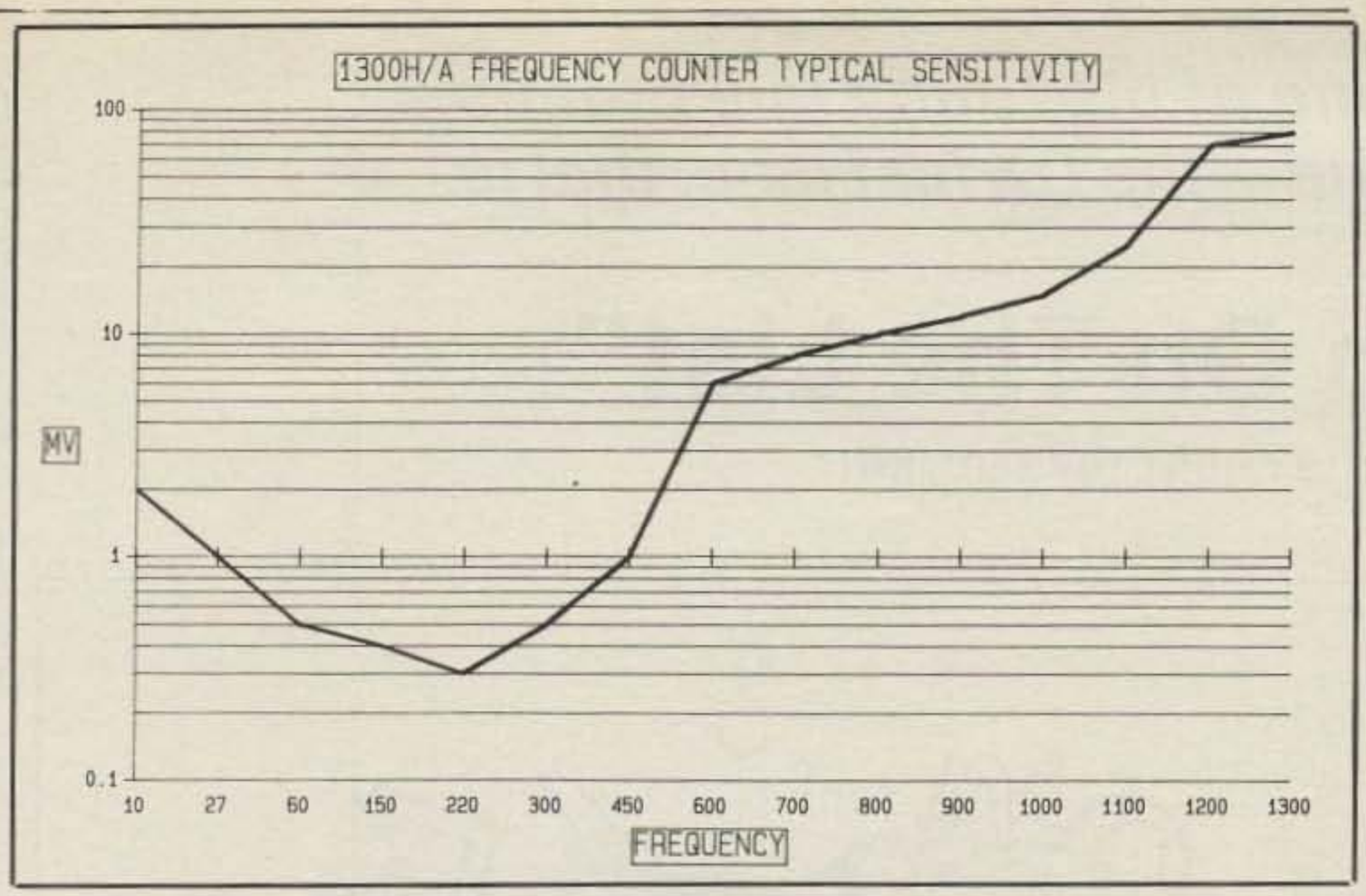


Fig. 2– Graph showing sensitivity versus frequency.

tenna with swivel base. Also available are a direct probe with BNC connector (P-100, $20) and a low-pass probe which attenuates RF noise from audio frequencies (P-101, $20).

My personal observation is that it is a real pleasure to use the Model 1300 simply because it is in a very handy form, it is extremely accurate, and it has more than enough sensitivity. The Model 1300 H/A is priced at $169.95 and is available from Optoelectronics Inc., 5821 N.E. 14th Ave., Fort Lauderdale, FL 33334 (305-771-2050 or 1-800-327-5912).

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CIRCLE 136 ON READER SERVICE CARD

K0HT spins another one of his funny tales for us about life in the fast lane—the DX fast lane, that is.

"I'm On The List"

BY HUNT TURNER*, K0HT

"Whazzat you say? . . . Oh yea, I'm a DXer . . . Big gun? . . . Well, if I were Clint Eastwood, my first picure would be *A Fist Full of Change*. Does that answer your question? It gets downright humiliatin' walkin' around Visalia with no lapel pin.

"Bulletins? . . . Oh, I take all the buzz rags: *Solar Flux Journal, Yasme Times, Slim Pickin's*. You name it. I take it.

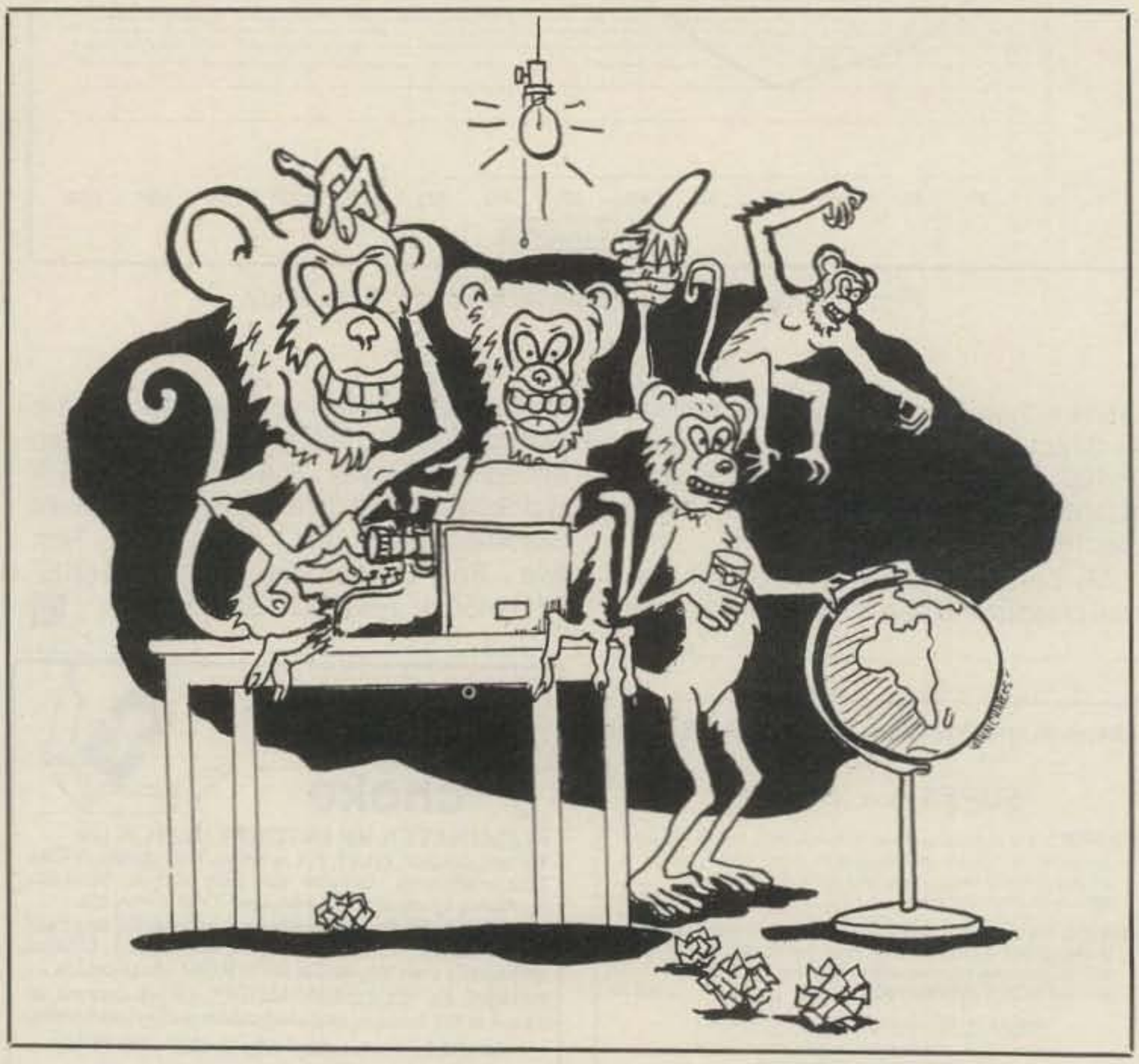
"Scuse me a minute . . . Tips on two say there's something goin' down on The Reliable Rumor Net 14.151. I tried to check in there once but I was driftin' too much. Seems that Mickey Finn, OH0MF, has it straight from the horse's mouth that there's some geothermal activity 226 miles off the coast of Iceland and they wanna be there when the lava cools. QSLs have already been printed.

"I worked old Mick once ya know . . . Yea, I really did. He was somewhere real rare, too, but I never did get his callsign . . . Seems no one else did either, but I'm sure it was a new one.

"Whazzat? . . . The wife's car? . . . Oh yea, we got rid of it. They were askin' for donations to buy that Frenchman down in the Indian Ocean some new equipment. Thanks to me an' some others he was able to purchase an abandoned naval shore station and a small nuclear power facility. He was on last week for about a half hour givin' out contacts. Maybe I'll get him when the K drops a little.

"Whazzat? . . . How are my totals? . . . Oh I'm doin' lots better now that the wife and kids are gone . . . Oh, yea! She went back to her mother when I sold her car to make that donation. I told her I'd get her something with an engine in it just as soon as I dumped that sweep tube linear I have listed in the yellow sheets. You remember that linear, don't you? . . . Sure you do. It's the one I heated the house with that winter when the propane trucks couldn't run 'cause their transmission fluids were congealed. Remember? That was the same winter I burned out the rotator tryin' to DF the woodpecker on 80.

"Scuze me. It's time for the Beehive Net. Great net, lotsa DX checkin' in. I worked Canada on there last year. Still waitin' on the card, though. I'm sure I'll get it. Sent him an SAE and three IRCs. I worked a rare one there, too! Yea! Some country with no vowels in the spelling. Skeptics claimed it was invented by monkeys at a typewriter. I got the card, but it won't count until the controversy is cleared up. Seems they can't prove it *wasn't* monkeys at a typewriter.



"Seems they can't prove it wasn't monkeys at a typewriter."

"Did you hear that? . . . The Finn's trip is off. Bilge pump problems. It must be true. Someone intercepted a scrambled telephone message between him and his manager just hours ago. Better get on two and spread the word . . . Attention, attention . . . The Finn is finished, swamped bilge, returning to port, details at seven. KERCHUNK.

"Whazzat? . . . The twitch? . . . Yes, it's better since I traded that 2 Hz CW filter for the Cray. Plan to automate the station as soon as the software is available. Ole Bill told me his PC has just about put him on the Honor Roll with that new FOTPLOT-BEAMSWINGWRKNLOGUM™ program. Said he hasn't been in the shack in over two years. Just waits for the cards now. Though he tells me Vaporware, Inc. has just about perfected its BOXWATCH™ program.

"Listen to that roar, will ya. Must be the qwerp from Kathmandu running 5 watts to a log periodic. They say he's out there but nobody's heard him yet. Rumor has it he's listening every day at this time. Now *that's* a rare one! 'Scuze me. Think I'll dump my call in with the rest. 9N1QRP, 9N1QRP, W0XYZ, W0XYZ for a new one, over. Boy, I sure needed that one bad! Ah, he'll be back. There's a rumor floatin' that he might make an appearance on the Fish In The Barrel Net next week sometime on 14.165. I know I'm only a General,

---

**306 West First St., Summerville, GA 30747*

The artwork was done by Hunt's brother, John Charles Turner.

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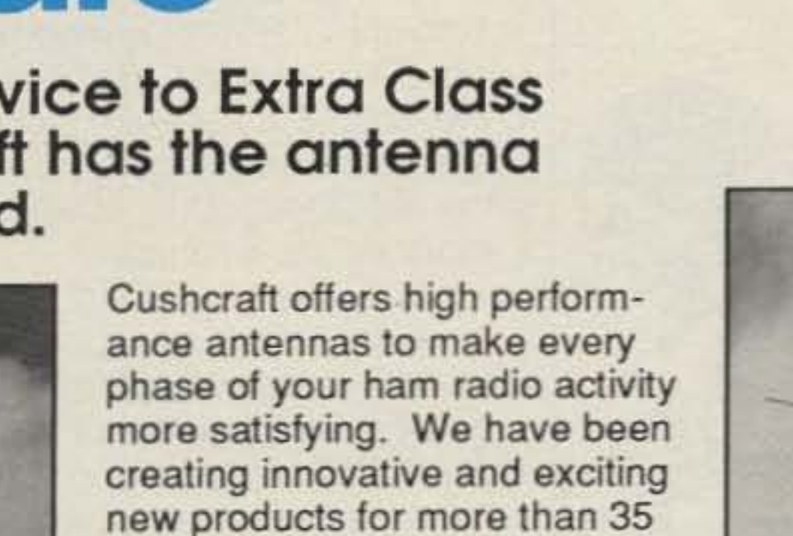

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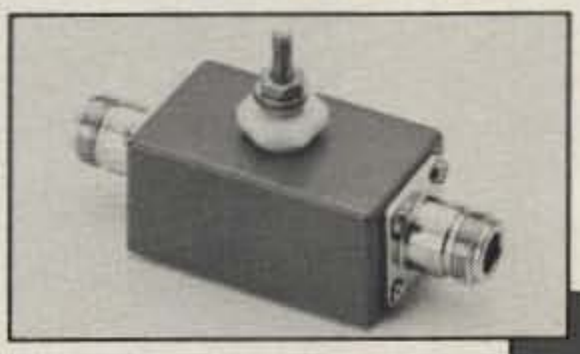

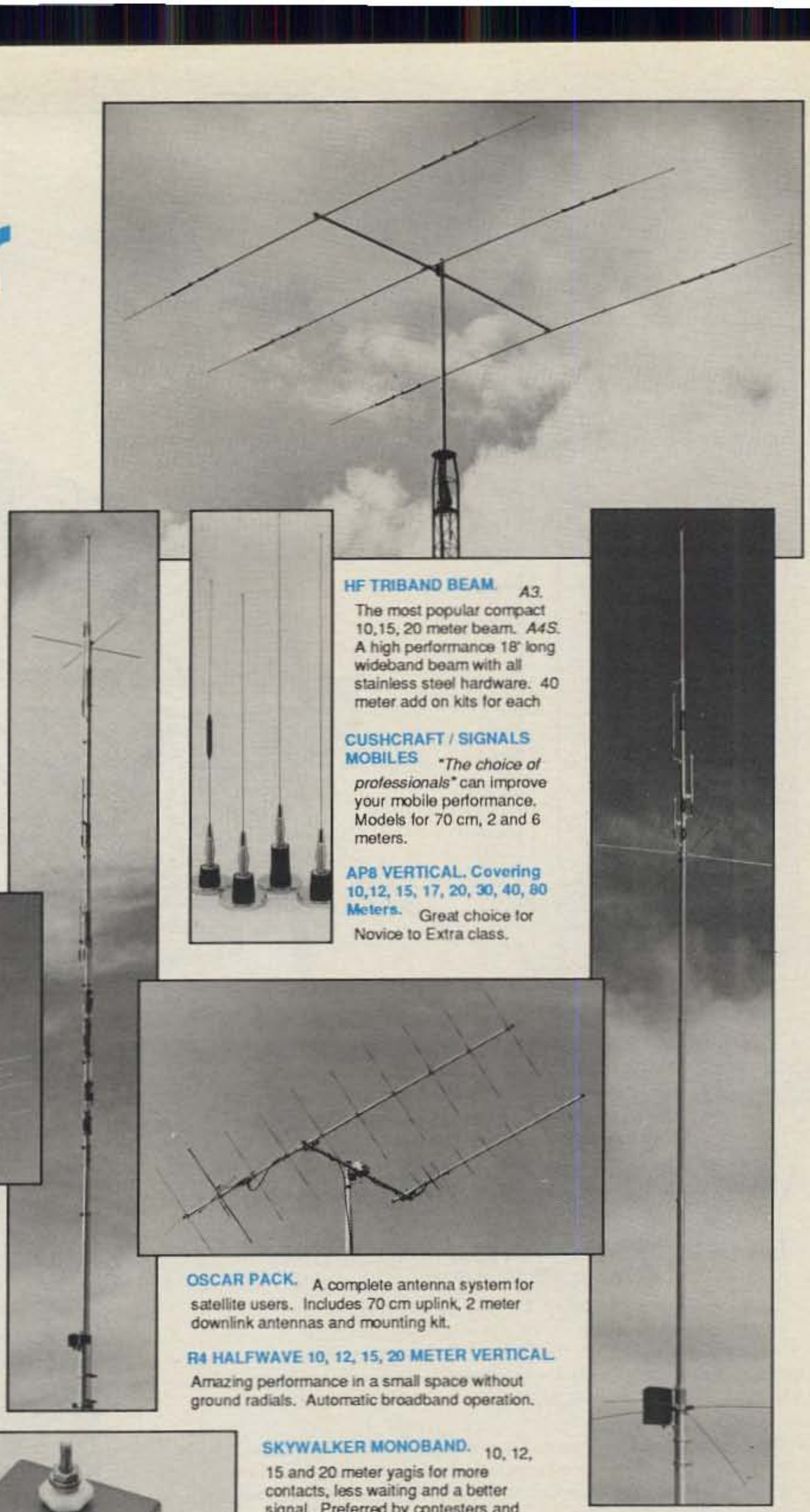

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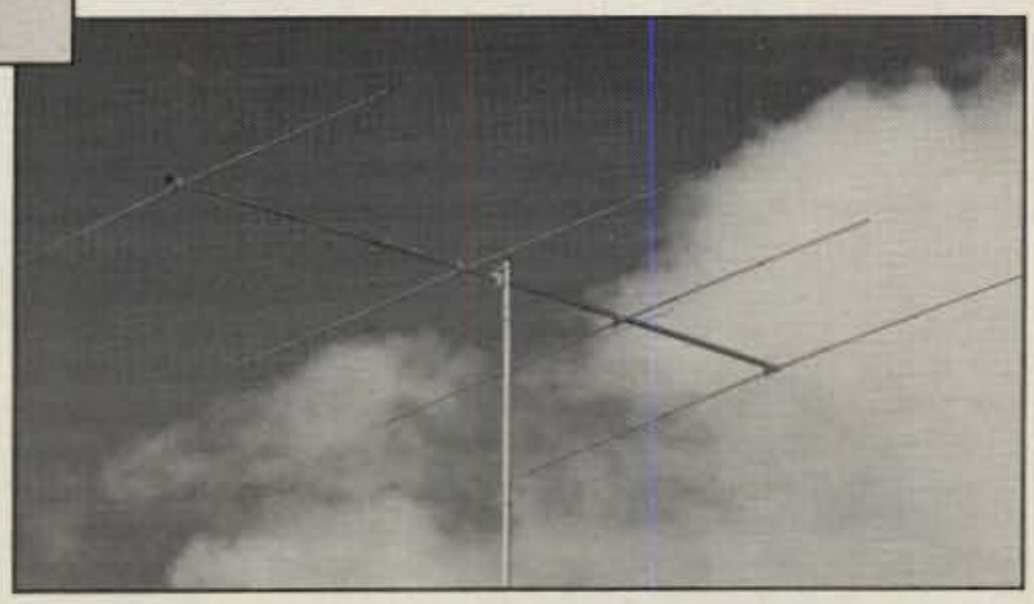

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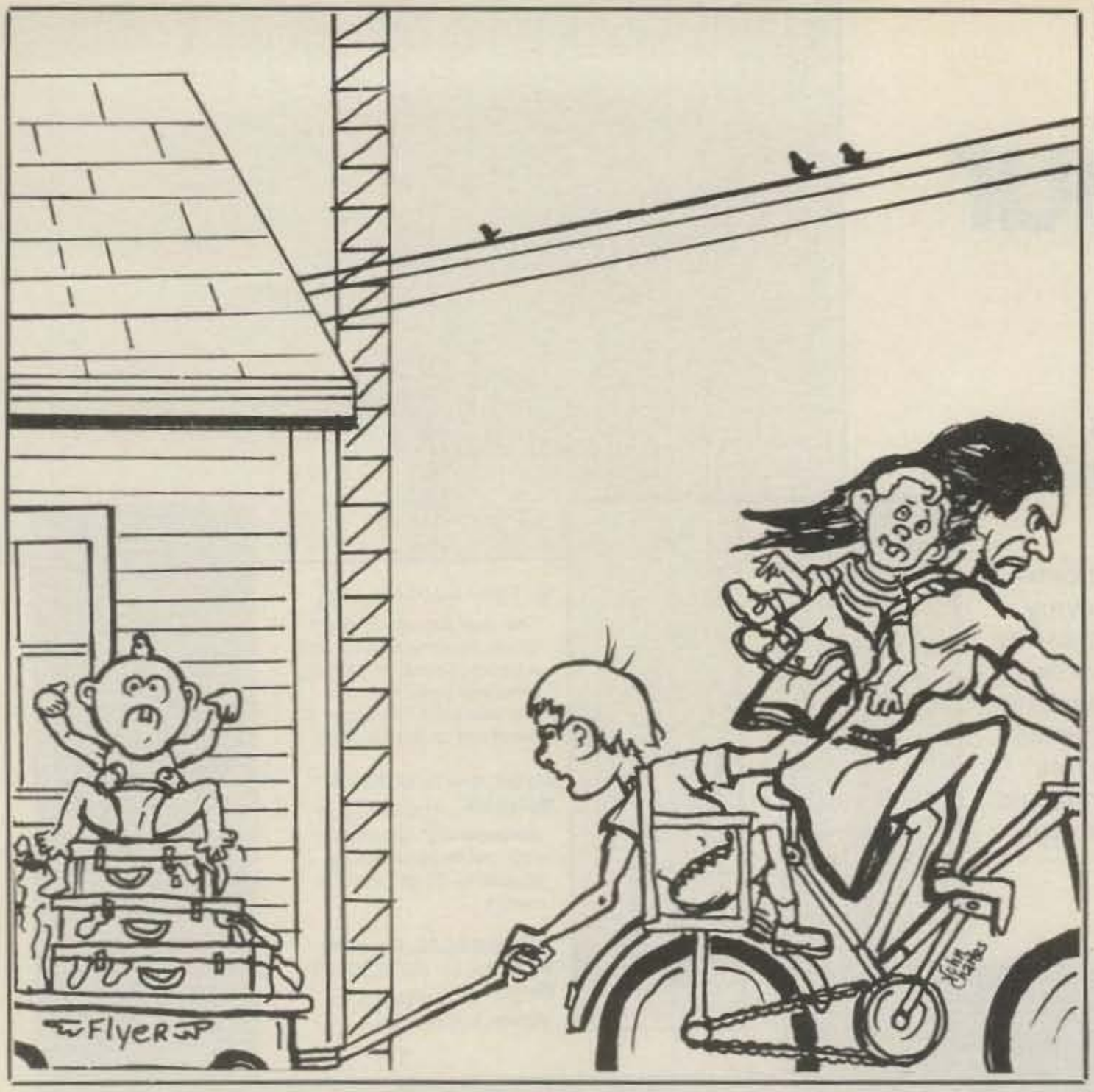

"I told her I'd get her something with a motor on it as soon as I dump that linear."

but I'll be in and out before they even know I'm there.

"I'm a sniper at heart. That's the only real way to work em, ya know. I got Costa Rica once. He was on 14.0249 an' I just twitched the XIT a little an' I was back in the ghetto above 025 before you could say South Sandwich Islands. Ya gotta be sneaky in this DX game. It ain't like it used to be in the old days when a Slim with a good name and a pretty card counted for somethin'. Now it's mostly heckle and hide for a lot of the big boys. It's lonely at the top and some like it that way; stacked monobanders banging away with 5 KW at the list takers. They say it makes it a lot more fair for all of us.

"Whazzat? . . . You got Bouvet on 80? . . . Well, it don't count for nothin' without the old card, ya know? And even then it may not be a *counter* until they send in a soil sample. Looks like you've reached the worry-later stage. To quote the inimitable bard:

'I've worked the rare ones many times.
I've also QSLed 'em.
My long lost cards came back to me.
They also QS seldom.'

"Whazzat? . . . Nah, I'm not down in the mouth. I'm glad you got him. Not bad for a Novice. You'll make a real DXer some day, and you can quote me on that. Meanwhile I've got to get down to the Quick Quarry Net. There's a real rare one comin' up and I'm on the list." CQ

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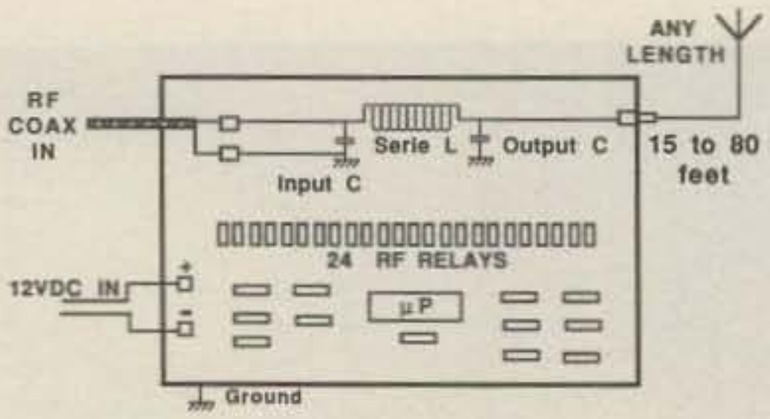

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With **three continuously** variable components -- two massive 6 KV capacitors and a high inductance roller inductor -- you get precise control over SWR **and** the widest matching range possible from 1.8-30 MHz.

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

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

MFJ-989C **$349.95**

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

Its compact 10¾x4½x15 inch cabinet slides right into your station.

The MFJ-989C is not for everyone.

However, if you do make the investment, you'll get the finest 3 KW tuner money can buy -- one that will give you a lifetime of use, one that takes the fear out of high power operation and one that lets you get your SWR down to absolute minimum.

MFJ's *Best* VERSA TUNER II

MFJ-949C **$139.95**

The MFJ-949C gives you more precise matches than any tuner that uses two tapped inducters. Why? Because you get two **continuously** variable capacitors that give you infinitely more positions than the **limited** number on switched coils.

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

You also get a dual range lighted Cross-Needle SWR/Wattmeter, 6-position antenna switch, 50 ohm 300 watt dummy load, balun for balanced lines and continuous 1.8-30 MHz coverage -- all in a compact 10x3x7 inch cabinet that fits right into your station.

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

MFJ's *smallest* VERSA TUNER

MFJ-901B **$59.95**

The MFJ-901B is our smallest -- 5x2x6 inches -- and most affordable) 200 watt PEP Versa tuner -- when both your space **and** your budget is limited. Matches dipoles, vees, random wires, verticals, mobile whips, beams, balanced and coax lines continuously 1.8-30 MHz. Excellent for matching solid state rigs to linears. Efficient airwound inductor. 4:1 balun for balanced lines.

144/220 MHz *VHF* TUNERS

MFJ-920 **$49.95**

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MFJ's newest VHF tuners cover both 2 Meters and the new Novice 220 MHz bands. They handle 300 watts PEP and match a wide range of impedances for coax fed antennas. MFJ-921 has SWR/Wattmeter.

MFJ's *Fastest Selling* TUNER

MFJ-941D **$99.95**

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

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

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

MFJ's *Mobile* TUNER

MFJ-945C **$79.95**

Don't leave home without this **mobile** tuner! Have an uninterrupted trip as the MFJ-945C **extends your antenna bandwidth** and eliminates the need to stop, go outside and readjust your mobile whip.

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

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

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Has 6-position **ceramic** antenna switch and a teflon wound two-core balun with ceramic feedthru insulators for balanced lines. 10¾x4½x14 7/8 in.

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MFJ-16010 **$39.95**

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

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

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The best of all CW worlds - a deluxe MFJ Keyer using a Curtis 8044ABM chip in a compact configuration that fits right on the Bencher iambic paddle!

This MFJ Keyer is small in size but big in features. It features iambic keying, adjustable weight and tone and has front panel volume and speed controls (8-50 WPM), dot-dash memories, speaker, sidetone and push button selection of semi-automatic/tune or automatic modes. It's also totally RF proof and has ultra-reliable solid state outputs that key both tube and solid state rigs. Uses 9 V battery or 110 VAC with MFJ-1305, $9.95.

The keyer mounts on a Bencher paddle to form a small (4 1/8 x 2 5/8 x 5½ inches) attractive combination that is a pleasure to look at and use.

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MFJ's best selling TUNER

MFJ-941D **$99.95**

The MFJ-941D is MFJ's best selling (and probably the world's best selling) 300 W PEP antenna tuner! Why? Because it has more features than tuners costing much more and matches everything from 1.8 to 30 MHz for your solid state or tube rig: dipoles, inverted vees, random wires, verticals, mobile whips, beams, balanced and coax lines.

New dual-range SWR wattmeter reads forward and reflected power in both 30 and 300 watt ranges. Convenient **front-panel mounted** 6-position antenna switch lets you select 2 coax lines, direct or through tuner, random wire/balanced line or tuner bypass for dummy load. New, larger, more efficient airwound inductor gives lower losses and more watts out. **Plus** . . . built-in 4:1 balun for balanced lines. 1000 V capacitor spacing, brushed aluminum front panel on all-metal cabinet. 11x3x7 inches.

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$59.95 MFJ-901B

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A new Kiss interface makes the MFJ-1278 TCP/IP compatible.

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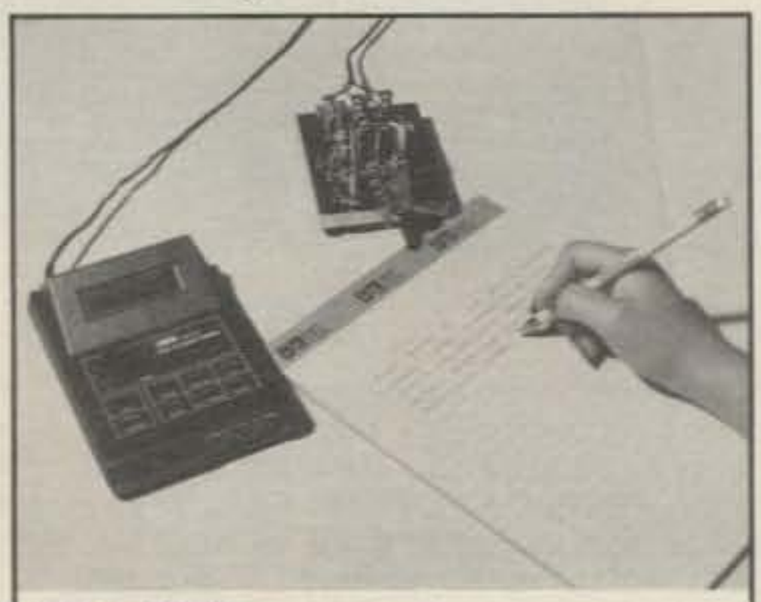

TRAINER

Code generator	• Random code generator 5 characters/code group
Speed	• 5 WPM to 30 WPM 1 WPM increment

ELECTRONIC KEYER

Paddle input	• TTL level —LO/Actuating, HI/Stop Contact input —ON/Actuating, OFF/Stop
Key input	• TTL level —LO/Mark, HI/Space Contact input —ON/Mark, OFF/Space
Keying speed	• 5 WPM to 30 WPM 1 WPM increment
Keyer output	• Transistor switching, Open collector type

SPECIFICATIONS

Model	• AR-501 Radio telegraph terminal
Power source	• DC 12V to 13.8V—165mA
Size	• 4.5"-W x 2.24"-H x 6.25"-D
Weight	• 12.5 oz. (358 g)
Controls	• Power On/Off • Random code generator On/Off • Print-out On/Off • Monitor speaker level • Electronic keyer mode select • Speed Up & Down
Display	• LCD 32 characters—16 per line
Indicators	• Power On—Green LED • Tuning—Red LED
Front connections	• Paddle—Standard/Iambic • Ordinary telegraphic key • Headphone/Earphone
Rear connections	• DC 13.8V input • Audio input • External speaker • Keyer output • Printer output

PRINTER PORT

• Compatible with Centronics 8-bit parallel printer. At least 4K byte data buffer is required in a printer.

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The AR-501, triple mode CW terminal in a small package, is a powerful gear to practice and play with. For the Novice, SWL and Amateur radio operators it detects Morse code between 5 to 30WPM. Just plug the AR-501 to your receiver to start translating the Morse code onto full 32 character LCD display. Very simple and easy to operate. You ask; for code practice?, both receive and transmit? Yes, the AR-501 does just that. It will improve your cord reception and keying technique at the speed you want. More?. it operates as an electronic keyer both standard and iambic. More Yet? How about a printer port? You bet, the AR-501 provides parallel printer port for hard copy. You can Log the QSO, and Practice. It will help you immeasureably. We even offer a standalone Nicad operated thermal printer as an option. **ACCESSORIES SUPPLIED:** The AR-501 Radio telegraph terminal comes complete with Receiver cable, DC Power cable, Miniature Phone plug, Miniature stereo phone plug, Spare fuse, Wall receptacle style power adaptor and Instruction manual. **ACCESSORIES AVAILABLE:** CC-501 Parallel printer cable — **$30.00**/DPU-411 Standalone Thermal printer with 8K buffer.—**$235.00**

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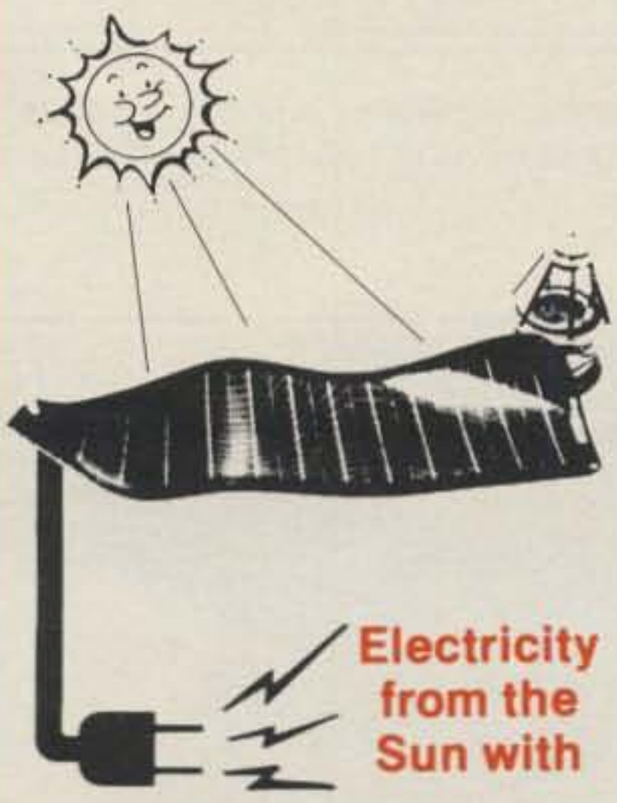

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Morse code has been used in a variety of ways over the years, not just as a test for an amateur license.

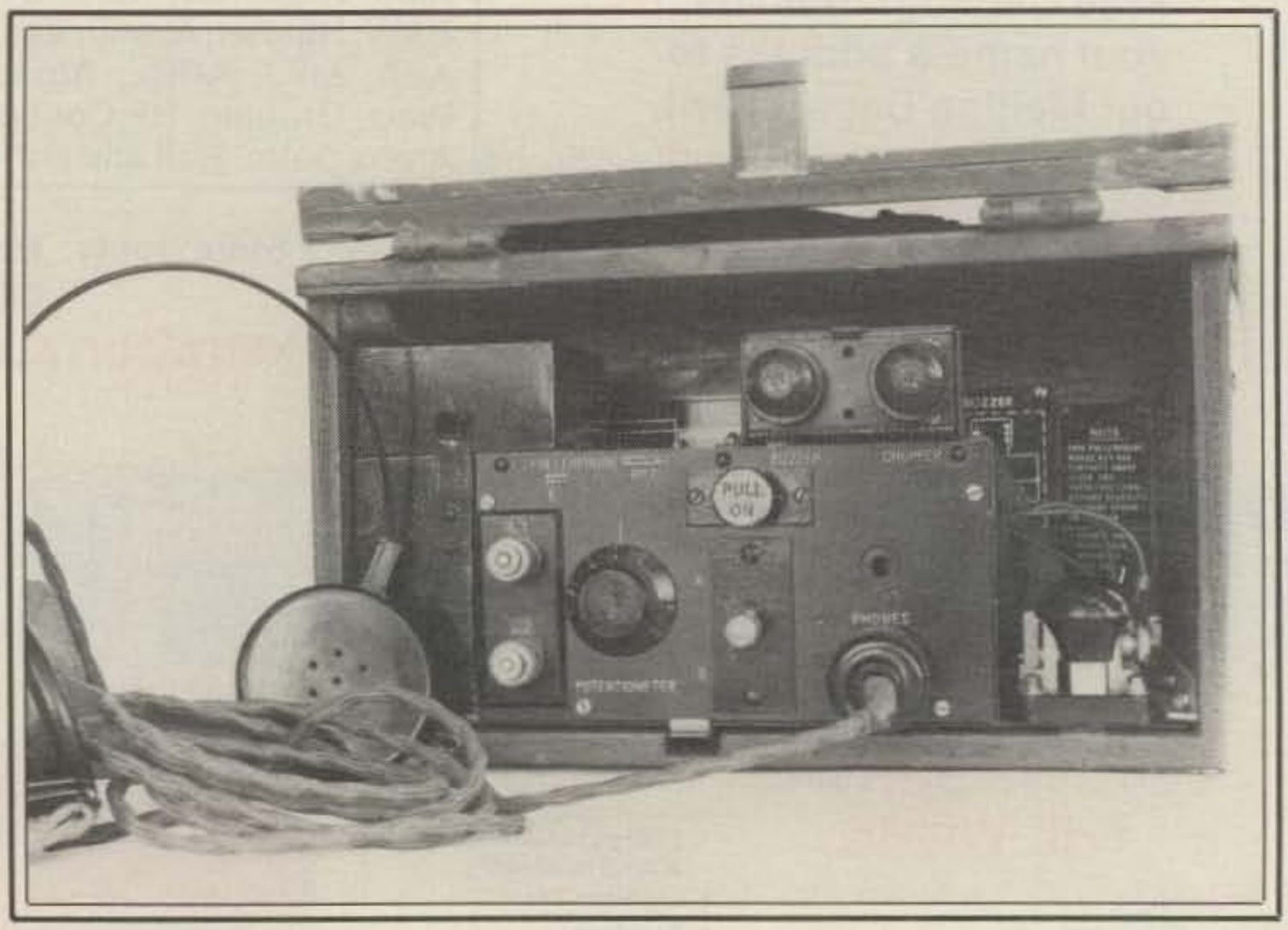
It's All Morse!

BY LEWIS COE*, W9CNY

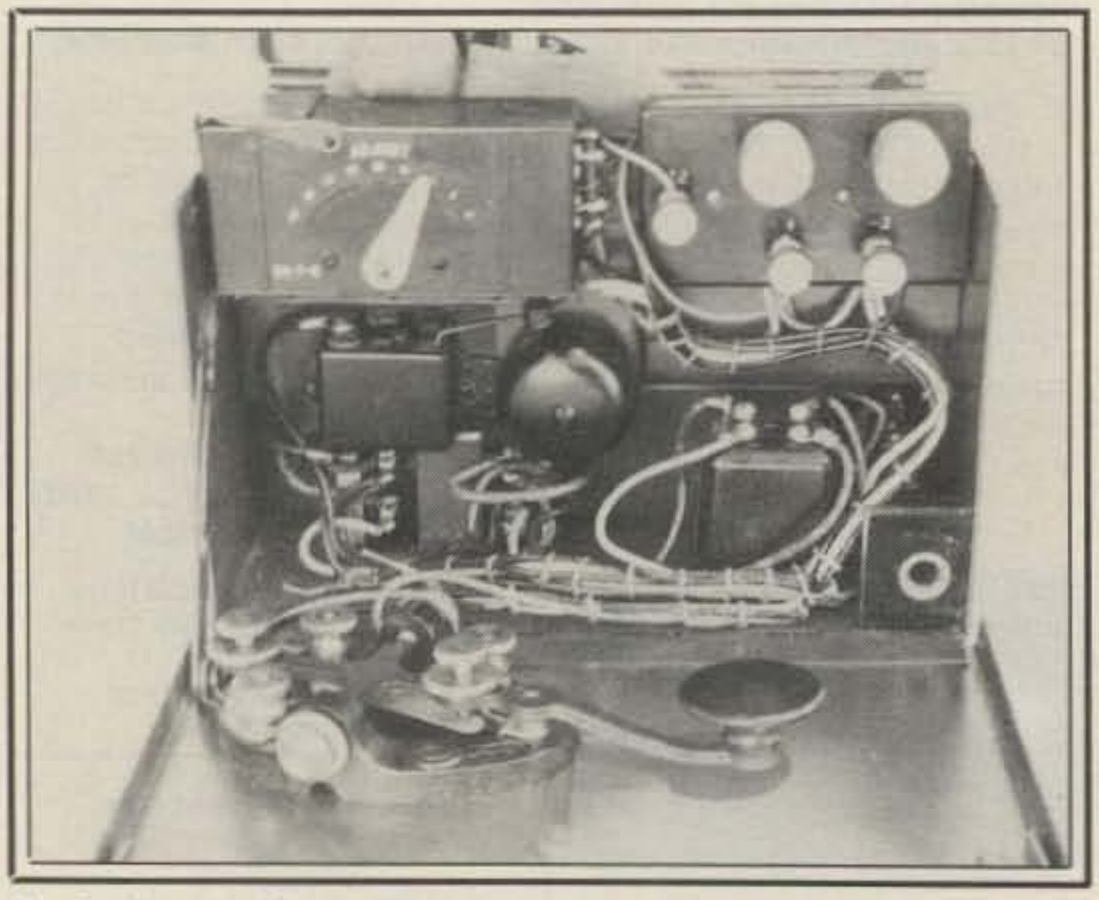
Samuel Finley Breese Morse is an impressive name. In giving a name like that to their child, his parents obviously had great hopes for their offspring. Struggling through much adversity in early life, Morse (1791–1872) eventually became famous enough to gratify any parent.

Morse first became a successful portrait painter, and in this field alone his reputation would have been assured. Morse's paintings today are among the most valuable artworks around. When his "The Gallery of the Louvre" changed hands in 1982, the price was a cool 3.25 million. At the time the buyer, Daniel J. Terra of Evanston, Illinois, said the price might have gone higher except for a stipulation by the seller that the painting remain in the United States and be kept on public exhibition. The Louvre painting, done in 1831–1833, was Morse's last great painting. The artist was disappointed at the lukewarm reception it received

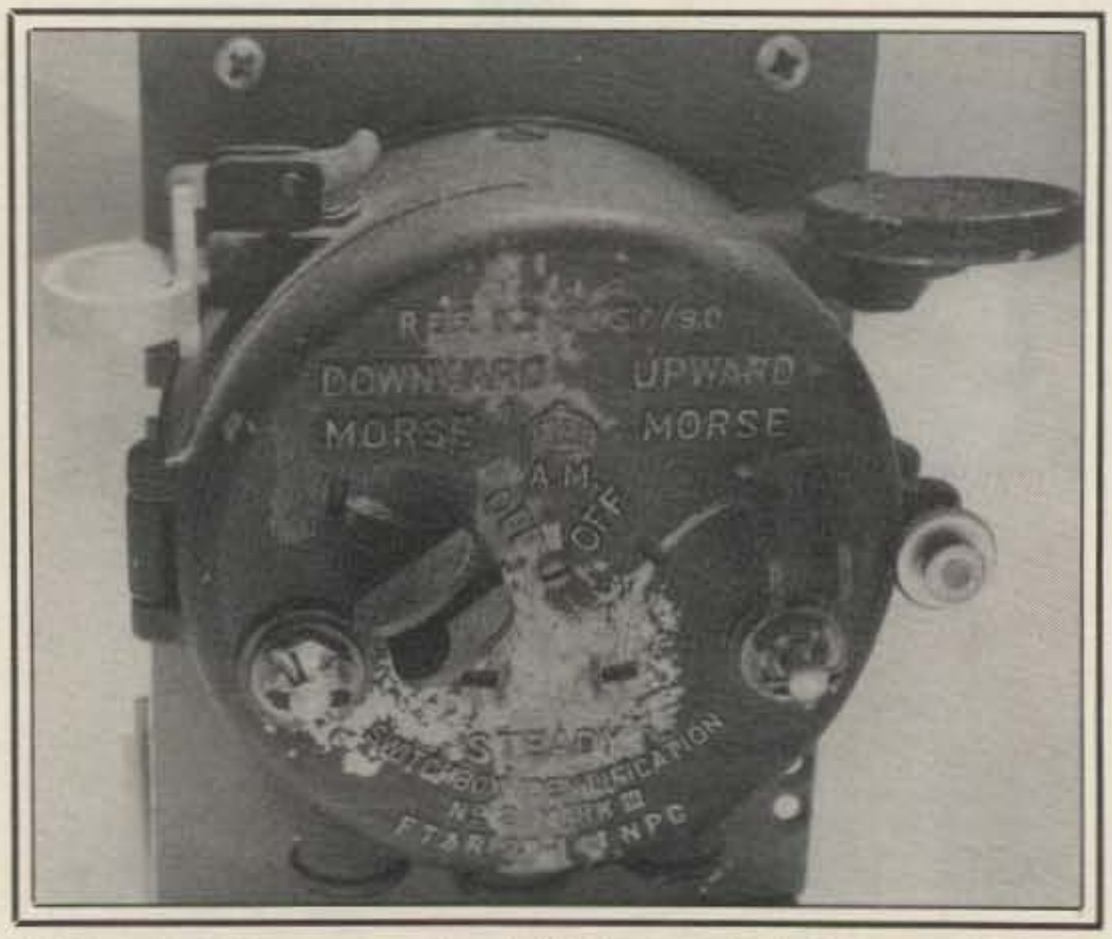
*115 East 113th Ave., Crown Point, IN 46307



Fullerphone was a versatile Morse code signaling instrument for use on wire lines. It would operate on as little as 2.5 microamperes line current. (All photos by Lewis Coe.)



U. S. Signal Corps Telegraph Set TG-5-B, a very compact Morse instrument of WW II. It was used for the same purposes as the British Fullerphone, but the circuit design was entirely different.



Blinker light key as used on WW II aircraft. Selector switch enables Morse signals to be sent either upwards or downwards from the aircraft.

Say You Saw It In CQ

Canadian Mark V heliograph was used in the Canadian army until 1941. It is keyed by mirror deflection and can easily cover ranges of 25 miles in suitable terrain.

from the public, and this is thought to be the reason why Morse thereafter devoted his energy entirely to the telegraph.

Today Morse is generally credited with being the originator of the dot-dash alphabet. However, there had been proposals for telegraph codes as far back at 1787. In 1836 Steinheil of Germany devised a dot-dash alphabet. It was the same Steinheil who first discovered the conductivity of the earth. Morse later discovered the same principle by accident, and the single wire, ground return circuit became standard in the telegraph industry. Morse's first telegraphic code using dots and dashes to directly represent the alphabet appeared in 1838. A revised version in 1844 became the standard landline telegraph code in North America.

The original Morse equipment recorded the dots and dashes on paper tape. This explains the spaced dots and different length dashes that appear so illogical to present-day radio operators. By 1850 operators had become accustomed to the clicking of the recorder mechanism and discovered they could read the messages directly by sound. The old registers were soon discarded, and sound reading became the normal method of operation. Sound reading removed the speed constraints of the register, and traffic could speed along the wire at 35 to 40 wpm on the busy circuits. The versatility of the simple key and sounder equipment plus the phenomenal skill of the operators enabled the Morse telegraph to endure for over 100 years before it was replaced by newer technology.

The actual origin of the alphabet we now call "Morse code" has always been a subject of conjecture. Morse generally gets the credit, yet there are others who persist in the claim that it was Alfred Vail, Morse's faithful assistant, who really authored the code. Vail himself never claimed credit, but in 1911 his grandson had Vail's tombstone in the Morristown, New Jersey churchyard inscribed as follows: "Inventor of the telegraph dot and dash alphabet."

The International, or Continental, code now used in radio was first adopted at a European conference in 1850. Submarine telegraph cables were coming into use, and the time lag inherent in such cables gave a sluggish keying characteristic that was not well adapted to the original Morse code with its spaced dots. The present Continental code is the same as the 1850 version except for minor revisions of punctuation symbols that were made at the radio conference of 1938 in Cairo, Egypt. Except for North America, where the original Morse code remained in use on land telegraph lines, Continental code became the standard code for

Grimes aircraft signal light has sights and a trigger for keying and can be used to send Morse light signals.

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telegraph, cable, radio, and all types of visual signaling.

The American Morse code has some inconsistencies that seem strange today, yet they never caused any problems. For example, few Morse operators ever learned to send exactly 6 dots for the numeral "6." It seems that most of us find it easy to send 5 dots for a "5" but "6" was always a problem. It was solved by simply sending a string of dots, 6 or more, to represent the numeral "6." The original Morse symbol for the numeral zero was a long dash, but there was already a dash for a "T" and a longer one for an "L," so how long was a dash for zero? No way could anybody handle that, so numeral zero was always sent as "dit-dit," just the same as letter "O," and it worked fine. Morse telegraphers, being human, made a mistake now and then, but few were due to the inconsistencies of the code. American Morse, with its dot letters, was faster to send; it has been estimated that a given message could be sent in American Morse in about 25% less time than the same message in Continental.

After its use in telegraphy and before the invention of radio, the Continental version of the Morse alphabet was found to be just what was needed for visual communications using light beams. One of the earliest devices and one that became very important was the heliograph, which used the reflected rays of the sun.

Invented around 1865 by a British officer, the heliograph was first used by the British army in India and Afghanistan. The first heliographs in the United States were obtained from the British in 1877 and used by General Nelson Miles in Montana. Later Miles used the heliograph extensively in Arizona and New Mexico during the Indian campaigns of the 1880s. The last major use of the heliograph was during the Boer war in South Africa, where both sides used it. Using the reflected rays of the sun, keyed either by mirror deflection or a shutter, the heliograph sent the most powerful visual signal known. In suitable terrain it could cover ranges up to 100 miles and operate at speeds of 10 or 12 words per minute.

The U.S. Signal Corps augmented the heliograph with an acetylene lantern for night signaling. Using carbide and water to generate the gas, the lantern fitted the same tripod as the heliograph. Morse keying was accomplished by a key-operated gas valve that gave a bright flame for key down and a weak flame for key up. Also, the lantern could be turned up to full brightness and the heliograph shutter used to send Morse.

By the late 19th century, as electricity and incandescent lamps became available on ships, Morse was widely used for signaling with masthead blinker lights and searchlights fitted with shutters. The searchlights could even work a little over-the-horizon DX if a convenient low-hanging cloud was present that could be illuminated by the light beam. Blinkers and searchlights are still an important part of naval communications, as they can be used for short-range work without breaking radio silence.

A clever device for Morse signaling over wire lines was the British "Fullerphone" of World War I and II. The operator of a Fullerphone sent and received tone signals so that any radio operator was at home with it. However, the signal going out on the line was a very weak DC signal that could not readily be intercepted by the enemy. Operating with as little as 2.5 micro-amperes of line current, the Fullerphone would work over lines in marginal condition and also could be superimposed on a working telephone line without interference to the voice signals.

The U. S. Signal Corps also had a tone signaling set that was used in the same way as the Fullerphone. Called a "Telegraph Set TG-5-B," it was housed in a small metal cabinet about the size of a 4" × 6" file card box.

It is very probable that Morse code will eventually be completely phased out of commercial and military service. It is, of course, still the basic mode in the maritime service and is used for a wide variety of ID purposes in repeaters, aircraft navigation beacons, and marine radio beacons. CQ



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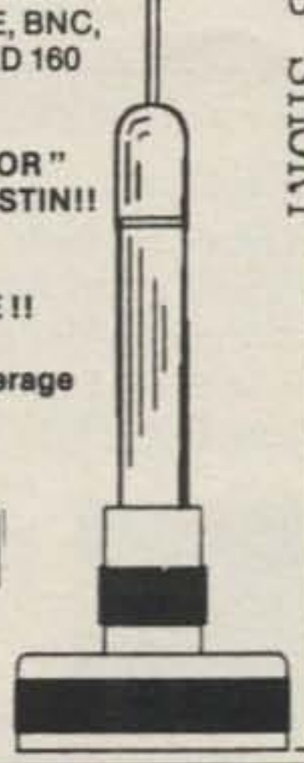

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Here's a simple modification that will improve the operating flexibility of your Kenwood TS-930S.

How To Add A Variable Power Control To The Kenwood TS-930S

BY MARV GONSIOR*, W6FR

Among the nice features of the TS-940S is the front-panel variable power *with ALC* at all levels. As a convenience, and for operators using some of the newer linear amplifier tubes, this is a significant safety feature, preventing excessive grid dissipation or overdrive which would result in distortion. For a few cents and less than an hour's work, the modification described here will approximately provide the same flexibility in the TS-930S without drilling any holes, altering any connections, or affecting the operation of the radio in any manner.

The Requirements

The following are needed to complete the modification:

One piece of phenolic rod approximately 1⅛ inch (29 mm) long by ¼ inch (6.25 mm) in diameter.

One small knob to fit the above.

Two rubber feet which are 1½ inches (37.5 mm) long to extend the existing two front feet.

A small amount of 5-minute epoxy cement.

Three inches (75 mm) of 5/16 inch (8 mm) shrink tubing.

The Procedure

1. Square one end of the rod and lightly sand it for adhesion. Shrink the two layers of tubing to the rod (see fig. 1).

2. Locate R8 on the signal board by referring to the factory service manual or to fig. 2. Kenwood has conveniently cut an access hole, for adjustment, directly above this hole. Using a flashlight, verify that it is centered on R8.

3. Remove the top and bottom covers of the radio.

4. Lightly abraid the top of R8 for adhesion.

5. Place the radio on a level surface and epoxy the squared end of the rod to the center of R8, allowing it to cure in about 30 minutes. Although it is called "5-minute" epoxy, it actually doesn't reach its full cure strength for about 30 minutes, depending upon the ambient temperature. Be certain that the rod is well centered and vertical, as initially the epoxy sets up rather quickly.

6. Replace the bottom cover by gently slipping it over the rod which will protrude outside by the dimension of the inset of the knob which was chosen.

7. The rubber-foot extenders are now

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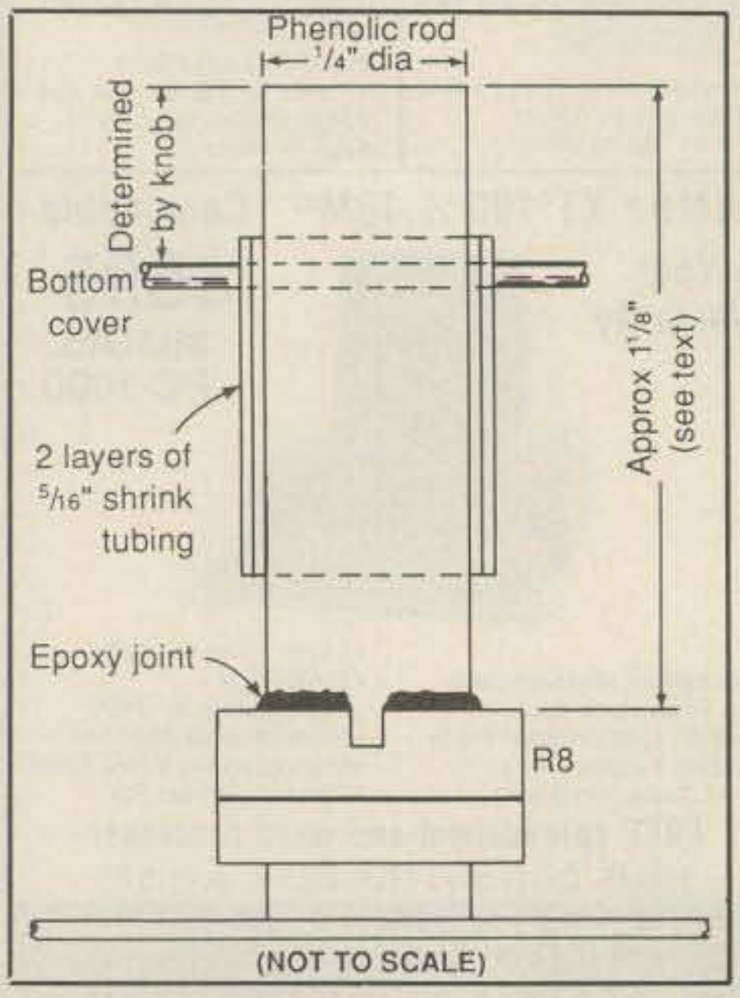

Fig. 1– Adapter shaft (cross-section view).

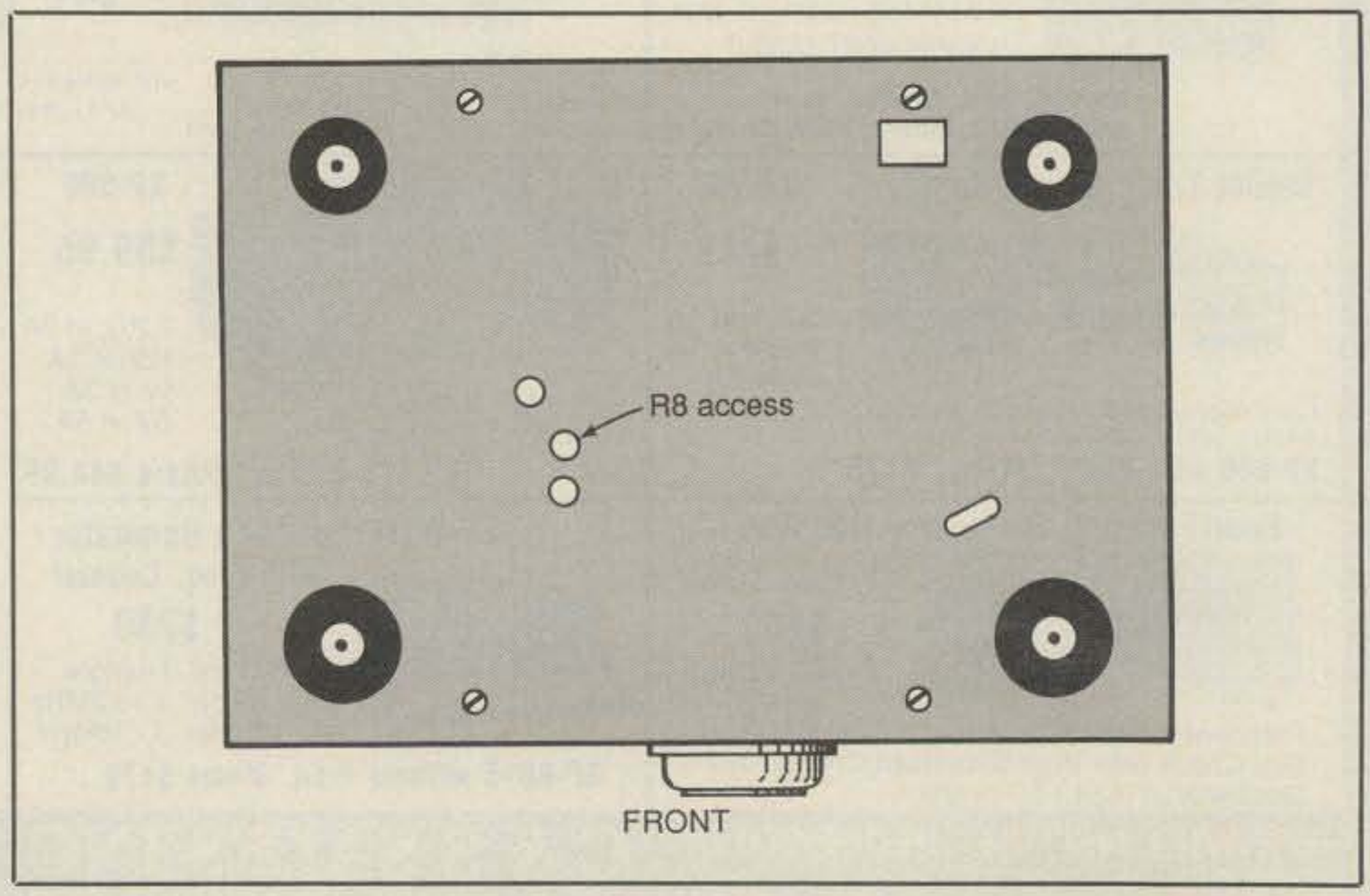

Fig. 2– Bottom cover layout.

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added to the existing front feet of the cabinet using epoxy after having lightly sanded the mating surfaces, for two reasons: One, for better ergonomics for most adults, and second to provide the necessary hand clearance for access to rotate R8.

8. Verify that the CW power has remained at 110 watts at the threshold of ALC as set by the factory. I have found that the internal power meter is very accurate as compared to a Bird model 43 wattmeter.

The Results

The SSB/CW power will now be continuously variable in the normal fashion, but ALC will be provided at any preset level of power, in both modes, in the range of 4 to 110 watts. Slightly higher ALC will be generated in the lower power region, which should be compensated by a reduction in the related Processor Out, Microphone Gain, or Carrier control.

Some Caveats

First, users should be reminded that the manufacturer's warranty terms apply to **any** modification to their equipment for understandable reasons.

Second, it should be noted that R8 is **not** designed for continuous, rotating-type operation. Therefore, proper caution should be exercised for its limited use. It is really one of those "set and forget" type controls. To minimize the mechanical stress to R8 the doubled shrink tubing was added to the shaft, since the access hole is slightly oversize, measuring $\frac{5}{16}$ inch (8 mm) in diameter. A suitable Teflon™ sleeve would be an ideal alternative. Of course, users are reminded that the knob must be taken off prior to removal of the bottom cover. Should the user's requirements dictate continuous use of the modified power-controlling capability, then a miniature potentiometer, such as an RV-6 type, would have to be installed.

Conclusion

For those operators with equipment dictating the use of an external ALC loop, such as Class AB1, for power control and for others desiring lower drive levels *with ALC* this modification will fully provide that capability without any deleterious effects. CQ

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4 tapes & 2 books for theory plus 6 tape stereo code set for CW speed building.

GENERAL CODE COURSE **$39.95**
6 tape stereo code course for CW speed building from 5 wpm to 13 wpm.

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4 tapes & 2 books for theory plus 6 tape stereo general or extra class code course. (Specify which CW tapes you want.)

ADVANCED THEORY CLASS **$19.95**
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EXTRA CODE COURSE **$39.95**
6 tape stereo code course for CW speed building from 13 wpm to 22 wpm+.

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200 page marine electronics book plus marine mobile antenna hints. **$19.95**

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Please send all reader inquiries directly.

CQ Showcase

AOR/ACE Scanning Receiver

AOR, Ltd. of Japan has introduced a hand-held receiver that offers complete public-service band coverage for under $200. The radio is 5¾"H × 2⅛"W × 1¾"D. Frequency coverage is 30-50, 118-174, 436-512, and 800-999 MHz. This allows coverage of all the police, fire, and emergency bands, plus the new services now available above 800 MHz in 12.5 and 25 kHz increments. A special top panel offset switch allows accurate reception of the 12.5 kHz offsets used in some trunking systems in the 800 MHz range.

At only 12 ounces total weight, the model AR880 can be carried in a pocket, with the standard belt clip, or in an optional leather carrying case. The suggested retail price is $199, which includes two antennas and a stainless steel belt clip. The unit uses four user-supplied AAA-size batteries. Front-panel keys allow programming of the 20 channels. For more information, the sole North American source for the unit is ACE Communications, Monitor Division, 10707 East 106th Street, Indianapolis, IN 46256, or circle number 107 on the reader service card.

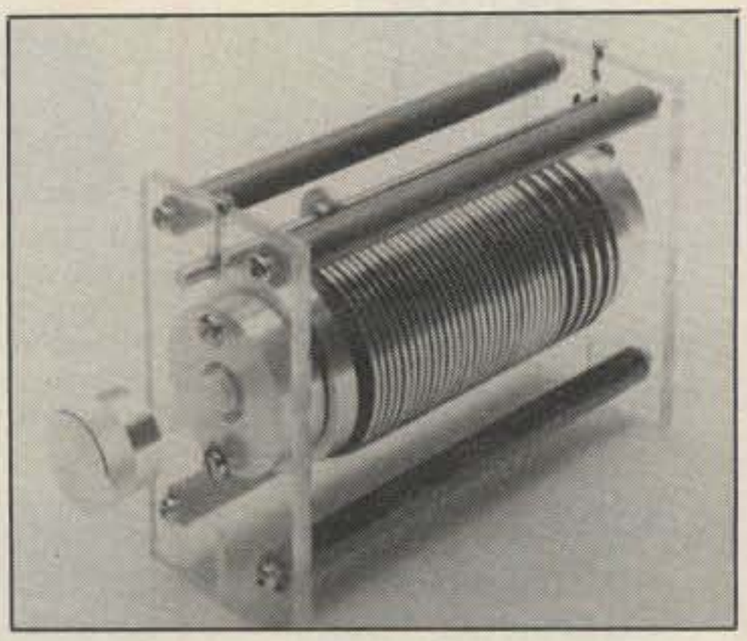
CES Autopatch

Communications Electronics Specialties, Inc. has announced their model 510SA-II telephone autopatch for amateur radio fixed-station and repeater applications. The 510SA-II is a full-feature microprocessor-controlled automatic telephone interconnect system that can be configured to operate in a simplex sampling mode for amateur VHF or UHF fixed stations or it can be used at the repeater site in a half- or full-duplex mode for mobile-initiated calls.

Other features include multi-digit DTMF connect code, activity timers, time-out timers, CW ID, toll restrict and disconnect override code, all programmable by use of any DTMF telephone with a special security access code, plus more. For more information contact CES, 931 S. Semoran Blvd., Suite 218, Winter Park, FL 32792, or circle number 101 on the reader service card.

Packet Booklets

Kantronics Press is now marketing a series of specialized booklets for packet operation. Written by *CQ*'s Buck Rogers, the booklets cover topics such as advanced packet operation, packet commands and RS-232. Priced in the $3.00 class, the booklets are available from Kantronics dealers or the publisher. For more information, contact Kantronics, 1202 E. 23 Street, Lawrence, KS 66046 or circle number 104 on the reader service card.

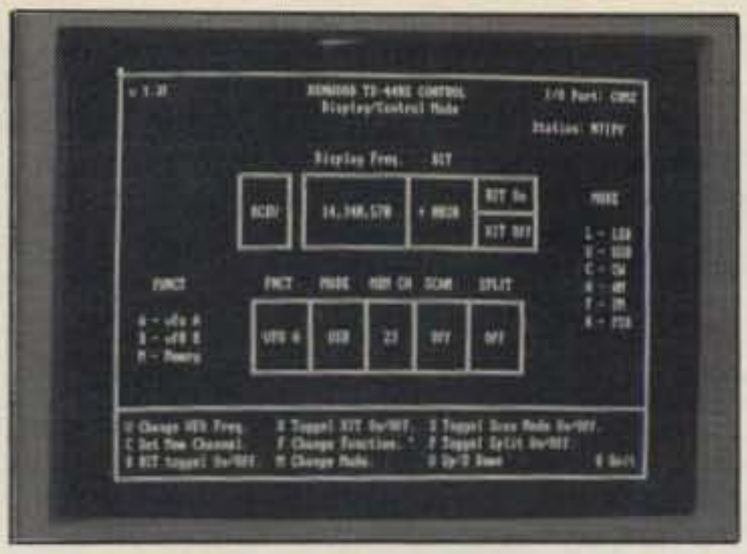


Kilo-Tec's Nevada High Power Roller Inductor

The Nevada High-Power Roller Inductor, Model RC-26, is a variable inductor intended for use in high-power antenna tuning units and transmitter output stages. According to Kilo-Tec, the design minimizes "contact bounce" and ensures the best possible contact between roller and coil during adjustments. The RC-26 will handle 1 KW plus RF, and the inductance is approximately 1-30 micro-Henries. Price is around $50.

For more information contact Kilo-Tec, P.O. Box 1001, Oak View, CA 93022, or circle number 102 on the reader service card.

Say You Saw It In CQ



Rad-Com Soft-Control

Rad-Com's Soft-Control gives you remote access to your radio's functions via a serial link from your PC. Using the radio's built-in command set, the program lets you control the functions of your transceiver from a menu. It also includes complete maintenance of the radio's memory channels. Memory data can be added, deleted, or edited and then saved to, or restored from, disk.

Available immediately for the Kenwood TS-940S, TS-440S, R-5000, and IBM PC or compatible computers. Other radio-computer combinations are expected to be available. The program sells for $59.95 directly from Rad-Com. For more information, contact Rad-Com, 7958 Limewood, Pleasanton, CA 94566, or circle number 105 on the reader service card.

ICOM EX-20 Automatic Antenna Selector

ICOM has announced the EX-20 automatic antenna selector for the 6 meter, 10 meter IC-575A/H. When connected to the transceiver, the EX-20 can automatically select between two connecting antennas—a 50 MHz VHF or 28 MHz HF antenna. The EX-20 is also adaptable to an additional HF radio. Suggested retail price is $75. For more information contact ICOM America, Inc., 2380 116th Avenue NE, Bellevue, WA 98009, or circle number 106 on the reader service card.

Lindsay's Electrical Books Catalog

Lindsay's 40-page two-color catalog features books on motor construction and rebuilding, Tesla coils, induction coils, shortwave radio, antique radio collecting, wireless equipment, and more. Among this collection of the old and new in electrical equipment, design, and history, are titles such as *Communications Receivers, Principles and Design; Electrical Instrument Making for Amateurs; Tesla Coil Secrets;* and *Collect Antique Radios*. Also included are "fringe science" books that, according to Lindsay, cover topics that lie somewhere between science and fantasy.

For a copy of this catalog contact Lindsay Publications, Inc., P.O. Box 12, Bradley, IL 60915-0012, or circle number 108 on the reader service card.

Logging Software for IBM Compatibles

Aerospace Consulting is now marketing a new logging program for the IBM/compatible PC user. Written in compiled Turbo-Pascal, LOGWRITE™ is fast, flexible and easy to use. It comes with a detailed operator's manual and is completely menu driven. The user can even use the computer for copying CW or making notes while LOGWRITE takes care of logging. A text processor mode is built-in, too. Additional features offered by the program are the ability to print and edit records, search for call signs or prefixes, and automatic time and date stamping of contacts. For more information, contact Aerospace Consulting, PO Box 156, Gwynedd, PA 19436 or circle number 103 on the reader service card.

"How Does Your Remote Base Stack Up?"

Now it's easy to add a multi-band remote to your repeater.

Your repeater can link to any frequency on up to six bands with ACC's new interface to the ICOM IC-900 Super Multi-Bander System.

Our new FC-900 Interface connects your ACC controller to the ICOM band units (the ICOM fiber optic controller and interface aren't needed). Add new bands to your system by just adding band units. And best of all – everything just plugs together!

If you've built remotes before, you'll appreciate the simplicity – and the performance. If you haven't, now is the time to add a new remote base or linking system to your repeater.

Extend the range of your repeater, link to other repeaters for emergency and public service activities, and benefit from the elevation of your repeater site for all bands. From ten meter DX to 1200 MHz linking – and everything in between.

ACC pioneered freqency agile remotes and links on repeaters years ago. Now we've made it easy. One more reason that ACC is the right choice for your repeater system.

Write or call for more information on ACC's line of repeater controllers, voice storage units, and the new FC-900 Interface.

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NEW Top-of-the-Line HF Transceiver
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TM-721A
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All Mode 2m Mobile

COMPACT 2M FM Mobile

TM 2570A (70W) **TM3530A (25W)**
TM 2550A (45W) **TM 221A (45W)**
TM 2530A (25W)

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High Tech 2M HT XCVR

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New All Mode Base Transceiver
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HIGH
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- **5W Output**
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FT 23R 2m HT
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- **compact size**
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ASTRON POWER SUPPLIES

Heavy Duty-High Quality-Rugged-Reliable

- **Input Voltage: 105-125 VAC Output:13.8 VDC ± .05V**
- **Fully Electrically Regulated 5mV Maximum Ripple**
- **Current Limiting & Crowbar Protection Circuits**
- **M-Series with Meter A-Series Without Meter**

Model	Cont. Amps	ICS Amps	Price
RS4A	3	4	$ 45
RS7A	5	7	55
RS12A	9	12	75
RS20A	16	20	95
RS20M	16	20	115
RS35A	25	35	145
RS35M	25	35	160
RS50A	37	50	215
RS50M	37	50	240

ICOM

IC-781
HF "PERFORMANCE" RIG
- **160-10M/General Coverage Receiver**
- **Built-in Power Supply and Automatic Antenna Tuner**
- **SSB, CW, FM, AM, RTTY • QSK to 60 wpm**

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IC-761 New HF XCVR
- **Built-In AC Power Supply**
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- **PBT Plus IF Shift**
- **QSK Up to 60 WPM**

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IC735 NEW General Coverage
Ultra Compact
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IC-27A **IC-37A** **IC-27H** **IC-47A**
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High Tech HT XCVRS

NEW IC-μ2AT 2m HT
- **micro design covers 140-163 MHz**
- **10 mem. w/scan**
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AMERITRON

AL80A

AL80A	$985.00	ATR10	$325.00
AL84	479.00	ATR15	380.00
AL1200	1825.00	RCS4	134.50
AL1500	2370.00	RCS8V	134.50

CALL FOR SALE PRICES!

concepts

rfc 2-317 2M
30W in = 170W out
LIST $299.00

Model	Band	In-Out	List Price
2-23	2M	2-30W	$112.00
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
3-312	220	30-120W	$264.00

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PARAGON

General Coverage HF Transceiver
Microprocessor Controlled Multi-Scan
62 Memories

List $2,245.
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OMNI V

New HF Transceiver
Ham Band Optimized for Reduced Phase Noise and Dynamic Range
Dual VFO's, Scannable Memories & More

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TITAN

HF Linear Amplifier

1500 Watts Output Full QSK
160-15 Meters Pair of EIMAC 3CX800A7

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AEA

PK-232 Packet Controller	$299.95
144 MHz Isopole	$49.95
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Other AEA products also in stock call!!!

Kantronics

KAM All Mode Terminal Unit	$289.95
KPC II Packet Controller	$159.90
KPC 4 Node Controller	$299.90

MFJ

NEW Model MFJ-986 3KW Tuner
Only $239.95

1278 Multi Mode TNC	$219.95
1270B/1274 TNC Units	$129.95/$159.95
202/204 Antenna Bridges	$59.95/$79.95
250 Oil Load	$39.95
260/262 Dry Loads	$29.95/$59.95
407/422 Elect. Keyers	$69.95/$119.95
901/941D Tuners	$59.95/$99.95
949C/989 Tuners	$139.95/$299.95

NYE VIKING

MBV-A 3KW Tuner

- Low Pass Pi-Network Tuning
- Built-in Antenna Switch/Balun

List Price $675 CALL TODAY TO SAVE $

NEL TECH LABS

DVK-100 Digital Voice Keyer
- **Built-in Auto Repeat Function**
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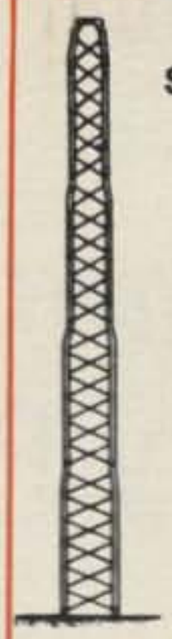
CRANKUP SALE!

All Models Shipped Factory Direct—Freight Paid*!

Check these features:
- All steel construction
- Hot dip galvanized after fabrication
- Complete with base and rotor plate
- 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—Call! Prices Shown Are Your Total Delivered Price In Continental U.S.A!



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Self Supporting Towers On SALE!

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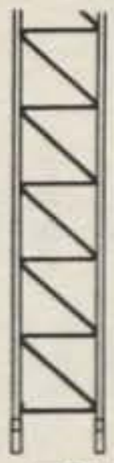
- All Steel Construction—Rugged
- Galvanized Finish—Long Life
- Totally Free Standing—No Guy Wires
- America's Best Tower Buy—Compare Save $
- Complete With Base and Rotor Plate
- In Stock Now—Fast Delivery

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 Continental 48 States. Antenna Load Based on 70 MPH Wind.

ROHN

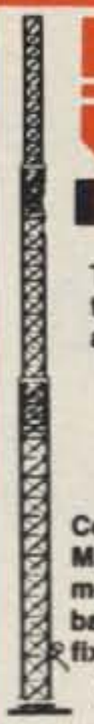
Guyed Tower Packages



- 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'	$669	$1369	$1689
60'	849	1549	1899
70'	919	1699	2069
80'	1099	1899	2299
90'	1179	2199	2489
100'	1269	2399	2689
110'	1499	2569	3129
120'	1579	2749	3349



US TOWER CORPORATION

These rugged crankup towers and masts now available from Texas Towers!

Check these features:
- All steel construction
- Hot dipped galvanized
- Totally self-supporting-
- No guys needed

Coax arms, Thrustbearings Masts, Motor drives, Remote controls, Hinged bases, Rotor bases, & Raising fixtures also in stock-

CALL FOR SALE PRICES!

Model	Min.Ht.	Max.Ht.	Ant.load*	Sale price
MA40 mast	21'	40'	10 sq ft	$629
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

$.36/ft $349/1000 ft. Up to 600 ft via UPS

- RG-213/U—95% Bare Copper Shield
- Mil-Spec Non-contaminating Jacket for longer life than RG8 cables
- Our RG-213/U uses virgin materials.
- Guaranteed Highest Quality!

RG-8X

$.22/ft $209/1000 ft.

- RG8X—95% Bare Copper Shield • Low Loss
- Non-contaminating Vinyl Jacket Foam Dielectric

9086

$.42/ft $409/1000 ft.

- Same Specs as Belden 9913
- Lower loss than RG8U
- 100% shielded-braid & foil

HARDLINE/HELIAX®

Lowest Loss for VHF/UHF!

½" Alum. w/poly Jacket	$.79/ft.
½" LDF4-50 Andrew Heliax®	$1.99/ft.
⅞" LDF5-50 Andrew Heliax®	$4.99/ft.

select connectors below

Heliax® is a Registered Trademark of the Andrew Corp.

Coaxial Cable Loss Characteristics (DB/100 ft)

Cable Type	Imped.	10MHz	30MHz	150MHz	450MHz
RG-213/U	50	.6	.9	2.3	5.2
RG8X	52	.8	1.2	3.5	5.8
9086	50	.4	.64	1.7	3.1
½" Alum	50	.3	.5	1.2	2.2
½" Heliax	50	.2	.4	.9	1.6
⅞" Heliax	50	.1	.2	.5	.9

HARDLINE & HELIAX® CONNECTORS

Cable Type	UHF FML	UHF MALE	N FML	N MALE
½" Heliax®	$29	$29	$29	$29
⅞" Heliax®	$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.
¼ mile 18ga copper-clad steel wire	$30
Dog bone end insulator	$.79 ea.

Van Gorden

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

ALPHA DELTA

DX-A 160-80-40 Sloper	$49

CUSHCRAFT

A3 3-el Tribander	$259
A4S 4-el Tribander Beam w/S.S. Hdwre	$349
A743 & A744, 30/40 mtr KIT for the A3 & A4	$ 89
R4 20-10 mtr Vertical	$229
AP8 80-10 mtr Vertical	$159
AV5 80-10 mtr Vertical	$119
D40 40 mtr Dipole	$159
40-2CD 2-el 40 mtr Beam	$339
A50-5 5-el 6 mtr Beam	$ 98
215 WB NEW 15-el 2 mtr Beam	$ 89
230 WB NEW 30-el 2 mtr Beam	$229
4218 XL 18-el 2 mtr Beam	$129
3219 19-el 2 mtr Beam	$109
424B 24-el 432 MHz Beam	$ 89
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Discoverer 2-el 40-mtr Beam	
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QK710 30/40 mtr. Add-On-Kit	
V2S 2-mtr Base Vertical	
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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 AVQ 20-10 mtr vertical	
14 AVQ 40-10 mtr vertical	
18 AVT/WB 80-10mtr Vertical	
18HTS 80-10 mtr Hy-Tower Vertical	
23BS 3-el 2 mtr Beam	
25BS 5-el 2 mtr Beam	
28BS 8-el 2 mtr Beam	
214BS 14-el 2-mtr Beam	
2BDQ 80/40 mtr Trap Dipole	
5BDQ 80-10 mtr Trap Dipole	
BN86 80-10 mtr KW Balun W/Coax Seal	

HUSTLER

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

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

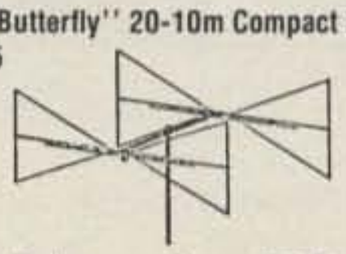
Accessories:

RMK II Roof Mtg. Kit	$55
STR II Stub-Tuned Radials	$35
TBR160 160m Coil Kit	$55
30m Add-on Kit	$35
17/12m Add-on Kit	$35

HF6V HF2V

FREE UPS on ACCESSORIES when purchased with antenna

HF5B "Butterfly" 20-10m Compact Beam $229.95



- Unique Design Reduces Size
- No Lossy Traps
- Turns w/TV Rotor
- Boom Length 6 Feet
- Element Length 12.5 Feet

FREE UPS Shipping in Continental USA

MIRAGE/KLM

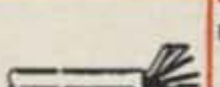
KT34A 4-el Broad Band Triband Beam	$399.95
KT34XA 6-el Broad Band Triband Beam	$589.95

ROTORS

Alliance HD73 (10.7 sq ft rating)	$119.95
Alliance U110 (3 sq ft rating)	$49
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

Standard 8 cord cables $.22/ft. (vinyl jacket 2-#18 & 6-#22 ga)
Heavy Duty 8 Cond cable $.39/ft (vinyl jacket 2-#16 & 6-#18 ga)



ROHN GUYED TOWER SECTIONS

10 FT. STACKED SECTIONS

20G	$49.50	45G	$139.50
25G	$59.50	55G	$179.50

ALL ACCESSORIES IN STOCK—CALL

ROHN FOLDOVER TOWERS

Model	Height	Ant. Load*	Price
FK2548	48 ft.	15.4 sq. ft.	$1129
FK2558	58 ft.	13.3 sq. ft.	1199
FK2568	68 ft.	11.7 sq. ft.	1239
FK4544	44 ft.	34.8 sq. ft.	1489
FK4554	54 ft.	29.1 sq. ft.	1599
FK4564	64 ft.	28.4 sq. ft.	1699

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

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

TOWER/GUY HARDWARE

3/16 EHS Guywire (3990 lb rating)	$.15/ft
1/4 EHS Guywire (6650 lb rating)	$.18/ft
5/16 EHS Guywire (11,200 lb rating)	$.29/ft
5/32 7 × 7 Aircraft Cable (2700 lb rating)	$.15/ft
3/16 CCM Cable Clamp (3/16" or 5/32")	$.45
1/4 CCM Cable Clamp (1/4" Cable)	$.55
1/4 TH Thimble (fits all sizes)	$.45
3/8EE (3/8" Eye & Eye Turnbuckle)	$6.95
3/8 EJ (3/8" Eye & Jaw Turnbuckle)	$7.95
1/2 × 9EE (1/2" × 9" Eye to Eye Turnbuckle)	$9.95
1/2 × 9EJ (1/2 × 9" Eye & Jaw Turnbuckle)	$10.95
1/2 × 12EE (1/2"12" Eye & Eye Turnbuckle)	$12.95
1/2 × 12EJ (1/2" × 12" Eye & Jaw Turnbuckle)	$13.95
5/8 × 12EJ (5/8" × 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

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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

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Length	5 FT	10 FT	15 FT	20 FT
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.18 in Wall	$49	$89	$129	$149
.25 in Wall	$69	$129	$189	$249

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(Antenna/tower product prices do not include shipping unless noted otherwise)

CIRCLE 62 ON READER SERVICE CARD

Here's a good idea from KA8RMB. Paul has been on the air only a few years and now joins his family in amateur activities.

A Santec HT Owner's Replacement Battery Pack

BY PAUL M. PETTY*, KA8RMB

The author in his shack. The radio is an R.L. Drake TR-4CW with digital readout. It is fed into an 11 meter ground plane converted for 10 meters. To the left is a Knight full-coverage BCB receiver, plus a Regency public service scanner.

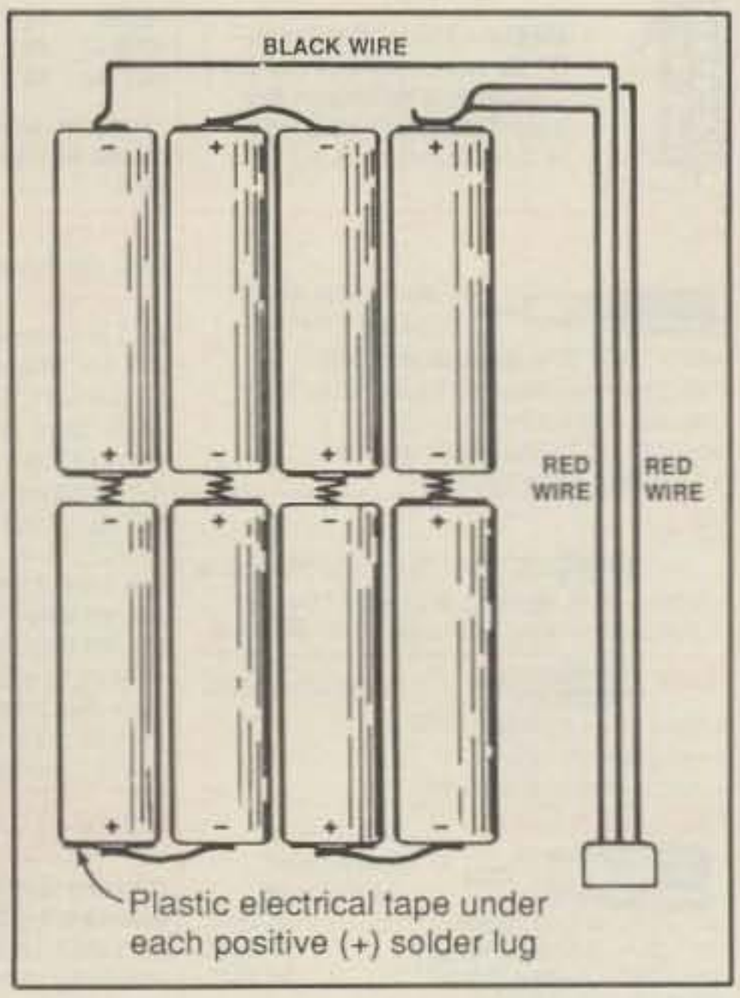

Fig. 1– Schematic of the battery pack as it should be when finished.

Paul M. Petty, KA8RMB, received his Novice license on January 1, 1983 at the young age of 72. His daughter, Paula DiGennaro, KA8HQJ, has been a licensed amateur since 1979 and is a Technician. Paul's son-in-law, Nelson DiGennaro, WB8VUU, has been licensed since 1976 and has an Advanced class license. Paul upgraded to a Technician on July 28, 1983. He is a member of the Dayton Amateur Radio Association and can be heard on 10 meters.

Many owners of Santec ST144UP 2 meter handheld transceivers have found it difficult, if not impossible, to obtain a replacement battery pack for the rigs. There is a remedy for this situation, and that is to make one for yourself! It's not hard to do. I did it and it works just fine.

First secure eight #23-190 Radio Shack nickel-cadmium rechargeable "AA"-size cells. They come two to a pack at around $4.39 per pack. The cells have solder lugs afixed to both the positive and negative ends.

Next take the plastic cover from an old, original Santec ST144UP battery pack. Note the assembly and remove the connector plug and three wires. The black (center) wire goes to the negative (–) side of the pack and the two red (outer) wires go to the same positive (+) side.

Connect the new cells in series as in the old pack. Place a disc of plastic electrical tape under each positive solder strip to prevent shorting when the pairs are pressed tightly together. While pressing a pair together end to end, wrap the joint with a good vinyl tape. Lay the pairs on a flat surface side by side, and tape them together as a flat, solid unit.

Now solder the top and bottom connectors so you have eight cells connected in series. Solder the black wire to the negative (–) end of the top cell on the left side and both red wires to the positive (+) end of the top cell on the right side. After all connections have been made, tightly wrap the unit with tape both vertically and horizontally. Be sure the unit is pressed together tightly so it will fit the cavity in the transceiver.

After completion, charge with the furnished slow charger at 12 volts, 45 ma for 12 to 14 hours.

I have found the replacement pack works just fine for me and costs less than half the price of a new battery pack. CQ

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01/89

29th ANNUAL

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FEBRUARY 4-5, 1989

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CIRCLE 125 ON READER SERVICE CARD

DAYTON Hamvention®

April 28, 29, 30, 1989

Early Reservation Information

• General Chairman, Bill McNabb, WD8SAY • Asst. General Chairman, Ed Hillman, N8ALN

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

Flea market tickets and grand banquet tickets are limited. Place your reservations early, please.

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

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

License Exams
Novice thru Extra exams scheduled Saturday and Sunday by appointment only. Send FCC form 610 (Aug. 1985 or later) - with requested elements shown at top of form, copy of present license and check for prevailing ARRL rates (payable to ARRL/VEC) to: Exam Registration, 8830 Windbluff Point, Dayton, OH 45458

1989 Deadlines
Award Nominations: March 15
Lodging: April 7
License Exams: March 26
Advance Registration and banquet:
USA - April 4 Canada - March 31
Flea Market Space:
Spaces will be allocated by the Hamvention committee from all orders recieved prior to February 1. Express Mail *NOT* be necessary! Notification of space assignment will be mailed by March 15, 1989.

Information
General Information: (513) 433-7720
or, Box 2205, Dayton, OH 45401
Lodging Information: (513) 223-2612
(No Reservations By Phone)

Lodging
Please write to **Lodging, Dayton Hamvention, Chamber Plaza, 5th & Main Streets, Dayton, OH 45402** or refer to our 1988 Hamvention program for lodging information which includes a listing of hotel/motels located in the surrounding areas of Dayton. Reservations for the surrounding area will then become the responsibility of the individual.

HAMVENTION is sponsored by the Dayton Amateur Radio Association Inc.

Advance Registration Form

Dayton Hamvention 1989
Reservation Deadline – USA-April 4, Canada-March 31
Flea Market Reservation Deadline: February 1

Enclose check or money order for amount indicated and send a self addressed stamped envelope.

Please Type or Print your Name and Address clearly.

	How Many		
Admission (valid all 3 days)	_____	@ $10.00*	$_____
Grand Banquet	_____	@ $20.00**	$_____
Women's Luncheon			
(Saturday)	_____	@ $7.00	$_____
(Sunday)	_____	@ $7.00	$_____
Flea Market (Max. 3 spaces)	_____	$25/1 space $50/2 adjacent	
Admission ticket must be ordered with flea market tickets		$150/3 adjacent	$_____
		Total	$_____

* $12.00 at door ** $22.00 at door, if available

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Make checks payable to – **Dayton HAMVENTION**

Mail to – **Dayton Hamvention**
Box 2205
Dayton, OH 45401

Awards

a monthly feature by
DOROTHY JOHNSON, WB9RCY

NEWS OF CERTIFICATE AND AWARD COLLECTING

The Story of the Month for January is:

John Withrow, WB6FJU USA-CA All Counties #562, 20M Mobile, 2-20-88

"I surely was happy to receive USA-CA All Counties #562. It was comparable to some other happy experiences in my life that were realized after expending the effort needed to reach the goal, like getting my General class ticket some 25 years ago, for instance.

"I started county hunting in 1980. One of the best things I've gotten out of it is the many friendships that have developed over the years. I really enjoy going to conventions and seeing old friends and meeting new ones.

"I was born in Los Angeles, California in 1924, and have lived here all my life. During World War II, I was a radio operator serving in the South Pacific. One of my major responsibilities was copying coded messages for a submarine squadron operating out of Perth in western Australia. From Australia I moved on to New Guinea, and at the war's end I was on the first U.S. ship to steam into Tokyo Bay.

"I work as a truck driver, pushing one of those 18-wheelers over the highways. I am married, and my wife and I have raised two fine children, a son and a daughter, both adults now. Along with amateur radio, my hobbies include fishing and square dancing.

"Yes, I am working on a second time around. I am also working toward the Master County Hunter Award, also known as 'Bingo,' offered by the Mobile QSL Bureau. I just couldn't see dropping out of county hunting after enjoying the chase for USA-CA All Counties #562 so much. I can't think of a better way to keep in touch with the many good friends I have come to know and appreciate over the years. Yes, you will be hearing WB6FJU on 14.336 MHz for some time to come. 73, and Good Hunting!—John."

John, WB6FJU, USA-CA All Counties #562 and his 18-wheeler "mobile."

Awards Issued

Owen Chelf, KY9Y, took that final step and received USA-CA All Counties #580, Mixed, dated 9-2-88.

Vincent M. Robel, Jr., NB8R, did it all in one step by claiming USA-CA All Counties #581, USA-CA 3000 #614, USA-CA 2500 #689, USA-Ca 2000 #757, USA-CA 1500 #845, USA-CA 1000 #1030, and USA-CA 500 #2270, All SSB, dated 9-3-88.

Harley P. Maines, NF8G, received a fully endorsed certificate by claiming USA-CA All Counties #582, USA-CA 3000 #615, USA-CA 2500 #690, USA-CA 2000 #758, USA-CA 1500 #846, USA-CA 1000 #1031, and USA-CA 500 #2271, All SSB Mobiles, dated 9-6-88.

Donald H. Pile, K7EQ, filed his application for a complete set of endorsements and received USA-CA All Counties #583, USA-CA 3000 #616, USA-CA 2500 #691, USA-CA 2000 #759, USA-CA 1500 #847, USA-CA 100 #1032, and USA-CA 500 #2272, All CW, dated 9-7-88.

The Mobile Amateur Radio Awards Club, WBØDPD (R. L. "Bob" Dyson, KØAYO, Trustee), completed the quest and received USA-CA All Counties #584, Mixed, dated 9-9-88.

Paul E. Friebertshauser, W6YMV, filed his good application and received a completed certificate for USA-CA All Counties #585, USA-CA 3000 #617, USA-CA 2500 #692, USA-CA 2000 #760, USA-CA 1500 #848, USA-CA 1000 #1033, and USA-CA 500 #2274, All SSB, dated 9-15-88.

D. Geneal Bailey, NK8P, made a clean sweep of it by claiming USA-CA All Counties #586, USA-CA 3000 #618, USA-CA 2500 #693, USA-CA 2000 #761, USA-CA 1500#849, USA-CA 1000 #1034, and USA-CA 500 #2276, Mixed, all dated 9-19-88.

O. Brian Schreen, NT7R, took the next to last step in his quest for all counties by claiming USA-CA 3000 #619, Mixed, dated 9-23-88.

George F. Gallagher, N2DAD, claimed his certificate for USA-CA 2500 #688, USA-CA 2000 #756, USA-CA 1500 #844, USA-CA 1000 #1029, and USA-CA 500 #2269, Mixed, dated 7-27-88.

333 South Lincoln Ave., Mundelein, IL 60060

USA-CA Special Honor Roll

Owen T. Chelf, III, KY9Y
All Counties #580, Mixed, 9-2-88

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

Harley P. Maines, NF8G
All Counties #582, All SSB, Mobile, 9-6-88

Donald H. Pile, K7EQ
All Counties #583, All CW, 9-7-88

Mobile Amateur Radio Awards Club, WBØDPD
Bob Dyson, KØAYO, Trustee
All Counties #584, Mixed, 9-9-88

Paul E. Friebertshauser, W6YMV
All Counties #585, All SSB, 9-15-88

D. Geneal Bailey, NK8P
All Counties #586, Mixed, 9-19-88

USA-CA Honor Roll

3000		1500	
NB8R	614	N2DAD	844
NF8G	615	NB8R	845
K7EQ	616	NF8G	846
W6YMV	617	K7EQ	847
NK8P	618	W6YMV	848
NT7R	619	NK8P	849
		KUØA	850

2500		1000	
N2DAD	688	N2DAD	1029
NB8R	689	NB8R	1030
NF8G	690	NF8G	1031
K7EQ	691	K7EQ	1032
W6YMV	692	W6YMV	1033
NK8P	693	NK8P	1034
JH8GWW	694	OH3YI	1035
AK2H	695		

2000		500	
N2DAD	756	JJ1FSK	2268
NB8R	757	N2DAD	2269
NF8G	758	NB8R	2270
K7EQ	759	NF8G	2271
W6YMV	760	K7EQ	2272
NK8P	761	JA4ESR	2273
KAØNVT	762	W6YMV	2274
		JA8CAQ	2275
		NK8P	2276
		N6OKX	2277
		OH3YI	2278

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

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IC-761 Loaded With Extras	2699.00	Call $
IC-735 Gen. Cvg Xcvr	1099.00	Call $
IC-751A Gen. Cvg. Xcvr	1699.00	Call $
IC-575A 10m/6m Xcvr	1399.00	Call $
Receivers		
IC-R7000 25-1300 + MHz Rcvr	1199.00	Call $
IC-R71A 100 kHz-30 MHz Rcvr	999.00	Call $
VHF		
IC-228A New 25w Mobile	509.00	Call $
IC-228H New 45w Mobile	539.00	Call $
IC-275A All Mode Base w/PS	1299.00	Call $
IC-275H All Mode Base 100w	1399.00	Call $
IC-28A FM Mobile 25w	469.00	Call $
IC-28H FM Mobile 45w	499.00	Call $
IC-2GAT, New 7w HT	429.95	Call $
IC-2AT FM HT	319 00	Call $
IC-02AT FM HT, HP	409.00	Call $
IC-μ2AT Micro HT	329.00	Call $
IC-900 Six Band Mobile	639.00	Call $
UHF		
IC-475A All Mode 25w	1399.00	Call $
IC-475H All Mode 75w	1599.00	Call $
IC-48A FM Mobile 25w	509.00	Call $
IC-4GAT, New 6w HT	449.95	Call $
IC-4AT FM HT	349.00	Call $
IC-04AT FM HT	449.00	Call $
IC-448A, 25w Mobile	TBA	Call $
IC-3200A FM 2m/70cm 25w	649.00	Call $
IC-32AT Dual Band Handheld	629.95	Call $
IC-3210 Dual Band Mobile	TBA	Call $
220 MHZ		
IC-375A All-Mode, 25w, Base Sta.	1399.00	Call $
IC-38A 25w FM Xcvr	489.00	Call $
IC-37A FM Mobile 25w	499.00	Call $
IC-3AT FM HT	349.00	Call $
IC-03AT Deluxe HT	449.00	Call $
1.2 GHz		
IC-1271A All Mode 10w	1269.00	Call $
IC-1200 FM, 10w Mobile	699.00	Call $
IC-12AT Deluxe 1w HT	473.00	Call $

TS-940S

HF Equipment	List	Juns
TS-940S/AT Gen. Cvg Xcvr	$2449.95	Call $
TS-440S/AT Gen. Cvg Xcvr	1379.95	Call $
TS-140S Compact, Gen. Cvg Xcvr	929.95	Call $
TS-680S HF Plus 6m Xcvr	1099.95	Call $
TL-922A HF Amp	1649.95	Call $
Receivers		
R-5000 100 kHz-30 MHz	999.95	Call $
R-2000 150 kHz-30 MHz	749.95	Call $
RZ-1 Compact Scanning Recv.	599.95	Call $
VHF		
TS-711A All Mode Base 25w	1029.95	Call $
TR-751A All Mode Mobile 25w	649.95	Call $
TM-221A Compact FM 45w	439.95	Call $
TM-2530A FM Mobile 25w	479.95	Call $
TM-2550A FM Mobile 45w	499.95	Call $
TM-2570A FM Mobile 70w	599.95	Call $
TH-215A, 2m HT Has It All	379.95	Call $
TH-25AT 5w Pocket HT NEW	349.95	Call $
TM-721A 2m/70cm, FM, Mobile	649.95	Call $
TM-621 2m/220, FM, Mobile	699.95	Call $
UHF		
TS-811A All Mode Base 25w	1,229.95	Call $
TR-851A 25w SSB/FM	749.95	Call $
TM-421A Compact FM 35w	449.95	Call $
TH-415A 2.5w 440 HT	399.95	Call $
TH-45AT 5w Pocket HT NEW	369.95	Call $
TW-4100A, 2m/70cm FM	599.95	Call $
TH-55 AT 1.2 GHz HT	499.95	Call $
TR-50 1w 1.2GHz FM	629.95	Call $
220 MHZ		
TM-3530A FM 220 MHz 25w	499.95	Call $
TH-31BT FM, 220 MHz HT	299.95	Call $
TM-321A Compact 25w Mobile	449.95	Call $
TH-315A Full Featured 2.5w HT	399.95	Call $

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HF Equipment	List	Juns
FT-747 GX New Economical Performer	$889.95	Call $
FT-757 GX II Gen. Cvg Xcvr	1129.95	Call $
FT-767 4 Band New	1929.00	Call $
FL-7000 15m-160m Solid State Amp	1995.00	Call $
Receivers		
FRG-8800 150 kHz - 30 MHz	759.95	Call $
FRG-9600 60-905 MHz	699.95	Call $
VHF		
FT-411 New 2m "Loaded" HT	TBA	Call $
FT-212RH New 2m, 45w mobile	459.95	Call $
FT-211 RH 2m, 45w, FM	459.95	Call $
FT-290R All Mode Portable	599.95	Call $
FT-23 R/TT Mini HT	344.95	Call $
FT-209RH FM Handheld 5w	389.95	Call $
UHF		
FT-712RH, 70cm, 35w mobile	499.95	Call $
FT-711RH FM Mobile 35w	449.95	Call $
FT-73 R/TT Mini HT	349.95	Call $
FT-709RH FM HT 4w	389.95	Call $
FT-790R MKII FM/SSB, 25w	799.95	Call $
FT-2311R 10w, 1.2 GHz, FM	559.95	Call $
VHF/UHF Full Duplex		
FT-736R, New All Mode, 2m/70cm	1749.95	Call $
FEX-736-50 6m, 10w Module	259.95	Call $
FEX-736-220 220 MHz, 25w Module	279.95	Call $
FEX-736-1.2 1.2 GHz, 10w Module	539.95	Call $
FT-690R MKII, 6m, All Mode, port.	569.95	Call $
Dual Bander		
FT-727R 2m/70 cm HT	439.95	Call $
FT-4700RH, 2m/440 Mobile	TBA	Call $
220 MHZ		
FT-33R, mini HT	389.95	Call $
FT-109 RH New HT	399.95	Call $
FT-312 RM, Mobile	TBA	Call $
FT-311 RM Mobile	499.95	Call $
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CIRCLE 142 ON READER SERVICE CARD

Yasu-Tada Ninomiya, JH8GWW, filed his good application and received USA-CA 2500 #694, All SSB, dated 9-26-88.

Warren H. Ash, AK2H, claimed USA-CA 2500 #695, All CW, dated 9-29-88. *(Note: In reporting Warren's 2000-level achievement in the September 1988 column we gave credit to Vernon Ash. Sorry, Warren. My error, my apology.—Dorothy.)*

Clyde Kane, KA0NVT, added another gold seal to his certificate by claiming USA-CA 2000 #762, Mixed, dated 9-29-88.

Nelson P. Moyer, KU0A, filed his good application for USA-CA 1500 #850, All SSB, dated 9-24-88.

Ossi Lehvas, OH3YI, collected his confirmations and qualified for USA-CA 1000 #1035 and USA-CA 500 #2278, Mixed, dated 9-26-88.

USA-CA 500 certificates went to:

Akira Okada, JJ1FSK, USA-CA 500 #2268, All CW, dated 8-26-88.

George F. Gallagher, N2DAD, USA-CA 500 #2269, Mixed, dated 8-27-88.

Vincent M. Robel, Jr., NB8R, USA-CA 500 #2270, All SSB, dated 9-3-88.

Harley P. Maines, NF8G, USA-CA 500 #2271, All SSB Mobiles, dated 9-6-88.

Donald H. Pile, K7EQ, USA-CA 500 #2272, All CW, dated 9-7-88.

Masaoki Kawata, JA4ESR, USA-CA 500 #2273, Mixed, dated 9-12-88.

Paul E. Friebertshauser, W6YMV, USA-CA 500 #2274, All SSB, dated 9-15-88.

Mamoru Wakasugi, JA8CAQ, USA-CA 500 #2275, All CW, dated 9-17-88.

D. Geneal Bailey, NK8P, USA-CA 500 #2276, Mixed, dated 9-19-88.

Dick Elkins, N6OKX, USA-CA 500 #2277, All SSB, dated 9-20-88.

Ossi Lehvas, OH3YI, USA-CA 500 #2278, Mixed, dated 9-26-88.

Awards Available

Field Award. The Swedish Amateur Radio Society will issue the Field Award diploma to licensed radio amateurs and shortwave listeners for verified contacts with *fields*, as defined by the locator system adopted as of 1 January 1985 (Maidenhead locator). Contacts on or later than this date are valid for the diploma.

The Field Award is issued in four classes: Bronze (basic diploma) 100 fields verified; Silver (sticker) 200 fields verified; Gold (sticker) 300 fields verified; and Platinum (sticker) all 324 fields verified. All amateur radio bands and modes are permitted. Endorsements will not be issued.

All contacts shall be made with stations on the surface of the earth. Contacts shall be verified by QSL cards or their equivalent, on which the field or position is clearly stated with such accuracy that the field can be determined. The term "position" refers to latitude and longitude or to a place name.

Field Award, offered by the Swedish Amateur Radio Society.

If there is any uncertainty about a field, the SSA may demand further information before approving the contact. If the uncertainty remains, then the contact will not be approved.

A random sample of individual QSL cards will be made, which must be sent in for checking.

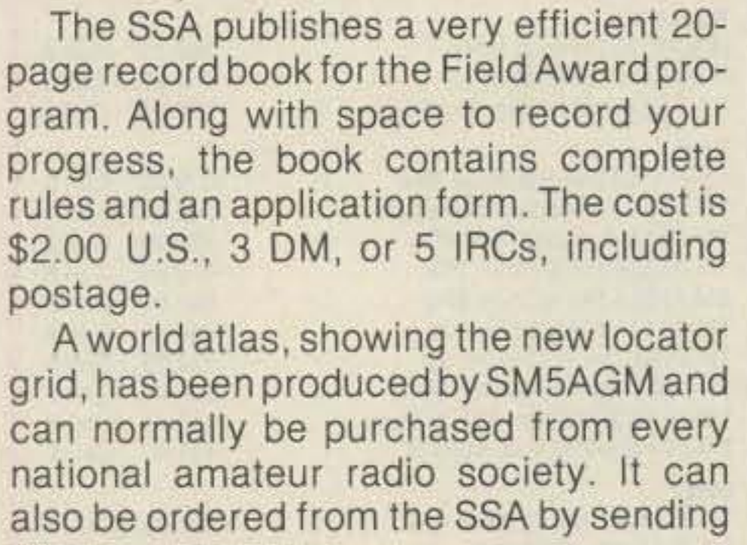
The application shall be made on a GCR list, containing the information from each QSL card which is required for approval. The GCR list shall be verified by the applicant's national diploma manager or other official in the applicant's national amateur radio society.

The fee is SEK 30, 10 IRCs, or $4.00 U.S. Send application to: Field Award Manager, SSA, Ostmarksgatan 43, S-123 42 Farsta, Sweden.

The SSA publishes a very efficient 20-page record book for the Field Award program. Along with space to record your progress, the book contains complete rules and an application form. The cost is $2.00 U.S., 3 DM, or 5 IRCs, including postage.

A world atlas, showing the new locator grid, has been produced by SM5AGM and can normally be purchased from every national amateur radio society. It can also be ordered from the SSA by sending an SAE and 6 IRCs.

ON4CLM—Canadian Liberation March. In the autumn of 1944 Canadian troops fought a long and exhausting battle in the Belgian coast area. On November 1, 1944 the town of Knokke was finally liberated at great cost in Canadian lives. Each year the Canadians are remembered with ceremonies, festivities, and a Canadian Liberation March. Many Belgian and Canadian veterans, radio amateurs, and VIPs participate in the events.



Canadian Liberation March Award, available from ON4CLM, Knokke, Belgium.

Special-event station ON4CLM (Canadian Liberation Movement) participates and offers a six-color printed award for all contacts. For 1988 ON4CLM, which was on the air from 28 October to 2 November, offers an award featuring the cap badge of La Regiment de la Chaudiere. Each successive year will honor one of the nine Canadian regiments that participated in the liberation of Knokke. Cost of the award is $5.00 U.S. or 10 IRCs, or the equivalent, all proceeds going toward a welfare fund. The money is used to maintain memorials, displays, etc.

To enable amateurs to collect the entire series of awards, there are still limited quantities available (at half price) of the '83, '84, '85, '86, and '87 awards. These back issues are in honor of the Stormont Dundas and Glengarry Highlanders, the Regina Rifle Regiment, the Canadian Scottish Regiment, the Royal Winnipeg Rifles, and the Queen's Own Rifles of Canada. These are available as "specimens" for collectors.

For more information, write to Radio Station ON4CLM, P.O. Box 110, 8300 B-Knokke Heist, Belgium.

Club De Radioamadores Awards. Club De Radioamadores De Cascais sponsors two awards, the 100 CT Award and the CCA-Cascais County Award. The awards are available to licensed amateur radio stations and SWL stations worldwide. Any band, any mode is acceptable.

100 CT Award: Submit proof of two-way contact, or hearing, 100 or more different CT amateur stations, including at least three CT2 stations and three CT3 stations.

CCA-Cascais County Award: Submit proof of having worked, or heard, at least one amateur station in each administrative division of Cascais County (Alcabideche, Carcavelos, Cascais, Estoril, Parede, and S. Domingos De Rana) or work ten CRC members.

All contacts from February 13, 1984 are valid for these awards. Send list certified by two amateurs or local radio club officials and 12 IRCs or $5.00 U.S. each. For Portuguese amateurs the same rules apply, and the fee is 600$00 (escudos) for each award.

Send certified list and fee to CRC, Club De Radioamadores De Cascais, P.O. Box 209, 2752 Cascais, Portugal.

TTI Award. The TTI Award, sponsored by the Radio Club of Costa Rica, is available to licensed amateurs and SWLs. Contacts after September 29, 1953, any mode, any band, are valid for the award. The award is offered in three classes:

Class 1—QSOs with seven of the eight

The TTI Award sponsored by the Radio Club of Costa Rica.

different Costa Rican call areas.

Class 2—QSOs with six different call areas.

Class 3—QSOs with five different call areas.

Stations with special prefixes such as TI1, TE1, or others will be classified from where they operate. The same rule applies for club stations using the prefix TIØ or TEØ.

The eight different call areas of Costa Rica and their prefixes are as follows. 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, TIØRC, 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 U.S. (or equivalent in other currency), to Bengt Hallden, Awards Manager of RCCR, Box 9, San Joaquin de Flores 3007, Costa Rica.

K1BV DX Awards Directory

Ted Melinowsky, publisher of the "K1BV DX Awards Directory," has compiled a list of at least 15 awards based on contacts made in the year 1988, such as the Seoul Olympics Award and the RSGB 75th Anniversary Award. Ted will be pleased to give a free set of the complete rules to anyone who sends him an SASE (or SAE and one IRC if overseas).

Ted also announced the availability of the 1988 revision of the *K1BV DX Awards Directory*. The 1988 revision includes the following features:

- Rules for over 830 different DX awards;
- Listings from 99 DXCC countries;
- Extensive research including most National Society Awards, *CQ* and *73 Magazine* series, plus CHC/IARS awards;
- Club member lists shown when available for specialized awards; and
- Full identification of awards available to SWLs.

In addition to the more than 200 pages of detailed and complete rules and award requirements, the *K1BV Directory* includes a special section with hints and suggestions, including:

- Sample application form;
- Descriptions of terms, such as General Certification Rule;
- Effective QSLing;
- Using contests for award hunting purposes; and
- Use of QSL bureaus.

For further information, get in touch with Ted Melinowsky, The K1BV Directory of DX Awards, 525 Foster Street, South Windsor, CT 06074-2936 U.S.A.

Happy New Year!

73, Dorothy, WB9RCY

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Please send all reader inquiries directly.

Bill's Basics

a monthly feature by
BILL WELSH, W6DDB

"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

ARRL Novice Roundup Contest

The American Radio Relay League (ARRL) sponsors the annual Novice Roundup (NR) Contest. This is a nine-day contest which sandwiches a full week in between two weekends. This is a pleasant, low-pressure contest for Novices and Technicians who may otherwise have little (or no) interest in contesting. You can participate just a few minutes or as long as 30 hours (maximum) in the NR.

The name "Novice Roundup" was established many years before Technician licensees were granted code operating privileges in the so-called Novice bands. The name remains appropriate because operation remains confined to the frequency segments (subbands) available to Novice class licensees, on a shared basis with all other classes of American amateur radio licensees. Technicians have full operating privileges above 50 MHz, but their NR activities are limited to frequencies shared with Novices.

Objective. The objective is for Novices and Technicians to contact as many amateurs as possible. A contest score is multiplied by the total number of ARRL/CRRL sections and foreign (DX) countries contacted.

Participants. This contest is primarily for American Novice and Technician class licensees, but General, Advanced, Extra, and foreign (DX) operators are also invited to operate in it. Novices and Technicians can work all amateurs (Novice, Technician, General, Advanced, Extra, and DX), but General, Advanced, Extra, and DX amateurs are only allowed to work Novices and Technicians in the contest. This is a good rule, because it guarantees that at least one Novice or Technician is involved in each NR contact. This contest is open to all Novice and Technician operators in the 50 states, plus those who in U.S. possessions and territories.

Rules. A basic condition of entry for NR contest participants is that they abide by the ARRL NR rules, decisions of the ARRL awards committee, and regulations of the FCC. Failure to abide by these requirements is reason for disqualification. It is common to have other amateurs ask you what "NR" is, or what the NR rules are, during the first few days of this contest. It is unreasonable of them to expect you to lose operating time providing such information; it is suitable to simply direct these operators to the January issues of *CQ* or *QST* for NR details. Know the NR contest rules and abide by them. Read this article carefully a couple of times before getting on the air in the contest.

Benefits

I advise you to operate in the NR even if you have a poor station and/or low code proficiency. It will be nice if you get a certificate for working at least 200 NR contacts, and you will have just cause to be extremely proud if you are the top scorer in your ARRL section or division, or one of the top ten scorers in the country. However, you do not need to achieve these lofty accomplishments to benefit from NR activity. This contest provides a great opportunity to contact amateurs in many counties, states, and countries. You can probably work more contacts during one day of the NR contest than you normally work in a month. These contacts can help you qualify for hundreds of operating awards. Novice contacts remain valid after one upgrades, even if the callsign is changed.

NR operation will let you judge your operating skills and station performance against those of other operators. NR participation can also help you increase code receiving and sending proficiencies to help you prepare to pass license upgrade tests. You can benefit in many ways by operating in contests.

2814 Empire Ave., Burbank, CA 91504

Competition and Awards

This contest provides a unique opportunity for Novices and Technicians to compete on the air against other Novices and Technicians in their own ARRL sections, plus against those who operate from other ARRL sections. Novices just compete against Novices, and Technicians only compete against Technicians; Novices and Technicians do not compete against each other in this contest.

The ARRL issues a nice certificate to each Novice and Technician who participates in the contest. These certificates are endorsed appropriately for the top-scoring Novices and Technicians in each ARRL section and division.

General, Advanced, Extra, and foreign (DX) amateurs are invited to take part in the NR contest, but they are not eligible for NR certificates. These operators provide contacts, cards, and code practice for Novices and Technicians.

No certificates are awarded to DX Novices who operate in the NR. However, American Novices greatly appreciate opportunities to contact DX amateurs, and I hope many DX amateurs will be on the Novice bands during this contest. Novices and Technicians are likely to be happy with a few DX contacts.

Dates and Times

The NR contest starts at 0001 UTC on January 28th and ends at 2359 UTC on February 5th. To state it more simply, it starts Friday evening January 27th (local time), and it ends Sunday evening February 5th. The NR starts at one minute past 4, 5, 6, and 7 PM PST, MST, CST, and EST, respectively. Similarly, the NR ends one minute before 4, 5, 6, and 7 Pacific, Mountain, Central, and Eastern Standard Times, respectively.

The NR contest length is 215 hours and 58 minutes. Novices and Technicians are allowed to work a maximum of 30 hours in the NR. The NR log must show each time you go on and off the air during the contest, and the minimum allowable time off the air is 15 minutes. Listening time on the air counts as contest operating time, and it must be shown as time on the air. I advise you to be completely honest in all contest matters; it helps you to accurately gauge your improvement in subsequent contests.

Here is 10-year-old Tim Sunderman, KB8ENN, of Cincinnati, Ohio. He has been active on the Novice bands since April 1988. Tim particularly enjoys working DX on 10 and 15 meters. In addition to amateur radio, he is very active in baseball, basketball, and soccer. Tim shares this station with his father, Butch Sunderman, KA8QFK, who operated from Berlin, Germany as DL/KA8QFK. His Dad's activity got Tim interested in working DX.

Frequencies, Modes, and Output Powers

The 80 meter Novice subband is 3700–3750 kHz. Only code (A1A) may be used. All classes of U.S.A. amateurs are limited to 200 watts maximum output power in this subband.

The 40 meter Novice subband is 7100–7150 kHz. Only code (A1A) may be used. All classes of U.S.A. amateurs are limited to 200 watts maximum output power in this subband.

The 15 meter Novice subband is 21.1–21.2 MHz. Only code (A1A) may be used. All classes of U.S.A. amateurs are limited to 200 watts maximum output power in this subband.

The 10 meter Novice subband is 28.1–28.5 MHz. Code (A1A) is allowed throughout this subband, but it is commonly used just in the 28.1–28.3 MHz segment, where RTTY (radioteletype) and packet radio are also allowed. The suggested simplex packet-radio frequencies on this subband are 28102.3 and 28104.3 kHz. Voice contacts are restricted to the 28.3–28.5 MHz segment of this subband. Only Novices and Technicians are limited to 200 watts maximum output power in the 28.1–28.5 MHz Novice subband; all other classes of U.S.A. amateurs may operate at up to 1500

Say You Saw It In CQ

watts PEP (peak envelope power) maximum output power on this Novice subband.

The 1.25 meter Novice subband is 222.10–223.91 MHz. Novices and Technicians may operate all modes available to all other classes of U.S.A. amateurs on this band. However, Novices (only) are limited to 25 watts maximum output power on this subband. The national simplex packet-radio frequency is 223.40 MHz, and the national simplex voice calling frequency is 223.50 MHz. It is standard practice to make the initial contact on a calling frequency and to shift up or down one channel to complete the contact. However, if the calling frequency is not busy, it is okay to complete the contact on the calling frequency.

The 23 centimeter Novice subband is 1270–1295 MHz. Novices and Technicians may use all modes that are authorized for use by all other classes of U.S.A. amateurs on this subband. However, Novices (only) are limited to 5 watts maximum output power on this subband. The national simplex calling frequency is 1294.5 MHz.

Categories

Most entries are by single operator stations wherein the individual Novice or Technician transmits, receives, and logs all contest contacts without assistance.

Multi-operator entries will be accepted. The assistance may be operating and/or logging help during the NR.

Operating

All NR contacts must be made in the Novice subbands. A Novice or Technician operator must be involved in each NR QSO (contact). General, Advanced, Extra class, and DX amateurs should not contact each other while they are participating in the NR contest.

Crossband contacts are not allowed, such as receiving on 10 meters and transmitting on 15 meters. Crossmode contacts are no longer allowed, such as listening to a DX voice station on 15 meters and transmitting to her/him using code (A1A). NR contacts are not allowed on any repeater frequency. Packet-radio digipeater contacts do not count in the NR.

The same station may be contacted two times during the NR. One contact must be digital (A1A code, radioteletype, or packet radio) and the other contact with the same station must be voice (SSB or FM). Any subsequent digital or voice contact with the same station is invalid, regardless of the subband that is used.

It is beneficial to use at least two bands to have a reasonable chance to contact amateurs in many countries and ARRL/CRRL sections. The 15 and 10 meter bands provide the best opportunities to contact amateurs in other countries (DX), plus amateurs in the Canadian (CRRL) provinces and distant parts of our own country. Use 10 and 15 during the daylight hours. Switch to 40 and 80 at night when 10 and 15 close down. This type of operation provides the best chance to work desired states, provinces, and countries. When operating on the high-frequency (3–30 MHz) Novice subbands, it is advisable to start at the low end, and to shift up through the band as contacts are made. Most NR contest activity will be evenings of weekdays, plus night and day of weekends. If you can do so, schedule your operating time to be on the air during periods of maximum activity.

Identification. Novices add /N and Technicians add /T to their callsigns during this contest to indicate their eligibility to all amateurs participating in the NR. As examples, a Novice with a callsign such as KB6RXU uses KB6RXU/N, and a Technician with a callsign such as WA6FNM uses WA6FNM/T during the contest. Out-of-area operation is also indicated in callsigns to minimize confusion. As an example, if a Technician with an apparent California callsign, such as WA6FNM, is operating in the NR from Louisiana, he would identify as WA6FNM/5T to indicate that he is operating from the ARRL Louisiana (LA) section instead of the Los Angeles (LAX) section.

General, Advanced, and Extra class licensees are not required to indicate class of license as part of the callsign used in the NR. However, many of us use /G, /A, or /E to make it very clear to other General, Advanced, Extra, and DX amateurs that we are not valid NR contacts for them; we are only valid NR contacts for Novices and Technicians. This additional identification is particularly useful in cases in which General, Advanced, and Extra class amateurs have retained callsigns that could indicate they are Novices or Technicians.

Exchange. The on-the-air NR contest exchange is limited to a signal report (RST for code or RS for voice) and your ARRL section. The ARRL sections are listed in the accompanying table for your information. This information must be exchanged both ways for the contact to count.

Where more than one identifier is shown, the preferred (shorter) identifier is listed first. You must know your ARRL section to participate in the NR. Fortunately, most ARRL sections are entire states or provinces.

Since the objective is to work as many amateurs as possible, in as many countries and ARRL/CRRL sections as you can contact in the NR contest, it is helpful to maintain a check sheet that shows at a glance which countries and sections you have already worked during

ARRL 74 Sections Check-Off List

(1)	CT	CONN	Connecticut
	EMA	E MASS	Eastern Massachusetts
	ME		Maine
	NH		New Hampshire
	RI		Rhode Island
	VT		Vermont
	W MA	W MASS	Western Massachusetts
(2)	ENY		Eastern New York
	NLI		New York City and Long Island
	NNJ		Northern New Jersey
	SNJ		Southern New Jersey
	WNY		Western New York
(3)	DEL	DE	Delaware
	E PA	E PENN	Eastern Pennsylvania
	MDC	MD or DC	Maryland or District of Columbia
	W PA	W PENN	Western Pennsylvania
(4)	AL	ALA	Alabama
	GA		Georgia
	KY		Kentucky
	NC	N CAR	North Carolina
	N FL	N FLA	Northern Florida
	SC	S CAR	South Carolina
	S FL	S FLA	Southern Florida
	TN	TENN	Tennessee
	VA		Virginia
	WIN		West Indies (KG4, KP4, KV4, etc.)
(5)	AR	ARK	Arkansas
	LA		Louisiana
	MS	MISS	Mississippi
	NM		New Mexico
	N TX	N TEX	Northern Texas
	OK	OKLA	Oklahoma
	S TX	S TEX	Southern Texas
	W TX	W TEX	Western Texas
(6)	EB	E BAY	East Bay
	LAX	LA	Los Angeles
	ORG		Orange
	PAC		Pacific (KH6, KS6, etc.)
	SB	S BAR	Santa Barbara
	SCV		Santa Clara Valley
	SDG		San Diego
	SF		San Francisco
	SJV		San Joaquin Valley
	SV		Sacramento Valley
(7)	AK	ALAS	Alaska
	AZ	ARIZ	Arizona
	ID	IDA	Idaho
	MT	MONT	Montana
	NV	NEV	Nevada
	OR	ORE	Oregon
	UT		Utah
	WA	WASH	Washington
	WY	WYO	Wyoming
(8)	MI	MICH	Michigan
	OH		Ohio
	WV	W VA	West Virginia
(9)	IL	ILL	Illinois
	IN	IND	Indiana
	WI	WIS	Wisconsin
(Ø)	CO	COLO	Colorado
	IA		Iowa
	KS	KANS	Kansas
	MN	MINN	Minnesota
	MO		Missouri
	NE	NEBR	Nebraska
	ND	N DAK	North Dakota
	SD	S DAK	South Dakota

Canadian Provinces

MAR	VE1/VO	Maritimes or Newfoundland
PQ	VE2	Quebec
ON	VE3	Ontario
MB	VE4	Manitoba
SK	VE5	Saskatchewan
AB	VE6	Alberta
BC	VE7	British Columbia
NWT/YU	VE8	Northwest Territories or Yukon

the contest. It is simple to start with a list showing all the ARRL/CRRL sections grouped by callsign areas, and just cross out each section as you work it. Maintain a second list showing the callsign of the first amateur contacted in each country worked during the NR.

Each time a new section or country is worked, it must be indicated (in sequence) in the NR log. Simply start with number one and continue up as you earn multipliers, including countries other than Canada and the United States.

Typical Contacts. As is true in all contests, NR contacts should be as brief as possible. A typical good NR code contact between KB6RXU and W6JEP in the first few days of this contest could be as follows:

CQ NR CQ NR CQ NR CQ NR
CQ NR DE KB6RXU/N
CQ NR CQ NR CQ NR CQ NR DE
KB6RXU/N KB6RXU/N
CQ NR CQ NR CQ NR DE KB6RXU/N
KB6RXU/N KB6RXU/N K

KB6RXU KB6RXU DE W6JEP W6JEP NR K
W6JEP DE KB6RXU BT 579 LA 579 LA BK
BK R 589 LA 589 LA DE W6JEP BK
BK R 73 CQ NR CQ NR CQ NR DE
KB6RXU/N KB6RXU/N NR K

Look at the preceding typical exchange and evalute it very carefully with regard to the comments in the rest of this paragraph. In the initial call, KB6RXU included the /N each time with his callsign to indicate contest eligibility to all other amateurs. Notice also that the number of CQ NR transmissions decreased from five to three and station identification increased from one to three during the calling sequence, and the NR contest activity was again indicated prior to the invitation to transmit (K) at the end of the third CQ NR sequence. When W6JEP answered the call, she just identified both stations twice, left off the /N, and indicated contest participation by sending NR before the invitation to transmit. Once the two-way contact has been established, there is no need to continue using /N or /T.

The KB6RXU reply to W6JEP is very brief; the callsigns are just sent one time each, and only at the beginning of the reply. The RST report and ARRL section are sent twice to minimize possible requests for repeats. Neither the term *RST* nor the word *section* precedes the report and League section, since it is obvious what both are, and the break sign (BK) is used to eliminate unnecessary identifications. During contest activity, a series of short transmissions is not likely to extend past 10 minutes, and the identification shown in the sample exchange suffices. Note that the W6JEP response is short; the R advises that the KB6RXU contest data has been received. W6JEP then sends the report (RST) and her section twice, identifies with just her callsign to give KB6RXU assurance that he is copying the correct signal, and sends the break sign to invite KB6RXU to respond.

When KB6RXU answers, he sends R to indicate the contest data has been received. He may send best regards (73), and he then sends a short contest call in case another station is waiting for a contest contact. When the short call is sent, the /N is again added to indicate contest eligibility to all amateurs. This indicated brief exchange is further abbreviated after the first few days the contest has been in progress, but the sample exchange is suitable at the start of each year's NR.

After the first few days of NR activity, shorten the call to a single 3 by 3 or 2 by 2 (CQ NR CQ NR DE KB6RXU/N KB6RXU/N NR K, as an example) and listen carefully (above and below your transmitting frequency) for answers before repeating this call. The rest of the previous explanation holds true when using this preferred shorter calling procedure.

A typical NR voice contact could be as follows:

CQ Novice Roundup (2 or 3 times) this is WA6FNM Technician Whiskey Alfa Six Foxtrot November Mike Over
WA6FNM this is KB6SOH Novice Kilo Baker Six Sierra Oscar Hotel Over
KB6SOH from WA6FNM 5 by 9 in Los Angeles Section Over
WA6FNM from KB6SOH 5 by 9 in Los Angeles Section Over
Thank you KB6SOH This is WA6FNM Technician Whiskey Alfa Six Foxtrot November Mike Calling CQ Novice Roundup Over

The voice procedure is basically the same as for a code contact. Again, the calling sequence is abbreviated after the contest has been running a few days.

Brevity. Do not routinely exchange normal contact information during contest contacts. In other words, do not send your name, location (QTH), rig, antenna, weather (WX), or mailing address information as parts of contest contacts. Keep each contact brief. Do not send faster than you can receive accurately; let the other fellow slow down to a speed you can copy. If the other operator sends too fast, tell her/him to send more slowly (QRS).

If you contact a county, state, or country you need to have confirmed, simply request a QSL when you send your card. I send a card to each amateur contacted for the first time, which is not a common practice among most amateurs. However, most amateurs send a QSL in response to each card received. If all amateurs just responded to cards received, none would be exchanged. Nevertheless, if received cards initiate completion of the QSL exchange, that is okay; the person who wants the other amateur's card is simply the one who begins the exchange.

Required Log Entries. Your NR log must show the time each contest contact started. It is preferable to use Universal Time Coordinated (UTC) when logging radio contacts, since it eliminates possible time-zone confusion. Most experienced amateurs only use UTC. UTC is still called Greenwich Mean Time (GMT), Greenwich Civil Time (GCT), Zebra time, or Zulu (Z) time by many amateurs, and they are all meant to indicate the same time. However, UTC has been the correct term since 1 January 1974 and it should be used. The other amateur's callsign (/N and /T indicators not required) and ARRL/CRRL section (or country) must be logged for each contact. Received and sent signal (RST/RS) reports must both appear in the NR log. Your station callsign, frequency, and dates of contest operation are also required.

It is best to maintain separate logs and check sheets for voice and digital contacts.

Scoring

Contact Points. One point is earned for each station contacted by voice while on the air in the NR, whether or not contacted amateurs are participating in the contest, as long as the

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report and ARRL/CRRL section (or country) are obtained. Each digital (A1A code, RTTY, or packet radio) contact counts for two points.

Code Proficiency Points. If you have an ARRL code proficiency certificate, your stated receiving speed (words per minute) is added to the point total for the stations you contacted. If you do not hold such a certificate, or if you want to increase the rate shown on your certificate, you can submit your January or February W1AW or W5OWP qualifying copy with your NR material to claim these extra points.

Multipliers. The total number of points derived from your contest contacts and your ARRL (not FCC) certified code proficiency rate are multiplied by the number of foreign countries and ARRL/CRRL sections you contacted during your NR contest operation. Remember that Alaska, the Canadian Provinces, Hawaii, and the West Indies (Guantanamo Bay, Puerto Rico, and the Virgin 1slands) are ARRL sections, and they do not count as countries in this contest.

Forms

It is advisable to request one set of NR contest forms from the ARRL, preferably before the contest starts. If you send a self-addressed and stamped business (#10) envelope to the ARRL with your request for a set of NR material, they will send two log sheets, two dupe (duplication avoidance) sheets, and one NR contest summary sheet. You are welcome to duplicate League material to meet your needs. The ARRL mailing address is 225 Main Street, Newington, Connecticut 06111.

NR logs do not have to be mailed to the ARRL until one month after the contest ends, so you have time (until 5 March 1988) to request logs from the ARRL, fill them in, and mail them. If you transcribe NR contest entries from your original log, be sure to repeat all contact information on the forms to be turned in. If you make more than 200 contacts, you must include a sequential list of callsigns worked, using the callbook sequence system. Callsigns are arranged by number (one through zero/ten), then by suffix, and last by prefix.

Submitted Material. The contest material submitted to the ARRL is not returned, so do not send your only (original) log sheets. It is a simple matter for most of us to duplicate material before mailing it to the ARRL. Take your time and try to submit correct material that is easy to read. Checking contest entries is a tough job, but you can make it easier for League checkers by turning in good material. The League appreciates receiving check logs from General, Advanced, Extra, and DX operators who take part in the NR.

Incomplete and/or late logs are just used as check logs. They are not eligible towards NR awards or *QST* listing.

Closing Comments

NR contest activity has always been slow at the start, and it is common to have other operators request an explanation of contest rules. As previously stated, I advise you to direct them to the NR coverage in this column or in other magazines, which is simpler and better than trying to give all this information to each amateur who requests it. NR activity continues to build as the days pass and more amateurs become aware of it. By the last few days of the contest, activity is excellent. If you get this issue before the contest starts, please mention the Novice Roundup to every amateur you contact to let them prepare for this excellent contest.

I hope to contact you on one of the Novice bands. I work about 1,000 Novice band contacts every year, and I have participated in each Novice Roundup. When the NR contests were held in the 1952 through mid-1970 era, the Novice license was just valid one year; it could not be renewed, and it was not available to anyone who had previously held any class of amateur radio operator license. In that time frame no Novice could compete in more than one NR as a Novice, and newer Novices seldom participated at all. Novice licenses are now valid a maximum of ten years and they can be renewed, which means that many Novices have acquired experience in previous NR contests, and improved scores should result. Similarly, it is a relatively recent change that allows Technicians to use the Novice code bands. Enjoy this contest by putting your station in top condition and reserving adequate good operating time during the NR.

We appreciate the cooperation of the NR Contest Manager, Billy Lunt, KR1R. He informed us of no changes in this year's NR contest.

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DX

a monthly feature by
HUGH CASSIDY, WA6AUD

NEWS OF COMMUNICATION AROUND THE WORLD

Ah! Sweet mystery of DX at last I've found you,
And now I know the secret of it all.
'Tis the power, 'tis the calling, 'tis the CQs,
'Tis my band-skirts blotting out all others when I call. . .

One of the problems we have encountered with speed reading is that we sometimes have to realize that the eye can be faster than the mind. Other DXers have noted similar problems, in pile-ups believing that the DX station came back to their call, proving that the ear can be faster than fact. Another parallel situation is the DXer out on the far Pacific Rim who sadly reported that while he could send at 35 wpm, he had problems in copying at 5 wpm. Recently, a letter was subjected to our speed-reading skills, and when we slowed down a bit we realized that what we had understood was not exactly written.

The writer was noting that the 10 meter band has Novice and Tech privileges from 28.3 to 28.5 MHz and that it would be nice at times if DX stations would listen down rather than traditionally up. The writer did acknowledge that DX stations were showing in the 10 meter segment, but often they only listened up. It was evident that the writer was a good listener, but was interested in being a DXer. A noble ambition!

On a morning when we caught the Old Timer striding down the hill and heading for the village, we showed him the letter. Some have asked if the Old Timer ever walks up the hill. A good question. Often he takes the long path and circumnavigates the young mountain where our QTH is. Maybe sometime we will have to ask, the possibility having occurred that he might be more interested in a walk through the woods than in answering questions. But we caught him this morning. Often, no matter what we think, he comes up with an added perspective.

"The fellow has a good point," he said, nodding his head. "It is especially understandable that DXers often tend to run in familiar, though habitual, grooves on the bands. And DX stations generally show in the same areas, this being understandable when you realize that all they have to do is flip a switch and they can get all the attention they can handle—sometimes even more. But DX does live in other areas besides the familiar lower edge of the bands, and there can even be activity in the restricted areas where the Novices or Technicians might hopefully be listening. And it might also be an introduction to DXing for some who have the interest but are not sure or are reluctant to jump into a pile-up even though they are permitted."

The writer of the letter had noted that the current count shows some 95 thousand Novices in the license totals and 188 thousand Techs. And while many may have found a life

77 Coleman Drive, San Rafael, CA 94901

Someone once asked what DJ9ZB does. The reply was quickly heard: "He is a DXer, one of the top, one of the best!" So, what else is important? Here is Franz Langner, DJ9ZB, at an amateur radio convention in Europe a couple of months back. On the right is Mohammad Balbasi, JY4MB, often heard out of Amman.

on VHF, there were also signs that some dream of a life on the DX freeway, the fast lane of amateur radio. And while some do work the 28.3–28.5 MHz area, few DX stations heard regularly listen down in that area.

Mostly that is the way it has always been. DXers listen up, always! The edge of the subbands is the battle grounds, and an overwhelmed DX station has always sought sanctuary below the band edges. At least that is the way it once was. However, in the later decades some overseas countries have moved to match the W/Ks in total numbers, and what once was a sanctuary can now be a DX feeding ground. One learns about these things as well as finding that DX can be found, sometimes, in other areas. The writer wanted to make the point that it is possible to find it in areas where some might think DX interest is unknown. We offered this in comment to the Old Timer, and he did not disagree.

"Some have asserted that they sometimes have listened down in the DX bands and found little activity and scant utilization. This might be hard to believe, but you can encounter quiet periods. Some of the non-DX types may even venture to rag-chew on the band edges, even going so far as to set up future schedules. The bands may be quiet, but you can almost hear the heavy listening that is always going on there. Years back there was an instance when one of our exalted leaders in organizational activities sat down one Saturday morning to enjoy a bit of rag-chewing low on the bands and ran into the middle of a DX contest with multitudes of DXers happily enjoying a lovely uproar on the band edges. It was no place for rag-chewing; those looking for a contact and a country counter were merciless. The exalted one obviously was out of his element and soon out of that portion of the band. But he was not out of indignation and soon issued a scathing editorial on contests, especially DX contests, where all the norms and the fine virtues of consideration, courtesy, and gentlemanly conduct were ignored, battered, and trampled under.

The Old Timer leaned closer to make his inevitable point. "Anyone who might suspect that the hallowed DX portions of the bands are not being utilized should listen there in a contest. The realization will come that the band is always being utilized, by listeners if nothing else. It has been said that DXers tend to save their talk for the important moments. And to DXers any moment when a DX country is on is definitely an important moment."

That was a foursquare proclamation on DXing, definitely! "So you think," we said, cautiously adding even a bit more fuel, "that it is a good idea for DX stations operating close to the subbands to try listening down rather than up? But when I mentioned this to a couple of other DXers, their reply was, putting it pointedly, to let the Novices and Techs upgrade if they want to share the DXing. '. . . let 'em work for it like we did!" That's what some others have said. What do you think of that?" We thought it was a good question, but somehow the reply was not just what we anticipated.

"Of course they are right," the Old Timer said with a small, thin smile. "We should always encourage DXers and potential DXers to upgrade. And one should keep in mind something that may at times be forgotten: a lot of these Techs and Novices may one day be found on the Honor Roll—maybe not all of them, and those which are there undoubtedly will have upgraded. But they should always be encouraged to achieve their potential, nothing less than the Extra class license. Let them prove their worthiness to be DXers. Let them upgrade to be accepted. That's the way it always should be. That's tradition!"

We were hearing the words but not the usual ringing in our ears that came when the Old Timer spoke of some of the Eternal Truths of DXing. "You really mean that?" we had to ask, and somehow we were relieved to see him shake his head.

"Not at all," he admitted and continued. "Let me tell you something that was taught to me years back. It was taught not by a DXer telling me but by the way he acted when I was first getting interested. If you have been alert as any DXer should be, you probably have noted instances where a number of the elder DX types always seem to catch up with anything they need to maintain their imposing DX totals but do not seem to work very hard at it." We nodded. This has been noted at times.

"You will note, perhaps," the Old Timer continued, "that these types are often the ones considerate towards the newer members at club meetings. You will find them passing on what to them is routine DX information but which can be invaluable to a new DXer. They help with suggestions on bands to watch and frequencies where needed DX countries can be found. They are easy to ask when information is needed. You probably know some older DXers like that, the eternal tillers of the DX vineyards who continue to reap a bountiful crop of DX in their later years."

Actually, we were not sure that we did. We

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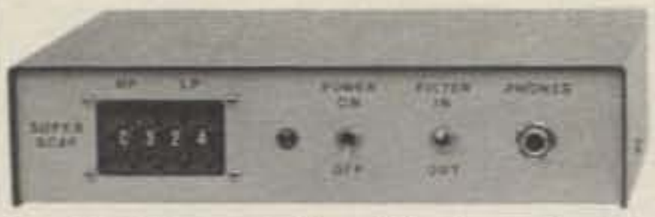

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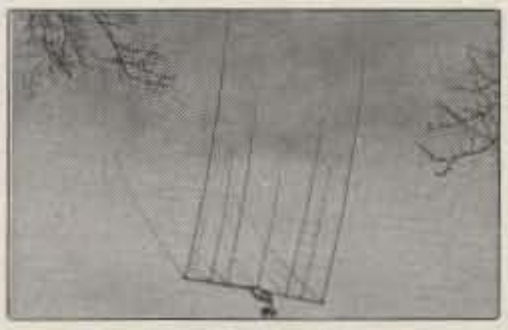

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Oceania:	SM3EVR, I8RFD

Award of Excellence: SM3EVR with 160 meter endorsement.

Award of Excellence Plaque Holders: W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GQ, VK9NS, DE0DXM, DK4SY, UR2**, AB9O, FM5WD, I2DMK, W4BQY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, HI8LC, KA5W, K0JN, W4VQ, KF2O, K3UA, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL.

Award of Excellence Plaque Holders with 160 Meter Endorsement: OK1MP, N5TV, W8CNL, W1JR, W6OUL, W4BQY, W5UR, N4NO, W8RSW, N4KE, I2UIY, W8ILC, W1BWS, NN4Q, G4GUE, LU3YL/W4, I4EAT, VE7WJ, W9NUF, N4NX, VK9NS, DE0DXM, VE7IG, K9BG, AB9O, FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, W3ARK, HI8LC, KA5W, UR2**, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF2O, SM3EVR, K5UR.

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.

Put them in tee-shirts and you will find that DXers fit the mold—always smiling, always happy, and always showing the signs of good living. From the site of 4J1FS on Malyj Vystoskij Island are (standing) Martti Laine, OH2BH; UZ3AU; UW3AX; Enn Lohk, UR2AR; and OH5NZ. In front is OH2RF. Never doubt that DXing is anything but the good times!

did know a number of DXers who continue to enjoy the good things of DXing. These were the laid-back types, congenial, convivial, and always concerned for and helpful to the newer members. When we observed their firm handshake, their left hand bracing the newcomer's elbow, we even suspected them of being closet politicians, maybe even remnants from the Toastmasters Club. But now we were wondering if something might have slipped by us. We had to have the Old Timer advise us further. Later we were to realize that the signs had been there all the time. We just had not read them right.

"It was years back," the Old Timer continued, "and this DXer advised me to always be considerate and helpful to the newly licensed amateur—even to the new DXer. Since then we always have tried to make sure that a new DXer was welcomed and made to feel part of the group at DX club meetings.

Now this was way back before WW II, you must remember," the Old Timer emphasized, "and I never forgot the memory of this freely given kindness. In later years when this elder DX type had worked everything and possibly was spending more time in the sun in his garden than working at DXing, he never missed a new country or a rare one that might count for something. It took me awhile to realize that all those young-to-the-trade DXers he had helped were making sure that he never missed anything when he grew slow of key and fond of memories. In other words, this one over the years had built his own alert system, and it was in place when he slowed. He slowed but never missed any because he knew of everything important that was happening. But keep in mind that he did it by being friendly and helpful to the new licensees. They did not have the Novice or Technician class of license back then. And generally you will find that help given to a Novice or a newcomer to DXing will always be remembered and appreciated.

We had to think over all of this. We thought we knew of whom he spoke and recalled that this old DXer only showed sporadically on the frequencies and always it was when there was some new or rare DX on. We were quite sure, because we also had been a part of the alert system but never considered that others might be involved.

"We always thought that was an inside deal," we had to say, "but for years we checked the antenna every time we went down to the village. If it had moved we knew he had been alerted when something was brewing. That always seemed to be the only time the heading changed from the last big activity. If it had not, we made sure that he got the word. And he did help us when we first got started in DXing. Actually, he took us to our first DX club meeting."

That got a good response from the Old Timer. "Me too," was all he said. For awhile we were quiet, possibly both thinking of those other years. Finally the Old Timer prepared to resume his walk down the hill.

"Your friend who wrote about listening for the Novices and Techs is thinking right," he said, "and one must realize that there is nothing set nor unchangeable in DXing. We should help when we can; we should encourage always. Often these little kindnesses and help will be remembered. I still do." With that he was gone.

Long after we continued to remember his words. Once a DXer gets into the more rarified areas, it is easy to forget the early days and to seek the company of our peers, these often being the big guns. Possibly the realization will come that when we help the newer DXers we help ourselves and DX, generally. And sometimes it may be nothing more than listening down in the Novice and Tech areas for one who hopefully waits for a chance to work some DX.

Long Path

Recently a note came through from Ron Hill, K6OZL, a radio operator on one of the reflagged Kuwati tankers making the Persian Gulf run. At the time the signs were that all the communications gear would be replaced with FCC-approved gear, indicating possible stateside runs. The tanker was shuttling from Kuwait to Turkey earlier this year with Ron hoping that it might soon be getting closer to W/K land.

Ron maintains a daily schedule with W6YO and a few more of the Deserving at 14005 kHz at usually around 1400Z, often being a /mm contact as the tanker travels the Red Sea and the Arabian Gulf. The propagation conditions might be interesting, these being noted on a recent traverse of the Persian Gulf heading for the Straits of Hormuz. When off A6, A4, or 701 the path to the States was over Japan. On the turn into the Red Sea and off 4W1, the path changed to long path and the path over Japan faded. With a number of the Deserving back home dropping in on the schedule, Ron was able to note the different signals and especially those with whom he had some first-hand experience back home.

While beams generally were used, the difference between the single-beam operators and those running stacked arrays was quite definite. On one visit home Ron had helped N6UR install his stacked array, and the resulting signal strength emphasized the reward of the work.

More than once mention has been made that the more attention paid to the antenna system, the bigger the results will be. Beams work best and big stacks of beams work best of all is the whisper often heard in the dark of night.

Ron notes that the best propagation for the 4W1 area is usually around the 1400–1500Z area with the long path opening a bit earlier back in W4/W5 land. All this is told should there be anything in that area that you might be interested in working.

Say You Saw It In CQ

The WAZ Program

15 Meter Phone

259 ..... JA1KRW

20 Meter Phone

690	K3NEE	695	HB9BVV
691	KB9ATM	696	JI2EMF
692	EA3EQT	697	WA4IUM
693	EA3EQS	698	W7AHX
694	KK4LM	699	AJ3K

80 Meter Phone

45	DJ8NK	47	JA3EMU
46	JA4DND		

15 Meter CW

131 ..... LA9XG

20 Meter CW

308	K3UA	310	WB5MTV
309	WA4IUM		

40 Meter CW

86	W6EUF	87	OK2PEX

All Band WAZ

SSB

3230	WB3KUH	3236	EA3BER
3231	OZ1ACB	3237	ZP5ZR
3232	FM5CL	3238	KK4LM
3233	WB8RFN	3239	PY4IL
3234	WB4FLB	3240	HB9DDM
3235	EA5EYP	3241	WA8SXM

Phone/CW

6385	I0UY	6394	W9AA
6386	LA1MBA	6395	JR6CSY
6387	JA8AFS	6396	JH1ROJ
6388	DK9NM	6397	OK3CSC
6389	W2DE	6398	NR2W
6390	SM5DUT	6399	DL2GBB
6391	AG9S	6400	F6DSX
6392	WB1CTV	6401	WA2AOG
6393	K8OOL		

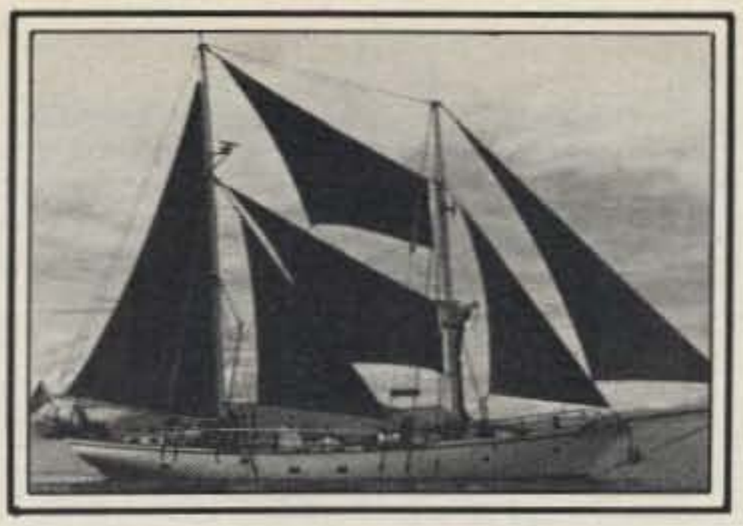
Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (39 cents) size 4½ × 9½ to the W A Z Manager, Leo Haijsman, W4KA, 1044 S.E. 43 Street, Cape Coral, Florida 33904. Applicants forwarding QSL cards either direct to the WAZ manager or to a check point should include sufficient postage for safe return of their QSL cards. The processing fee for all C.Q. awards is $4.00 for subscribers and $10 for non-subscribers. In order to qualify for the subscriber rate, please enclose your latest *CQ* mailing label with your application.

Revillagigedo

About the time you receive this issue of *CQ* there will be action from Revillagigedo with the callsign XF4C. Hector Espinosa Flores, XE1BEF, passes along all the information, this being an effort of the Club de Radio Experimentadores de Colima.

There will be a number of operators—XE1BEF and XE1IAK for sure, plus some additional operators to be added as the planning firms. The group will cover all the bands from 160 through 10 meters, mostly SSB but with some CW, RTTY, and maybe even packet. In 1987 there was an effort from Revillagigedo by XE1BEF and XF4CIS. But with relatively low power and a 2-element antenna plus dipoles, the QSO total was not what had been anticipated. This outing will have a linear plus some new beam antennas. This year they are going to be heard!

The operation will be from the Island of Socorro in the group, this being at 18°43'N and 110°57'W. QSLs can go to XE1BEF, Box 231, Colima, Mexico, or to the CBA of any of the operators whose calls you catch.



This is the sailing vessel VARUA which is providing transportation for the Kingman/Palmyra effort this January and then on to more stops in the Pacific. A classic schooner, the vessel has been charted in the past for other efforts.

Largo Island

This will be an IOTA QRP operation starting January 1st by a group from the Clube de CW Aguias Do Sul in Florianopolis, Brasil. Actually, it is a QRPer club, and this operation will use auto batteries for power. They will operate 40 through 10 meters. The frequencies to be used are 7030, 14060, 21060, and 28060 kHz. The band or bands in use will depend on the propagation conditions. Listen for ZZ5AS and ZZ5FO, these being signed by PP5AS and PP5FO, respectively.

QSLs will immediately be sent via bureaus, and the group will welcome SWL reports. This effort will count for the IOTA, WPX awards as well as for any QRP awards, and even for DXCC should you need a Brazilian contact. That's what is called covering all bases and looking for a few more. The club address is P.O. Box 27, 88,000 Florianopolis-SC, Brasil. Ernst Grimm, PP5AS, is the president of the club, and the effort is intended to show the possibilities of low-power operations. With the improving conditions, they are looking for a good number of contacts. The operation period will be from January 1st to the 7th. Largo Island is in the Santa Catarina Archipelago (IOTA SA-26) and is at 27°42'S and 48°36'W. The only structure on the island is a maritime beacon.

Palmyra/Kingman

Joe Adams, VE3CPU, advises of the planning for the January effort to these two DXCC countries. The operators will be HB9AHL, HB9AEE, F5II, ZF2KN, KD2HE, NM2L, and VE3IEO, Ian, who is also the team leader on the effort.

While the KH5s Palmyra/Kingman are the initial stops, the effort also plans a number of additional DX operations. Perhaps Jarvis might be substituted for Palmyra. And then they will be on to the North Cooks-ZK1, Central Kirabati-T31, and then a stop in French Polynesia at Papeette-FO. The vessel for the trip is the *Varua* which has made a good number of trips in the Pacific, including previous trips to Palmyra and Kingman.

Joe Adams is doing much of the support work for the effort and notes that in early fall when this itinerary and operator's information was being issued there was still need for financial assistance. Write to Joe, VE3CPU, at 5 Romko Court, St. Catherines, Ontario L2N 7A1 if you need information or wish to help. Departure from Honolulu on the first leg southward to Palmyra is set for the first week in January, about the January 3–5th period. There are callsigns in the group that will be recognized from other efforts, and a good bit of DXing can be anticipated from this trip.

222 MHz

The FCC has cautioned amateurs on investing in amateur gear covering only the 220-222 MHz section of the 220 band. While amateurs can continue, for the time being, to operate in that segment, with UPS moving into the picture it is expected that this segment will be lost to amateur use early in 1990.

While the effect on the amateur use of these frequencies is clear, it is a band where more information on usage is available, and the ARRL's *Operating Manual* takes two pages to cover 220 MHz with all the fine print and the allocations and international usage. DXers who may want to know more of the background information should have this book in their shack. It is a valuable reference and often useful for exact understanding. Not only the U.S. amateur allocations are noted, but also the international usage in IARU Regions 1, 2, and 3. Some DXers probably will remember when the HF frequencies were the threatened ones, some even remembering when the 20 meter band went to 14.400 MHz. With changing technology, the lower frequencies are in possibly less danger, but the VHF/UHF amateur bands definitely are in danger.

The future is not always an exact replica of the past, though some seem to expect it to be, these mostly being young lovers and hopeful DXers. Things do change, and one only has to study the November cover of *CQ* to realize how much it has changed. Thus, as the Hero of Mafeking would often shout during those dark nights on the veldt, "Be Prepared! And don't yield a kilocycle!"

5 Band WAZ

As of October 1, 1988, 192 stations have attained the 200 zone level.

New recipients of 5 Band WAZ with all 200 Zones worked:

SM7BYP
G4LJF
W0ZV
OK3CSC
HB9RG

The top 8 contenders for 5 Band WAZ are:

1. N4WW, 199
2. W8UVZ, 199
3. K6YRA, 199
4. K9GX, 199
5. SP6JCY, 199
6. W2YY, 198
7. W7UR, 198
8. KB0U, 198

503 Stations have attained the 150 Zone level.

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This is Eva Perenyi, PY2PE, from Sao Paulo in Brasil. Long a voice easily recognized on the bands, Eva often knows what DX is coming long before anyone else. This photo was taken at a DX convention in Europe last summer.

Hurricane Gilbert

It is acknowledged that years back emergency work and traffic was considered the main thrust of amateur effort. Many still do consider it to be so, but over the years amateur activity has often moved in other directions. One realizes that emergency work to many DXers is something that one might hear of, but it is also thought of as something that might not affect you. Some have found that it can and does, while some have also found that they know little about emergency traffic or message-handling.

The North Florida Amateur Radio Society, based in the Jacksonville area, had some comments to offer after the emergency caused by hurricane Gilbert's swath across the Caribbean and the west Gulf of Mexico. In their *Balanced Modulator* a month or so back there was a review of the hurricane and some of the problems encountered.

Briefly, the sequence was the raking of Jamaica when practically all commercial communication systems were wiped out. The next day, Tuesday, the Caymans were hit with heavy damage. Amateur Emergency Nets were established on 20 meters to gather information needed by the emergency coordinators and to assist in the movement of relief supplies and equipment. With no communications at the Kingston or Montego Bay airports, amateur communications was used for air traffic and landing control. Strange and unfamiliar callsigns started to show on 20.

After Cayman it was on to the Yucatan Peninsula with Gilbert. Again just about all communications was lost, amateur radio filling in with one amateur operating mobile as soon as the height of the storm passed, he passing information on the situation on Cozumel. In Florida the TV stations watched the amateurs handling emergency communications. Even the national news programs monitored the amateur effort, this being about the best on-the-scene source.

All this may sound straightforward. There is the amateur standing firm in the middle of the storm, mike or key in hand, passing the word just like Walter Cronkite did in London during the blitz of the forties. But there were problems, and many came from inexperience and impatience. Many of the problems were with health and welfare messages, these being offered, sometimes demanded to be handled, when the stations were trying to handle only "emergency" traffic. Many with such mes-

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Total countries are now 319. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be made at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement. All updates must be accompanied by an SASE for confirmation. The fee for endorsement involving the issuance of a sticker is $1.00.

CW

N4JF	319	K6JG	314	K4XO	311	WB4RUA	300	IT9ZGY	292	W1WAI	283
K2FL	319	K9AB	314	K8PYD	310	W0SR	300	K2OWE	292	G2GM	282
W9DWQ	319	DL8CM	314	AA6AA	309	DL6QW	300	N5DX	291	JH1VRQ	282
K4CEB	319	N6CW	313	W9RY	308	W7CNL	299	WA4JTI	290	K1VHS	282
K2TQC	319	K1MEM	313	EA2IA	308	K3FN	298	KQ9W	290	N4AH	281
K9MM	318	N4MM	313	W4OEL	307	DJ7CX	297	IT9QDS	290	K7ZR	280
ON4QX	318	W2FXA	312	N2KW	307	K8LJG	297	W1WLW	289	I5XIM	280
SM6CST	317	K6EC	312	SM6CTQ	306	WD9IIX	296	W4BV	289	W2LZX	280
W6PT	316	OK1MP	312	K3UA	306	N8MC	295	K8NA	288	W9NUF	280
DL1PM	316	SM3EVR	312	K9IW	305	W9WAQ	295	W6YQ	287	HB9AFI	279
N4PN	315	YU1HA	312	AB4H	304	W0HZ	295	G2FFO	287	DL1QT	277
DL7AA	315	N6AR	311	W6SN	304	N5FW	294	WA4DAN	287	KA3R	276
N6AV	315	DJ1XP	311	W0IZ	303	K9BWQ	294	W9SC	287	W6DN	276
K6LEB	315	W6ID	311	WA8DXA	302	IT9TQH	294	NN4Q	286	DJ2PJ	276
W1NG	315	DL3RK	311	YU2TW	301	NN4Q	293	K4CXY	286	K4SE	275
W4BQY	315	K9QVB	311	I3OBO	301	WD9IIC	292	I8WY	286	K2JF	275
W8KPL	314										

SSB

N4JF	319	OZ8BZ	315	WD8MGQ	310	W2LZX	303	YU7KV	297	F6BFI	287
K6WR	319	K9AB	315	K1UO	310	KB0U	303	XE1OW	297	N8BJQ	286
DL9OH	319	N6AW	315	KU9I	310	KB3OQ	303	WA4ECA	297	VE6PW	286
F9RM	319	K1UO	315	W6SN	310	K0GT	303	KS0Z	297	N3ARK	286
W6EUF	319	K9BWQ	315	N6AHV	310	K1MEM	302	WB3GPR	296	N9CPW	286
VE3MR	319	PY2DBU	315	KB9OC	310	N5FG	302	KB3KV	296	K9MNT	285
W4UG	319	YV5DFI	314	W8IMZ	310	W6FET	302	I0SGF	296	KB5RF	285
OZ3SK	319	K6JG	314	K2JLA	310	I3OBO	302	K8NWD	296	I8IGS	285
K2FL	318	VE3XN	314	NY5L	310	K9UAA	302	W0IYR	295	K4JLD	285
DJ9ZB	318	YS1RRD	314	N4PN	309	KP4EQF	302	KK0C	295	KD8V	284
W4NKI	318	K8LJG	314	ZL1BIL	309	N5FW	302	G3XTT	295	KC7EM	284
4Z4DX	318	W3GG	314	WD9IIX	309	I5EFO	302	W6MFC	295	KB2MY	284
W4DPS	318	I2LLD	314	K9QVB	309	KQ9W	302	VE3XO	295	WB3HAZ	283
W0YDB	318	W1NG	314	W2FGY	309	I2MQP	302	K4LR	295	VE3MV	283
ZL3NS	318	W1LQQ	314	KR9O	309	K4CXY	302	XE1MDX	295	IN3ANE	283
W9DWQ	318	W8JXM	314	WB3DNA	309	WD8PUG	302	WA2FKF	295	ZP5JCY	283
VE1YX	318	DL6KG	314	VK4VC	308	I8XTX	302	KI3L	295	CX4HS	283
W4EEE	318	SM4CTT	314	YV5AIP	308	WB4NDX	301	IK8BQE	295	AE5B	282
VE3GMT	318	W8ILC	313	N6AV	308	WA3HUP	301	WD0BNC	294	AI9R	282
W9JT	318	EA4LH	313	N4KG	308	VE3FJE	301	I5BDE	294	TG9EP	282
ZL1AGO	318	W8PCA	313	I8KCI	308	W8ILC/QRPp	301	K1VHS	294	N1ALR	282
K6YRA	318	N2SS	313	I4EAT	308	W9OKL	301	WB3CQN	294	WA8YTM	281
ZS6LW	318	VE7WJ	313	AI8M	308	YU2TW	301	SM6CST	294	F6BFI	281
KS2I	318	K4XO	313	NS7Z	308	N4CRU	301	KE4HX	294	K9TI	280
PY1APS	318	N6AHU	313	VE7DX	308	KZ0C	301	VE3DLR	294	ZL1BOQ	280
N4MM	317	OE2EGL	313	YV1AJ	308	N8BKF	301	K4SE	293	G4FAM	280
I8AA	317	W7OM	313	NN4Q	308	WT4T	301	KC8JH	293	KU9Z	280
I0ZV	317	F2MO	312	WA4DAN	308	KB2HK	301	AI5I	293	XE1XM	280
DJ1XP	317	W0SD	312	VE4SK	307	K7LAY	301	W9NUF	293	WD9IIC	280
K9MM	317	K9RF	312	WB1DQC	307	AG9S	301	G4GED	293	W9VA	280
KD8VM	317	K4MQG	312	I0MBX	307	KB9KD	301	KD5ZM	293	KB5DN	279
W2SUA	317	K9HDZ	312	KV2S	307	K2JF	301	WB6OKK	293	EA6DE	279
CT1FL	317	LA7JO	312	VK3JF	307	W0ULU	301	W5LLU	293	JH8NYK	279
N7RO	317	LU3YL	312	NJ2C	307	W4UW	301	WA4LOF	292	KX5V	279
W0SFU	317	W7FP	312	KA9ABC	307	W4BQY	301	AC0A	292	K4BYK	278
OE3WWB	317	N6OC	312	W4UNP	307	VE4AT	300	VE3FEA	292	VE3IUE	278
VE2WY	317	K3UA	312	WA2MID	307	I1POR	300	VP9CP	292	KB8O	278
TI2HP	317	W6DN	312	K9HQM	307	SV8CS	300	W8LKG	292	KG9N	278
K5OVC	316	9H4G	312	N4KE	306	WZ4I	300	SV1JG	292	WB0UFL	277
YV1KZ	316	VE3MRS	312	KC8EU	306	WB5TED	300	WD9GQV	292	W4PTT	277
I0AMU	316	W4SSU	311	KB5FU	306	I2ZGC	300	VE3IPR	291	KB0SY	277
W3AZD	316	K6EC	311	K8CMO	306	NW5K	300	W4JFE	291	KB7VD	277
OA4OS	316	I4LCK	311	XE1OX	306	WB6GFJ	300	DU9RG	291	WD0DMN	277
OK1MP	316	W0SR	311	KE3A	306	JH1VRQ	300	XE1CI	291	N0AMI	276
W9SS	316	K8NA	311	W6NLG	306	WB6PSY	300	VE3CKP	290	N7ASL	276
IT9ZGY	316	NJ0C	311	K3LUE	306	IT9TQH	300	WE2L	290	WA4OPW	276
EA2IA	316	N2KW	311	EA1QF	305	WA0TKJ	299	KC2FC	290	KC2RS	276
I8ACB	316	W2CC	311	NA5W	305	I6PLN	299	JA5PUL	289	WA9IVU	276
OZ5EV	316	K9IW	311	KZ8Y	305	KA8T	299	W9TA	289	WA9RCO	276
K8PYD	316	G4CHP	311	K8VFV	305	DJ7CX	298	G4ADD	289	K0HQW	276
XE1AE	315	AI8S	311	WB4UBD	305	K9SM	298	AI9U	289	I2WZX	276
I8YRK	315	KZ2P	311	K4RIG	305	I8LEL	298	KA3HXO	288	I8INW	275
N6AR	315	KB8DB	311	K8ZZU	305	JH4PRU	298	OK1AWZ	288	WB1EAZ	275
I4ZSQ	315	IV3YRN	310	I4WZK	305	EA9IE	298	WA6DTG	288	VE7BSM	275
I8KDB	315	DK2BL	310	W6BCQ	304	XE1HI	298	EA3KW	287	VE5FX	275
K9LKA	315	AA6AA	310	KB4HU	304	K4LR	298	AB9E	287	KE4VU	275
N4WF	315	WA4JTI	310	KC8YM	304	K5DUT	297	W9SC	287	I2EOW	275
YU1AB	315	AB9O	310	XE1KS	303	HP1JC	297	PA0XPQ	287	W0FF	275
ON5KL	315	WA4WTG	310								

Say You Saw It In CQ

CQ DX Awards Program

SSB

1633	Y8IZN	1636	NS8R
1634	YC8VFB	1637	N4SKE
1635	I4WZK		

SSB Endorsements

310	OE3WWB/317	300	KC8YM/304
310	KS2I/318	275	IK8BQE/295
310	W7OM/313	275	W9SC/287
310	K9IW/311	275	VE6PW/286
310	KB9OC/310	275	WA8YTM/281
300	WA4DAN/308	275	W9VA/280
300	YV1AJ/308	200	KU0S/240
300	K9HQM/307	150	N4SKE/161
300	I4WZK/305		

CW Endorsements

300	K9IW/305	275	W9SC/287
275	W9WAQ/295	3.5/7 MHz	W0JLC
275	WA4DAN/287	1.8 MHz	W0JLC

Total number of active countries is 319. The basic award fee for subscribers to CQ is $4. For non-subscribers, it is $10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are $1.00. Updates not involving the issuance of a sticker are made free when an s.a.s.e. is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

sages considered them top emergency traffic. They are not. Health and welfare are those messages concerned with a relative or friend who is known to be, or thought to be, in or close to the disaster area. Often the emergency station was overwhelmed by callers trying to file health and welfare messages. Advice that they did not handle this traffic did little good. When it was all over, the FCC indicated that it would like some suggestions from amateurs on how to handle such emergency communication work. A number of the ARRL Official Observers in the southeastern part of the country are or have been studying the record, and there undoubtedly will be some recommendations.

How does this affect DXers? Sometimes more than one might anticipate. It should not be necessary to point out that DXers are the long-distance operators, and often that is just what is needed. Gilbert, Mexico City, Grenada, Anchorage . . . much of the emergency communications were carried on the higher frequencies. Usually DXers were involved, trained and knowledgeable or not.

As one does not know when an emergency might drop into one's shack for an uninvited visit, a little advance thought can be helpful, and actually only a little is needed. A reading and understanding of the message form is helpful. It is even more helpful to have it typed up for quick reference and especially the message precedence. Knowing how to locate your local Emergency Coordinator (amateur) is useful, as is a clear understanding of what is health and welfare traffic.

Most DXers realize that this is far afield from their normal interest and one aspect that they have no plans to visit. However, it does happen that one finds oneself at times far from the familiar skies, and a little planning can save a lot of confusion. More than one DXer has found the problem dumped into his lap without his asking, and though you may not have thought of it, DXers often are the ones best equipped to help.

Should you wonder about that item telling about the aviation traffic and landing orders being handled on amateur radio, keep in mind that the aviation frequencies start at about 108 MHz and run up to around 140 MHz—just below the 2 meter band. Maybe it took some jiggling; maybe it took some handhelds. A few years back there was a big drug bust in the bay area here, a really big and complex operation. For short-range communications they used altered CB rigs fixed to operate between the CB channels. They also used a lot of amateur gear. Very interesting. More interesting is what the entrepreneurial types can do to we Deserving types if we are not alert.

Bob Johnson, WB9YXY, is 26 years old and on the DXCC Honor Roll. First licensed at age 14, Bob learned DXing early and well, working everything available since then. He has also operated as JY8XY and acknowledges that in the past he did skip school to work some needed ones. He is a young DXer, but he has a lot of counters.

Youngest Honor Roll Member

Some may have noticed that we have been trolling for the youngest on the Honor Roll—not when you got on it, but how old you are now. After about six months of trying we have come up with Bob Johnson, WB9YXY, who was born in 1962 and was first licensed in 1976. That should put him still in the 26-year-old bracket, and that is young for such a long and arduous award.

It took ten years to go from the first license to the Honor Roll. Along the way Bob picked up some treasures such as XW8 Laos and 3Y Bouvet. Currently his DXCC total is about the 320 mark, depending on what the mails brought in the last month or so. Not content to work DX, he has operated as JY8XY and on that trip also visited 9K2 and A6 lands.

Currently Bob is waiting for a few cards to finish out a 160 DXCC and a 5BDXCC. Also he is filling out the needed ones for a 5BWAZ, but that may take a few months longer. The station is a TS-830 with an MLA-2500, a TH6DXX flying at 70 feet, and a 2-element beam for 40. He splits his operating between SSB and CW, but does like high-speed code, the High-Speed QRQ Morse, and similar contests.

What does he think of DXing? We quote at length! "The best part of my career, though, has been the opportunity to meet and make so many friends through ham radio. I believe that DXers are really each and all Ambassadors of Goodwill, and a true-blue DXer's station is actually an embassy where we can meet and shake hands over the airways."

Son of a gun! Already this one is talking like the Old Timer! We think that WB9YXY is definitely something of a DXer and the youngest Honor Roll member we came up with. Something good to note.

W6AM Museum

In recent months we have run a couple of articles on the museum to save and display W6AM gear, trophies, and other memorabilia. Jan Perkins has petitioned the FCC for a trusteeship of the W6AM call and is heading the drive to get the museum established. However, some clarification might be needed, and the following is from a letter received from Gary Pesselt, WB6PSY, of the Southern California DX Club:

"The Southern California DX Club is NOT currently working on the W6AM museum as stated. Jan Perkins, N6AW, is not a member of this club and hasn't been in four years or more. The club does not currently hold the call W6AM nor is the FCC issuing SK calls to clubs. The club has no knowledge as to the parcel acquired as mentioned in the article."

That is to get everything straight. Jan Perkins is working on the museum, and that is definite.

Rotuma

Understanding this one has caused a few wrinkled brows among DXers and possibly the nuances in the thinking may be slow in being understood. Right from the inside we whip out this lucid explanation. If you understand this easily, you will understand most anything.

". . . when the ARRL Board of Directors adopted new working in January 1988, they made a change to Rule 2 which now seems to qualify Rotuma for separate country status.

"Prior to January 1988 one had to make a distinction between 'island nations' and 'mainland nations.' Old Rule 2(a) stated, 'islands situated offshore from their governing area must be geographically separated by a minimum of 225 miles of open water. This point is concerned with islands which are part of an island group.' "

Then old Rule 2(b) went on to say: "Islands forming part of an island group or which are geographically located to an island, or island group, which have a common government, will be considered as separate entities provided there is at least 500 miles of open water separation between the two areas in question."

Fiji is clearly an island nation. Because old Rule 2(a) applied only to islands offshore of "mainland" nations, Rotuma could not qualify under old Rule 2(a). Further, since Rotuma is but 280 miles from the adjacent Fijian Island group, it could not qualify under old Rule 2(b) either.

Then in January 1988 came the new working of the DXCC criteria. Rule 1 states (in the pertinent part) that ". . . an independent country or nation-state having sovereignty (that is, a body politic or society united together, occupying a definite territory and having a definite population, politically organized and controlled under one exclusive regime, and engaging in foreign relations—including the capacity to carry out obligations of international agreements) constitutes a separate DXCC country by reason of government."

There is no disputing that Fiji is a DXCC country by reason of government. Now comes the new Rule 2 stating: "Separation By Water: An island or group of islands which is part of a DXCC country established by reason of Government, Point 1, is considered as a separate

5 Band WAZ #68

A radio operator for the French Gendarmerie Mobile, Hubert Loubere, F6DZU, was the second French amateur to attain the coveted 5 Band WAZ Award. As in many cases, 80 meters was the hard one to fill out for the award. F6DZU did it with power not especially high and with nothing exotic for antennas.

Just off the Bay of Biscay and south of Bordeaux, Hubert Loubere, F6DZU, works for the Gendarmerie Mobile at Biscarosse. He was first licensed in 1969 as F1AVO, changed license in 1975 to operate on all bands and modes, and picked up his present call then.

Forty years old, F6DZU operates on the communication network for the French police in his employment. He is married with three children.

Hubert hold DXCC with 305 countries on the wall as of a while ago, has 5BDXCC for SSB which he got in 1980, 5BWAS #68, and as of this writing (again, a while back) needed a handful to fill out a 5BWAS. Actually, Hubert does work CW. He has QSLs from BY1PK and S9VCT to prove it.

The antenna system is a three-element Mosley beam up 75 feet. On the lower bands it is multi-dipoles for 80 and 40 oriented on the north/south path. A Kenwood TS830S with an outboard VFO is used with a Swan 1200X amplifier. All this brings home 400 watts of power.

The lower bands are always the hardest to fill out, and the QRM from stations in eastern Europe when trying to work the path to Asia and Oceania on 80 meters doesn't help.

Hubert does jump in on the DX contest, SSB only. He also drops in on a couple of nets including the VK9JS net at 14220 kHz and the Pacific DX Net 14265 kHz. On 40 he again picks up the Pacific DX Net at 7085 kHz.

DXCC country under the following conditions: (a) The islands or islands are situated offshore, geographically separated by a minimum of 225 miles of open water from a continent, another island or group of islands that make up any part of the 'parent' DXCC Country . . . ."

Briefly put, the foregoing does indicate that a change in mileage was written into the new criteria, reducing the mileage from 500 miles to 225 miles. If this one gets the "Big Okay," look for many more new ones to pop up under these rules. Then again, you have to ask if this was the intention of the new rules.

We copied the analysis from the Northern California DX Club bulletin, that club always noted for its keen understanding of some of the Great Mysteries of DXing.

WAZ

Mike Smedal, 5B4TI, has submitted cards for his second 5BWAZ, it taking 2½ years to fill out a second one. The first one came when he was A71AD in Qatar. Mike is currently located near Nicosia on Cyprus. He was 5BWAZ #102 from A71AD. We will check to see if this ever was accomplished previously, many thinking working one 5BWAZ is a lifetime's effort.

Many stations have taken advantage of *CQ*'s WAZ RTTY Awards Program. W4KA advises that the following stations have been awarded RTTY certificates, as of October 1, 1988.

RTTY Mixed: F8XT, TG9VT, DK3CU, WB5HBR, JA1ACB, JA1JDD, W1DA (first U.S.A.), and WA6PJR.

20 Meter Single-Band RTTY: JR2CFD, TG9VT, JA1ZF, I8AA, JA1DSI, W1DA, JA3AUG, WA6PJR, I5FLN, JA1JDD, JE1DTV, F6HUJ, JH1BIH, W2FG, UT5RP, and NJ0M.

15 Meter Single-Band RTTY: I5FLN.

10 Meter Single-Band RTTY: KH6VP.

The WNZ Novice Program: Five stations have been awarded certificates, completing the WNZ Novice Award. They are: KA0GZS, KA7AIG, KN4RID, KA3RBC, and WB5RUS.

Some Short DX Notes To Start The Year

The *CQ Amateur Radio 1989 Buyer's Guide* is available at most DX shops, and it can be helpful in planning your station upgrading.

Jim Smith, VK9NS, showed all the way from Norfolk Island for the Kansas City DX Club's Carp Tournament. Showing with 5 fishing poles, Jim won with a 14 pound 7 ounce fish. For the tournament on the Kaw River 127 DXers showed up, many armed with handhelds to report their triumphs. W0JM won the Old Timers Division with a 5 pound snapping turtle. Mean it was!

W6TPH urges early registration for the International DX Convention at Visalia, California from April 21–23. KE6ZE can furnish registration information; pre-registration closes March 20th. The Northern California DX Club is the host this year.

K4PR has shut down the 5BWAZ newsletter after two years of labor in the WAZ vineyard. Bob is hoping someone will pick up the torch.

The 4W-Yemen plan was finally scrapped. While it did seem that everything was lined up, the final okays were hard to corner. IA0KM may make one of its showings in late December (December 20–22). I0IJ is handling the details. Incidentally, the "1" prefix is still unofficial. The ITU list starts the numbers with 2AA–2ZZ and everyone, just about, has worked that country. UA1OIL is back on Franz Josef and there for a two-year tour—all bands, CW and SSB. RA0AD/JT5 will be in Mongolia for two years; he likes the lower frequencies but tries them all. You might check the Great Circle distance to Mongolia from your QTH. From this point on the California coast Ulan Bator is closer than Recife in Brasil. JX1UG will be on Jan Mayen until April.

The seals in South Georgia are a problem for VP8BBB's antennas, and Tony sometimes thinks of taking them down, though he will be there well into spring (here), fall (there). VP8BUB is being heard from South Georgia and will be there until next year. Steve does not favor pile-ups and often is found on nets or lists. Vietnam operation rumors continue, though actually getting operating permission does seem the big hurdle. Several Eastern Bloc nationals travel there, but the only things DXers get are eternal hope and the promise "It's coming!" Just don't ask when.

The quest for the youngest member of the DXCC Honor Roll did turn up a good number of young DXers (relatively speaking), these mostly in the just-turned-30 group. Retrieving the correspondence from our files, and we probably missed one or two, we turned up Murray Adams, now 31 years old, who made the Honor Roll in 1988; Phil Koch, K3UA, also 31 years old, who made it in 1983 at the age of 26; Jack Jackson, N4JJ, who made it in 1985 at the age of 36; and Stan Dicks, W8YA, who made it in 1978 when he was 31 years old. Stan says he has now matured to the point where "young" is a relative term. He has long passed the point where he thought "middle-age" started at 25. There were a few more, but this gives an idea that may help refute the belief that DXers are often old, sometimes cranky, and always embedded in the "Golden Years." And to figure your niche in the scale, what were you doing the year WB9YXY was born (1962)? We still think Bob's achievements are noteworthy and believe that there are more such DXers out there.

73, Cass, WA6AUD

QSL Information

Back a few months you may have encountered some CK/CZ or VX prefixes. These were used to mark International Development Day in Canada, and VE7AAP and VE7ACM at Port Alberni give the decodes: CK1 Newfoundland, CK2 Labrador, CZ1 Maritimes, CZ2 Quebec, CZ3 Ontario, CZ4 Manitoba, CZ5 Saskatchewan, CZ6 Alberta, CZ7 British Columbia, CZ8 Northwest Territories, and VX1 Yukon.

AT0G to F6FNU
AX9LZ to JH9GRM
A35PP to ZL4OS
AY3F to LU6AFZ
AY6D to LU1DJU
AX0NE to VK9NS
AZ6ETB to LU6ETB
BT4YL to JA3UB
BT5MI to JA1FUY
BT0LS to VK3CNT
BT0ZML to JR1MXT
CR0CBU to CT1CBU
CR3EU to G3PFS
CY9DXX to VE1AL
ED3IPL to EA3CUU
ED5PFP to EA5FHE
EX0DR to RW3DR
EK0ABA to UA9OBA
EK0AKR to UA9OBA
FH5EF to F6EZV
FT2XE to F6ESH
GB4CDX to G4JVG
GB75DXN to G4YDO
HB9CVB/ET to HB9CVB
H22H to 5B4MF
HD2A to HC2GRC
HZ1AB to K8PYD
HL9JZ to KA1OXO
HC1MD to K8LJG
JW1CY to LA1CY
JW5E to LA5NM
JX1UG to LA5NM
JX8KY to LA8KY
K9EL/VS6 to K9EL
L4D to LU5DCK
LR1V to LU1VZ
LS1E to LU8DPM
LS0F to LU1FT
OD5VT to HB9CRV
OH1XX/CT3 to OH2BH ('88 CBA)
OK1XC/JT to OK1XC
OG0HFC to OH2A
OX3SG to LA5NM
T28RK to K8JRK
VP8BRR to G4YLO
VP8VK to G4RFV
VP8BNO to G3LZQ
VP8BRE to G0ACJ
XF4C to XE1BEF
ZB2FX to G3RFX
ZD8IAN to G4ZAO
ZD8MAC to G3IFB
3D2OM to WA5Y
3D2YL to N5IMM
3B9FR to F6FNU
9Q5DX to KQ3E
A22MH to Hans Myer, Box 369, Gaborone, Botswana
AY9D to Box 35(1846), Androgue, Argentina
C30EAC to DK8FD, Alexander Wilhelm, Feld tr. 13, 6116 Eppertshausen
DJ9ZB to Franz Langner, Box 150, D7637 Ettenheim, West Germany
HD8GZ to Luis Hildalgo A., Box 777, Guayaquil, Ecuador
HS0B to Box 2008, Bangkok 10501, Thailand
L7D to Carlos Affranchino, Box 35 (1846), Androgue, Argentina
LU9DBK to Carlos Affranchino, Box 35 (1846), Androgue, Argentina
VP8BUB to British Antarctic Survey, Bird Island, Falkland Islands via England
VU2RCK to Dick Kwiatkowski, American Embassy/ROC, APO New York 09662
V85GA to Gerald Ashcroft, Box 1200, B.S.B, Brunei
ZK3RVC to Bing Crosby, Box 344, Forster, 2428 NSW, Australia

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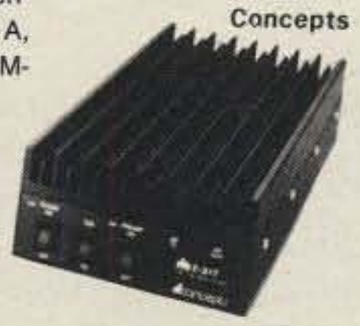
YAESU
FT-23/73/33/727R
FT-2/1/709R/H
FT-1903/1123
FTH-2005/7005

ICOM
IC2AT/12AT
ICO2AT-32AT
IC2/4GAT
IC-A2/U16
IC-448A

Landmobile HT's
ICOM: U16, H16, V100, U400
MAXON, MOTOROLA,
YAESU: FTH 2005/2007
UNIDEN, REGENCY, KING, TAD
MARINE ICOM: M5, M55, M700
AVIATION ICOM: A20 H.T.

PRIVATE PATCH V, Duplex 8000

RF Concepts



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World of Ideas

a monthly feature by
DAVE INGRAM, K4TWJ

A LOOK AT THE WORLD AROUND US

OSCAR 13: Amateur Radio's New Super Satellite— Part II

As you will recall, our November 1988 "World of Ideas" column highlighted amateur radio's new OSCAR 13 super satellite. We discussed each of the bird's operating modes, overviewed equipment requirements, and explained the basic concepts of communicating via satellite. This month's column continues the OSCAR 13 story with our special ideas on satellite equipment selections, antenna views, and notes on station assembly. Hopefully, we have inspired you to join today's OSCAR 13 activities or at least "listen in" on its fascinating action. Modern Phase III type satellites are quite different from their limited-range and briefly accessible counterparts of past decades. Today's OSCAR 13, for example, supports globe-spanning communications for many hours each day and only minor antenna-tracking adjustments are required during usual one- or two-hour operating stints.

The general air and friendliness of satellite QSOs is grand, and it attracts many amateurs' interest around the world. If you really enjoy talking with others rather than simply exchanging the usual statistics, you will love OSCAR 13. Come on in and join the fun. It's great!

Satellite Equipment Selections

Expanding your amateur radio interests usually involves purchasing some new equipment, but investments in multimode VHF/UHF gear suitable for OSCAR operation has never been more logical and attractive. That statement is especially true if you live in an area sensitive to large HF beam antennas. OSCAR arrays are quite small, and you can even mount them on a camera tripod placed on an apartment balcony or patio. The DX is often better than 20 meters, and you do not need even a quarter-kilowatt to work them. In fact, you can easily carry a complete OSCAR setup into a motel room or vacation condo and get on the air faster than putting up an HF antenna.

Concerned about resale values? Additional amateur satellites operating the VHF and UHF bands are also planned for the near future, and terrestrial activities on upper bands (like packet and tropo DXing) are expanding daily. Four micro-

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Fig. 1.– Yaesu's new FT-736R is a complete Mode B, J, and L OSCAR 13 station in one cabinet. Simply add GaAsFET preamps for 2 meters and 70 cm, antennas, and enjoy.

satellites favoring packet are slated for launch aboard the European Space Agency's mission 34 rocket in June 1989, and our ultimate system of Phase IV super satellites is moving closer to reality every day. If you decide to sell your VHF gear and return to only HF, you may need to chase off waiting buyers!

A very popular rig among all OSCAR enthusiasts is Yaesu's new all-in-one-box FT-736R transceiver shown in fig. 1. This highly updated version of their well-known FT-726R is factory equipped for SSB, CW, and FM operations on 2 meters and 70 cm, it operates crossband with full duplex action, and it includes auto tracking of two bands with one knob for satellite work. Internal slots are provided for optional 1.2 GHz, 220 MHz, and 6 meter boards. Power output on 2 meters and 70 cm is 25 watts. Just add a pair of 10 to 13 dB gain antennas, and a GaAsFET preamp, and you're ready for action.

A brief scan across the FT-736R's front panel indicates this is really "going in high style." Notice it features a built-in AC supply, 100 memories, speech processor, IF shift, noise blanker, and optional iambic keyer. You can even interface it to your home computer for automated station madness.

If you prefer a totally deluxe OSCAR setup, ICOM's 2 meter IC-275H and 70 cm IC-475H are the satellite enthusiasts dream rigs (see Fig. 2). These 100 watt output multimode transceivers include every imaginable operating feature and even weather-band reception. They are loaded for bear! ICOM's optional CT-16 satellite interface unit "slaves" the IC-275 and IC-475 for single-knob satellite-tuning/frequency-tracking, and you can even shift it for Doppler compensations. These high-power units obviously require external AC supplies, but since you transmit on only one rig at a time, ICOM's PS-30 supply easily and simultaneously powers both rigs. ICOM also manufactures optional GaAsFET preamps for both units. Adding Mode L operation is also a snap; just include ICOM's 1.2 GHz band IC-1275 multimode transceiver and a loop Yagi antenna. An impressive number of all-ICOM stations are continuously apparent on all OSCARS, and their signals always stand out beautifully.

Kenwood's multimode satellite rigs are the attractive 2 meter TS-711A and 70 cm TS-811A transceivers (see fig. 3). These 25 watt output "twins" are also packed with features and make an impressive "OSCAR pair."

Budget-conscious amateurs anxious to join OSCAR 13 action should seriously consider Ten-Tec's 2510 Satellite Station/Converter shown in fig. 4. This compact unit holds a 10 watt SSB/CW 70 cm transmitter and tuning-slaved GaAsFET 2

Fig. 2.– ICOM's IC-275H and IC-475H transceivers are satellite enthusiasts' "dream rigs," and their optional CT-16 interface (right) creates Collins S-line type transceiving via one rig's dial. (The rigs look alike; thus, only one is shown.)

Say You Saw It In CQ

Fig. 3.– Kenwood's TS-711A and TS-811A satellite "twins." An attractive pair with impressive performance. (The rigs look alike, thus only one is shown.)

Fig. 4.– Ten-Tec's 2510 Satellite Station/Converter for Mode B operates in conjunction with your HF transceiver. It is economical and works like a champ.

meter receive converter for Mode-B operation. Simply connect a mike to the 2510, direct its converter's output to your HF receiver or 10 meter transceiver, plug in antennas, and enjoy. I have personally used a 2510 for several years and love its single-knob transceive operation. It's just like using an HF rig—no "signal zeroing," a definite blessing in OSCAR work. The 2510 also operates full duplex, so you can copy your own (2 meter) downlink signal while transmitting. I added an external Lunar GaAsFET preamp "in front" of my 2510, and reception is great—just like HF!

Present owners of Ten-Tec 2510's should contact Ten-Tec for crystals and expansion boards to operate OSCAR 13. Factory-supplied 2510s covered only 435.0 to 435.5 MHz transmit, and OSCAR 13 works 435.475 to 435.575 MHz. The new board is model 2511, and its cost is economical. Additionally, many early 2510s were RF-peaked for maximum output around 435.100 and "drop off" at 435.500 MHz. Do not "dig in" and butcher your prized unit. Check with Ten-Tec directly on simple modifications for high OSCAR 13 output.

Bill Olson, W3HQT, of Down East Microwave (Box 2310, RR1, Troy, ME 04987; phone 207-948-3741) is a good person to know when you are thinking of Mode-S and Mode-L gear. Bill is not a big advertiser, but he had the goodies at surprisingly low prices. One example is his imported L&W 2400 MHz to 2 meter downconverter kit and complementing 2400 MHz Avantec-equivalent GaAsFET preamp (.8dB NF) for $155 and $139, respectively. Bill also has linear amplifiers, loop Yagis for 1.2 GHz, and more.

John Beanland of Spectrum International (P.O. Box 1084Q, Concord, MA 01742) is another good satellite equipment importer. John's goodies include Microwave Modules converters, transverters, and amplifiers plus Jaybeam antennas. I have used those antennas until they literally disintegrated from horrendous weather, and they still work well. Great products, indeed. If you need additional information on the previously mentioned products, please write directly to them rather than querying me. I do not mean that offensively; just no one knows a product—what it will and will not do—better than its manufacturer. If you need advice assembling your setup, however, I frequent 14.180 to 14.225 MHz Sundays 2200 to 2300 GMT just to talk with friends (and I'm on OSCAR 13 when XYL WB4OEE relinquishes the mike). If you write, be patient for an answer, include an SASE, and understand I use advertisement sheets for my new book *OSCAR Satellite Revue* for replying. The more questions you ask, the more in-between ad text reading of handwritten notes.

Satellite Antenna Systems

As previously discussed, circularly polarized antennas are most desirable for communicating via a rolling satellite in space. Cross Yagis with their phasing networks and polarity switches are the popular choice for 2 meters and 70 cm. These arrays are readily available from KLM, Cushcraft, Spectrum International, and their dealers nationwide. If you like "full package" systems, Cushcraft's AOP-1 combo shown assembled in fig. 5 is a gem—20 elements on 2 meters, 16 elements on 70 cm, a mounting crossboom, and all hardware ready to assemble. Loop Yagis like Down East Microwave's antennas are favored for 1.2 GHz, and small satellite TV dishes are used for 2.4 GHz. Check your local TVRO outlets for fold-up 5 or 6 foot dishes that sit on a patio or lawn. Simply place them in a clear sky-view area and point them at the satellite by hand. Since the dish will be close to your rig, you can step outside and "tweak" their aim by hand.

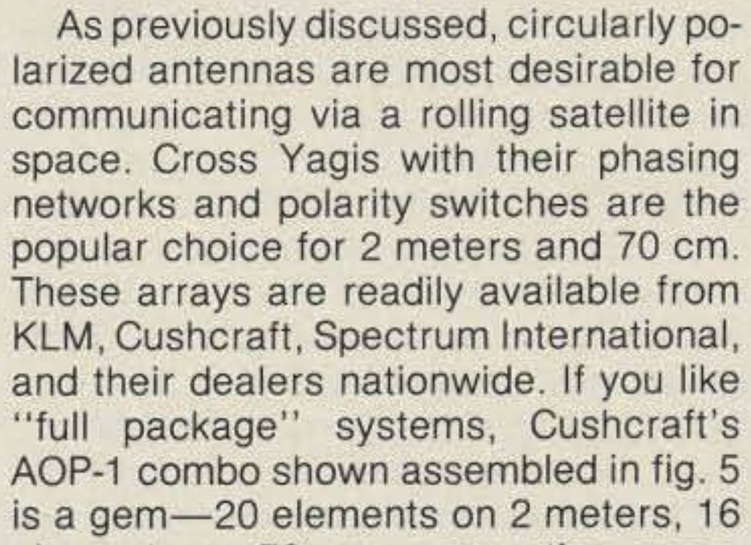

Fig. 5.– Cushcraft's AOP-1 satellite antenna package includes 2 meter and 70 cm "twists," crossboom, and mounting hardware at an economical price.

Always insulate your satellite antennas from their supporting crossboom to avoid crosstalk and downlink receiver desensing. Strips of heavy rubber or shims of plastic tubing are good for this purpose. Several wraps of high-quality electrical tape can also be used if you are in a bind. Likewise, mount one of your twist antennas canted approximately 30 degrees (as viewed from their rear) to minimize cross induction of RF energy. I also suggest "dropping" their coax cables down each side of the antenna system's supporting mast or mini tower with 4 or 5 foot separation between those cables to further sidestep desensing while minimizing cable lengths and reducing line losses. Cables neatly taped together may look better, but they are equivalent to an outdoor "open air" transformer.

In Part I, I emphasized locating your antennas and rig within 20 feet of each other to reduce cable losses. Hardline coax can be used if that distance must be increased, but hardline and its connectors are quite expensive and difficult to handle. Why make life difficult? The best overall solution I have found is Certified Communications new CQ-4XL "poor man's hardline" cable. It looks similar to regular RG-213 low-loss 50 ohm cable, conveniently fits PL-259 and N-type connectors, and is semi-stiff, of very low loss, and quite economical. The only hitch is CQ-4XL does not like rotor flexing. My personal solution is using Certified's flexible CQ-213 for 2 meters and 70 cm, and CQ-4XL for upper frequencies. Certified Communications' ("The Wireman") address is 261 Pittman Road, Landrum, SC 29356 (phone 1-800-727-WIRE). He's a good man to know when you need top-quality cable and wire.

Special Notes on Station Assembly

Let's now bring all the ends together and discuss the fine points in assembling a smooth-working OSCAR station. As a convenient means of assuring few aspects have been overlooked, let's begin at the antennas and work toward the indoor gear. A hypothetical station is thus illustrated in fig. 6.

The crossboom's length is not critical, but good separation between antennas minimizes pattern distortions and crosstalk. Plan ahead so later you can add a 1.2 GHz loop Yagi near the middle. Crossbooms of 5 to 8 foot lengths are popular. Remember to thoroughly weatherproof all antenna and cable connections. Make them tight enough for underwater operation. A roll of "Coax Seal" is a good in-

vestment. Remove all cable movement stress from connectors, but avoid sharp coax bends. Taping cables onto wooden extensions behind each antenna's boom, then allowing the cables to slowly droop downward, works great.

If your antennas are mounted close to ground level, a rear wooden counterweight arm and handle can be bolted to the crossboom for manual aiming. Alternately, two small TV rotors can be utilized. Bend a 2 foot pipe at a 90 degree angle in its middle, insert one end in your azimuth rotor, then mount the elevation rotor on the other end. Azimuth-only systems can also be used if your antennas have a fairly wide beamwidth at their −6 dB points. Simply tilt them up roughly 30 to 40 degrees and plan your operating times for best signal advantage. As previously discussed, use only short lengths of low-loss cable and avoid any splices. Their lumped impedance creates noticeable losses.

While many RF-protected GaAsFET preamps are weathersealed, I heartily advise locaging them indoors for security. Disconnecting them from your antennas during nonuse sidesteps lightning-spike damage and costly repairs. A word to the wise should suffice. Your uplink transmitter and downlink receiver should be powered via separate AC supplies to minimize crosstalk and diversify current loads. If an external linear amplifier is included for transmitting, another AC supply may be required. Mirage's popular D-1010 100 watt output 70 cm amplifier, for example, typically draws up to 20 amps on peaks. If your downlink receiver's supply is "beefy," you might tap its output for the uplink amplifier. Variations in OSCAR gear and our previously discussed hypothetical setup are plentiful, but our generally highlighted concepts are universal in application. The main point is to get cracking on assembling your own OSCAR station and join the fun of satellite communications. Like many other aspects of life, you learn the "inside ropes" better by being actively involved rather than by being an onlooker.

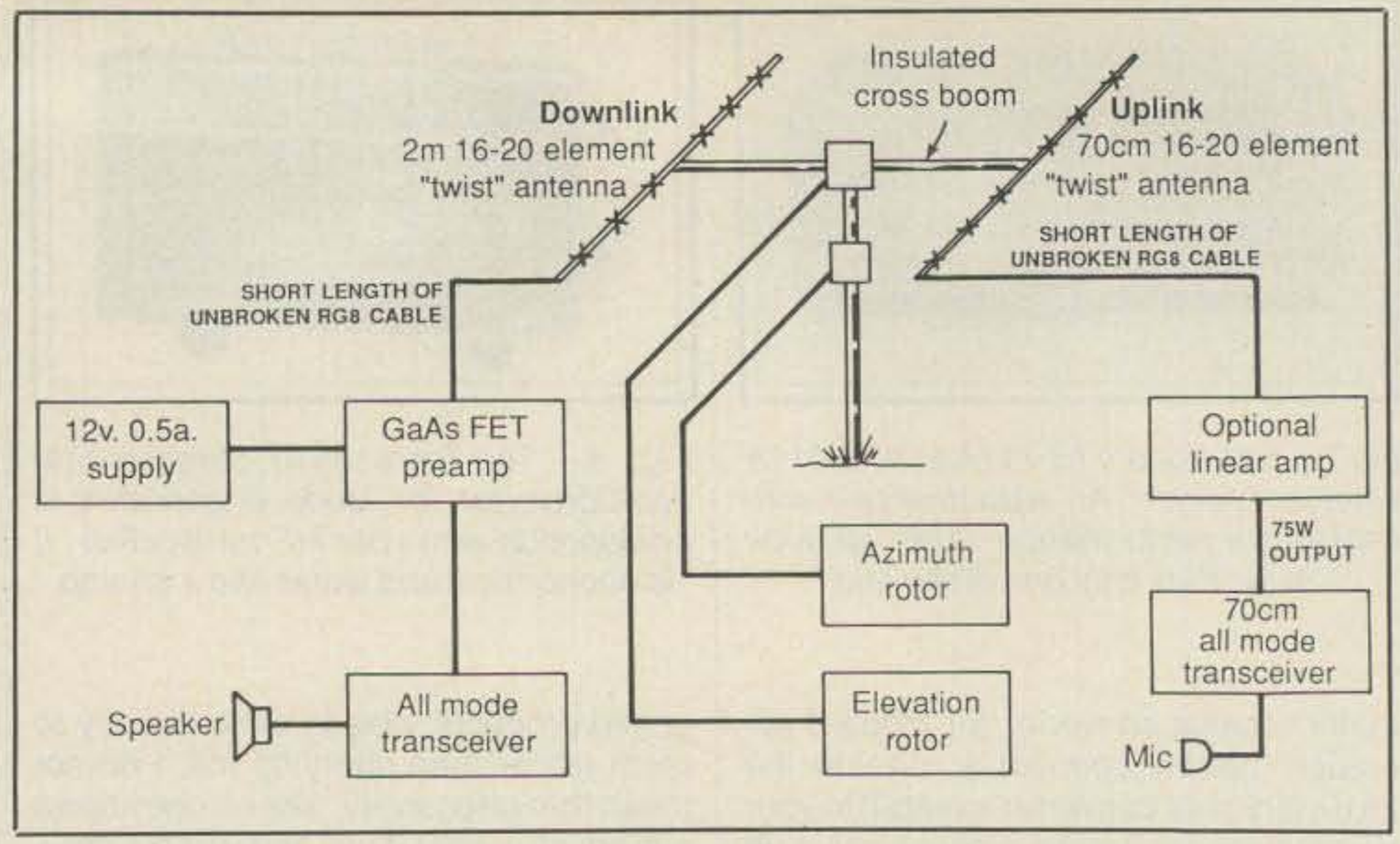

Fig. 6.– A hypothetical yet typical example of OSCAR station assembly (see text).

Orbital Notes

While computerized tracking is the popular craze among satellite communicators, many amateurs continue asking how to simply visualize OSCAR 13's orbit with respect to their QTH. Briefly studying a month's worth of orbital predictions while plotting their paths on a world globe marked with longitude and latitude increments, I thus derived the following information. It is in general terms, but it works for station planning, antenna aiming, and estimating DX ranges.

First, understand OSCAR 13 travels in a fixed-position orbit while the earth rotates beneath it. The orbit is tilted or inclined 5 degrees below the equator (as of August 1988. Since AMSAT says the orbit is inclined 57 degrees, this factor will probably change over a two year period). Two approximate 12 hour orbits occur each day, one in view of the U.S. and one on the world's opposite side. The orbits thus exhibit a 9 or 10 day cycle with their points of apogee "beginning" in southwestern skies (as seen from the U.S.) and progressing to southeastern skies at the rate of roughly 14 degrees longitude per day. This concept is illustrated in fig. 7. During each day's orbit, the satellite "rises" in the east, travels to its point of apogee, then "sets" in the west. Apogees occur roughly 45 minutes earlier each day.

If all this is too confusing to visualize, simply use computer-printout tracking. Personally, I prefer simple mental calculations. The fun of satellites is using them, not fiddling with orbit calculations.

Potpourri: Looking Ahead

Since OSCAR 13's Mode-S transponder and RUDAK Digipeater have yet to be activated, a third part of this feature column may evolve a few months down the line. Watch for it. Meanwhile, OSCAR 13 continues performing beautifully. I've received orders for my new *OSCAR Satellite Revue* book from Saudi Arabia, New Hebrides, Australia, Japan, . . . all over the world, so plenty of DX is getting in on the action. Some interesting contests are also planned for OSCAR 13; weak-signal reception and worldwide foxhunts are two examples. Get cracking on satellite communications. They're great!

We are lining up more "Keys Revisited" and "Classic Rigs" features for coming months, and have some real gems to highlight. Stick with us for a fun-filled 1989!

73, Dave, K4TWJ

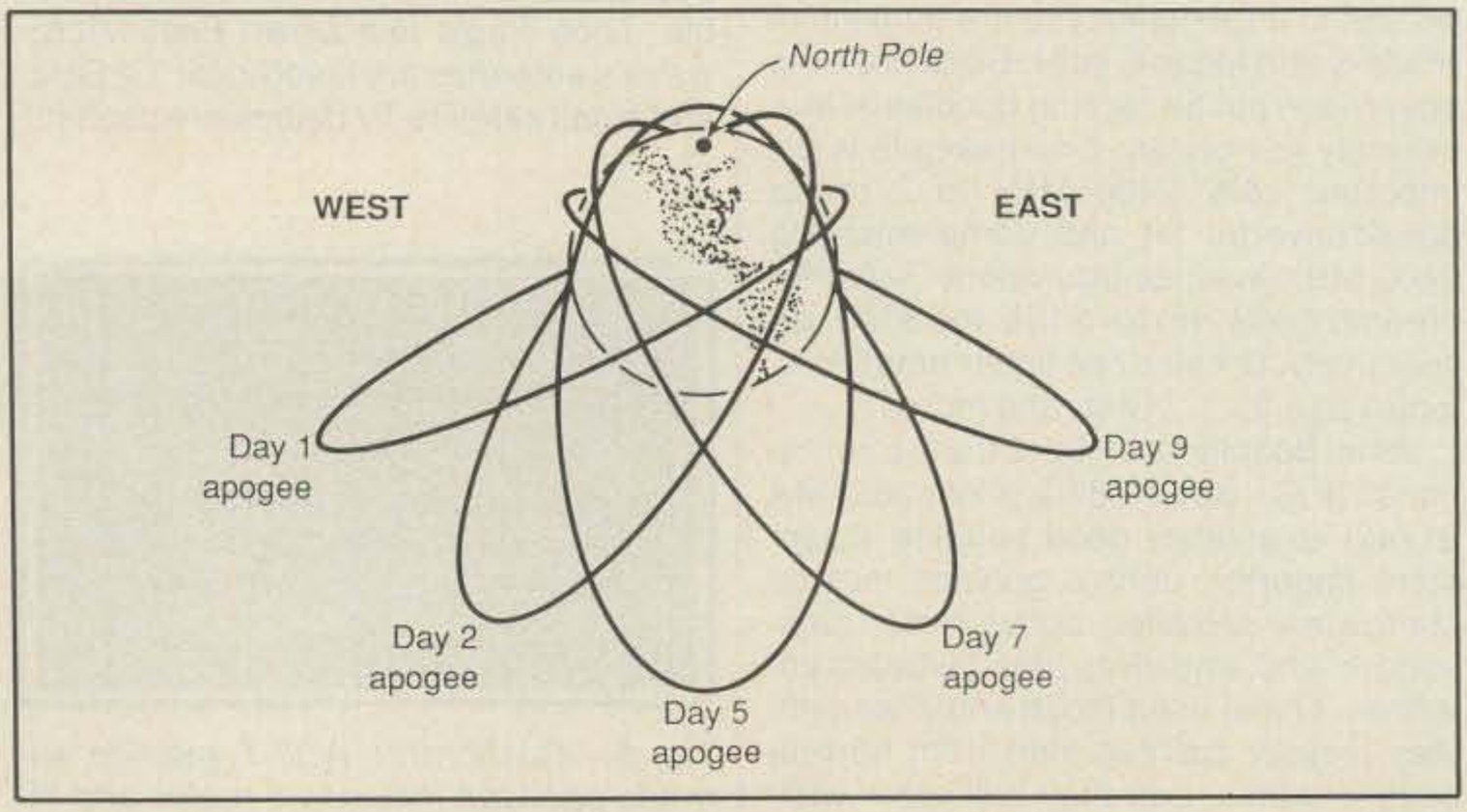

Fig. 7.– Example of OSCAR 13's daily orbits and 10-day cycle. Plot these orbits on a world globe for full three-dimensional clarity.

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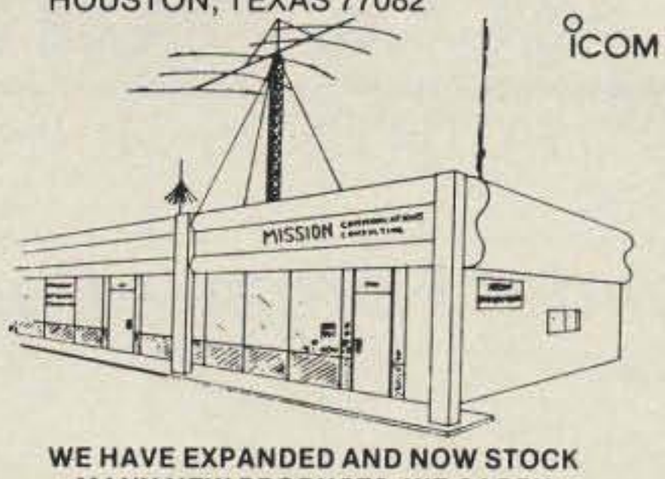

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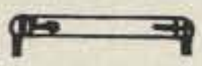

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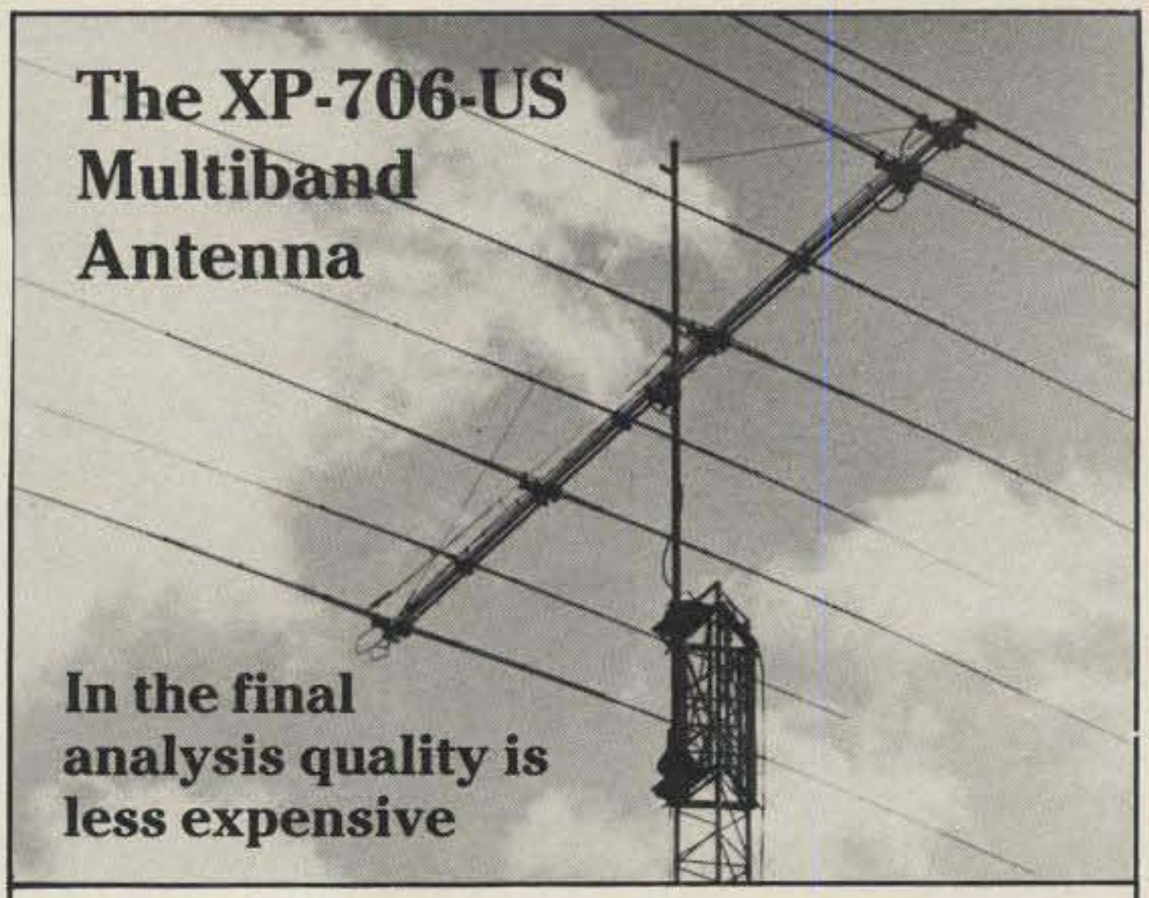

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Antennas & Accessories

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

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

Reader Forum—Part I

This month, finding that our columns over the past few months have built up a good deal of reader mail, we'll devote much of the column to reader feedback. Following that, we'll again examine some new amateur radio and general—purpose software we think you'll find interesting and useful.

First, let's catch up on the mail.

Reader Forum

Follow-up: Radio Shack Coax. In last May's column we pointed out that Radio Shack was, at last, doing something about its poor reputation for selling imported high-loss cables with inadequate shielding. We pointed out that the 'Shack's new Archer brand cables were now manufactured in the USA in their own factory, using new braid-making equipment, and that the new cables featured 95% shielding and a low-loss polyethylene dielectric. Probably, the RG-8/M cable is of most interest to radio amateurs, although several other cable configurations are offered in the "new and improved" product line. I asked for comments from readers who had used the new cables.

Charlie Tiemeyer, W3RMD, didn't make any precise loss measurements, but he did have some useful general comments:

"I must admit that the XYL, Bettye, K3VRZ, and I have [had] excellent results using the Radio Shack RG-8/M coaxial cable. I installed Radio Shack's RG-8/M cable on the XYL's 2 meter antennas and on her 10 meter antenna. (One of her 2 meter antennas is the AEA IsoPole and the other is a Ringo Ranger 2, both verticals; her 10 meter antenna is a Ringo Ranger 10. Additionally, I built her a 10 meter dipole which is near the top of my tower, and it is also fed with the RG-8/M cable.)

"All of these [antennas] have been up at least a solid year or more, and we have had no adverse results. As such, I can only give this cable a big, fat pat on the back and a 'hip, hip, hooray' to Radio Shack for finally selling a decent cable product. Incidentally, I have no stock in Radio Shack."

We've no connection with Radio Shack, either. But while my personal preference is to stick with the coax of a major cable manufacturer, either purchasing my coax needs by mail or hanging on till the next hamfest rolls around, it's nice to know that "real" coax is available at the neighborhood electronics emporium for that "need it now" Sunday afternoon antenna project.

More on Eminent Domain. If you'll pull out last June's column, you'll note that we reviewed the trials and tribulations of an amateur who was caught up in the bureaucracy when his property was to be taken over by his state's highway department in order to build a bypass around town.

It seemed that the highway department had little experience in displacing and compensating an amateur, so they didn't have a good precedent for determining how much to allow for a set of amateur antennas and the costs associated with their removal and reinstallation.

At the bottom line, we wondered what the dollars-and-cents value of your antenna installation would be should your home be "acquired" by a government agency for some public purpose such as highway construction. The hapless amateur, and I, wondered whether the highway department's tentative offer of $2500 cash for all of the costs associated with his inconvenience was reasonable.

Gary A. Stilwell, KI6T, presented some of the legal considerations for *CQ*'s readers:

"There are really two issues involved: acquisition (eminent domain) and relocation (the Uniform Relocation Act).

"The ham could choose to call the antennas real property (a part of the QTH), and he would be entitled to 'fair market value' [for them]. Since non-amateurs as buyers would not be willing to pay extra for these antennas when purchasing the QTH, payment under this concept would be close to zero."

Gary feels that the best approach, and the approach to be taken in this case, is to call the antennas personal property. If you do this, then you're entitled to payment to move the antennas.

"Federal relocation rules and regulations are contained in Part 25 of the Code of Federal Regulations [if you need to look them up, they are in 49CFR 25.301]. Individual states may vary in their laws, but if federal funds are used in the highway project, [this reference] would be your guide. [The Code] would allow actual moving expenses that are *reasonable* and *necessary*. The move costs covered are disconnecting, dismantling, packing, moving, unpacking, reassembling, and reinstalling. Unfortunately, relocation does not cover purchase of masts or towers."

Gary points out that under the uniform rules $2,500 is the highest amount that's allowed for relocation without getting into a lot of documentation and having to secure competitive bids for the work involved. The amateur would need to find two individuals or firms to give him estimates and present these to the highway department should he feel that $2,500 is inadequate compensation. But the payment would then be directly to the contractor doing the work (not to the amateur), and it still wouldn't allow for any mast purchases.

Gary concludes that, at the bottom line, "Not knowing the kind of antennas [that are involved] makes it hard to suggest a course of action. However, the $2,500 offer is quite generous and cash in hand would perhaps allow him to purchase masts, pay for professional help where needed [the amateur's age and health in our example preclude him from doing the antenna relocation himself—ed.] and perhaps leave some cash in his pocket."

Thanks, Gary, for the professional advice. For the moment, though, I hope and pray that no one other than a regular homebuyer wants *my* property!

Follow-up on the T2FD. Also in last June's issue we revisited the T2FD (short for "Terminated Tilted Folded Dipole"), a unique type of multiband sloping dipole that we attributed to *CQ*'s former Novice Editor, Don Stoner, W6TNS, and which he showed in his Novice column of June 1957. In his 1957 column he noted that the antenna was several years old then, but Don didn't cite the originator. We reprinted basic information on the antenna in our August 1980 column as well as in last June's column.

Several readers—including VE7BS, W4UW, KA1DWX, and K3CJ— provided us with their comments on the design and information that says that the antenna is really an old-timer, appearing in various *QST* and *CQ* articles as early as 1949. Our readers, some of whom have been using the T2FD as early as 1953, attribute its design to antenna experimenter and author Gilbert ("Gil") H. Countryman, W3HH.

Gil published several articles on the antenna, including *CQ* for November 1951 and February 1953, and *QST* for June 1949, which is the earliest article on the antenna that we know of. We find, too, that G2NS also described the antenna in *Short Wave Magazine* for January 1953. I think I bought my first *QST* and *CQ* along about 1954, so perhaps I can be duly excused for not picking up on the earlier articles!

When we covered the antenna in our two columns, we described the so-called 40-meters-and-up version as having a 47 foot flattop, but when it reached print the 47 foot flattop became a 40 foot flattop. This discrepancy caused several readers to call to our attention the dimensioning error, including Tony Ferraro, K3CJ, who helpfully modeled the 40 foot design using the MININEC antenna analysis software and came up with poor results. In the process of reviewing Tony's work and researching the original articles, we were able to shake out the antenna's interesting early history and the several versions that W3HH proposed and discussed.

According to Gil, writing in the June 1949 *QST* where he first reported his findings on "an experimental all-band nondirectional transmitting antenna," the T2FD design isn't entirely original with him. Rather, it was based on some Navy antenna studies that suggested to him that the T2FD might provide a reasonable solution to the problem of effective amateur multiband antenna operation.

The Navy tests were made using a vertical

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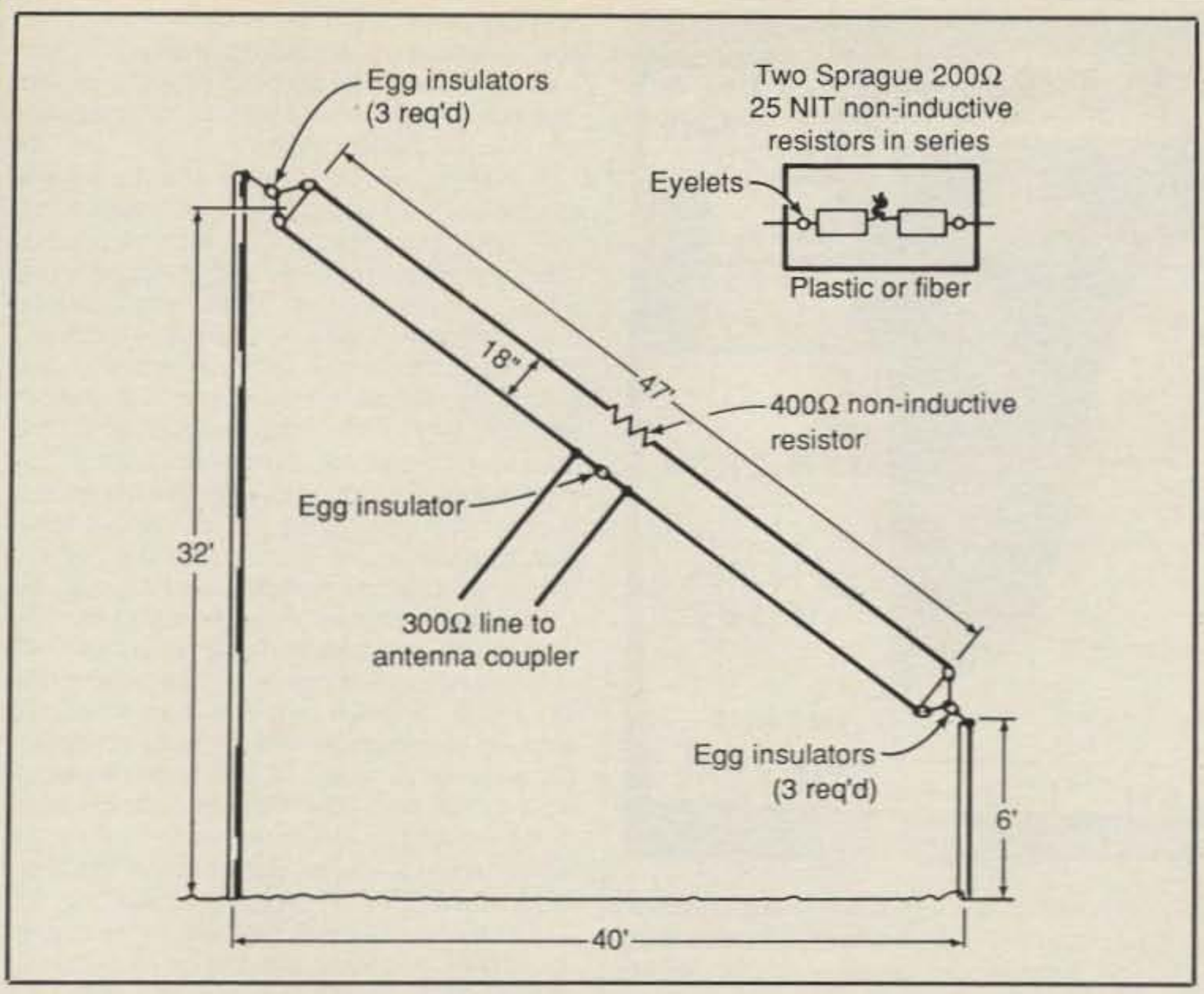


Fig. 1– Shown here is the 47 foot version of Gil Countryman, W3HH's early multiband design, as shown by CQ's then Novice Editor Don Stoner, W6TNS, in his June 1957 column. The T2FD, short for "Terminated Tilted Folded Dipole," is based on 1940s-era Navy vertical monopole antenna research which was published by W3HH as early as 1949 in QST and 1951 in CQ. The original design used a 600 ohm resistor for openwire line, whereas Don's version used a 400 ohm resistor for use with 300 ohm twinlead.

monopole erected over a metallic ground plane, and they were admittedly more theoretical than operational. But the lab estimated encouraging SWRs for the test monopole over various frequencies from 4 to 22 MHz, which ranged from a minimum of 1.4 to a maximum of 2.6, with an average of about 1.7. Gil asserts that the T2FD should have a five-to-one frequency ratio such that one "untuned" antenna is all that is required for operation on from three to five or more amateur bands.

As it turns out, Gil proposed several versions of the antenna, depending on the lowest frequency band to be covered. (Stoner's 1957-style, 47 foot, 40-and-up version, which is similar to the original W3HH design, is shown in fig. 1.)

In Gil's February 1953 *CQ* article he provides the basic design data for the antenna, as follows:

1. The length of each leg from the center is equal to 50,000 divided by the lowest desired operating frequency in kHz, and then multiplied by 3.28. The answer is in feet.

2. The spacing between the radiating wires is equal to 3,000 divided by the lowest desired operating frequency in kHz, and then multiplied by 3.28. This result is also in feet.

3. The sloping angle should be on the order of 30 degrees.

4. The terminating resistor preferably should be noninductive and have a rating equal to 35% of the transmitter input power.

Bob Eldridge, VE7BS, a long time T2FD user, provides us with some insight into the antenna when he tells us that he started using one in 1953, after reading an article by G2NS in *Short Wave Magazine*.

Bob simplified W3HH's dimensioning, coming up with flattop lengths and wire spacings for antennas covering 80-and-up, 40- and-up, and 20-and-up to be 94′ and 2′10″; 47′ and 1′5″; and 24′ and 9″, respectively. These figures are based on the simplified formulas: flattop length = 328/F (MHz), and spacing = 9.84/F (MHz).

As Bob indicates, "Originally the terminating resistor was the same as the feedline impedance, but by the mid-fifties it had been found to be about 390 ohms for 300 ohm feeder and 650 ohms for 600 ohm feeder. A coaxial version [of the T2FD] was also in use, and the termination was higher than the coax impedance—I believe 64 or 68 ohms for 50 ohm coax; I was using 75 ohm coax and a 90 ohm resistor. In any case, [the value with transmission lines of lower impedance appears to be] critical, and if you vary the resistor while listening to a signal there is a definite peak as you go through the critical impedance . . . the resistor dissipates about one-third of the power supplied to the antenna. This is not too much when you think of it as 2 dB, or a third of an S-point on transmit.

"[I have found that] the best angle of tilt is 30 degrees from the horizontal [W3HH's suggested limits were 20 to 40 degrees], and it is more or less omnidirectional. I also discovered in the 70s that Japanese coast stations were using the T2FD as an omnidirectional receiving antenna."

Bob also had some comments on the popular G5RV multiband antenna, but we'll save them for next time.

Dick Genaille, W4UW, added his two cents on the T2FD and his experiences with it, as based on W3HH's 1953 *CQ* article:

"I was operating as W5RSN in Harlingen, Texas at the time and I tried the T2FD based on the [February 1953] article. I was running 500 watts AM at the time on 80 through 10 meters, with most of my operation on 80 and 20. The T2FD that I put up was the 40 meter version [47 feet long] which was supposed to work satisfactorily on 80 . . . I obtained a noninductive resistor from the Carborundum Corp. that did the trick, and I fed the antenna with openwire line. It worked [on 80], but I was never really happy with it."

Dick told me that, being an antenna experimenter at heart, he eventually took the support mast he used with the T2FD to shore up a 44 foot vertical which he fed at the base through various networks for 80 through 15 meters, and which seemed to outperform the T2FD. (Dick didn't indicate whether this comparison was for short- or long-haul work, though presumably it's for the latter.) Dick believes that the excellent radial system which he installed, along with extremely good soil conductivity, may account for some of the greater performance of the vertical over the T2FD.

Dick concluded with an observation that I would share with him: "I always wonder about the results fellows who are touting various oddball antennas get. I wouldn't be surprised if someone used his bedspring, like some guys did in the old days, and then wrote an article telling what a swell antenna it is! Some guys rave about anything that will put out a signal, regardless of what it is."

Point of Order. Though sometimes the volume of mail we receive becomes overwhelming, we do appreciate the effort readers take in writing to us and offering suggestions, comments, and even criticisms. We read each and every letter or card received, and where an individual reply is appropriate, we do so—though often no SASE or IRC is offered.

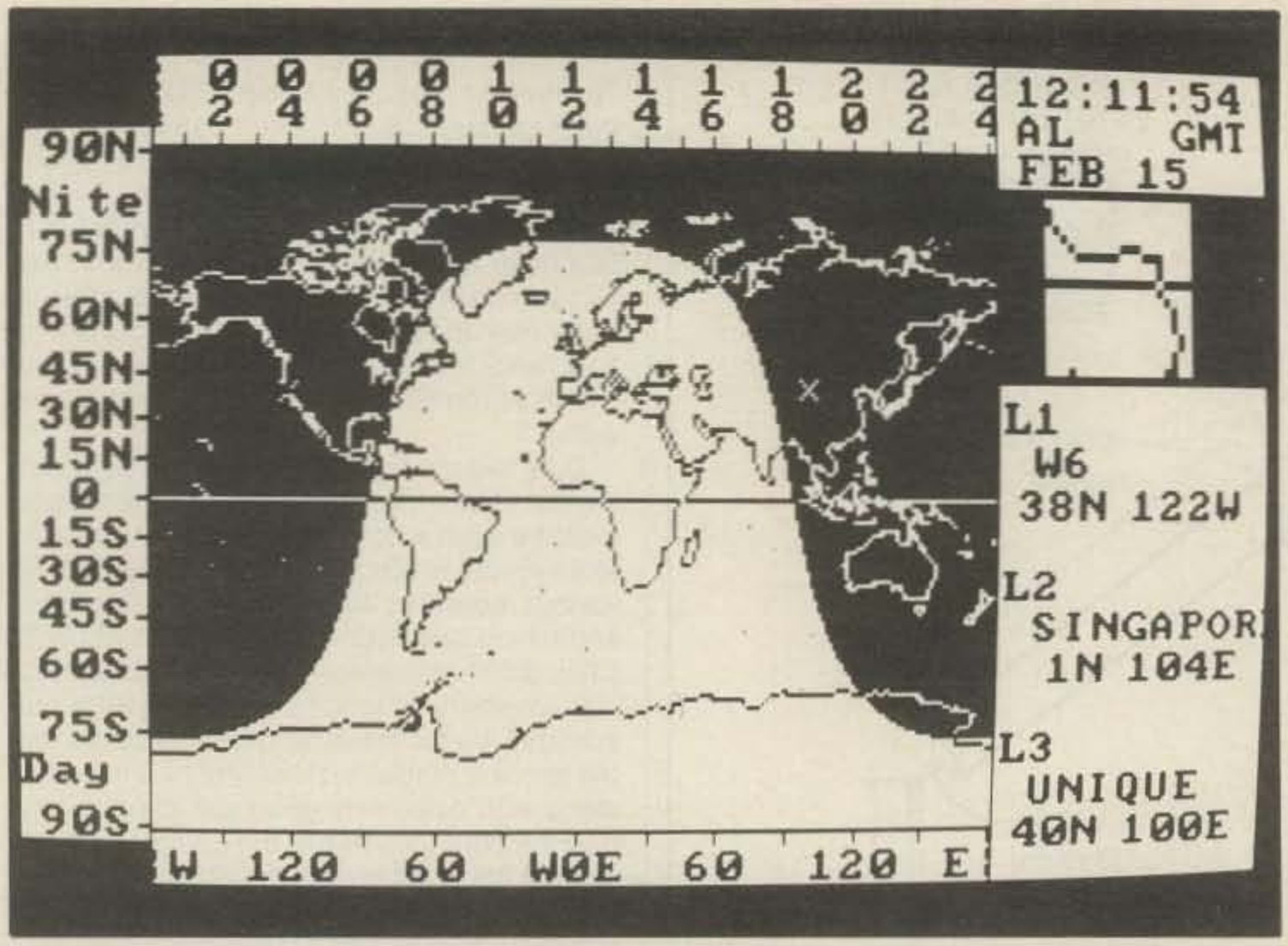
Unless you tell us differently, we assume that any letter you send us is one we can reprint in *CQ* for the benefit of other readers. But if you don't want your name or call used, or don't want your letter published, let us know that, and we'll respect your wishes. In any case, we won't knowingly embarrass you in print!

Software Snapshot

We'll temporarily detour from antenna topics at this point to turn to our other love, computers. We'll examine a couple of new software offerings: two amateur radio programs and two general—purpose utilities that you may want to add to your hamshack computer's bag of tricks. This month we'll focus on IBM-PC compatible software.

Super DX EDGE™. We've described Xantek's grayline and propagation forecasting products in the past, beginning with the original slide—rule DX EDGE™ and continuing with computerized versions of the DX EDGE™ for the Commodore 64. Recently Xantek's president, Tony Japha, N2UN, advised me that he is now offering an IBM version of the DX EDGE™ in response to many requests from users who wanted a program that will run on their PC, XT, AT, and compatibles.

To briefly review, the Super DX EDGE™ is used to determine optimum DX contact timing, especially for determining the best times and bands for long—path and grayline communications, and for estimating when both ends of the contact will be in darkness (for the lower



This photo shows the Super DX EDGE™ main menu screen which comes up after the program is fully loaded into the computer, and from which most of the program's major features are accessed. Note the high-contrast day-night display of the grayline curve. (Photo courtesy Xantek, Inc.)

frequency bands) and when the two points will be in daylight (for the higher frequency bands).

The new IBM version runs very quickly, takes advantage of advanced computer graphics possibilities, and gives instant DX information at the push of a few keys. The Super DX EDGE™ provides accurate graphic presentations of sunrise and sunset times, as well as daylight and darkness areas of the world for any time of the year and at any time of day. The IBM versions include a close-up or "zoom" feature that's used to look at a small portion of the world in more detail.

The program lets you shift the grayline (terminator) in real time, should you desire, to keep a current picture of the world on the monitor screen, and it also offers you the option of keeping time linked to the curve position in any of the world's time zones. Two other major capabilities are included: a calculator of Maximum Usable Frequency (MUF) and a Great Circle bearing calculator.

The program includes a built-in file of country names and amateur radio prefixes, making it easy to pinpoint any location for the purpose of marking it on the displayed map or for making MUF and Great Circle bearing calculations.

The IBM version, which is priced at $34.95, requires two disk drives, 384K of memory, an appropriate graphics package (Hercules, CGA, or EGA), and DOS 2.1 or later. A color monitor isn't required, but it is highly recommended.

For more information, contact Tony Japha, N2UN, at Xantek, Inc., P.O. Box 834, Madison Square Station, New York, NY 10159.

LOGGER. How's that for a generic-sounding software program name? Actually, Jim Bobo, W5ODD's LOGGER is anything but generic. It's actually a very capable system made up of several programs used to keep a detailed log of amateur radio contacts, with a special focus on tracking awards. According to Jim, the program was developed because of the need to keep current on all aspects of record-keeping for DXCC and other awards, and to be able to research past contacts easily. LOGGER logs can be used to print out lists of contacts made, DXCC/WAS/WAZ lists, and display contacts on the monitor screen.

A wide range of features is offered, several of which are not usually included in run-of-the-mill logging programs. Some of LOGGER's features include the generation of monthly calendars; country, zone, state, and province count; display of full and abbreviated contact records; computation of bearings and distances as well as sunrise/sunset times (both features very nice for a logging program); various print options, including production of QSL card address strips and various data lists; a number of maintenance options, among them setting parameters, maintaining the country file, and updating prefixes; and several file manipulation utilities that allow you to truncate, combine, move and change log files.

In addition, two optional programs, CONTEST and SCORER, are available for use in working and scoring contests. Future program enhancements, some of which may be available by the time you read this, include automatic sending for CW operation in conjunction with an AEA PK-232, as well as automatic scoring for the CONTEST program option.

The basic LOGGER program is for use on the IBM-PC and true compatibles. DOS 2.0 and at least 256K of user memory and a hard disk drive are required. An IBM compatible printer is needed if you wish to print out information.

The LOGGER program is available for $35.00 from Alamo DX Amigos, 106 Tomahawk Trail, San Antonio, TX 78232. Contact Jim for pricing and availability of the CONTEST and SCORER options.

Fig. 2 shows the LOGGER File Info Menu, while fig. 3 shows the bearing and distance screen.

PC-GLOBE. Roy Kessler, president of Comwell Systems, Inc., sent me a copy of PC-GLOBE, a rather remarkable new program that provides "instant profiles" of 177 different countries—understandably not as many "countries" as in the latest DXCC list, but quite a few nonetheless. The program wasn't really designed with amateurs in mind, as it's mainly aimed at the educational, travel, and business markets, with special application to international business trip and marketing planning. But it's also a program that may very well be of interest to those wanderlusting, DXpedition-oriented amateurs in our midst.

```
F I L E   I N F O   M E N U        Data: C:\HAM\LOGGER\LOGFILE.DAT
                                   Index: C:\HAM\LOGGER\LOGFILE.IDX

                Index Analysis - I
                File Size Data - F
           Count Countries/Zones - C
                  Count States - S
               Count Provinces - P
            Bearing and Distance - B
        Sunrise and Sunset Times - T
                Dates (Calendar) - D
    Make Selection (ESC to Exit)->
```

F

Fig. 2– Here's the File Info Menu from Jim Bobo, W5ODD's LOGGER program for the IBM-PC. Note the menu's inclusion of options to calculate bearings and distances as well as sunrise and sunset times, and to produce calendars—options not typically found in logbook-type programs.

When it comes to effective low-frequency DX antennas for limited-space applications, the world-class Alpha Delta DX-A high-performance Twin Sloper is it!

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Bruce Brady, KA9SOX
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The DX-A is (apex) up at 60′ with the 80 meter leg sloping down to 20′ and the 40/160 meter leg sloping down to 15′. The antenna is installed in an oak tree with a wire ground lead down to a 9½′ ground rod. The antenna is fed with 125′ of RG/8U foam coax. Once again, no amplifier has been used, just 100 watts to my DX-A. (A wide range tuner is used on all bands. I move every few years and why cut the antenna for frequency at one QTH when it won't be the same at a different QTH under different conditions.)

I just wanted you to know what an excellent job you've done on the DX-A! If you ever decide (for some bizzare reason) to stop making the DX-A, write to me, and let me know so I can buy a life-time supply first! Thank you! It's the best antenna for the money I've ever bought!

73, Bruce Brady, KA9SOX

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Each of the 177 countries covered by the program can be highlighted on the world and continent maps for instant identification. Maps of six continents and individual countries can also be displayed with overlays showing major cities, population density, and elevations. The database for each country features charts and tables displaying information ranging from demographics, health statistics, political parties, economic trends, and balance of trade statistics to climate, currencies, time zones, cultural considerations, and tourist attractions. Countries are also ranked in terms of their population, area, economic growth, and the production of major commodities.

The program requires DOS 2.0 or later, 256K RAM, and a color-graphics (CGA) board; it will run on the IBM-PC/XT/AT/PS2 or compatibles with two floppy drives or a hard disk. It's presently priced at $59.95.

There's more, though. Roy tells me that by the time this column hits the newsstands, he'll have available a revised and updated PC-GLOBE + (at $69.95) which will include a host of new features, including some amateur-radio specific data. The new program version will support EGA and Hercules boards as well as the CGA. There will be built-in drivers to support most popular laser and color printers and plotters, and the user interface will be a slick "mouse-driven" one with handy pull-down menus.

Of greater interest to us amateurs, the new version (which we hope to report on after its introduction) will allow the user to plot and display great circle distances between more than 1,000 major cities, toggling at any time between miles and kilometers. In the database, new information will include amateur radio prefixes (Aha!), telephone country codes, and telex codes. You'll also be able to compare and display statistical information on up to 10 different countries at a time.

According to Roy, one of the most important features of the updated program, and one for which amateurs could find good use, will be the ability to create, modify, and save screen displays and build customized menus. A built-in editor will enable the user to add specialized information to the database for each country for custom applications—such as amateur radio.

For more detailed information, contact Comwell Systems, Inc., 2100 South Rural Road, Suite #2, Tempe, AZ 85282.

Live GOfers Inside? So tantalizes the outer mailing envelope of Microlytics' advertising fliers, enticing the recipient to see what the devil they're hyping. I was so enticed, and thereby became intimately familiar with their newest product, GOfer. While GOfer is billed by Microlytics mainly as an "auxiliary wordprocessing product," I found that it can have many additional applications, including amateur radio.

GOfer is an unusual add-on utility program used for rapid text search and insertion. A pop-up, RAM-resident program, GOfer is easy to use and operate in that you don't have to mess with prior indexing of files, convert them to a special format, or identify key words to be used in searching for "lost files" on your hard disk.

The program searches through multiple files at rates of up to 1 megabyte per minute on a standard IBM PC-AT hard disk, without the need to refer to cumbersome and time-wasting index files. According to Mike Weiner, Microlytics' president, the program is excellent for anyone who deals with text, whether for business or home use, wordprocessing, database management, or scientific research. And since the program is RAM-resident, you can search for text from within a document or program without returning to DOS—though you can load GOfer directly from DOS without it being RAM-resident, if you wish.

```
        B E A R I N G   A N D   D I S T A N C E

Enter country number (0 - 318) 91

Origin is:  Latitude:  32°30.00' North
           Longitude:  86°18.00' West

   Prefix: JA-JS
  Country: JAPAN
 Location: TOKYO
 Latitude:  35°45.00' North
Longitude: 139°30.00' East

Bearing is      323.9  Degrees

Distance is   6863.04 Miles
              5963.82 Knots
             11045.00 Kilometers

Do You Want Another? Y/N
```

Fig. 3– Depicted here is the LOGGER program's bearing and distance calculation screen, useful in making on-the-fly beam heading decisions while your PC is tied up running the logbook program.

GOfer will let you begin a search with a simple word or phrase, or perform complex searches, including Boolean AND/OR/NOT logic and "how close do I want this" parameters. Once GOfer has located the text you're after, you then have the option to insert the text "find" into the document you're working on, even from files created by different programs. You can also direct the "found text" to your printer, or write text finds to another disk file for future use.

How do I use GOfer? My main use for the program so far has been to find references to various items (such as new products, amateur call signs, antenna designs, etc.) in previous columns, retrieving the information to help answer a reader's inquiry or to insert the information in an upcoming column I'm currently working on.

Another big use I have for the program lies in its file compression feature, which lets me free up lots of space on my hard disk. This feature allows me to take "old files" (such as lengthy program documentation or "DOC" files as well as letters and articles) that I don't need now but might need at some point in the future, and compress them up to 50%. When GOfer creates a compressed file on my hard disk, I still retain complete access to the file, as GOfer doesn't need to decompress it in order to search, browse through, or even export text from it. And I can decompress the file if I care to so that it's just like it was before compression, even bringing back the original file name.

You may also find GOfer to be a useful utility for logging programs, where your logger has created lots of log files on your hard disk, and you're trying to locate a particular QSO or contest contact. While the logging program can usually retrieve this information, with most loggers you first have to know in which file the contact resides, and then load that file into the logging program to search for the contact. But since GOfer can read standard ASCII and dBase files, often used by amateur logging programs, it may help you to take a shortcut to finding the right file and the information you're after. Packet types may also find the program interesting because GOfer can be used while you're "on-line" using a communications terminal program, searching through files while online and even pasting text into your messages.

Although I must admit that I'm a sucker for interesting and novel computer utility program add-ons, I have to admit that GOfer is one of the better-designed and more practical RAM-resident utilities I've run into in some time. List-priced at $79.95, it's designed to work with the IBM PC/XT/AT, PS/2, and compatible computers using PC/MS-DOS 2.0 or higher, and it requires as little as 79K of user RAM. GOfer is compatible with at least 30 different wordprocessors, database managers, and spreadsheets.

Before we close out this month's column, let me add that we'd like to hear from readers who find good use for general-purpose computer software utility and "productivity" programs in the hamshack—not only programs we've highlighted here but also programs you've discovered and like working with. We'll share that information with other readers via the column. We're interested whether you use an IBM, a Mac, a Commodore, an Atari, or whatever.

Wrapping It Up

That's it for this time, guys and gals. Next month more antennas and accessories topics of current interest. See you then.

Overheard: I'm here to tell you that my interest is in the future, because that's where I plan to spend the rest of my life!

73, Karl, W8FX

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RM-35A	25	35	5¼ x 19 x 12½	38
RM-50A	37	50	5¼ x 19 x 12½	50
• Separate Volt and Amp Meters				
RM-35 M	25	35	5¼ x 19 x 12½	38
RM-50 M	37	50	5¼ x 19 x 12½	50

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RS-5A	4	5	3½ x 6⅛ x 7¼	7
RS-7A	5	7	3¾ x 6½ x 9	9
RS-10A	7.5	10	4 x 7½ x 10¾	11
RS-12A	9	12	4½ x 8 x 9	13
RS-20A	16	20	5 x 9 x 10½	18
RS-35A	25	35	5 x 11 x 11	27
RS-50A	37	50	6 x 13¾ x 11	46

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RS-20M	16	20	5 x 9 x 10½	18
RS-35M	25	35	5 x 11 x 11	27
RS-50M	37	50	6 x 13¾ x 11	46

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• Built in speaker				
RS-7S	5	7	4 x 7½ x 10¾	10
RS-10S	7.5	10	4 x 7½ x 10¾	12
RS-12S	9	12	4½ x 8 x 9	13
RS-20S	16	20	5 x 9 x 10½	18

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VS-35M	25	15	7	35	5 x 11 x 11	29
VS-50M	37	22	10	50	6 x 13¾ x 11	46
• Variable rack mount power supplies						
VRM-35M	**25**	**15**	**7**	**35**	**5¼ x 19 x 12½**	**38**
VRM-50M	**37**	**22**	**10**	**50**	**5¼ x 19 x 12½**	**50**

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Propagation

a monthly feature by
GEORGE JACOBS, W3ASK

THE SCIENCE OF PREDICTING RADIO CONDITIONS

1989—A Great Year

Sunspot Cycle 22, which began during September 1986, continues to increase at an unprecedented rate. The Royal Observatory of Belgium, the world's official keeper of solar records, reports a monthly mean sunspot number of 121 for September 1988. Daily values ranged from a low of 74 on September 9th to a high of 190 on the 23rd. According to measurements made at the Algonquin Radio Observatory at Ottawa, Canada, a median level of 153 in the 10.7 cm solar flux was observed during September.

The monthly mean number for September results in a 12-month smoothed sunspot number of 71 centered on March 1988. The level of a solar cycle is measured by the smoothed number. In the first 19 months of its life Cycle 22 has risen from a low of 12 to the present level of 71. This is a more rapid rise than has been observed for the same time period during any of the previous 21 solar cycles recorded since the middle of the 18th century.

The National Geophysical Data Center at Boulder, Colorado forecasts a smoothed sunspot number of 138 (plus or minus 28) for January 1989. The center also forecasts a steady increase in solar activity during 1989, with the smoothed number expected to reach 185 (plus or minus 47) by the year's end. If these predictions materialize, 1989 will witness the highest level of solar activity since the record high level of 1957–58. While it is still too early to know if Cycle 22 will surpass the record level of 201 established in 1957 during Cycle 19, it appears almost certain that it will be one of the highest ever recorded. This means that propagation conditions on the HF bands during 1989 should be better than they have been for at least the past 30 years. The New Year is most certainly one to look forward to for unusually good propagation conditions on the HF bands from 160 through 6 meters.

CQ WW DX Phone Contest Conditions

Initial reports indicate that good conditions existed during the October 29–30 weekend for the WW DX Phone Contest period. The reported 10.7 cm solar flux level was 156 on October 29th, rising to 167 on the 30th. The geomagnetic field was generally quiet with A levels varying between 1 and 9 on the 29th and 5 and 11 on the 30th. A more detailed critique should appear in next month's column.

11307 Clara Street, Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for January 1989

	Expected Signal Quality			
Propagation Index	**(4)**	**(3)**	**(2)**	**(1)**
Above Normal: 12-13, 16, 21	**A**	**A**	**B**	**C**
High Normal: 5, 9, 14-15, 17, 20, 22, 26	**A**	**B**	**C**	**C-D**
Low Normal: 3-4, 6, 8, 10-11, 18-19, 23, 25, 27	**A-B**	**B-C**	**C-D**	**D-E**
Below Normal: 1-2, 7, 24, 28-29	**B-C**	**C-D**	**D-E**	**E**
Disturbed: None	**C-E**	**D-E**	**E**	**E**

Where expected signal quality is: **A—Excellent opening, exceptionally strong, steady signals greater than S9.**

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 fair-to-poor (C-D) on January 1 and 2, good-to-fair (B-C) on the 3rd and 4th, good (B) on the 5th, good-to-fair (B-C) on the 6th, etc.**

January Band Openings

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

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

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

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

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

Say You Saw It In CQ

HOW TO USE THE SHORT-SKIP CHARTS

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

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

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

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

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

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

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

CQ Short-Skip Propagation Chart
January & February 1989
Local Standard Time at Path Mid-Point
(24-Hour Time System)

Band (Meters)	Distance From Transmitter (Miles)			
	50-250	250-750	750-1300	1300-2300
10	*Nil*	*Nil*	07-08 (0-1) 08-09 (0-2) 09-10 (0-3) 10-12 (0-4) 12-15 (0-3) 15-17 (0-2) 17-18 (0-1)	07-08 (1) 08-09 (2-3) 09-10 (3-4) 10-12 (4) 12-15 (3-4) 15-16 (2-4) 16-17 (2-4) 17-18 (1-3) 18-19 (0-3) 19-20 (1-2) 20-21 (0-1)
15	*Nil*	07-08 (0-1) 08-10 (0-2) 10-15 (0-3) 15-17 (0-2) 17-18 (0-1)	06-07 (0-1) 07-08 (1-3) 08-10 (2-4) 10-15 (3-4) 15-17 (2-4) 17-18 (1-4) 18-19 (0-3) 19-21 (0-1)	06-07 (1) 07-08 (3-2) 08-18 (4) 18-19 (3) 19-21 (1-3) 21-23 (0-1)
20	09-11 (1-2) 11-14 (1-3) 14-15 (1-2) 15-17 (0-1)	06-07 (0-2) 07-09 (0-3) 09-11 (2-4) 11-14 (3-4) 14-15 (2-4) 15-17 (1-4) 17-19 (0-3) 19-20 (0-2) 20-06 (0-1)	06-07 (2-3) 07-08 (3) 08-09 (3-4) 09-17 (4) 17-19 (3-4) 19-20 (2-4) 20-21 (1-4) 21-23 (1-3) 23-02 (1-2) 02-06 (1)	06-07 (3-2) 07-08 (3) 08-12 (4) 12-14 (4-3) 14-21 (4) 21-23 (3-4) 23-01 (2-3) 01-04 (1-2) 04-06 (1)
40	07-08 (0-2) 08-09 (1-3) 09-10 (2-4) 10-19 (4)	07-08 (2-3) 08-09 (3) 09-11 (4-3) 11-15 (4-2)	07-08 (3) 08-09 (3-2) 09-11 (3-1) 11-15 (2-1)	07-08 (3-1) 08-15 (1-0) 15-17 (2-1) 17-18 (3)
80	19-21 (2-3) 21-00 (1-2) 00-07 (0-1)	15-19 (4) 19-21 (3-4) 21-00 (2-4) 00-02 (1-3) 02-06 (1-2) 06-07 (1-3)	15-17 (4-2) 17-18 (4-3) 18-00 (4) 00-02 (3-4) 02-06 (2-4) 06-07 (3-4)	18-06 (4) 06-07 (4-3)
80	07-08 (2-4) 08-10 (4) 10-15 (4-3) 15-00 (4) 00-04 (3-4) 04-07 (2-3)	07-08 (4-3) 08-09 (4-2) 09-10 (4-1) 10-15 (3-1) 15-16 (4-1) 16-18 (4-2) 18-04 (4) 04-07 (3-4)	07-08 (3-1) 08-09 (2-0) 09-16 (1-0) 16-18 (2-1) 18-20 (4-3) 20-06 (4) 06-07 (4-3)	07-08 (1-0) 08-16 (0) 16-18 (1-0) 18-20 (3-2) 20-04 (4) 04-06 (4-3) 06-07 (3-1)
160	09-17 (1-0) 17-19 (3-2) 19-06 (4) 06-08 (3) 08-09 (2-1)	17-18 (2-1) 18-19 (2) 19-21 (4-3) 21-05 (4) 05-06 (3) 06-07 (3-2) 07-08 (3-1) 08-09 (1-0)	17-18 (1-0) 18-19 (2-1) 19-21 (3-2) 21-03 (4-3) 03-05 (4) 05-06 (3-2) 06-07 (2-1) 07-08 (1-0)	18-19 (1-0) 19-21 (2-1) 21-03 (3) 03-05 (4-2) 05-06 (2-1) 06-07 (1-0)

ALASKA
January & February 1989
Openings Given in GMT#

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

HAWAII
January & February 1989
Openings Given in Hawaiian Standard Time#

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

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

*Indicates best time to listen for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a forecast rating of (2), or higher.

Note: The Alaska and Hawaii Propagation Charts are intended for distance *greater* than 1300 miles. For openings over shorter distances, use the preceding Short-Skip Propagation Chart.

Check for 6 Meter openings at times when the 10 Meter forecast rating is shown as (4).

on the order of 150 miles or so.

All in all the New Year is off to a good start. January should be a good month for propagation conditions on all HF bands. Atmospheric noise levels (static) should also be at the lowest values of the year in the northern hemisphere, and signal levels are expected to be exceptionally strong during many band openings.

Short-Skip Charts

This month's column contains a Short-Skip Propagation Chart for use in the continental United States for distances between 50 and 2300 miles. (The maximum distance generally possible for one-hop, short-skip propagation is 2300 miles.) Special prediction charts centered on Hawaii and Alaska are also included. The charts appearing in this month's column are valid through the months of January and February 1989. See last month's column for detailed DX Propagation Charts for use during January.

VHF Ionospheric Openings

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

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

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

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

The Packet User's Notebook

a feature by
BUCK ROGERS, K4ABT

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

Flow Control, Hardware versus Software

This month begins a new year for "The Packet User's Notebook." I plan to build this column into an even more useful series as related to the amateur radio packet operator. To do so, I plan to include viewpoints and information from other packet users and authorities.

Packet is no longer a mode of communication for a few users. It has grown rapidly into a way of life. We will enlist the help of the developers and authors of other uses for and protocols in packet while soliciting input from you, the reader. If you have a topic you would like to discuss, please send a brief outline of the packet radio subject to my address. Include your name, callsign, and address, as I will include this information in the article covering your area of interest so that others may contact you for further information about the topic.

I have received several letters requesting more information about the PacketCluster. Readers who are interested in communicating with the sysops of an existing system can contact Bart Fay, K4CEF. Portions of the November 1988 "Packet User's Notebook" command and feature list were from the PacketCluster manual of Dick Newell and from the "User's Guide to the North Alabama DX PacketCluster" by Bart Fay, K4CEF, and David Reasoner, N4KTY.

The complete "User's Guide" may be had by sending $1.25 or a large self-addressed, stamped envelope to Bart Fay, K4CEF, 113 Malor Circle, Madison, AL 35758.

My main goal is to provide as much and as current information about packet radio as possible. We have lots to cover and this month is no exception. This month's topic on flow control was selected because so many letters ask the same question about how and which method to use with a given type of computer or terminal.

Right up front we need to look into the computer manual and determine if the computer you are using supports RS-232C, TTL, or partial RS-232 (sometimes called a "Bit Banger" port). This becomes the key to the question we are about to help you answer in this month's column.

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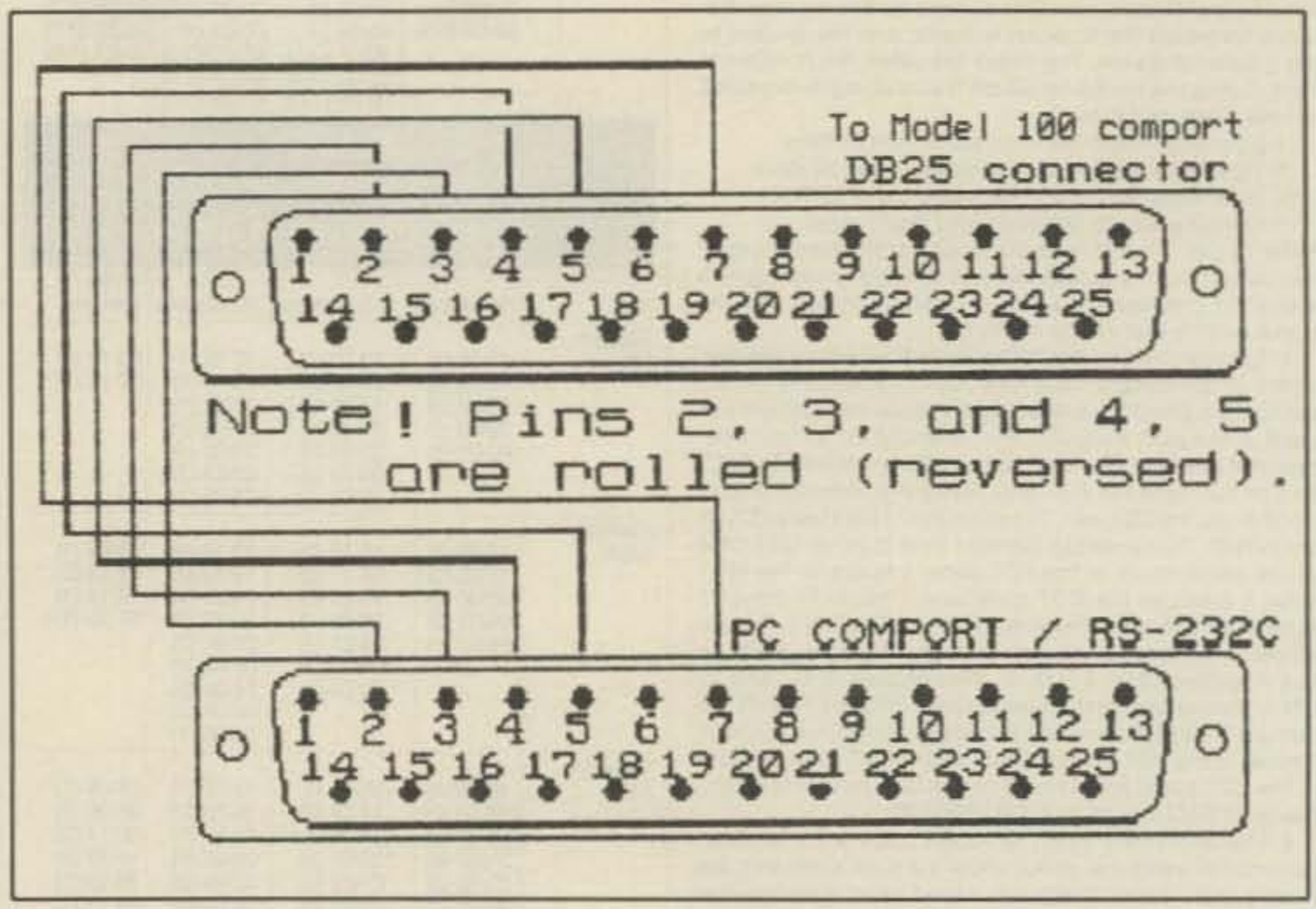

Fig. 1 - Null-modem cable used between terminals when passing ASCII files from one computer to another.

Decisions, Decisions!

I often use my portable computer to upload a text file to one of my PC clones. After a few futile attempts at the file transfer from the portable to my PC, I then discover my terminal program in the PC is set to hardware handshaking. It only takes a moment to reset my terminal program to software flow control. Two simple commands—XON and XOFF—are enabled and the XFLOW is set to "on." This is flow control in the broadest, RS-232C sense. Hold on to this thought for a moment while I bring this statement into perspective. RS-232C does NOT provide an outright flow-control mechanism.

We should build our flow-control mechanism from the existing RS-232C system lines, or resort to software flow control. Let's explore both avenues of the handshaking or flow-control issue for a moment.

RS-232C was originally developed for computer-to-computer communications over twisted-pair or telephone lines. The thinking was that software flow control could be used at either end. RS-232C standard does not in itself define a flow control. As higher data rates were set into motion, a means of flow control had to be developed which would maintain an orderly flow of data without loss of information. This demand for higher data rates produced a need to explore the use of hardware flow control.

Many data communications experts will say the RTS and CTS flow control is not sufficient to provide optimum data and file transfer. Let's examine this information further so that we are able to arrive at a reasonable answer. Some terminal programs will attempt to stop the data-dump bottleneck by providing buffers for holding and storing the incoming data until the terminal program sees room to receive it. This only delays the problem, since there is only a limited amount of room in any buffer. So, to prevent loss of data the computer must have a means to stop whatever is sending the data, and after it has disposed of the data into the buffer (or storage media), it must be able to command the device to resume sending. If you are a computer user already, you are probably aware of this type of flow control.

There are two methods which can be used for flow control within a TNC. The first method is called XON and XOFF, or *software flow control*. It utilizes, in most

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FT [illegible]	all
FT [illegible]	all
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[illegible]	64.9
[illegible]	89.9
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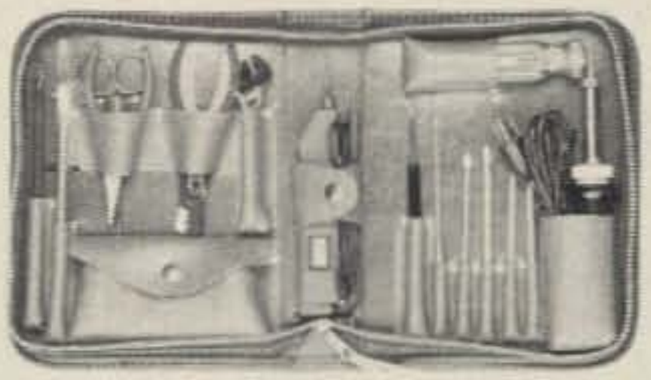

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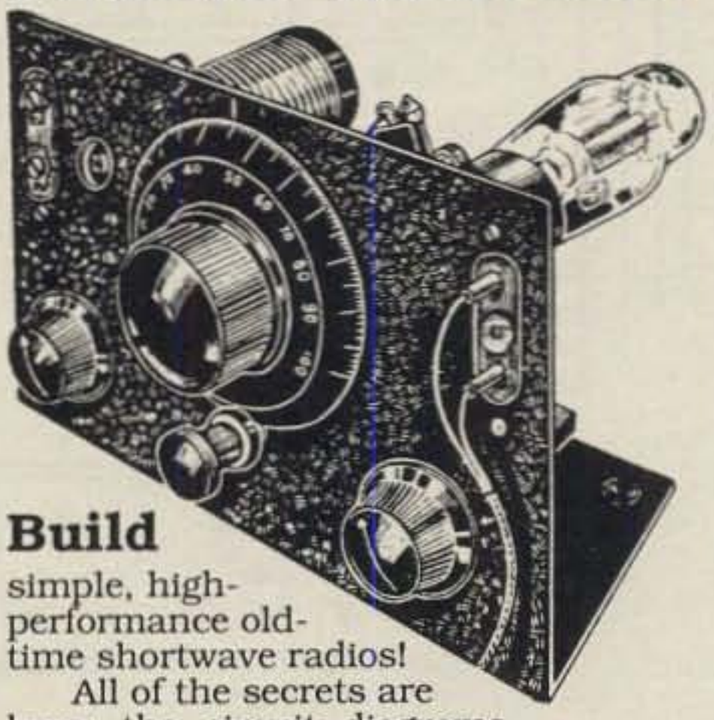

Build
simple, high-performance old-time shortwave radios!

All of the secrets are here: the circuit diagrams, parts layout, coil specifications, construction details, operation hints, and much more!

This is a compilation of shortwave construction articles from *"Short Wave Craft"* magazines published in the 20's & 30's. It's wall-to-wall "how-to."

Included are circuit diagrams, photographs, and design secrets of all shortwave receivers being manufactured in 1934 including some of the most famous: SW-3, the SW-5 "Thrill Box", the deForest KR-1, the Hammurland "Comet Pro", and many more.

Also included is a new chapter showing how you can use transistors to replace hard-to-find vacuum tubes. You'll even see the circuit that was lashed together on a table top one night using junk box parts, a hair curler and alligator clips. Attached to an antenna strung across the basement ceiling and a 9 volt battery, signals started popping in like crazy. In a couple of minutes an urgent message from a ship's captain off Seattle over 1500 miles away was heard asking for a navigator to help him through shallow water!

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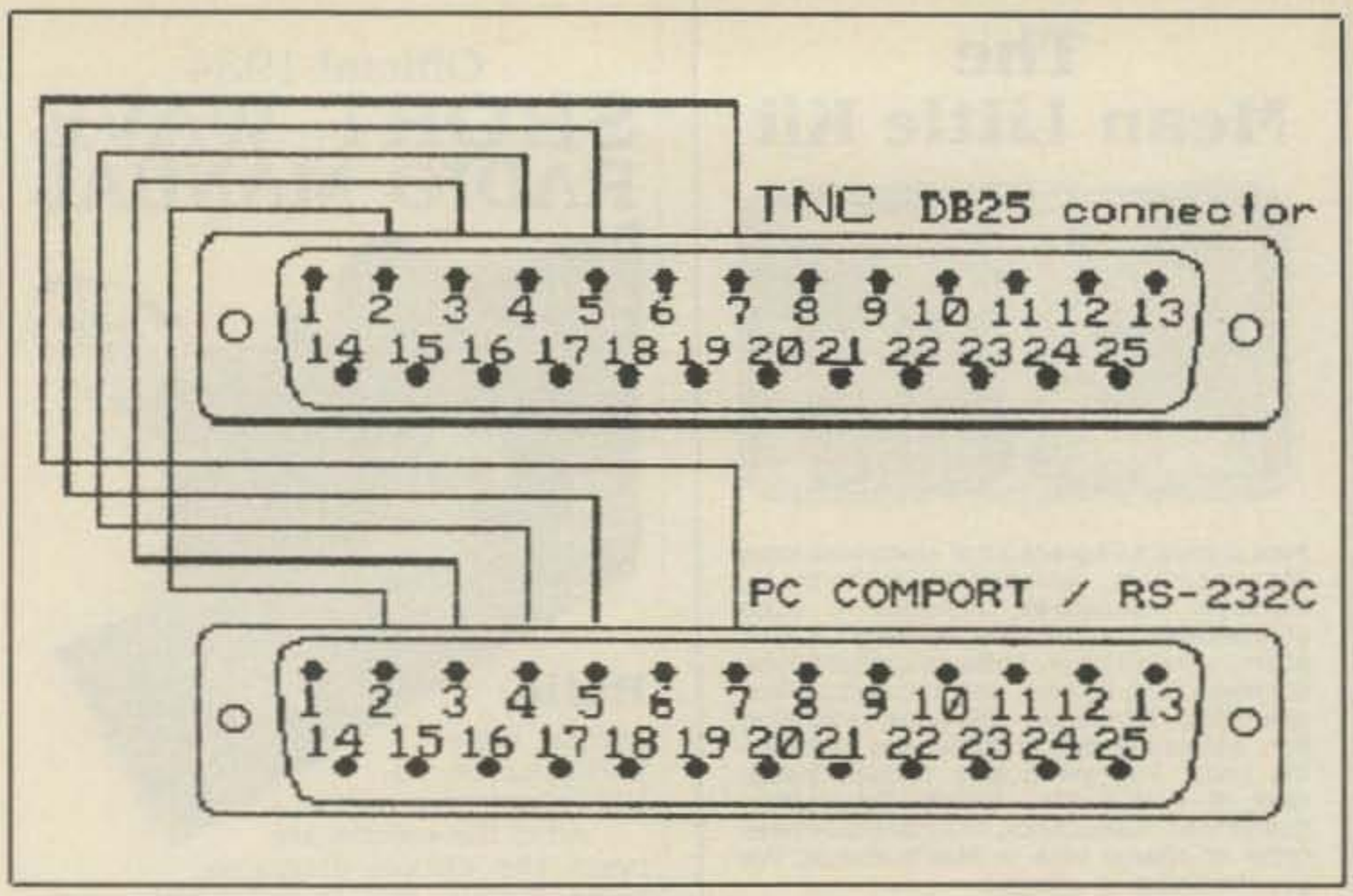

Fig. 2- A very popular cable configuration for use with hardware handshaking.

cases, the control S to stop the data flow and the control Q to resume the data flow.

The second method is *hardware flow control*, and it uses, in most cases, the Request To Send (RTS) and the Clear To Send (CTS) lines (DSR, DTR, and DCD are sometimes used also) in the RS-232C standard. Here is where a problem sometimes arises.

Many home computers do not provide a means of using hardware flow control, plus some terminal programs do not provide a way to implement software flow control. If you discover your TNC is losing data in the midst of a file transfer, check first for flow-control problems. In most amateur packet radio TNCs we have timing commands that enable us to set our timing functions to the same level or speed. This gives us the edge over some other types of data communications where no timing controls are available to the end user. As I use the RTS/CTS for flow control, I find more often that hardware handshaking is the technique or method I plan to use for a long time to come.

To make my system work smoothly and to complete my file transfers from my portable computer to the PC, I usually use a 5-wire DB-25 connector cable between the two computers. This is not the standard 5-wire cable. The transmit and receive pins 2 and 3 wires are rolled between connectors. This means that pin 2 at one end will arrive at pin 3 on the opposite end. The same scheme takes pin 3 to pin 2 of the opposite connector. I sometimes use this cable for hardware handshaking, so I do the same with the RTS and CTS (pins 4 and 5) wires (fig. 1). In data communications this is one of several forms the null-modem cable can take.

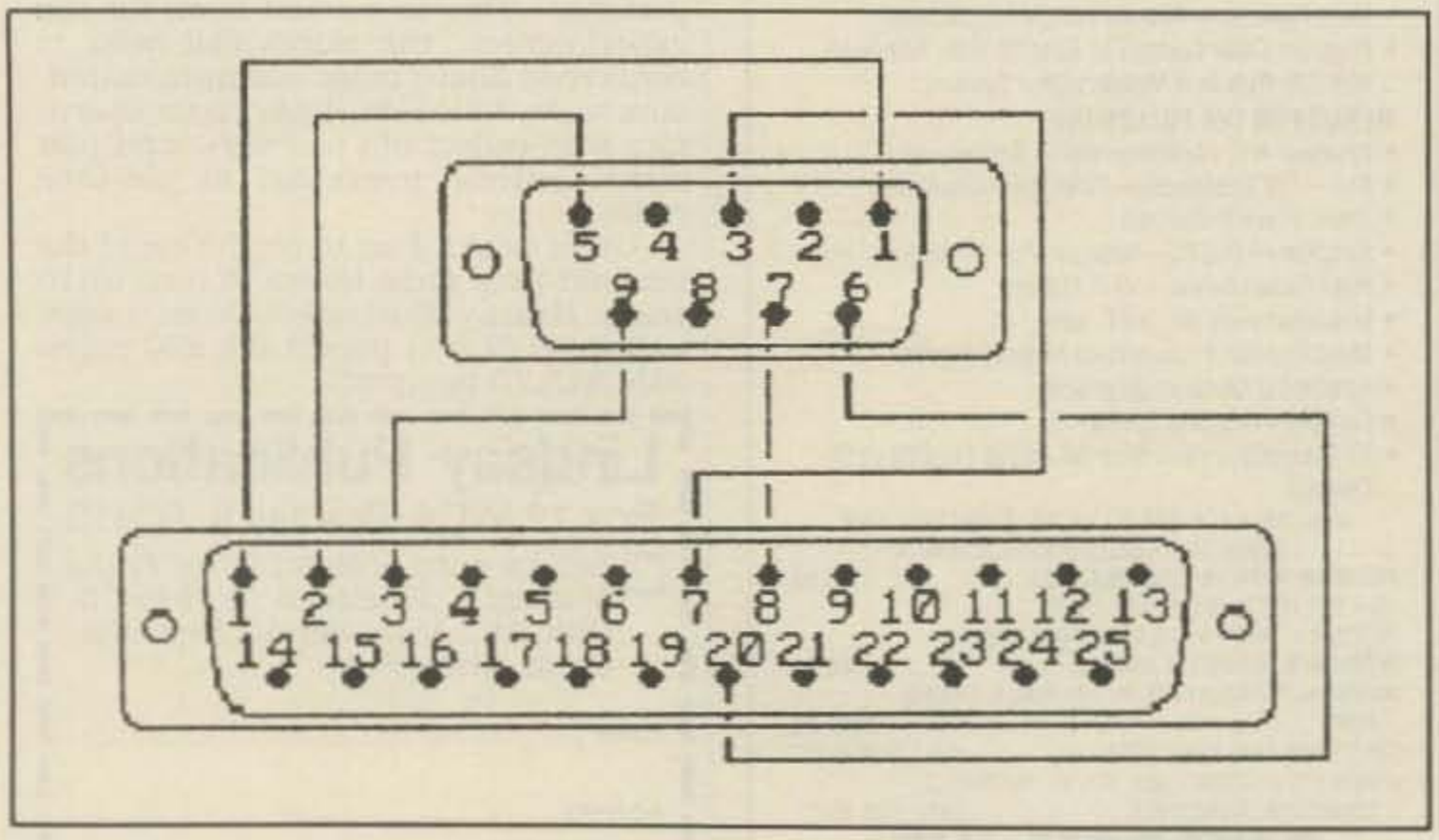

Fig. 3- This drawing illustrates the hardware handshake method used between the Macintosh and the AEA PK-232.

XON/XOFF

Whenever data is transferred via computers, there is a likely chance some of the data will be received into the buffer faster than the computer can accommodate it. In order to prevent buffer overflow and possible loss of data, some programs have an automatic "stop sending" command which it sends to the other computer while it is dumping the data. An XOFF or <control S> will alter the flow of data, while an XON or <control Q> will allow the forward flow of data. There are other factors which affect the software data flow in the packet station. The commands START and STOP will prevent buffer overflow when XFLOW or TRFLOW commands are set to "ON."

In the situation just stated it will make sense to have the "flow" commands set to ON. These include XFLOW, TXFLOW, and TRFLOW. The XON and XOFF commands will default to the settings of hex $13 for XOFF (control S) and hex $11 for XON (control Q). In some TNCs you may find the XON and XOFF are set to 0 (zero). If this should happen, you will need to enter the correct XON/XOFF setting. You will quickly discover this input will have to be entered in decimal. At the prompt cmd: you would enter the commands in this manner:

cmd: XON 17 < enter >

cmd: XOFF 19 < enter >

If you are not familiar with the use of hexadecimal to decimal conversion, you may find this to be a bit confusing, but go ahead and try it anyway. You will discover that the TNC which requires this method of decimal input will convert the decimal numbers to the hex equivalent for you. To assure yourself that this is true, at the prompt cmd: type only the command without the number as shown below.

XON <enter >

The TNC should return this answer:

cmd: XON $11

The same rule applies to the XOFF command.

cmd: XOFF <enter >

The TNC returns this:

cmd: XOFF $13

Say You Saw It In CQ

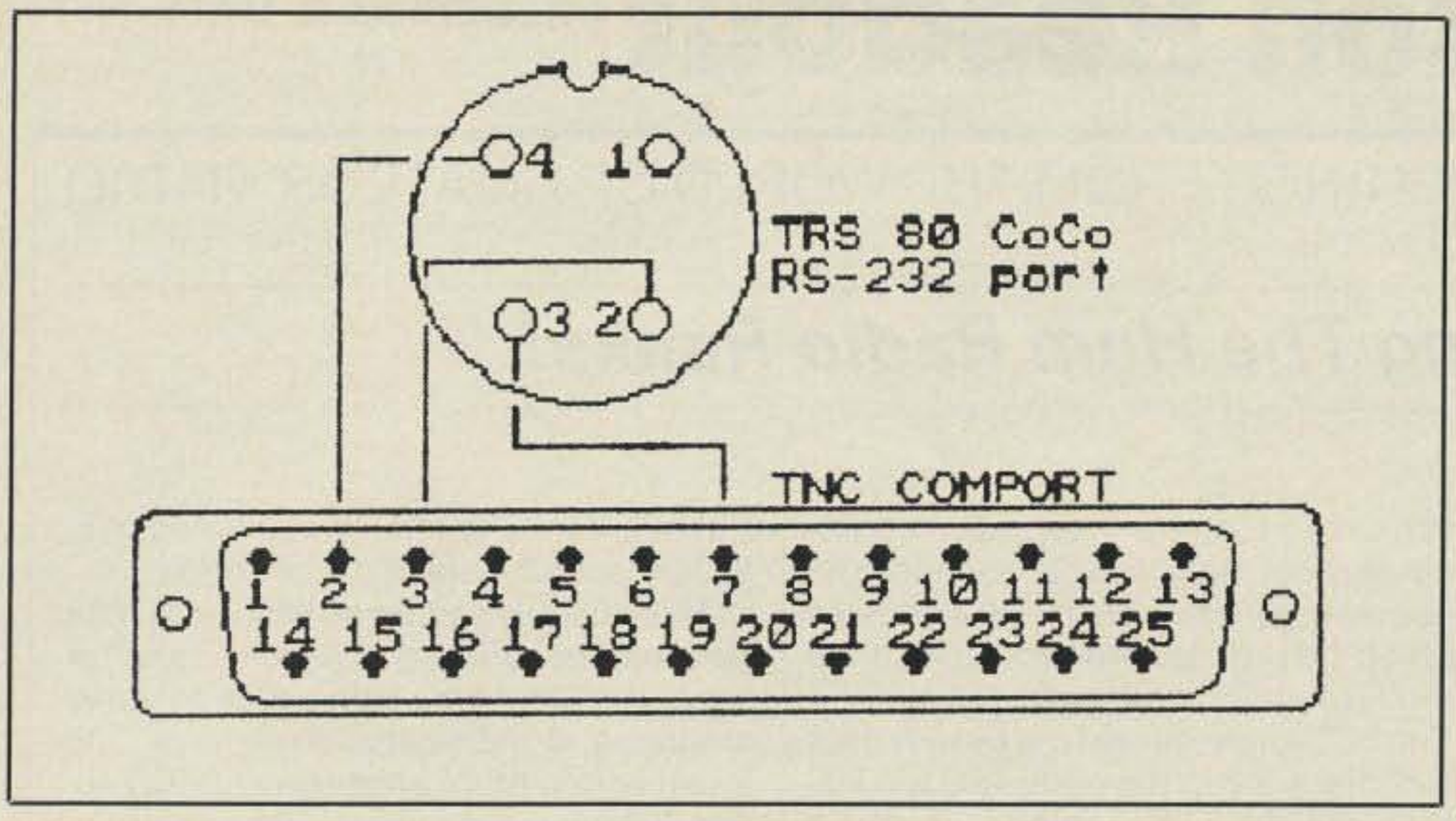

Fig. 4-Software handshaking using only three wires. Pin 7 is signal ground.

If we enter the hex numbers by mistake, the TNC will have an XON and XOFF character which will not be acknowledged by the terminal, and vice versa. Remember, use decimal input if your TNC requires the decimal equivalent numbers when hexadecimal numbers are used in the command. The TNC will take care of the conversion to hexadecimal.

Hardware Flow Control

Most TNC formats will recognize any change in the XON, XOFF, XFLOW, TXFLO, TRFLOW, START, and STOP. If the START, STOP, XON, and XOFF are set to OFF and/or zero, the TNC will automatically switch to CTS/RTS or hardware handshaking if your terminal program is configured for this type of handshake (fig. 2). Some cables can be wired to accommodate other types of hardware flow control (fig. 3).

Here is a way to circumvent the terminal program "software flow control" by letting the TNC and computer handle the handshaking via hardware flow control. If you are using the standard RS-232C serial port, then hardware handshaking may be the command set you will want to implement. As I pointed out earlier, RS-232C does not in itself support a "flow control" mechanism, so we must formulate our own by utilizing some of the features which are part of the RS-232C standard. We can either develop a flow-control routine within the software or we can make use of various RS-232C functions to provide us with a simple handshake to stop the computer terminal from sending data to a full and sometimes overflowing buffer. This is accomplished by using the 5-wire cable, which utilizes pins 2, 3, 4, 5, and 7 of the DB-25 connector. In this case, when software control is asserted, pin 5 is enabled, or "made true." On the other hand, if you have a nonstandard (Bit Banger) RS-232C, it then becomes imperative that only the 3-wire cable (fig. 4) be used, and all flow commands are turned on, or set to the correct label.

Some home computers use a transistor-to-transistor logic (TTL) communications port and may require an RS-232C interface into some TNCs. Most TNCs provide for these TTL ports by supporting both TTL and RS-232C strapping options. With either selection, RS-232C or TTL, we are still able to accommodate the software flow control. In the case of hardware flow control it would be advisable to look into the purchase of a computer which supports a total RS-232C serial communications port. In a manner of speaking, we have only two states of handshaking or flow control. These two methods of flow control are defined in this way:

1. If the XON/XOFF handshaking is administered via the terminal program, then flow control is considered to be *software* flow control.

2. If the handshaking is a function of the secondary signals, such as RTS, CTS, DTR, DSR, or DCD being exerted, then the flow control is considered to be *hardware* flow control.

So here we have the flow-control mystery unraveled. I hope this topic will enable you to read your computer manual and determine which one of the handshaking methods your packet station will require.

Fig. 5 is for your "Packet Notebook" this month. This is a very useful applications drawing since it allows us to use almost any TNC with the handhelds which use the microphone circuit to activate the transmit (PTT) of the HT.

Terms related to this month's "Packet User's Notebook."

Flow control: The process that starts and stops terminal output to prevent loss of characters or data by the receiving device.

TTL: Transistor-to-Transistor Logic. Some TNCs will not accommodate this form of interface. A separate signal converter is required when a TNC does not support TTL. Some TNCs have built-in TTL strapping options or connectors.

73, de Buck4ABT

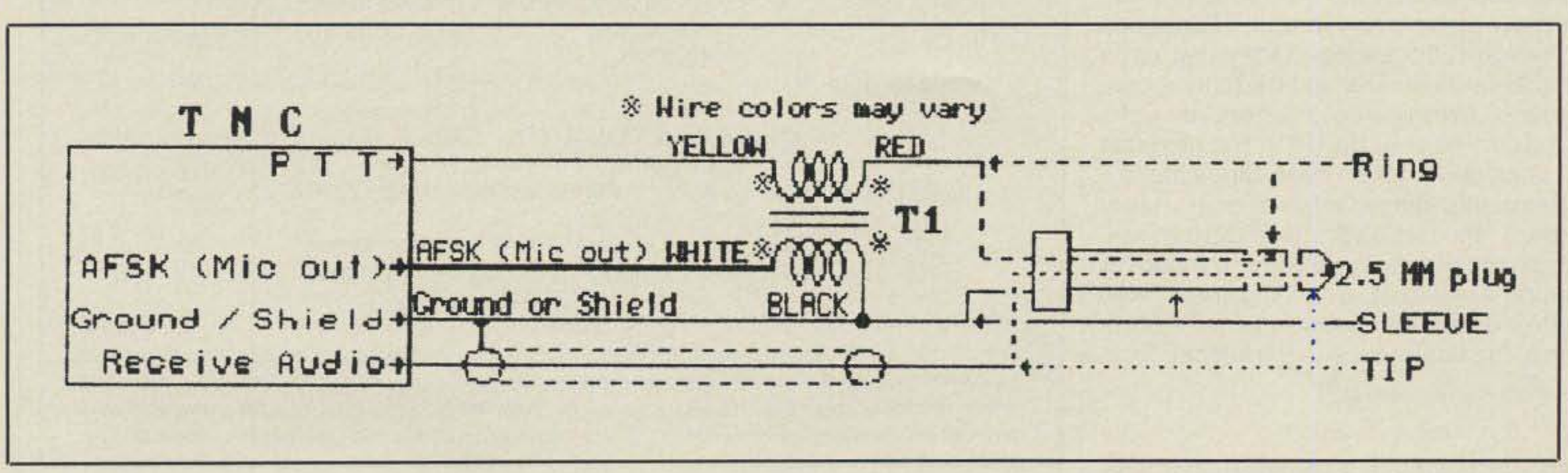

Fig. 5- A proven method for interfacing the TNC to an Alinco DJ-100-T HT. This same technique can be used with many handhelds. Use the appropriate connector(s). T1 is 1:1 audio isolation transformer, Radio Shack part number 273-1374.

Washington Readout

a monthly feature by
FREDERICK O. MAIA, W5YI

REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

Increasing The Ham Radio Ranks!

Many amateur radio enthusiasts are becoming increasingly concerned about the future of our hobby. Well-funded outside interests are demanding additional frequencies, and there simply is not enough spectrum to go around. Amateur band "frequency attacks" have become a way of life! Some have been successful.

Industrial firms and user groups are constantly petitioning for new or expanded radio spectrum from the FCC. Their needs are legitimate and the Commission, decreed to act in the public interest, must consider their requests. Providing frequencies for a two-way Television Response Service whereby viewers may immediately respond to questions posed via TV programming in "real" time, or additional radio reading channels for the blind, can hardly be called frivilous. The demands by business interests, particularly in the larger metropolitan areas, is enormous.

Why Allocations?

The amateur radio bands, particularly at the valuable VHF and higher frequency level, are perceived by industry and the regulators alike to be underutilized spectrum. We think that the amateur bands belong to us, but that is not so. The 200-nation-strong Geneva-based International Telecommunications Union (ITU) is the worldwide governing body managing the entire radio spectrum. The ITU allocation plan divides the world into three geographical regions.

Since radio waves do not respect national boundaries, the ITU members collectively agree every couple of decades on which radio services may use each frequency slice. The last frequency conference overhauling the entire radio spectrum was held in 1979. The next one is scheduled for the 1990s. Since the ITU agreements have international treaty status in the United States, FCC frequency allocations must conform to those for Region 2—that is, providing the United States delegation does not take exception at the conference to the allocation, in which case a footnote inserted in the proceeding record lets the U.S. escape from its provisions. There are many instances in which the U.S. deviates from the general ITU Region 2 allocations.

The FCC implemented the Final Acts of this conference in the early 1980s (General Docket 80-739). Table I indicates a simplified version of the incredibly complicated international and U.S. radio service allocations that affect the amateur bands above 6 meters. The important point to remember is that all amateur spectrum above the 2 meter amateur band is shared with other radio services. If potential users from these other services petition the government for amateur spectrum and can justify its reassignment, the FCC has a mandated obligation to reallocate. It is that simple.

This recently happened to the 220–222 MHz portion of the 1.25 meter amateur band. While it came as a shock to many amateurs, it really should not have. The amateur community has been on FCC notice for nearly ten years that redistribution of the band was a distinct possibility, if not a probability. Actually, all of the amateur bands above 2 meters have become prime candidates for reallocation.

What was once considered unused, "experimental" spectrum above 50 MHz is now worth billions of dollars to the commercial sector. Well-paid professional lobbyists are convincing legislators and regulators with well-reasoned arguments

Meter Band	Frequency	ITU Region 2 (United States)
6	50–54 MHz	AMATEUR exclusive
2	144–146 MHz	AMATEUR, AMATEUR SATELLITE exclusive
	146–148 MHz	AMATEUR exclusive
1.25	220–225 MHz	AMATEUR, FIXED, MOBILE Co-primary Users Radiolocation Secondary (Until Jan. 1990)
	FCC reallocated in 1988 to:	
	220–222 MHz	US: MOBILE exclusive
	222–225 MHz	US: AMATEUR exclusive
0.70	420–430 MHz	Region 2: FIXED, MOBILE U.S.: Amateur with exceptions
	430–440 MHz	Region 2: RADIOLOCATION U.S.: Amateur
	440–450 MHz	Region 2: FIXED, MOBILE, Radiolocation U.S: Amateur
0.35	902–928 MHz	Region 2: FIXED, Amateur, Mobile, Radiolocation, Industrial/ Scientific/Medical (ISM) U.S.: (ISM), Automatic VehicleMonitoring (AVM), Pulse-ranging RADIOLOCATION, Amateur Secondary with exceptions
0.23	1240–1300 MHz	Region 2: RADIOLOCATION, RADIONAVIGATION-SATELLITE (Space-to-Earth), Amateur U.S.: AERONAUTICAL-RADIONAVIGATION, Amateur, Amateur-Satellite with exceptions.
	2300–2450 MHz	Region 2: FIXED, MOBILE, RADIOLOCATION Amateur
	2300–2310 MHz	U.S.: Amateur
	2310–2390 MHz	U.S.: AERONAUTICAL MOBILE, Mobile
	2390–2450 MHz	U.S.: Amateur, 2400–2450 MHz/ISM

Radio services in capital letters are primary users, upper-lower case are secondary. Definitions: Fixed Service—a radio communications service between non-movable points. Mobile Service—a service between surface movable stations and/or base-to-mobile stations. Radiolocation Service—a service to determine positions of radio signals. Radionavigation Service—a service involving radio positioning for guidance purposes.

Table I-Allocation, assignment, and use of frequencies, Amateur Radio Service bands 50 MHz and higher.

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

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	Cert. Test	Privileges
"A"	Regulations, procedures, basic theory (Elementary)	All bands above 30 MHz All emissions/modes 250 watts input Commercial transmitter
"B"	5 wpm code (25 char./minute for 3 minutes	All bands below 4 MHz All emissions/modes 250 watts input Commercial transmitter
	Cert. "A" and/or "D" must also be held	
"C"	12 wpm code (60 char./minute for 3 minutes)	All bands below 30 MHz All emissions/modes 250 watts input Commercial transmitter
	Cert. "A" and/or "D" must also be held	
"D"	Advanced theory	1000 watts input Homebuilt transmitters Sponsor repeaters/club stations Operate remote-control links
	Cert. "A" must be held	

Written Examinations: Certificate "A"—100 multiple-choice questions; passmark is 60 correct. Examination emphasizes station operation and regulations. Certificate "D"—50 multiple-choice questions; passmark is 30 correct with emphasis on electronic circuits, design, and equipment construction.
Morse Code Examinations: Certificate "B"—Applicants must transcribe 75 characters in a row with 5 errors or less at 5 words per minute. Certificate "C"—applicants must copy 180 characters in a row with 5 errors or less at 12 words per minute. Code tests are administered in plain language and may contain the 26 letters, 10 numerals, and the comma, period, question mark, dash, and slant bar.

Table II-Canada has restructured its amateur radio service. There will be four classes of amateur certificates available as shown above.

that they deserve the spectrum far more than the amateur. Political Action Committees are making campaign donations in exchange for legislative favors. Like it or not, it is our political system.

The usefulness of spectrum keeps moving up in frequency! Sixty years ago the government gave all spectrum 200 meters and down to the amateurs, since it was thought worthless. Now in this age of satellites, 200 GHz (and we have an amateur band at 241–250 GHz) is a feasible communications medium.

Wider Use of Amateur Radio

Recent comments to the FCC from the commercial sector point out that the Amateur Radio Service has more spectrum per licensed user than any other service. This is a very dangerous statistic, and it is very apparent that amateur radio operators as a whole need to redirect their emphasis from retaining our valuable spectrum to much wider use of what we have.

There are, however, other considerations besides spectrum utilization. Today's youth are born into a digital world. Computers are everywhere—in schools, at home, in the workplace. They play a key part in everyone's life. Today's youngsters are not exposed to, and have little interest in, the Morse code which remains a requisite to amateur band access. Computer-oriented youngsters should make excellent amateurs. Many will go on to upgrade further into the mainstream of the hobby once exposed to its many facets, and many will be directed towards a high-tech career that otherwise might not be considered.

Other Nations Change With the Times

There seems to be a direct relationship between the quantity of amateur radio operators a nation has and their number of engineers and technicians. Japan turns out more high-tech engineers per capita than any other nation. With about half our population, Japan has four times as many licensed amateur operators—more than 1.6 million.

Canada has just completed restructuring their Amateur Service, and their new four-certificate modular licensing system will be implemented during the summer of 1989. Canadian authorities and amateurs feel that amateur radio has changed much over the years and "the traditional role of the amateur as a designer and builder of stations is no longer the primary activity. At present, amateurs seem to be increasingly engaged in public-service and recreational communication activities using commercially manufactured and serviced equipment."

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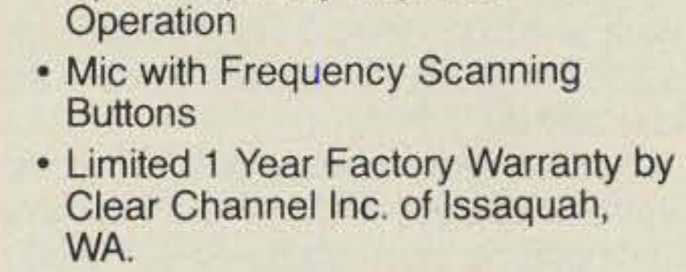

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and other Canadian citizens will shortly be able to gain access to the amateur airwaves above 30 MHz using commercially manufactured transmitting equipment. While Morse code proficiency is not required, there will be a 100-question, multiple-choice, entry-level examination involving regulations, procedures, and basic theory. See Table II for highlights of the new Canadian amateur radio restructuring.

The American Ham Ranks

Our present system of increasing the pool of beginning amateur operators is absolutely not working. Novice Enhancement, implemented in early 1987, has not contributed the "numbers" that were anticipated. According to recently released FCC statistics, 9.6% less applicants joined the amateur ranks for the first time in fiscal 1988 than in 1987 (21,080 versus 24,338). Total amateur radio growth still remains at a very, very low level, while the need for our frequencies skyrockets. There were only 1.54% more licensed amateurs at the end of the 1988 fiscal year than a year previous (436,828 versus 430,201). Computer analysis of the FCC data base reveals the average American amateur is 50 years old and only 1.9% of all U.S. licensed amateurs are under age 20.

Amateur radio should provide spectrum for those interested—or those who could become interested—in our hobby. With a larger pool and interaction with existing licensees, many will go on to upgrade even further. Amateur radio is just not a technical pursuit. It is participation in a very wide range of communications-related activities. There is something for everyone. While the Citizen's Band Radio Service provided a beginning radio interest for tens of thousands of individuals, CB was never intended to be a hobby service. Newcomers to hobby radio need to be exposed to amateur radio procedures, amateur operation, and amateur radio courtesy.

The argument that Morse code knowledge acts as a filter to attract a higher class individual is simply not valid, and the requirement has the unhealthy side effect of keeping the number of amateur radio operators low. Except for the code requirement, many excellent candidates would immediately become amateur radio licensees. In short, there is no relationship between code proficiency and being a desirable candidate. Amateur radio operators make up the same population cross-section as any other group—some excel, some are disagreeable, but most are good.

The Amateur Radio Service has the spectrum, particularly at the reusable higher frequency bands, to support large numbers of operators. Newcomers, wishing acceptance, will follow the lead of present users. Chaos won't exist where it does not already exist. "What you see is what you get" holds true. CB radio degenerated into disorder because it lacked the leadership, organization, and courtesy of the Amateur Radio Service.

U.S. Amateur Expansion Is Needed

It appears that the time is appropriate to consider wider amateur use of our valuable frequencies. We certainly are not proposing amateur radio without rules, without training, or without examinations. We are also not suggesting wild, uncontrolled amateur radio growth. The testing function will control growth to a manageable level.

The 902–928 MHz amateur band is basically unused and could make an excellent high-capacity hobby communications or computer-to-computer band with all sorts of enhancements. The propagation and equipment characteristics of 900 MHz are superb! The public has demonstrated that they want to communicate among themselves. Rag-chewing is certainly a legitimate amateur pursuit. Shouldn't 900 MHz be considered as an entry-level amateur band?

Is it necessary to be code proficient to leisurely chat across town on a store-bought transceiver? Do we need to redefine our thinking as to what is an amateur radio operator? At present it is one who is Morse code proficient, which seems terribly outdated considering today's technology and operation. It appears to us that most amateur communication on the VHF amateur bands is really personal communication by individuals who have passed a code test. What really are our motives for requiring the code? It almost appears as if we really want to keep the amateur ranks low.

We recently sent a letter to members of the amateur radio industry and to certain prominent amateurs to determine how they feel about the need to increase the amateur ranks. Changing the entry-level requirements to allow greater participation in the radio hobby is not something that every amateur is in favor of. We have heard from enough amateurs about the subject, however, to determine that there is much interest, and an effort is being considered to organize their support.

We have taken the liberty of contacting Raymond A. Kowalski, the previous FCC division chief overseeing the Amateur Radio Service (now a communications lawyer in private practice in Washington, D.C.) to get his views on the subject and to determine what he feels it would take to get a no-code amateur radio license class considered by the Commission.

I believe our nation, as well as our hobby, would benefit if we had more participation—particularly by our nation's youth—in the world's greatest educational pastime. We would like to hear your views on such a proposal, and whether you have any interest in lending your organizational or financial support to an all-out, professionally orchestrated effort. We have also started an Amateur Radio Expansion Fund with a beginning balance of $1000. May we hear from you? Write to W5YI at P.O. Box 565101, Dallas, TX 75356.

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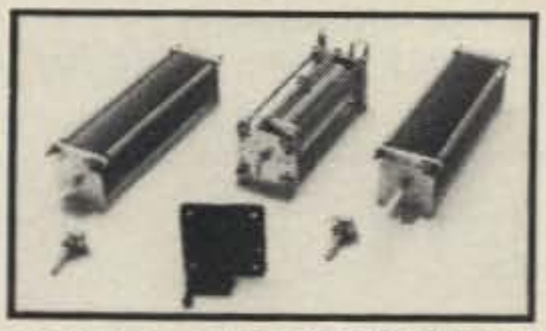

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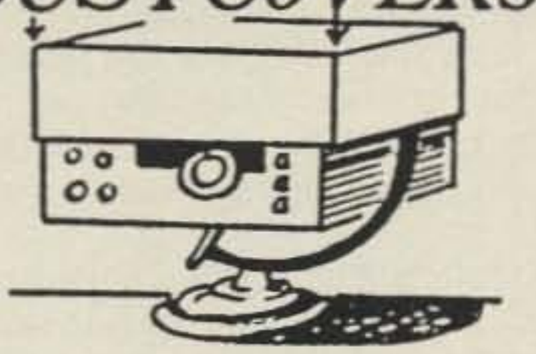

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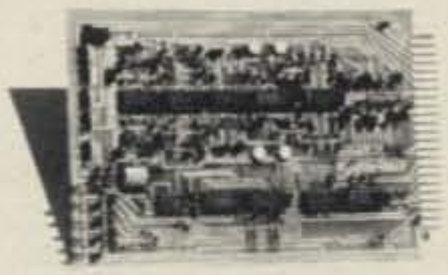

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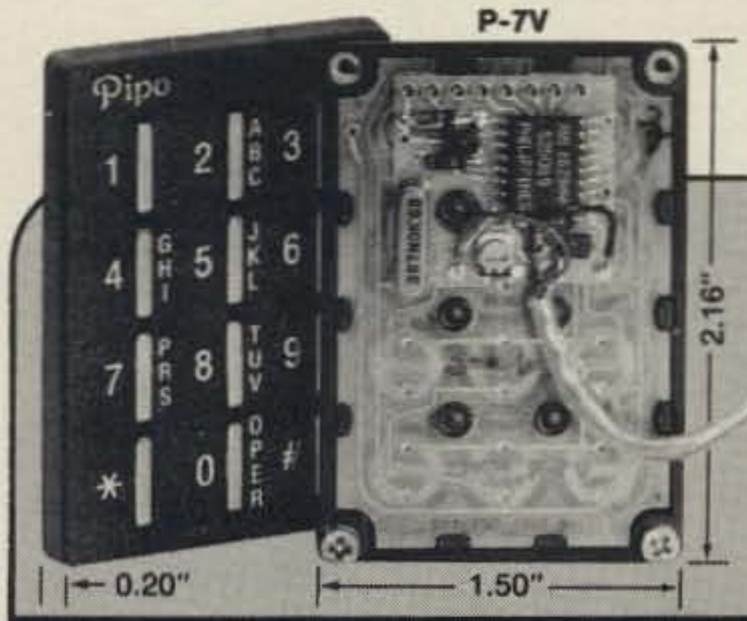

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Contest Calendar

a monthly feature by
FRANK ANZALONE, W1WY

NEWS/VIEWS OF ON-THE-AIR COMPETITION

This is probably the most active month of competitive activities in the whole year. Fortunately, there are only a couple of major contests scheduled, and except for the weekend of January 21 and 22 most of the activities are on different bands and modes. What would appear to be a number of serious conflicts, therefore, is not as bad as it appears.

We have not heard from *73 Magazine*, who sponsored a series of single-band contests which saturated the whole month of January last year. We have therefore come to the conclusion that *73* has bowed out of the contest business. Can you imagine the confusion if those six individual contests were added to this month's list of contests?

Much too late for the December issue was the announcement of the commemoration of the departure of Cristobal Colon from Comera Island in September 1492, which eventually ended with the discovery of American by Columbus five centuries ago. The contest was from 1600Z December 17th to 1600Z on the 18th, single operator SSB only on all five bands, 3.5–28 MHz. The exchange was RS and *CQ* Zone plus two letters by the Canary Islanders identifying the seven different islands, also part of the multiplier. QSO point credit was given according to the Exchange Point Table. There were also other detailed items in the scoring, etc. If you made any contacts during the above period it is recommended you write to the organizers for more information, including a list of awards. They are Comision 5th Centenario, Apartado 9, San Sebastian 38800, Isla de la Gomera, Canary Islands.

This is being written before the *CQ* WW DX Phone weekend. At the time the forecast was for good to very good propagation, which of course may have varied by the actual contest time. One thing for certain however was the unusually large number of expeditions to all areas of the world, especially the Caribbean islands. The reference to a contest expedition can be described in two different categories: (1) The operation from an existing station by a guest operator, (2) by a station where all operating facilities, antennas, and equipment were set up by individuals or a group of operators at the time of the contest. Only the latter can be judged as a bonafide contest expedition that merits a contest award.

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

*	Dc.31	- Jn.1	ARRL Straight Key Night
*	Jan.	1	AGCW Happy New Year
	Jn.1	- Dc.31	UBA SWL Competition
	Jan.	7-8	ARRL RTTY Roundup
*	Jan.	7-8	Hunting Lions CW Contest
*	Jan.	14-15	Hunting Lions SSB Contest
†	Jan.	14-15	European YL/OM Contest
	Jan.	14-16	ARRL VHF Sweepstakes
	Jan.	15	ARCI QRP Phone Sprint
	Jan.	21-22	Texas QSO Party
	Jan.	21-22	North Dakota QSO Party
	Jan.	21-22	Michigan QRP Club Contest
	Jan.	21-22	Hungarian DX CW Contest
	Jan.	21-22	AGCW-DL QRP CW Contest
	Jan.	**27-29**	**CQ WW 160 M CW Contest**
	Jan.	28-29	French CW Contest
	Jan.	28-29	YL-ISSB CW QSO Party
	Jan.	29-30	Classic Homebrew Exchange
	Jn.28	- Fb.5	ARRL Novice Roundup
	Feb.	4-5	Vermont QSO Party
	Feb.	4-6	New Hampshire QSO Party
	Feb.	11-12	QCWA CW QSO Party
	Feb.	11-12	Dutch "PACC" Contest
	Feb.	11-13	YLRL YL/OM SSB Contest
	Feb.	18-19	ARRL DX CW Contest
	Feb.	**24-26**	**CQ WW 160 M SSB Contest**
	Feb.	25-26	French Phone Contest
	Feb.	25-27	YLRL YL/OM CW Contest
	Mar.	4-5	ARRL DX SSB Contest
	Mar.	11-12	QCWA SSB QSO Party
	Mar.	18	YLRL "East Meets West"
	Mar.	18-19	YL-ISSB SSB QSO Party
	Mar.	**25-26**	**CQ WW WPX SSB Contest**
	Apr.	12-14	YLRL DX-YL to NA-YL CW
	Apr.	19-21	YLRL DX-YL to NA-YL SSB

* *Covered last month.*
† *Not official.*

Deadline for announcements for the April issue is January 15th and February 15th for the May issue, to my home address, please.

73 for this time, Frank, W1WY

U.B.A. SWL Competition

January 1 to December 31, 1989

The U.B.A. is again sponsoring this year-long competition for the benefit of SWLs.

There are five categories: Phone, CW, RTTY (AMTOR, ASCII, packet), and SSTV (FAX) for single operators. And all modes for clubs and multi-operators.

Use all 6 bands, 1.8–28 MHz.

Each station heard counts 1 point on each band. Each country heard is a multiplier (counted once only). Final score is total of different stations heard on all bands × the country multiplier.

To enter the competition you must report your progress to the Contest Manager on April 1 and September 1. Your final log must be submitted no later than January 20, 1990. There will be certificates and trophies to the winners in each category and area.

The U.B.A. suggests that you use their special log forms. Your requests for log forms and more detailed information should be directed to the Contest Manager. Include 3 IRCs if in Europe; 4 IRCs for all other areas ($2 US).

Contest Manager: Marc Domen, (ONL 6945), P.O. Box 38, Borgerhout, B-2200, Belgium.

ARRL RTTY Roundup

1800Z Sat. to 2400Z Sun., Jan. 7–8

This is the first annual all-digital contest sponsored by the ARRL. Any station may work any other station worldwide. You may operate more than one digital mode, but QSOs and multipliers are counted once only regardless of modes used.

Operation is limited to 24 hours out of the 30-hour contest period. Two rest periods must be taken in two separate blocks of time and clearly marked in the log.

Modes: Baudot, RTTY, ASCII, AMTOR, and packet.

Bands: 3.5–30 MHz on those frequencies recommended for digital operation (no 10, 18, or 24 MHz).

Categories: Single operator, multi-band, (1) less than 150 watts output, (2) 150 watts or more. And multi-operator, single transmitter, all band.

Exchange: Signal report and QTH. State for the U.S., province for Canada. DX will send a serial QSO number.

Scoring: One point per QSO. A station may be worked once per band for QSO credit.

Multiplier: Each US state (48), each VE province (12), and each DXCC country, counted only once, not once per band. (KH6 and KL7 are countries; VO1/VO2 counts as one VE province).

Entries with 200 or more contacts must submit a duplicate QSO check sheet.

Awards: Certificates to the top-single operator, both low and high power, and multi-operator scorers in each ARRL/CRRL section, and each DXCC country. Novice/Tech entrant with at least 50 QSOs will also receive a certificate.

Detailed information appeared in the November issue of *QST*. Contest forms

Say You Saw It In CQ

are available from the ARRL for an SASE and two units of first-class mail and are recommended.

Postmark your entry by February 8th and send it to: ARRL RTTY Contest, 225 Main Street, Newington, CT 06111.

ARRL VHF Sweepstakes

1900Z Sat. to 0400Z Mon., Jan 14-16

This is the 42nd ARRL January VHF Sweepstakes. ARRL Headquarters recommends that you use the official log forms. It will make your log keeping and the scoring much easier. A large SASE to Newington will get you the necessary forms.

Complete rules will be found in the December issue of *QST*. They are a bit complicated, so look them over carefully.

European YL-OM "Midwinter" Contest

CW: Sat., Jan. 14 Phone: Sun., Jan. 15
0700Z to 1900Z each day

This contest is organized by four European YL Clubs—the English, Belgian, Dutch, and Italian.

Bands: All five bands, 3.5 through 29.7 MHz. Use sections according to IARU Region I recommendations.

Exchange: RS(T) plus QSO serial number and country. OMs start with 001; YLs start with 2001.

Points: Each QSO with a YL, 5 points. OM QSOs, 3 points. Stations may be worked once on each band.

Multiplier: Each DXCC country worked, counted once only, *not* once per band.

Final Score: Total QSO points from all bands times the DXCC countries worked.

Frequencies: CW—3510–3560, 7010–7040, 14025–14070, 21025–21070, 28025–28070. Phone—3600–3650, 3700–3775, 7050–7100, 14150–14250, 21200–21300, 28500–28700.

Awards: Certificates to the top YL and OM winners in each category in each country.

There is an SWL division. Score 5 points for each YL station heard. Multiplier same as above.

Use separate logs for CW and phone. Include a column for each new multiplier and QSO points. A summary sheet showing the scoring, a signed declaration that all rules and regulations have been observed, and your name and address in Block Letters are also required.

Mailing deadline to the contest manager is February 28th. They go to: D. Wildeboer, PA3CEB, Kettingweg 3, 8281 PN Genemuiden, The Netherlands.

ARCI QRP Winter Phone Sprint

2000Z to 2400Z Sunday, Jan. 15

Like the "Homebrew" CW Sprint last month, this is also a 4-hour shorty with a similar format except for the homebrew feature.

Exchange: RS and state, province, or country. ARCI members will include their membership number. Non-members include their power output.

Scoring: Contacts with members 5 points. With non-members 2 points. If on a different continent 4 points.

QTH Multiplier: Sum of different states, provinces, and countries worked on each band.

Power Multiplier: Up to 2 watts PEP × 10, 2–10 watts × 7. Over 10 watts is a check log.

Power Supply Multiplier: Battery supply × 1.5, solar/natural × 2.

Final Score: Total QSO points from all bands × QTH multiplier × power × power supply multipliers.

Frequencies: 1810, 3985, 7285, 14285, 21385, 28385, 28885, 50885 kHz.

Awards: Certificates to the top three overall scorers, and to the top scorer in each state, province, and country in which two or more entries are received.

Include a summary sheet showing the scoring, a dupe sheet for entries with 100 or more QSOs, and other essential information. Sample log forms are available and also a copy of the results. Include a large SASE for each.

Mailing deadline for logs is February 15th to: Red Reynolds, K5VOL, 835 Surryse Road, Lake Zurich, IL 60047.

Texas QSO Party

0000Z Sat. to 1800Z Sun., Jan. 21–22

This year's party is again organized by the West Texas DX Association. The same station may be worked on each band and each mode, and mobiles in each county change. Single operator only.

Exchange: QSO no. and QTH. County for Texas stations. State, province, or country for others.

Scoring: Texas stations score 1 point per QSO on phone, 2 points if on CW, fixed or mobile. (In-state contacts permitted for QSO and multiplier credit.) Non-Texans same as above. However, Texan phone mobiles are worth 5 points, CW mobiles 7 points.

Multiplier: Texans use states, VE provinces, DX countries, and Texas counties. Non-Texans use Texas counties (maximum of 254).

Frequencies: CW—3565, 7065, 14065, 21065, 28065. Phone—3940, 7260, 14280, 21370, 28600. Novice—3710, 7110, 21110, 28110.

Awards: Certificates to the top scorers in each state, VE province, and DX country, and top 10 Texas stations. There are also plaques for the overall winners in seven different areas: U.S., U.S. Novice, DX, VE, Texas fixed, mobile, and Novice stations.

All logs must be received by March 14th. They go to: Les Bannon, WF5E, 3400 Bedford, Midland, TX 79703.

North Dakota QSO Party

0000–0800Z & 1600–2400Z Sat., Jan. 21
0800–1600Z Sun., Jan. 22

Sponsored by the Red River Radio Amateurs of Fargo, North Dakota, this one will make one of the rarer states available for WAS and County Hunters.

The same station may be worked once on each band and each mode.

Exchange: RS(T), and QTH. County for ND stations; state, province, or country for others.

Scoring: Count 10 points for phone QSOs, 20 points for CW, and 50 points for RTTY. ND stations add 1000 bonus points for working 5 Novices.

Final Score: ND stations multiply total QSO points from all bands by sum of states, provinces, and countries worked per band and mode. Others multiply by total number of ND counties worked (maximum of 53).

Frequencies: CW—35 kHz up from band edges. Phone—3905, 7280, 14295, 21380, 28450. Novice—25 kHz up from edges of Novice bands.

Awards: Certificates and plaques. Include a large SASE with your entry for a copy of the results to see if you won anything.

Mail logs by February 28th to Mike Beaton, KDØA, 2267 Flickertail Drive, Fargo, ND 58103.

Michigan QRP CW Contest

1200Z Sat. to 2359Z Sun., Jan. 21–22

This is the ninth annual CW contest sponsored by the Michigan QRP Club. The contest is open to all amateurs and all are eligible for awards.

Classes: (A) Less than 250 milliwatts. (B) 1 watt to 250 milliwatts. (C) 5 watts to 1 watt. (D) Over 5 watts.

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

Exchange: RST; state, province, or country; and Club membership number. Non-members send power output.

Scoring: Contacts with members 5 points. Non-members 1 point. Bonus of 1.5 if power used is 100% battery or natural.

Final Score: Total QSO points × states, provinces, and countries worked per band × 1.5 power bonus if applicable.

Frequencies: 1810, 3560, 7030, 7040, 14060, 21060, 28060. Novice—3710, 7110, 21110, 28110 kHz.

Awards: Certificates to top scorers in each state, province, and country.

Use a separate log for each band and include a summary sheet showing the scoring, operating class, and equipment

used, plus the usual signed declaration.

Sample forms are available with an SASE to K8DD, 1640 Henry, Port Huron, MI 48060.

Logs must be received no later than Feb. 17th by L.T. Switzer, N8CQA, 654 Georgia, Marysville, MI 48040. Include a large SASE for a copy of the results.

Hungarian CW Contest

2200Z Sat. to 2200Z Sun., Jan. 21–22

This is an annual affair organized by the Hungarian Radioamateur Society to promote better relations between HA's and amateurs in other countries.

Classes: Single operator, both single and all band, and multi-operator all band (club stations).

Exchange: RST and QSO contact number starting with 001. HA stations will also add two letters to identify their county. There are 20 counties: BA, BE, BP, BN, BO, CS, FE, GY, HA, HE, KO, NG, PE, SA, SO, SZ, TO, VA, VE, ZA.

Points: Contacts with HA stations count 6 points. With other stations outside own continent, 3 points. Same station may be worked on each band for QSO points.

Multiplier: Each different HA county worked on each band.

Score: Total QSO points from all bands times the sum of the multipliers from each band.

Frequencies: 3500–3590, 7000–7035, 14000–14090, 21000–21090, 28000–28090 kHz.

Awards: Certificates to the top three entrants of countries and continents in each category. Plaques and memorial awards to the overall winners in each category. (Hungarian, Europeans, and DX stations will be judged separately.)

Contest contacts can be used for the following Hungarian Awards (use separate application forms): WHD, Savaria, Pannonia, Dunakanyar DD, Balaton BD, Budapest BPA.

Use a separate log sheet for each band, and the usual signed-declaration summary sheet showing the scoring and other essential information.

Mailing deadline for your log is no later than six weeks from the end of the contest. Mail to HRAS Contest Bureau, P.O. Box 86, H-1581 Budapest, Hungary.

Results of the 1988 contest for USA single operator, all band: K3IPK 51,570; KA1DWX 32,841; K3WW 32,165; K3ZO 30,756; W3ARK 13,888; K3BG 5,520; W2QYA 99; and NL7DU 260 points.)

AGCW-DL QRP CW Contest

1500Z Sat. to 1500Z Sun., Jan. 21–22

This is the winter edition of this QRP contest organized by the AGCW-DL. It's a CW only on all 6 bands, 10–160 meters. The same station can be worked on each band for QSO and multiplier credit.

There are five classes as follows:

A. Single Op.—3.5 watts or less.
B. Single Op.—10 watts or less.
C. Multi-Op.—10 watts or less.
D. QRO stations, over 10 watts.
E. SWL's.

Multi-operator stations may operate the full 24 hours. All other classes must take a 9-hour break, which may be taken in two segments.

Exchange: RST, QSO no., and power input. Add × if transmitter is crystal controlled (559001/5×, QRO stations 579002/QRO).

Points: QSO with own country, 1 point. Other countries own continent, 2 points. DX outside own continent, 3 points. Crystal-controlled stations are limited to 3 crystals for each band, and take double above points.

Multiplier: One for each country and one for each DX contact. For scoring purposes call areas in JA, PY, VE, VK, W/K, and ZS are counted as multipliers.

Final Score: Total QSO points times the multiplier on that band. Add the sum of scores from each band.

Awards: Certificates to the first three places in each class on each band. Use a separate log for each band.

All entries must be received no later than six weeks after the end of the contest. Include 1 IRC for copy of results.

Entries go to Siegfried Hari, DK9FN, Spessartstrasse 80, D-6453 Seligenstadt, Fed. Republic of Germany.

CQ WW DX 160 Meter Contest

CW: Jan. 27–29 SSB: Feb. 24–26
2200Z Friday to 1600Z Sunday

Complete rules were published in the December issue and are the same as those we have been using these past many years. Following is a brief rundown.

Exchange: RS(T) and QTH. State for the U.S., areas for Canada, prefix for DX, country abbreviation for those with unusual prefixes.

Stations operating in a state different from that indicated by the call are required to sign portable.

Scoring: Contacts with stations in own country 2 points, other countries in same continent 5 points, and with other continents 10 points.

Multiplier: Each U.S. state (48), Canadian area (13), and DX country. (ARRL and WAE country lists and WAC boundaries are the standards.)

Awards: Certificates to the top-scoring stations in each U.S. state, Canadian area, and DX country. And an assortment of 12 plaques for U.S. and world winners.

Penalties: Three contacts will be deleted for each duplicate that has not been removed.

Disqualification: Taking credit for excessive duplicate contacts, and the usual assortment of rules violations and unsportsmanlike conduct.

The traditional "DX Window," 1825–1830 kHz, that has been a part of 160 since the start of DXing on the top band, is being phased out, but a new spot, 1907–1912 kHz, has been created for Pacific DX. *(The old window was no longer being observed, so the success of the new window is questionable.—ed.)*

Mailing deadline for logs is February 29th for CW entries and March 31st for the SSB section.

They can be sent directly to the 160 Contest Director, Donald McClenon, N4IN, 3075 Florida Avenue, Melbourne, FL 32904. They can also be sent to *CQ* 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. Be sure to indicate CW or SSB on the envelope.

French DX Contest

CW: Jan. 28–29 SSB: Feb. 25–26
0600Z Sat. to 1800Z Sun.

This year's announcement shows no change from the format used last year. It's still the world working the French Europeans as well as the other French departments and territories all over the world. The French areas can be identified by the prefix F and TV, HW, TK.

Classes: Single operator, multi-operator, and SWL. Multi stations must remain on the same band at least 15 minutes.

Bands: 3.5–28 MHz (no WARC bands) in the IARU segments designated for DX contest operation.

Exchange: RS(T) plus a three-figure QSO number starting with 001. French stations will also include two figures or letters identifying their department.

Points: One point per contact between stations in the same continent; three points if with other continents.

Multiplier: Each French European department (95) and each overseas department and territory worked on each band. (Corsica TK has two departments, 2A and

1988 REF Contest Results
USA Single Operator

CW			
W1GIH	24,717	W7LVI	1,716
K3ZO	24,360	W8VSK	1,076
K2SX	19,182	K9BG	714
W3ARK	18,304	WA2UDT	707
W5BOS	13,662	W0IZV	243
W8KV	10,206	WA4SSB	63
KA1GET	8,930		
K2FE	7,059	**SSB**	
W5HTG	6,232	NG1W	196,374
KC7KU	5,700	K3FN	36,855
KA1DWX	4,590	KE2CG	6,678
W8IQ	2,772	WK4F	2,635
W6NAL	2,664	W8KV	2,430

Say You Saw It In CQ

YAESU'S DUAL BANDER GOES PLACES OTHER MOBILES DON'T.

Introducing Yaesu's FT-4700RH dual-band mobile. Choose Yaesu's FT-4700RH, and you open the door to a lot of tight spaces.

While other dual banders just won't fit in today's small cars, the FT-4700RH utilizes a versatile "remote head" design. So you can mount the "brains" on your dash, visor, or door, and hide the "muscle" under your seat.

High-performance package. Packing a solid 50-watt punch on 2 meters (40 watts on 70 cm), the FT-4700RH includes Dual-Band Watch for simultaneous monitoring of both bands, with independent squelch settings on the main and secondary bands. When you transmit, opposite band monitoring goes on in a full-duplex mode.

You can adjust the relative volume of the two receive channels with the balance control, too. And with Yaesu's bright LCD display, transceiver status is clearly visible in sunlight or shade.

Convenience on the road. Human engineering, long a Yaesu specialty, is an important aspect of the FT-4700RH design. The ten-button front panel keypad includes a "do-re-mi" audible command verification, and all important controls are backlit for night operation. Plus you get extended receive coverage of 140-174 MHz (MARS/CAP permit required for transmit on 140-150 MHz), or 430-450 MHz on 70 cm. Nine memory channels on each band. High/low power selection (low power: five watts). One-touch reverse repeater shift button. Optional CTCSS module. And 16-key DTMF microphone.

Optional accessories. FTS-8 CTCSS unit. MH-15D8 Autodialer Microphone with 10-telephone number memory. SP-3 or SP-4 External Speakers. And YH-1 Headset/Boom Mic or MF-1A3B Flex-Arm Boom Mic, both with SB-10 PTT Switch Unit.

Discover Yaesu's FT-4700RH today. And see what "high performance" really means. For dual-band mobile operation, Yaesu's FT-4700RH really fits!

FT-4700RH control head (1 15/16" x 5 7/8" x 1")

Yaesu USA 17210 Edwards Road, Cerritos, CA 90701 (213) 404-2700. **Repair Service:** (213) 404-4884. **Parts:** (213) 404-4847. Prices and specifications subject to change without notice. Specifications guaranteed only within amateur bands.

YAESU

CIRCLE 22 ON READER SERVICE CARD

2B. The French Army, DA1 and DA2.) And club station F6REF/00.

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

Awards: Certificates to the top scorers in each class in each country.

Stations making over 100 contacts must include a dupe check list with their log and a summary sheet showing the scoring and the usual signed declaration. Disqualification rules for excessive duplicate contacts and other violations will be strictly enforced.

All entries must be received no later than March 15th for CW and Aporil 15th for the Phone section. This year they go to a new address: Reseau des Emetteurs Francais Contest, c/o M. Pacchiana Christian, F6ENV, 7 Chemin des Ecoles, Quartier St-Jean, 13110 Port-de-Bouc, France.

YL ISSB QSO Party

CW: Jan. 28–29 SSB: Mar. 18–19
0001Z Saturday to 2359Z Sunday

The party is open to all, but the emphasis is on membership participation.

Categories: Single operator, DX-US Partners, and YL-OM Teams.

Exchange: Call, RS(T), QTH (state, prov., terr., dist. or country), name, ISSB number, YL-OM teammate, DX-US partner.

Points: One point for non-member contacts, 3 points for member contacts on the same continent, and 6 points if in a different continent.

Multiplier: Only contacts with member stations count as a multiplier. There are ten different categories. Get the list from WA9AEA.

Frequencies: The General portions of the CW and phone bands, 10 through 80 meters. Avoid 14332 used by ISSB Net. Check 40 and 80 hourly. VHF and UHF may be used simplex.

Awards: Category and QTH area winners.

Logs: Should be set up as outlined in the exchange and should indicate at least two 6-hour rest periods. A summary sheet showing the scoring and other essential information would be helpful.

Mailing for all entries is April 30th, and they go to: Bill Early, WA9AEA, P.O. Box 401, McHenry, IL 60050-0401.

(Note: Rules and logging format are much too lengthy and complicated to list here. Strongly suggest you send a large SASE to WA9AEA for more details.—ed.)

Classic Radio Exchange

2000Z Sun. to 0400Z Mon., Jan. 29–30

This is the winter edition of this unusual event. The format is still the same as it has been for the past years. Object is to restore and operate older equipment with like-minded hams, not required in the exchange, but a distinct advantage in the scoring.

A classic radio is any equipment at least 10 years old. Homebrew solid-state gear is age rated for scoring at 25 years old, plus age of a similar design article. Homebrew tube gear age is established as the actual year of such an article.

The same station may be worked on each band and each mode, and with different equipment combinations. Non-contesters may be worked for credit also.

Exchange: Name, RS(T), QTH, receiver and transmitter type, and other interesting conversation.

Scoring: Multiply total QSOs by total number of receivers, transmitters, state/provinces/countries worked on each band and mode. Multiply that total by your Classic Multiplier, the total age of all receivers and transmitters used. Three QSOs minimum per unit. Multiply age by two if gear is a transceiver.

Frequencies: CW—60 kHz up from low edge of band. Phone—3880, 7280, 14280, 21380, 28580. Novice/Tech.—3720, 7120, 21170, 28120, 28320.

Awards: Certificates and appropriate memorabilia are awarded for highest scores, longest DX, exotic equipment, best excuses, and other unusual achievements.

This year send your log, comments, anecdotes, pictures to: Jim Hanlon, W8KGI, 5560 Linworth Road, Worthington, OH 43085. Include a large SASE for a copy of the "Classic Radio Newsletter" with the results.

ARRL Novice Roundup

0001Z Sat. Jan. 28 to 2359Z Sun. Feb. 5

With Novice Enhancement now in effect, this year's Roundup will be operating under new rules to take advantage of the new Novice privileges.

It's a nine-day long contest, but only 30 hours of actual operating time is permitted for scoring.

Novice/Tech will work each other and higher class licensees who, of course, are limited to contacting Novice/Tech only. All bands and modes open to Novice/Tech can be used.

Exchange: Signal report and ARRL section (country for DX stations).

Scoring: One point for phone QSOs, two points for CW, including RTTY and packet.

Multiplier: Each ARRL/CRRL section plus each DXCC country. There is also a bonus for stations holding a code proficiency certificate.

Final Score: Add your code bonus to your QSO points total and multiply that total by your multiplier.

Awards: Certificates to every Novice/Tech who submits a valid entry. Higher class licensees are not eligible for awards.

The use of official forms is not only highly recommended, but is a *must*. A large SASE to ARRL Novice Roundup will get you a contest package with all the necessary forms. The December issue of *QST* had a detailed announcement with suggestions and operating details

Postmark your entry no later than March 5th to: ARRL Novice Roundup, 225 Main Street, Newington, CT 06111.

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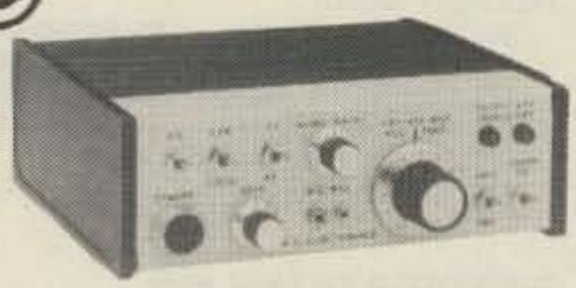

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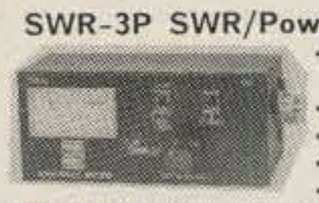

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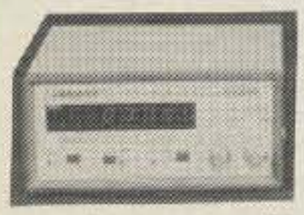

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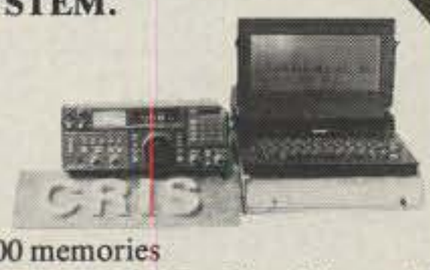

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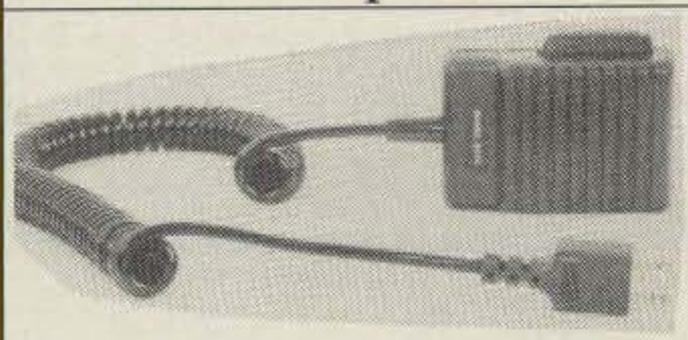

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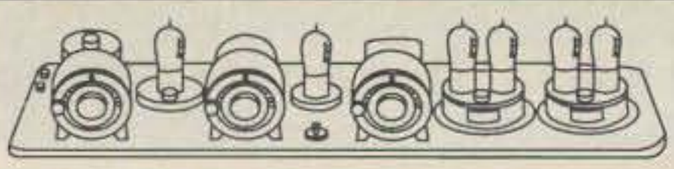

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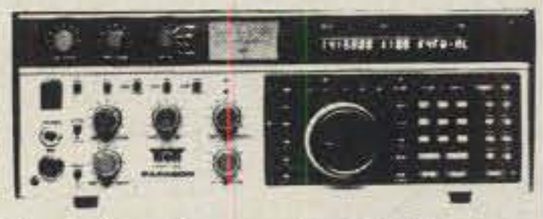

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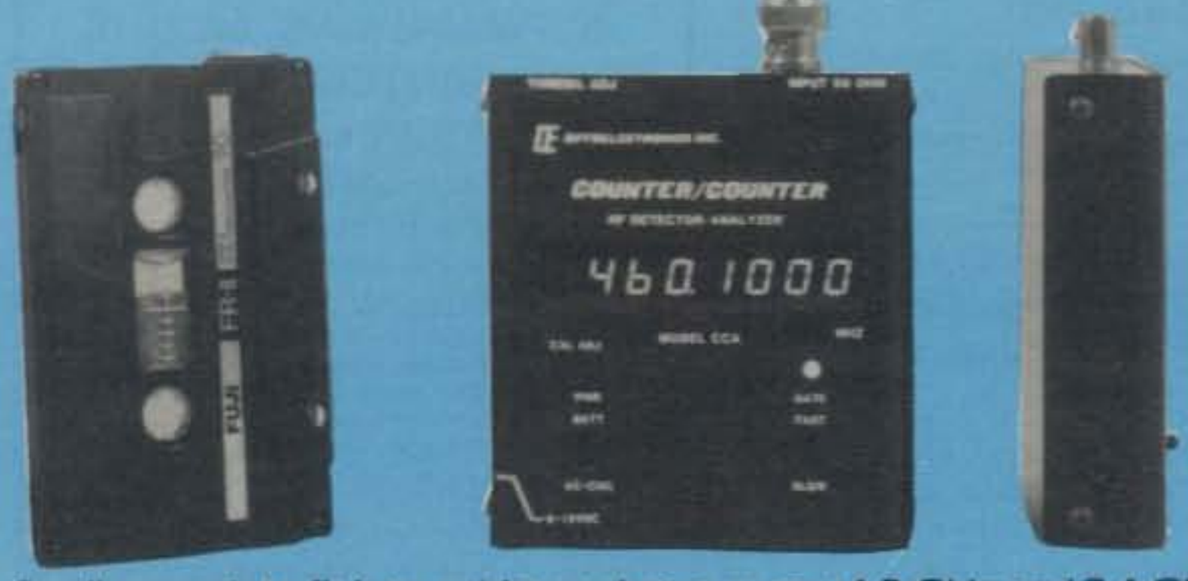

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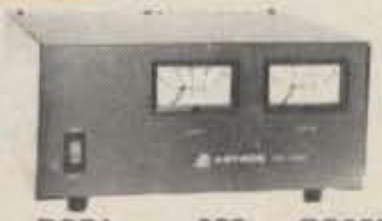

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Midsize Masterpiece! The deluxe IC-751A includes more high performance features and professional circuitry per cubic inch than any other HF transceiver. Its smooth-as-silk operation and long-term reliability produce the ideal contesting, DX'ing, mobiling and portable rig. Owning an IC-751A truly means "Going First Class!"

Unsurpassed Quality and Reliability. Quality and Reliability is important to you and it's important to ICOM. ICOM now covers you and your investment with its exclusive

one year warranty. There's more! The IC-751A's receiver boasts 105dB dynamic range for superb listening. The 100% duty cycle transmitter defies abuse and delivers 100 watts of exceptionally stable and clean RF output. Reliability. Quality. One year warranty. That's ICOM.

All Bands, All Modes Included. Operates 160 through 10 meters, it's easily modified for MARS operation, plus it includes general coverage reception from 100kHz to 30MHz. No compromise, no comparison!

32 Tunable Memories. Store both frequency and mode information. Use them to quick-access your favorite spots or as 32 preferred frequency-remembering VFOs.

A Modern Amateur's Delight! Special attractions include an electronic keyer, semi or full break-in rated to 40 WPM, panel selectable 500Hz/FL-32A CW filter, and volume control-tracking sidetone. SSB transmissions are enhanced with an RF speech processor and tone control to produce sparkling clear audio. PLUS there's a new rubberized tuning knob for velvet-smooth tuning and a full line of accessories and filters.

RF Power Control. Varies output independent of mic gain, ALC and speech processor action. Enjoy maximum "talk power" at any drive level!

To see the IC-751A, contact your local ICOM dealer.

CIRCLE 27 ON READER SERVICE CARD

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