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ICD 08241

CQ Amateur Radio

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The Western Sahara Story Part II—Conclusion

CQ Reviews:
Create CV48 Vertical Antenna
Yaesu FT-736R VHF/UHF Transceiver
Kenwood TH25AT/45 AT Handhelds
MFJ Gray Line DX Advantage

The NP4A QTH
Ponce, Puerto Rico

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THE RADIO AMATEUR'S JOURNAL

KENWOOD

...pacesetter in Amateur Radio

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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DX-cellence!

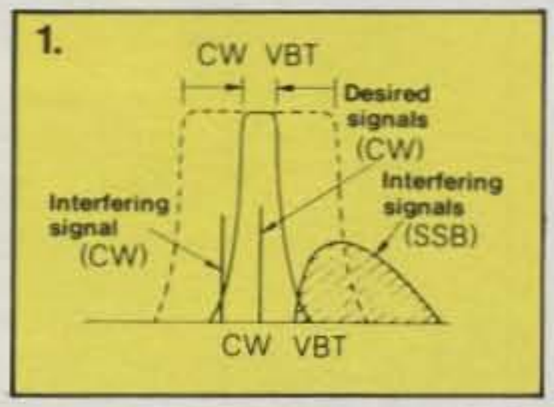
#1 Rated HF!

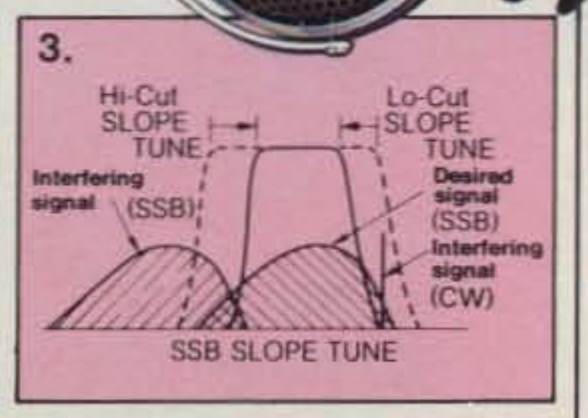
TS-940S

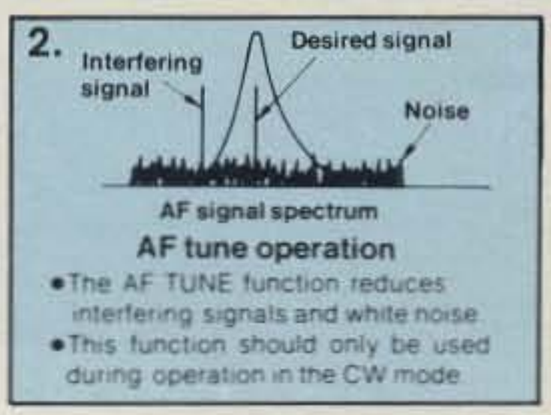
Competition class HF transceiver

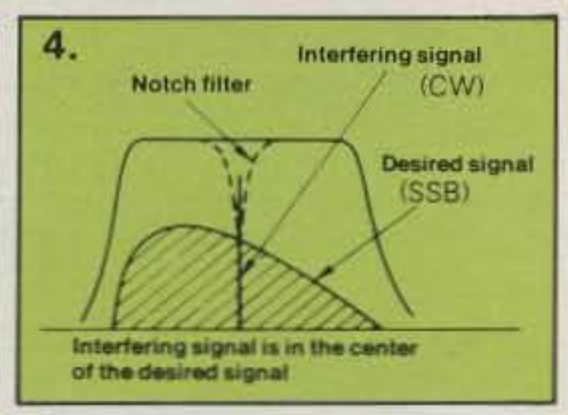
TS-940S—the standard of performance by which all other transceivers are judged. Pushing the state-of-the-art in HF transceiver design and construction, no one has been able to match the TS-940S in performance, value and reliability. The product reviews glow with superlatives, and the field-proven performance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

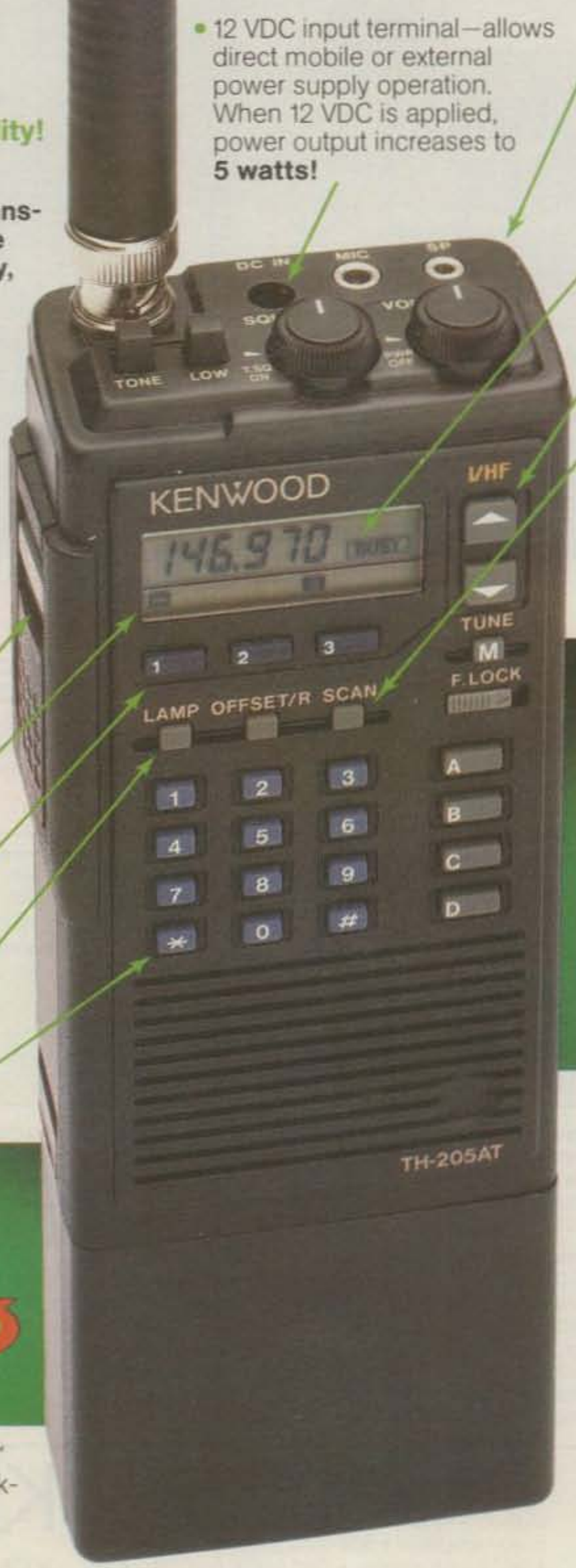
TH-205AT

Affordable 5-watt hand-held transceiver. Ultimate Affordability!

It's here now! The affordable, "Kenwood Quality" hand-held transceiver. Standard features include a large, easy-to-read LCD display, wide-range power requirements (operates on 7.2 VDC—16 VDC), 3-channel memory, built-in battery saver circuit, and, when operated on 12 VDC, a robust five watts of power! The die-cast metal rear panel/heat sink assures cool, reliable operation. Receiver frequency coverage from 141—163 MHz is also standard—you can even listen to the "weather channels" at 162.40 or 162.55 MHz!

- Monitor switch—to check frequency when PL encode/decode switch is on.
- Extended frequency coverage for certain MARS and CAP operations.
- 3 memory channels store frequency and offset. And so easy to use! Simply press the memory channel number to recall your favorite channels!
- Night light, offset/reverse.
- 16-key DTMF pad for repeater autopatch is standard.

- NEW! Twist-Lok Positive-Connect™ battery case. A wide range of quick-change commercial duty battery packs are available.



- 12 VDC input terminal—allows direct mobile or external power supply operation. When 12 VDC is applied, power output increases to **5 watts!**
- Heavy-duty final amplifier and heat sink. The die-cast rear panel assures reliable operation. With the optional 12-volt PB-1 battery pack, the TH-205AT provides 5 W output. The standard 8.4 volt PB-2 provides 2.5 W output. (500 mW low power).
- Large, easy-to-read LCD display. Frequency, offset, memory channel, TX, RX, and battery indicator.
- Frequency UP/DOWN keys. Used to select frequency or scanning direction.
- Scan function
- Automatic battery saver circuit extends battery life. No buttons to push!
- Supplied accessories include: Rubber flex antenna, belt hook, 8.4 V, 500 mAH NiCd battery pack, wall charger.

Optional Accessories:

1) PB-1 12 V 800 mAH NiCd batt. pack (5 W output). **2)** PB-2 8.4 V 500 mAH NiCd batt. pack (2.5 W output). **3)** PB-3 7.2 V 800 mAH NiCd batt. pack (1.5 W output). **4)** PB-4 7.2 V 1600 mAH NiCd batt. pack (1.5 W output). **5)** BT-5 AA manganese/alkaline battery case. **6)** BC-7 Rapid charger for PB-1, 2, 3, or 4. **7)** BC-8 Compact battery charger. **8)** SMC-30 Speaker microphone. **9)** SC-12, SC-13 Soft cases. **10)** RA-3, RA-5 Telescoping antennas. **11)** RA-8B StubbyDuk antenna • TSU-3 CTCSS encode/decode unit • VB-2530 2 m, 25 W RF power booster • LH-4, LH-5 Leather cases • MB-4 Mobile bracket • BH-5 Swivel mount • PG-2V DC cable • PG-3C Filtered cigar lighter cord.

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The Radio Amateur's Journal

ON THE COVER: No, it certainly isn't sunset in the Western Sahara. As the cover caption says, it's the operating QTH of Pedro Piza, NP4A near Ponce, Puerto Rico. The windmill tower was liberated from an old sugar cane plantation some years ago and is now being heavily reinforced. We can only guess why.

JULY 1988 **VOL. 44, NO. 7**

FEATURES

DEPARTMENTS

Zero Bias AN EDITORIAL

Well, another Dayton bites the dust, remanded to fanciful history. By now the stories of this one are boring some of the folks who didn't get to go, but it's their fault and loss for not being there. Outside of a chilly couple of hours on Friday morning, the weather was perfect.

Let me tell you what you missed. This year the crowd seemed bigger than last year, at least from our perspective inside. Usually good weather (and that means anything slightly above freezing, including snow, hail, and blizzards) entices people to wander around the fleamarket rather than spend large amounts of time inside. The result is that there are throngs of people going through the arena complex in waves, with sort of slow periods of traffic in between. This year it seemed as though it was wall-to-wall people for the whole weekend. The fleamarket, on the other hand, was smaller than last year with empty slots everywhere. Don't get me wrong; there was more than enough "good stuff" to go around, but it took less time to see it all this year. I've been told that some enterprising amateurs went as far as buying fleamarket spots just to have a guaranteed parking spot for the three days and to provide a central mobile storage facility for all the "good stuff" they bought.

Could you actually see everything there in 2½ days? Probably, but it would be extremely hard to accurately remember everything you saw and where it was. This year it was truly sensory overload for some folks. The dazed wanderings started earlier this year, and by late Saturday afternoon there were a lot of vacant stares and silly smiles on people's faces. It really was the place to be.

"What about the food?" you ask. Well, you certainly won't see any examples of hamfest cuisine on any of the PBS TV cooking programs. There's just so much you can do with starches, carbs, and grease-dogs. They did come up with a new variation this year that was tasty but not readily available. It had a name sort of like "franko Bueno" and resembled a grease-dog burrito, complete with spicy chile and cheese. On the down side, they were in short supply. Next year check out the food early and try to get one.

Eleven-Tec

Ten-Tec Masters One-upsmanship

Most of us suffer from an illness called "seriousnessitis." That translates into the fact that we all tend to take everything concerning ourselves and amateur radio to the extreme nth degree of seriousness. Most of the time it doesn't really matter except that it does leave a gaping abyss in the library bookshelf labeled "amateur radio humor." Sometimes, however, there exists a remarkable sense of humor that even extends to practical jokes and

No, it's not trick photography, but rather the result of the insidious mind of Ten-Tec's Jack Birchfield, K4JU. It must have taken a long time to do, and I'll treasure the bottle as a keepsake for a long time, too. I can't swear for the contents, though.

the concept of getting even no matter how long it takes. Take this as fact from a very serious Editor and publication. It also involves a very serious manufacturer.

About seven years ago I reported in the February and March 1981 Zero Bias on the *CQ* Jack Daniels Relief Column that I headed to Sevierville, Tennessee. It was in a sense a practical joke that we played on the folks at Ten-Tec. I brought them several bottles of their locally produced libation, which is generally unavailable there. It was a lot of fun and a big joke.

Never let it be said that the folks at Ten-Tec haven't got a sense of humor or ever give up on the concept of getting even. It may have taken over seven years to do so, but it was worth the wait. It started with an honest mistake. In the April issue we ran Part I of a review on the Ten-Tec Paragon. Somehow the front view of the Paragon was printed in reverse so that everything was backwards. It actually looked, as one reader commented, like Russian writing on the rig (see Our Readers Say this month). Well, obviously, we all saw it after it was printed, when it was too late to change it. A few readers commented on it, and the folks at Ten-Tec apparently took it very well and seemed to understand how it could happen.

Well, along came Dayton and everyone was friendly toward one another. Saturday afternoon Jack Birchfield, K4JU, and Joe Redwine, N4AVF, of Ten-Tec came over to the booth to see if Dick, Arnie, and I were there. They left saying that they would be back shortly. Jack and Joe came back a while later carrying a camera bag, so I just thought they were going to take a group picture. Joe started off saying that they weren't angry with us, which he repeated several times, and each time he got louder. Then he opened the camera bag and produced a giant bottle of Jack Daniels and handed it to me. It took a few moments for it to sink in that the label on the bottle was printed in reverse. Since Jack had been involved in the event seven years earlier, he evidently planned this "revenge" and spent a lot of time creating the reverse label. As it happened, everyone was so busy laughing that no one took a picture of the presentation. The bottle is now resting at my home, where I have been testing the contents. It took seven years, but it was most definitely worth the wait. I wonder if that means we now have seven years to come up with a suitable reply?

More Travels With CQ

The middle of May signals the local LIMARC fleamarket. More people show up to wander around here than at many regular hamfests. Tradition here is that the weather must be bad. This year tradition went out the window, as the weather was perfect. Amateurs, being logical folks, would rather spend a few hours wandering around a fleamarket and meeting friends than doing household chores and cutting the grass. I should also point out that it was evident that a lot of folks left their serious side home, and that there were actually signs of smiling, laughing, and people having a good time, which as we all know translates into FUN.

The next few weeks will see us on the road again, first at Rochester, New York and then two weeks later in Dallas. If you're tired of hanging around the house, then think about giving both you and your rig a break by going to a hamfest. You can use some fresh air, and the rig can use a rest. Who knows, you might even smile and have some FUN.

Antenna Special

Next month is our summer Antenna Special issue. We've got a lot of reviews on antennas and antenna products plus some interesting do-it-yourself projects lined up. I realize that most of you will only gather the material in August, put it aside, and then wait for the perfect overcast day in February or March to do the actual work. Still, it's interesting to see what's out there and to give you an excuse to check out the antenna farm for either replacement or improvement.

With the sunspot cycle moving along as briskly as a brand-new Schwinn, this fall promises to see some terrific activity on the bands. Perhaps you had better not wait for February or March to consider some of those antenna projects.

73, Alan, K2EEK

Put More Punch in Your Packet

Outstanding mechanical design makes the IsoPole the only logical choice for a VHF base station, especially for Packet operation. All Isopole antennas yield the **maximum gain attainable** for their respective lengths and a maximum signal on the horizon. Exceptional decoupling from the feed line results in simple tuning and a significant reduction in TVI potential. The IsoPole antennas are all impedance matched in the factory so that no field tuning is required. The IsoPoles have the broadest frequency coverage of any comparable VHF base station antenna. This means no loss of power output from one end of the band to the other, when used with SWR protected solid state tranceivers. **Typical SWR is 1.4 to 1 or better across the entire band.**

A standard 50 Ohm SO-239 connector is recessed within the base sleeve (fully weather protected). With the IsoPole you will not experience aggravating deviation in SWR with changes in weather. The impedance matching network is weather sealed and designed for maximum legal power. The aerodynamic cones are the only appreciable wind load and are attached directly to the support (a standard TV mast which is not supplied).

High Performance Hand-Held Antenna — The Hot Rod

The Hot Rod antenna can be expected to make the same improvement to hand-held communications that the IsoPole antennas have made to base station operation. **Achieve 1 or 2 db gain** over ANY 5/8 wave two meter telescopic antenna. The factory tuned HR-1 is 20% shorter, lighter and places far less stress on your hand-held connector and case. It will easily handle over 25 watts of power, making it an excellent emergency base or mobile antenna. In the collapsed position, the Hot Rod antenna will perform like a helical quarter wave. Three Hot Rods are available; HR-1 1/2 wave 2M Ant., HR-2 for 220 Mhz, and HR-4 for 440 Mhz. Amateur Net Price on all Hot Rods is $19.95.

For either base station or hand-held operation AEA has the perfect VHF/UHF antenna. Put more punch in your Packet station with an AEA IsoPole or Hot Rod antenna. To order your new antenna contact your favorite Amateur Radio Distributor. For more information contact Advanced Electronic Applications, P.O. Box C-2160, Lynnwood, WA 98036, or call 206-775-7373.

IsoPole Specifications

Model	144	220	440
Freq. Coverage (Mhz)	135-160	210-230	415-465
2.1 VSWR bandwidth	›12Mhz @ 146Mhz	›15Mhz @ 220Mhz	›22Mhz @ 435Mhz
Power Rating	1 kw	1 kw	1 kw
Gain**	3 dbd	3 dbd	3 dbd
Radiating Element Length	125.5" (3.2m)	79.25" (2m)	46" (1.2m)
Amateur Net Price	$49.95	$49.95	$69.95

**dbd — db gain over a dipole in free space

Prices and Specifications subject to change without notice or obligation.

AEA Brings you the Breakthrough!

Announcing

• **Project Unity 2000 Foundation** - Project Unity has been developed as an entirely volunteer effort to collect memories of a nation and store them for future reference. All Americans are invited to send in a 3″ × 5″ card upon which is written reflections of life in this century, including photos, drawings, etc. Amateur operators are encouraged to submit their QSL cards. The foundation plans to house the cards in a vault with a tourist-attracting museum upstairs. All cards will be locked in the vault on December 31, 1999 and become available for historical study 100 years later. Some 4000 cards from 35 states have already been collected. The foundation is Federally recognized and is tax-exempt. A 25 cent donation is asked per card. Place card in an envelope and send to: Project Unity 2000, P.O. Box 964, Silverdale, WA 98383.

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

KA1BB, from Flat Hammock Island, NY; Tri-City ARC; July 17 from 1300–2000Z; lower 20 kHz of General phone and CW bands—20 and 40 meters, center of 40 meter Novice band, and 2 meter SSB band. QSL with SASE to Tri-City ARC, Box 686, Groton, CT 06340.

W2QFC, from East Aurora, NY; Pioneer Radio Operators Society; July 31 from 1400–2100Z; 3935, 7235, 14235 kHz. For QSL, send SASE to W2QFC, 308 Parkdale Ave., East Aurora, NY 14052-1619.

KY2F, from Fulton, NY; Oswego County Amateur Radio Emergency Service and Fulton ARC; July 23–24 from 1500–2300Z each day; lower third of the General 40, 20, 15, 10, and 2 meter bands and the Novice portion of 10 meters. For certificate send large SASE to Fred Swiatlowski, KY2F, P.O. Box 5227, Oswego, NY 13126.

Two-land, from Lyons Falls, Lewis County, NY; Black River Valley ARC; July 3–4 from 1600–0200Z each day; lower portion of the General 80–10 meter bands, emphasis on phone operation; different calls to be used. Send QSL and SASE to Will Jacks, NQ2W, RD –2 Box 22, Lowville, NY 13367.

W3BN, from Reading, PA; Reading Radio Club; July 30 from 1400–2400Z; phone lower 25 kHz of 40, 20, 15 General bands, CW 7.035, 21.035, 14.035, Novice CW 7.120, 21.130. For special certificate send QSL and SASE to W3BN, P.O. Box 13777, Reading, PA 19612-1377.

W3GFS, from Chesapeake Bay, MD; Laurel ARC; from 1800Z July 23 to 1800Z July 24; lower 25 kHz of 80–10 meter General bands and 147.54. For 8 x 11 certificate send SASE to LARC, P.O. Box 1436, Laurel, MD 20707.

KI4BR, from Waynesboro, VA; Waynesboro Dept. of Parks and Recreation; July 9–10 from 1500Z both days; General portion of all bands. For certificate send QSL and SASE to KI4BR, 2133 Pickett Road, Waynesboro, VA 22980.

Five-land, "Field Day" exercises from Lake Canton, OK; WD5HPU, WA5LTM, and others; July 9–10 from 3 PM saturday through noon Sunday; General phone portions of the 40, 20, 15, 12, and 10 meter bands, and 6 and 2 meters SSB. For certificate send large SASE to Tim Mauldin, WA5LTM, Lake Canton Field Day, P.O. Box 19097, Oklahoma City, OK 73144 (405-682-2929).

K6MF, from NAS Moffett Field, CA; NASA Ames Research Center ARC and Navy Moffett Field ARC; July 2–4 from 1600–0100Z all three days; 14.280 and 21.380 MHz voice (A3) only. For QSL send SASE to AARC, P.O. Box 73, Moffett Field, CA 94035.

KB7KU, from Fort Laramie, WY; High Plains ARC; 0000Z July 4 to 000Z July 5; phone 3.850, 7.250, 14.250, 21.360, 28.550, CW 50 kHz up from lower band edge. QSL for business-size SASE to KB7KU, 3642 Bighorn, Torrington, WY 82240.

KL7KC, from Fairbanks, AK; Arctic ARC; July 16–24; phone and CW in the 10, 15, 20, and 40 meter bands. For QSL send SASE to KL7KC, P.O. Box 81389, Fairbanks, AK 99708-1389.

W7ZA, Olympic National Park, WA; Grays Harbor ARC; 1500Z July 2 to 2400Z July 4; lower 25 kHz of the General phone bands on 15–80 and on 28.435 plus or minus QRM on the Novice portion of the 10 meter band. For QSL send QSL and SASE to ARS KA7AIR, Joe Ledesma, 516 Sixth Street, Hequiam, WA 98550.

K8QYL, from Neil Armstrong Air & Space Museum, Wapakoneta, OH; Reservoir ARA; July 16 from 1300–2000Z and July 17 from 1600–2000Z; 40 meters, phone, CW, and RTTY, and Novice 10 meter phone. For certificate send QSL and #10 SASE to K8QYL, 1005 Linden Ave., St. Marys, OH 45885-1327.

W8AL, from Pro-Football Hall of Fame, Canton, OH; Canton ARC; July 25–29 from 2200–0200Z and July 30–31 from 1700–2300Z; SSB 7.270, 14.270, CW 7.060, 14.060, RTTY and Novice operation possible also; SWLs welcome. For QSL or certificate send QSL and business-size SASE to Randy Phelps, KD8JN, 1226 Delverne Ave. SW, Canton, OH 44710.

KB8S, from Flint, MI; Amateur Radio and Youth; 1600Z July 30 to 1600Z July 31; lower 25 kHz of the General 80–15 meter phone bands, all Novice CW bands, and 10 meter Novice phone band. For QSL send QSL and SASE to ARAY, P.O. Box 512, Mt. Morris, MI 48458.

K8EPV, Marysville, MI; Eastern Michigan ARC; July 16–17 from 1400–0200Z each day; 3.910, 7.235, 14.235, 21.235, 28.335 phone and 3.710, 7.110, 10.110, 21.110 CW. For certificate send business-size SASE and QSL to K8EPV, 654 Georgia, Marysville, MI 48040.

WB8ZVS, from Clarksburg, WV; Stonewall Jackson ARA; 1400Z July 4 to 0100Z July 5; lower 20 kHz of the General phone bands on 40 meters from 1400–2000Z and 80 meters from 2000–0100Z. For certificate send SASE to JR Chiado, KA8ZQP, 289 Magnolia Ave., Clarksburg, WV 26330.

KD8FJ, from Thompson, OH; July 4 starting at 1400Z; lower edge of the 40 and 80 meter phone band and on 10 phone, 28.450 propagation permitting. For certificate send SASE to KD8FJ, 386 Cedarbrook Drive, Painesville, OH 44077.

K8VON, from Fort Defiance, Defiance, OH; Defiance County ARC; July 2–3 from 1600–2200Z; 10–40 meter phone and CW bands. For certificate send 9 × 12 SASE to DCARC, Inc., Box 494, Defiance, OH 43512.

W9ZL, from Experimental Aircraft Assn. Fly-in, Oshkosh, WI; Fox Cities Amateur Club; July 30; on or near 14.293 and 7.243 MHz plus other bands as conditions permit. For certificate send QSL and large SASE or $1.00 to K9DHR, 264 Evergreen Drive, Kaukauna, WI 54130.

0-land, from Camp Cedars near Cedar Bluffs, NE; amateur radio operators of Boy Scout troop 155; July 4 from 1500–2300Z; 3.725, 7.125, 21.125, 28.125 MHz CW at 5 wpm, and 28.325 phone. For QSL send SASE to KA0VEU, Steve Wright, 929 W. Park St., Albion, NE 68620.

KA0WKG, from Holyoke, CO; July 2–3 and 3–4 from 1500–0400Z; phone 3900, 7250, 14260, 21325, 28350, and Novice CW 7130, 21130, all plus or minus 10, HF Packet, 14.101 MHz, 2 meter Packet via WD0HDR-1. For certificate send QSL with business-size SASE to KA0WKG, 217 N. Campbell, Holyoke, CO 80734.

W0KEM, from Hannibal, MO; Hannibal ARC; July 2–3 from 1500–2100Z both days; 7.240, 14.255, 21.340, and Novices

28.400. For certificate send QSL and 9 x 12 SASE to Hannibal ARC, W@KEM, P.O. Box 1522, Hannibal, MO 63401-1522.

W2@@VL, from Long Island, NY; LIMARC; July 23–29; CW and phone on all HF bands. QSL with SASE to WA2KXE, 162 West Hudson St., Long Beach, NY 11561.

W2@@RR, from western New York; Western New York DX Assn.; July 23–28; all bands and modes. For QSL send SASE to WNYDXA, W2@@RR, 91 Boll Rd., Elma, NY 14059.

W2@@RKC, on June 25–26 from Shenandoah County, other times from Winchester (Frederick County); Shenandoah Valley ARC; 00001Z June 25 to 2359Z July 1; 80–10 meters CW and SSB and on 2 meters FM. For QSL send QSL and SASE to SVARC, P.O. Box 139, Winchester, VA 22601; c/o NJ3H, George A. Stein.

VE3CRC, from Chatham, Ontario, Canada; Chatham Kent ARC; July 2–3; phone 3.875, 7.240, 14.250, 21.360, 28.340; CW 3.450, 3.725, 7.045, 7.125, 14.030, 21.090, 21.125; FM 147.720/147.120 VE3KCR. For certificate send QSL to VE3CRC, Chatham Kent ARC, P.O. Box 284, Chatham, Ontario, Canada N7M 5K4.

VE4IHF, from International Peace Gardens, Manitoba, Canada and North Dakota border; 9 AM to 9 PM CST July 7–9, and 9 AM CST to noon July 10; 1.900, 3.885, 7.230, 14.230, 21.330, and 28.330 MHz. For Peace Garden Award send 3 IRCs and SASE to Dave Syndal, VE4XN, 25 Queens Crescent, Brandon, Manitoba, Canada R78 1G1. For QSL send QSL and 1 IRC plus SASE to John Swanke, KA@SLI, P.O. Box 304, Lakota, ND 58344.

GB4OOA, from Plymouth, Devon, England; Plymouth Radio Club; month of July, with a QSL card available from July 21–28, when the club will be on the air each day and into the night to account for time differences around the world, plus on July 28 the club will try to put the Lord Mayor in touch with most of the 38 other Plymouths throughout the world. Contact Philip Daymond, Public Relations Officer Plymouth Radio Club, Radford House, Plymstock, Plymouth, Devon PL9 9NH, England.

The following hamfests, etc., are slated for July:

July 2–3, **West Virginia State Hamfest and ARRL Convention**, Jackson's Mill State 4-H Camp. Contact Hal Tate, 121 East Olive St., Bridgeport, WV 26330.

July 4, **Harrisburg RAC Hamfest**, Harrisburg, PA. Contact Dave Dormer, KC3MG, 131 Livingston St., Swatara, PA 17113 (1-717-939-4957).

July 8–10, **International Hamfest**, Peace Garden on the international boundary 14 miles north of Dunseith, ND. Contact Tom Williams, WD@ATI, 612 South 11th St., Bismarck, ND 58504.

July 8–10, **Okanagan Ham Fair**, Illahie Beach RV Park, Summerland, BC, Canada. Contact Glenn Borgens, VE7GSB, 604-492-5684; or write to Ham Fair, Box 477, Penticton, BC Canada V2A 6K6.

July 9, **South Milwaukee ARC Swapfest**, Oak Creek, WI. Contact South Milwaukee ARC, P.O. Box 102, South Milwaukee, WI 53172-0102.

July 9, **Fourteenth Annual Ontario Hamfest**, Burlington Central Arena, Ontario, Canada. Contact Ontario Hamfest, P.O. Box 836, Burlington, Ont. Canada L7R 3Y7.

July 9, **DMRAA Hamfest 88**, Adventureland Inn, Altoona, IA. Contact Des Moines Radio Amateur Assn. Hamfest 88, P.O. Box 88, Des Moines, IA 50301, or call Jim Zellmer, KA@VSL, 515-276-8949.

July 9–10, **Indiana State ARRL Convention and Hamfest**, Marion County Fairgrounds, Indianapolis, IN. Contact Indianapolis Hamfest Assn., P.O. Box 11776, Indianapolis, IN 46201.

July 10, **North Hills ARC Hamfest**, Northland Public Library, Pittsburgh, PA. Contact Bob Ferrey, Jr., N3DOK, 9821 Presidential Drive, Allison Park, PA 15101 (412-367-2393). (Handicap and wheelchair accessible.)

July 10, **Batavia Hamfest**, Alexander Firemen's Grounds, Alexander, NY. Contact GRAM, P.O. Box 572, Batavia, NY 14020.

July 10, **Wood County ARC Ham-A-Rama**, Wood County Fairgrounds, Bowling Green, OH. Contact Jim Davis, N8DWR, 10990 Newton Rd., Bowling Green, OH 43402 (419-352-3321).

July 14–16, **XVI Convention of the Asociacion de Radio Aficionados de la Republica Mexicaca**, Colima, Col., Mexico. Contact M.E.C. Guerra, XE1ANU, Cristobal Colon 143, Villa de Alvarez, Colima, Col., Mexico, 28950.

July 15–17, **Glacier-Waterton International Hamfest**, Three Forks Campground, Glacier National Park, MT. Contact Flathead Valley ARC, P.O. Box 2549, Kalispell, MT 59901, or call W7BKM at 406-862-4962.

July 16, **Straits Area ARC Swap Shop**, 4-H building on the fairgrounds, Petoskey, MI. Contact Irene 616-539-8986, or Clark 616-582-6455.

July 16, **NOARSFEST**, Lorain County Fairgrounds, Wellington, OH. Contact John Paul Jones, WA8CAE, c/o 41751 North Ridge Road, Elyria, OH 44035 (216-324-3181 days, 216-282-4256 evenings).

July 16, **Ausable Valley ARC Swap-n-Shop**, Mio-Ausable School, Mio, MI. Contact Gerry, N8GWP, 517-826-5996, or Tim, KA8YWV, 517-826-5549.

July 17, **SCARC 88**, Sussex County Fairgrounds, Augusta, NJ. Contact Don Stickle, K2OX, Weldon Rd., RD 4, Lake Hopatcong, NJ 07849 (201-663-0677).

July 17, **Van Wert ARC Hamfest**, Van Wert County Fairgrounds, Van Wert, OH. Contact Van Wert ARC, P.O. Box 602, Van Wert, OH 45891-0602.

July 17, **Fox River Radio League Hamfest**, Pheasant Run Lodge, St. Charles, IL. Contact Phil Fors, N9FXQ, 104 May St., West Chicago, IL 60185.

July 20–24, **County Hunters Convention**, Ramada Inn South, Indianapolis, IN. Contact (SASE) Herb Morgan, WD9GBH, 735 East 50th St., Marion, IN 46953.

July 23–24, **Amateur Cross Link Repeater Club Hamfest and Banquet**, DeVry Institute of Technology, Chicago, IL. Call 312-712-5100 for more info.

July 30, **Tidelands ARS Hamfest**, Nessler Center, Texas City, TX. Contact Tidelands ARS, P.O. Box 73, Texas City, TX 77592.

July 30, **40th Annual Upper Peninsula Hamfest**, Manistique, MI. Contact Manistique ARA, P.O. Box 144, Manistique, MI 49854.

July 30, **Ski Country ARC Hamfest**, Colorado Mountain College Community Education Center, Glenwood Springs, CO. Contact SCARC, P.O. Box 302, Carbondale, CO 81623 (303-945-9342).

July 31, **Hamfesters RC Hamfest**, Will County Fairgrounds, Peotone, IL. Contact (SASE) Hamfesters, 13058 Finch Ct., Lockport, IL 60441 (312-403-1043).

July 31, **WA2WEB Antenna Gain Measuring Contest and Fleamarket**, Trenton State College, Ewing Township, NJ. Contact Russ Pillsbury, K2TXB, RR 7 Oakshade Rd., Tabernacle, NJ 08088 (SASE) (609-268-9586).

July 31, **BRATS Maryland Hamfest and Computerfest**, Howard County Fairgrounds, West Friendship, MD. Contact Mayer Zimmerman, W3GXK, P.O. Box 5915, Baltimore, MD 21208.

Our Readers Say

A Russian-Made Paragon?

Editor, *CQ*:

In regard to your page 44 (April *CQ*) review of the Ten-Tec Paragon by John Schultz, W4FA, I very much fear that you have been taken advantage of—by those pesky Russians. The picture of the rig clearly shows the Cyrillic alphabet.

The name of the rig is ИОДАЯЯ(eeoayar in transliteration). No doubt a clever ploy to gain free advertising, nyet?

Comparing this rig to my American-made Ten-Tec Paragon, I find that my S-meter and tuning knob work exactly backward compared to the unit reviewed.

I'll bet that CQ (in Morse) comes out of the speaker as __ . __ __ . __ . __, right? (or maybe left?)

You will probably blame this whole thing on the fact that this is the April issue.

Oh, by the way, it's a great review article if you hold it up in front of a mirror!

James M. Mozley, W2BCH
Camillus, NY

Novice CC A Winner

Editor, *CQ*:

I have just received my 100th QSL card and am very anxious to apply for membership in the Novice Century Club. Please send me any paperwork that is necessary for application, along with the rules and any directions that I might need, as soon as possible. I think that you have a very good idea in the Novice *CC*, and I really do thank *CQ* for making this award available for us "little guys"!

In looking at all of the awards that are available to hams, it sometimes seems that getting a certificate is almost out of reach of someone like me, and being able to earn an award such as this makes me want to try just that much harder to get some of the ones that I once thought I would never be able to earn. I would really like to see some more awards that are geared for the operators who have only a modest station (and hams like me who are physically disabled in some way, making it hard to get up a very good antenna system).

Thanks again for the good work.

Bailey Dickinson, KB4UGW
Leeds, AL

Fishing For Wire Antennas

Editor, *CQ*:

For many years I have used a method to place antenna support lines in trees (similar to that described by NV7K and W7GBI in their May 1988 *CQ* article) which I believe provides more ease in making one's shot over the "ideal" limb. To the handle of a slingshot, almost identical to that shown in the article, I attached an inexpensive fishing reel. With this combination, I can easily move around to find the right spot to avoid branch entanglement, since the monofilament line follows a direct path from my extended arm to the target area sighted.

Paul Valentino, K4FPF
Springfield, VA

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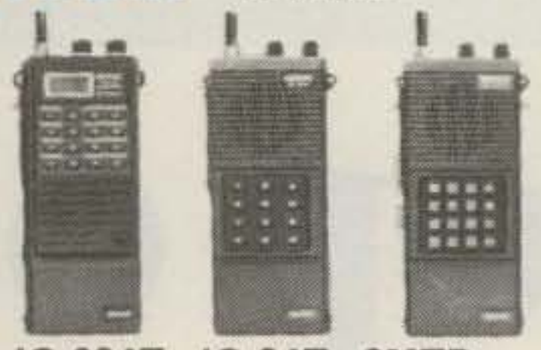

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Some people might call a DXpedition fun, adventurous, and even romantic. Others might compare it to being stuck at a small airport during a snowstorm on a holiday weekend, knowing that you'll be there for a few days. Yes, it's sort of the same. You get to meet new people, eat strange food, and lose sleep, but do you get the chance of a lifetime in putting a new one on the air?

The Western Sahara Story Part II—Conclusion

SØRASD Gets On The Air From The Saharan Desert

BY MARTTI LAINE*, OH2BH

QSL card for the SØRASD operation.

A massive Iberia Airlines jet was taxiing to the passenger terminal at Algiers International on a hot October day last year when this story began. Being met by RASD (Republica Arabe Saharaui Democratica) authorities at the airport gave us a comfortable start and allowed us to skip tedious inspection by customs officials. We were given something of the red-carpet treatment usually reserved for foreign dignitaries arriving on a state visit. This was all very good in view of the heavy cartons of gear, beams, and associated equipment that we were carrying, stuff that normally would give rise to lengthy discussions with customs officials. The RASD had instructed us to take an absolute minimum of gear with us for this introductory operation. There was no way of including an amplifier or a back-up transceiver in the baggage. The beam was handled separately as a risky item that might be seized at customs.

The next two days were spent obtaining all the necessary permits authorizing us to fly to Tindouf at the southern end of Algeria (7X) to reach a point for crossing into Western Sahara. With Tindouf one of the major military outposts in the area, it was necessary to file a good deal of red-tape to be able to go through the base. In Algiers the RASD authorities wanted us to give a detailed presentation on our intentions, since they had never heard anything about amateur radio. With the RASD embassy in Algiers acting as a representative office for dealing with the outside world, there were no international telecommunications links available from Western Sahara itself, no postal services, no currency. All that sounded very outlandish.

Destination Tindouf

To ensure their total safety in a war situation, visitors were normally accompanied by RASD authorities immediately upon their arrival in Algiers. Our visit was no exception, and we had them close on our heels all the time. Cars with RASD license plates provided us with all-around service in Algiers. Visitors were coming in substantial numbers but usually only for very short periods of time. Many of them represented the world press and other media. Given our scheduled seven-day visit, there were indications of some problems because accommodations and other facilities in the desert appeared highly limited. Why should we be "broadcasting" that long, they wondered. Evidently our mission was not fully understood.

Arriving in Tindouf was like entering a military front line far out in the desert. It was a vast, forbidding, desolate area with no greenery. They surely had a lot of military hardware deployed there. We saw almost no civilians in that small town but felt like VIPs, because the ever-suspicious eyes of military personnel were following our every movement. It wasn't

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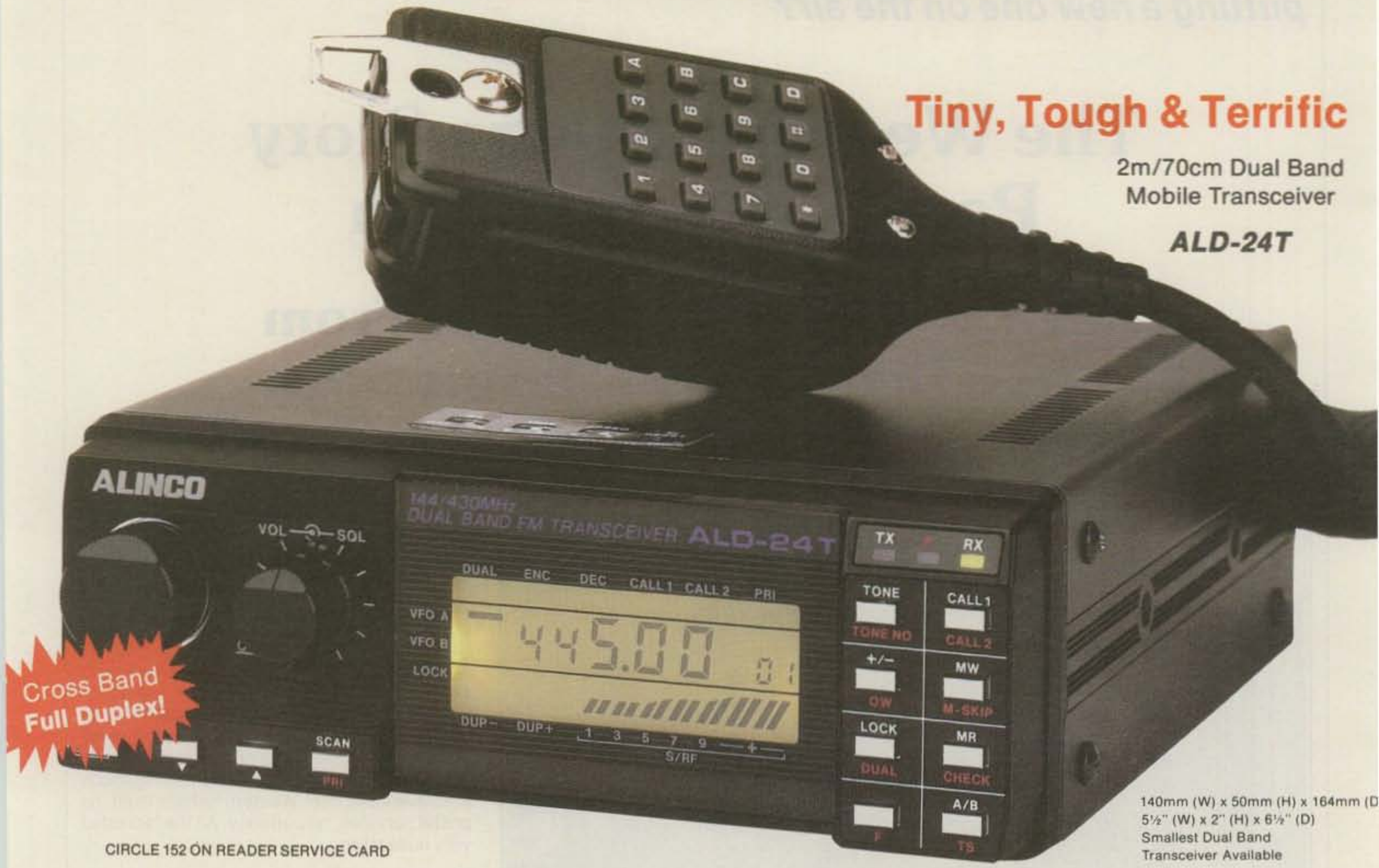

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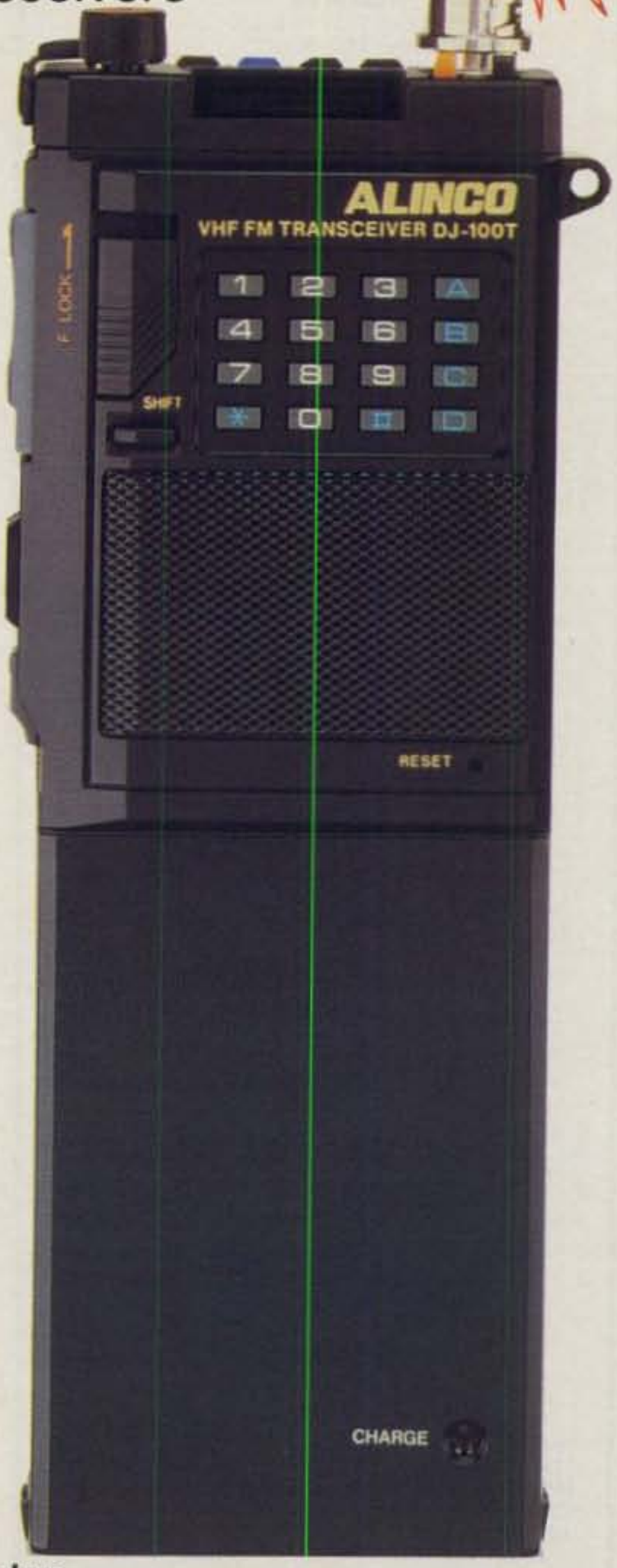

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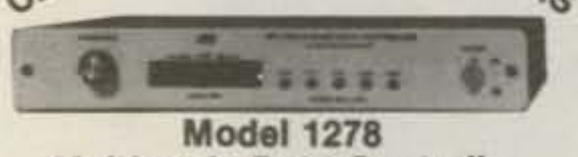

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designed to make us feel good when any abrupt motion or attempt to walk at a slightly hurried pace immediately sent the soldiers quite instinctively feeling for the trigger of their automatic rifles. We were being shadowed every inch of the way traveling on an aging RASD military vehicle from the airport to the border area. Needless to say, the presence of RASD personnel made us feel like doing the right things. They even smiled occasionally in contrast to our troubled faces showing signs of fear and worry. How about taking some pictures now that we were in Tindouf? Well, we thought we'd take them at a later date—if we ever came back here.

Entering Western Sahara A New DXCC Counter

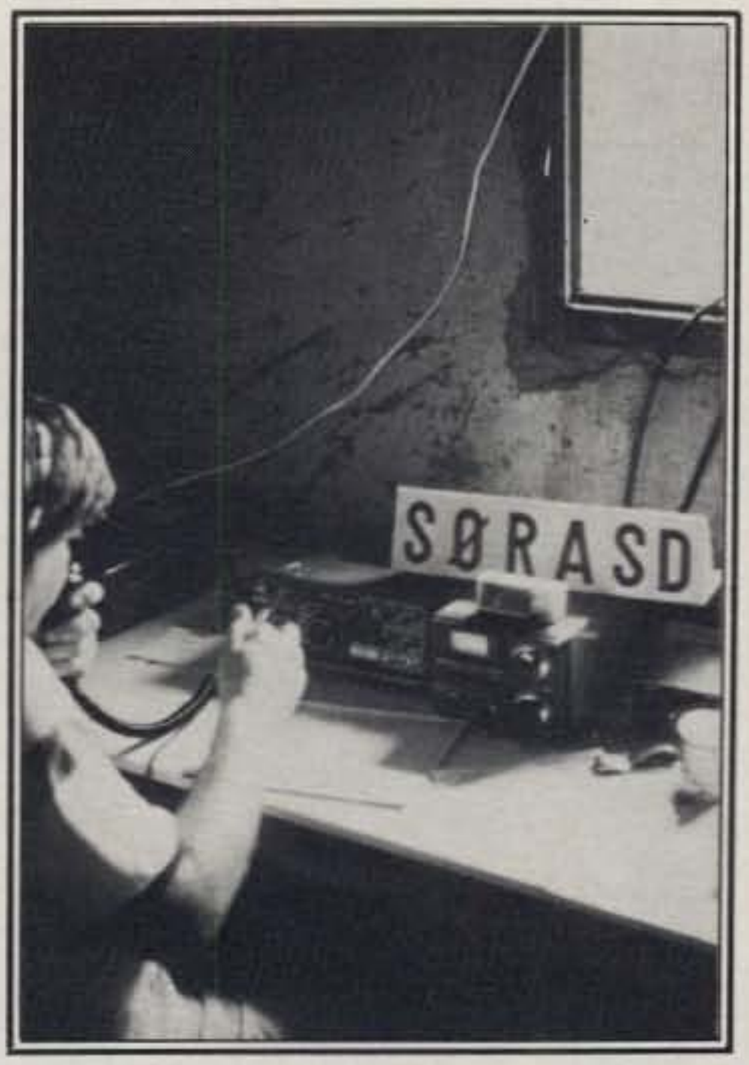
Everything looked very different when we started searching for the Saharan Arab Democratic Republic in the middle of a desert ravaged by war. We passed one of several military checkpoints that served as a borderline—or, maybe not. There were no roads, no traffic rules in this country, but Jeeps were zigzagging all over the place in a kind of structured way. There were road markings in the desert to get you from one place to another—painted stones studded along the way to put you back on the right track should you ever get lost.

Having reached a massive building complex, probably a military headquarters in the middle of nowhere with the RASD flag flying overhead, we understood that this was it. We were in the region far away from our daily worries, entering a totally different world and a newly born country.

Would this be our location for the next seven days? It seemed to us like a good idea not to keep asking questions, but to take a positive view of what ever lay in store for us regardless of its size or format. This compound would surely be our home, because we unloaded our stuff in a guest room and introduced ourselves to a group of RASD officers there. Among them was an interesting guy, well-built but rather short of stature—Mr. Naama Zeine-Eddine, Director of the RASD Department of Telecommunications. Henceforth, he would be our partner now that hopefully we soon would be setting up our station. Naama proudly informed us that his broadcasting station was operating on 1355 kHz.

A typical Saharawi community in time of war. Our own tidy residential tent is shown on the right. Sario, a Saharawi lady, is out in front with her children. She cooked our food in a simple kitchen nearby, a house doubling as an air-raid shelter.

Operating from a lonely Saharan outpost in the middle of a desert war. OH2BH and EA2JG were checking out the juice on a Jeep battery used as a power source for the SØRASD operation.



Only very basic equipment was allowed to be taken along and used for this introductory operation from Western Sahara. Kenwood Corporation donated several sets, but it was a barefoot TS430 and a tuner that produced the potent SØRASD signal during this first operation.

How about putting up the 18AVT and giving a live demonstration? Well, all the entry papers were fixed, and we helped ourselves to a few cups of Arabic tea at a highly ceremonial function. All this was electrifying the atmosphere and finally leading the way for some broadcasting of our own from the RASD. The first potential problem was lurking just around the corner, though. They wanted to see our "broadcasting" in action, whereas we were probably more inclined toward running a little "pile-up," as we called it. Their expectation and idea was that we would be broadcasting to the whole big wide world, telling everyone about their sad and unjust situation. In other words, no pile-up. A difficult mix, as Albert would say.

We made our first contacts with Spain for the benefit of our hosts' language capabilities which were Arabic, Spanish, and French. Naama, the director, was well prepared and very talented. Keen to try out his skills on the radio, he grabbed a mike and started "broadcasting" with our equipment right away. What a mess! Fortunately, he soon realized the number of people screaming on the frequency for some reason wished to contact Western Sahara but cared little about broadcasting. Although Naama was not yet ready to understand this, much less believe it, we were muttering to ourselves something about this being one of the Ultimate Realities of DXing.

Soon after our initial appearance on the air, after a long arduous journey and a lot of nerve-racking excitement, our hosts called it a day and told us to hit the sack. All the group members would sleep in a single facility. But before falling asleep, we inspected the military hardware positioned at the camp, which was all loaded and tuned up for the following day's battles. It was not the first time during this exercise that tears ran down my cheeks as I rested my head on the pillow—utterly tired and hungry, cursing my destiny of having ever been born into this wonderful world of amateur radio. We had probably amassed as many as

The operating room at SØRASD was simple and austere—not much comfort. A picture of the President, a Polisario Front poster, and a map of Western Sahara reminded us of our critical location during this DX outing. Instructor Arseli, EA2JG, and trainee Naama, SØ1A on duty.

30—yes, 30—contacts to our credit. What a disaster!

SØRASD QRV After All—Right on Schedule

Lying on my military mattress, sweating and smelling awful, I couldn't get any sleep. Under a clear, starlit sky with not a single cloud in sight, an otherwise perfect stillness was only marred by the steady hum of a generator running somewhere in the vicinity. The generator was on, then, and the gear just waited to be fired up in this same room a few feet away. What could I lose or gain? A lot or just nothing.

Approaching Naama who was sleeping just across the room and who had not flashed a single smile yet, I asked whether I could sit down at the radio for a while and see if it was still working. Everyone was sound asleep. That's what I thought anyway. Dim TS430 dial lights were switched on, volume turned down next to nothing, and a Viking Nye keyer placed on the table. SØRASD was in business on 7 MHz CW. A few hours later, without realizing it, I had made the first 1200 QSOs in one solid shot during the first night. I tell you, it was far from fun. Rather, it was a compelling duty that had to be done, because of all you wonderful people to whom we had given a firm commitment. A glance at the log indicated that the first U.S. contacts were WA2UXC, W1ZE, K4DLI, N1AIM, and KR1R, and the first stations west of the Rockies sported familiar calls such as N6RJ, K6NA, N6ND, W6RT, and W6YA. How about good old Canada? Well, the first one north of the border was VE3HGN.

Sleeping on a hard, uninviting concrete floor without a mattress was the Telecommunications Director—or was he really asleep? With one eyeball shining brightly in the pitch-dark Saharan night, Naama was ready to register every unexpected movement by the enemy. The next day he explained to me the full meaning of what he called *desert sleep*. It was just a matter of being always alert and vigilant with only part of your brain relaxing. In the darkness of that night the other half of Naama's brain identified me as a partner, not an enemy. The ice was broken, to use a figure of speech familiar from more northerly latitudes. A curious bond of friendship was forged between us that would last throughout the remainder of our stay in the RASD. In spite of that, at first he was very angry about that long transmitting stint and ordered our power cut immediately. This brought our proceedings to a calamitous halt—no more operating, although the JAs started booming in right along that narrow long-path window. Naama simply was not quite sure of what I had been transmitting that night. He told me that from then on everything would have to be done in plain language using the loudspeaker only. He surely had been goofing off on the job for tne first 1200 guys.

Moving To The Camp Among The People

Having come all the way to visit this northwest African nation, we were called upon to be on the move, not to get stuck in any particular location. Safety was an important consideration here, because our station and the beam could be expected to be tracked by radar from the occupied side of the territory. The whole nation was on the move, so why not this DXpedition!

There was no choice but to dismantle our setup, load everything aboard a Jeep, and head out deeper into the desert. Our destination was Bir Lehlou, an administrative center and a major military outpost. It was an exciting five-hour trip across a virtually empty desert. The surface was not exactly smooth, giving us a rough ride and the Jeep a real-life vibration test. We survived it and so did our sturdy four-wheel drive vehicle. Would there be any life, any vegetation in the desert? Sure there was wildlife, or should I say *wild life*, there in the form of an indigenous Saharawi Air Force made up of millions and millions of 3 inch locusts which were a real scourge for this part of Africa. We surely had thousands of them killed on the Jeep windshield. Driving on, we saw more Jeeps and some military camps but absolutely no green vegetation, only black-colored mineral-bearing rocks which made us feel like walking on the moon, a country still out of our reach.

Finally we arrived at our designated camp, which consisted of hundreds of tents and some massive school buildings and administrative facilities. Entering the camp just before dusk, we paid courtesy calls on the village

A Saharawi fiesta was organized in honor of this delegation. Village administrators and elders attended the function. There were many kilowatts of electric and audio power, but no RF energy that night, although many of you were no doubt tuning.

Is DXpeditioning a lot of fun? It surely requires plenty of skill, devotion, and commitment, particularly when you do it in the middle of a desert war among people with whom you cannot communicate. After a few days of doing it, you look like sunset.

administrators with whom we had tea in the local ceremonial fashion. Then it was time to get settled in a tent placed at our disposal at the heart of the village. We slept like logs that night, totally exhausted. We were sleeping between snow-white sheets with the stars our only illumination. We didn't have a generator in the vicinity, and we didn't care about you tuning for us there that night. The sheer excitement had simply killed us down to the last man.

Getting Used To A New Lifestyle and Limited Operating Hours

It was on the morning of the third day when we finally got set up in the administrative building. Our multilingual antenna-raising party was most successful. The daily routines were not exactly supportive of our efforts to mount a full-scale DXpedition, but the limited hours available for operating were after all better than nothing. The generator was shut down at 2200Z every night when we were taken back to the camp. So, no more 7 MHz . . . having our simple breakfast and driving to the operating site effectively clashed with the very narrow LP window to Japan. During the daylight hours there were appointments, other social commitments, and visits to Saharawi sites, leaving less and less time for tackling the huge, never-ending pile-ups.

Because there was only one station available, the "off-duty" operators were able to spend more time getting Naama fully trained in all aspects of amateur radio. The Director was all smiles now and most excited about amateur operating, having forgotten the broadcasting business. To this Old Timer it was a sheer joy to see our new recruit handing out a string of 59 reports at a highly professional rate. Naama lost no time in absorbing all the basic information. He read all the books we had brought him and filled the pages with his own notes. In view of the difficult desert conditions and the fact that the DXpedition types were getting progressively weaker, Naama gradually took full command of everything and produced a tremendous amount of energy organizing everything and keeping us busy.

We must have created many excited and confused situations when Naama was in charge of operating at the peak propagation hours. But we were making progress and had already established something that would stay and not disappear as a one-shot deal after this first operation. In a matter of a few days we had managed to get our message through, and Naama was convinced that there were some Japanese DXers waiting for us at the breakfast hour. So early one morning he took the Jeep and drove to the station and left us more wondering types to enjoy our breakfast at the camp. JA1BK soon got a list organized, and Naama was working down the list without a moment's hesitation. What a wonder child we had found! We had come all the way to Sahara to zero in on a trainee who was doing the job only four days after he had heard anything about amateur radio.

Naama's team had completed the low-band antennas and hoisted them high up in the air—and learned that those bands were never open during the daylight hours. I was getting very close to another target—that of working my way through to another night run on 7 MHz to do some business with the Stateside gang. It was worthwhile waiting there, you guys, as I did show up.

How Is Life in This Republic?

All members of the male population were out on the front along a 1500-mile earthen wall protected by mine fields, a wall built by the Moroccans to keep RASD troops out of the occupied area. This being the case, women were responsible for running the camps—doing all the work, looking after health care, and providing education for the children. All the villages were well organized, concentrating on the short-term needs of survival. Everywhere I could see evidence of a heart-rending hope for and belief in a better tomorrow which would enable the Saharawis to return to their homeland now under foreign occupation. This situation had been going on for 12 years, and, honestly speaking, it might still go on for much longer—maybe too long.

The world community was supporting the RASD, which could not survive a day without international assistance. Since water was available and pumped from deep wells, the drought had not hit this part of Sahara in the same way it had afflicted other countries in Africa. The Saharawis had managed to make the desert bloom, and they were self-sufficient in most vegetables and other crops. They were also keeping goats and sheep, and camels provided a means of long-distance transportation. Life was extremely hard at the camps, but with God's blessings and a spirit of hope, they felt that they could only win, knowing that their efforts were well supported.

They relied heavily on increasing their population to protect the country and make it survive. A strong emphasis put on education came as one of the big surprises to us, and it was really touching to see groups of children from different schools come to our station and sing for us every day. With their hair well combed and neat school uniforms, the look in their eyes bespoke a powerful conviction and dedication to their cause. Their songs echoed the Saharawi yearning for a return to home.

Temperatures at times could drop to the freezing point at night, and occasional snowfall interspersed with constant sandstorms strained human endurance to its limits. We met a group of German doctors who were there to train Saharawi personnel to run a system of basic health care. We saw their primitive hospital facilities and could only guess how effective and successful those facilities were in dealing with more serious surgical operations, not to mention the likely infant mortality rate.

No organized sanitary facilities were available, nor any reasonable premises for people to get washed. The sanitary zone, as it were, was only a line drawn in the sand far away from the camp. No toilets; it was just a matter of sitting down. It was all that simple. During our

Supervising the TH3 assembly project was part of Naama's training program. He read the Hy-Gain instructions without hesitation, and the beam tuned up precisely as figured out on the Nebraska drawing boards.

Kenwood provided these white outfits as a token of their involvement in this first operation from Western Sahara. In a war situation the white color symbolizes neutrality, peace, and assistance.

seven-day stay we had the pleasure of swimming in a pool which formed part of an irrigation system used to water their vegetable farm. It was quite an experience to splash in a Saharan swimming pool. It surely took some pumping to fill it up! The pump was powered by a 2 kw Honda generator running on gasoline, wherever that came from.

The country and its spirit of survival were based on a strong sense of national identity, allegiance to the RASD flag, and confidence in a better future which would see the Saharawis return to the occupied half of their country. Even though some of the camps were located only some 15 miles from the front line, the men rarely came back to spend time with their families because their presence was constantly needed at the front to defend what was left of their country. What a sad situation! A human disaster for some 200,000 people. Their only sources of modern enjoyment were volleyball and Naama's broadcasting station, which was transmitting wild music and hope of a better tomorrow to all the tents that still had some voltage left in the batteries powering their portable radios.

The DXpedition Moves Toward Success

Running the TS430 barefoot was a real uphill battle, and for the first time it was the pile-up that controlled me and not vice-versa. I simply did not have enough juice to keep things under control. Every once in a while I went down to CW when the pile-ups became too messy with the SSB crowd. Naama could hardly believe the amount of interest shown in his country. We were proud to be able to report to the president of the RASD the tremendous amount of publicity created by our expedition. The president was informed daily of our progress.

Thanks to their confidence in us and their belief in the value of amateur radio, we came close to gaining another victory. Having seen my Spanish partners EA2JG and EA2ANC go to bed at 2200Z, Naama and I drove back to the station to run heavy cables from the Jeep battery to the transceiver. Hooray! We were now in business on 7 MHz CW. The pile-up was spread all over the band, and I was working it down as fast as I possibly could. THe question on my mind was just how long I could use the Jeep battery without running it dry. Without you folks ever realizing it, I often turned the output way down to 10 watts to save power, but that made no difference to the people calling there. I wanted to make sure the Jeep would still start in the morning. You see, there were no spare batteries within a 10 mile radius, and the camels could not tow the Jeep fast enough.

Thank God, turning the ignition key in the morning, we managed to start the Jeep for some sightseeing. I wasn't too interested in seeing the tourist sights just because they were something extra special. But I was keen to get the battery recharged for the following night. The second night was surely getting out of control, since I started hallucinating, fearing the enemy and death. I simply passed out and left you calling on the frequency. All the excitement and the overall situation coupled with the star-bright Sahara night, the presence of armed guards, and the nearness of war had thoroughly overwhelmed this Old Timer. Yet early in the morning some of the Deserving were logged even on 80 and 160 meters for a brief showing.

The Final Count

All things considered, I think it was a success. A total of 11,864 QSOs were made in some 80 hours of active operating. By now Naama was fully trained to run the station and manage his morning long-path session with the always well-behaved Japanese crowd.

We were successful in demonstrating amateur radio to the RASD authorities with the aim of enlisting their full support for continued amateur activity on the DX bands. We had a unique opportunity to share a human experience with the Saharawi people. We will never forget Sario, a Saharawi lady who was so friendly playing host to us, baking fresh bread for us every morning in her rudimentary camp-site kitchen.

Then how about finding Naama one bright morning operating the station and telling us that he had now licensed himself as S01A! How could he choose such a super-sounding call! Well, his method was quite simple: S0 was the prefix for Western Sahara, he was the number one amateur operator, and the suffix A stood for the city of Aaiun, where his mother and father were still hopefully alive and waiting for his return. How moving!

My partners and colleagues, Arseli, EA2JG, and Agustin, EA2ANC—never ran into an argument in our difficult circumstances. They fully understood this strange Finn who was never satisfied not being able to work the pile-ups down to the very bottom layer. They were super nice guys whose support contributed a great deal to the overall success of this first operating and training program with Naama. Agustin, do you still believe the moving objects in the cloudless sky were missiles rather than satellites? If you still wake up in the middle of the night to your own cries of anguish, just believe me . . . .

The Happy End

It was Sunday afternoon, October 25 when the gear was finally switched off and the first S0RASD operation went down in history. We were treated to a ceremonial Saharawi fiesta—a farewell party—with thousands of the local population attending. Many huge generators were producing kilowatts of electric and audio power to make our last evening at the camp absolutely memorable. What a situation! A party in the middle of a desert war. It must have left the troops on the front wondering what was going on on that crystal-clear Sahara night.

Lights off, as usual, and with only the stars shining in the sky, we retired to our tent. No more operating. Early departure was scheduled for 7:00 AM the following morning.

Breaking the stillness of the night was the sound of a Jeep approaching our camp at 2:00 AM. We were advised to leave immediately rather than await the break of dawn. We did just that, sensing that a thunderstorm was building up on the horizon. Bolts of lightning were blazing across the skies and all around us, some of them striking the ground near us. Not a word was exchanged. Everybody was concentrating on driving the Jeep as fast as possible. We got lost twice driving in the dark, but luckily we found the painted road markings to give us the necessary directions. We left the Saharawi people without saying good-bye, but we sincerely hope for a better future and a brighter tomorrow for them.

It all sounds like a real adventure and a terrible nightmare, but it was not. It was more like making another new one for the Deserving and establishing amateur radio on a permanent basis in Western Sahara as a human link between the Saharawi people and the rest of the world.

When I wake up in the middle of the night and cry over everything that I experienced there, it is DXCC country number 319 and the great Saharawi nation that come to my mind. I also think of my godchild Naama, DXer by the grace of God.

Will be seeing you from the next one. CQ

HF-PACKET DESERVES A GOOD MODEM

NEW

The ST-7000 HF-Packet Modem From HAL

The HF data communications world is not forgiving. Everything bad can and does happen to your HF-Packet signal. Selective fading, noise, interference, poor tuning indicators, and simplistic phone line modem designs all conspire to destroy the traffic handling capability of HF-Packet. We should be sending data, NOT repeats!

The HAL ST-7000 modem is designed specifically for 300 baud HF-Packet. Techniques developed for our government and military ST-8000 (MD-1232/G) HF modem are now applied to the special problems of HF packet radio. All filters and detectors are optimized for 300 baud HF-Packet, NOT a "do-everything" compromise design.

Two Modes

The ST-7000 transmits and receives two modes for HF-Packet: the "standard" 200 Hz shift, and a more optimum 600 Hz shift. Both shifts are fully supported by separate optimized 6-pole input filters, and a 40 dB AGC system. Our 600 Hz shift mode uses separate 4-pole Mark/Space filters, active detectors, and a 3-pole post-detection filter. The transmit tone generator uses our proven sine-wave synthesizer circuit to assure minimum phase distortion and spectrum splatter.

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The ST-7000 tuning indicator is a truly unique display of frequency spectra that makes quick work of tuning an HF-Packet signal. No more guessing about your frequency!

Interfaces With All Packet Controllers

The ST-7000 has three different packet controller (TNC) interfaces: RS-232C, TTL, *and* TNC audio. The audio interface connects to *any* TNC VHF radio connector and converts the VHF tones to HAL HF standards. TNC audio is switched to a separate VHF radio connector when the ST-7000 is turned OFF.

Best of all the ST-7000 is completely manufactured in the United States by a company you've known and trusted for 20 years. We do radio data communications, and we do it extremely well!

ST-7000 is available direct from the factory for $349.95. An optional 12VDC, 0.5A power supply is priced at $19.95. Write or call now for your HAL ST-7000.

Introductory Price: $299.95. Order Now!

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CIRCLE 81 ON READER SERVICE CARD

CQ REVIEWS:

The Create CV48 80-/40-Meter Vertical Antenna

BY PETER R. O'DELL*, WB2D

First of all, the CV48 is built like a battle ship through and through. Second, this antenna is a real "screamer." It plays. This is the first HF vertical antenna that I have ever used that I didn't feel was a compromise on 40 and 75.

Installed, the CV48 stretches nearly 40 feet into the air. At the base, it is almost 4 inches in diameter and tapers down to about a half inch near the top. The mounting bracket is made out of heavy-duty cast aluminum. The aluminum tubing is the thick-wall kind. Short of making it out of stainless steel at ten times the price and twenty times the weight, I don't know what you could do to make this thing any sturdier.

But when I first opened the box, I almost put it away without assembling the unit. I thought for sure that I would have to call the importer to find out how to put it together. Violating my usual SOP, I decided to read the instructions before attempting to assemble the unit. *Don't do that. If you find anything in the box that looks like instructions, throw them away!*

As good as the antenna is, that's how bad the instructions are. I read through them three times and couldn't make any sense out of them. Then I went back to the box before putting it away and looked at the pieces. There was only one way that it could go together. I didn't need the instructions!

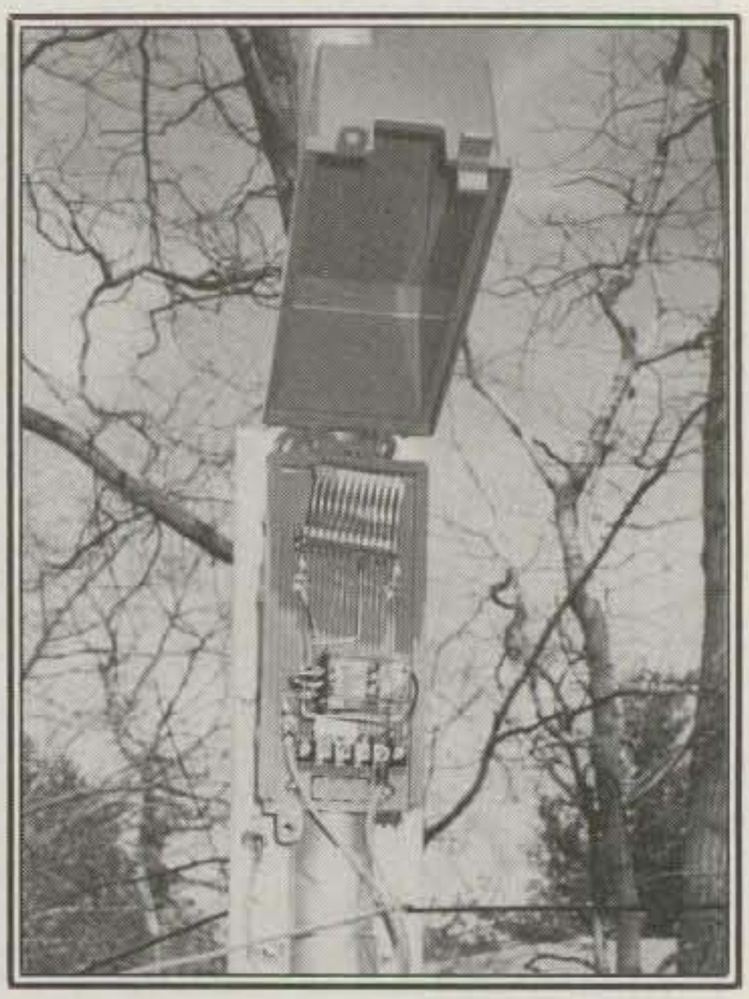
Unlike its American counterparts, the Create CV48 does not use compression clamps to hold the telescoping sections together. Each section has a set of holes drilled through it at each end (except the top and bottom sections which have only one set of holes). The resonant frequency is predetermined by the factory.

Once I realized this, it took about twenty minutes to put it together. My 10-year-old daughter, Anita, helped me with it. One person might be able to get it together and mounted, but it would be a lot easier with two (or three). Once we had it assembled, I stood on top of a step ladder and she walked it up to me. Then I lifted it up and dropped it down over the mounting mast. It wasn't easy, and there were a couple of times when I thought that we would have to wait for some adult assistance. But we got it up.

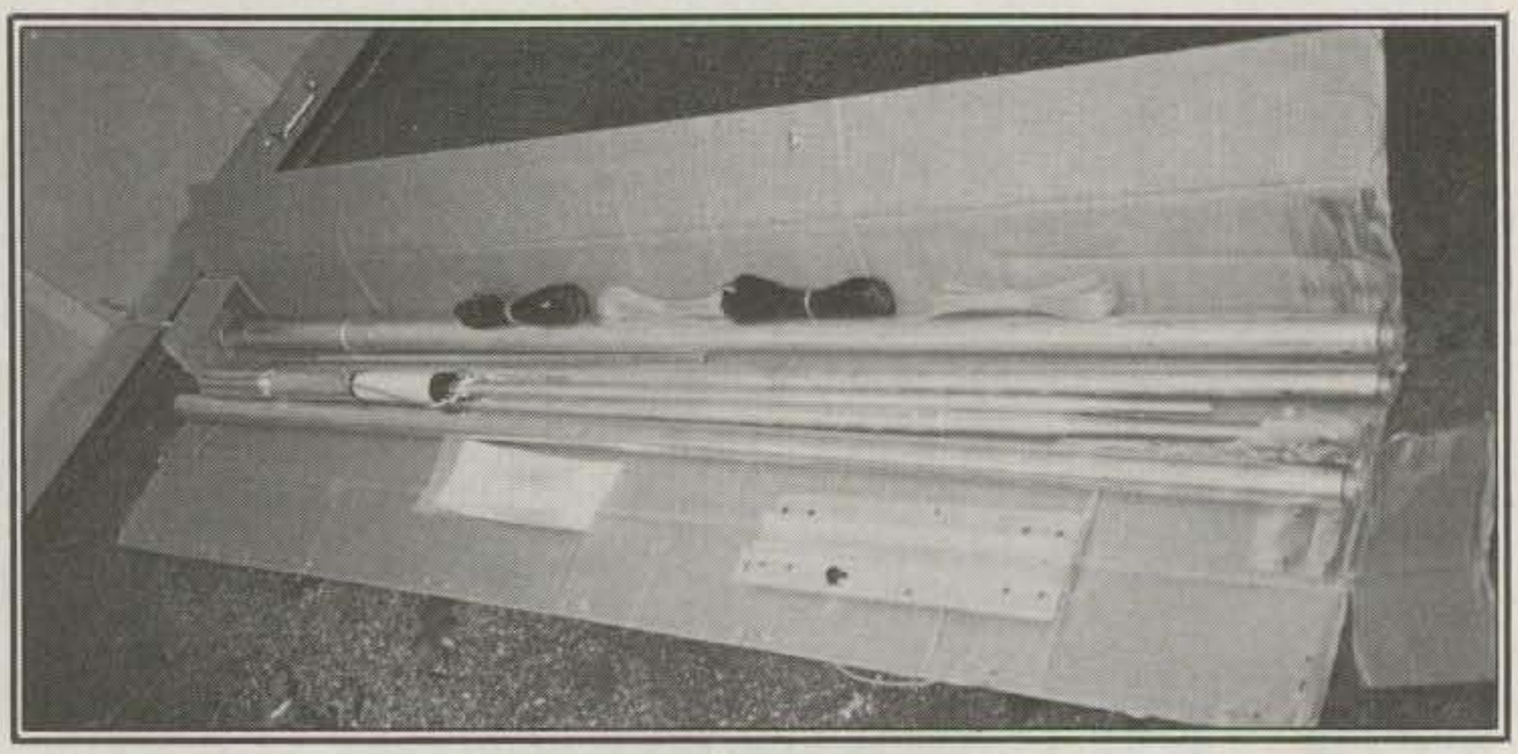
One thing that should be emphasized here is this. **Don't even think about putting up this antenna if you have power lines anywhere near.** I put it up in the backyard. All of our utilities are in the front. This antenna is tall, and it is unwieldy when you are putting it up. No antenna is worth the risk of becoming a human french fry.

Performance

I mounted the unit on a mast approximately 6 feet above ground level. Using the wire supplied with the kit, I installed



The AD385 with its lid raised for servicing.



Everything that you need for installation except the mounting mast and feedline comes in one "UPS shippable" box. Create even includes radials precut for each band.

*Associate Editor, CQ
CompuServe 76440,271

With the weather resistant-cover down, the AD385 protects the relay and CW matching coil from the worst that mother nature has to offer.

If you have a few trees, you neighbors are not likely to notice the CV48, even though it is substantially larger than the average multi-band trap vertical.

two radials each for 40 and 80. The radials are also about 6 feet above ground level and attached to trees in the backyard. On 40 meters the SWR is less than 1.5:1 across the band. On 75, the SWR dips to about 1.7:1 near 3.75 MHz. It is below 2.0:1 between 3.7 and 3.8 MHz. Create suggests adding 1500 pF of series capacitance and 300 pF of shunt capacitance to the feed point if the unit is ground mounted. I tried the capacitors, and they did change the SWR pattern quite a bit, but not the way they suggested.

Since my installation is neither a true ground plane installation nor a true ground mount installation, it is not surprising that my results deviated from what they suggested I should get. When it gets a little warmer here, I am going to experiment with some different values of capacitance to bring the SWR down a bit. I'm not a fanatic about an SWR of 1:1—I can get that with a dummy load.

It is results that I want, and the results are there. The first contact that I made with this antenna was on 75 a few hours after we completed installation. I tuned across an F6 calling CQ. I haven't run the power line for the amplifier in the new QTH, so I didn't have much hope of getting him, but he came back on my first call and gave me a 58. While the F6 continued to work stateside, I compared the receive signals here on the CV48 versus my wire Vee that peaks at about the same height as the top of the CV48.

The F6 was at least 3 S-units stronger on the CV48, but the stateside stations (those within a couple hundred miles, particularly) were a couple of S-units stronger on the Vee. In the weeks that followed, I confirmed that the difference for DX stations held up both on transmit and receive. When you are on a city lot on Long Island and get these results on 40 and 75, who cares whether the SWR is 1.5:1 or 1:1. I'll take the S-unit differential any day.

AD385 Adaptor

The review unit came with the AD385 Matching Adaptor. It is a relay-switched loading coil that attaches to the base of the CV48. Normally, the coil is by-passed for 75-meter phone operation and all 40-meter operation. When you switch the coil in line with the 12V relay, the CV48 resonates near 3.55 MHz.

Everything works as specified by Create. Schematic and pictorial diagrams ensure that your installation will be quick and smooth—it looks like the same author for the written portion. You'll have to come up with your own 12-V source (AC or DC) and enough wire to go from your control point to the base of the CV48.

One thing to keep in mind with the AD385 is that the feed point is a low voltage point as long as you are operating near the resonant frequency. The components used are more than adequate for legal amateur power limits. On the other hand, if you attempt to operate the unit at a frequency somewhat removed from resonance (1.8 MHz, for instance), voltages may be developed that exceed the ratings of the components used. The antenna itself could certainly handle anything you could put through it that would not cause a black-out in the whole neighborhood. The AD385 is designed for legal amateur power level near resonance; any other style operation would be risky.

Summary

The CV48 is an *extremely* well-built antenna that provides excellent DX performance on 40 and 75 (75/80 with the AD385 adaptor). If you are stuck on a city lot like I am, you probably don't have room to put up a 40 or 80 Yagi—even if you could get permission from the town fathers. The CV48 may not make you equal to the station running the 3-element full-sized 80-meter Yagi on the 200-ft tower, but you are going to be a lot "equaler" than you are with the Vee at 40 ft. If you are serious about 40/75 DXing or contesting, it would be difficult to find a better performer without moving up to a Yagi. The CV48 is in the $250 price class, and the AD385 is in the $60 range. CQ

Contesting affects different amateurs differently. KJ0H describes how he gave his all to three consecutive weekend contests. Whatever was left over, the chiropractor got.

Would I Again?

BY JOHN SCHWANDKE*, KJ0H

Just entering my third year as a serious contester was possibly dangerous. You older contest types should be able to relate to this feeling. You remember, don't you? The first couple of years you stick your callsign in the water to see what happens, and you find out that there's some good DX in those contests, and that if one of the "Club Hotshots" happens to be out of town for the weekend, you might even do something scary, like win first place in your section!

That's when the dangerous part is starting to take root, because now you start to think that OH2BH and NP4A will recognize you from the pile-up as one of the gang. "Oh, good morning, John, this is Martti . . . You remember me, don't you? Martti Laine? Yeh, that's correct, the one in Finland." The dream continues: "Well, as usual, John, you're the only signal I can hear from stateside so far this morning. The other boys probably won't start coming through for another hour or so. Anyway, you're 599-plus-plus like always, my number 1305, and give me a second to get a bigger piece of paper to write your QSO number on."

You remember those early days of contest mania, don't you? As I entered my third year of contesting I got a really dumb idea. It didn't seem dumb at the time, mind you, but hindsight is a marvelous thing. I decided that I would enter three contest weekends in a row. So I did, much to the delight of my chiropractor's pocketbook. First came the CQ WW CW, followed by the ARRL 160 Meter CW the very next weekend, and then the ARRL 10 Meter CW Contest. Three weekends in a row, and sometimes with a straight 15 hour hitch in front of the rig. That's where the chiropractor part came in.

On Monday morning my wife helped me out to the car for a visit to Doctor Bendover's office. "Boy, you don't look well, John," said the good doctor. "What the heck have you been up to this time? I thought you gave up the booze," he said. His jumping to conclusions surprised me. "It's not that, Doc. I've been contesting!" He sat down and pulled his chair up close. "Contesting?" he whispered. "I thought you outgrew that faze, John." He pulled his chair still closer. "Tell me, just how many women were involved in this contest of yours?" "No, No, you've got the wrong idea on this, Doc. I'm an amateur radio buff and we sometimes have these contests just to see how good we are. Me against the rest of the world, that type of thing," I said.

He looked disappointed as he got up from his chair and walked across the room to view some other misfortunate's x-ray. "Well, come on over and get on the table and tell me more about this contest thing while I try to straighten out your back and neck. Looks like you've really done yourself up good this time."

He studied me for awhile. "Can't you move your head at all?" he asked. "Not much," I responded. "You see, I've been sitting in the same chair all weekend long. In fact, for the past three weekends all I've done is sit there in front of my radio set." Doctor Bendover got a real serious look on his face about this time and sat down beside me with a pad and pencil. "Tell me more, John," he said. "Tell me just what you do the most while you're sitting in front of this radio thing."

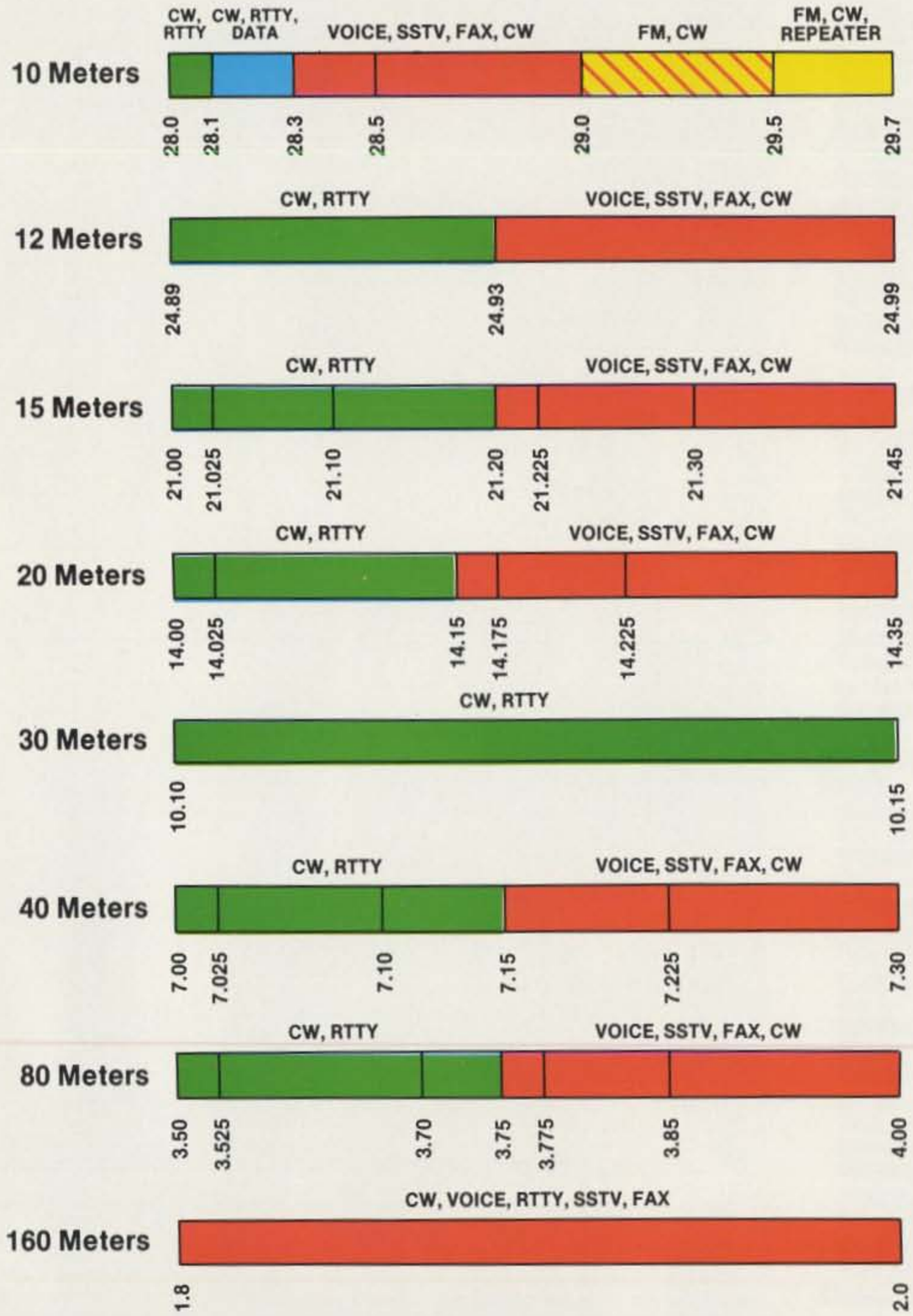
"Mostly I just sit there and send CQ a lot," was my joking response. "CQ?" he inquired. "What does CQ mean?" he pried. I had to think for a second. "Gee, I don't really know what that means, Doc." At this point I let my eyes wander up to the fluorescent light on the ceiling. It appeared to be on its last leg sort of flickering and blinking like a fluorescent light fixture will do. You know, it's funny, but after

*1515 Lucas St., Muscatine, IA 52761

(Continued on page 110)

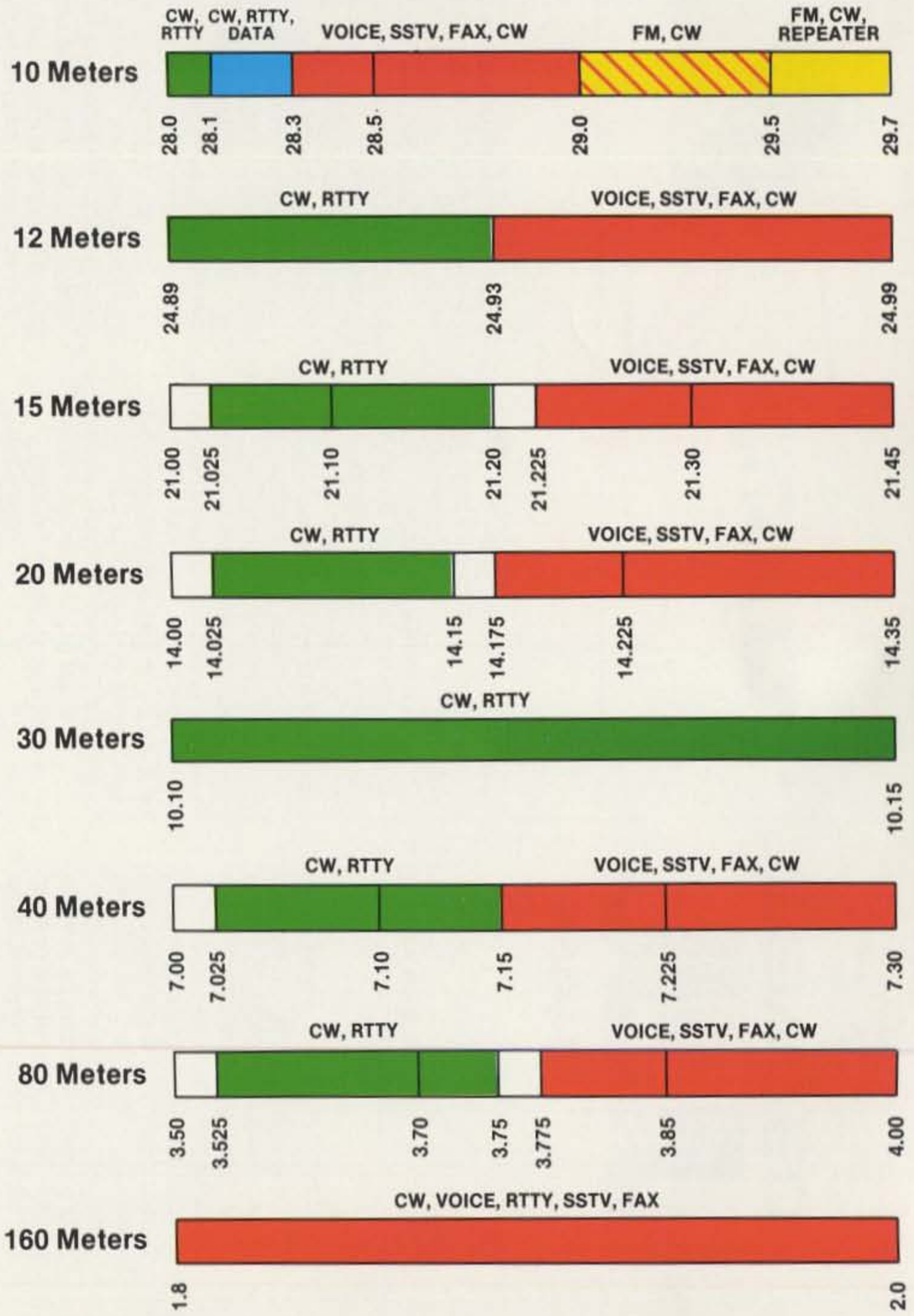
CQ H.F. Amateur Radio Frequency Chart

Extra Class Privileges



General Class Privileges

Advanced Class Privileges



Novice & Technician Class Privileges

Depend on Paragon Performance!

Transmitter audio quality that is a pleasure to hear and a receiver that has set new standards for sensitivity and quietness. Receives from 100 kHz to 29.999.99 MHz with two tuning rates. Transmits on all bands from 1.8 MHz to 29.999.99 MHz with 100 watts output. SSB, CW, real FSK and optional FM. Standard equipment includes speech processor, noise blanker, dual VFOs, TX split, RX split and QSK with a changeover time of 30 ms or less. Five i-f filter positions with the 6 kHz AM filter and 2.4 kHz SSB filter, standard. Optional 1.8 kHz, 500 Hz and 250 Hz filters. All are push button selectable in any mode. Passband tuning, notch filtering, audio bandpass filtering, tone control, squelch and more!

Sixty-two programmable memories that store frequency, mode, filter selected, channel number and a 7 character alpha-numeric "tag" for I.D. Scan rate is selectable and as each memory is scanned all of the stored information is displayed (what a light show!). The scanning routine is easily controlled with both individual and global lock-out and reset functions. Alternately, the memories can be tuned with the main tuning knob.

Frequency selection is with the main tuning knob, direct keypad entry or up/down buttons that will shift in 100 kHz or one MHz increments or to the next ham band. DISPlay button selects 24 hour clock or date or tag. VOICE button causes a voice frequency announcement when optional synthesized voice board is installed.

Rear panel controls adjust the VOX, CW monitor level and tone, and SSB sidetone monitor level. Switching is provided to control conventional linear amplifiers and high speed switching for QSK linears, such as the Titan. Other rear panel connections are included for a transverter, FSK (170 Hz shift), fixed level audio out, audio in, external speaker, aux dc and provision for the optional RS-232 control interface.

An absolute delight for the all mode operator.

The construction of the Paragon is impressive too. All of the circuit boards are G-10 glass epoxy and can be removed easily. All aluminum construction and the use of an external power supply, keeps the weight of the Paragon at a svelte 16 lbs.

The Paragon is the result of a three year computer aided (CADEC 4) engineering effort. Much of that effort was invested in improving receiver performance. We are proud of the Paragon and we think it has set new standards of excellence in synthesized rigs. Check it out yourself. We think that you will share our pride in the Paragon.

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The TITAN has it all! Maximum legal power with ease, all bands 160 through 15 meters (through 10 meters after authorized modification), lightning fast QSK for full break-in CW and the digital modes, plus a two speed blower for quiet operation on phone. This awesome performance from a desk top amplifier is made possible by a pair of Eimac® 3CX800A7 ceramic triodes and an absolute "horse" of a power supply.

The heart of the power supply is our own tape wound, four core, Hypersil® transformer which weighs in at an impressive 41 pounds. This transformer is conservatively rated at 2.5KVA CCS (continuous commercial service) or 9KVA IVS (intermittent voice service). The power supply is housed in a separate utility enclosure for remote operation and is nearly noiseless even at full power.

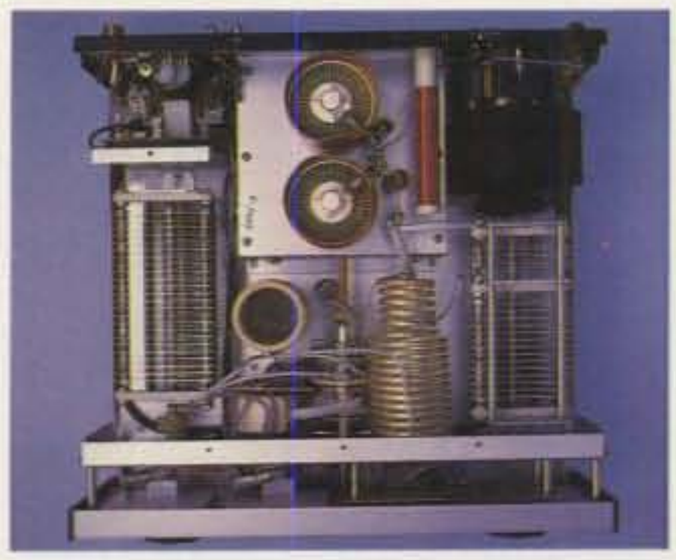
Front panel features include an instantaneous 10 element LED peak output power indicator, a dedicated plate current meter, a multi-meter to read grid current, forward power, reflected power or plate voltage, HI/LO plate voltage select, STBY/OPR switch and power ON/OFF switch. A red LED warns you if grid current becomes excessive and three other LEDs indicate status: WAIT, STBY and OPERATE. Vernier TUNE and LOAD controls, in combination with an outstanding RF deck design, make the Titan a real "pussy cat" to load and operate.

The low drive requirement of the Titan (65 watts in for 1500 watts output typical) makes life much nicer for your exciter too. Operating temperatures are significantly lower and component life extended accordingly. This is especially comforting using "keydown" modes such as RTTY. Adjustable ALC is provided for controlling exciter RF output levels.

The Titan has been the subject of two "product review" magazine articles. See QST, April 1986; CQ February 1986.

The Titan is designed to match our 100 watt exciters but it pairs up nicely, no matter what exciter you operate. If you are ready to choose your dream amplifier the Titan has everything but the highest price. Check it out!

Write for our new full-line catalog.



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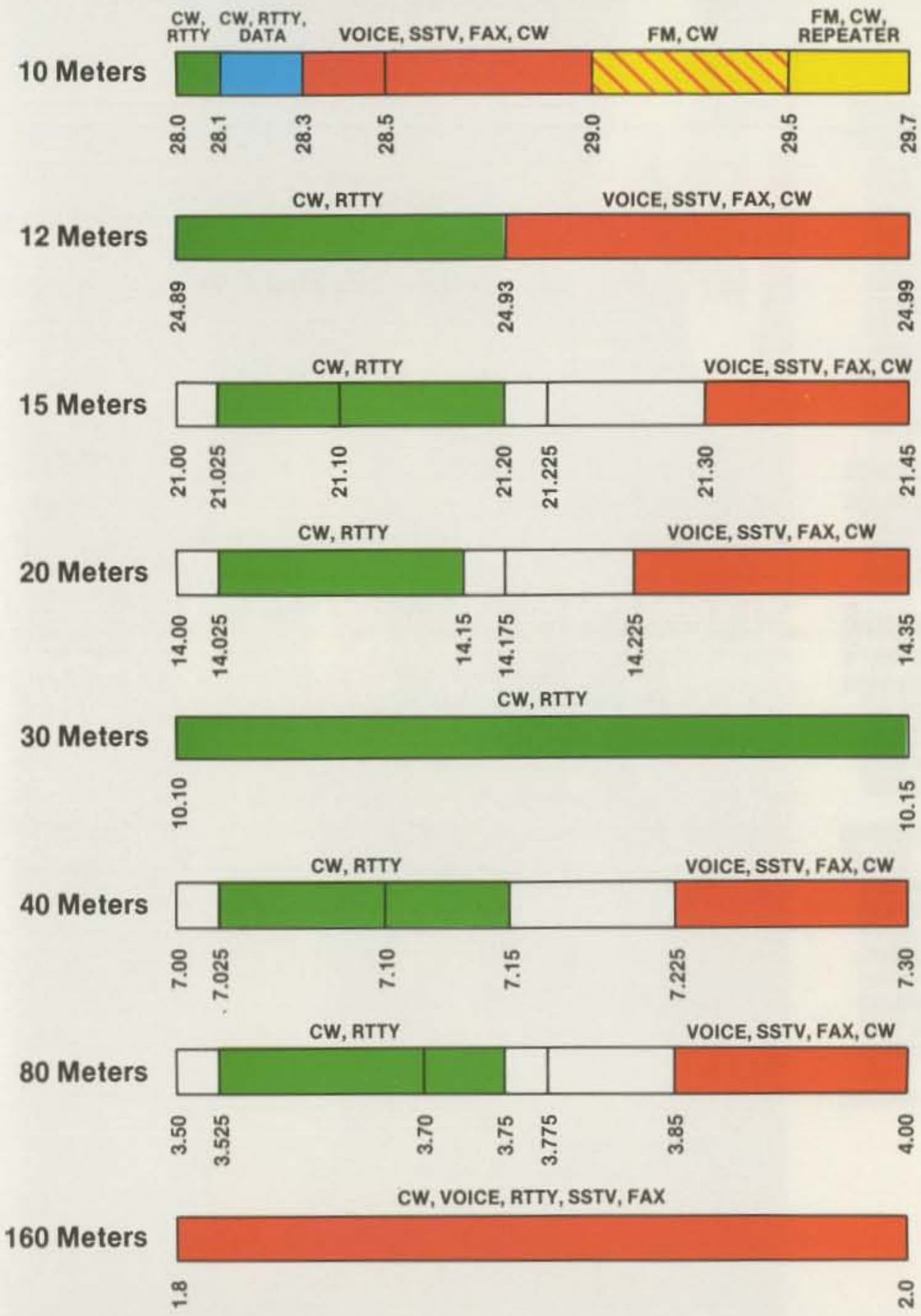
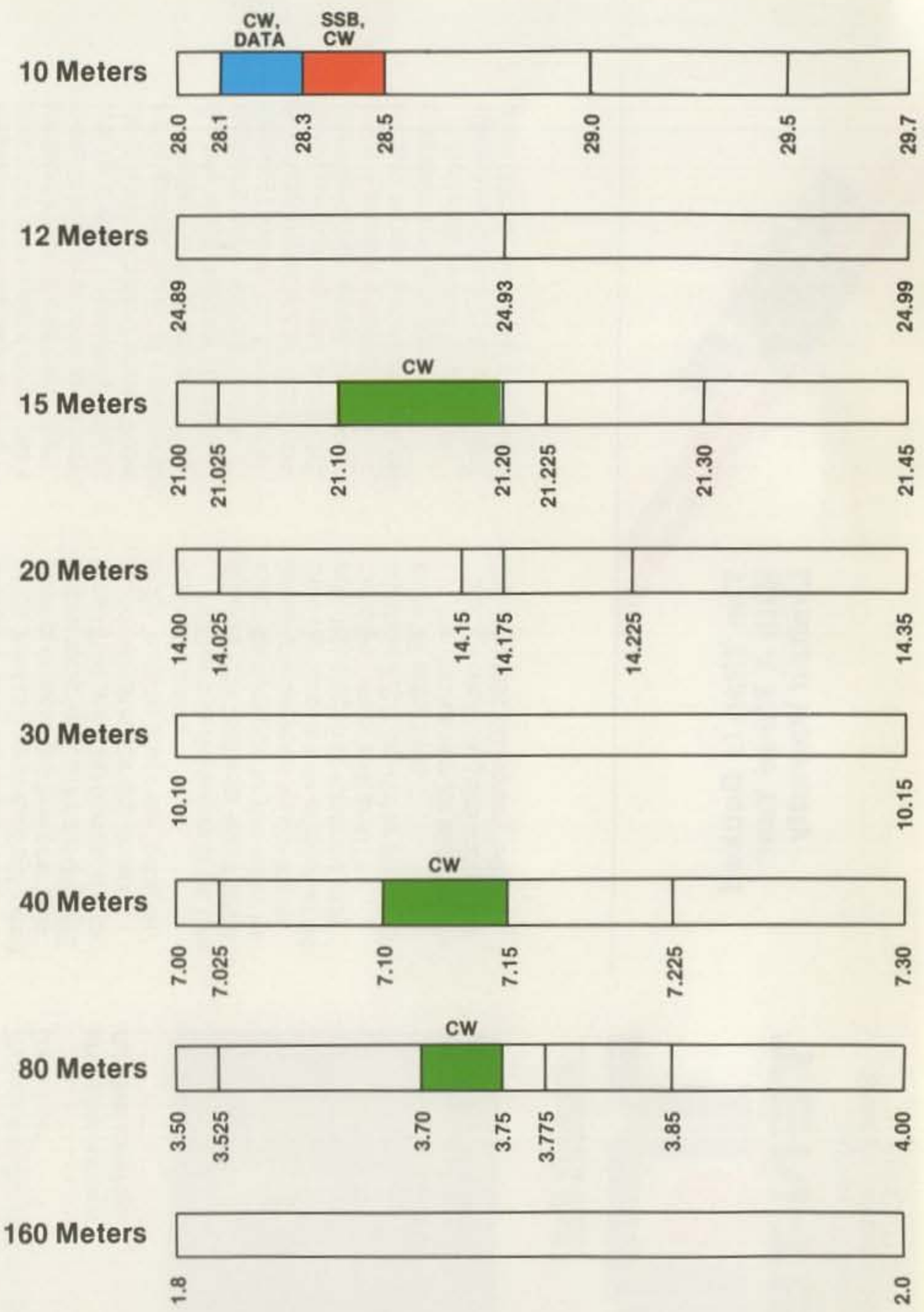




NOTES: **(1).** These charts are intended for general reference by Amateurs and can in no way include full details of every aspect of frequency, license and mode privileges for all Amateurs. Such details are best determined from the most current FCC Rules. **(2).** 160 Meter DX windows 1.825-1.830 MHz and 1.850-1.855 by gentleman's agreement. **(3).** 75 Meter DX window 3.790-3.800 MHz. **(4).** 30 Meters is shared with fixed services outside the U.S. Use caution to avoid interference with these services. Power limit on this band is 200 watts PEP output. **(5).** 12 Meters is shared with fixed service outside the U.S. Use caution to avoid interference with these services. **(6).** Novices are also permitted voice operation from 222.1 to 223.91 MHz with 25 watts PEP output and 1270.0-1295.0 MHz with 5 watts PEP output. On HF, Novices are restricted to 200 watts PEP output. **(7).** Technician, General, Advanced and Extra class licenses are also entitled to all Amateur privileges above 50.0 MHz.

In the last 50 years electronic technology has changed drastically . . . or has it? PA0SE presents another piece of WW II equipment that has some remarkable qualities even for today.

The Tonschreiber "b"

A German WW II Tape Recorder For Monitoring Services

BY DICK W. ROLLEMA*, PA0SE

The tape recorder as we know it now was introduced to the world by AEG/Telefunken before WW II. The first publications describing the *Magnetophon* appeared in 1934 and 1935. Recording on steel tape is older, but suffered from severe limitations in sound quality. Magnetophons using tape of powdered iron on film were extensively used by the German *Reichsrundfunk* during WW II.

A special model by AEG/Telefunken was developed for monitoring purposes and called *Tonschreiber "b."* The accompanying photo shows such a machine in immaculate condition. It is part of the magnificent collection of German WW II communication equipment brought together by Arthur Bauer, PA0AOB, of Diemen (near Amsterdam). Tonschreiber "b" is in all respects very similar to a modern tape recorder. Tape width is a quarter inch; in fact, modern tape can be used on it without any problems. The mechanism which locks the beginning of the tape to the reel is still used in the same form today!

The whole unit can be transported in three cases: one contains the tape deck, the second electronics and power supply, and the third case houses spare parts and tape reels. When in use, the first two units are placed on top of each other and connected together by fasteners, as shown in the photo.

**v.d. Marckstraat 5, 2352 RA Leiderdorp, The Netherlands*

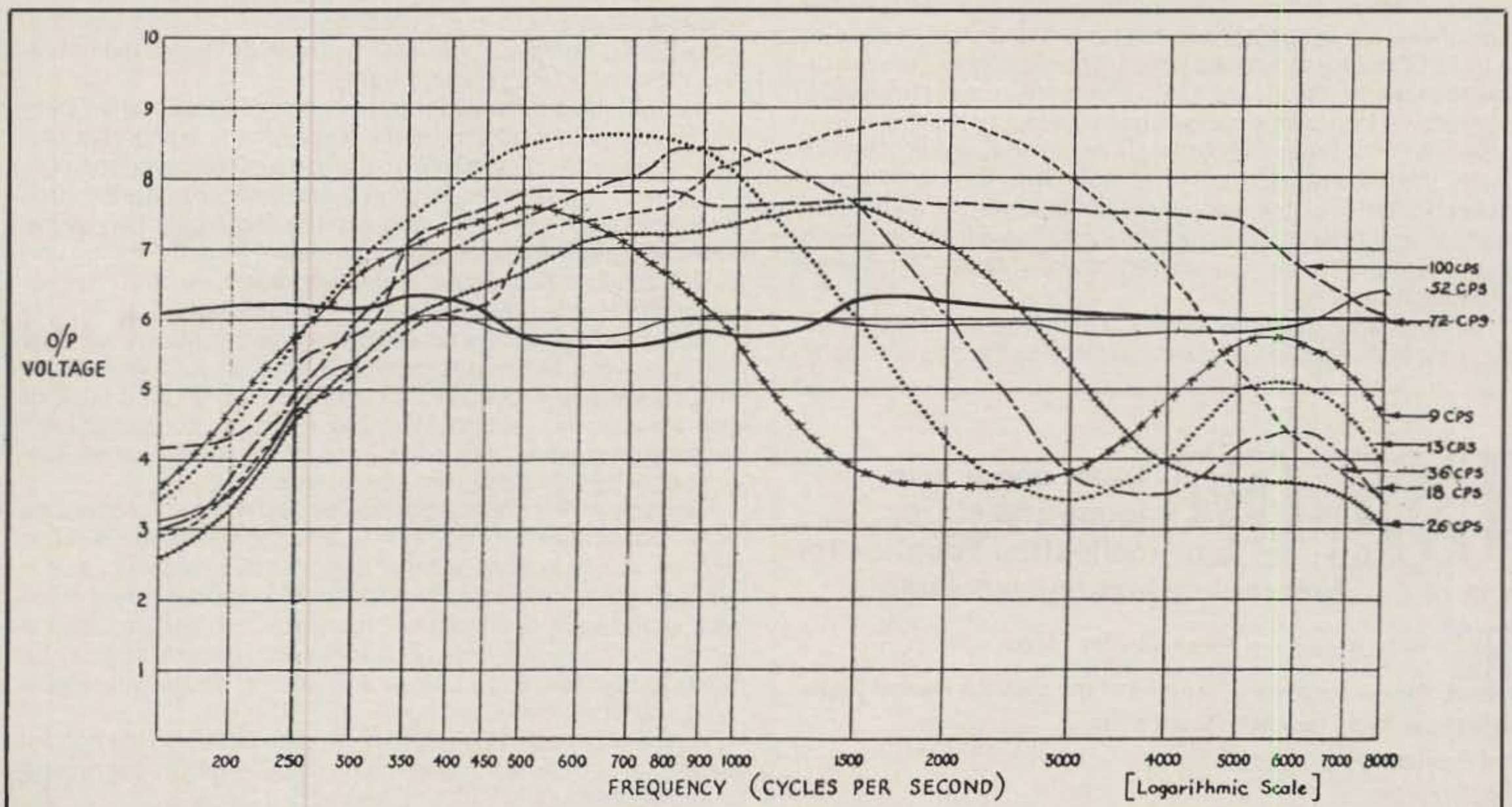


Fig. 1– Frequency response of Tonschreiber "b" at the different tape speeds as measured in July 1945 by No. 6 Central W/Shop, R.E.M.E., Greenford, England.

Under the cover below the reels are three heads—for recording, replay, and erase. Bias for recording and erase is by a DC field. Radio frequency bias was known to AEG, but possibly Arthur Bauer's machine dates from the time before RF bias was discovered, or the better quality it provided was not considered necessary for monitoring purposes. Monitoring high-speed Morse often requires replay at a lower speed. To make this possible Tonschreiber "b" can record and replay at nine different tape speeds from 9 cm/sec. (3.54 inches/sec.) up to 120 cm/sec. (47.2 inches/sec.).

After the war No. 6 Central W/Shop R.E.M.E. at Greenford (England) reviewed Tonschreiber "b" and produced a report dated July 13, 1945. From this report fig. 1, frequency response at different tape speeds, was taken.

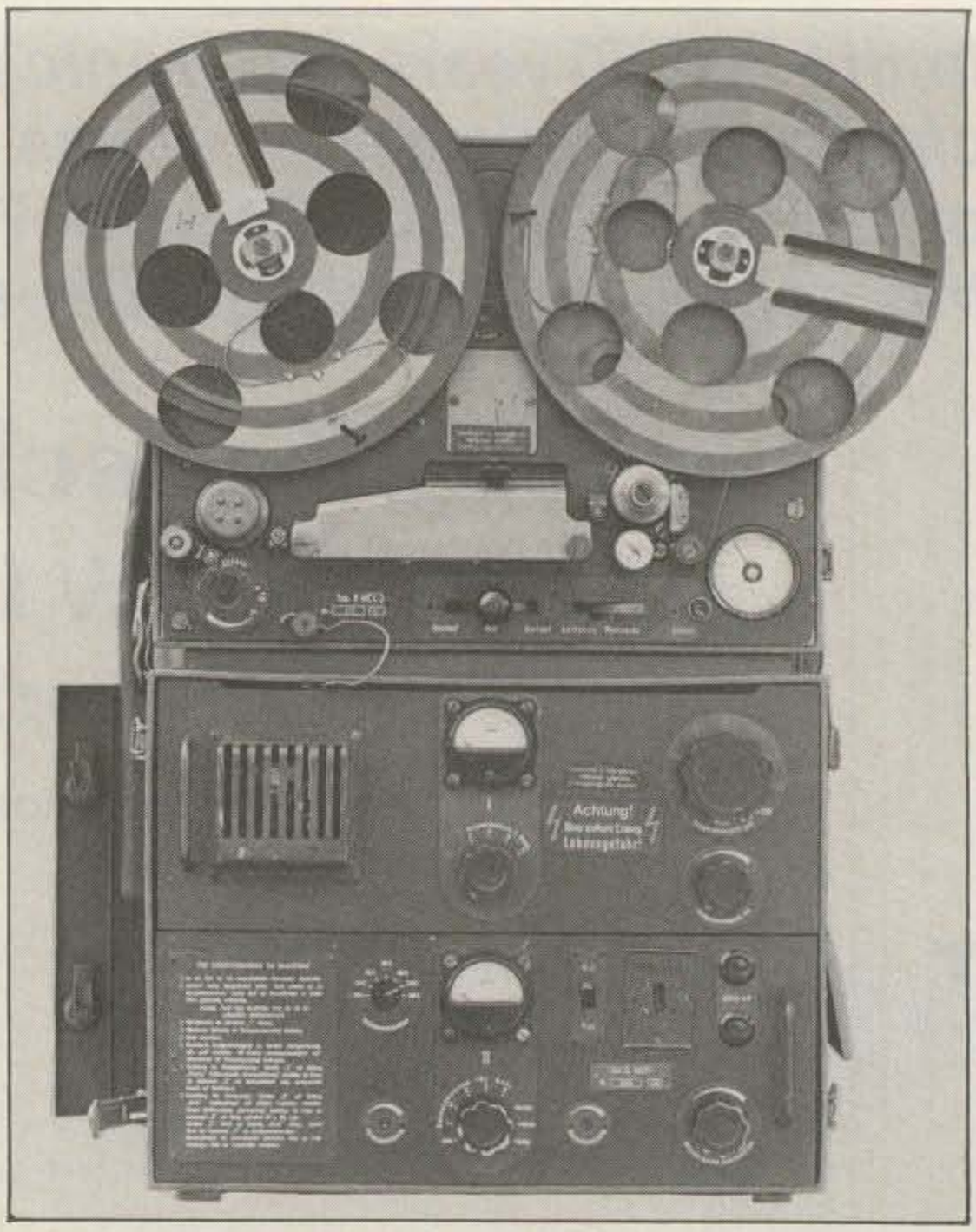
Tape drive is by a synchronous motor fed from an audio generator delivering an average of 20 watts of power on frequencies of respectively 22, 32, 44, 63, 88, 125, 175, 253, and 292 Hz, corresponding to the nine tape speeds which are selected by the big knob at the right of the center panel. The synchronous motor is by its nature unable to bring up speed to the required level. Therefore, a DC motor is on the same shaft. The speed of this motor is controlled by the smaller knob below the one just mentioned.

Actual tape velocity is indicated by the meter below the right reel. In operation, the required speed is selected by the big knob. Then tape velocity is brought up by advancing the DC motor's control. When speed approaches the proper value, as read from the meter, the synchronous motor locks and takes control. This is clearly seen by the meter needle suddenly becoming steady.

The third motor drives either the right or left reel, for recording or replay, respectively (or fast wind or rewind). Fast Morse recording is done at a high audio note and high speed, so reading the message can be done at a slower speed and comfortable pitch. Unfortunately, this simple trick does not work for speech. Nevertheless, Tonschreiber "b" offers this facility by means of a clever device.

Under the left reel a round object with four screw heads can be seen. This is called the *Dehner* ("stretcher"). Dehner consists of a drum carrying at its circumference four replay heads, one of which is in contact with the tape. The drum can be rotated by a DC motor at a speed which is controlled by the knob below the Dehner. By means of a commutator, the replay head in contact with the tape is connected to the input of the replay amplifier. When a speech recording is replayed at a lower tape velocity, the drum with the four heads is spun by the motor at such speed that the relative velocity of the tape with respect to the head in contact with it is equal to the original velocity at recording. Therefore, speech is slowed down without affecting the pitch of the voice!

Arthur Bauer gave me a striking demonstration of this feature. He had recorded a news broadcast by radio. This was replayed at a quarter of the recording speed. Using the normal replay head, this sounded like a gramophone record slowly rotated by hand. Then Arthur switched to the Dehner and speeded up the device. At a certain speed speech became clearly understandable, although irritatingly drawn out. Some extraneous noises and distortion were present, but these did not affect readability to a serious extent.



The Tonschreiber "b" ready for use.

It is intriguing to consider what exactly happens when Dehner is used. Obviously, the same piece of tape is scanned several times, with consecutive scans more or less overlapping.

To me the most surprising fact is that Dehner rotates in such a direction that the heads move in the same direction as the tape. So when revving up Dehner, relative velocity of tape versus heads first decreases, then becomes zero, and then reverses! The tape therefore is scanned backwards!

As far as I know tape recorders having this facility were, or still are, used by broadcasting companies, for instance, to stretch a prerecorded talk to make it fill the allotted time, or compressing it in the opposite case. However, corrections like these are no more than a few percent, of course, while Tonschreiber "b" stretches time by factors.

German WW II communication equipment always features extensive built-in testing features, and Tonschreiber "b" is no exception. The bottom panel and the center one show a meter with selector switch that permits checking anode current of the valves and several voltages in the electronic circuitry. At the left of the meter on the lower panel a switch is seen that can be operated by inserting a coin or screwdriver and which selects seven different mains voltages.

A nice refinement is the two neon glow lamps on the bottom panel that show when mains voltage is DC—before the recorder is switched on!

Acknowledgement: I am grateful to Arthur Bauer for making his Tonschreiber "b" available for photography and for the loan of several documents pertaining to the machine. CQ

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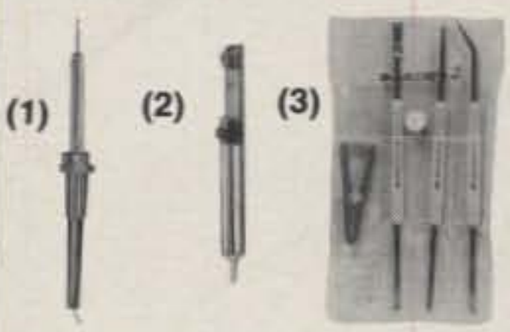
(1) (2) (3)



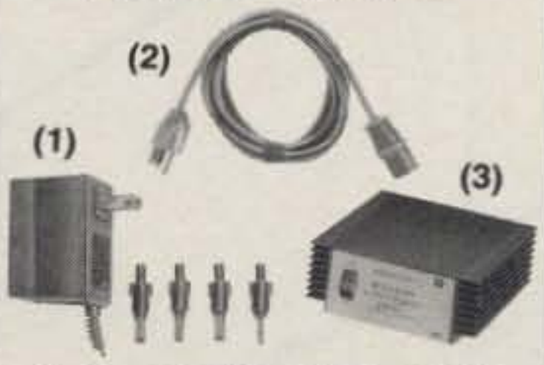
(1) 12VDC, 30-Watt Soldering Iron. For on the spot repairs. 12-foot cord with cigarette lighter plug. **#64-2105 .. 4.99**

(2) Vacuum Desoldering Tool. Easy one-hand operation. **#64-2098 .. 4.95**

(3) 4-Piece Tool Set. Heat sink, brush/scraper, probes. **#64-2227 ..... 2.99**

Power Values

(2) (1) (3)



(1) Plug-In 12VDC Adapter. Includes four Adaptaplugs. **#273-1652 ... 10.95**

(2) Computer/Printer AC Line Cord. 10-ft. with grounded plug and CEE-type connector. **#278-1257 ..... 3.99**

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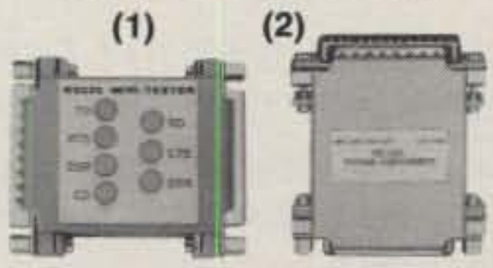
9-Pos. Female	276-1538	2.49
Hood for Above	276-1539	1.19
25-Pos. Male	276-1547	1.99
25-Pos. Female	276-1548	2.49
Hood for Above	276-1549	1.29

RS-232C Items

(1) (2)



Connect Inline

(1) RS-232 Mini Tester. Diagnose interface problems! Dual-color LEDs indicate status of D, RTS, DSR, CD, CTS and DTR lines. **#276-1401 ..... 14.95**

(2) RS-232 Spike Protector. AC line protection is not enough! Use at each EIA port to stop spikes cold. Shielded. **#276-1402 ..... 16.95**

Coax Fittings

(1) (2) (3) (4)

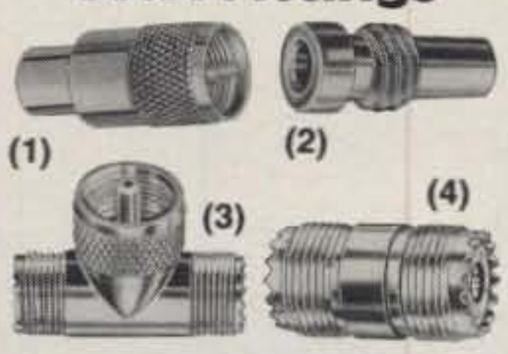


Fig.	Description	Cat. No.	Price
1	PL-259	278-205	2/1.99
2	Reducer for RG8M, RG59	278-204	2/.99
2	RG58 Reducer	278-206	2/.99
3	T Coupler	278-198	3.49
4	Double Female	278-1369	1.69

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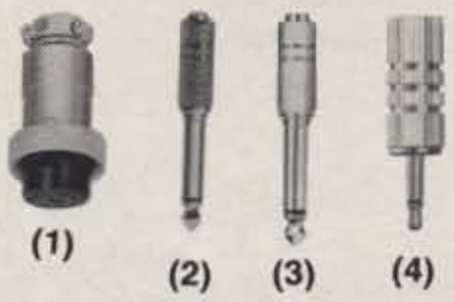
Cable	Cat. No.	Per Foot
RG8	278-1323	.40
RG8M	278-1328	.25
RG58	278-1326	.20
RG59	278-1327	.18

Sealant Tape. Keeps outdoor fittings dry and clean. **#278-1645 ..... 2.49**

Audio Adapters



(1) (2) (3) (4)

(1) 8-Pin Mike Plug. #274-025 .. 2.19

(2) Headphone Adapter. Accepts 1/8" stereo plug and plugs into 1/4" monaural jack. Use lightweight "mini" phones with your Ham equipment. **#274-348 .. 1.99**

(3) Plug Adapter. As above, but accepts 1/8" mono plug. **#274-325 .. 1.59**

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R4 FEATURES

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SWR: 1.2-1 typical
2:1 SWR bandwidth: 10M-1.7 MHz 12M-100 KHz
15M-450 KHz 20M-350 KHz
Power handling watts: 1800 PEP
Connector: UHF Female SO-239
Self-supporting
Height: 18 ft. 5.5 M
Weight: 8 lbs. 3.7 Kg
Mast mount, in (cm): Min.-Max. 1.5 (3.8)—1.75 (4.44)

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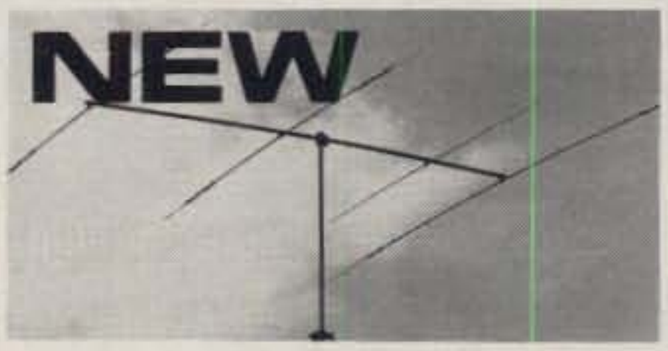
Front to Back Ratio	>30 dB
SWR	1.2:1
Boom Length	18 ft (5.5 m)
Longest Element	19 ft 10.5 in (6.1 m)
Turning Radius	15 ft (4.6 m)
Wind Surface Area	4 ft² (.46m²)
Weight	21 lb (9.5 kg)



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Forward Gain	8.9 dBd
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SWR	1.2:1
Boom Length	18 ft (5.5 m)
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Turning Radius	18 ft (5.5 m)
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CIRCLE 93 ON READER SERVICE CARD

CQ REVIEWS:

The Yaesu FT-736R All-Mode VHF/UHF Transceiver

BY STEVE KATZ*, WB2WIK

The new Yaesu FT-736R is an attractive, lightweight (20 pounds) transceiver which offers some amazing features in a desktop package. Intended to replace the popular FT-726R, the new rig includes several features not found in its predecessor.

Boasting 64 front-panel controls (knobs and switches), many of which are dual-function, the 736R offers its operators an incredible variety of functions. Contrary to rumor, the rig will not cook your breakfast. However, I understand the engineers at Yaesu are working on that one, and the "food" option may become available in the future (only kidding).

Where can I begin an assessment of such a complex product? Let's start with band coverage, power output, and general features of interest to the largest cross-section of readers.

The FT-736R as it is normally supplied ("stripped," so to speak) provides 25 watts output power on the 144 and 432 MHz bands in SSB, CW, and FM modes. Coverage on two additional bands (of three available: 50, 220, 1260 MHz) is provided for by expansion slots which accommodate optional "band modules." These optional modules are essentially transverters, each of which includes its own phase-lock-loop circuit, LO, mixers (TX and RX), buffers, drivers, power amplifier (TX), RF stage (RX), requisite bandpass filtering, and antenna switching circuitry. The 736R's receiver functions as a double-conversion superheterodyne on 6 and 2 meters, and as triple-conversion on the higher three bands. The "band modules" are not interchangeable between the FT-726R and the FT-736R, and the 23 cm module will not work in the older rig. Sorry about that.

"Exceptional digital integration and control," says the operating manual, is provided by an 8-bit CMOS main microprocessor and 4-bit I/O coprocessor. The rig features selectable tuning rates or mode-dependent channelized tuning and a variety of scanning methods. Further, the 736R includes many features normally found only on HF transceivers, such as adjustable IF shift and notch, a noise blanker that really works, all-mode VOX, three-speed selectable AGC, four separate amplifier/accessory key lines, rear-panel PTT input, optional narrow CW filter and electronic keyer, and a high-stability temperature-compensated crystal reference (synthesizer) oscillator. As if that weren't enough, the FT-736R contains provision for an optional (TV-736) fast-scan ATV unit which plugs into the 1.2 GHz "band module."

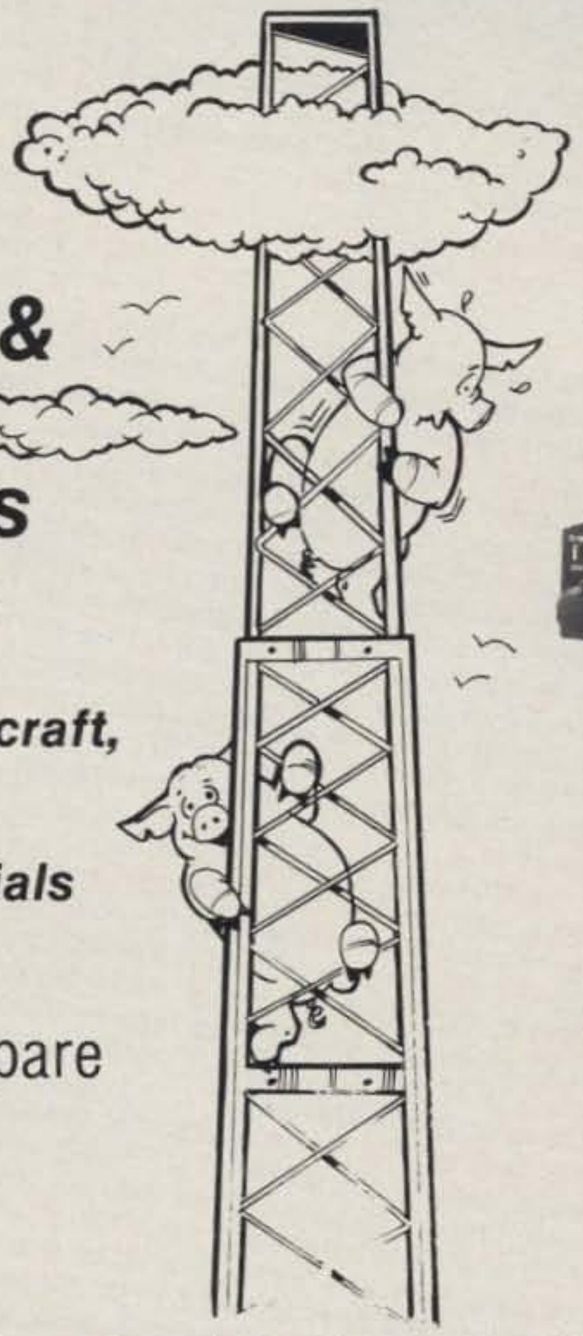
*153 Rodman Court, Eatontown, NJ 07724

The rather imposing front panel of the FT-736R becomes friendly as you get to know it.

Frequency tuning/programming is accomplished several ways: 1 MHz steps may be tuned by depressing the large **MHz/CH Down/Up** keys; smaller increments may be tuned by turning the large main tuning knob, or by depressing the large **Down/Up** keys just above the main tuning control, or by depressing keys of the same function on either of the optional PTT microphones, or by turning the **Channel** knob (lower right of the main tuning); or, any frequency may be programmed by strokes made to the numeric keypad **(Function)** on the right side of the front panel. For rapid QSY to a frequency not already stored in one of the 736R's 115 memories (!), I found the keypad fast and easy to use. However, the keys are not backlighted and may be somewhat difficult to see in a dimly lit room.

In case you thought there was a typographical error in the previous paragraph, let me restate this rig as having 115 memories. It depends on how you view a "memory." Per Yaesu's discussion of the subject, "The memory system includes one hundred general purpose memories plus ten full duplex cross-band memories, one global call channel memory that can be recalled from any band or mode, and up to four band-specific call channel memories, all of which store mode and receive and transmit frequencies independently. That gives you one hundred fifteen memories storing up to two hundred thirty frequencies. In addition," the discussion continues, "fourteen VFO's are provided: two general purpose plus one PMS (Programmable Memory limit Scanning) on each band, two special-purpose full duplex VFO's, and up to four clarifier (RX offset) memories, one per band."

Confused enough? It takes some getting used to, but all this stuff actually works. For example, the FT-736R has no **RIT** (**R**eceiver **I**ncremental **T**uning) control—an alarming omission, until you discover that depressing the **CLAR** (Clarifier) button in the lower left corner of the **Function** keypad instantly changes the main tuning function to a smoothly operating RIT, allowing you to tune 9.999 kHz above or below your transmit frequency, which remains stored in memory the moment you enable the clarifier. Maybe a separate RIT knob would be



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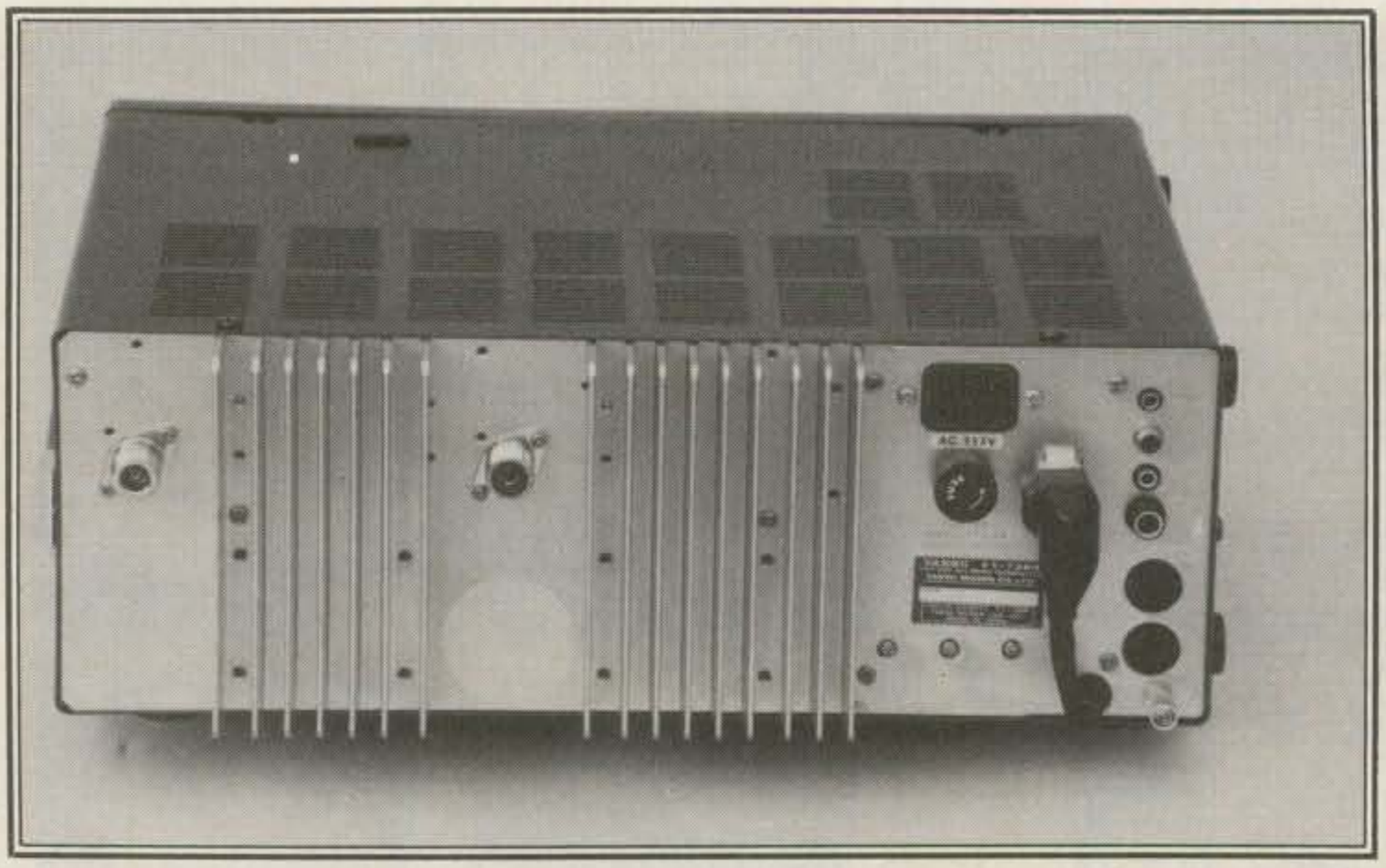


The FT-736R's rear panel is mostly heatsink. Two more coaxial receptacles are accommodated below the two shown when optional band modules are installed.

better, but I must admit that using the large knob and slow, precise rate of the main tuning control makes this the nicest RIT I've ever used. And the 100 Hz resolution frequency display reverts to showing the TX frequency every time the PTT or key is depressed.

The FT-736R is a satellite operator's joy. The designers included several satellite-specific circuits and controls, including two full-duplex VFOs mentioned earlier. Each of these VFOs can be selected so that its RX and TX frequencies and modes are displayed and tuned independently or linked to tune synchronously in opposite directions—ideal for satellite operations.

I've also enjoyed using the rig on FM, where its splendid modulation has accounted for a number of "This is the best you've ever sounded!" reports. Use of the standard-equipment "Narrow FM" filter has allowed me to receive weak signals directly adjacent to extremely strong, fully-modulated signals with no trace of interference. (Minor problem: Switching to the "Narrow FM" mode restricts the bandwidth of both the TX and RX, causing very narrowband transmission that may sound undermodulated. This can be surmounted by readjusting the front-panel **MIC** control, which changes deviation on FM.)

Yaesu designers included an internal switched-mode power supply to allow operation directly from the AC mains for convenient home station operation. This supply produces 13.8 VDC regulated at up to 8 amperes, and its connection to the rig is via a rear-panel jumper cable which may be removed for mobile/portable operation from an external DC source. The power supply, shown as "PS Unit FP1274A" in the FT-736 schematics (with no component details given), runs very cool even after long periods of key-down service.

While I'd like to offer some discussion of the front- and rear-panel controls and connections, even a cursory description would consume pages of text. After all, this rig has 64 front-panel knobs and switches (some of which are dual-function), plus a minimum of ten receptables on its rear panel. The FT-736R operating manual discusses the functions of all these parts in sufficient detail to consume ten printed pages in its Section 2. Despite this overwhelming complexity, the rig can be quite simple to use if you choose to ignore the majority of its unique features and simply operate it as a common VFO-controlled transceiver. This is to say, you needn't know much about the rig's controls or functions—or anything at all about its internal workings—to get on the air and begin having fun. And this is exactly what I'd recommend any new owner do. I was on the air, first on 2 meters and then on 70 cm, for a couple of weeks before I studied the manual in any depth.

Let's look a bit at the circuitry, beginning with the receiver. The FT-736R's front end on 2 meters is an AGC-controlled 3SK121 dual-gate MOSFET the output of which is filtered by a 144–148 MHz bandpass circuit before driving an IC mixer, the output (first receive IF) of which is 13.69 MHz. This IF signal passes through a 2-pole crystal filter, then a 3SK122 dual-gate MOSFET first IF amplifier before it leaves the "144 MHz Main Unit" PCB (printed circuit board) to be routed to the "RX Unit" PCB where it is buffered by a 2SK125 grounded gate JFET and further filtered by another 2-pole crystal filter at 13.69 MHz. A second output from the JFET buffer supplies a signal to the electronic noise blanker circuit, which consists of cascaded bipolar differential amplifiers (the second input of which is from an AGC amplifier specifically part of the noise blanker), driving a high-gain Noise Blanker Control amplifier (cascaded 2SC458's)—which in turn supplies the bias signal for the Noise Gate, three 1S1588 diodes arranged as a fast switching modulator between the 2SK125 buffer and balanced JFET second mixer (a pair of 2SK241's). Whew!

The output of the second mixer at 455 kHz is then filtered by any one of four possible switch-selected multipole bandpass filters: the "standard" SSB/CW filter (2.2 kHz bandwidth); the "narrow" CW filter (600 Hz); the "normal" FM filter (12 kHz); or the "narrow" FM filter (8 kHz). Only the narrow CW filter is optional, the other three being included in all units. The 455 kHz IF signal is then further amplified (or buffered) by two tuned bipolar stages before it is further filtered and limited to drive the diode discriminator for FM reception.

For SSB/CW reception, the signal from the appropriate IF filter is amplified by an AGC-controlled 3SK74 dual-gate MOSFET before it is routed through the IF notch filter and another 3SK47 AGC-controlled IF amplifier to be demodulated by an integrated product detector (uP1037). A second output from Q3036, the second 3SK47 IF amp, drives a buffer amplifier and AGC amplifier, then the SSB squelch circuit and S-meter amplifier. (On FM, the S-meter amplifier signal is supplied by a second output from Q3020, the post-filter IF buffer amplifier.)

I haven't mentioned the various LO (local oscillator) sources to this point, but they deserve some comment. The first LO is a tunable signal of 157.69 to 161.69 MHz providing "high side" injection to the integrated first mixer, an ND487C. The tunable oscillator that produces the 159.69 MHz (nominal) injection signal is, of course, a frequency synthesizer which is programmed in various tuning increments by a number of possible sources, including the main tuning knob or the Channel dial. The synthesizer is so complex that without some written description provided by Yaesu (there isn't one), it would be difficult to discuss in any depth. It appears to begin with a 20.5 MHz VCXO (voltage-controlled crystal oscillator) the two outputs of which drive (1) a times 7 multiplier whose 143.5 MHz output is filtered, buffered, and mixed down to 14.18–18.18 MHz (on RX; on TX, the range is offset +100 kHz), then filtered, amplified, and applied to the MC145155 PLL (phase lock loop) circuit which produces the 157.69–161.69 MHz (again, offset by +100 kHz on TX) signal discussed earlier; (2) a buffer and mixer the output of which at 21.47–24.28 kHz is filtered then applied to an integrated phase detector (TC5081); this stage's other input at 21.42–24.28 kHz is derived from a "144 MHz Sub VCO unit" whose frequency divided output at 2.4–2.72 MHz is further divided by a 1/112 stage (TC9122). Double whew! And, of course, that is by no means a complete description of the synthesizer, since I've omitted the source of PLL data and any discussion of the 430 MHz PLL!

Suffice it to say that the synthesizer appears very stable, resettable, and of low enough internally generated noise that the end product is a pleasure to use. I've not measured SSB phase noise, although given enough time, I could make this measurement on the FT-736's transmitted signal and assume the data applies to the receiver as well. Possibly more on this in a future issue.

The transmitter uses circuits contained on three separate PCBs: the "144 MHz Main Unit," the "TX Unit," and the "144 MHz PA Unit." The "TX Unit" contains the low-level stages including the 13 MHz TX PLL and yields a signal at 13.79 MHz which is applied to the "144 MHz Man Unit" PCB where it is mixed with the tunable 157.79–161.79 MHz synthesizer output to derive a signal in the 144–148 MHz range. This transmit mixer is a balanced pair of 2SK241 JFETs the output of which is bandpass filtered before being applied to a 2SC2026 bipolar pre-driver (the keyed stage in the transmitter, incidentally) then a 2SC2053 driver stage. The 2 meter output signal is then applied to the "144 MHz PA Unit" PCB where it

Parameter	144 MHz	432 MHz
Output power, max. CW/FM	28 W	22 W
Output power, max. SSB*	20 W	10 W
Output power, min. any mode	0 W	0 W
Output power vs. meter rdg:		
"1"	2 W	1.8 W
"2"	4 W	3 W
"3"	6 W	4 W
"4"	8 W	6 W
"5"	11 W	8 W
"6"	15 W	10 W
"7"	20 W	15 W
"8"	26 W	20 W
Receiver sensitivity:		
MDS, CW/SSB	−140 dBm	−132 dBm
MDS, FM	−127 dBm	−124 dBm
20 dB qtg (FM)	−113 dBm	−110 dBm

S-meter readings vs. level:	FM/SSB	FM/SSB
S1	−117/−114 dBm	−118/−114 dBm
S2	−109/−112 dBm	−111/−112 dBm
S3	−106/−110 dBm	−108/−111 dBm
S4	−104/−109 dBm	−106/−110 dBm
S5	−103/−107 dBm	−104/−108 dBm
S6	−102/−105 dBm	−103/−106 dBm
S7	−100/−103 dBm	−102/−104 dBm
S8	−99/−99 dBm	−101/−101 dBm
S9	−98/−95 dBm	−100/−97 dBm
S9 + 20	−93/−79 dBm	−95/−80 dBm
S9 + 40	−88/−63 dBm	−89/−64 dBm
S9 + 60	−82/−50 dBm	−84/−50 dBm
Average "S" unit	2.4/2.4 dB	2.3/2.1 dB
Average "dB" above S9	.27/.75 dB	.27/.78 dB

General Data Applying To Both Bands:

Notch depth: 17 dB

IF shift range: 3.3 kHz

Frequency shift for mode change: < 200 Hz USB/LSB
600 Hz SSB/CW
0 Hz SSB/FM

IF bandwidth, −6 dB: 17.1 kHz FM (normal)
11.1 kHz FM (narrow)
2.5 kHz SSB

IF filter shape factor, 6:60 dB: 1.6 FM (normal)
1.5 FM (narrow)
2.5 SSB

AGC decay speed: < 10 mS (Fast)
20 dB/sec (Medium)
4 dB/sec (Slow)

**Note: Peak envelope power output with 1 kHz tone injected at mic input, level adjusted for max. reading on ALC scale, speech processor "on." (This yielded a higher PEP reading than with processor "off.")*

Table I– WB2WIK's lab measurements on the FT-736R receiver and transmitter.

drives the hybrid PA (power amplifier) stage, shown as P/N M57727. No details of the hybrid's internal circuitry are given.

The "PA Unit" also contains the PIN diode antenna switch and output detector circuit which supplies a drive signal to the ALC amplifier and ultimately the front-panel output meter. The "TX Unit" also contains (in addition to those circuits already discussed) the VOX circuitry, microphone preamp, lamp drivers, and (optional) keyer unit.

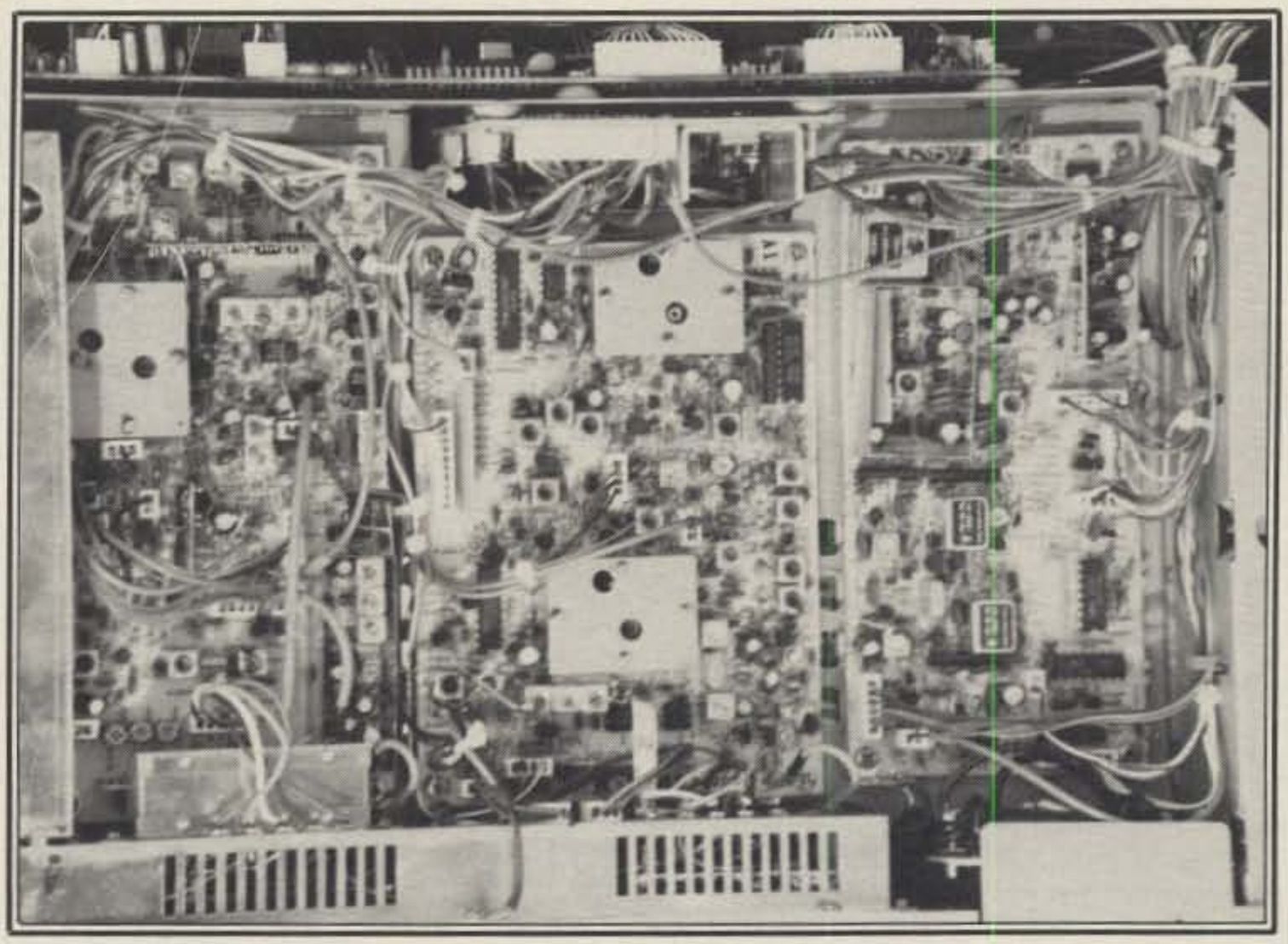
An entirely separate RF Unit—with accompanying PLL Unit, Front End Unit, and PA Unit—is used for 430 MHz. The 13.69 MHz RX IF and 13.79 MHz TX IF systems are shared on both bands, and any other bands the user chooses to install. Major differences in circuitry between 430 and 144 MHz RF systems include the use of a 3SK164 dual-gate GaAsFET RF preamp and mixer stages, and one additional conversion stage (first IF is 47.43 MHz; second IF is 13.69 MHz) for the higher band, plus a different PA hybrid (P/N M57745), also rated for 25 watts output, is necessarily used.

Ample room is provided for the installation of two additional "Band Modules," although three are offered for sale. These band modules, also called "Optional Units" throughout the operating manual, require only a few minutes each for installation. Unfortunately, the review unit was not equipped with any optional units, as I believe none were available back in January when we took delivery. It is assumed their performance is similar to that of the internal RF units for 144 and 432 MHz; however, only the optional 135 cm band module provides 25 watts output power. The 6 meter and 23 cm modules are rated for 10 watts output each.

It is not possible to configure the FT-736R for any four bands of your choice. You are limited to 144, 432, and any two of the remaining three optional bands. So you cannot, for example, equip your transceiver for 50, 220, 432, and 1296 MHz or 50, 144, 220, and 1296 MHz. Small sacrifice for the versatility and performance offered.

The band modules install in the lower part of the rig and the exercise appears simple, based on the instructions in the operating manual. Each module mounts to the rear-panel/heatsink assembly of the rig with four machine screws, then is further secured with one or two (depending on the module) self-tapping screws to the chassis. One single red wire and two multi-pin connectors are installed to complete the electrical connections, and you're on the air!

The operating manual is thorough and well-written, leaving few questions unanswered. There is no operating theory or circuit descrip-



This is the view inside the top cover. The entire rig is of modular construction, with most interconnections made with molded plugs.

tion section, nor are there complete schematic diagrams of the switched-mode power supply and some other "units" contained in the 736R. Even with these omissions, I like the manual. It does an adequate job of explaining the function of each of the rig's panel controls, and even I—the world's worst "appliance operator" who cringes at computers and has spent years fighting off advanced technology—found the rig a breeze to operate after a few days' time.

Now comes the big question: Does the rig really perform? I'd answer with a resounding "Yes!" Even before putting the 736R on the air from the home station, I spent a couple of hours making lab measurements on the receiver and transmitter and offer the tabulated data shown in Table I.

Using the FT-736R on the air is a joy. I've programmed the weak-signal band edges and lots of simplex and repeater frequencies into the memories and found that recalling and scanning the memories is a fast, simple way to find activity of interest. Using the mating MH-1B8 hand-held microphone I've received nothing but outstanding audio reports. Every single station contacted reported that the speech processor made the transmitted signal sound better, cleaner, and crisper—and the oscilloscope reveals the processor also dramatically increases average output power without adding distortion. The receiver sensitivity is good, especially when one considers there is considerable filtering of the input signal prior to the first RF stage. (Really low-noise preamplifiers employ little if any bandshaping, since these circuits have losses which contribute to overall noise figure.) The addition of 1 dB NF (noise figure) GaAsFET preamps ahead of the FT-736R's receiver sections yielded no improvement in sensitivity on 2 meters and a slight improvement on 70 cm. This would imply the 736R's NF is somewhat higher than 1 dB on 432 MHz; the test is probably meaningless on 144 MHz, since with an antenna connected, atmospheric noise typically overrides internally generated noise in modern receivers.

One cannot help trying to draw comparisons between any new piece of equipment and those already on the market. In the case of the FT-736R, I'm hard pressed to do so, because its only competition is other Yaesu rigs like its predecessor FT-726R and the new all-band FT-767, a deluxe HF transceiver with accommodations for VHF/UHF band modules.

The FT-736R has a suggested retail price of $1749.95 as normally supplied for 2 meter and 70 cm coverage. The optional band modules have retail prices in the range of $250 to $300 each. I understand these prices are heavily dependent upon our currency exchange rate with Japan, but discounts are often available. Considering the operating flexibility and performance offered by the 736R, I think the rig is worth its price. It isn't quite the same as having entirely separate stations, but it's close: A push of the "BAND" button, and you're instantly on a new band, with all memories retained from prior use there. Separate RF receptacles (UHF for 50 and 144 MHz, type N for the higher bands) and amplifier keying lines make this rig feel like two (or three, or four) complete stations that just happen to occupy a single box. No question about it, Yaesu has another winner here.

For further information, contact Yaesu USA, 17210 Edwards Road, Cerritos, CA 90701, or your local franchised distributor. CQ

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IC-28A 25W 2m FM, **TTP** mic	469.00	**409.95**
IC-28H 45W 2m FM, **TTP** mic	499.00	**439.95**
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IC-38A 25W 220 FM, **TTP** mic	489.00	**429.95**
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UX-29H 2m 45W band unit	349.00	**319.95**
UX-39A 220MHz 25W band unit	349.00	**319.95**
UX-49A 440MHz 25W band unit	349.00	**319.95**
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EX-310 Voice synthesizer	59.00	
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Put away your calculator and reference books for a while. K1GW comes up with some good "hands on" suggestions to get you started with vertical antennas.

Vertical Antennas For The New and Not So New Amateur

BY GLEN WHITEHOUSE*, K1GW

Trapped vertical antennas are very cost effective and offer relatively easy exposure to many HF amateur bands. For this reason they are very popular particularly among new amateurs. A trapped vertical antenna typically offers performance on many amateur bands. The simplest vertical usually covers three bands, and fancier models can cover as many as eight bands. Many of the HF transceivers available today cover nine bands between 160 and 10 meters. Having an antenna that covers many of those bands means that from time to time the user can work all of those frequencies without having to switch to different antennas.

The purpose of this article is to expose the reader to some of the factors to consider when installing a vertical. The explanation of how the antenna works is intentionally incomplete, as this subject is extensively covered in amateur literature. The electrical diagram of a trap is shown in fig. 1. The resonant frequency of each trap is in the amateur band where it is effective. For example, a 10 meter trap is resonant from 28–30 MHz. Its effect is to electrically turn off all of the antenna above the trap frequency. Only the portion below the trap is effective. On frequencies lower than the resonant frequency the trap acts like an inductor. Its effect is to physically shorten the length of the antenna.

You've probably heard many things about antennas. One certainty concerning quarterwave verticals is that they must work against a ground. There is another type of vertical, however, and that is the halfwave vertical, which is independent of the ground. Some amateurs report that they've had good results when installing the quarterwave type with only a small ground rod or perhaps no ground at all. They were very lucky, probably living where soil conditions are very conductive. On the other hand, halfwave verticals need only be grounded for lightning protection.

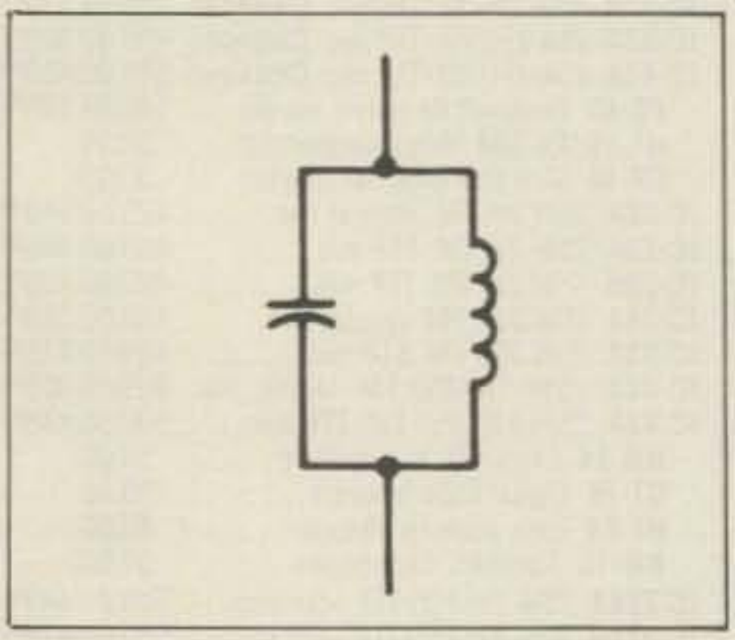


Fig. 1–The schematic of an antenna trap.

Ground Systems For Quarterwave Verticals

The simplest ground system for a quarterwave vertical is often the ground radial kit supplied by the manufacturer, usually as a separate item. They are shorter and more compact than a full-fledged ground system. Most quarterwave users have to improve the conducting ability of the earth to provide a ground condition sufficient for good antenna performance. Quarterwave-vertical users do this by spreading radials on the ground below their antenna. These are wires that are attached to the base of the antenna much like spokes are attached to the hub of a wheel. They are the most maligned part of an antenna system. Most amateurs talk about them, or have an opinion about them. Some amateurs brag about how many they have; some brag about how few they have. They're really quite simple and don't deserve the negative publicity they get. They're just pieces of wire.

The simplest way to install a quarterwave vertical is to mount it on the ground and bury the radials. This is done by selecting a spot for the vertical that is as clear of obstacles as possible. Try to avoid placing the antenna near buildings or trees. Trees and buildings, especially buildings, tend to have a detuning effect on antennas.

The next step is to install a pipe in the ground. Obtain the largest size pipe available that will fit the base of the antenna. The pipe may be driven into the ground with a sledge-hammer. If this approach is adopted, place a 2 by 4 on top of the pipe to absorb the pounding and prevent the top from flaring and thus not fitting the antenna mount. Another technique would be to dig the hole with a fence-post digger. Place the pipe into it and then fill in the hole, taking care to ensure the pipe remains vertical. Usually a 3 foot pipe with 12 inches remaining above the ground is sufficient.

The next part of the project is to install the radials. Follow the antenna manufacturer's instructions. Generally, they will recommend at least three radials on each band. Sometimes one set of radials will perform on two bands. The harmonic relationship between 15 and 40 meters often allows the 40 meter radials to operate on 15 meters. Similarly, 30 meter radials should also allow operation on 10 meters. Radials can be made out of any wire. There are two basic guidelines: It should be inexpensive and steel should be avoided. Either coated or bare wire may be used. The size of the wire is not critical, but it should be at least 20 gauge. Radials may range in length from 66 feet on 80 meters to 8 feet on 10 meters. When you measure the length of the radials, try to cut them as close to the recommended length as possible. It is not necessary to be exact. Don't forget to leave a few

*4 Newbury Dr., Amherst, NH 03031

inches of extra wire to use in attaching the wire to the antenna.

You may find that some of your radials will not fit in the space available to you. Don't cut them! Doing this reduces their effectiveness. In the event that you come to an obstruction, your property line or your house, just gradually bend the radial and head off in a convenient direction. It is okay to have radials cross each other.

As each radial is cut, it should be attached to the base of the antenna at one end and stretched out like a spoke fanning away from the antenna. Do this as they are cut, or you may end up in a giant tangle of wire. Do one band at a time, starting with the longest radials. The far end radial should be temporarily anchored. Wooden stakes are good for this. When the system is completed and you are satisfied with the layout, you can leave it as is or bury the radials. One way to bury the radials is to slice the ground with an edger, poke the wires into the slots, and push the soil/grass back over the wire. In a couple of weeks neither you nor your family will be able to tell where the radials are buried.

Another way to install a vertical is on a rooftop or on top of a mast. This is a tricky installation for a quarterwave vertical and a relatively simple one for a halfwave vertical. In the quarterwave case the radials still have to be attached at the base of the antenna. The lengths the manufacturer suggests for above-ground installations are different from the radial lengths for on- or in-ground installations. This is due to the lack of capacitive coupling between the radials and the earth in the above-ground installation. When installing a rooftop quarterwave, follow the same procedure suggested for the ground-mounted model. The radials will fan out from the base of the antenna across the roof. When you encounter the edge of the roof, run the radial along the eaves of the house. Don't cut the radials, as you will need the entire length for best results. Mounting a vertical on top of a pole follows the same pattern. The result is an umbrella-like effect with the vertical sticking out above the middle.

Installing The Antenna

After the antenna is assembled, check the dimensions one more time. While the dimensions of the radials are not critical, the dimensions of the antenna are quite critical. You should try to maintain accuracy to within ⅛ inch or as close to that as you can come. Next attach the antenna to the mounting pipe. If you are using a halfwave vertical, you may want to drive a ground rod into the earth near the pipe and attach the base of the antenna to it. If the halfwave is on the roof or on a pole, run a wire from the base of the antenna to ground if practical. It will help prevent the build-up of static electricity.

If you have an SWR bridge, or perhaps your rig has one built in, you can check your SWR. If it is less than 2:1 in the portion of the bands where you intend to operate, you are ready to get on the air. If it is not, just follow this simple procedure to tune it.

Before making adjustments to your antenna you should understand what portion of the antenna should be changed for each band. For example, on a 10, 15, 20, 40, and 80 meter trapped vertical, the 10 meter portion is the portion between the base and the first trap. The 15 meter portion is between the first and second trap, while the 20 meter portion is between the second and third trap, etc. Newer vertical designs often include some of the WARC bands which have been assigned to amateurs in recent years. These bands are quite narrow in frequency range and often do not require adjustment. They are not adjustable on all models. (Not all verticals operate on all bands).

You should make adjustments to your antenna from the highest frequency down. Using your SWR meter, measure the SWR each 50 kHz across the highest frequency band where the SWR is too high. You will be able to tell if the best SWR is above or below your desired frequency by using this information.

If the best SWR is too low, you can move it up the band by shortening the appropriate section. It is best to shorten the section by 1 inch and take the SWR measurements again. This will give you an idea of what effect a 1 inch change will make. The second length change will probably be very close to the final setting. If not, keep on adjusting. Remember, shorten to raise the frequency and lengthen to lower it. Once you have the highest band adjusted, check the next lower band and adjust it if necessary. Continue this procedure until the antenna has an SWR of less than 2:1 on all the proper band segments.

One note of caution: All antennas are potential shock hazards. When you are transmitting, there can be very high voltages present on your antenna. Take care to see that people and pets do not come in contact with them.

Verticals offer an excellent way to enjoy amateur radio with a minimum of expense and trouble. The newer halfwave designs even eliminate the need for the ground radial systems that quarterwave verticals demand. In either case, remember that assembling and installing antennas is just as much a part of our hobby as enjoying successful, friendly QSOs. CQ

CQ REVIEWS:

The Kenwood TH25AT/45AT and Accessories

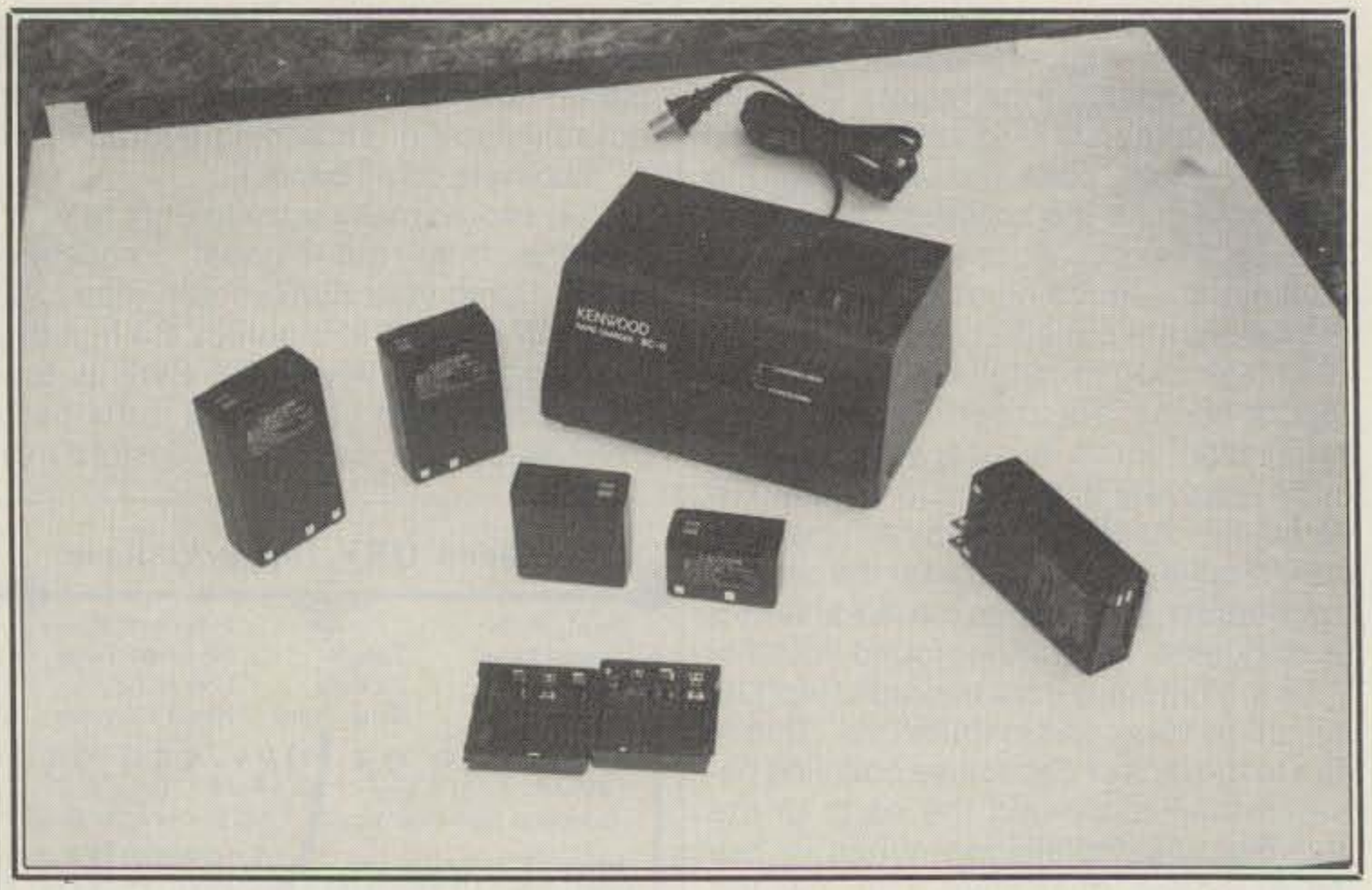
BY PETER O'DELL, WB2D

In the March issue, Bill Clarke, WA4BLC, gave a short overview of the TH25AT after using one for a brief period of time. In this issue, Peter O'Dell, WB2D, provides his observations on the unit based upon extensive use over the past couple of months. Peter has been experimenting with the various options available for the TH25AT/45AT line and gives some suggestions for customizing a package for your personal needs.-K2EEK

One of the joys of being a parent is watching your child "wheedle" toys out of your parents—those same people who had 8000 reasons why you didn't need and they couldn't afford the $1.95 Super Whiz Bang. Anita, my daughter, has been phenomenally successful at that endeavor with my father. She has had a fondness for Barbie Dolls, which the contents of her toy box attest to. But, you see, the doll is just the beginning. Choosing accessories is where the fun starts. After all, "customizing the package" is what makes each doll unique and very personal. Handheld transceivers are the adult amateur's Barbie Doll.

Kenwood's TH25AT/45AT line of handhelds offer a complete selection of accessories that should allow just about any configuration that an amateur might desire. At the heart of the package is the transceiver. Let's take a quick look at it. The TH25AT is the 2-meter version, while the TH45AT is the 450-MHz rendition. I used the TH25AT for this review.

It is a compact, sturdy unit. Since the days of the Tempo S-1, the first synthesized handheld, most of the units manufactured for the amateur market have felt "delicate." By that I mean that I have sensed that most of them would not take much abuse, compared to a Motorola HT-220, for instance. I can think of maybe one or two different models that didn't feel delicate to me—I've handled just about all of them at one point or another. Well, the TH25AT is one of those exceptions to this. It feels sturdy. That's just an impression, but it is an important one to me.



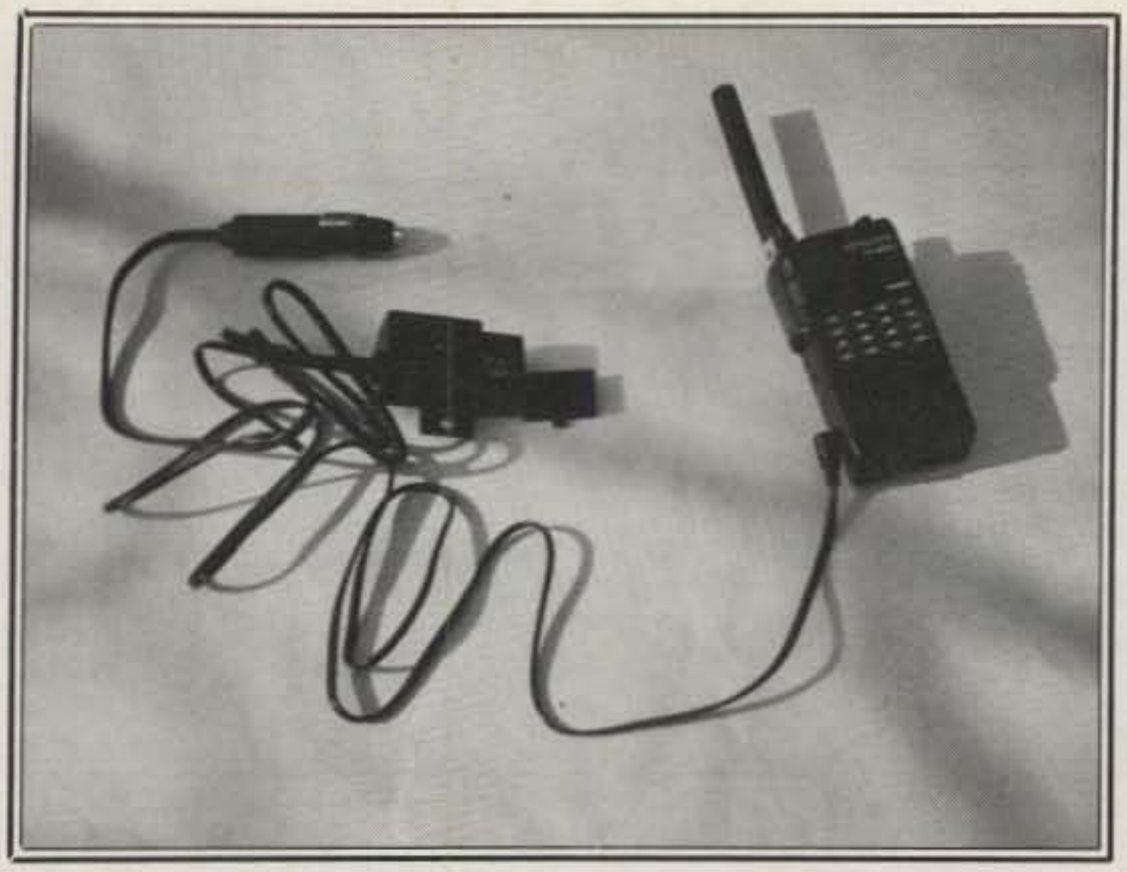
The BC11 charger and battery packs for the TH25AT. In front, the BT6 battery case is open showing the AA cell holders. Far left is the PB7 and PB8. The PB6 (supplied) and the tiny PB5 are between the BC11 and BT6. On the right is the PB9 with the AC plug prongs extended.

The TH25AT is exceptionally easy to use. If you have experience with other Kenwood synthesized radios, you will probably be able to "guess" the steps necessary to get most of the functions working. I always attempt to use a radio before reading the manual—that way I have some idea of what I am in for if I lose the manual. It was easy enough to program in a couple of memory channels and switch back and forth between memory channels and "VFO" operation. Offsets for repeater operation are automatically programmed in according to the ARRL Band Plan. A different offset can be selected, if that is your desire. Two memory channels are reserved for "odd ball" splits, too.

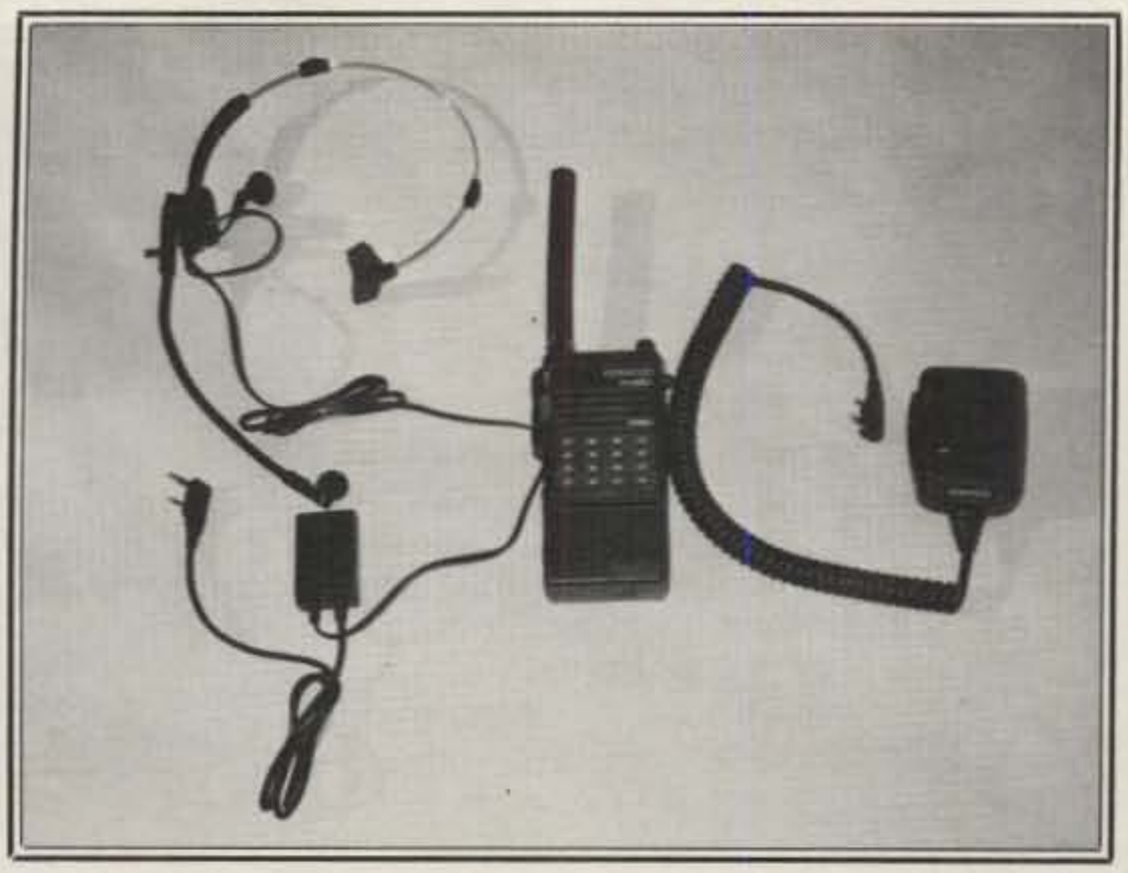
Depressing the **VFO** key for more than one second initiates band scanning. Here, band refers to the entire receive range, which is 141 to 163 MHz. Holding the **MR** button down for more than a second initiates memory channel scan. When the radio detects an active channel (both scan modes), it pauses on the channel for approximately five seconds and then moves on. This is the only function that I felt some operators might desire a wider range of choices and capabilities than offered in the TH25AT.

When using 5-kHz steps, there is a tendency to undershoot on strong signals. It is not a design defect, but it is simply a fact of life when using such small frequency steps. The only way around it is to use a sophisticated "center frequency"

Associate Editor, CQ
CompuServe 76440,271



TH25AT with the DC1 and Pg-3D power cord. The filtering circuit is located in the housing that connects the two cables.



TH25AT with the two optional speaker/microphone systems. Both plug into the jack on the right side of the TH25AT case.

algorithm, such those employed in Kenwood's top-of-the-line base/mobile units. This tendency is greatly reduced when you use 10-kHz steps. Memory scan, of course, is totally unaffected by this phenomena.

All programmed information is stored in memory. A lithium battery is contained in the transceiver to retain memory. Turning off the power switch, or changing or fully discharging the normal battery will not erase the memory. Kenwood estimates the back-up battery life to be on the order of five years. The manual recommends returning the unit to an authorized service center for battery replacement. A quick glance at the *Service Manual* suggests that an amateur with some experience and a lot of courage could do the job, however.

The TH25AT comes with a battery saver circuit that activates after 10 seconds of inactivity. For 800 mS of each second, this circuit powers down the receiver. It is powered up the remaining 200 mS. If activity is detected during the up time, the receiver remains active until another 10 second period of inactivity occurs.

A second battery saving feature is the automatic power off circuit. After 59 minutes of inactivity, the TH25AT sounds a 5 second alert. One minute after this, the radio shuts itself off and displays the word "OFF" on the LCD readout. Except for the minute amount of current required for the LCD, the radio is completely powered down. Reactivating the unit requires turning the **On/Off** switch off and on again or pressing the **MONI** button.

Although it is clearly explained in the *Instruction Manual*, this function slipped my mind the first few times that I used the TH25AT. Sally and I were on simplex. She was rather angry that I didn't respond. At first I thought that the battery was gone. Then I noticed the "OFF" on the display. It was only then that I remembered wondering who the nerd was that was playing around with a tone generator on frequency. Oh, well. That's the kind of error you only make once.

Model	List Price
TH25AT	$329.95
TH45AT	349.95
PB5	54.95
PB7	76.95
PB8	76.95
PB9	59.95
BT6	15.95
BC10	39.95
BC11	99.95
DC1	19.95
PG3D	24.95
PG2	9.95
SMC31	42.95
HMC2	49.95
WR1	19.95
TSU6	39.95
SERVICE MANUAL	15.00
RA3	19.95
SC14	19.95
SC15	19.95
SC16	19.95

Fig. 1– Prices for the TH25AT series and accessories.

The Batteries

I would guess that the most frequently purchased accessory for a handheld is a spare battery pack. If you don't have a spare, you are asking to be a victim of Murphy. The TH25AT comes with a nominal 7.2 V at 600 mAH pack, the PB6. If you are monitoring a very active frequency and talking occasionally, a PB6 should last you around 2 hours. Of course, the more transmitting that you do, the less time you will have on the pack. Conversely, with the battery saver circuits functioning on a quiet channel, the PB6 should last substantially longer.

The PB5 pack offers 7.2V at 200mAH. As would be expected, it provides about ⅓ the service of the PB6. But, it is also about ⅓ the size of the PB6. Sally and I use the handhelds to keep in touch in malls and other places, where channel activity is at a minimum. For those type situations, I prefer the PB5. Look at the photographs for the relative sizes of the various battery packs.

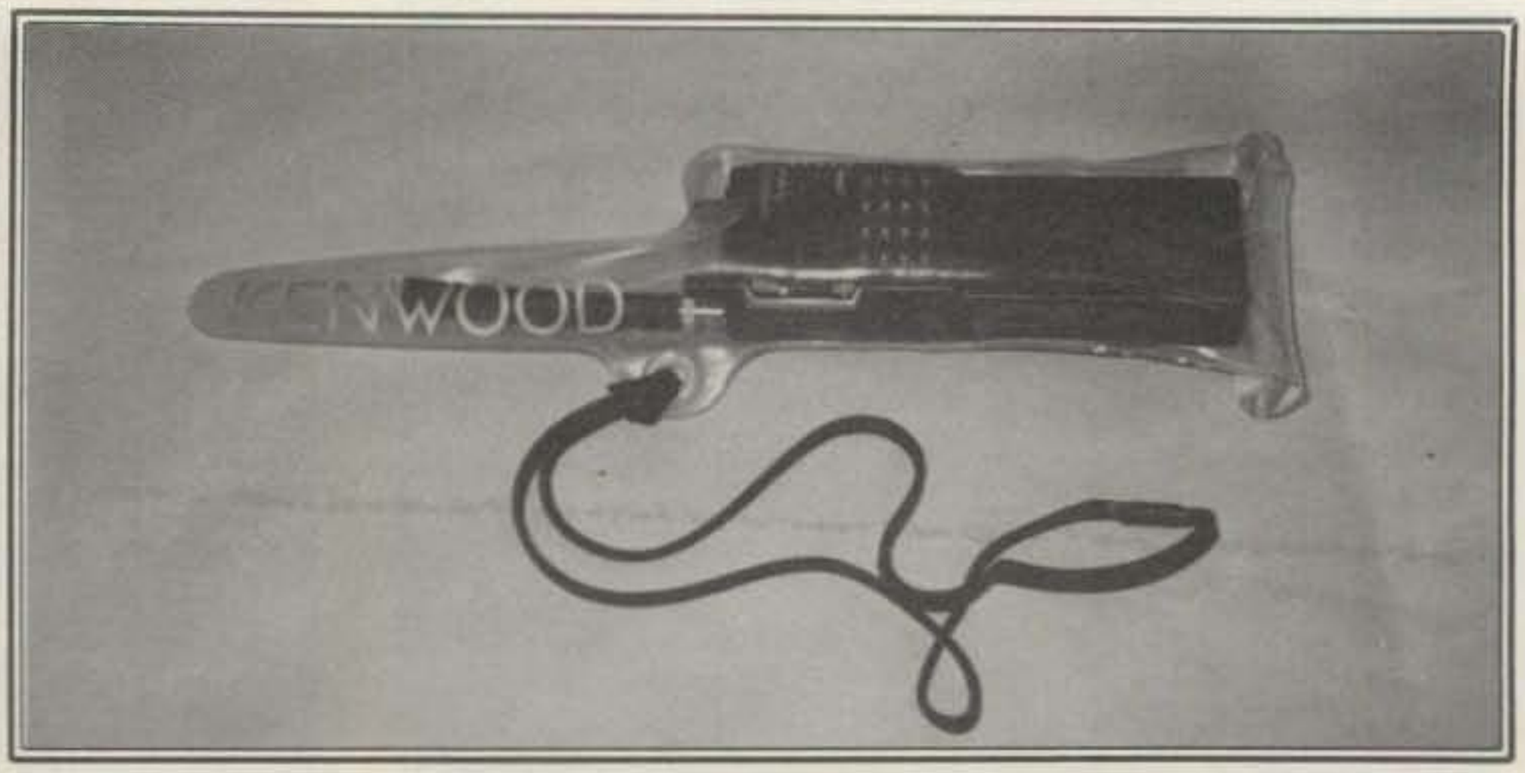
At the opposite end of the spectrum is the PB7. Also rated at 7.2V, the PB7 has a capacity of 1100 mAH, almost double that of the PB6. This pack will provide you with several hours of normal operation. It is ideal for people who frequently participate in public service events, such as marathons.

If you do a lot of traveling, you've probably had the experience of forgetting the battery charger once or twice. The PB9 should be ideal for the amateur who wants to take the TH25AT on the road. It is a 7.2 V, 600 mAH battery pack that has its own charger built in! Approximately the same size as the PB7, the PB9 has a slide button on the bottom that extends and retracts the prongs that plug into a standard wall outlet. An LED reminds you that the unit is charging.

If you are located in a marginal spot for your favorite repeater, you may be interested in the PB8. The PB8 provides 600 mAH of capacity at 12 V. This raises the output of the TH25AT to approximately 5 W, instead of the nominal 2 W with the 7.2 V sources. Operating time will be approximately the same as you would have with the PB6. Therefore, the only advantage to this pack will be for those who need every mW that the radio is capable of. Replac-

ing the duck antenna with Kenwood RA-3 telescoping antenna will also boost your ability to get into the machine from difficult locations.

To round out the line of batteries, Kenwood offers the BT6 battery case. The BT6 holds 6 AA cells—any type. This is one option that every TH25AT owner should have. Battery packs fail, sooner or later. Even though Kenwood has an excellent tradition of supporting products that have been discontinued, it may take you a few days to get a replacement. Having a BT6 around ensures you that fresh batteries are as close as the nearest store. It just makes good sense to have one of these around, even if you never use it.



TH25AT with PB7 battery pack inside the WR-1. There is room for a slightly larger duck antenna.

Chargers

If you have rechargeable batteries, you need a battery charger—unless you stick with the PB9! The TH25AT comes with BC9 charger, which supplies approximately 60 mA of current. It is adequate for use with the PB6 and PB5. To use the BC9, you must remove the battery pack from the radio and slide it onto the charger. In short, this means that you cannot use the charger to power the radio, even during receive.

All the other battery packs require the use of either the BC10 or BC11 charging stands. The BC10 is a relatively simple charging stand designed to provide a slow charge (approximately $\frac{1}{10}$ capacity) to the various packs. The charging terminals are located in different positions on each of the packs, providing a simple means for providing varying voltage and current to the different packs.

On the other hand, the BC11 is a much more sophisticated rapid charger. Over the years, some rapid charging circuits have earned the reputation of being battery "eaters." Their convenience was offset by the shortened life expectancy of the battery packs. The sophisticated circuitry of the BC11 should avoid these problems. As a pack recharges, it reaches a peak voltage, and then the voltage begins to decline. The BC11 senses this change in voltage and cycles off when the pack reaches full charge. Thus, if you place a pack that is only slightly discharged in the BC11, the unit will sense it and provide only the necessary amount of current to recharge the pack. Other designs would not sense this situation and would provide enough current to potentially damage the pack and shorten its life expectancy.

I found that the BC11 would recharge a completely discharged pack in about one hour. A couple of times I placed an almost fully charged pack in the BC11. After a few minutes, the BC11 would turn the charger off. Thus, I am of the opinion that the BC11 will not shorten the life expectancy of the battery packs. It is extremely convenient to use, too. If you want a charging stand, the BC11 would seem to be the ideal choice.

If you are looking to run the TH25AT directly from the charger current, think again. None of the chargers are designed for this. You will be better off with a simple 12-V supply and the DC-1. The DC-1 slides on the bottom of the TH25AT just like a battery pack, and it has a coaxial jack on the side for connection to a 12-V source. This is the proper path for those who need to operate the TH25AT from a 110-V supply for extended periods of time.

Kenwood provides two different cords for attaching the DC-1 to the 12-V electrical system of an automobile. The PG-2 is simply a fused cord with a cigarette lighter plug. On the other hand, the PG-3D has these features and a filtering section. Even if no one has complained about "whine" on your signal while operating mobile, the PG-3D is the better choice. An ounce of prevention is worth a pound of cure.

Speaker Microphones

Kenwood offers two choices for external speaker/microphones for the TH25AT. These units will not work with the TH21 series, but they do work with the TH-205/TH-215 series. The SMC-31 is a traditional style speaker/microphone in a rugged hand-held microphone housing. Operators on the other end thought that the SMC-31 provided good tonal quality on transmit. It mates to a jack on the side of the TH25AT with a right-angle plug. The cord "feels" durable and should provide years of service to the average user.

The HMC-2 is the ultimate "speaker/microphone" for the busy amateur. It consists of a headband with a single ear piece for listening and a boom microphone. The headband unit attaches to a module with a belt clip affixed that provides either **VOX** or **PTT** service. This setup would seem to be ideal for public service applications. I envision using it for tower work later this spring. That will beat trying to yell instructions to the ground crew when you are "up on top." It's also ideal for staying in touch when you are doing yard work.

If you use the TH25AT as a mobile unit, I would recommend the SMC-31. It is probably a little safer. Some states prohibit using "ear phone" devices while driving a car. Anyway, do you really want your radio operated via **VOX** when the guy in the green '57 Ford pick-up cuts you off?

Take It Swimming

I remember the guffaws that the first telescoping 5/8-wave for handhelds got from the ARRL Tech crew—until one of us tried it. Now it is hard to imagine that such a commonly accepted item was ever an unknown. This time I restrained myself from laughing when I unpacked the WR-1 water resistant bag from Kenwood. This is a heavy-duty "baggie" for the TH25AT. It features a pocket for the duck antenna and closes with three separate "zip lock" type seals and a strip of velcro. The instructions indicate that the WR-1 will not protect a radio from submersion, but it is ideal for rainy weather.

I couldn't resist trying it out, and since it wasn't raining, I filled the tub with water and dropped the WR-1 with the TH25AT snugly inside into the tub. After a half hour, there was no indication that the any water was leaking into the WR-1. Receive audio is clear when using the WR-1. Sally reported the transmit audio to sound a little "funny" when using it. There are no provisions for attaching an external speaker/microphone when using the WR-1. It would seem ideal for those occasions when you must be outside and operating in bad weather. Public service events and disaster relief would seem to be likely scenarios that call for the WR-1.

Another use will be for those who like to go boating with their TH25ATs or simply carry them pool side. A friend of mine destroyed a synthesized handheld when it fell out of his back pocket into the Ohio River. Although he was able to recover the unit and dry it out, it never worked properly again. I guess the pollution was too much for the delicate electronics. The WR-1 would have prevented this small tragedy.

CTCSS

As the bands have become more and more crowded, amateurs have learned the advantages of constructively using CTCSS, or as it is commonly called PL™. Kenwood offers the TSU-6 CTCSS encoder/decoder. Most amateur use of CTCSS has been to install a CTCSS decoder on the repeater receiver. Those wishing to use the repeater must have a corresponding encoder on their transmitter. This is probably an outgrowth of CTCSS first being used by amateurs as a tool for keeping a closed repeater closed to the "great unwashed majority."

If you look at the uses that commercial radio makes of CTCSS, you will note that it's used primarily to keep the receiver quiet while some other group uses the channel. Kenwood, along with some of the other manufacturers, is now including decode CTCSS options as well as encode in their CTCSS units. I see this as a step forward. What it means to me is simply this. With a decode option active on my TH25AT and the local repeater transmitting a CTCSS signal, I don't hear all the static laden signals from repeaters sharing the same frequency in Boston and Philadelphia. Band openings make this a common occurrence here on LI. Having a CTCSS decoder on the TH25AT prevents me from turning off the radio in frustration and missing a call.

Installing the TSU-6 couldn't be simpler. Remove the battery pack from the TH25AT. Take out the four screws that hold the bottom plate on. Discard the plastic sleeve that insulates the built-in plug. Attach the plug to the socket on the TSU-6. Reinstall the bottom with the four screws. *Anybody* can do this installation.

It's in the Book

I consider a service manual to be a necessity—not an option—for any radio that I buy. Kenwood's TH25AT *Service Manual* is excellent. Unfortunately, it is not included with the basic radio, but it is widely available from Kenwood dealers. Even if you never plan to pull the back off of the radio just to look around, you should have the service manual. It will enhance the resale value of the radio when the time comes to trade up.

There is always the possibility that a friend can do minor repairs, even if you don't want to. Not having the service manual would severally hamper any such attempt, no matter how simple the repair might be. Buy the service manual.

Finally, Kenwood offers three different soft leatherette cases for the TH25AT, the SC-14, SC-15, and SC-16. You'll need the SC-14 for a proper fit with the PB5 battery pack. The SC-15 gives the best fit for the PB6 and BT6. For the larger battery packs, you will need the SC16.

If you are looking for a versatile 2-meter or 440 handheld FM transceiver that you can customize to your personal wants and likes, you should give consideration to the Kenwood TH25AT/45AT. The fun has only just begun when you buy the radio—then you get to select the options that you want! CQ

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

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

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

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

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

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

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

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An AFSK CW mode lets you ID in CW.

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***You'll** be fascinated as you watch WEFAX signals blossom into full fledged weather maps on your printer.* Other interesting FAX pictures can also be printed -- such as some news photographs from wire services.

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

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

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

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

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

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

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

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

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

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

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

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

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

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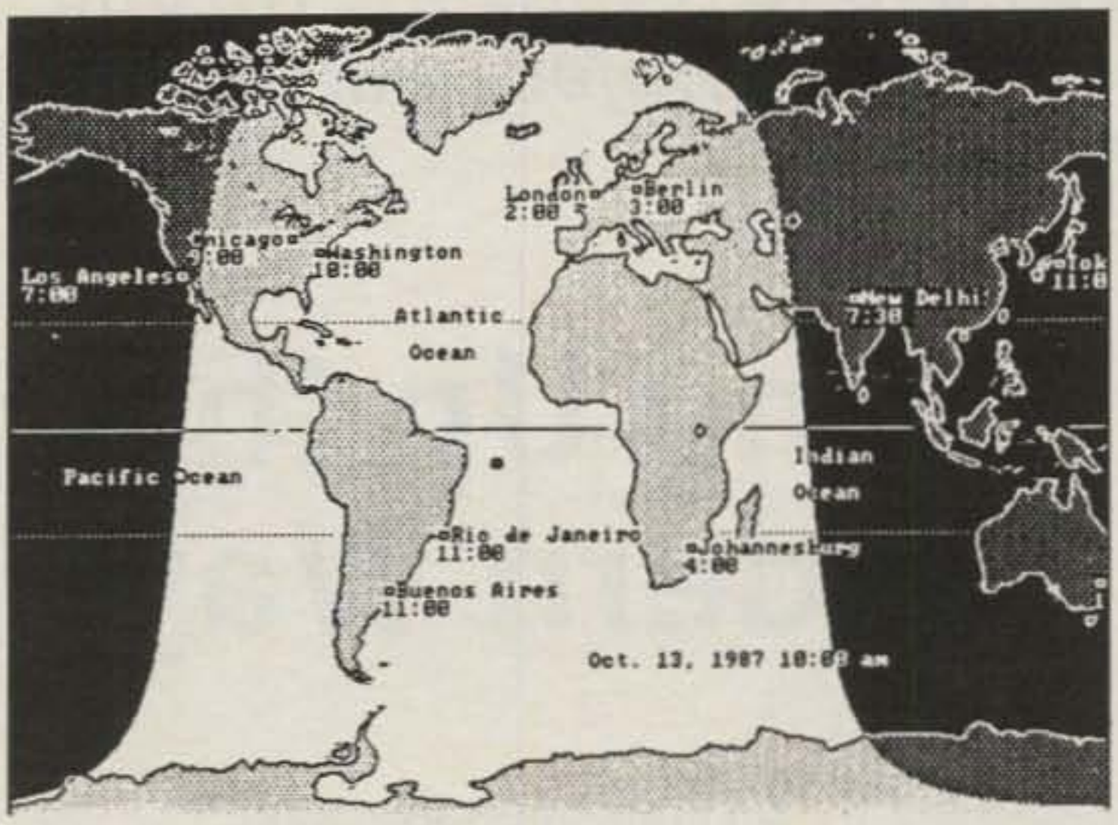

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You can run it by itself or as a memory resident program with other software. It works with all graphics: composite, Hercules, CGA and EGA.

You can enter any date to set your Skeds for any time in the future. Or you can check the solar/gray line positions from past QSOs to answer questions about particularly good or bad RST.

Or use it to Sked your next DXpedition by previously determining the sunrise/sunset time at the QTHs you plan to work.

You can easily customize the program to display any 24 QTHs.

Toggles let you instantly display and undisplay the local date/time, the time zone display, the city display and the sun position marker.

Pressing F9 switches the MFJ-1286 Gray Line DX Advantage to the high speed display mode. This lets you watch Gray Line and solar positions change in increments of 2 minutes, 6 minutes, 1 hour, 1 day or 1 week.

You'll be fascinated as you watch seasons change and days go by on your computer screen. One keystroke lets you set the high speed display to start on any date and time so you can determine optimum Skeds for DXing.

You get a choice of three maps: the default Land Mass Map; the Timezone Map that displays the division of timezones throughout the world; and the Lattitude and Longitude marker map. It's easy to switch maps. CGA displays the Land Mass map.

Correction is made for the north/south position of the sun and the curvature of the earth. You'll see the 24 hour days and nights in the Polar regions.

Graphics are better than excellent: they are incredible. In addition to being an indispensible DXing tool, this is a program your non-ham buddies and family members will enjoy seeing.

It's fun to see the exact position of the sun at particular times and dates. It's fun to press two keys on your computer and instantly see where it is dark and where it is light. It's fun to instantly see the correct time for any and every place in the world. It is also educational -- for children of *all* ages.

You can even change the "hot" activator key to avoid conflicts with other software you want to use.

It's the DXing tool of the year for $29.95!

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CIRCLE 64 ON READER SERVICE CARD

There's no need to disrupt someone else's QSO just because you have to retune the rig and transmatch. This simple project will let you do it the easy, silent way.

Tune Up the Modern Way!

BY WILLIAM VISSERS*, K4KI

When my brand new MFJ 202B Noise Bridge arrived a few days ago, I was fascinated with its ease of use, sensitivity and utility. After quickly reading the instruction manual, I used it to tune my rig and transmatch (antenna matching network).

The only drawback was the necessity of disconnecting the antenna system from the rig, inserting the noise bridge, tuning the transmatch, removing the noise bridge, and reconnecting the rig. (Whew!) Such an involved process would be too time consuming in day-to-day use. It was obvious to me that I needed a switching network to switch the noise bridge in and out of line.

My requirements for the system were:

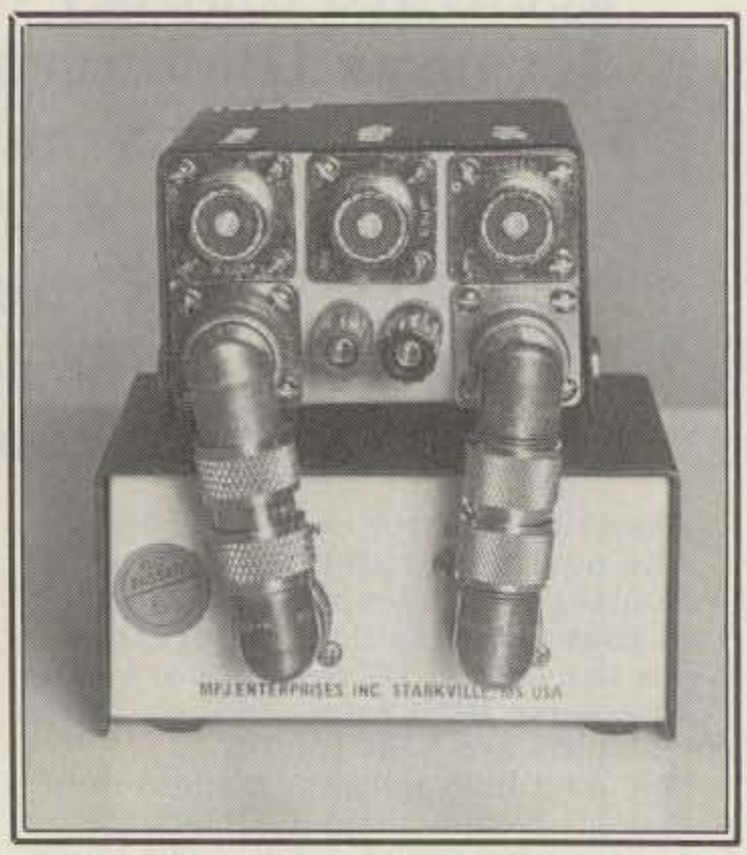
- Be simple and easy to build.
- Use commercially available parts.
- Act as a neat terminal for all my coaxial cables.
- Connect to my dummy load.
- Provide for safety during tune up and operation.
- Maintain low SWR by not introducing stray reactances.

The Circuit

Fig. 1 gives the schematic diagram of the unit that I built. If you **never** run more power than the output of an average transceiver, you can use the same components that I used. On the other hand, if you use or plan to use an amplifier, you should opt for better switches.

S1 is a 4PDT "Heavy Duty" toggle switch distributed by GC Electronics and available in many electronic supply stores. S2 is a DPDT switch from the same source. If you cannot locate these switches locally, look for switches rated at a minimum of 250V and 10A per contact. An alternative is to use ceramic rotary switches, but they are more expensive and usually harder to locate. Scrape the paint away from the cabinet where the coaxial connectors are mounted to ensure good contact.

Front view of the switching unit and the MFJ Noise Bridge combination.



Rear view of the two units. Notice the use of the coaxial adapters to rigidly affix the two together.

Use #16 (or heavier) copper wire for the internal RF path. #18 stranded hookup wire or similar can be used for the other wiring. Stray coupling can be a problem at higher power levels, so you might want to use shielded cable (short pieces of coax) for the RF paths inside.

A noise bridge is a sensitive piece of equipment that can be damaged if you apply RF directly to it. To avoid any possible damage, I incorporated a lockout circuit as well as a warning LED indicator. With the wiper arms of S1 thrown to the **XMTR ON** position, the transceiver connects directly to the antenna. The bottom section of S1 (the **Defeat** circuit) conducts between the two binding posts. In the upper section of S1, the circuit between the battery and the LED is open, so the light is extinguished.

When the wiper arms are moved to the **TUNE** position, the circuit for the LED is closed, so it lights. The antenna connects to the **Unknown** input of the noise bridge, and the other side of the bridge feeds to the **Receiver** input. The circuit between the two binding posts is now open.

The **Defeat** circuit provides the means for positively disabling the transmitter

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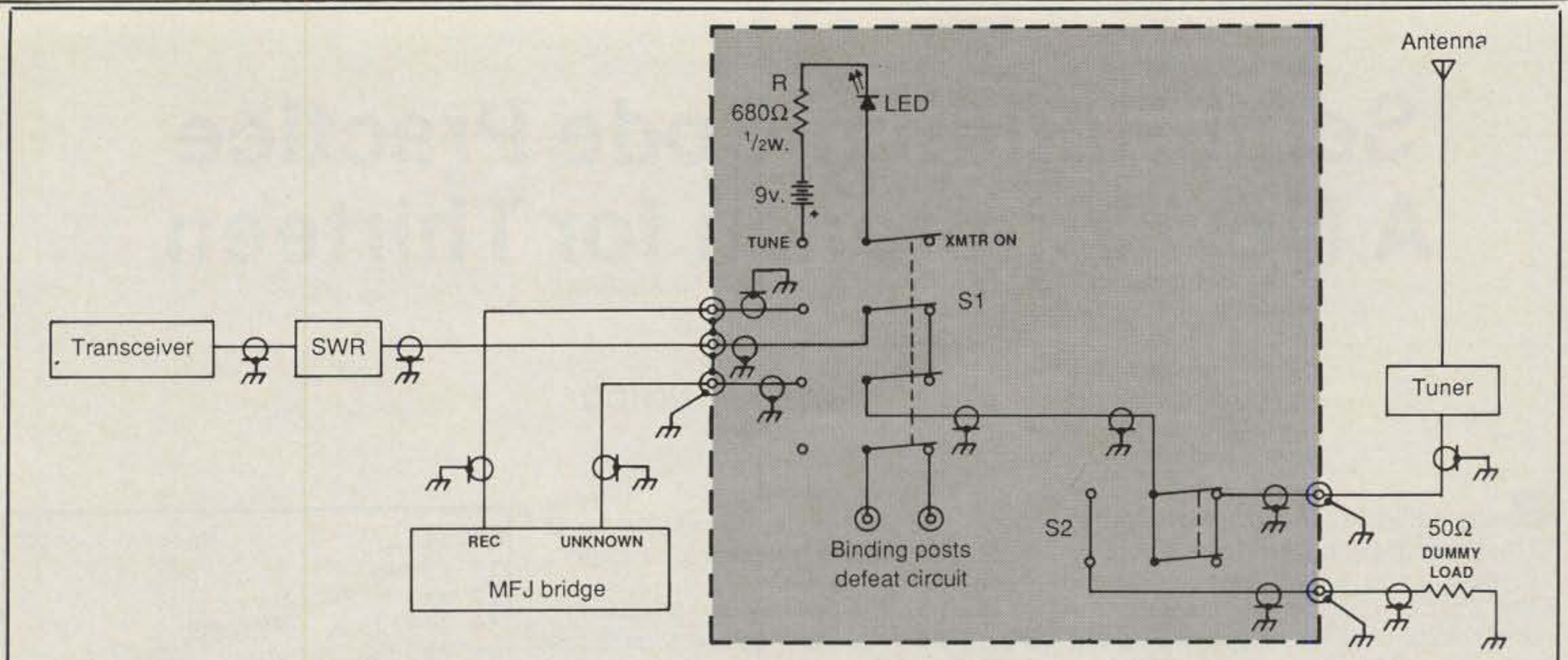


Fig. 1– Schematic diagram for the switching unit. The dotted line indicates the metal enclosure that the switching unit is mounted in. The cabinet used by the author is the Radio Shack 270-251A. Miscellaneous components include a battery connector and clip, co-ax chassis connectors, nylon binding posts, and hardware. All of these items can be obtained from Radio Shack. The blinking LED is Radio Shack 276-036. See text for details on other components.

when S1 is in the **Tune** position. In my case, I brought the wires going to my transceiver's transmit relay out to the binding posts. When S1 is in the **Tune** position, there is no way that the transmitter can be activated. Another method that I tried was to place the defeat circuit in series with a key and always put the transmitter in a keying mode when tuning up. I prefer the first method since it is foolproof. Since I am 74, I perhaps forget a bit more readily than the average amateur. You will have to examine the schematic diagram of your particular radio to determine the best way to implement this feature in your station.

Incidentally, I used a "blinking" LED, which has a flashing circuit built into the housing. An ordinary LED will work, but I like way the blinking light draws my attention.

Both poles of S2 are wired in parallel to reduce the effects of stray inductance. If you are using a ceramic switch, it is not necessary to use more than one pole.

Operation

Notice in the photo of the rear view of the unit that I used coaxial **L** connectors and double male connectors to attach the noise bridge to the unit. While this is not necessary, it has the advantage of keeping the two rigidly affixed without the need to drill holes. From an RF perspective, regular cable-type connections would work just as well.

Once the units are properly attached to each other and the station, tune up is simple, straight forward, and non-interfering. Make sure that your transceiver is in the normal **Receive** mode, and then turn on power to it. Move S1 to the **Tune** position, and bring the dummy load on line with S2. Turn on the noise bridge and adjust it for a null. The reactance should read "0," and the resistance dial should read 50 ohms. Some slight variation can be expected, but both dials should read close to these values. In practice, I prefer watching my S-meter for the sharp deep nulls obtained rather than using the audio noise null method.

Switch from dummy load to antenna using S2. Now adjust your transmatch for a null, and your antenna system is properly tuned up. Move S1 to the **XMTR ON** position, and switch back to the dummy load. The LED will go out, signifying that you can turn on your transmitter power. If your rig requires it, tune up your transmitter into the dummy load. Switch from the dummy load to your antenna, and you are ready to go on the air. *Be sure your transceiver is in the receive position each time you change a switch setting.*

You haven't radiated any output power, except what has leaked from your dummy load, and your transmit SWR has been 1:1. Naturally, remember to turn off your noise bridge to conserve battery life.

In addition to allowing for a silent tune up, the unit protects your rig. Attempting to tune up your rig into a load with a high SWR can be dangerous. High SWR means high voltage and current somewhere in the system. It doesn't take nearly as much to destroy a solid-state device as it does a tube. With all the knobs and controls of both the rig and transmatch being manipulated almost simultaneously, you may often wish you were an octopus. I haven't felt like that since I bought the noise bridge and built this unit. CQ

Semi-Random Code Practice A New Approach for Thirteen

BY LARRY W. LOEN, N0HCQ

Being active in the Novice portion of 10 meters, I meet a lot of folks who, like me, discovered a great barrier at 13 WPM. Most of us who experience that try many things until we find a way past. Some of us continue to struggle. Unfortunately, some just give up and quit trying. Here's a specialized bit of code practice that got me by which differs from ordinary random code practice and is much more useful. This approach broke the barrier for me and helped several other local amateurs.

Why Ordinary Tapes Failed

Like most people, I purchased many code tapes. Since I own a personal computer, there's the added advantage of being able to create "code tapes" at will and try things out. Still I didn't get much advantage at first, because I still had the same problems people experience with the two dominant kinds of tapes—Canned QSOs and Random.

A "Canned QSO" tape is either one or more amateur QSOs or an old radio article. The problem with these tapes is that once you copy them once or twice, you memorize them. Still, they aren't all bad. They do give you that most critical cue—feedback. You know if you copied something correctly. Also, it is possible to start and end a copying session anywhere in the tape. This enables practice every day, even if it has to be brief. For me, daily practice, even if only ten or fifteen minutes on some days, made a big difference.

On the other hand, random tapes cannot be memorized. In spite of that, most people now learning code tell me they are of little use. While popular back in the random code test days for obvious reasons, they aren't used much today. The reason? You never know for sure if you're getting it right. Most are far too random. There's more prosigns in five minutes than you'll get in twenty code tests. Frankly, you can pass a code test without knowing the prosigns well as long as you don't lose your place, so random tapes really don't provide much help for today's code tests.

Most people I've met at "the barrier" share the following problem. I found that knowing and copying about 75% of the letters was good enough for ordinary messages like, say, a paragraph of this article. I could correct goofs, fill in blanks. But, knowing that, the makers of code tapes are sure to slip in numbers and amateur call signs at regular intervals.

Because of this, you really have to know the code cold. Otherwise, when you hit a hard letter, you lose your place and letters just fly by. You may be able to guess ordinary text, but not a call sign! I failed a code test personally because of that. So did some friends.

What's clearly needed, if you're like I was, is a random code stream that teaches you the hard letters and numbers. But, it must not be a random jumble. It must have just enough structure to keep you from memorizing the tape, yet let you know whether you're copying the tape correctly. It must also concentrate on the letters and numbers that are tougher to copy—no point in copying many "t"s and "o"s.

The Semi-Random Code Stream Structure

Fig. 1 shows the outline of the semi-random structure that worked for me. First, generate a "random" number between 1 and 99. The purpose of this is to get an unpredictable one or two digits to lead off. While it is two digits most of the time, it is one digit enough to keep you from counting on that.

After putting in a space to enable you to rest a split second, the next letter is the "target" letter for this group. You want to copy everything sent, of course, but it is most important to copy the target letter. The target letter is sent twice. Then, a number is sent and the target letter is repeated twice more immediately. The number in between repeats is in sequence and is there to keep you from dwelling on the target—you must react. The second two sends of the target is the

```
37 11111          Target Letter
74 pp2pp            /     \
12 xx3xx           /       \
49 11411    74    pp    2    pp
86 88588     /              \
24 55655 Random              Sequence
61 22722  number              number
98 99899
36 66966     55 66566
73 33033     92 33633
11 00100     30 00700
48 77277     67 77877
85 44344     5 44944
23 zz4zz     42 zz0zz
60 bb5bb     79 bb1bb
97 dd6dd     17 dd2dd
35 ww7ww     54 ww3ww
72 vv8vv     91 vv4vv
10 qq9qq     29 qq5qq
47 ??0??     66 ??6??
84 rr1rr     4 rr7rr
22 ee2ee     41 ee8ee
59 qq3qq     78 qq9qq
96 11411     16 11011
34 pp5pp     53 pp1pp
71 xx6xx     90 xx2xx
9 11711      28 11311
46 88888     65 88488
83 55955     3 55555
21 22022     40 22622
58 99199     77 99799
95 66266     15 66866
33 33333     52 33933
70 00400     89 00000
8 77577      27 77177
45 44644     64 44244
82 zz7zz     2 zz3zz
20 bb8bb     39 bb4bb
57 dd9dd     76 dd5dd
94 ww0ww     14 ww6ww
32 vv1vv     51 vv7vv
69 qq2qq     88 qq8qq
7 ??3??      26 ??9??
44 rr4rr     63 rr0rr
81 ee5ee     1 ee1ee
19 qq6qq     38 qq2qq
56 11711     75 11311
93 pp8pp     13 pp4pp
31 xx9xx     50 xx5xx
68 11011     87 11611
6 88188      25 88788
43 55255     62 55855
80 22322     0 22922
18 99499
```

Fig. 1– Output of the program in fig. 2. These 99 groups represent my hard letters and numbers. Structure of a code group is broken out in the upper right.

3117 11½ Ave. NW, Rochester, MN 55901

```
50 OPEN "rndrslt.txt" FOR OUTPUT AS #2
98 REM  To make more output, change 100 to loop
99 REM   to a larger value than 99.
100 FOR I=1 TO 99
110   PRINT#2,(I*37) MOD 99;
120   GOSUB 1000
130 NEXT I
998 CLOSE#2
999 END
1000 ON (1+(I MOD 23)) GOTO 1100,1200,1300,1400,
   1500,1600,1700,1800,1900,2000,2100,2200,2300,
   2400,2500,2600,2700,2800,2900,2930,2940,2950,2960

1100 A$="qq"
1105 GOTO 3000
1200 A$="11"
1205 GOTO 3000
1300 A$="pp"
1305 GOTO 3000
1400 A$="xx"
1405 GOTO 3000
1500 A$="11"
1505 GOTO 3000
1600 A$="88"
1605 GOTO 3000
1700 A$="55"
1705 GOTO 3000
1800 A$="22"
1805 GOTO 3000
1900 A$="99"
1905 GOTO 3000
2000 A$="66"
2005 GOTO 3000
2100 A$="33"
2105 GOTO 3000
2200 A$="00"
2205 GOTO 3000
2300 A$="77"
2305 GOTO 3000

2400 A$="44"
2405 GOTO 3000
2500 A$="zz"
2505 GOTO 3000
2600 A$="bb"
2605 GOTO 3000
2700 A$="dd"
2705 GOTO 3000
2800 A$="ww"
2805 GOTO 3000
2900 A$="vv"
2905 GOTO 3000
2930 A$="qq"
2935 GOTO 3000
2940 A$="??"
2945 GOTO 3000
2950 A$="rr"
2955 GOTO 3000
2960 A$="ee"
2965 GOTO 3000
3000 PRINT#2,A$;
   CHR$(48+(I MOD 10));A$
4000 RETURN
```

Fig. 2– Listing of the IBM PC BASIC program which produces the output for fig. 1. It is easy to modify this program to change the letters being tested. For instance, to delete "w" and add "j", change 2800 to: A$ = "jj"

check. You know whetner you're getting it right or not.

The program in fig. 2 chose the 23 letters, punctuation and numbers I needed the most work on. Choosing 23 (relative prime to 99 and 10) creates a large, non-repeating stream of such that each target, when repeated, will have a new sequence number and prefix. The output in fig. 1 comes from fig. 2. The program in fig. 2 will create as many as 22,700 unique lines of semi-random code. You could also just enter fig. 1, if you don't write programs, with any word processor or editor that can somehow create an ASCII file.

Getting the "Tape" Played

Once you devise the data, there are any number of computer programs available which will take an ASCII file and beep the contents as morse code at any speed. The best ones enable you to vary the speed. Many code beeping programs can send the individual letters faster than 13 WPM and lengthen the spacing to get 13 overall. This is good for teaching recognition and also mimics what I hear over the air better, too. However, the test tapes don't compress the letters much.

They seem to be sent at either 13 WPM or perhaps 15 with longer spaces to get 13. If you are speeding up the letters and lengthening the spaces between, I recommend you stop doing that for the last week before the test so you don't get thrown by the slower letter speed and the reduced spacing.

Summary

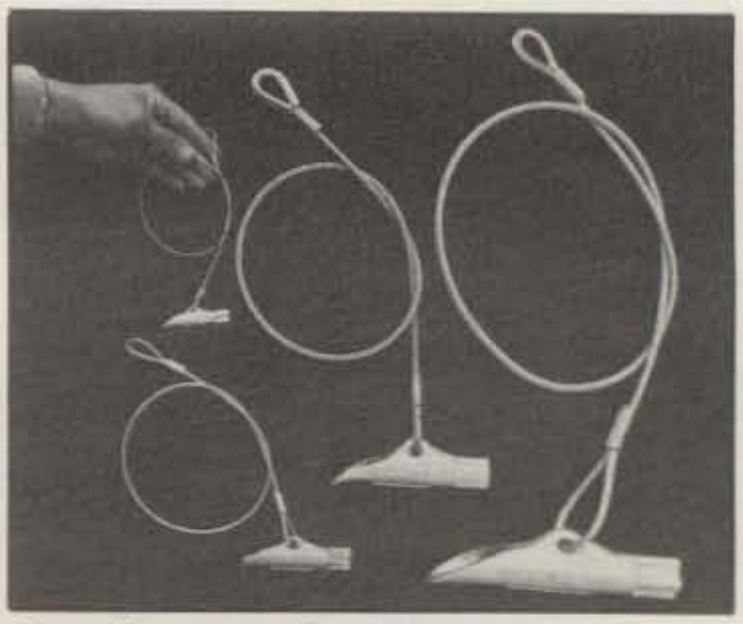
Well, that's all there is to it. The traditional techniques had gotten me close, but a week or two on this got me through the barrier for sure. I can't copy eighteen now, but I can still get fifteen. See you on HF! CQ

Please send all reader inquiries directly.

CQ Showcase

Electronic Design Software

Spefco Software is now marketing its *TAME* program to the amateur community. Written for IBM/compatible computers, *TAME* analyzes, optimizes and synthesizes RF networks up through microwave applications. Analysis and optimization routines for RLC elements, transmission lines, controlled sources, gyrators, and directional couplers among others are included. Graphics output includes a choice of magnitude and phase plots of any S-parameter, as well as Smith Chart plots. A full screen editor is integrated into the program. In the synthesis mode, you can design lumped, distributed or even mixed lumped-distributed matching networks between complex sources and loads. The terminations may be described by tables of S, Y, or Z parameters or modeled by circuit elements. Competitive programs performing similar functions often cost in excess of $1000. *TAME* is priced at $55 ppd in the US. For more information, contact Spefco Software, 18 Bennett Lane, Stony Brook, NY 11790, or circle number 104 on the reader service card.



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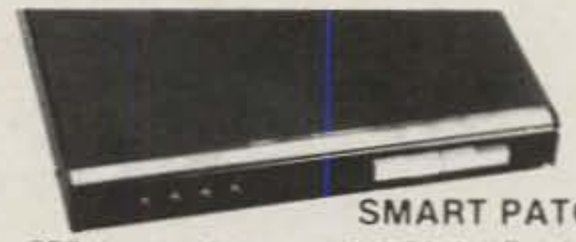

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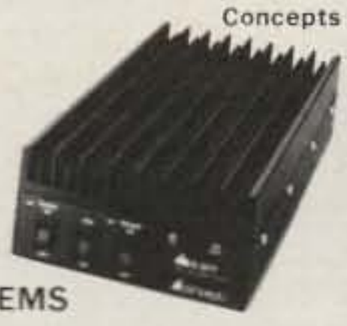

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Necessity? No, just a desire for an easier way is all it takes for invention. N1II shows you how to overcome easily one of those daily inconveniences.

Armchair Copy From the Living Room TV

BY PAUL M. DANZER*, N1II

TR8ZZ is due to show up on 14,205 at 8 p.m. local time. "The Brave and the Sexy," starring Lolita Leggy, is scheduled for the same time on TV. Lolita will be there, but the TR8 could be a little late or not at all. This is a standard problem we all face. After missing the first 15 minutes of a movie or news show, it looks like some quick way of checking the amateur frequency would be nice, especially if it means you don't have to move out of your easy chair.

The gadget in fig. 1 does just that. It is a standard *TV modulator* sold to interface a computer with a TV set. The modulator is actually a very low power TV transmitter, with a selector switch to allow the use of an unused channel (usually either channel 3 or channel 4). As you can see it has four connections, of which we only use three. The antenna output connection is usually an RCA phono jack or F connector, and is used to connect the modulator to the TV. I suggest, as shown in the figure, that a coaxial splitter be used so that the modulator does not place a load on the line any more than the addition of a single second TV.

A headphone plug to match your rig is used with a short length of cable to connect the receive audio to the audio input jack on the modulator. Finally, power is connected using either a small power supply or batteries which match the voltage needed by the modulator.

Wiring the modulator to your TV system is not difficult nor tricky. But do a little thinking, or even make a sketch of your setup before you connect anything. As I mentioned, the modulator is a low-powered TV transmitter. If you connect it to an antenna, you will become a low-powered broadcasting station retransmitting signals originating in the amateur service. The FCC takes a dim view of this. It could be a real quick way to lose your amateur license.

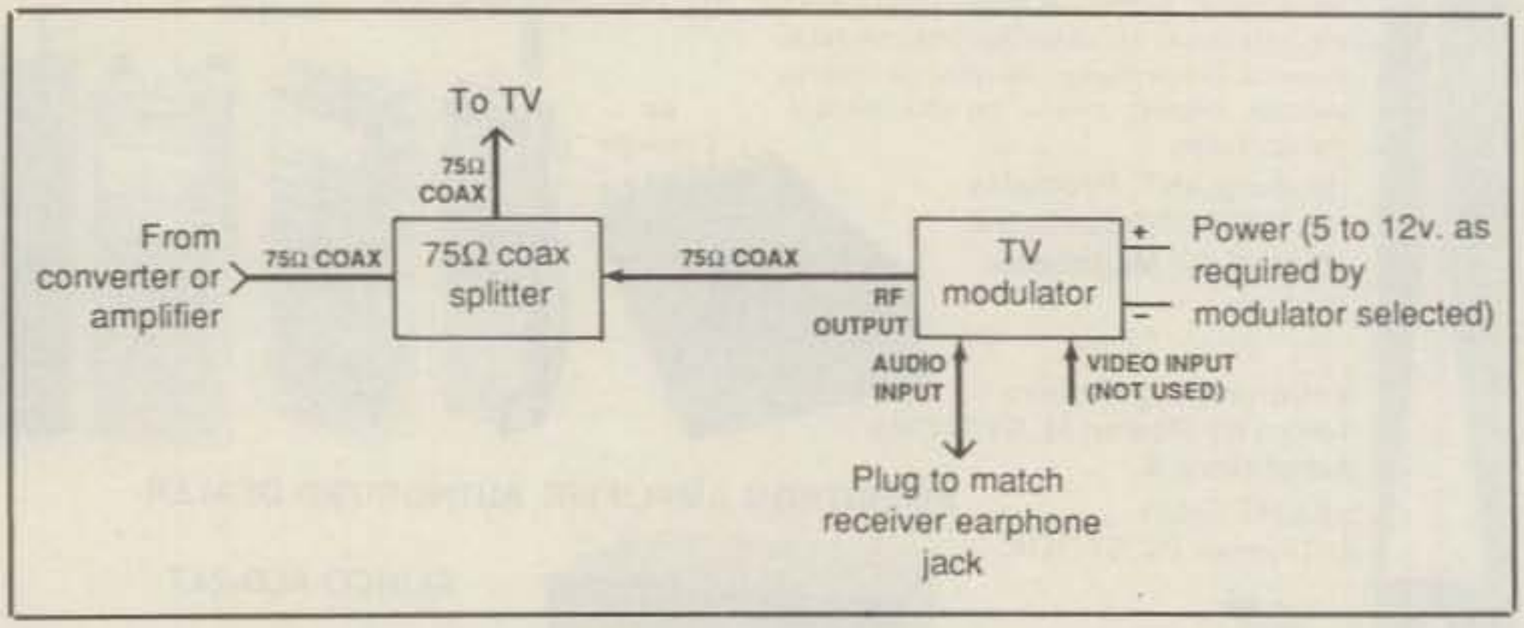

Fig. 1– Block diagram of TV modulator system for remotely monitoring your amateur band receiver.

Use only high-quality 75 ohm coaxial cable for the connection. By high-quality, I mean coaxial cable that is 100% shielded. Connection should be made between your cable-TV converter box and your TV. Most cable companies use all the VHF channels. If you connect before the converter box, you will generate interference to the channel for which your modulator is set. Also, the converter will filter out that channel when it is tuned to another one.

If you are not hooked up to a cable system and are receiving off the air, you should make the connection between the distribution amplifier and the TV. The distribution amplifier will block the signal from flowing back into the antenna. If you don't have such an amplifier, you can purchase one from Radio Shack for around $10.

Several modulators are readily available. Radio Shack now offers a unit in a neat case, with power supply, for about $27 (Radio Shack number 15-1273). An older Radio Shack unit which is still available in some areas is Radio Shack number 277-221. Cost is about $10, and you have to add a power source. The least expensive way to go is the use of a modulator from an inexpensive computer. I picked up a unit designed for Commodore VIC-20 and 64 units for $5. This unit has a single connector for all inputs with pin 1 for plus 5 volts, pin 2 audio ground and power negative, and audio input on pin 3.

The first time you use the gadget, throw the switch on the modulator to the unused channel. Set the volume control on your receiver to a moderate level and check the TV to make sure it is not so high as to cause distortion by overdriving the modulator.

Now sit down and enjoy your TV program. Whenever you want to see if TR8ZZ has shown up, just flip the TV channel, take a listen, and return to your TV program. Remote controls are very nice. Now if I could just find one to bring me a little snack from the refrigerator. CQ

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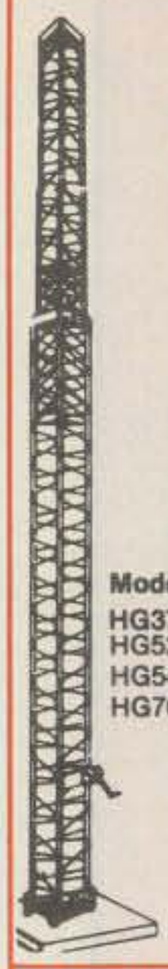

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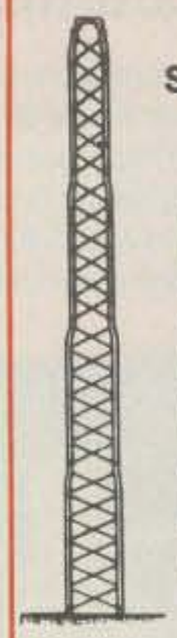

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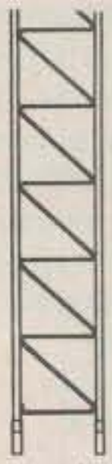

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90'	1069	1999	2249
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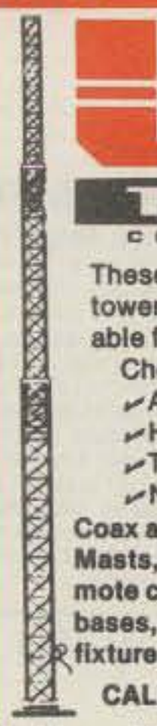

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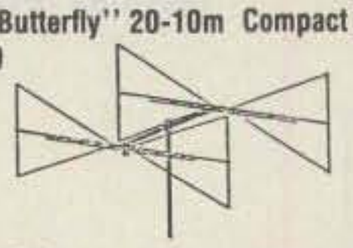

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CIRCLE 168 ON READER SERVICE CARD

CQ REVIEWS:

MFJ Gray Line DX Advantage

BY PETER O'DELL*, WB2D

One of *CQ* Editor Al Dorhoffer's dreams has been to own a GeoChron World Clock™. If you've ever seen one hanging in a bank lobby or brokerage house, you may share that fantasy. It is an exquisite piece of mechanical technology that gives you the time anywhere in the world at a glance. But it does it in a manner that could make the average DXer's eyes pop.

MFJ is now selling a program that may satisfy these champagne tastes on a beer budget. When I first saw the computer disk from Tridos Software with the label *Terminator* on it, I figured that it was just a stupid game program based on the movie. Then I realized that the title refers to the apparent line across the earth separating night from day as seen from space. MFJ has now acquired rights to sell this program to the amateur community. *Regardless of which title is on the disk that you purchase, the program is identical. I'll use* Terminator *in the balance of the review to refer to both sources of the program simply because the title is a little less cumbersome.*

Within 10 minutes, I had the program loaded into my MS-DOS compatible computer in the office. It was a case of love at first sight. For the next several weeks, I often found myself mesmerized before the screen. Still, I use it almost daily in the office and the shack. If you are a DXer, even a casual one, you are going to want to know about this program.

There is something almost mystical about watching the "footprint" of the sun move across this little planet of ours. It's like working DX—you realize that the term "foreigner" doesn't mean much these days. Technology has shattered that illusion. This was driven home to me after watching the lift off of STS-9 with W5LFL on board. I was standing with a group of amateurs at the press site marveling at the adventure that was just beginning. NASA announced over the PA system that the Columbia was over England. Phil Karn, KA9Q, pointed skyward at the vapor trail *that hadn't yet dissipated.* That's how small our little world has become. Watching the sun's footprint move across the *Terminator* screen brought back that sense of perspective.

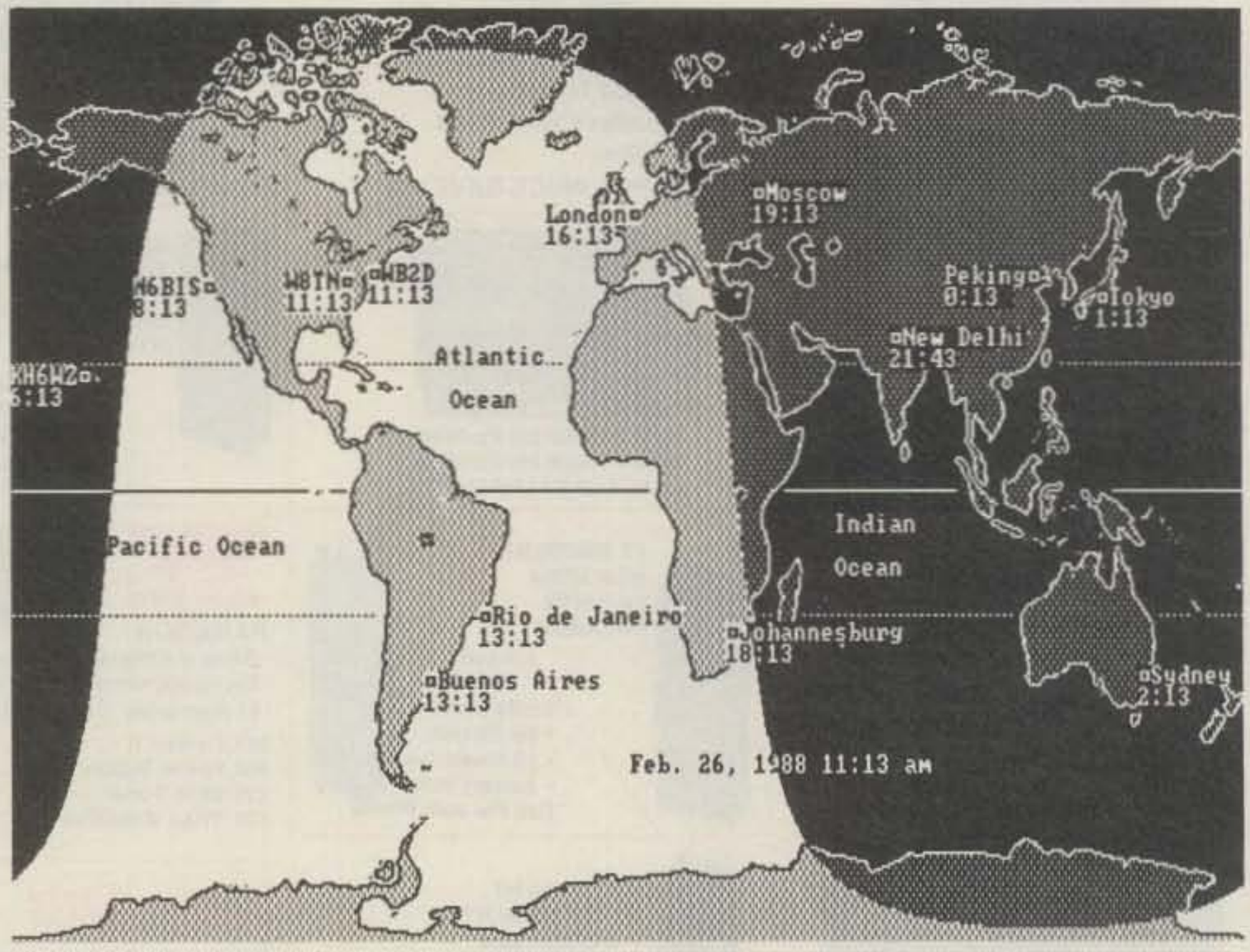

Fig. 1– Print out of the Terminator *screen after it was customized by the author. The print out was generated using* Pizzaz *and an HP Laser printer.*

It's mid afternoon here on Long Island as I write this. If I stop and think about it, I can figure out that it is somewhere around dusk in western Europe. It must be early morning in Japan. By pressing one "hot key" on my computer, *Terminator* **shows** me at a glance just what time it is all over the world. Instantly, I know if it is dusk, dawn or midnight. And at a glance, I can tell how long it has been daylight or night or whatever.

In addition to being useful for spotting potential gray line DX paths, *Terminator* gives you insights into who is likely to be on the air—all at a glance. If you are interested in DXing and don't know the significance of this, put Bob Locher's *The Complete DX'er* at the top of your required reading list—it is available from the *CQ* Book Shop for $10.95 plus $2 shipping. Put simply, if you have a PC in the shack, you will find *Terminator* to be a very useful tool.

Take a look at fig. 1. Some of the labels are cities, but some are call signs! Using a simple text editor, you can customize the *Terminator* parameters file to display up to 24 different locations and times. You can choose a 12-hour or 24-hour format, and you can base it on any time

*Associate Editor, CQ
CompuServe 76440,271

zone. The screen shows the program set for 24-hour format, but based on the Eastern Time Zone instead of GMT. You can set it up anyway you like. It even changes to Day Light Savings Time when appropriate. And the foot print of the sun takes atmospheric refractions and other factors into account. It's all very accurate.

Other maps having time zone or longitudinal information are included for those equipped with EGA systems. The apparent position of the sun, indicated by the marking near the center of South America can be toggled on and off. This is true of the location labels and time. All in all, *Terminator* is extremely versatile.

You can also run *Terminator* in a high speed mode that shows up to two weeks of the changing footprint in just a couple of minutes. *Terminator* can be run as a stand alone program or it can be loaded via the autoexec.bat to be a TSR program. You have the option of changing the "hot key" that brings it up by making the appropriate changes in the parameters file with your text editor. The manual explains how to do this.

Terminator is published by Tridos Software, 4004 SW Barbur Boulevard, Portland, OR 97201, phone 503-228-8223. It is in the $40 price class, and it is not copy protected. The *Gray Line DX Advantage* is sold by MFJ, PO Box 494, Mississippi State, MS 39762. It is in the $30 price class, and it is not copy protected. CQ

Bill's Basics

a monthly feature by
BILL WELSH, W6DDB

"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Equipment and Accessories—Part II, Conclusion

The first part of this article was printed in last month's issue. It covered transceivers, plus a brief introduction to accessories.

Accessories

Antennas. You could have poor transmitting and receiving equipment, but still experience relatively good communication results using a good antenna. On the other hand, you can have an excellent transceiver, but experience poor communication results due to using an unsuitable antenna. If you go to the expense and trouble of setting up an excellent transceiver in your shack, it makes sense to add a good antenna system to enhance your station's usefulness. Using an excellent transceiver with a poor antenna is about the same as riding a bicycle with the tires almost flat.

The dipole is the first antenna installed by most new amateurs. It is easy to construct and erect. It performs well if it is cut to the correct length and mounted at least one-half wavelength above electrical ground. If a dipole is lying on electrical ground, it radiates signals straight up, and any signal refracted by the ionosphere returns straight down; this results in a minimum communication range. If a dipole is erected one-half wavelength above electrical ground, its signal radiation lobe is about 30 degrees, which can provide reasonably good communication range, since the signal refracted by the ionosphere returns to earth a long distance from the transmitting antenna. If a dipole is installed one full wavelength above electrical ground, it becomes a good antenna for extremely long-distance (DX) contacts. The previous 30 degree lobe moves up to about 50 degrees, and a new lobe develops at about 15 degrees. This new low-angle lobe provides improved DX communication capability. Height is important to optimum performance of all antennas, not just dipoles. Another consideration that applies to all antennas is that antennas made with large-diameter conductors (wire or tubing) are useful over more of the band than antennas that are made with small diameter conductors.

Various types of wire antennas are manufactured by companies which advertise their products in amateur radio magazines. Look through these magazines to get an idea of what each company offers. If you become interested in a specific model, write to the manufacturer and request a copy of their associated specification sheet. There is no standard antenna system that suits everyone. Every amateur needs an antenna system that is custom designed to meet her/his needs.

2814 Empire Ave., Burbank, CA 91504

This is 23-year-old Mike Baker, KA6SAR, of Santa Ana, California. He has been operating the Novice bands since he received a Novice license in 1981. Mike thanks Dale Hoppe, K6UA, for getting him started in contesting and DXing. Mike has 96 countries confirmed on 15 meters and 38 countries confirmed on 40 meters, all of which were worked using code. In addition, he has 75 countries confirmed on 10 meter SSB voice. He has the Worked All States (WAS), Worked All Continents (WAC), and several other operating awards. His station includes a Kenwood TS-520 transceiver, a 6-element KLM triband Yagi-Uda (for 10, 15, and 20 meters), a 5-element 10 meter Yagi-Uda, Delta loops on 40 and 80 meters, and slopers on 40 and 80 meters.

The most popular wire antennas are the dipole (including drooping, folded, sloper, bent, and trap versions), random wire (less than 2.5 wavelengths at the lowest frequency used), long wire, windom, and Zepp. There are many variations of these wire antennas.

An antenna tuner and SWR (standing wave ratio) bridge are needed to make proper use of random- and long-wire antennas. These tuners use variable capacitance and inductance to make wire antennas act like they are correct (resonant) lengths for various frequencies. Tuners make antennas electrically correct in length, regardless of their actual physical lengths.

The random/long wire offers all-band operation with a single antenna that is not critical as to its length. No coaxial cable (or any other) feedline is required. The wire simply needs to be at least one-quarter wave long at the lowest frequency to be used. In other words, it should be at least 63 feet long for 80 meter Novice band use, or 33 feet long for 40 meter Novice band use. However, the lengths of the vertical (uplink) and horizontal portions are additive, making it possible to erect a useful low-frequency antenna in relatively small areas. It is advisable to avoid any reversal in the direction a random/long wire is erected. In other words, if it runs from a low to a high point, avoid any subsequent run to a low point. If it runs east to west, avoid a subsequent west-to-east reversal. Also, avoid kinks and other abnormalities along the length of wire. Do not loop the wire through the eye of an insulator; let it run through the eye a single time. If the wire must be secured to an insulator, tie it in position with nonconductive twine (string) or tape. Simply go to the furthest useful attachment point, cut off any excess wire, secure the end of the wire to an insulator (clean wire down and solder it to prevent motion, which can result in noise during windy conditions), and use a nonconductive line to secure the far end of the antenna to the attach point through an insulator.

The toughest installation problem you must overcome is preventing the long/random-wire antenna from tending to pull the antenna tuner out of the shack. It might be possible to secure the tuner in place where the pull of the antenna causes no problem, but this has never happened in any installation I have seen. Most of us secure the long/random wire at the point where it exits the building. This is easily done by soldering an obstruction to the wire at the point where it enters the feedthrough insulator to exit the building.

The Yagi-Uda (Yagi) is the most popular directional (beam) antenna for DX operation. It is relatively easy to assemble and install. The Yagi enables you to concentrate transmission and reception in any desired direction. A properly installed Yagi seldom requires maintenance.

Serious DX operators often prefer the quad beam antenna. A 2-element quad provides about the same gain as a 3-ele-

ment Yagi. The quad is an excellent antenna, but it does require occasional repair of damage caused by high-velocity winds.

The Delta Loop beam antenna is a rugged version of the quad. Like the quad, the Delta Loop provides excellent DX opportunities at a lower height than is required for a Yagi to do the same job.

The vertical antenna requires the least amount of horizontal space. It requires a good RF ground to provide optimum performance. It is a simple antenna to assemble and erect. The vertical antenna is highly susceptible to man-made noise, such as automobile ignition interference. It is not the optimum choice in many locations.

The ground plane is a good choice for many stations. It provides good DX capability, and it functions relatively immune to the station's RF ground. Do not ground the radials (wires) up at the antenna; they must be off ground to function. The coax shield is not at RF ground at the antenna end, even though it is connected to the transceiver chassis (and RF ground, supposedly) in the shack.

The *ARRL Handbook* provides excellent coverage of antennas. In addition, there is a variety of specialized antenna publications. It is worthwhile to acquire a good understanding of antennas and radio-wave propagation.

Headphones and Loudspeakers

If you decide to use a loudspeaker external to your transceiver, the loudspeakers designed for use in mobile installations are satisfactory. A narrow-frequency reproduction range is what is needed.

Realize that even a rare DX station is just noise to nonamateurs in your place of residence. Do not subject your family to the squeaks and squawks that we find to be thrilling. Use headphones if you operate in close proximity to other people. Headphone use also minimizes distraction to the amateur, and enables her/him to hear weak signals better than they would be heard using a loudspeaker. One has to arrive at a compromise between sensitivity and weight when selecting a pair of headphones. The extremely sensitive headphones are heavy, and they can prove to be uncomfortable when they are worn for a long time. It is best to use limited frequency range headphones, instead of high-fidelity headphones.

Lighting

Subdued lighting suffices for most amateur radio operation. Avoid the glare and heat that are associated with high-wattage lighting. Simple low-wattage incandescent bulbs are preferable to fluorescent lights. Use light fixtures that can be positioned to shield you from lamp glare.

Clock

A 4-digit clock is a worthwhile addition to your station. Such clocks are built into many of the new transceivers. If you use a clock that is external to your rig, position it where it can be read easily without having to move your head. Many active amateurs use 24-hour 4-digit time for all operating activities, with UTC (Universal Time Coordinated) preferred over local time.

Electric Power

If you can, power your amateur radio station from a dedicated circuit; use a line that is not used to supply AC power to anything else. Multi-outlet power strips are readily available; they enable an operator to throw (set) a single switch (or circuit breaker) to apply or remove AC input power in a station. These power strips can be purchased with built-in surge protection, which could save solid-state equipment from damage due to abnormalities (spikes, etc.) coming in on the AC power line. Use an adequate-size line with conductors that can handle your total current requirement without excessive heating and unwanted voltage drop. If you have equipment that can be operated on 220 VAC, it is advisable to install an adequate 220 VAC line and to use it to power equipment that requires high-input current.

Telegraph Apparatus

Do not use a junk manual (hand) key. Such a key will be uncomfortable to use, and the resultant code is likely to be difficult to read. Get a good handkey. Top-quality handkeys are expensive if they are purchased new, but they are worth their price. The Japanese manufactured TK-11 is a good handkey at a low price. It is sold under many names by several electronic distributors. Also, surplus outfits usually have handkeys for sale, and many of these keys are excellent.

Some transceivers have an electronic keyer built in, and they just require an external paddle (key) to be used. In most cases, an external paddle and electronic keyer combination is required. Some companies manufacture electronic keyers with the paddle built into them. The electronic keyer and paddle are easy to master, but it is advisable to develop sending rhythm (spacing) with a handkey before changing to an electronic keyer. I know people who did not develop sending rhythm before going to a keyer. Almost without exception, such people send garbage that consists of a bewildering sequence of perfect dits and dahs. Develop good sending capability to 10–15 wpm with a handkey before switching to a keyer. The best electronic keyers and paddles are expensive, but they are worth the cost. I like semi-automatic keys (bugs). I use them for most of my code operation, but I do not recommend them to new amateurs. Keyers are easier to master, and many of them include memory for auto-

matic transmission of repetitive calls, such as contest CQ calls.

Older Gear

Now that I have given it my best effort to convince you to hock your wife and kids to buy sophisticated new gear, let's come back to the real world. If your financial situation is like mine, it may be a long time before you can afford to purchase new gear. That does not mean you cannot enjoy operating in the meantime; simply get lower priced older equipment and get on the air, but please do not buy junk.

The November 1977 through March 1978 issues of *CQ* contain a 5-part article "Amateur Radio Station Installation Tips." That article provides a lot of useful information about older equipment. Any reader who wants a copy of it is welcome to one at no charge. Simply send a large (9″ × 12″ minimum) self-addressed envelope to me (to my California address) with triple first-class postage attached to it. Please remember to include a note stating what you want sent. We make many offers involving SASEs, and we frequently do not know what the person wants us to send.

An advantage related to starting with older (used) equipment is that you get a low-cost opportunity to try the various bands and modes. There is plenty of old gear available that can satisfactorily meet the initial communication needs of new amateurs. There is no way to know what type of operation will appeal to you. You may find 1.25 meters to your liking, or 23 centimeters (1270–1295 MHz) may entrance you with facsimile or TV operation. You may find that you prefer radioteletype, packet radio, radiotelegraph (code), or radiotelephone (voice) operation on one of the HF (3–30 MHz) bands. I hope you will try all the bands and all the modes.

Related Previous Novice and Basics Columns

Several previous columns have been devoted to equipment and accessories. Such articles are referenced herein by month and year of the *CQ* issue in which they appeared. If you have access to prior issues of *CQ*, you should have no difficulty locating the referenced articles; simply look in the table of contents (near the front of each issue) for the Novice/Basics column beginning page. Most past issues of *CQ* can be purchased for $2.50 each from *CQ*, 76 North Broadway, Hicksville, NY 11801. Also, I have sets of printed aids which I distribute to students in licensing courses I conduct. Your SASE and request will bring a data sheet regarding the scope and availability of these printed aids.

"Amateur Radio Station Installation Tips" are covered in the November 1977 through March 1978 issues. That material is supplemented by the September 1978 article "Amateur Radio Station Grounding." "Station Installation Information' is summarized in the December 1982 *CQ*. The February through September 1987 columns contain additional data about equipment and accessories in the "Getting Started" series. Electrical power considerations are covered in the February 1985 issue, and electric shock is detailed in the April 1983 *CQ*. The January 1982 Novice column is about converting CB gear to amateur radio equipment. The November 1987 issue covers military equipment designations in detail to enable readers to identify military surplus gear for possible use in amateur radio stations. Coaxial cable data is listed in the August 1983 issue to help amateurs select military transmission lines for use in their stations. The May through July 1983 coverge of dipole antennas has proven to be one of the most useful articles I have had printed in *CQ*. The April and May 1988 Basics columns provide a useful introduction to random- and long-wire antennas. The April 1982 column provides an introduction to microphones and headsets. The preceding information shows that many columns have been directed towards helping newcomers become familiar with amateur radio station equipment and accessories.

Choose your equipment and accessories with care, but remember to get on the air with whatever station you assemble. I hope you will be an operator, rather than a license holder who does little (or no) operating. Amateur radio has far too many inactive operators. These are exciting times to be an amateur. *Operate!*

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Awards

a monthly feature by
DOROTHY JOHNSON, WB9RCY

NEWS OF CERTIFICATE AND AWARD COLLECTING

The Story of the Month for July is:

Dennis F. Miller, WB5KEA
USA-CA All Counties #344, All SSB, 10-6-81

"I was born in Elgin, North Dakota (Grant County) on 8 November 1948. I started school in Mott, N.D. We later moved to Tonkawa, Oklahoma, where I graduated from high school. I lived a farm life until I enlisted in the U.S. Air Force on 19 December 1966. My exposure to electronics and radio was very limited until I was trained as a weather equipment repairman at Chanute Air Force Base, Illinois.

"My first assignment from Chanute was overseas to Korat Air Base, Thailand in November 1967. While there I installed weather radar, navigational aids, and ground radio throughout Thailand. While on a ground radio job on U-tapao Air Base, Thailand, I helped a team member install a dipole antenna and KWM-2 radio. He was a ham and when he started talking to Russia, Japan, and the U.S., I was impressed. The ham radio seed had been planted. I then learned of the MARS station and talked to my parents back in Oklahoma from Thailand, and this added to my curiosity. I came back to McConnell AFB, Kansas, near Wichita, in November 1968, and from there I went back to Illinois for advanced electronic training in October 1971.

"A classmate discovered my interest in radio and introduced me to mobile amateur operating with his 'bug catcher' antenna. My radio 'seed' was nurtured as he started teaching me code. I was then (June 1972) stationed at Keesler AFB, Mississippi near Biloxi.

"I finished teaching myself code and radio theory and was licensed as WN5KEA. I upgraded to WB5KEA and operated with General class privileges for two weeks before going to Wiesbaden, Germany for my next assignment in May 1974.

"Germany was a beautiful assignment, and in September of 1974 I came back to Miami, Florida to marry Donna, my future logger and county-line sitter/navigator. We traveled extensively in Europe, and I was active in MARS, the German Radio Club of Wiesbaden, and the American Radio Club. I operated on DXpeditions as DA1DM/LX and HB0XAA.

333 South Lincoln Ave., Mundelein, IL 60060

Dennis, WB5KEA, at the Ramey Solar Observatory, his work QTH in Puerto Rico. Note dipole on 160 foot cliff overlooking the ocean.

"I worked WA2WCW, Howie, on the ISSB net as DA1DM on November 2, 1976, and good fortune allowed me to give Howie his last county on March 29, 1978 (see November 1979 *CQ*).

"My next assignment took us to Minot AFB, North Dakota in May 1977. While trying out my mobile rig in McHenry County, N.D., I ran across the CH net. K7CLO patiently explained the operation and turned me loose. I felt like I was on another DXpedition, and with the attitude I detected I knew this was a special group. My travel around North Dakota for the next two years allowed me a rare opportunity to explore my home state. I was able to put out all the North Dakota counties but two. It took an ill-timed flood to keep me from running those two.

"My next tour of duty was at Ramey Solar Observatory, Puerto Rico, where I reported for duty in June 1979. In this assignment I was able to mix my vocation with my avocation of radio. With the sunspot activity peaking, I was able to study solar phenomena and its effect on amateur radio. In fact, while experiencing short-wave fading, the constant activity at known locations of county hunters was very helpful. While I was at Ramey, WA3ZMY made a special trip to Richmond County, Virginia for my last one on 1 August 1981. To my pleasant surprise he later sent me a tape of the contact.

"The Air Force has been responsible for my traveling, or has allowed me to travel, extensively. I have been to 48 states and from Australia to Turkey. In this travel I have had the immense pleasure of giving out over 500 countries in 25 states, including three to complete All Counties, and personally meeting many county hunters.

"County hunting is also ideal for anyone who wants to work for a major award from more than one QTH. This is a very important point for anyone who moves frequently.

"Our Air Force career isn't complete yet, and Donna and I are busy raising our four-year-old son, Darren. Collecting sea shells, scuba diving, snorkling, and tending a tropical fish aquarium currently occupy our time. However, I will be putting out USA-CA All Counties #344 and many more counties as time in the U.S.A. permits.

"I want to express my deepest appreciation to all the county hunters for all the great fun I've had so far. This is especially true for the mobiles and the operators who volunteer as net control. The QSL bureau deserves special praise for their help in confirming counties at a reasonable cost. Of course, my wife deserves the highest commendation for her patience waiting on county lines in −60 degree weather in North Dakota to +110 in New Mexico. Thanks again, and I look forward to meeting you on the CHN.

—73, Dennis"

USA-CA Special Honor Roll

Paul H. Rossiter, N6EBU
All Counties #564, All SSB, 3-7-88

Alma L. Aylesworth, WA5INV
All Counties #565, All SSB, 3-8-88

Awards Issued

Paul Rossiter, N6EBU, completed it all in one giant leap by claiming USA-CA All Counties #564, USA-CA 3000 #594, USA-CA 2500 #668, USA-CA 2000 #737, USA-CA 1500 #825, USA-CA 1000 #1010, and USA-CA 500 #2237, All SSB, dated 3-7-88.

Alma Aylesworth, WA5INV, also did it all in one step by claiming USA-CA All Counties #565, USA-CA 3000 #595, USA-CA 2500 #669, USA-CA 2000 #738, USA-CA 1500 #826, USA-CA 1000 #1011, and USA-CA 500 #2238, All SSB, dated 3-8-88.

Owen Chelf, KY9Y, took the penultimate step toward his goal of all counties by filing for USA-CA 3000 #596, Mixed, dated 3-24-88.

Theodore E. Palmer, WA6MUK, added another endorsement to his good record by qualifying for USA-CA 2500 #670, Mixed, dated 3-12-88.

Clarence A. Graham, Jr., W0SZC, filed

USA-CA Honor Roll

3000			**1000**		
N6EBU		594	N6EBU		1010
WA5INV		595	WA5INV		1011
KY9Y		596	KA0NVT		1012
			WA2DWP		1013
2500					
N6EBU		668	**500**		
WA5INV		669	N6EBU		2237
WA6MUK		670	WA5INV		2238
			KB7M		2239
2000			K4KAH		2240
N6EBU		737	NC1N		2241
WA5INV		738	VE6VW		2242
W0SZC		739	N7BZD		2243
N8FEB		740	IS0QDV		2244
			KA5VWD		2245
1500			W5RJH		2246
N6EBU		825			
WA5INV		826			
N8FEB		827			

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.

his good application and received USA-CA 2000 #739, All SSB, dated 3-23-88.

Jack D. Cale, N8FEB, received USA-CA 2000 #740, and USA-CA 1500 #827, All SSB, dated 3-24-88.

Clyde E. Kane, KA0NVT, qualified for USA-CA 1000 #1012, Mixed, dated 3-9-88.

Michael C. Saccento, WA2DWP, filed his good application for USA-CA 1000 #1013, Mixed, dated 3-9-88.

USA-CA 500 certificates went to:

Paul H. Rosseter, N6EBU, USA-CA 500 #2237, All SSB, dated 3-7-88.

Alma L. Aylesworth, WA5INV, USA-CA 500 #2238, All SSB, dated 3-8-88.

Jerry D. Tastad, KB7M, USA-CA 500 #2239, Mixed, dated 3-16-88.

Walter E. "Pete" Hattendorf, K4KAH, USA-CA 500 #2240, All 10M SSB, dated 3-18-88.

Charles H. Ross, Jr., NC1N, USA-CA 500 #2241, Mixed, dated 3-19-88.

Norm Waltho, VE6VW, USA-CA 500 #2242, Mixed, dated 3-23-88.

David D. Waits, N7BZD, USA-CA 500 #2243, Mixed, dated 3-23-88.

Mario Pillai, IS0QDV, USA-CA 500 #2244, Mixed, dated 3-24-88.

Pat Sligh, KA5VWD, USA-CA 500 #2245, Mixed, dated 3-29-88.

Al Sligh, W5RJH, USA-CA 500 #2246, Mixed, dated 3-29-88.

Awards Available

Master County Hunter Award. The Master County Hunter Award (sometimes called "Bingo") is offered by the Mobile QSL Bureau and may be worked in conjunction with USA-CA, MARAC Second Time Around, or the Bureau Third Time Around Awards.

The object is to work stations, fixed, portable, mobile, or any combination thereof, with the station having the **first** letter of the county name as a part of the suffix of his call. Example: **D**ane, Wisconsin could be worked with K9**D**CJ, W5V**D**W, W9Z**D**, etc.

To make it a little easier, the following "Wild Cards" may be used:

1. Holders of USA-CA numbers (the *CQ* Award) or USA Counties (issued by MARAC) may be used regardless of county name provided the contact is made after date of issuance of number.

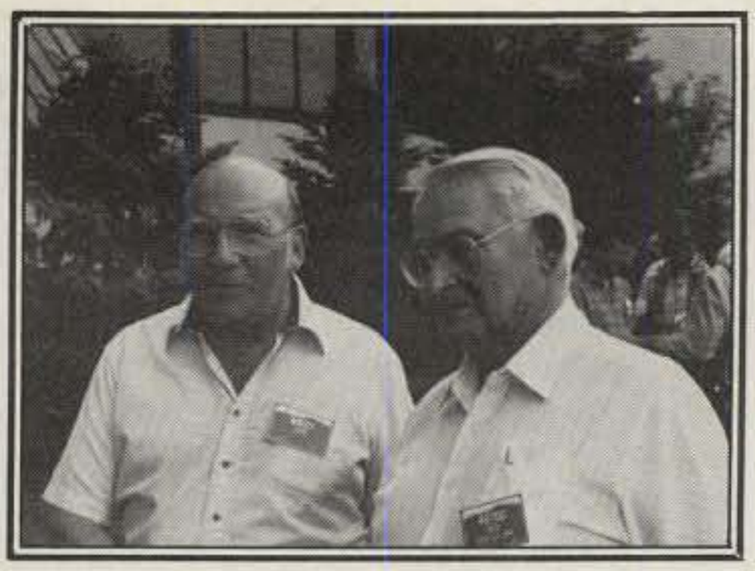
2. Dual letter calls such as W6**CC**M, WB4**FF**V, W2**C**U**C**, K**C**5**C**V, etc., may be used one letter above or below. For W6**CC**M, a county name beginning with a "B" or a "D" could be used in addition to the "C" and the "M"! (Note: Calls with WW and YY may be used for a V and W and Y and Z, and thus are not upgraded to wild card.)

3. Any letter may be used from calls such as AI5P, N2BL, KB7QO, etc. (two by one, one by one, or two by two calls). And, since there are no counties beginning with the letter "X," a call with an "X" in it may be used for *any* county. The call must contain an "X" to qualify for a wild card.

4. For counties with two or more words in the name, the first letter of any word may be used to coincide with the call (i.e., W, B, or R for West Baton Rouge; J or H for Jim Hogg). For Alaskan counties use either First Judicial Division or Southeastern, etc.

Record of all existing counties must be kept in a United States of America Counties Record Book (coloring book) available from the Mobile QSL Bureau. Confirmation is not required! No classes, band, or mode endorsements. The bureau will be pleased to issue you an 8" × 10" walnut plaque upon completion. Mail the record book together with your plaque fee in the amount of $15.00 plus $2.50 for postage to the Mobile QSL Bureau, P.O. Box 6436, Florence, SC 29502.

Eddie, G4KHG, enjoying the festivities at the MARAC National Convention in Denver, July 1987.



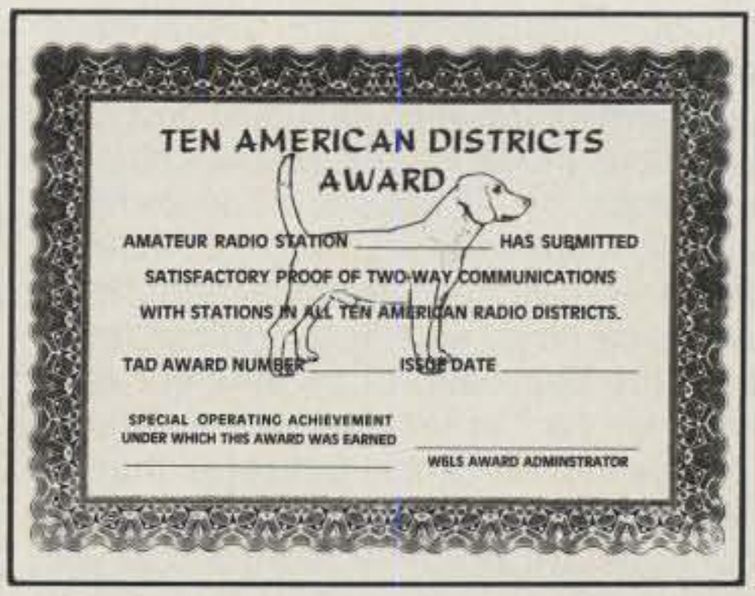
Ken Wosika, KB7QO, County Hunter and Mobiler of the Year with John Ditmer, W0IZV, at Denver convention, July 1987.

Ten American Districts Award. The Ten American Districts (TAD) award is in memory of Tadpole (TAD), a Beagle dog who considered himself to be a W6LS club member. Tad liked the sound of code, and he spent more time at W6LS than most members. Tad's person was Bill Welsh, W6DDB. Tadpole was the name of the youngest son of our 16th President, Abraham Lincoln. A tadpole is a baby frog (pollywog) with a large tail for a body. Tad Welsh had a tail that he whirled around like an airplane propeller. He was born in 1961 and died in 1974. Tad was an extremely intelligent animal with real class!

The Lockheed E.R.C. Amateur Radio Club (W6LS) is pleased to offer the TAD award to recognize operating achievements. Almost 4000 TAD awards have been issued.

Availability. The TAD award is available to all licensed amateur radio operators and amateur radio clubs.

Requirements. Contacts with all 10 American callsign areas must have been made from the same callsign area (such as W4, G2, VE3). However, all contacts



Ten American Districts Award available from the Lockheed E.R.C. Amateur Radio Club, W6LS.

do not have to be from one location in the callsign area. Hawaii (KH6, etc.) counts as the 6th district, and Alaska (KL7, etc.) counts as the 7th district.

Contacts can be to and/or from fixed, mobile, portable, or fixed-portable stations. Contacts count for the callsign area in which they are made. Cross-band and cross-mode contacts are acceptable. Contacts do not have to be after any beginning date nor before any closing date.

If your callsign has been changed, contacts with your previous callsign are still accepted as long as they were made from the same callsign area. Your present callsign will appear on the award unless you request otherwise.

Endorsements. Handprinted endorsements will be added to the award for code, one-band, OSCAR, QCWA, QRP, RTTY, SSTV, YL, 10-X, and any other special operating achievement endorsements. Separate TAD awards can be requested for each proven operating achievement.

Cost. Award application must be accompanied by payment in the form of cash, check, IRCs, or USA stamps as follows:

$1.00 for Canadian, Mexican, and USA amateurs furnishing verified list with no QSLs.

$2.00 for Canadian, Mexican, and USA amateurs requiring return of QSLs.

$2.00 for DX amateurs furnishing verified list with no QSLs.

$3.00 for DX amateurs requiring return of QSLs.

50 cents extra for each separate award requested for a specific operating achievement and mailed with another TAD award.

Validation. Following are the validation requirements.

Cards—It is preferred that QSL cards are not sent in, since they are harder to check and could be lost in the mail. If cards are sent, they must include all the information needed to verify your two-way radio contacts. If cards are received, they will be returned in the same envelope with your TAD award.

List—Verified lists are preferred instead of QSL cards. The list must show all pertinent information including other station callsign, date, time, mode, and band or frequency. If special endorsements are requested, the list data must indicate that they have been earned. The list must be validated by an elected official (other than the applicant) of an amateur radio club, or two other licensed amateurs. This validation simply indicates that another amateur has seen that the claimed contacts are properly recorded in your station log and/or verified by your received QSL cards. This list is not returned.

Registered Mail. Please do not send award requests by registered mail, since members are not normally at the club during the day and registered mail is delayed.

Address. All TAD award requests should be sent to Amateur Radio Station W6LS, 2814 Empire Avenue, Burbank, CA 91504-3297 U.S.A.

Issue Date. TAD awards are almost always issued the 19th day of each month.

Honor Roll

#1 W8RSW	#2 W2MEI	#3 KA5A	#4 W1JTD
#5 W3HQU	#6 W3ARK	#7 NG0T	#8 WB0ODS
#9 N2RT	#10 W1AQE	#11 N5QQ	#12 WA6VJP

Confirmed CW Contacts

	Jan. 88	Jan. 87		Jan. 88	Jan. 87
K3LK	3074	—	KN4Y	2790	2686
K7EQ	3071	3037	W8YL	2785	—
W0FBB	—	3071	WD9BCG	2742	2495
W3HQU	3066	(2nd time)	NF0X	2726	1930
KA4IFF	3063	3045	WB1EIL	2682	—
W7IEU	3060	3049	KD6PP	2580	2388
W6NNV	3049	2920	VE3IR	2560	2287
W2EMW	3047	2995	W3IIF	2543	—
N6QA	3046	3043	WA4KER	2540	1938
N0CKC	3037	3004	K7GJZ	2489	2355
W7GHT	3031	2980	N9DR	2473	2385
K8KIR	—	3021	K4MF	2405	1480
W2EZ	3007	2921	WA2EYA	—	2268
WA6VJP	2989	(2nd time)	W6TZD	2177	—
W4POA	2988	2925	W3XE	2023	1920
K8MW	2986	2824	VE3KZE	2011	1962
W1TEE	2940	2833	KA1CLV	1746	1617
K9WA	2910	2894	DL7CS	1737	—
OK1APV	2880	—	W9CRN	1702	716
W5VGF	2876	—	VE1WF	1675	1209
W7HZL	2870	2683	WB8IYS	1618	—
W2NCG	2867	—	W6CF	1558	1187
W9MYY	2864	2521	K2PF	1447	1230
N2CWG	—	2861	W6ISQ	1210	358
W3EYF	2855	2130	AD5F	—	1080
KA1HB	2801	—	KK0V	—	916
N0CYB	2800	2650	W0IZV	727	—
W8WVU	2791	—	KA8MSU	464	—

Table I– The January 1, 1988 annual listing of CW County Hunters, courtesy of Buster Boatman, N0CKC. Only 12 amateurs have recorded the achievement of working all USA counties on CW. Now there are two who are close to doing it a second time.

The OAA 1000 Odense Anniversary Award. On the occasion of the 1000 year jubilee of Odense, Denmark, the Radio Club of Odense, division of Experimental Danish Radioamateurs, has sponsored the OAA 1000 Award.

The award is issued for contacts with one of the club stations (OZ1000, OZ3FYN, or OZ5HCA) and with other stations with QTH in the area of the town of Odense, Denmark. The award is issued for all-mode and all-band contacts without special stickers. Only contacts between 1 January 1988 and 31 December 1988 will count for the award. The minimum acceptable report is 33 (9).

DX stations need 5 points. EU stations need 10 points. OZ stations need 15 points. Contacts with OZ1000 count for 5 points. Contacts with OZ3FYN count for 2 points. Contacts with OZ5HCA count for 2 points. Contacts with other stations located in the area of Odense count for 1 point. The special call station of the Hans Christian Andersen town OZ5HCA will only be active 10 July 1988 through 17 July 1988.

Each call only counts once on each band. OZ stations must have as a minimum one contact with either OZ1000, OZ3FYN, or OZ5HCA. The award is also available to SWLs.

Applications: Not later than 31 March 1989, send copy of log together with the fee of DKR 30.00, $5.00 U.S., or 10 IRCs to EDR Odense Division, P.O. Box 134, DK 5100 Odense C, Denmark.

Notes

Happy summer holidays!

73, Dorothy, WB9RCY

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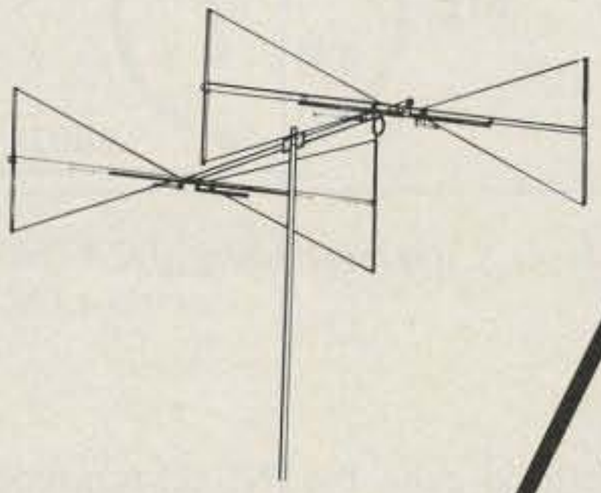

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The Packet User's Notebook

a feature by
BUCK ROGERS, K4ABT

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

Introduction To Packet, Part Three

In this installment of the "Packet Users Notebook," we move to the configurations that allow more versatile applications of the TNC. These applications include binary file and picture transfers.

I spent most of my free time this month on the air passing color packet pictures with *PACFILE*. The pictures are approximately 16 K bytes long, so the TNC got a real workout with each picture.

The high resolution color packet picture now takes less equipment and less time to transfer than a Slow Scan color picture and the packet picture is error-free. The SSTV picture is subject to streaking because of noise and other interference. Packet color picture transfer is one "novelty" of packet radio that does not wear off.

System Parameters Binary Files

By now, you have had time to get the feel of your packet system, which we started working with in the June issue of *CQ*. Let's look at a new kind of packeting this month. Pictures, as used by computers, are a form of binary information when they are stored to disk. In order to send or receive them, we must set our system parameters properly. The picture process also requires a terminal software which supports this kind of file transfer. Both stations will more than likely, be utilizing the same type, if not the identical program. At present, I know of only one terminal program which supports both binary file and color packet picture transfers. That is *PACFILE* from Kantronics and Southern Software Systems.

Because it is related to this months topics, I'm going to discuss some calls and questions, that I received last month. The calls were concerning "what, how, and why" situations with terminals and TNCs.

Q: I don't have any display on my screen when I type letters into my terminal, what is wrong?

A: It took about 2 minutes to discover the new packeteer had not set the proper **duplex** and **echo** parameters. Hence, if you have **duplex** set to full, the terminal will be looking for a character "echo" from the TNC. In this case, the TNC **echo** command should be turned "on." Likewise, if you have the terminal set to "half duplex," then set the TNC **echo** command, to "off."

Q: Lately I've been operating VHF packet and I hear something which sounds like a packet, but the sound is "high-pitched" and it will not print on my screen. Are there other forms of packet besides AX.25 at 1200 BPS?

A: Yes. What you are probably hearing are the 2400 BPS packets. 2400 BPS is legal but slightly different since it is phase shift keying "QPSK." I plan to devote a full installment of "Packet Users Notebook" to this nice addition to packet, very soon. The use of 2400 BPS QPSK is increasing in fast growing numbers. Many packet users are finding that files can be transferred faster, and QSO packets get through much easier at 2400 BPS. This results in less collisions, less retries and better throughput. It is AX.25 protocol.

Q: Can I send a binary file to a friend via packet?

A: Yes. This brings us to this months topic. Files, pictures, and stored data of all kinds can be transferred via packet. There are a few ground rules which should be applied.

If the file is an ASCII file, then the **converse** mode will suffice. However; it would be wise for both the transmitting and receiving station to use a similar terminal pro-

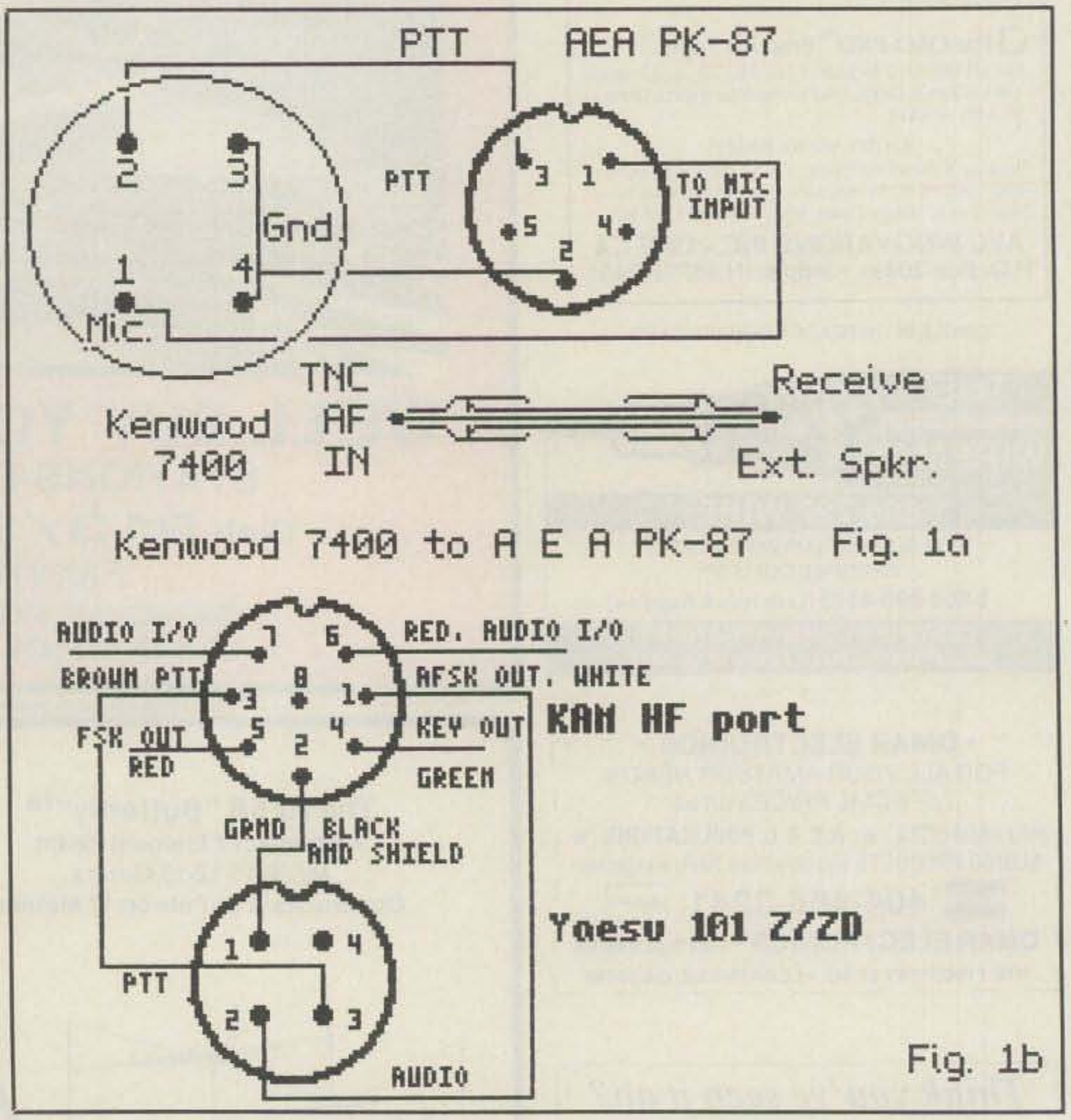


Fig. 1 – At A, the interfacing of the TNC to a VHF transceiver; at B, an example of interfacing a TNC to an HF transceiver.

506 Pheasant Ridge Drive, Warner Robins, GA 31088

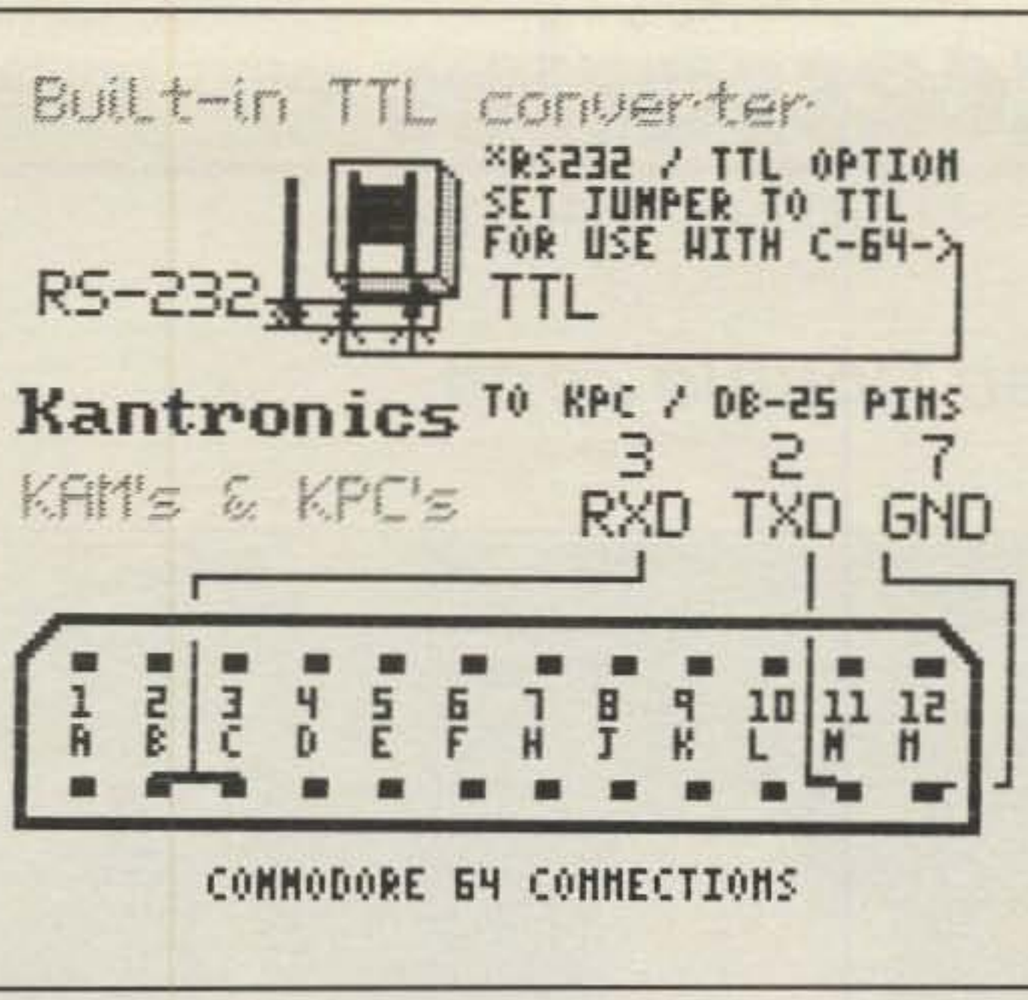


Fig. 2– When interfacing the Kantronics TNC to the Commodore C64, be sure the TTL strapping option is moved from the RS-232 position to the TTL pins.

Table 1

2 Transmit Data
3 Receive Data
4 Request To Send "RTS"
5 Clear To Send "CTS"
7 Signal Ground (In many PC compatibles this pin is also connected to pin 1).

gram, or at least have upload and download features built-in.

Last month, I mentioned the three "states" or modes of packet. First is the **command** mode, second is the **converse** mode, and the mode we are now interested in is the **transparent** mode. This is the only way to pass binary files via packet. The American Standard or I should say, "the ASCII set," contains 255 characters. Many of these characters are "control" characters and if you tried passing them through your TNC in the **converse** mode, it would "lock-up" or at best, would place the TNC into the **command** mode. This is where the term, "transparent" comes into play. The **transparent** mode of the TNC will allow the files to pass through, yet the TNC ignores any and all control codes, preventing any lock-up to the TNC.

A few terminal programs use software handshaking. This is used mostly by the smaller home computers and modems. When using software handshaking, a byte is sometimes lost due to the delay when a command is sent from the modem/DCE to the terminal/DTE. The command to stop sending when the transmit buffer gets full, is sometimes missed if there is any delay between the terminal and the TNC. If you are using a terminal program written in BASIC, you will notice even more lost or missed characters. This is an added trouble-spot since the basic commands must travel through the "CLI," better known as the "command line interpreter." With text file transfers, this can be overlooked in some instances, if they are in ASCII. With binary files, each byte becomes more important because it could be the register address, or part of the "machine language" program which executes an important action within a program. Here is where I strongly stress the use of a computer and terminal program which supports "hardware handshaking." By digressing for a moment, to part two of this column, (June issue) we noticed most TNCs support the 5 wire RS-232C interface cable and the Electronics Industries Association (EIA) pin designations depicted in Table 1.

The crude, but effective analogy for defining "software" and "hardware" handshaking, is to relate the software call to the speed of sound, and the hardware call to the speed of light. We can quickly understand, there is a big difference between 1127 feet per second and 186,280 miles per second. In either case, they both will out pace my buick. None the less, in some situations the difference in speed is critical.

For the binary and picture files transfer, let's set our TNC commands to a slightly different configuration. These setup configurations can be placed into a config file or "macro" for quick setup again and again. The macros can be automatically installed by the terminal program or printed for manual input. As you become more familiar with your terminal program, you will discover many features which allow this configuration to be made effortlessly and *very rapidly*. Try the settings in Table 2 for binary and picture transfer. When I plan to pass files, I also turn off the monitor and display commands as shown in Table 3.

If you are using a TNC which has the KANODER, GATEWAY, and PBBS features included, you will need to disable the features as shown in Table 4.

You will soon become so proficient with file transfer, that you may develop your own set of command configurations. There is much enjoyment as you find ways to pass the latest game or program which you have written to a friend. Even trading Public Domain programs is fun. You will find the pictures are still the biggest thrill—until you discover a way to digitize "matter" and . . .

I have included two more transceiver/terminal/computer interface illustrations this month (see figs. 1 and 2). Add these to your collection and I'll have more interface illustrations for you next month.

Good packeting, 73 de BucK4ABT

Table 2

X25L2V2	=	ON
MON	=	OFF
MCOM	=	OFF
SCREEN	=	0 (zero)
PACLEN	=	128
STREAMSW	=	$00
XFLOW	=	OFF
TXFLOW	=	OFF
TRFLOW	=	OFF
MAXUSERS	=	1
USERS	=	1
NEWMODE	=	ON
AUTOLF	=	OFF
CONMODE	=	TRANS
HEADERLN	=	OFF

Table 3

MON	=	OFF
MSTAMP	=	OFF
CSTAMP	=	OFF
MRPT	=	OFF
MBEACON	=	OFF
MCOM	=	OFF
MCON	=	OFF
MRESP	=	OFF
BEACON	=	OFF
UNPROTO	=	NONE

Table 4

NDMON	=	OFF
PBMON	=	OFF
GATEWAY	=	OFF

Antennas & Accessories

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

A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

Extended Double Zepp

Michael Meditz wrote us a lengthy letter regarding his experiences with the popular, 0.64-wavelength-on-a-leg Extended Double Zepp (EDZ) antenna dating back more than 35 years. We had mentioned the EDZ in several past columns (June 86 as well as March and April 1987), prompting him to write. He had a lot that's interesting to say, and we hope he'll forgive us for extracting the highlights:

"I've held KØIQA for 33 years now and I've used the EDZ for the last 12 years. I am located in Craig, Colorado, at about 6300 feet in elevation. I have had several Zepps in use here, and have had very good [results]. I know that working with ladderline is not as easy for some people as using coax, but since most everyone is using some kind of an antenna tuner they might as well do things right from the start."

"I learned of the antenna when I first received my ticket. A few of the hams of that time period were using this type of antenna. They handled a large volume of traffic daily, and they were always being heard."

"The antenna systems of 35 years ago were of the horizontal flattop design with 450/600-ohm feeders. The tuners were generally homebrew, although [some operators] had the high class Johnson Viking K.W. Match Box. Some had the 250-watt version."

"For those who are not familiar with the K.W. Match Box, it is very impressive, measuring 11" high, 12" deep, and 17½" wide. Inside you find a massive copper coil of heavy, thick flat wire, which is wound on edge. This design was built *to handle* about 6 K.W. AM power. These tuners are worth more than anything on the market today, with regard to balanced feedlines. Without a Johnson Viking type tuner, a Zepp-class antenna is going to *work* quite poorly."

While a Johnson Match Box may not be the only tuner worthy of working effectively into openwire line, his point is well-taken: "The new tuners try to use a balun coil for balanced line operation, and they fail in most cases when running *high* power. One of the main faults is that the RF saturates the ferrite powder core material [at high power levels]. When this takes place, you have a heat buildup and power loss. For balanced feedline antenna systems, [including] the EDZ, one must use a good quality coil and condenser arrangement to benefit from the features offered by the Zepp."

"I'm presently using what I call my 'fourth generation' EDZ. As the antenna books mention, you want each leg to measure 0.64 wavelength for the band of prime interest. This will, of course, give you a 3 dB gain [over a reference dipole]. Although it's not spelled out in the antenna handbooks in detail, you will notice a usable gain on subsequent bands, such as 20, 15, and 10 meters—not to mention all of the WARC bands. On the other hand, you can work 80 meters like gangbusters, and by tying the feeders together you can operate 160. I *use* my EDZ as a loaded 'T' using a different tuner, for 160."

"I cut my EDZ's legs for the middle CW portion of the band, 7100 KHZ. This gave me a length 87 feet each side of the feedpoint. I am using some very good, heavy duty ladderline I ordered from Amateur Electronic Supply in Milwaukee, the best I've ever had and rated for better than 1 K.W."

"Everybody understands that a horizontal dipole *has a feedpoint impedance of about* 75 ohms, and if they make it an inverted-Vee, *this* drops to about 50 ohms. I also make my EDZ into an inverted-Vee: the center is at 58 feet, and the legs slope down and out, making it much easier to use on a city lot. *By doing this* the normal feedpoint impedance is lowered to about 450 ohms for a much better match to 450-ohm ladderline. The inverted-Vee configuration makes any antenna less directional broadside. I feel that I am getting from 3 to 5 dB gain overall."

"Another point of concern is the feedpoint location. If you study the current lobes on an EDZ you will find that the maximum lobe of the current will not be at the physical point of the attachment, but will extend down the feedline by 0.11 wavelength. This *works out to* 14.6 feet down from the feedpoint for an antenna cut for 40 meters, as I have. *The feeder length* should then be calculated from this point into your hamshack so that you will have an even one-half wavelength multiple, giving you a feedpoint that is *of* high current but low voltage at the tuner. This assures that you will have the maximum current distribution across the EDZ, and not a distorted pattern as you would receive with a random selection of feedline. This, again, is of primary concern only for the band on which you cut the Zepp for."

Thanks to KØIQA for his sage observations about an antenna that's slowly coming back into favor for its simplicity. There are problems with tuners that use ferrite-type baluns when you're running high power into balanced feedlines under some conditions, so not all tuners are good choices for use with the EDZ. If you use an EDZ, especially on other bands than the one for which it was designed, it's best to use a tuner that does not use a balun—at least one with a ferrite core—for the reasons described.

Your Antennas & Accessories columnist hard at work (?) in the hamshack. Karl is happy to answer questions from readers about antennas and other topics covered in the column. Please include an SASE for his convenience. DX correspondents should include enough IRCs for return postage as well as a self-addressed envelope.(W8FX photo)

317 Poplar Drive, Millbrook, AL 36054

Antenna Products of Note

Supertenna: There are some folks out there who enjoy mobiling so much that they put up with all of the difficulties of working the lower HF bands while in motion, while most of us are usually content to work mobile on two meters and up using antennas that are measured in inches rather than in feet. On HF, the mechani-

cal problems involved in changing frequencies and bands are the main considerations.

Several manufacturers have tackled the problem of operating efficiently from an automobile, boat, or mobile home. One of these is Gene Hansen, who several years ago introduced his "Supertenna," which features a large air-wound center loading coil for high efficiency.

This is an all-band mobile antenna for use on boats, cars, trucks, vans, and other recreational vehicles, including mobile homes. The antenna is simultaneously resonant on five bands—10, 15, 20, 40, and 80 meters. This, of course, means that you don't have to stop on the highway to switch a resonator or change a whip section. While the taps are preset, they can be changed if you like.

The Supertenna has a large, high-Q center loading coil. The bandwidth and SWR are typical for such a design, and on the lower bands, an antenna tuner is desirable. The antenna features stainless steel hardware and mast, and there are no moving parts, clip leads, or screw-on joints, thus making it especially suitable for marine use. The antenna's overall length is 8 feet, while the lower mast is 30 inches. The antenna will handle 500 watts PEP. The Supertenna is priced at around $100.

For more information, contact the Gene Hansen Co., 1000 Hansen Road, Corrales NM 87048.

Custom Profile Yagis: Frank B. Zolfo, W6SJC, offers a line of moderate-sized HF Yagis—beams that are small in size compared with full-sized models, but are not so small as to be properly categorized as mini-beams. In fact, boom lengths are normal-sized while the elements are short, resulting in a short turning radius, low windload, and a low-visibility profile. The short elements are loaded; the loading system uses nickel plating and gold alodine for maximum conduction and weatherproofing. Except for the U-bolts, stainless steel hardware is used throughout, while 6061-T6 aluminum tubing and Delrin insulators are used.

Models are available for 20, 15, and 10 meters in 3-, 4-, and 5-element versions. There's also a new "Novice Special," a 2-element model that claims 5.5 dBd gain and an 18 dB front-to-back (F/B) ratio, on a 5-foot boom. It's priced at about $130. The antenna is light enough to be mounted on a small TV mast and turned using a TV rotator.

For more information, contact Custom Profile Antennas, 3500 Clayton Road B200, Concord CA 94519.

H. Stewart Designs Update: A recent flyer summarized their interesting and expanding HF and VHF antenna product line. They are well known for four major antenna products.

The DX Hidden Asset Loop Antenna: this unusual two-loop design was originally intended for use where regulations or conditions precluded outside antennas. Both outdoor and indoor versions are now available for use on the 2, 6, 10, 12, and 15-meter bands. You can purchase a complete kit, or just the plans alone to cover those frequencies as well as 80 and 160 meters.

The II-DX Directional Antenna: this is a space-limited, inconspicuous two-element directional beam that's stocked in about the same band scheme as is the Hidden Asset series. Feed is direct with 50-ohm coax, and the antenna can be installed either vertically or horizontally. The antenna is sold as a partly assembled kit, which requires you to provide some PVC tubing and do some cementing.

The DX Quick-Shift Antenna Mount: this is an unusual mobile accessory that mounts on the vehicle roof or sidewall. It takes the effort out of getting on the air when you back out of your garage and retracting the antenna when you drive back in. You can raise and lower the antenna from inside your vehicle, and lock the antenna vertically or horizontally. An interesting device, indeed!

The MagCup Mobile Antenna Mount: this is a combination magnet mount and support arm to better resist wind and other impacts, and to make antenna removal fast and easy. It's not expensive or complicated, but it is said to safely hold up to a quarter-wave six-meter antenna or lightweight base- or linear-loaded 10-meter antenna. A coiled steel mounting spring also can be furnished with the MagCup; a double-magnet model is available as well. For a catalog, contact H. Stewart Designs, PO Box 643, Oregon City OR 97045.

QRV Product Line: An up-and-coming antenna supplier is Jim Stevens, KK7C's AntennasWest, operating under the QRV brand. Perhaps one reasons for the firm's popularity is the minimization of customer risk. According to Jim's flyer, if a customer is dissatisfied with a product for any reason, all he needs to do is to repack and return it for a full refund.

Major products offered include the 160-10 Emergency Pack (which includes the 160-10 All-Band HF Antenna and the QRV-QL Quick Launch System), the QRV-DX HalfSquare Antenna, 160/80 and 80/40-meter broadband FB Slopers, and a power-mains-independent solar power supply for remote, portable, repeater, and home use.

The 160-10 Emergency Pack is an unusual kit. Their first product, they originally designed it for an international relief organization. Though the antenna and quick launcher may be purchased separately, the complete kit has everything needed to install a versatile and effective system for use on all of the HF amateur bands.

The 160-10 antenna is an 8-band (80-10 meter) centerfed dipole, though it can be used as a Marconi on 160 through 30 meters. Based on the popular G5RV design, it has a flattop of 102 feet and a linear matching section of 30 feet. The antenna can be fed directly by 50-ohm coax.

The Quick Launcher part of the Emergency Pack is a system for hanging wire antennas quickly from available supports up to 75 feet in height. The system is designed to eliminate the need for climbing or to learn how to safely and accurately use a bow and arrow or slingshot. The kit consists of a high-visibility fluorescent projectile, kink-proof launch line, safety protector, and a line carrier which also serves as a storage container for the kit.

In addition to the antenna and launching system, the kit also includes a counterpoise and adapter which together may be used to transform the antenna into a top-loaded vertical for use on the 160, 80, 40, and 30 meter bands. Detailed instructions for using the antenna system and the counterpoise are in the kit's 48-page technical manual.

Also included are a 70-foot coax feedline extension and 200 feet of rot-proof, 200-lb. test support line. The entire $139.95 system is packaged in a reusable weatherproof carrier.

For a catalog and descriptions of Jim's novel product line, contact AntennasWest, 1971 N. Oak Lane 1300 E., Provo UT 84604-2138.

Software Notes

Tornado Notes Library: In the January issue, we reviewed a particularly nice specialized database for the IBM-PC, *Tornado Notes*. To recall, this is a free-form "random information processor" or organizer that lets you ride herd on all kinds of information, rather than structure it as you must with conventional databases. With *Tornado Notes*, you process information in stacks of superfast "intelligent windows"—several on your screen at once. You type into

The gang at the Radio Club of Junior High School 22 just before the holidays last winter. For information on how you can help support this worthwhile group that was covered in this column a couple of months back, contact the club at 111 columbia St., NYC, NY 10002, phone 516-674-4072.

the windows, interconnect and prioritize them, and scan through them in a variety of ways. In effect, you can build a sophisticated "knowledge base"—an unstructured database—without having any programming skills. It's not an exaggeration to repeat what the manufacturer claims, that the product, with its up to 25,000 windows, can act like extra memory for your brain. As we pointed out in our review, you can use the $99.95 system to retrieve ideas, memos, lists, things to do, numbers, formulas, procedures, reminders, and much more. The amateur applications are obvious.

After our review appeared, Tornado expanded the product with the *Tornado Library*. With it, you get a "library" of windows that includes a free-form calendar, project planner, grid maker, sophisticated city/state/area code/time zone calculator, and more—all of which you can customize. The new library is a great addition, though it jacks up the price to $149.95—perhaps a little steep for something for home or hamshack use, though certainly a bargain for business applications. Nevertheless, the original *Tornado Notes* is still available without the Library at the original price.

For more information, contact Micro Logic Corp., 100 2nd St., PO Box 174, Hackensack NJ 07602.

The Commodore Diagnostician: Most amateurs, myself included, feel close to helpless when their computer becomes balky and doesn't want to "do its thing" anymore. Commodores, especially the early C-64 computers and 1541 disk drives, seem to suffer from significant problems in quality control. I know from experience, having owned a C-64 and 1541 since late 1982; they've both been in the shop several times.

Developed about two years ago in Australia, Kasara Microsystems' intriguing quick-lookup chart is a sort of cookbook-on-a-page that technically inclined users should find helpful for when "the chips go down." The firm claims that the Commodore Diagnostician will allow even the "average" Commodore computer user to diagnose and repair his machine, especially when the problem is with faulty chips, in 95% of the cases.

The two-sided laminated sheet offers 80 variations which can locate faulty chips on the computer using the symptom/solution method. The chart also contains a pictorial layout of each chip with corresponding identification numbers. Also included is a "hint section" which contains suggestions of what to look for other than possible chip failures. For example, it mentions that over 50% of computer failures are caused by the external power supply delivering excessive voltages to the computer. The flip side of the chart also includes a symptom/possible solution chart for the 1541 and 1571 disk drives.

Reference Aid –4 sells for $6.95 plus $1.00 shipping and postage; an IBM Diagnostician, in two parts, also should be available by the time this appears in print. Contact Kasara Microsystems, Inc., 33 Murray Hill Drive, Spring Valley NY 10977.

From the Bookshelf

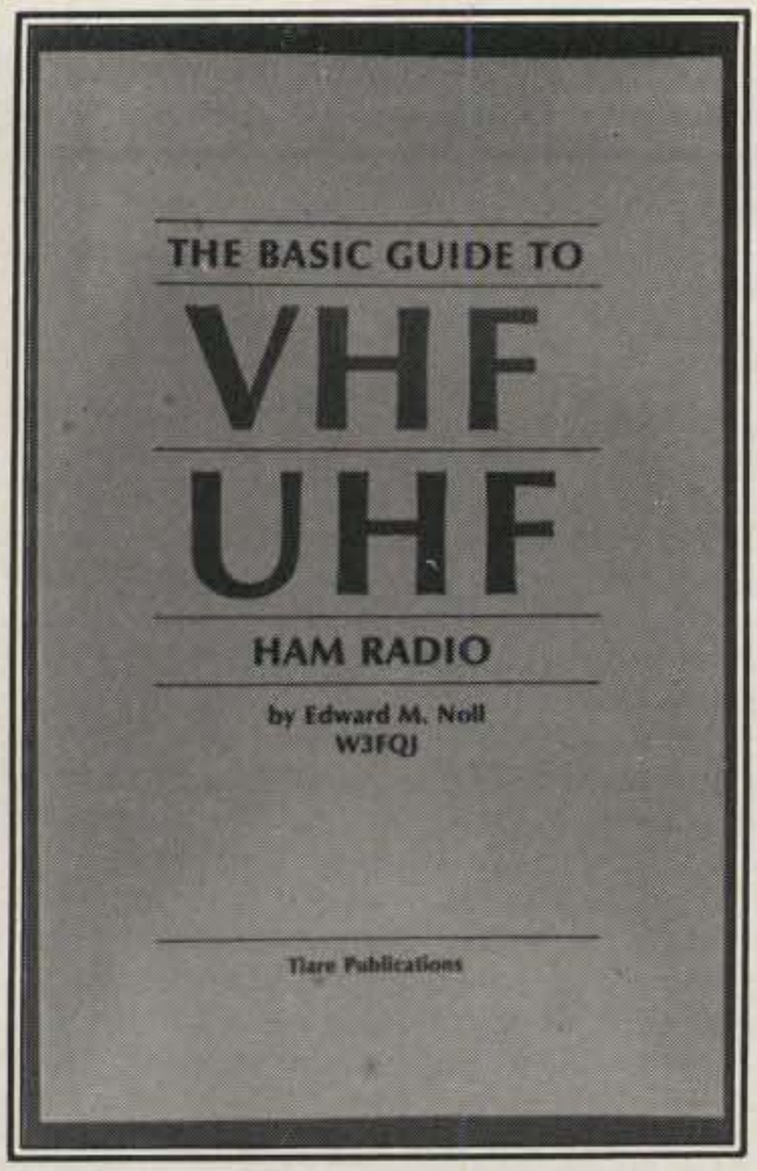
The Basic Guide to VHF/UHF Ham Radio: Ed Noll, W3FQJ, Antenna Editor for our sister publication, *Popular Communications*, recently sent me a copy of his new book to help Novices and Technicians get up and running on VHF and UHF.

Published by Tiare Publications, Ed wrote this basic guide for the prospective Novice or Tech and puts a special emphasis on the 70 CM and 1.25, 2, and 6-meter bands. The book covers band plans, propagation, equipment operation, multiband operations, antennas, repeater activities, contests, and awards. A good introduction to what these bands offer, the book shows one how to get on the air quickly, effectively, and at low cost.

The book is available directly from the author for $6.95 plus $1.00 shipping and handling. Contact Ed Noll, W3FQJ, PO Box 75, Chalfont PA 18914.

Your Gateway to Packet Radio: Our colleague Stan Horzepa, WA1LOU, writes the "On Line" column in *QST*. Stan's column appears every other month, and constitutes a useful computer forum that focuses greatly on the exchange of computer programs for most popular computers—especially public domain programs that can be freely traded. It's a good column, and I encourage you to check out the various program listings that are available through Stan's PX Program Exchange. If you want a list of all of the programs in the PX library, send a business-size SASE with 25 cents postage to ARRL, Dept. PX, 225 Main St., Newington CT 06111. At last count there were about 170 programs in the library, which is growing all the time.

Stan sent me a copy of his new book, *Your Gateway to Packet Radio*. It's perhaps the most readable of any of the packet books I've seen to date. Stan's book is organized on a "yesterday, today, and tomorrow" basis that clearly describes most facets of packet radio—including what it's really good for, what uses the average ham might find for it, how to set up



Ed Noll, W3FQJ's new book is designed with the new or prospective Novice or Technician in mind. Ed's the Antenna columnist for CQ's sister publication, Popular Communications. *(W3FQJ photo)*

the necessary equipment, what the protocols are, how bulletin boards work, the details of message handling, and the like. The $10 book is published by the ARRL.

Computer Book Roundup: Recently, we've received quite a few review copies of various publishers' computer books. We've found it difficult to work reviews of many of these books into the column, since this is an amateur radio publication and not one devoted to general interest computing. So, we've saved up a number of these titles for "thumb nail sketch" reviews.

Sybex, Inc: If you're "into" using spreadsheets on your PC, Greg Harvey's heavyweight, 976-page hardcover *Lotus 1-2-3 Desktop Companion* may be for you; it's one reference you'll probably want to pull out whenever you boot up *Lotus*. If you're not yet quite up to speed with *Lotus*, check out Carolyn Jorgensen's highly readable, 466-page *Mastering 1-2-3* for a step-by-step guide to getting the most from the program.

Que Corp: If you're about to plunge into a top-of-the-line wordprocessing package such as *WordStar*, look for Steve Ditlea's comprehensive guide to *WordStar Release 4, Using WordStar*. Practically everything you need to know about that very capable but somewhat hard-to-master program is packed into its 536 pages.

HPBooks: If your preference is for the somewhat easier-to-use *WordStar 2000*, then look for Janet Crider's *Quick and Easy WordStar 2000*, an inexpensive, 208-page guide and tutorial that takes you from the beginning, assuming no prior knowledge of wordprocessing.

Howard W. Sams & Co: Alan Simpson's *The Best Book of Lotus 1-2-3* is another excellent guide to *Lotus*, which includes numerous tutorials to lead you step-by-step. The 336-page book includes several reviews and quizzes to check your progress.

Brady/Prentice Hall Press: These folks must produce an incredible output of computer books; they've been keeping our mailbox full. In the area of wordprocessing, another comprehensive tutorial on *WordStar 2000* is David Barry's and Rob Krumm's *Using WordStar 2000 and 2000 Plus*; the 357-pager is written in a friendly lesson-style format. If you're using an earlier version of *WordStar*, look for M. David Stone's *Getting the Most from WordStar and MailMerge*. This book, subtitled "Things MicroPro Never Told You," provides lots of tricks and tips as well as special purpose applications. And, if you're wordprocessing choice is the top-of-the-line *WordPerfect*, then Rhyder McClure's *Fast Access/WordPerfect* may be your ticket to harnessing the power of this top rated word processor. McClure's reference guide is organized alphabetically to give you step-by-step help.

If databases are your domain, then *dBase III Plus To Go*, by Peter G. Randall and Steven J. Bennett, with its included disk of 20 ready-to-run business and utility programs, should be your cup of tea. Pop open the book, and in a few minutes you'll be running new *dBase III Plus* applications with no programming required.

And, if you're into heavy-duty *Turbo Pascal* programming, Brady has two very comprehensive titles: Robert Jourdain's *Turbo Pascal Express*, which includes a software library of 250 ready-to-run software routines on disk. For advanced programmers, there's also Kent Porter's *Stretching Turbo Pascal*; the 341-page guide includes more than 100 sample programs you can key in.

Finally, Brady sent me a fascinating and educational book, one that touches on an area of technology we're destined to hear a lot more about in the next few years. It's Laura Buddine's and Elizabeth Young's 476-page *The Brady Guide to CD-ROM*. The book presents one of the best overviews of CD-ROM discs I've seen, with their vast memory storage capability to hold as much information as 1,500 floppy disks or 250,000 pages of text. There's lots of technical information between the covers, but the book is quite readable even by the casual computer user.

Most of these books are available at any well-stocked bookstore, though I'd better give you the address of HPBooks. It's PO Box 5367, Tucson AZ 85703.

That's all for this time, gang. Next month, more antennas and accessories subjects of current topical interest. See you then.

Overheard: Solving problems is fairly easy. It's living with the solutions that's tough!

73, Karl, W8FX.

DX

a monthly feature by
HUGH CASSIDY, WA6AUD

NEWS OF COMMUNICATION AROUND THE WORLD

The whole earth is my birthplace,
And all DXers are my brothers . . . .

July is the middle of the summer here, and DXers are being heard from every direction. We are past the solstice, but the change in the days is not yet noticeable. This is a good time of the year, with long daylight hours and late-night DXing.

One warm morning last week we were sitting in the hillside garden when the Old Timer trudged by. Energetic DXers are always in need of rest, so the Old Timer joined us on the bench. One can learn a lot while resting, just as one can learn by listening to the DX Elders. Just ask one of them should you have any doubt. One learns quickly that they lean to the same school of philosophy. They have done everything, and helped figure out the basic angles of DXing success. Always the complete amateur, the elder DXers are! Believe that always!

But this morning the Old Timer was sounding a slightly different note. While he might agree to all the salient points made in the preceding, he also might sound a "maybe" from time to time. At times we suspect that the Old Timer is not firmly positive in believing that some Old DXers may not show some slight blemishes—slight, but noticeable. Newly minted DXers might be reluctant to voice such heresies. The older one gets the more likely the possibility. And the Old Timer has been heard to say that "DXers are made, not born, and it takes years to make them."

The Old Timer was not long in getting to what was on his mind. "Remember when Jim Smith was signing VK9YS back towards the start of the year?" the Old Timer asked, and we did recall that one. "Did you know that the way some well-known DXers acted at times drove Jim to the point of complete exasperation? This was when he was working the low bands trying to give Cocos-Keeling to those who might need it on 80 and 160. Jim is reported as saying that at times things were so difficult that he was driven to giving up any operating at all. He was quite upset about some of the activities encountered."

This was understandable. If you are trying to work in a rare or semi-rare stop, you just about automatically expect cooperation from DXers to help work as many as possible while the bands are open. "Operating conditions?" we ventured. "Conditions not good on the low bands?" The Old Timer shook his head. "Not operating conditions, operator conditions!" We had to think over that problem.

"Tell us more," we finally had to suggest. The Old Timer was waiting for the invitation.

"As you well know," the Old Timer started in, "on the lower bands the openings often are not the length found on the higher frequencies.

77 Coleman Drive, San Rafael, CA 94901

Abu-Ail was the site of a DXpedition back in February of this year. Shown in front of the hotel at J28 are DL8CM (A15AB) on the left, and DJ6SI (A15AA). Not in the photo is DJ6JC (A15AC). QSL info is as follows: CW A15AA to DJ6SI; SSB A15AB to DL8CM; and RTTY A15AC to DJ6JC. (Photo via Jack, W2LZX)

There is also the problem of shared spectrum, with available space not always what one might wish." This was all understandable, and we were already well aware of most of it, so we just nodded our heads and waited.

"From VK9YS Jim operated often within a narrow range. Using split frequencies, he would designate the part of the band where he would be listening, asking that calls to him not be made in certain areas. Say, for example, he would be listening 3785 to 3793 kHz. But repeatedly there would be the same stations there each day to work him, and after making their daily contact, they would move but a kaycee or so to raise and ragchew with one of the buddies, this often a station back in their own neighborhood. This brought some interference, which did upset Jim. One has to wonder whether all this came from just a simple lack of consideration for the DX effort or possibly in the hope that the splatter from an adjacent signal might move Jim to another band—160, for example. There was some feeling that some stations were out to work VK9YS on both bands every single day of the operation. Whatever it was, there was interference, and the interference brought both problems and exasperation. You should be able to understand that."

Of course we understood. After all, these tactics were neither especially new nor brilliant. But we could also be dense when the occasion demanded it, and we very seriously asked, "Oh, insurance contacts?" That did it for sure.

The Old Timer fastened a hot eye on us. "Insurance might be needed when one works a needed DX station in the middle of a wild pile-up with copy difficult or maybe incomplete. But even under such conditions anything beyond a second contact comes from more than a need for insurance. Tell me something! Why would one prominent European low-frequency DXer be found in the VK9YS log seven times on one band? A contact for every day of the operation. It should be no secret now to anyone that when a big gun with a big signal repeatedly works a rare DX station, someone else who really needs it will lose out on his chances. This is even worse when there are marginal openings to some parts of the world, but the repeaters keep working the DXpedition. Do you find that admirable?"

Somehow the idea was developing that the Old Timer did not approve of such tactics no matter how long the perpetrator had been DXing. But maybe we have been around a bit longer than the Old Timer credits us for at times. We well remember one big-name DXer and DXpeditioner back a couple of decades who was quick to point out the path to righteousness to any who sought to make a daily display of their DX prowess. Try the daily-contact routine when he was operating from a new or rare spot, and swift justice could be invited. This could include over-the-air castigations and a warning that if the call was heard again during the operation or found in the logs for a contact after that date, there would be no hope for a QSL. Some considered it rough justice—rough but perhaps deserved. And it did seem to work.

There was also the memory of another great DX happening almost a couple of decades back when one of the Locals maneuvered his way onto the official position of stateside liaison, this with a new one coming on the air. This one had a good signal and all the time in the world to devote to the task. The due and more than expected service was rendered often a number of times a day, checking in to advise how good the DXpedition signal was, how it compared with the prior report a couple of hours back, queries after the health and well-being of every member on the effort, advising how technical problems might be satisfactorily handled. All this plus rundowns on how the DXpedition was being received with regard to other parts of the world, passing on any local or mildly relevant gossip and effusively signing off each contact with "the best of 73s to you and yours and all the members of the DXpedition who are doing a great job that will be long remembered . . . and . . . and . . . ."

The flak that was flying during this effort was startling. But the Local was true to the commitment, persisting in the face of adversity and criticism. Later on when a casual query was directed his way on a slow afternoon, asking just why he had let himself in for all the acrimony directed his way, his reply was a model of incredulity. "But they asked me to do it," was his ready explanation. "They knew I had a good signal and would be there when needed."

The prevailing thought among many DXers was that he was there all right and ready to expand every golden moment when the multitude of DXers were waiting for a chance to work the new one. But that was only a surmise—a good one, however.

Sitting there in the quiet of the July morning, our conversation flowed towards what DXers themselves might do to lessen such instances, incidents such as we had been talking about. But while some might think that such in-

The WPX Program

Mixed

1334	PA0JMJ	1336	W5EIJ
1335	IK2BHX		

SSB

1953	W2EKO	1959	Y8IZN
1954	JT1BQ	1960	I2UPG
1955	NY5Y	1961	IT9JKY
1956	PY1KZ	1962	NX0I
1957	YC8VFB	1963	WB3LTT
1958	K0PVI		

CW

2504	LZ1HY	2507	YC0BLO
2505	IK6ASR	2508	KA1KPH
2506	G4UOL	2509	NX0I

Endorsements

Mixed: 450 VE7CXN, PA0JMJ, IK2BHX, W5EIJ. 500 PA0JMJ, IK2BHX, W5EIJ. 550 VE1AI, PA0JMJ, IK2BHX, W5EIJ. 600 VE1AI, PA0JMJ, IK2BHX, W5EIJ. 650 VE1AI, PA0JMJ, IK2BHX, W5EIJ. 700 VE1AI, NX0I, W5EIJ, N3KR. 750 VE1AI, NX0I, W5EIJ, AA4LB. 800 VE1AI, NX0I, W5EIJ. 850 VE1AI. 900 VE1AI. 950 VE1AI. 1000 VE1AI. 1050 VE1AI, IS0MVE. 1100 VE1AI, IS0MVE. 1150 IS0MVE. 1200 N2CIC. 1300 W4UW. 1350 K2POF. 1400 K2POF. 1600 SM3EVR. 1850 IN3ANE, N7TT. 1900 N7TT.

S.S.B.: 350 YC8VFB, K0PVI, I2UPG, NX0I. 400 K0PVI, I2UPG, NX0I. 450 K0PVI, I2UPG, NX0I. 500 K0PVI, NX0I. 550 NX0I. 600 NX0I. 650 NX0I, IK8GCS. 800 KD9OT. 850 IS0MVE. 900 IS0MVE. 950 DK5WQ, IS0MVE. 1050 I2EOW. 1100 N2CIC. 1600 N7TT.

CW: 350 KU0S, LZ1HY, IK6ASR, G4UOL, YC0BLO, KA1KPH, NX0I. 400 KU0S, LZ1HY, IK6ASR, G4UOL, KA1KPH. 450 KU0S, LZ1HY, IK6ASR, G4UOL, KA1KPH. 500 KU0S. G4UOL, KA1KPH. 550 KU0S, G4UOL, KA1KPH. 600 KU0S, G4UOL. 650 KU0S, G4UOL, VE1ACK. 700 VE1ACK. 750 VE1ACK. 800 VE1ACK. 850 I0ZUT, VE1ACK. 900 I0ZUT, VE1ACK. 950 VE1ACK. 1000 VE1ACK. 1050 AK2H. 1100 AK2H. 1150 K2POF. 1200 K2POF. 1450 N7TT. 2050 G2GM. 2350 N6JV.

10 Meters: K3UA, K0PVI
15 Meters: K3UA, IN3VZE
20 Meters: G4UOL, KA1KPH, K3UA, IT9JKY
40 Meters: G4UOL, OZ4RS, K3UA
80 Meters: K3UA, G4UOL, AA4LB, NX0I
160 Meters: NX0I, KD9OT

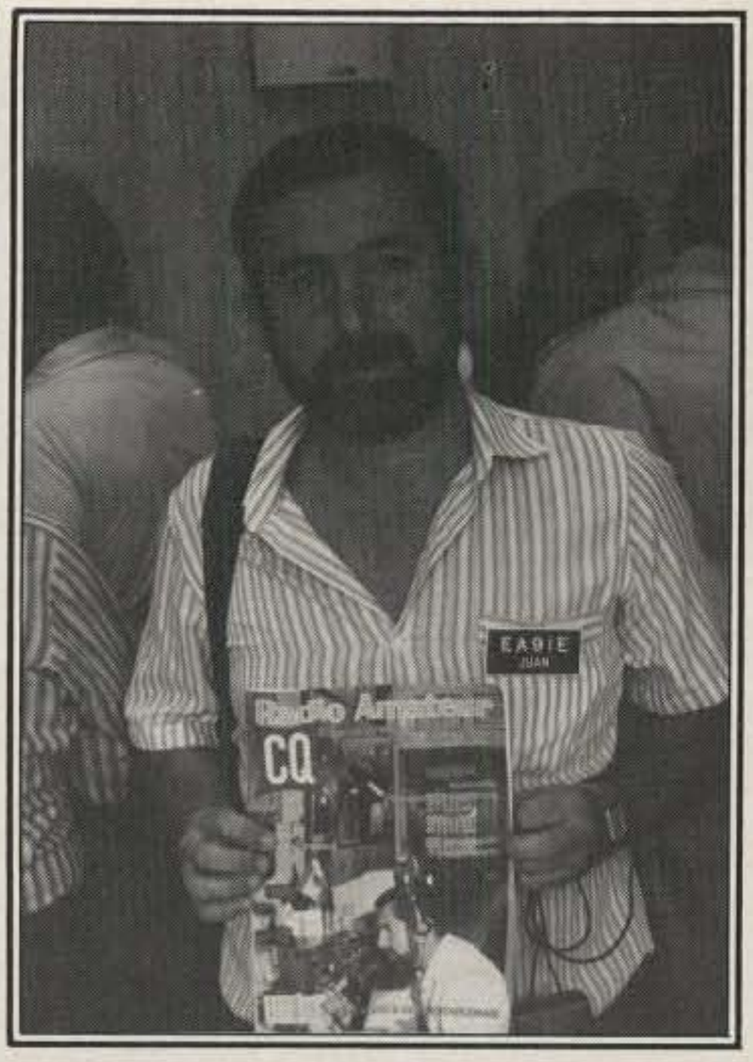
Asia: LZ1HY, OK3TAY, JT1BQ, EA3AAY, IT9JKY, NX0I
No. America: KA1KPH, K0PVI, NX0I
So. America: HA8XX
Europe: LZ1HY, G4UOL, KA1KPH, IT9JKY, NX0I
Oceania: NX0I

Award of Excellence Plaque Holders: KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, 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.

Award of Excellence Plaque Holders with 160 Meter Endorsement: K6JG, W4CRW, N4MM, SM0AJU, KF2O, K5UR, 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.

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.

stances might be things of recent origin, they could be wrong. We mentioned this to the Old Timer and he shook his head. "Not quite so," he differed, "and if you think things over, you might conclude that while the tactics may be



Juan Rosales, EA9IE, never leaves home without his copy of CQ magazine. EA9IE is President of the Spanish Lynx DX Group, and at the International DX Convention he said that the Spanish edition of CQ. Juan was a major mover in the S0RASD effort, and at Visalia he announced that the Lynx DX Group has all the papers in hand for a 4W1A operation in the latter part of June.

familiar, often they come with new and different performers. Some quickly learn that their clever tactics are seldom heralded by loud cries of admiration, but rather some pointed and quick criticism will be given. To be less than admired is sometimes a spur to reconsider and change."

While this had been a quiet July morning, we were starting to feel the weight of the Old Timer's stern eye. Knowing the signs, we went to full brace in anticipation of a delivery of his unassailable logic that would be difficult to argue. We were right. He did deliver. We were ready.

"Ask a DXer why he dreams of big-bore DXing at every moment he can, and you will get a variety of answers. Some say the challenge, the fascination with distant places, the mystique, the joy of plunging into a pile-up and having your signal immediately heard and recognized. They will give you a lot of answers. But look over all of them carefully and weed out the extraneous and generally you will find among the reasons left can be detected a hope for posterity, a desire to be admired for one's cleverness, and the admiration of one's peers. There is nothing wrong with this. DXers are clever, but always there are some who wish to be thought more clever than others. The awards, the certificates are looked upon not only as testaments to a DXer's cleverness, but also as a possible enduring record for posterity." The Old Timer was not finished, but he paused to make sure that our attention had not wandered even a bit.

"How many really active DXers do you know," he demanded, "who work a lot of DX, are always active, but who do not bother with QSLing, DXCC certificates, or check the annual DXCC listings to know where they stand? How many?" We had to think a bit, but frankly we could not come up with any. Possibly there are such, but none came quickly to mind. We told the Old Timer that we were at a loss. It was what he was expecting.

"There are some," he conceded, "but they are rare and seldom noted. But what would happen if a DXer got the feeling that his contemporaries, his fellow club members and those who know of him because of his unflagging prowess in DXing, were not overflowing with praise and admiration, and perhaps even some were jealous of his clever operating tactics? Do you think that this would encourage the continuance of such practices?" That was not a difficult question to answer. "Not at all," we said confidently. When the Old Timer points the way, we know which way the winds are blowing. And we remembered easily how as DXers move up the DXCC ladder, their success is more likely to be remembered if they are recognized more for their obstructive operating than for their consideration of others. The Old Timer was silent for a bit.

"I may get a bit worked up over these matters," the Old Timer finally resumed, "but it does seem that DXers themselves have often moved to handle their own problems, not waiting or calling for others to do it for them. I have often tended to believe that there is a persuasive feeling among DXers, perhaps not often recognized, that tends to correct excesses.

The WAZ Program

10 Meter Phone

318	OK1VAM

15 Meter Phone

254	NX8J

20 Meter Phone

657	N1CWA	659	WD9GQV
658	WA9AEA	660	KI4FW

20 Meter CW

289	I4YNO	291	JA0SU
290	SM6OLL		

40 Meter CW

74	JH2TPI	75	JA5BEN

80 Meter CW

15	SM6DYK

All Band WAZ

SSB

3187	KC8QT	3193	WA8DXG
3188	I2YYO	3194	IK7FRV
3189	JA0UMV	3195	I2OGC
3190	N4HOH	3196	K3JGJ
3191	DK5HX	3197	K7CAJ
3192	PA3AOS		

Phone/CW

6277	WA2YMX	6284	JH1OWW
6278	W4DJT	6285	N0XA
6279	SM3RCA	6286	IV3YYK
6280	SM6MSG	6287	W5EIJ
6281	YU3JZ	6288	W6MND
6282	EA3DBO	6289	JA3HF
6283	W8IRY	6290	W7HS

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.

5 Band WAZ

As of April 1, 1988 172 stations have attained the 200 zone level.

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

I4USC
N0XA

The top 9 contenders for 5 Band WAZ are:

1. N4WW, 199
2. K6YRA, 199
3. W8UVZ, 199
4. K4CEB, 199
5. SP6JCY, 199
6. EA5AD, 199
7. W2YY, 198
8. W7UR, 198
9. K9GX, 198

457 Stations have attained the 150 Zone level.

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

Activity abounded in Dublin, Ireland last St. Patricks Day, March 17th. Dublin amateurs came out of the woodwork and not just in EI, but also in Dublin Australia, New Zealand, Virginia, Pennsylvania, Texas, New Hampshire, Georgia and even Dublin village on Banana Island off Sierra Leone. Dubliners were united in celebrating 1000 years since its foundation as a city. A special millennium group from the Irish Radio Transmitters Society re-activated the call-sign EI1000. A unique prestamped QSL card from the Irish Postal Service is available direct at P.O. Box 2223 Dublin 1. The next event planned for the millennium will take place on July 10th and it is hoped to run a portable special event station in the Pheonix Park in the center of Dublin to coincide with an Amateur Radio Emergency Network exercise.

The force is there and it does move, but often some think it moves not fast enough. No DXer ever wants to be considered as less than worthy; no DXer really enjoys having an accusing finger pointed at his operating practices, though some may try to bluster things aside. Maybe the correction is not done instantly; sometimes it may take years. But it does work. Believe that. DXers have always set their own standards. And that is the way it should be."

We had to think over all this. Maybe what the Old Timer spoke about does work its way with DXers, or it might be that those with the aberrant operating practices just disappear. We thought of some whom we had known in other years who initially had been the targets of some harsh criticism, but somehow over the years had become good fellows, thoroughly acceptable and acolytes in the Inner Temple of DXing. Heck, even at the club meetings, DX conventions, and other gatherings of the Deserving they are greeted with fraternal enthusiasm. Then we thought of something else.

"What you say might be right," we countered, "but most, if not all, DX clubs call for an applicant to be voted into membership. Recently we heard of a club where when some members were not very happy with an applicant because of some operating trangressions, they openly talked of voting his membership down. After a lot of talk one of the club members took it on himself to advise the DXer to withdraw his application, as he probably would be voted down. This was a young DXer and that is what he did. Wasn't that a good way to handle things?" If we had thought the Old Timer would be enthusiastic in replying, we were quickly disappointed. Instead of approval we got a quick frown of dissent. "Why did they do something like that?" he demanded, and we could not come up with a ready answer. We had heard some of the discussion and had thought that it had been done to protect the high principles of the club, to maintain the exceedingly high technical standards of excellence, and to protect the membership from exposure to and association with possible deleterious influences. We explained this to the Old Timer, but if we had anticipated some enthusiastic agreement, we were quickly disappointed. We suspected that he was not in agreement, but we were not yet sure where a mistake might have been made. it was not long before we were enlightened.

"I will admit," he started in, "that years back I was caught thinking along the same lines. A handful of members took exception to the operating practices of an applicant and rounded up a group to vote down the application when it came before the meeting. Actually, there was a big uproar, but the application did finally get approval. This was a long time back, and I will admit that I was more a spectator than anything else in all the debate and the shouting.

"Anyhow, a week or so later I was talking about the meeting to one of the really old local DXers, one who had shown on the Honor Roll back in the thirties when it first started to be listed. I thought that he would find it interesting, as in other years he had been a big leader in the DX club. Guess what he told me?" We may not have known all the answers previously, but we were sure that we could handle this one. To be safe, however, we pretended puzzlement.

"This old fellow told me," the Old Timer continued, "that no one should ever be denied membership in a DX club. No one! And I now believe that he was right. If a DXer has some bad operating practices, how are they ever going to be corrected unless other DXers have a chance to work on him? Cast him out and mark him as an object of scorn by other DXers, and the rejected one will possibly spend years attempting to prove that he is right and the membership is wrong. It is a continuing adversarial situation. Include him in the membership and you have a lever to change his directions. Then you most likely will get a good DXer, a good operator, and one who is more considerate of his operations. It is just another case of DXers always handling their own problems. Don't you see that?"

We did then. But at times one thinks only of correcting an immediate situation, not being especially concerned about the future. But we could easily recall how in other instances we had thought of and spoke out about DXers handling their own problems and protecting their common interests. And it does work. The problem is that sometimes it just slips our mind.

Namibia

Nico Schoonwinkor, ZS4NS, will be in Southwest Africa signing ZS3/ZS4NS starting June 26th and running to mid-July. Nico will cover all the bands from 80 through 10 meters, SSB possibly being the main activity, but some will be on CW. Nico says to try him at about 12 wpm. Action around that speed is a bit easier for him to handle.

ZS4NS will be in Namibia/Southwest Africa until July 16th. For QSLing purposes use his home address—POB 472, Welkom 9460, Republic of South Africa. He notes that airmail returns take 3 IRCs or $1.00 (U.S.)

Canadian/Soviet Transpolar

The joint Canadian/Soviet skiing trip to the North Pole got underway in March, and by the time you read this they should be well beyond the pole and headed for Ellesmere Land in the Canadian Arctic. Toward the start of April they passed Dixon Island north of Nova Zemlya on the 600 mile leg to the North Pole. Beyond the pole they have a 450 mile stretch to Cape Columbia on Ellesmere Island. By June the trip should be in its final stages. All communications for the effort are being handled by amateur radio, the expedition being supplied by six air-drops along the way.

This is not what you call an official effort, as it is privately organized and financed by the Polar Bridge Company, this being Canadian participants supported by commercial sponsors, and on the Soviet end by *Komsomolskaya Pravda* (Soviet youth newspaper). All the equipment and living gear went in backpacks ranging from 80 to 90 pounds in weight.

To some extent the travel time will depend on the conditions encountered enroute. Among the possible problems are areas of open water, pressure ridges in the ice pack which impede travel, cold temperatures which can reach as low as −50°C (−130°F), and areas of thin ice and periods of high wind.

This effort was a privately funded effort. Anyone who might wish to help in the success of this transpolar effort can send a donation to Cross Country Canada, c/o Suite 300, The Carriageway, 55 Murray Street, Ottawa, Ontario, I1N 5M3.

How Far Must One Go?

For the local DX club, we mean. If you are going to be a regular at the meetings and cherish all that is good and noble and dear to DXing, sometimes it is necessary to hit the road.

As you might have heard, all things are relative, both in DXing and elsewhere. Attending a club meeting might be relative to your enthusiasm for DXing and the need to meet other Deserving types face to face. Recently we heard from Janis and Garry Cameron at Port Alberni in British Columbia. While they belong to the

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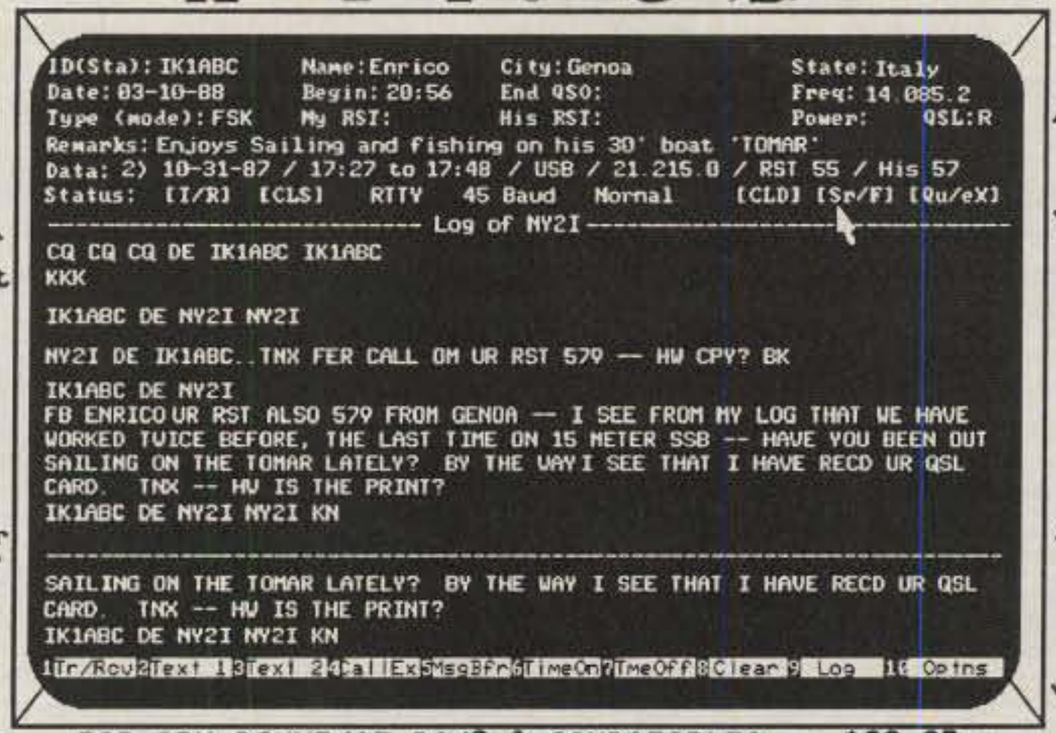

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TNC / XCVR Status

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- ... allows simultaneous use of Electronic Logbook (data entry/search) while using / reading data fron Transciever and All Mode Units.
- ... Automatically searches Logbook as soon as call is entered for duplicate. If duplicate is found, Computer beeps and the last previous information is filled in where appropriate (Name, City, State/Country and Remarks). Other data including number of times worked, dates, time on/off, mode, frequency used, signal exchange and remarks for each occurence is also shown in the Log area.
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CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. Total countries are now 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	K6EC	312	EA2IA	306	K8LJG	297	I8WY	286
K2FL	319	K4XO	311	K8PYD	305	WD9IIX	296	W1WAI	283
K4CEB	317	N6AR	311	N4KG	305	N5FW	294	W9SC	283
W6PT	316	DJ1XP	311	AB4H	304	W0HZ	293	G2GM	282
ON4QX	316	W6ID	311	W0IZ	303	K9BWQ	293	JH1VRQ	282
K9MM	316	DL3RK	311	WA8DXA	302	WD9IIC	292	K1VHS	282
N4PN	315	K9QVB	311	YU1HA	302	N5DX	291	WA4DAN	281
DL7AA	315	N4MM	311	YU2TW	301	WA4JTI	290	K2OWE	281
N6AV	315	OK1MP	310	I3OBO	301	KQ9W	290	N4AH	281
K6LEB	315	K1MEM	310	K3UA	301	IT9QDS	290	K7ZR	280
W1NG	315	DL1PM	310	W6SN	300	W1WLW	289	I5XIM	280
W8KPL	314	AA6AA	309	WB4RUA	300	W4BV	289	W2LZX	280
K6JG	314	DL8CM	309	W0SR	300	N8MC	289	W9NUF	280
K9AB	314	W9BW	309	DL6QW	300	K8NA	288	HB9AFI	279
N6CW	313	W9RY	308	W7CNL	299	W9WAQ	288	DL1QT	277
SM6CST	313	W4OEL	307	K3FN	298	W6YQ	287	KA3R	276
DL1PM	313	SM3EVR	307	K9IW	298	NN4Q	286	W6DN	276
W4BQY	312	N2KW	307	DJ7CX	297	K4CXY	286	K4SE	275
W2FXA	312	SM6CTQ	306						

SSB

N4JF	319	K9BWQ	314	K9IW	307	KB3OQ	300	JA5PUL	289
K2FL	318	W8JXM	314	W2FGY	307	VE4AT	300	W9TA	289
W6EUF	318	W8ILC	313	NJ2C	307	WZ4I	300	G4ADD	289
DJ9ZB	318	EA4LH	313	K3UA	307	WB5TED	300	KS0Z	289
W4NKI	318	W8PCA	313	KR9O	307	I2ZGC	300	AI9U	289
4Z4DX	318	N2SS	313	W8IMZ	307	WA2MID	300	KA3HXO	288
W0YDB	318	VE7WJ	313	K2JLA	307	NW5K	300	OK1AWZ	288
VE3MR	317	K4XO	313	W4UNP	307	WB6GFJ	300	WA6DTG	288
DL9OH	317	OE2EGL	313	N4KE	306	JH1VRQ	300	KI3L	287
I8AA	317	DL6KG	313	KC8EU	306	WA0TKJ	299	EA3KW	287
W4UG	317	F2MO	312	KB5FU	306	I6PLN	299	AB9E	287
W9DWQ	317	K8PYD	312	K8CMO	306	KA8T	299	W5LLU	287
I0ZV	317	W0SD	312	XE1OX	306	DJ7CX	298	G3XTT	287
VE1YX	317	K9RF	312	NY5L	306	K9SM	298	XE1MDX	287
DJ1XP	317	K4MQG	312	KE3A	306	I8LEL	298	PA0XPQ	287
ZS6LW	317	I8ACB	312	EA1QF	305	JH4PRU	298	N8BJQ	286
OZ3SK	317	K9HDZ	312	NA5W	305	EA9IE	298	N3ARK	286
KD8VM	317	LA7JO	312	KZ8Y	305	XE1NI	298	K9MNT	285
F9RM	317	LU3YL	312	PY2DBU	305	KC8YM	298	KB5RF	285
N4MM	317	W7FP	312	K8VFV	305	K5DUT	297	I8IGS	285
K6WR	317	N6OC	312	WB4UBD	305	HP1JC	297	KD8V	284
W4EEE	316	SM4CTT	312	K4RIG	305	YU7KV	297	KC2FC	284
I0AMU	316	W6DN	312	K9HQM	305	XE1OW	297	KC7EM	284
TI2HP	316	W4SSU	311	K8ZZU	305	K2JF	297	WB3HAZ	283
KS2I	316	K6EC	311	W6NLG	305	WB3GPR	296	VE3MV	283
YV1KZ	316	I4LCK	311	W6BCQ	304	KB3KV	296	IN3ANE	283
ZL1AGO	316	W0SR	311	WA4DAN	304	W4BQT	296	ZP5JCY	283
W9JT	316	K8NA	311	WB3DNA	304	I0SGF	296	K4JLD	283
VE3GMT	316	NJ0C	311	KB4HU	304	K8NWD	296	CX4HS	283
VE2WY	316	N6AHU	311	XE1KS	303	W0IYR	295	AE5B	282
W4DPS	316	N2KW	311	W2LZX	303	KK0C	295	AI9R	282
K6YRA	316	IV3YRN	310	KB0U	303	W6MFC	295	TG9EP	282
W3AZD	316	DK2BL	310	K0GT	303	KA9ABC	295	N1ALR	282
ZL3NS	316	AA6AA	310	K1MEM	302	VE3XO	295	F6BFI	281
OK1MP	316	WA4JTI	310	N5FG	302	W0ULU	295	K9TI	280
PY1APS	316	9H4G	310	W6FET	302	K4LR	295	ZL1BOQ	280
XE1AE	315	AB9O	310	I3OBO	302	WA2FKF	295	G4FAM	280
I8YRK	315	W7OM	310	K9UAA	302	I8ZTE	294	KU9Z	280
N6AR	315	W2CC	310	KP4EQF	302	WD0BNC	294	VE6PW	280
I4ZSQ	315	WA4WTG	310	AI8M	302	I5BDE	294	XE1XM	280
I8KDB	315	G4CHP	310	N5FW	302	K1VHS	294	WB6PSY	280
W9BW	315	WD8MGQ	310	I5EFO	302	WB3CQN	294	KB5DN	279
K9LKA	315	VE3MRS	310	KQ9W	302	SM6CST	294	EA6DE	279
N4WF	315	K1UO	310	I2MQP	302	W4UW	294	JH8NYK	279
K9MM	315	KU9I	310	K4CXY	302	KE4HX	294	KX5V	279
OZ5EV	315	W6SN	310	WD8PUG	302	K4SE	293	K4BYK	278
N7RO	315	N4PN	309	I8XTX	302	KC8JH	293	VE3IUE	278
W2SUA	315	ZL1BIL	309	WB4NDX	301	AI5I	293	KB8O	278
OE3WWB	315	WD9IIX	309	WA3HUP	301	W9NUF	293	KG9N	278
YU1AB	315	KB8DB	309	VE3FJE	301	G4GED	293	KB7VD	278
ON5KL	315	K9QVB	309	W8ILC/QRPp	301	KD5ZM	293	WB0UFL	277
CT1FL	315	VK4VC	308	W9OKL	301	WB6OKK	293	W4PTT	277
OZ8BZ	315	YV5AIP	308	YU2TW	301	WA4LOF	292	KB0SY	277
EA2IA	315	N6AV	308	N4CRU	301	AC0A	292	IK8BQE	277
K9AB	315	AI8S	308	KZ0C	301	VE3FEA	292	N0AMI	276
N6AW	315	N4KG	308	N8BKF	301	VP9CP	292	N7ASL	276
YV5DFI	314	I8KCI	308	KZ2P	301	W8LKG	292	WA4OPW	276
K6JG	314	I4EAT	308	WT4T	301	SV1JG	292	KC2RS	276
W0SFU	314	NS7Z	308	NN4Q	301	VE3DLR	292	WA9IVU	276
VE3XN	314	VE7DX	308	YV1AJ	301	WD9GQV	292	WA9RCQ	276
YS1RRD	314	VE4SK	307	K3LUE	301	VE3IPR	291	K0HQW	276
K8LJG	314	WB1DQC	307	K8ZZU	301	N5AWS	291	I8INW	275
W3GG	314	I0MBX	307	KB2HK	301	W4JFE	291	WB1EAZ	275
I2LLD	314	KV2S	307	K7LAY	301	DU9RG	291	VE7BSM	275
K5OVC	314	KB9OC	307	AG9S	301	XE1CI	291	VE5FX	275
W9SS	314	VK3JF	307	KB9KD	301	VE3CKP	290	KE4VU	275
W1NG	314	KZ2P	307	I1POR	300	N2CIC	290	N9CPW	275
W1LQQ	314								

Arrowsmith Radio Club in Port Alberni, they also travel 120 miles across the mountains to Vancouver for another club meeting. This is the Walter Percy Chrysler Club, and while it is primarily a car restoration club, the Camerons do meet a number of amateurs at the club meeting. That means a 240 mile round trip.

All this brought some thinking about Bruce Frahm, K0BJ, who lives out in western Kansas not too distant from the Colorado border. This is the mountainous part of Kansas, over 3000 feet in elevation, and some 400 miles west of the Kansas City DX Club of which K0BJ is a member. Sometimes Bruce goes even further than Kansas City to attend a club activity.

But one might wonder just what a "long" trip is for a DX meeting. In this area W6GO and K6HHD, Jay and Jan O'Brien, who publish the QSL Managers List, regularly travel around 125 miles each way to attend meetings of the Northern California DX Club. Even with freeways, that can be about three hours travel on each leg.

Somehow none of these long trips seem at times to be especially unusual. Possibly there are some who make such long trips just to be among other DXers. That does not seem to be an unknown need; DXers need other DXers. But we would like to hear of DXers who make long trips to attend club meetings.

Perhaps we will turn up some sturdy travelers on the DX trails. Maybe we will not hear anything at all. A year or so back we were talking about some who attained the DXCC Honor Roll at a very young and tender age. But by the time we mentioned the matter, those young and tender DXers had somehow turned into, well, let's say matured DXers—wide in girth, heavy with beard, and long in the tooth. So we asked for information on anyone who is both young and on the Honor Roll. Guess what return we got. Nothing!

All this rather confirmed our thinking that DXers tend to be durable—durable in QSOs, durable in their years. But the question as to who might be the youngest DXer presently on the Honor Roll is still unanswered. Certainly there must be someone on the Honor Roll younger than 40!

FA1/FB1

Work an FB1 and the question might be what rare DX it could be. The harder-to-work FA1 might also raise some questions. This one is harder because it is found only on 2 meters, being the area where the French novices might be found. The FB1s are a bit more likely to be heard outside France, they having A1A frequencies assigned in the CW bands on 40 through 10 meters plus A3 and the other modes on 10 above 28.4 MHz to 28.9 MHz. The FB1s have all the FA1 frequencies on 2 meters.

Having the ITU prefix allocations chart is often invaluable to the DXer. When a strange prefix shows, you can often figure out where it is from the prefix. It also helps to cull out some of Slim's activity when the prefix is for one country but Slim says he is operating from another. It is always better to have positive doubts on a possible rare one than to cling to wavering doubts. Knowing that Slim is not where he claims helps with the doubt problem.

This comes from Vincent LeCler in Fouville, not too far from Paris. Vincent notes that he finds *CQ* in the radio shops in Paris.

Vincent also notes that the new address for the REF QSL Service is: Service QSL, B.P. 2129, 37021 Tours Cedex, France.

CQ DX Awards Program

SSB

1599	JS1HEM	1601	YBØZEE
1600	KØPVI	1602	YU1HA

CW

722	K2FL	724	WD9GQV
723	JA6VI	725	N2KW

SSB Endorsements

310	N4JF/319	300	I8XTX/302
310	W4NKI/318	300	AG9S/301
310	WØYDB/318	300	KB2HK/301
310	4Z4DX/318	275	WB6OKK/293
310	N4MM/317	275	G4GED/293
310	VE2WY/316	275	WD9GQV/292
310	K9AB/315	275	N2CIC/290
310	EA2IA/315	275	KA3HXO/288
310	K9BWQ/314	275	KC2FC/284
310	W8JXM/314	250	W9SC/272
310	W6SN/310	250	EA4CQT/251
310	N2KW/311	200	JS1HEM/203
300	KE3A/306	200	YU1HA/220
300	KQ9W/302	200	W6TUI/200
28 MHz	AC3T	28 MHz	KØPVI
28 MHz	WB6PSY	28 MHz	EA4CQT
1.8 MHz	K3UA		

CW Endorsements

310	N4JF/319	300	EA2IA/306
310	K2FL/318	275	K9BWQ/293
310	K9AB/314	275	W9SC/283
310	N4MM/311	250	G3KMQ/264
310	DL1PM/310	200	AG9S/200
300	N2KW/307		

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.

5TØRIM

This operation was across the Easter weekend and from Tidra Island off the coast of Mauritania. There were a good handful of operations, including 5T5s HH, EV, CJ, DA, NU, PP, RA, and DX. The crew operated from 80 through 10 CW and SSB with 5T5CJ and 5T5DX handling most of the CW burden.

Tidra is about 115 miles north of Nouakchott and 5 miles off the coast there. You will find it at approximately 19°25′N and 17°25′W. QSLs go to W4JVU, who hopes that most everyone needing a 5TØRIM QSL remembers that the postage rates have gone up. But then again, considering how everyone seemed to rush to the post office and stand in long lines to gain the coveted 25¢ stamps, it might be difficult to believe that the word did not get around.

YB QSLs

YBØDPO sends along information on the quick and easy ways to QSL the YBs and maybe even the YCs. You can go via Dudy, YBØDPO, who handles the ORARI National QSL Bureau, or you can go to the individual handling the prefix.

Anyhow, here is the easy way to QSL your Indonesian contacts.

YB (all call areas): Dudy W. Ramli, YBØDPO, Box 96, Jakarta 10002.

YB1: Yohanes S., YC1BUY, Box 314, Bandung, Indonesia.

YB2: Hadi D., YB2BGZ, JL. Tanjung 11, Semarang, Indonesia.

YB4B–YB4E: Ghandi H., YC4BGH, Box 139, Jambi 36001, Indonesia.

YB4F (only): Abet S., YB4FNN, Box 78, Pangkal Pinang, 33101 Bangka Island, Indonesia.

YB4G–YB4R: M. Lubis, YC4BG, JL. Basuki Rakhmad 1027, Palembang 30126.

YB4S–YB4Y: Johny, YB4TE, Box 8/Tk Telukbetung, 35401 Lampung.

YB5A–YB5M: T. Effendi, YC5BEE, Box 190, Padang 35222, Indonesia.

YB5N–YB5Y: Rene D., YB5NDU, Box 392, CALTEX-DURI, Riau, Indonesia.

YB6: H.J. Fauzi, YB6MF, Box 666, Medan, 20112, Indonesia.

YB7A–YB7G: Chairil, YC7DF, Box 6, Sanggau, 78501, Indonesia.

YB7H–YB7Y: Frrianto, YB7UE, Box 6, Balikpapan, 76101, Indonesia.

YB8A–YB8U: Hans. Tular, YB8QD, Box 198, Menado, 95001, Indonesia.

YB8V–YB8Y: Martin, P.L., YB8VM, Box 29, Ambon, 97001, Indonesia.

YB9B–YB9F: Ketut. Y, YC9BEL, Box 434, Denpasar, Bali, 80001, Indonesia.

YB9G–YB9K: J. Widya, YB9LA, JL. Beringin 3, Kupang, Indonesia.

YB9V–YB9Y: J. Tobing, YC9VGJ, Box 79, Sorong 98401, Irian, Jaya.

YBØ: John T. Awuy, YBØHOB, Box 96, Jakarta, 10002, Jakarta.

The Return of the Woodpecker

Without a doubt there immediately will be some DXers who note that it never left. But maybe it is time to note that the U.S. Air Force, according to the Western Washington DX Club's *Totem Tabloid*, is giving you a choice. The testing is their own version of the Over-The-Horizon Backscatter radar system. Initial testing of a setup in Maine picked up a 26 foot cruise missile over 1800 miles distant.

Years back when the great step forward hit the amateur bands, after some of the outcry slowed a bit, some sources noted that the system needs spectrum where phone is the main usage. CW can provide some false readings on the radar return. The above system generally looks to operate in the 5–28 MHz range, and the operational control will be located at Mountain Home AFB in Idaho. There will be three transmitting antennas at Christmas Valley, Oregon and three 8000 square foot receiving facilities at Tulelake, California. But there is more to come. The above units should be under construction starting this spring with more being planned. These include one on Amchitka Island in the Aleutians with three more for installation on Guam. Other areas including the midwest and east coast will probably also see these installations.

The effect on amateur operations is probably only speculation until the units come on line. But often DXers have been noted as enjoying the speculation in anticipation of the good times to come, or maybe something even worse.

Some Hot Midsummer DX Notes

For cool DXers, naturally. KD7IK believes that amateur radio can be used to improve international relations. He maintains a weekly schedule with two English-speaking Russian stations and is looking to expand the circle of understanding. Skeds are Wednesdays at 0300Z with Gene, UA4RZ, in Kazan, and also Wednesday at 1700Z with Victor, UB5WE, in Lvov. Both schedules are at 14275 kHz. KD7IK and UB5WE are working on a plan for joint operations in the most difficult DXCC country in the USSR and the most difficult state in the U.S. Armenia (UG) is considered a possibility, and Victor is polling the locals to determine the most difficult state here. Put your money on the Dakotas or Wyoming—maybe even a parlay.

Roy Neal, K6DUE, whom you may have noted at times on TV network broadcasts, was a speaker at the Orlando Hamcation this year and noted that NASA scientists believe—at this point, anyhow—that this summer the sunspots might reach the highest count since 1957, possibly getting up into the 400 or above range. The *Balanced Modulator* of the North Florida ARS says to polish up your 10 meter gear and possibly even think of 6 meters. While some may gurgle in anticipation of a surfeit of sunspots, there have been some saying that after they get beyond something like the 200 mark, there is not the continued improvement that might be anticipated. Ah, but don't let that dismay you. Any DXer would rather have too many sunspots than too little. Most will just grit their teeth, grin, and bear it.

T53RC is a recent one from Somalia and QSLs to I2JSB. N1CIX was in Aruba last fall and will be there again signing P4ØP the third week in June from the 15th to the 22nd and will be in the All Asian Test. Naoki is also JH1VRQ and is at ARRL headquarters, where he is the source of valuable information on overseas operations should you be outbound. However, he is getting QSLs for stations other than P4ØP and P4ØM and knows nothing about them.

The spring planning for a possible Spratly operation was put on long hold when some of the claimants to the sacred ancestral Spratleys started shooting at each other. Vietnam is said to be occupying a number of the islands in the group; some say up to ten. But mainland China says that their long history shows that the Spratleys rightly belong to them. With things not quite placid, the planners tended to think that it was not the time to extend the precept of "International Goodwill Through DXing" and put the plans on hold. Some of the support, such as transportation, was to come from the Philippine Air Force, and the Philippines is also putting a claim on the Spratlys.

Father Moran, 9N1MM, will be in the states this fall, due to arrive along about September. A few years back when he was on a home visit he showed at a number of DX clubs around the country. If you get the chance to see Father Moran on this visit, don't miss it. This is one of the true living legends of amateur radio, one who has made Nepal available to DXers over the years.

Some will say that with the summer solstice behind us the Great Season of DXing is approaching, eagerly awaited every year with more trust and faith and anticipation than that of a small child at Christmas. And Frank Anzalone, W1WY, is still in there around the 4000 mark in his long list of contest activities. Never start a weekend without checking the W1WY contest list. But for those who delight in long anticipation, there was a report in *Inside DX* that when K9RHY was discussing the weather with RL8PYL, UL7PAE came up to advise that he would be leading a multi-single effort signing 3W8YL for the *CQ* WW in 1989. 3W8s have not been heard much in the last decade, but for those who might wonder, it's Vietnam. The on-

ly question is on what *CQ* World-Wide test? October or November, phone or CW? There is also mention in *Inside DX* of the rumor that UA9OBA would be on from 3W8 this fall with action also possible from XW.

The Colvins signed YB0AQL from Jakarta after their W6KG/4S7 Sri Lanka operation. They are back in the States now, being at the big DX gatherings and the International DX Convention in April. This time out they operated from Mexico (XE2GKG), Nepal (9N5QL), Sri Lanka (W6KG/4S7), and Indonesia (YB0AQL). They visited Bangladesh, Bhutan, and Burma, seeking operating permission with no success. They report hopefully that in S2, A5, and XZ they were not given outright refusals on licenses, getting "maybes" on future possibilities. The Colvins made strong efforts to present a good image of amateur radio, and they are determined to pursue those "maybes" in the future. Lloyd and Iris Colvin are a couple more of the legends of DXing. We have mentioned that before, but would again remind you that if you get the chance to see any of their DX programs or them in person, don't miss them.

QRZ DX notes that those 1X2 Russian callsigns are granted to WW II veterans who can drop the usual country identifier, or the second letter, in the call. 9L1GG will end his tour in Sierra Leone in August, but until his departure he will be found on 15 and 20 most days around 2100Z and 80 meters at 0600Z, down in the CW bands.

The effort headed by Jim Smith, VK9NS, on Baker/Howland made over 27,000 QSOs with conditions not always optimum. The activity included every band from 160 to 6 meters with one SSB contact made on 160 and 6 on 6 meter SSB. There were about 700 made on eighty, 3000 on 40, and large totals on 20/15/10. QSL both NO1Z/KH1 and VK9YL/KH1 to HIDXA, Box 90, Heard Island.

A61AB runs a schedule with GW3CDP. Look for them on Wednesdays after 1500Z in the vicinity of 14240 kHz. There was activity from Revillagigedo during the spring. The *DX Bulletin* notes that N6OND was there doing research and signing XE2HUM/XF4. The problem is that much of the operation was from aboard Skip's trimaran, and this counts for maritime mobile but not DXCC. There was some report of intention to operate ashore, but this one might be hard to get accepted. Chod Harris, VP2ML, who publishes the *DX Bulletin*, was at the International DX Convention adding to the Friday night conviviality, and a week later he was outside the DX Forum at Dayton. The local DX clubs are thinking of ordering a nameplate emblazoned "Convivial Chod."

KA3DBN reports from his KA3DBN/BV operation that ". . . IRCs are no good in Taiwan." This report is often heard and is 100 percent erroneous. A requirement of membership in the Universal Postal Union is that all members issue and accept the International Reply Coupon. The problem is that the word is not known in some local post offices. If a country does not join the Universal Postal Union, it cannot send mail beyond its own postal boundaries, as the UPU will not handle it.

73, Cass, WA6AUD

QSL Information

First, the bad news. N4RP/C6A is missing a shipment of QSLs forwarded from the Bahamas and put in the mails at Ft. Lauderdale in late January. The good news is that Dick says that if you have an overdue QSL from him, write to him at N4RP, Richard Phelps, Box 3073, Annapolis, Maryland 21403.

All of the following was compiled with help from Bob Truhlar, W9LNQ, who is always listening.

A61AB to F2CW '88 CB or OE6EEG
C53/DF3ZJ to DF3ZJ
DA?ER to W8IMZ
EI1000 to EI Bureau
FK8/DL4MDE to DL1MAM
GB4SPD to GI4YWT
GB75IOM to GD Bureau
ON9CDX to ON5NT
J37XD to W2GHK
PJ2/PA0VDV to PA0VDV
PJ4/K2NG to K2NG
PJ7J to K2KTT
SJ9WL to SM4FTF
T22JJ to JR2HCB
T22VU to DJ9ZB
T47DX to CO7KR
T53RC to I2JSB
V37XD to W2GHK
V31IEN to WA5Y
V47KLC to W2GHK
VI88VIC to VK3ER
VK9NF to DJ5CQ
XE2GCK to AA6EE
XE2HUM/XF4 to W6RQ
YB1AQC to W4FRU
YB0AQL to YASME
ZD7JD to KA1DE
ZK1AR (contest) to WB6HGH
ZL0AAA to DL1MAM
3D0 prefix to Swaziland
4K0E to UA1AFM
6D2DX to NI7Y
8P9EQ to VE2XB
8Q7/DA2ER to W8IMZ
GB4IMD to Cornish Radio Club, Box 100, Truro, Cornwell, Wales TR1 1AA
KH2A to Box 6488, Tamuning, Guam 96911
SV4AFY to Box 1232, Volos, Greece
3V1ALI to Braid Mollouecheche, B.P. 5114, Mahdia, Tunisia
5B4TI to Box 7121, Nicosia, Cyprus
6W1AD to Box 3204, Dakar, Senegal

5 Band WAZ No. 64

Geir Spachmo, LA6OT, hold in his hand what it takes to earn the 5 Band Award—QSL cards. A radio operator from Trondheim in northern Norway, Geir was first licensed in 1974. He holds 5 Band WAZ #64.

Geir Spachmo, LA6OT, in Trondheim, Norway, attained 5 Band WAZ #64 and brought some of the acquired skills of a professional radio operator to the task. First licensed in 1974, Geir is 35 years old, married with a young daughter, and holds a multitude of DX awards, including 5 Band DXCC #1079.

The gear line-up includes an FT901DM, an FT102, and a TL922 was added in the fall of last year. The antennas are a TH3 for the higher bands and dipoles for 40/80 meters. He is a member of the Trondheim DX Club and did attend Radio Officer School in Norway for two years.

Picking up the needed fillers on 80 meters was the tough ones. The fewer Geir needed the tougher they were. The last handful of zones needed on 80 were 23, 12, 6, 31, and 19. These are listed in the order they were caught. He holds the Norwegian Class "A" license.

Geir works both CW and SSB, jumps into the SAC CW test most years, and will not hesitate to pick up needed DX on nets, though he spends little time on these. The Trondheim DX Club is a small group, about 15 members, but interest is high.

At this time a look at W4KA's lists will show that the 5 Band WAZ does not come easily. It is always the mark of a top radio amateur when 5 Band WAZ is achieved, and LA6OT joins a select group who have. Always the best!

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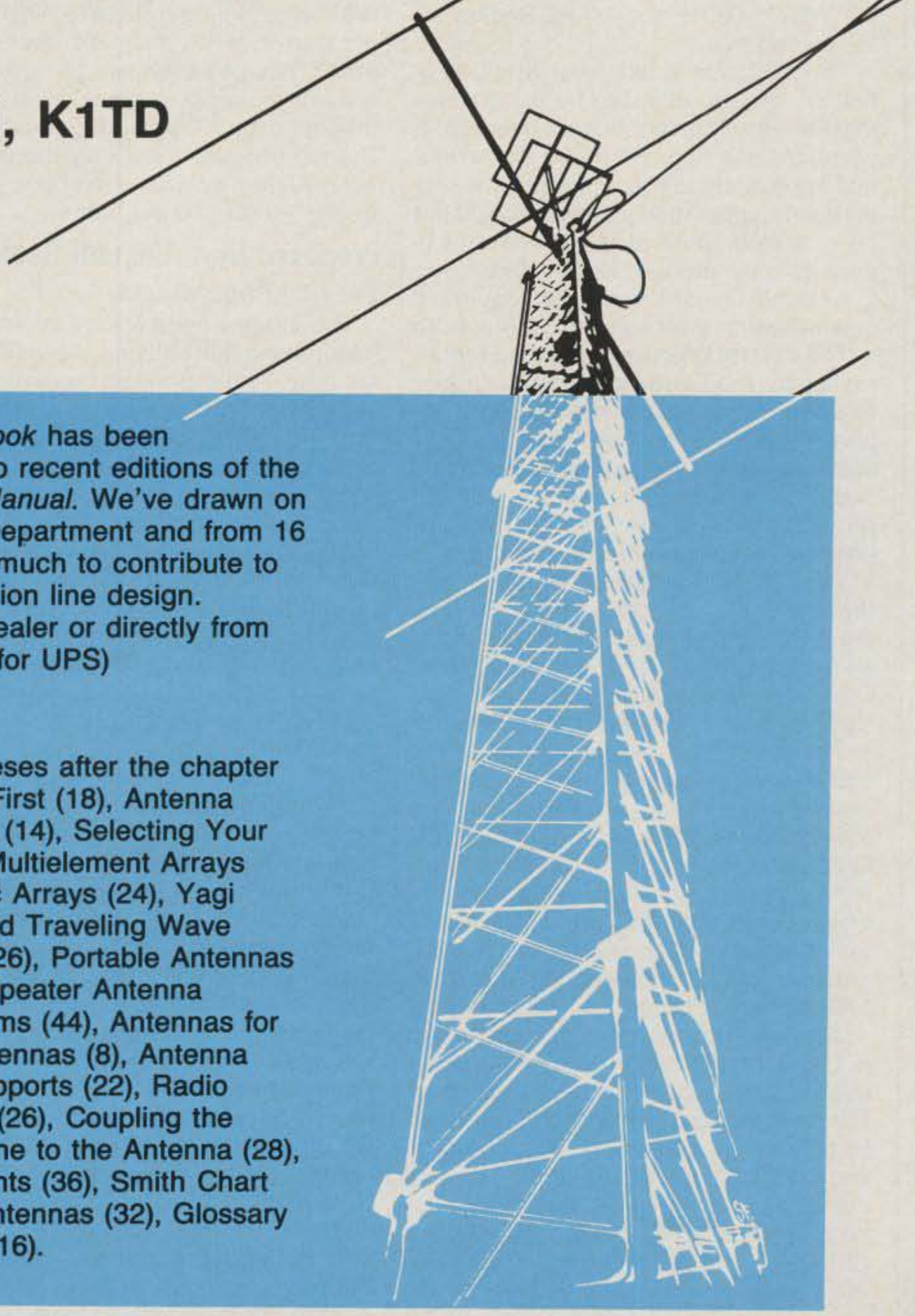

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CHAPTER LINEUP:

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ARRL 225 MAIN ST., NEWINGTON, CT 06111

CIRCLE 38 ON READER SERVICE CARD

Washington Readout

a monthly feature by
FREDERICK O. MAIA, W5YI

REGULATORY HAPPENINGS FROM THE WORLD OF AMATEUR RADIO

FCC Moves To Revoke VE, Applicant Licenses

The FCC has launched amateur radio license revocation proceedings against eleven amateur radio operators residing in Puerto Rico as a result of a continuing investigation into alleged schemes to obtain amateur radio operator licenses by fraudulent means. These probes involve the W5YI, ARRL, and MARS-Region 12 VEC programs.

"Show Cause, Suspension and Designation" orders, released by the government on May 3rd, require those accused, which include both volunteer examiners and applicants, to present evidence why their amateur station licenses should not be canceled. Their amateur operator licenses were ordered suspended effective May 28 unless a hearing is requested or written statement submitted to the FCC.

The Commission said that it had information that six Extra class level volunteer examiners may have plotted to assist applicants to obtain amateur radio operator licenses for which they were not qualified. The FCC charges that the VEs approved applications for amateur operator licenses under both the Novice and VE/VEC System programs when, in fact, the applicants had not been examined, or the VEs who certified the applications were not present at the test session. Other charges involve procuring false VEs and misrepresenting material facts.

The revocation proceeding does not come as a surprise. The FCC closely monitors pass rates of its amateur self-examining programs. At the Annual VEC Conference held at the FCC headquarters in Washington two years ago the Commission notified VE Coordinators that it was very concerned about the high amateur operator examination pass rates and self-testing programs in Puerto Rico.

At a time when the average expansion of U.S. amateur radio operators stood at about 3½% nationwide, the census of Puerto Rican amateur operators spiraled by about 50%. While four VEC programs were authorized, only three VEC groups actually coordinated amateur examinations in Puerto Rico—the W5YI-VEC, ARRL-VEC, and MARS-Region 12 VEC. Amid rumors of widespread irregularities, the VEC status of the MARS-Region 12 testing program was later canceled by the FCC "for failure to properly handle required VEC paperwork."

Last year in an unprecedented move, the FCC halted all VEC System testing in Puerto Rico and required the ARRL and W5YI amateur operator examination programs to recertify their volunteer examiners. "Those VEs whose performance is suspect should be dropped from accreditation," the FCC's Personal Radio Branch ordered. ". . . only those VEs in whose integrity you have absolute confidence" should be accredited.

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

Proposed New Amateur Radio Service Regulations

The long-awaited Notice of Proposed Rulemaking introducing new (Part 97) Amateur Radio Service regulations has been issued by the Federal Communications Commission. The new rules create a regulatory environment that encourages new techniques, technology, and uses of amateur radio.

The FCC avoided to the greatest extent possible placing detailed regulations, configurations, and operating parameters in the rules to allow the amateur service to branch out and follow an infinite number of paths. Only the very basic requirements are stated in the proposed rules.

The current Part 97 contains regulations that have been reworked many times over the past four decades. The new amateur radio guidelines are actually the first complete regulatory overhaul since the early 1950s, when hand-keyed Morse code and AM phone made up the majority of amateur transmissions. Today, amateur radio consists primarily of DX sideband, FM repeaters, and packet radio. Digital experimentation, communicating through amateur satellites, amateur television, and other new modes are becoming very popular with the amateur community and require the flexibility to develop.

The new Part 97 has been reorganized into six subparts and four appendices. Subpart A contains those rules concerned primarily with "License and Station Requirements." Subpart B organizes appropriate rules into groupings related to the five "Fundamental Purposes of the Amateur Service": Serving the public, Advancing the Radio Art, Advancing Skills, Training Operators, and International Goodwill.

Subpart C, "Station Operation Standards," is comprised of those principles that generally apply to all types of amateur station operation. Subpart D, "Special Operations," contains the requirements that apply only to nonstandard communications—such as beacons and repeaters, auxiliary operation, remote control of amateur stations and model craft, the Amateur-Satellite Service (AMSAT), and the Radio Amateur Civil Emergency Service (RACES). Subpart E contains the remaining "Technical Standards." Subpart F, "Qualifying Examination Systems," contains the requirements for the preparation and coordination of amateur radio operator examinations under the Novice and VE/VEC Systems.

The four appendices are: Appendix 1 lists the geographic areas where the amateur service is regulated by the Commission; Appendix 2 lists the volunteer-examiner coordinator (VEC) regions; Appendix 3 is a glossary of terms used in the proposed rules; and Appendix 4 is a summary of the frequency sharing requirements for the Amateur Radio Services stated in other FCC regulations.

The FCC seeks comments on NPRM Docket 88-139 from the public, the amateur community, and publishers/distributors of commercial versions of Part 97. The proposed new guidelines are just not a clarification of the existing Part 97. *There are many deregulated rules.* The Commission also included an extensive cross-reference table in the NPRM to make it easier to determine its previous and replacement rules.

The comment period closes on August 31, 1988. Reply comments must be received by October 31. The new proposed Part 97 (which ran to nearly 100 typewritten pages) has been typeset by the U.S. Department of Commerce. A highly condensed version appears in the *Federal Register* of April 19th. We have had several hundred booklets printed up detailing the complete new "Amateur Radio Service Regulations" and have reserved a quantity for *CQ* readers. Cost is $4.00 postpaid from: W5YI-VEC, P.O. Box #565101, Dallas, TX 75356-5101. Shipment is immediate.

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CIRCLE 31 ON READER SERVICE CARD

Transpolar Skitrek Reaches North Pole

Nearly two months after leaving Cape Arctic on the USSR's Severnaya Zemlyla, four Canadian and nine Russian skiers have reached the North Pole. They have skied over 600 miles to reach this, their first major objective on their journey to Canada's Cape Columbia on Ellesmere Island, another 500 miles away. The Skitrek, as it is being called, is a joint Soviet/Canadian expedition of human endurance aided by high technology. The ski junket from the USSR to Canada has never been accomplished before.

Throughout this long and hazardous journey, the skiers have been constantly in touch by amateur radio, which provides their safety and logistical lifeline with the outside world. Position reports are relayed to the skiers via amateur satellite UoSAT OSCAR-11's Digitalker on 2 meters (145.825 MHz) as it passes overhead. The positions are provided to OSCAR-11 by orbiting search-and-rescue satellites.

Several Canadian and Soviet dignitaries from Ottawa and Moscow flew to the North Pole to participate in a celebration. The official ceremony, lasting only about an hour, consisted of about 150 people, probably the largest gathering ever held at the Pole. No one knows for sure what time or day it took place since time and dates do not exist at the poles. Media coverage increased as Russian TV, CNN (the Cable News Network), and the CBC-TV (Canadian Broadcasting Company) covered activities live from the North Pole.

About 50 amateur radio QSOs using an ICOM-761 rig from a nearby Soviet floating scientific ice station (a skitrek radio control base) were made by UoSAT programmer Michael Meerman, G0/PA3BHF, who was flown to the pole by the USSR as a guest. The pile-up was enormous! Except for unexpected polar-bear tracks, there are no signs of life at the North Pole. The trekkers carry a rifle for protection.

The control station for the first part of the journey was located on Sridny Island where it was jointly manned by Leonid Labutin, UA3CR, and Rick Burke, VO1SA/UA0. Control has now been passed to North Pole 28, the floating Soviet scientific ice station near the pole. Canadian Barry Garratt, VE3CDX, using his USSR call sign 4K0DX, is working together with his USSR counterpart, 4K0DOC, at NP-28. Garratt had a close call when a large crack developed in the ice between his ICOM ham radio and its antenna. He had to cut the coax as his rig went in two directions. He was able to salvage his equipment. Control of the expedition will next be passed to Canada's Cape Columbia, where amateur station CI8C at Resolute Bay will assume the prime communications responsibility for the remainder of the trip.

The skiers, using EX0VE and CI8UA call signs, are using a crystal-controlled Soviet-built 10 watt sideband transceiver on two frequencies in the 20, 40, and 80 meter amateur bands powered by a 50 amp lithium battery pack. Amateurs and school children around the world have been following the Skitrek and monitoring its location as the UoSAT-OSCAR 11 with its talking computer orbits overhead.

International Packet Link To UK Formed

Long-distance digital message forwarding has been hampered by international regulations which affect the flow of packet radio messages. Strict third-party traffic regulations in the USA made it impossible to forward messages to or from the United Kingdom through the USA packet network.

Amateur satellite UoSAT OSCAR 11's onboard Digital Communications Experiment (DCE) had been rendered practically useless until the British government recently came to its rescue. UoSAT team members Jeff Ward, G0/K8KA, and Martin Sweeting, G3YJO, at the University of Surrey (England) contacted the UK Department of Trade and Industry (DTI) and asked their assistance. The DTI is the government agency regulating amateur radio in the U.K. They recognized the

UoSAT-2 DCE as an important communications experiment and granted the UoSAT DCE ground station the special callsign GB2UP.

The call-sign change allows United States AMSAT packeteers to take advantage of the limited third party agreement in effect between the USA and the United Kingdom. The treaty agreement allows third-party traffic to be passed to or from UK stations using callsign prefix "GB," *except those with "GB3."* Since the University of Surrey had the call sign GB3UP, its satellite-routed packet messages could not be transmitted to or from the United States until the call sign change. More than one megabyte of messages has now been passed to Great Britain from the USA packet network thanks to UK gateway station GB2UP and the British government.

The two amateur satellites capable of international packet message forwarding, UoSAT-OSCAR 11 and (Japanese) JAMSAT Fuji-OSCAR 12, were to be joined by Phase 3C OSCAR-13 in June. Phase 3C is a joint amateur radio project of the U.S. AMSAT-NA and West Germany's AMSAT-DL. The day of worldwide international packet message forwarding is here! We must be very careful to distinguish between acceptable international traffic and that which should be suppressed.

Newest OSCAR Ready For Launch

As we go to press, all is in readiness for the launch of AMSAT's Phase 3C satellite. The most powerful OSCAR ever built is scheduled to be hurled to orbit from the European Space Agency's Kourou, French Guiana launch site during early June. It may well be in orbit by the time you read this.

The launch vehicle will be an Ariane-4 rocket, the largest ESA has ever flown. This will be its 22nd flight and is designated V-22. The 300 pound AMSAT spacecraft, one of three satellite payloads on Ariane, will eventually operate from a high elliptical orbit completing just over two orbits of earth per day. About 30 days after launch and orbital insertion, Phase 3C will get its OSCAR-13 (Orbiting Satellite Carrying Amateur Radio) designator and will be placed in general amateur operation.

The new AMSAT satellite contains four separate transponders (space-based repeaters) covering frequencies in the 2 meter, 70 cm, 24 cm, and 13 cm bands (145 MHz to 2.4 GHz). A packet radio transponder is one of the four. One transponder will be capable of carrying more than 75 simultaneous QSOs. Another transponder uses FM and could be suitable for beaming bulletins to land-based VHF repeaters.

The satellite should operate for more than 5 years. Upgraded computer memory chips are "hardened" for the severe radiation encountered in orbit. This satellite is the third in the Phase 3 series. Phase 3B became AMSAT OSCAR-10 upon its successful launch in 1983.

Besides routine QSOs, Phase 3C will be used for so-called "Techno-Sport" activities. These on-air competitions emphasize technical skills and recognize superior ability with plaques and awards. The AMSAT "ZRO-Test" tests a stations' receive sensitivity by sending successively weaker signals from the satellite. The new "Sat-Fox Test" is a satellite version of fox-and-hound transmitter hunting. More Techno-Sports are in the planning stages.

AMSAT Phase 3C is a joint project of AMSAT North America and AMSAT-DL with additional contributions from other AMSAT-affiliated organizations. The project cost more than $400,000 US. Initial design of the Phase 3 generation of OSCARs began in the mid-seventies. AMSAT was founded in 1969.

From The Mailbag

Why can't permanent credit be given when an applicant passes an amateur radio operator examination element? The one-year (actually the rules state 365 days) time limit is an arbitrary time limit set by the FCC. The objective of the time limit is to add an added incentive for examinees to upgrade and to cut down on the record keeping required of volunteer examiners and VECs. It would be difficult to check on—or even remember—a completed examination many years after it was passed.

Where do I get IRCs? I understand the government issues them. IRCs (International Reply Coupons) prepay the basic first-class surface-mail postage from almost any nation. You send them to a foreign amateur station in order for the station to forward his QSL confirmation direct, rather than through a QSL bureau. "Bureaus" handle QSL cards in bulk to save postage, but it takes a long time—frequently years—to get that needed card! IRCs can be purchased at any post office and exchanged for local stamps by the DX station whose card you need. It takes from 2 to 5 IRCs to prepay airmail postage.

Most of what you pay for an IRC goes to the government as a service charge—not for postage. Effective April 3, IRCs cost 95 cents each from the U.S. Postal Service, although in the "secondary" market the cost is a lot less. This market is made by US DXers who receive the IRCs from foreign stations and then resell them. Current IRC price from other amateurs is around 50 cents each. Most DXers now use "green stamps" (dollar bills) and, less often, foreign stamps (also available from DX services) to prepay postage. Be careful, however, as not every foreign nation likes to have American currency in the possession of their citizens.

Contest Calendar

a monthly feature by
FRANK ANZALONE, W1WY

NEWS/VIEWS OF ON-THE-AIR COMPETITION

We always try to take advantage of major amateur radio conventions to award plaques won in our contests. With the huge attendance at the Dayton Hamvention last April, our representative Steve Bolia, N8BJQ, was able to award twelve 1986 World-Wide DX Contest plaques to stateside and DX winners. He also presented a number of WPX Contest plaques. Bob Cox, K3EST/6, took care of a half dozen or more at the Visalia DX meeting.

We have made good progress in cleaning up the backlog of awards prior to 1986. A few are still being held up because we have not been able to locate the winners. Inquiries about awards prior to 1986 should be addressed to me.

Our World-Wide Contest program was probably the first one to award trophies. Bill Leonard, W2SKE, and Larry LeKashman, W2AB (W2IOP/W9IOP), started the sponsorship back in the late 1950s. Over the years the sponsorship has ballooned to over 80 each year, making participation in the World-Wide Contest very competitive.

Other *CQ*-sponsored contests—especially the very popular WPX and 160 Meter Contests—also have a large selection of awards. In recent years the VHF and RTTY Contests have been well supported by eager trophy donors.

I still remember the familiar "loving cups" we orginally used for trophies. I took several of those to Caracas back in 1965 for a presentation to members of the Radio Club Venezolano, celebrating their big victory in the World-Wide Contest the previous year. And I'll never forget the problem I had meeting John Devoldere, ON4UN, at the airport in Amsterdam to give him his cup. *(He now uses it for a hat rack. Hi, John.)*

A few years later we got real classy and made our trophies pewter bowls and trays, collectors' items now. They became too costly, however, and we switched over to the more practical plaques we are now using. Some day I will have to review our experience in issuing certificates. That's a story in itself.

There has been no word from the SEANET contest usually held on the third weekend of July.

A "flash" announcement from Caracas stated that members of the Radio Club Venezolano are planning an expedition to the Los Monjes Islands on July 14–17 in celebration of the 165th anniversary of the Venezuelan Navy. The call will be YY5-M, and it might add a new island to the IOTA list used by the RSGB. *(See listing in this column for more detailed information.)*

The usual announcement: Deadline for October announcements is July 15th, and August 15th for November events. Send them to my home address, please.

73 for this time, Frank, W1WY

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

*	July	1	Canada Day Contest
	July	2-3	Venezuelan SSB Contest
*	July	2-3	Colorado 6 Meter Contest
	July	9-10	IARU HF World Championship
	July	10	ARCI QRP CW Sprint
	July	14-17	Los Monjes Is. Expedition
	July	16-17	FADCA VHF Packet QSO Party
	July	**16-17**	**CQ WW WPX VHF Contest**
	July	16-17	AGCW-DL QRP CW Contest
	July	16-17	Colombian Contest
	July	30-31	Venezuelan CW Contest
	July	30-31	FADCA HF Packet QSO Party
	July	30-31	Florida QSO Party
	Jul.30	-Aug.1	MARC County Hunters CW
	Aug.	6	YLRL YL/OM SSB Sprint
	Aug.	6-7	ARRL UHF Contest
	Aug.	13-14	European CW Contest
	Aug.	14	ARCI QRP SSB Sprint
	Aug.	20-22	New Jersey QSO Party
	Aug.	27-28	All Asian CW Contest
	Sept.	7-9	YLRL "Howdy Days"
	Sept.	10-11	European SSB Contest
	Sept.	**24-25**	**CQ WW DX RTTY Contest**
	Sept.	25-26	Classic Radio Exchange
	Oct.	1-2	VK/ZL/Oceania SSB Contest
	Oct.	1-2	Fernand Raoult F9AA Cup
	Oct.	8-9	VK/ZL/Oceania CW Contest
	Oct.	8-9	IRSA Radiosporting Contest
	Oct.	8-9	Pennsylvania QSO Party
	Oct.	**29-30**	**CQ WW DX SSB Contest**
	Nov.	11-13	Japan International DX
	Nov.	12-13	European RTTY Contest
	Nov.	**26-27**	**CQ WW DX CW Contest**

** Covered last month.*

Venezuelan Contest

SSB: July 2–3 CW: July 30–31

This is the 27th annual contest celebrating Venezuela's independence. It's a world-wide-type contest. Therefore, do not confine your activity to working YVs only. Working other DX is encouraged.

Use all bands, 10–160 meters (no WARC bands).

There are four classes: single operator, single and all band, and multi-operator, single and multi-transmitter. (No limit to transmitters, but only one signal per band.)

The exchange and scoring format has been changed from that used in previous years.

Exchange: RS(T), QSO number, and CQ Zone (i.e., 59-035-14).

Points: Contacts between stations in the same country, 1 point. Between stations in different countries but the same continent, 3 points. Between stations on different continents, 5 points.

Multiplier: One for each YV call area, one for each different CQ Zone, and one for each different country worked on each band (including own).

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

Awards: A plaque to the highest scorer in each class and special certificates to stations meeting the following: in the phone contest—work 15 YV stations and 30 different countries; in the CW contest —5 YVs and 30 different countries.

Use a separate log sheet for each band. Each YV call area (9), each CQ Zone (40), and each country (DXCC list) should be indicated in a separate column only the first time they are worked on each band.

Include a summary sheet showing the scoring, your name and address in block letters, and the usual signed declaration that all contest rules and regulations for amateur radio in the country of the contestant have been observed.

Include $2.00 US or 6 IRCs to cover cost of mailing and processing of any awards.

Mailing deadline is September 15th for SSB entries and October 15th for CW. They go to: Radio Club Venezolano, Concurso Independencia, P.O. Box 2285, Caracas 1010-A, Venezuela.

IARU HF Championship

1200Z Sat. to 1200Z Sun., July 9–10

This is the third annual IARU World HF Championship. All six bands, 10 through 160 meters, and the full 24 hours may be used by both single and multi-operator stations. (No WARC bands.)

Categories: Single operator, CW only, phone only and mixed modes. Multi-operator, single transmitter, mixed mode only. Must remain on a band for at least 10 minutes at a time. (Exception: Only IARU member-society HQ stations may operate simultaneously on more than one band with one transmitter on each band/mode.)

Exchange: RS(T) and ITU zone. HQ stations, RS(T), and official society abbreviation.

uniden®

$12,000,000 Scanner Sale

Uniden Corporation of America has purchased the consumer products line of Regency Electronics Inc. for about $12,000,000. To celebrate this purchase, we're having our largest scanner sale in history! Use the coupon in this ad for big savings. Hurry...offer ends July 31, 1988.

★★★ MONEY SAVING COUPON ★★★

COUPON COUPON

Get special savings on the scanners listed in this coupon. This coupon must be included with your prepaid order. Credit cards, personal checks and quantity discounts are excluded from this offer. Offer valid only on prepaid orders mailed directly to Communications Electronics Inc., P.O. Box 1045 – Dept. UNI2, Ann Arbor, Michigan 48106-1045 U.S.A. Hurry... coupon expires July 31, 1988. Coupon may not be used in conjunction with any other offer from CEI. Limit one coupon per scanner. Add $7.00 for shipping in the continental U.S.A.

Regency TS2-SA2 .....$269.95
Regency TS1-SA2 .....$199.95
Regency INF1-SA2 .....$139.95
Regency INF2-SA2 .....$159.95
Regency INF3-SA2 .....$119.95
Regency INF5-SA2 .....$109.95
Bearcat 200XLT-SA2 ...$262.95
Bearcat 100XLT-SA2 ...$189.95
Bearcat 800XLT-SA2 ...$249.95
Bearcat 210XLT-SA2 ...$177.95
Bearcat 70XLT-SA2.....$154.95

★★★★ VALUABLE COUPON ★★★★

NEW! Bearcat® 760XLT-SA3

List price $499.95/**CE price $279.95/SPECIAL**
12-Band, 100 Channel • Crystalless • AC/DC
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The *Bearcat* 760XLT has 100 programmable channels organized as five channel banks for easy use, and 12 bands of coverage including the 800 MHz. band. The *Bearcat* 760XLT mounts neatly under the dash and connects directly to fuse block or battery. The unit also has an AC adaptor, flip down stand and telescopic antenna for desk top use. 6-5/16" W x 1⅝" H x 7⅜" D. Model **BC 580XLT-SA** is a similar version without the 800 MHz. band for only $219.95.

SALE! Regency® TS2-SA

List price $499.95/**CE price $309.95/SPECIAL**
12-Band, 75 Channel • Crystalless • AC/DC
Frequency range: 29-54, 118-175, 406-512, 806-950 MHz.
The *Regency* TS2 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Aeronautical AM band, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The *Regency* TS2 features new 40 channel per second *Turbo Scan*™ so you wont miss any of the action. Model **TS1-SA** is a 35 channel version of this radio without the 800 MHz. band and costs only $239.95.

Regency® RH256B-SA

List price $799.95/**CE price $329.95/SPECIAL**
16 Channel • 25 Watt Transceiver • Priority
The *Regency* RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A *60 Watt* VHF 150-162 MHz. version called the **RH606B-SA** is available for $429.95. A UHF 15 watt, 10 channel version of this radio called the **RU150B-SA** is also available and covers 450-482 MHz. but the cost is $419.95.

★★★ Uniden CB Radios ★★★

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

PRO310E-SA *Uniden* 40 Ch. Portable/Mobile CB ... $85.95
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B-10-SA 1.2V AA Ni-cad battery for Ninja (set of 10) ... $20.95
KARATE-SA *Uniden* 40 channel rescue radio $69.95
PRO510XL-SA *Uniden* 40 channel CB Mobile $49.95
PRO520XL-SA *Uniden* 40 channel CB Mobile $59.95
PRO540E-SA *Uniden* 40 channel CB Mobile $119.95
PRO640E-SA *Uniden* 40 channel SSB CB Mobile ... $159.95
PRO710E-SA *Uniden* 40 channel CB Base $119.95
PRO810E-SA *Uniden* 40 channel SSB CB Base ... $179.95

★★★ Uniden Radar Detectors ★★★

Buy the finest *Uniden* radar detectors from CEI today.
RD7-SA *Uniden* visor mount radar detector $109.95
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RD25-SA *Uniden* visor mount radar detector $59.95
RD500-SA Uniden visor mount radar detector $79.95

NEW! Bearcat® 200XLT-SA

List price $509.95/**CE price $299.95**
12-Band, 200 Channel • 800 MHz. Handheld Search • Limit • Hold • Priority • Lockout
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The *Bearcat* 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 20 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz. band and 100 channels, order the **BC 100XLT-SA3** for only $199.95. Includes antenna, carrying case with belt loop, ni-cad battery pack, AC adapter and earphone. Order your scanner now.

Bearcat® 800XLT-SA

List price $549.95/**CE price $259.95/SPECIAL**
12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC
Bands: 29-54, 118-174, 406-512, 806-912 MHz.
The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½." If you do not need the 800 MHz. band, a similar model called the **BC 210XLT-SA** is available for $196.95.

Bearcat® 145XL-SA

List price $189.95/**CE price $98.95/SPECIAL**
10-Band, 16 Channel • No-crystal scanner Priority control • Weather search • AC/DC
Bands: 29-54, 136-174, 406-512 MHz.
The *Bearcat* 145XL is a 16 channel, programmable scanner covering ten frequency bands. The unit features a built-in delay function that adds a three second delay on all channels to prevent missed transmissions.

Bearcat® 175XL-SA

List price $279.95/**CE price $156.95/SPECIAL**
11-Band, 16 Channel • Weather Search Priority control • Search/Scan • AC/DC
Bands: 29-54, 118-174, 406-512 MHz.
The *Bearcat* 175XL has an automatic search feature to locate new frequencies. Priority, lock out, delay and scan speed are all included.

Regency® Informant™ Scanners

Frequency coverage: 35-54, 136-174 406-512 MHz.
The new *Regency* Informant scanners cover virtually all the standard police, fire, emergency and weather frequencies. These special scanners are preprogrammed by state in the units memory. Just pick a state and a category. The Informant does the rest. All Informant radios have a feature called *Turbo Scan*™ to scan up to 40 channels per second. The **INF1-SA3** is ideal for truckers and is only $179.95. The new **INF2-SA3** is a deluxe model and has ham radio, a weather alert and other exciting features built in for only $219.95. For base station use, the **INF5-SA3** is only $129.95 and for those who can afford the best, the **INF3-SA3** at $149.95, is a state-of-the-art, receiver that spells out what service you're listining to such as Military, Airphone, Paging, State Police, Coast Guard or Press.

Regency® HX1500-SA

List price $369.95/**CE price $179.95/SPECIAL**
11-Band, 55 Channel • Handheld/Portable Search • Lockout • Priority • Bank Select Sidelit liquid crystal display • EAROM Memory Direct Channel Access Feature • Scan delay
Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz.
Scan up to 55 channels at the same time. Includes belt clip, flexible antenna and earphone.

BC760XLT
800 MHz. mobile scanner
Only $279.95

★★★ Uniden Cordless Phones ★★★

A major consumer magazine did a comparison study on cordless phones. The check points included clarity, efficiency and price. *Uniden* was rated best buy.
XE700-SA *Uniden* Cordless Phone with speaker ... $114.95

★★★ Extended Warranty Program ★★★

If you purchase a scanner, CB, radar detector or cordless phone from any store in the U.S. or Canada within the last 30 days, you can get up to three years of extended warranty service from Warrantech. This service extension plan begins *after* the manufacturer's warranty expires. Warrantech will perform all necessary labor and will not charge for return shipping. Extended warranties are non-refundable and apply only to the original purchaser. A two year extended warranty on a mobile or base scanner is $29.99 and three years is $39.99. For handheld scanners, 2 years is $59.99 and 3 years is $79.99. For radar detectors, two years is $29.99. For CB radios, 2 years is $39.99. For cordless phones, 3 years is $34.99. Order your warranty for your merchandise today.

OTHER RADIOS AND ACCESSORIES

HR-2510-SA *Uniden* 25 Watt 10 meter Ham radio ... $239.95
BC 55XL-SA *Bearcat* 10 channel scanner $114.95
BC 70XLT-SA *Bearcat* 20 channel scanner $169.95
***NEW!* BC 560XLT-SA** *Bearcat* 16 channel scanner ... $98.95
MT5100 PLUS-SA *Regency* marine transceiver ... $134.95
MT5500 PLUS-SA *Regency* marine transceiver ... $159.95
R1090-SA *Regency* 45 ch. scanner $119.95
Z60-SA *Regency* 60 ch. scanner ... **CLOSEOUT** $129.95
UC102-SA *Regency* VHF 2 ch. 1 Watt transceiver ... $117.95
BPS5-SA *Regency* 16 amp reg. power supply $169.95
MA549-SA Drop-in charger for HX1200 & HX1500 ... $84.95
MA518-SA Wall charger for HX1500 scanner $14.95
MA553-SA Carrying case for HX1500 scanner $19.95
MA257-SA Cigarette lighter cord for HX12/1500 ... $19.95
MA917-SA Ni-Cad battery pack for HX1000/1200 ... $34.95
BP205 Ni-Cad battery pack for BC200/BC100XLT ... $49.95
B-8-SA 1.2 V AA Ni-Cad batteries (set of eight) $17.95
FB-E-SA Frequency Directory for Eastern U.S.A. $14.95
FB-W-SA Frequency Directory for Western U.S.A. ... $14.95
ASD-SA Air Scan Directory $14.95
SRF-SA Survival Radio Frequency Directory $14.95
TSG-SA "Top Secret" Registry of U.S. Govt. Freq. $14.95
TIC-SA Techniques for Intercepting Comm. $14.95
RRF-SA Railroad frequency directory $14.95
EEC-SA Embassy & Espionage Communications ... $14.95
CIE-SA Covert Intelligenct, Elect. Eavesdropping ... $14.95
MFF-SA Midwest Federal Frequency directory $14.95
A60-SA Magnet mount mobile scanner antenna ... $35.95
A70-SA Base station scanner antenna. $35.95
USAMM-SA Mag mount VHF ant. w/ 12' cable. $39.95
USAK-SA ¾" hole mount VHF ant. w/ 17' cable. $35.95
USAK450-SA ¾" hole mount UHF ant. w/ 17' cable ... $35.95
Add $3.00 shipping for all *accessories* ordered at the same time. Add $7.00 shipping per radio and $3.00 per antenna.

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CIRCLE NO. 114 ON FREE INFORMATION CARD

The annual meeting of the Bavarian Contest Club (January 6, 1988). Upper row, left to right: DJ4YS, DL7MAT, DL4NAC, DF7RX, DF9RB, DF4TD, DL6RAI, DF3CB, DL4MCF, DL5RBW, DL3MBG. Second row: DL3MAA, DH5MBB, DJ1US, DF7MV, DF6RI, DJ5VH, DK2OY, DK6NP, DK8MZ, DK3GI, DK6WL, DJ3TF, DL9RDG, DL9RAK. Seated: DL2NBU, DL5MAE, DF2RG, DL1MAJ, HS0A/DL, DF5RA, DL7MAE, DL3NBL, DL7AV, DL8NBJ, DJ5CQ. (Photo via DL6RAI)

Points: Contacts within own zone or with an HQ station, 1 point. Contacts within own continent but different zone, 3 points. Contacts with different continents, 5 points.

Multiplier: Total number of ITU zones plus IARU HQ stations worked on each band. (Note: HQ stations do not also count for zone multipliers.)

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 category, in each state, each ITU zone, and each DXCC country. In addition, achievement awards will be issued to those making at least 250 QSOs or having a multiplier of 50 or more.

Entries with more than 500 QSOs are required to include a dupe sheet with their log. A three QSO reduction will be assessed for each duplicate QSO for which credit has been taken. Disqualification may occur if the overall score is reduced by 2% or more.

It is recommended that you check *QST* (April 1988 issue) for more detailed information. A large SASE with 2 units of first-class postage or 2 IRCs will get you official forms and a ITU zone/prefix/continent map.

Mailing deadline for entries is August 10th to: IARU Secretariat, Box AAA, Newington, CT 06111 USA.

ARCI QRP CW Sprint

2000Z to 2400Z Sunday, July 10

This one is entitled the "Summer Homebrew Sprint," and like other ARCI Sprints it is only 4 hours long.

Exchange: RST and state, province, or country. ARCI members will include their membership number; non-members their power output. (Use "HB" or "C" to indicate if gear is homebrew or commercial.)

Points: Contacts with members 5 points, non-members 2 points, 4 points if in a different continent. Add 5 points if station worked is "HB."

Multiplier: State, province, or country worked on each band.

Power Multiplier: 4 to 5 watts output ×2; 3 to 4 watts ×4; 2 to 3 watts ×6; 1 to 2 watts ×8; less than 1 watt ×10. Over 5 watts check log only.

Power Supply Multiplier: Battery power × 1.5. Solar/natural or battery charged by solar/natural ×2.

Homebrew Bonus: If units used are "HB," add following bonus to final score on each band—transmitter 200, receiver 300, and transceiver 500 points.

Final Score: Total QSO points × QTH multiplier × power multiplier × power supplier multiplier + bonus points.

Frequencies: 1810, 3560, 3710, 7040, 7110, 14060, 21060, 21110, 28060, 28110, 50060 kHz.

Awards: Certificates to the top three overall scorers, and to the top scorers in each state, province, and country in each class with two or more entries. (Entries may be single band or all band.)

Include a summary sheet showing the scoring and other essential information with your log. Sample log forms are available from K5VOL. A copy of the results is also available. Include a large SASE for either request.

Mailing deadline is 30 days following the end of the contest to: Red Reynolds, K5VOL, 825 Surryse Road, Lake Zurich, IL 60047.

Los Monjes Island Expedition

0000Z Thur., Jul. 14 – 2400Z Sun., Jul. 17

The Venezuelan Navy, in honor of its 165th anniversary and to call worldwide attention to the Los Monjes Archipelago, will hold this special event from "Monje Sur" in the Gulf of Venezuela using the special prefix YY5-M in collaboration with the Venezuelan Radio Club, Club DX, and the Association of Radioaficionados of Venezuela.

Bands: Six bands from 10 to 160 meters.

Modes: SSB, CW, and RTTY.

Awards: Awards will be presented to those stations who contact YY5-M in four of the six previously mentioned bands, in whichever mode, including mixed. First place receives a bronze relief of the Archipelago, second and third receive trophies, fourth and fifth plaques, and diplomas to those others who establish contact on the four bands.

Only for Venezuelan (YV) stations: The first five Venezuelan stations who contact YY5-M in four bands in whichever of modes SSB, CW, RTTY, or Mixed will receive 1000 personalized QSL cards.

Rules: Contacts will be confirmed through receipt of the QSL cards. To receive the awards, final date of acceptance of the QSL cards is September 30, 1988. Cards should be sent to the IARU Bureau of Venezuela at the following address: Radio Club Venezolano, P.O. Box 2285, Caracas 1010-A, Venezuela.

CQ WW VHF WPX Contest

0000Z Sat. to 2400Z Sun., July 16–17

This is the fourth annual World-Wide

WPX VHF Contest. Complete and detailed rules can be found in the May issue, but will be reviewed here briefly. However, I strongly recommend that you refer to the May issue for detailed information.

Bands: All VHF bands, 6 meters through 23 cm, may be used. And 50, 70, 144, 220, 432, 902, and 1296 MHz.

Classes: 1. Single Operator (a) all band, (b) single band, (c) all band low power, (d) single band low power (30 watts PEP). 2. Multi-operator (a) all band, (b) single band. 3. Portable (temporary power source only). 4. FM only.

Exchange: Call sign and grid square (4 digits—e.g., FN20). Signal report optional.

Scoring: One point per QSO on 50, 70, and 144 MHz. Two points on 220 and 432 MHz. Four points on 902 and 1296 MHz. Stations may be worked once per band regardless of mode.

Multiplier: Number of prefixes worked, additive on a band-to-band basis.

Final Score: Total QSO points times the sum of different prefixes worked on each band.

A prefix is considered to be the three letter/number combination which forms the first part of the call sign—i.e., N1, W2, WB3, AA6, 4X4, Y32, etc. A station in a call area different from that indicated in the call is required to sign portable. The location of the portable determines the prefix.

Awards: A large selection of certificates and plaques will be awarded in each class in all major geographic areas, North America, Europe, and Japan. (US states, Canadian provinces, European countries, and Japan call areas.) Additional areas will be considered as returns justify.

Logs must be posted no later than August 31 and this year go to: CQ VHF WPX Contest, c/o SCORE, P.O. Box 1325, Eatontown, NJ 07724. They can also be sent to: *CQ*, 76 N. Broadway, Hicksville, NY 11801.

AGCW-DL QRP CW Contest

1500Z Sat. to 1500Z Sun., July 16–17

This is the summer edition of this CW-only contest. The same station may be worked on each of the six bands, 10 through 160 meters.

There are five classes: (A) 3.5 watts or less input; (B) 10 watts or less for single operators; (C) 10 watts or less for multi-operators; (D) QRO stations, over 10 watts input, may work only QRP stations; (E) SWLs. Class C may operate the full 24 hours. Others must take a 9 hour break in two segments.

Exchange: RST, QSO no., and power input (i.e., 559001/5, 579001/QRO). Add "X" if using crystal control.

Scoring: QSO within own country, 1 point. Other stations in own continent, 2 points. DX outside own continent, 3 points. Double points if using crystal control.

Multiplier: One for each DXCC country and one for each DX station worked. Call areas in JA, PY, VE, W, and ZS count as separate multipliers.

Final Score: Total QSO points times the multiplier as indicated. Sum of results from each band.

Awards: Certificates to the first three places in each class and each band.

Use a separate log sheet for each band and include a summary sheet showing the scoring, name and address, and other essential information. Sample log forms are available from DK9FN (1 IRC with your request).

Mail logs within 6 weeks of the end of the contest to: Siegfried Hari, DK9FN, Spessartstrasse 80, D-6453 Seligenstadt, West Germany. (Include 1 IRC for copy of the results).

Colombian Contest

0000Z Sat. to 2400Z Sun., July 16–17

This is still a world-wide-type contest. Use all bands, 1.8 through 28 MHz. Phone only or CW only.

Classes: Single operator, single and all band. Multi-operator, single and multi-transmitter.

Exchange: RS(T) and 178 for HK stations (178th year of Colombian indepen-

dence). RS(T) plus a QSO no. starting with 001 for all others.

Scoring: *For non-HKs*—QSOs with HKs 10 points; with other countries 5 points, with own country 1 point.

For HKs—QSOs with other countries 10 points; with HKs 5 points.

Multiplier: Number of different countries and HK call areas worked on each band.

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

Awards: Certificates to each station showing a minimum of 50 contacts, at least 10 of which are HKs on SSB and 5 if on CW. Plaques to the overall winning HK and non-HK in each class and each mode. Also for HKs in each call area.

Use a separate log sheet for each band. Indicate the multiplier in a separate column only the first time it is worked on each band. A summary sheet showing the scoring and other essential information, and the usual signed declaration, is also requested.

Disqualification rules regarding taking credit for duplicate contacts, violation of rules and regulations, etc., will be strictly enforced.

Mailing deadline is August 15th to: LCRA Contest Committee, Apartado Aereo 584, Bogota, Colombia.

FADCA Packet QSO Party

VHF: July 16–17 HF: July 30–31
0000Z Saturday to 2400Z Sunday

This is not only a new one, but also a new type mode contest sponsored by the FADCA. The purpose is to encourage keyboard packet operation and contact "live" packeteers in Florida.

Florida stations may work both in-state and out-of-state stations. Others work Floridians only. Operation is limited to 36 out of the 48-hour contest period each weekend. Single operator, except for club stations, where members may operate one at a time with no assistance.

Exchange: First name and QTH. County for FL; state, province, or country for others.

Points: One point per QSO on each band.

Multiplier: FL counties, states, VE provinces, and DX countries worked for Florida stations. FL counties for others.

Scoring: Total QSO points times the sum of the multiplier. Score HF and VHF separately; add total scores for combined HF/VHF.

Frequencies: HF—3615, 7068, 10145, 14115, 21115, 28115 (LSB). VHF—144.91–145.09. FL stations limit first hop to a radius of 50 miles unless there is no network entry point closer.

Awards: Certificates to top scorers in Florida and out-of-state. HF, VHF, combined HF/VHF, Novice, and most FL counties. (Results will be published in the *FADCA-Beacon* magazine.)

No means of communication other than packet may be used to solicit QSOs during the contest. Use of BBSs for any purpose related to the contest is prohibited.

Include a summary sheet showing the scoring and name and address, including FL county. Log forms are available from FADCA (include a large SASE).

Logs must be received no later than September 1st by: FADCA, 812 Childers Loop, Brandon, FL 33511.

Florida QSO Party

1400Z Sat. to 2100Z Sun., July 30–31

The 22nd Florida QSO Party has been rescheduled to a later date this year and is sponsored by the West Palm Beach ARC in conjunction with *Florida Skip*.

Phone and CW are separate contests and require separate logs. The same station may be worked on each band and each mode, and FL stations may contact other FL stations but for QSO points only.

Classes: Florida stations are divided into two classes: A—Portable and mobile operating outside own county using emergency power of 100 watts or less output. B—All other single and multi-operator stations.

Exchange: RS(T) and QTH. County for FL. US state, VE province, or DX country for others.

Scoring: *For Florida*—One point per QSO. Multiply total by sum of states (49), VE provinces (12), and DX countries (maximum of 47) worked (maximum multiplier of 88). Class A stations multiply total by 1.5 for final score.

Out-of-state—Two points for each FL contact. Multiply total by FL counties worked (maximum of 67).

Frequencies: CW—3725, 7125, 14055, 21150, 28150 kHz. Phone—3945, 7279, 14279, 21379, 28479 kHz.

Awards: Certificates, both phone and CW, to the top single operator score in each state, province, DX country, and FL county. Also to the top Novice CW score in each state. Multi-operator winners will receive certificates as activity justifies. There are three plaques for Florida stations—winning single operator on CW and on phone, and club with highest aggregate score.

There is the usual disqualification clause for taking credit for excessive duplicate contacts and multipliers and other infractions.

Include a summary sheet with your log showing the scoring and all essential information. Include a dupe sheet for entries with 200 or more contacts, and the usual signed declaration. A large SASE will get you sample log forms.

Mailing deadline for all entries is September 3rd to: Florida QSO Party Contest Committee, P.O. Box 8104, West Palm Beach, FL 33407.

County Hunters CW Contest

0000Z Sat. to 0200Z Mon., July 30–Aug. 1

The MARAC County Hunters Net is again sponsoring this year's contest. Mobile and portable operation from less active counties is welcome and encouraged.

The same station may be worked on each band, and mobile and portables from each county change for QSO credit. Mobiles operating on a county line give and receive one QSO number, but each county is valid as a multiplier. (Mobile and portables must identify by signing M or P after their call.)

Exchange: QSO no., category (M or P), RST, county and state for US, province or country for others.

Scoring: QSOs with fixed stations are worth 1 point, with mobile and portables 3 points. Multiply total QSO points by the sum of US counties worked for final score.

Frequencies: 3575, 7055, 14060, 21060, 28060. On 20 and 40 mobile and portables should call CQ below the suggested frequencies. Fixed stations above the suggested frequencies.

Awards: Certificates to winning stations as follows:

F—Fixed or fixed portable in each state, province, and country with 1000 or more total score.

P—Portables in each state operating from a county other than its normal location with a score of 1000 or more.

M—Mobile in each state operating from 3 or more counties with a minimum of 10 QSOs from each county.

Plaques to the top-scoring mobile, portable, and fixed station in the US meeting the above requirements.

Mobile and portables who change states calculate their score for a state certificate, and total score for a plaque.

A summary sheet showing the scoring is requested and a check sheet of counties worked is a must for entries with 100 or more counties.

Mailing deadline for logs is September 5th to: Jerry Burkhead, N6QA, 7525 Baltic St., San Diego, CA 92111. (Include a large SASE for copy of results.)

YL/OM Summer SSB Sprint

1800Z to 2200Z Sat., Aug. 6

As the name implies, this a 4 hour shorty organized by the YLRL. Only contacts between YLs and OMs count. Use all HF bands, 80 through 10 meters. No nets or repeaters, or WARC bands, and a power limit of 1500 watts PEP.

Exchange: Call, RS, name, and state, province or DX country.

Scoring: A—One point per QSO. Same station may be worked once on each band.

B—Alpha-numeric multiplier, using the last number and the first letter following that number of the call—i.e., W1XZ is 1X, W2GLB/7 is 2G, 9Y4A is 4A, etc. A total of 260 combinations possible, 26 letters with each number, 1–0. *(A most unusual multiplier.—ed.)*

C—Low-power bonus of 1.5 for stations using 200 watts PEP at all times.

D—Final score: Total QSO points (A), times the multiplier (B), times the low power bonus (C) if applicable.

Frequencies: 3955, 7255, 14265, 21395, 28395 kHz, plus or minus 15 kHz.

Awards: Certificates to the three highest scoring YLs and OMs. And to the top scoring YL and OM in each US district, VE province, and DX country (minimum of 10 valid contacts).

Print or type logs, show the scoring, and signature of operator is also requested.

All entries must be received by September 15th and go to: Mary Lou Brown, NM7N, 504 Channel View Drive, Anacortes, WA 98221.

Propagation

a monthly feature by
GEORGE JACOBS, W3ASK

THE SCIENCE OF PREDICTING RADIO CONDITIONS

New Cycle Off To A Great Start

Smoothed sunspot data, upon which the progress of a solar cycle is measured, is now available for the first year of Cycle 22, the newest sunspot cycle. The smoothed sunspot values from September 1986 through September 1987, as determined by the world's official keeper of solar records, the Royal Observatory of Belgium, appear in Table I.

Month	Sunspot Number
Sept. 1986	12
Oct. 1986	13
Nov. 1986	15
Dec. 1986	16
Jan. 1987	18
Feb. 1987	20
Mar. 1987	22
Apr. 1987	24
May 1987	27
June 1987	28
July 1987	31
Aug. 1987	35
Sept. 1987	39

Table I– Smoothed sunspot numbers for the first year of sunspot Cycle 22.

Based on the first year of data, the new cycle has risen faster than Cycle 19, the record-breaking cycle which reached a peak intensity of 201 in March 1958. The rise in Cycle 22 during its first year is compared in Table II to similar periods for the past three cycles—Cycles 19, 20, and 21.

While it is much too early in the development of Cycle 22 to forecast another record breaker or extremely high cycle, based upon the first year of its life it appears to be off to a great start.

The Royal Observatory of Belgium reports a monthly mean sunspot number of 76 for March 1988. Daily values fluctuated between a low of 20 on March 11 to a high of 120 on the 31st. A smoothed sunspot number in the high 70s to low 80s range is forecast for July 1988.

The Algonquin Radio Observatory in Ottawa, Canada reports a monthly mean 10.7 cm solar flux level of 115 for March 1988.

11307 Clara Street, Silver Spring, MD 20902

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for July 1988

	Expected Signal Quality			
Propagation Index.....	**(4)**	**(3)**	**(2)**	**(1)**
Above Normal: 5, 11-12, 18	**A**	**A**	**B**	**C**
High Normal: 3, 6-7, 9-10, 13, 17, 27, 30	**A**	**B**	**C**	**C-D**
Low Normal: 1-2, 4, 8, 16, 19-20, 24-26, 28-29, 31	**B**	**C**	**D**	**D-E**
Below Normal: 14-15, 21, 23	**C**	**C-D**	**D-E**	**E**
Disturbed: 22	**C-D**	**D**	**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.
3 dB 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 good-to-fair (B-C) on July 1st and 2nd, good (B) on the 3rd, good-to-fair again (B-C) on the 4th and Excellent (A) on July 5th, etc.**

July Propagation

As a result of the accelerated increase in solar activity, both *15* and *20* meters are expected to share honors for optimum DX propagation during July.

Good to excellent openings are forecast for *15* meters throughout much of the daylight hours, and to some areas throughout the early evening hours as well. Conditions will favor north-south openings and openings to southern and tropical areas, but some openings will also be possible to almost all areas of the world. Peak conditions are expected during the late afternoon and early evening hours.

Twenty meters should remain open for DX to one area of the world or another almost around the clock. Optimum conditions are forecast for the early evening hours, most of the hours of darkness, and the sunrise period, with excellent openings possible to just about every area of the world.

Although a seasonal decrease is expected in *10* meter DX activity, some good openings should be possible this month, particularly on north-south paths and to tropical regions. The band should open an hour or two after sunrise and remain open until sunset, with optimum conditions expected during the late afternoon hours.

Despite seasonally higher static levels, some fairly good *40* meter DX openings are expected to most areas of the world during the hours of darkness and the sunrise period. High static levels are expected to reduce the possibility of *80* meter DX openings during July, although some fairly good ones are forecast to many parts of the world during the hours

	Smoothed Sunspot Numbers			
Month From Cycle Start	**Cycle 22**	**Cycle 21**	**Cycle 20**	**Cycle 19**
1	12	13	10	3
2	13	14	10	4
3	15	14	11	4
4	16	14	12	5
5	18	14	12	7
6	20	15	13	8
7	22	17	14	8
8	24	18	15	10
9	27	20	15	12
10	28	22	16	14
11	31	24	16	16
12	35	26	17	20
13	39	29	20	23
Peak	?	165	111	201

Table II– Comparison of first-year rise in solar activity, Cycles 19–22.

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
July & August, 1988
Local Daylight Savings Time At Path Mid-Point

Band (Meters) — *Distance Between Stations (Miles)*

	50-250	250-750	750-1300	1300-2300
10	Nil	08-10 (0-1)* 10-14 (0-3)* 14-18 (0-1)* 18-22 (0-2)* 22-00 (0-1)*	08-10 (1)* 10-14 (3)* 14-18 (1-2)* 18-22 (2-3)* 22-08 (1)*	08-10 (1-0)* 10-14 (3-1)* 14-18 (2-1)* 18-22 (3-1)* 22-08 (1-0)*
15	Nil	08-10 (0-2)* 10-14 (0-3)* 14-18 (0-2)* 18-20 (0-3)* 20-22 (0-2)* 22-08 (0-1)*	08-10 (2)* 10-14 (3)* 14-18 (2)* 18-20 (3)* 20-22 (2)* 22-00 (1-2)* 00-08 (1)*	08-10 (2-1) 10-14 (3-2) 14-18 (2-3) 18-20 (3-4) 20-21 (2-3) 20-00 (2-1) 00-08 (1-0)
20	10-01 (0-1)*	07-10 (0-2)* 10-16 (1-4)* 16-21 (1-3)* 21-01 (1-2)* 01-07 (0-1)*	07-10 (2-3)* 10-17 (4)* 17-22 (3-4)* 22-01 (2-3)* 01-07 (1-2)*	07-10 (3-2) 10-16 (4-2) 16-17 (4-3) 17-22 (4) 22-00 (3) 00-01 (3-2) 01-07 (2-1)
40	08-12 (1-2)* 12-17 (2-4)* 17-21 (3-4) 21-23 (1-2) 23-08 (0-2)*	08-10 (2-4)* 10-12 (2) 12-17 (4-2) 17-18 (4-3) 18-21 (4) 21-23 (2-4) 23-05 (2-4) 05-08 (2-3)	08-10 (4-1) 10-17 (2-1) 17-18 (3-1) 18-21 (4-3) 21-05 (4) 05-06 (3-4) 06-08 (3)	08-18 (1-0) 18-21 (3-2) 21-06 (4) 06-08 (3-1)
80	07-12 (3-4) 12-16 (4-3) 16-22 (4) 22-05 (3-4) 05-07 (4)	08-10 (4-1) 10-12 (4-0) 12-16 (3-0) 16-18 (4-1) 18-20 (4-2) 20-22 (4-3) 22-07 (4) 07-08 (4-2)	08-10 (1-0) 10-16 (0) 16-18 (1-0) 18-20 (2-1) 20-22 (3-1) 22-05 (4) 05-07 (4-3) 07-08 (2-1)	08-18 (0) 18-20 (1-0) 20-22 (1) 22-04 (4-3) 04-05 (4-2) 05-06 (3-2) 06-07 (3-1) 07-08 (1)
160	18-19 (1-0) 19-20 (1) 20-22 (3-2) 22-00 (4-3) 00-06 (4) 06-08 (3-2) 08-09 (1) 09-10 (1-0)	19-20 (1-0) 20-21 (2-0) 21-22 (2-1) 22-00 (3-2) 00-04 (4-2) 04-06 (4-3) 06-08 (2-1) 08-09 (0-1)	21-22 (1) 22-01 (2-1) 01-04 (2) 04-06 (3-2) 06-07 (1) 07-08 (1-0)	21-23 (1-0) 23-01 (1) 01-06 (2-1) 06-07 (1-0)

* Predominantly Sporadic-E Openings

HAWAII
July & August, 1988
Openings Given in Hawaiian Standard Time

	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	14-16 (1)	06-11 (1) 11-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	13-15 (1) 15-17 (2) 17-18 (3) 18-20 (4) 20-22 (3) 22-02 (2) 02-04 (3) 04-06 (2) 06-09 (1)	18-20 (1) 20-00 (2) 00-02 (1) 21-00 (1)†
Central USA	14-16 (1)	06-08 (1) 08-13 (2) 13-17 (3) 17-18 (2) 18-19 (1)	06-08 (2) 08-14 (1) 14-16 (2) 16-18 (3) 18-20 (4) 20-23 (3) 23-03 (2) 03-06 (3)	18-21 (1) 21-22 (2) 22-01 (3) 01-02 (2) 02-03 (1) 20-22 (1)† 22-00 (2)† 00-02 (1)†
Western USA	11-14 (1) 14-17 (2) 17-18 (1)	07-08 (1) 08-10 (2) 10-12 (3) 12-16 (4) 16-17 (3) 17-18 (2) 18-20 (1)	06-08 (4) 08-10 (3) 10-13 (2) 13-15 (3) 15-20 (4) 20-22 (3) 22-05 (2) 05-06 (3)	18-19 (1) 19-20 (2) 20-02 (4) 02-04 (3) 04-05 (2) 05-06 (1) 19-20 (1)† 20-22 (2)† 22-02 (3)† 02-03 (2)† 03-04 (1)†

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

† Indicates best time for 80 meter openings. Openings on 160 meters are most likely to occur during those times when 80 meter openings are shown with a propagation index of (2), or higher.

Note: The Alaska and Hawaii Propagation Charts are intended for distances *greater* than 1300 miles. For shorter distances, use the preceding Short-Skip Propagation Chart.

ALASKA
July & August, 1988
Openings Given in GMT#

	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	Nil	00-02 (1)	12-15 (1) 22-01 (1) 01-04 (2) 04-06 (1)	07-10 (1)
Central USA	Nil	21-00 (1) 00-03 (2) 03-04 (1)	13-16 (1) 22-00 (1) 00-03 (2) 03-05 (3) 05-06 (2) 06-08 (1)	08-12 (1)
Western USA	01-04 (1)	17-22 (1) 22-00 (2) 00-03 (3) 03-04 (2) 04-05 (1)	13-14 (1) 14-15 (2) 15-19 (3) 19-01 (2) 01-03 (3) 03-05 (4) 05-07 (3) 07-09 (2) 09-11 (1)	07-09 (1) 09-12 (2) 12-13 (1) 09-12 (1)†

of darkness and at sunrise. Not many DX openings are expected on *160* meters during the month because of seasonally high levels of static and summertime solar absorption.

Short-Skip

This month's column contains Short-Skip Propagation Charts for July and August 1988. DX Propagation Charts for July appeared in last month's column.

Short-skip conditions are expected to be at their best during July mainly due to peak sporadic-*E* ionization, and to seasonally high nighttime F-layer ionization. During the daylight hours considerable short-skip openings are forecast for *10* and *15* meters between distances of approximately 400 and 1300 miles, with some *10* meter and a considerable number of *15* meter openings extending out to as far as 2300 miles. A number of short-skip openings may also be possible on these bands during the hours of darkness. Frequent short-skip openings on *20*, ranging between 250 and 2300 miles, should be possible almost around the clock. Peak conditions should occur during the late morning hours and again during the late afternoon and early evening.

Good daytime short-skip openings are expected on *40* meters between distances of approximately 100 and 700 miles, with excellent nighttime openings between 250 and 2300 miles. Good *80* meter openings are forecast for the daylight hours over distances up to approximately 300 miles, with the range extending up to the F-layer one-hop limit of 2300 miles during the hours of darkness. While no *160* meter short-skip openings are expected during the daylight hours, some should be possible during the hours of darkness for distances up to about 1300 miles. During periods of lower than usual static levels, *160* meter nighttime short-skip openings may extend out to as far as 2300 miles.

VHF Ionospheric Openings

The big VHF propagation event during July should be the numerous *6* meter and occasional *2* meter openings that are expected as a result of the seasonal peak in sporadic-*E* ionization. Fairly frequent *6* meter openings should be possible over distances between approximately 500 and 1300 miles, with some multi-hop openings extending out to 2300 miles. While short-skip openings can occur at just about any time of the day or night on 6 meters, statistics indicate that they generally peak a few hours before noon and again during the early evening hours. During many of the *6* meter openings expected during July, signal levels should be exceptionally strong. Some *2* meter sporadic-*E* short-skip openings are also expected during July, ranging between approximately 1000 and 1300 miles.

During July you can expect *6* meter openings on at least three out of every four days. Openings may last from a few minutes up to several hours. Considerably fewer openings are expected on *2* meters.

A good rule of thumb to remember about *6* and *2* meter short-skip openings is that as the skip distance gets *shorter* on 6 meters, the MUF is *increasing*. When you hear skip stations on *6* meters as near as 600 miles, the MUF should be high enough for *2* meter openings in the same direction. Generally, when the skip distance on *6* meters falls below 600 miles, *2* meter openings should be possible between distances of about 1000 and 1300 miles.

A good deal of meteor activity is expected in July, which should result in meteor-type ionospheric openings on the VHF bands. A major meteor shower, the *Delta Aquarids*, should take place between July 27th and 30th, peaking at approximately 8 a.m. EDT on July 29, with a meteor count of between 20 and 30 an hour.

Not as many Trans-Equatorial (TE) openings are expected on *6* meters during July, but some should be possible. Check between 8 and 11 p.m. local daylight time for openings toward South America, with conditions favoring the southern tier states.

Some VHF short-skip openings may be possible during July as a result of auroral ionization. The best dates to look for these openings are those shown as Disturbed or Below Normal in the Last Minute Forecast at the beginning of this column.

73, George, W3ASK

"They said I couldn't work DX with just 100 watts. Especially with a radio that has less than 1000 switches on the front panel.

But the truth is, I'm working lots of DX, more than some of these blockbuster types, thanks to my Yaesu FT-747GX.

You see, my no-nonsense FT-747GX was designed with me in mind, so I can hop around the band fast to nail those DX stations. While the other guys are warming up their amplifiers, I'm working the new country!

My FT-747GX has a super receiver, with a directly-driven mixer for great overload protection. And, Yaesu included the CW filter in the purchase price (I used the money I saved on postage for the QSL cards!).

And my FT-747GX is loaded with other features. The receiver works from 100 kHz straight through to 30 MHz, and it's a fantastic shortwave broadcast receiver. I can use all twenty memories for that alone! Plus it's got dual VFOs. A noise blanker. Split frequency operation for the pile-ups. And scanning up the band helps me check out openings as they happen.

I just put in the optional crystal oven, and next month I'm going to pick up the FM board. I can't wait to tell my buddies I worked England on a repeater!

And with the money I saved when I bought my FT-747GX, I got a second ten-meter antenna for satellite work on the high end of the band. I use my personal computer to tell me what satellites are going by, and the computer even sets the frequencies on the radio for me.

Now my friends are getting FT-747GX rigs, too. I knew they'd figure out my secret weapon sooner or later. But now I'm setting the pace!

Thanks, Yaesu. You've made a rig that makes sense."

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.

YAESU

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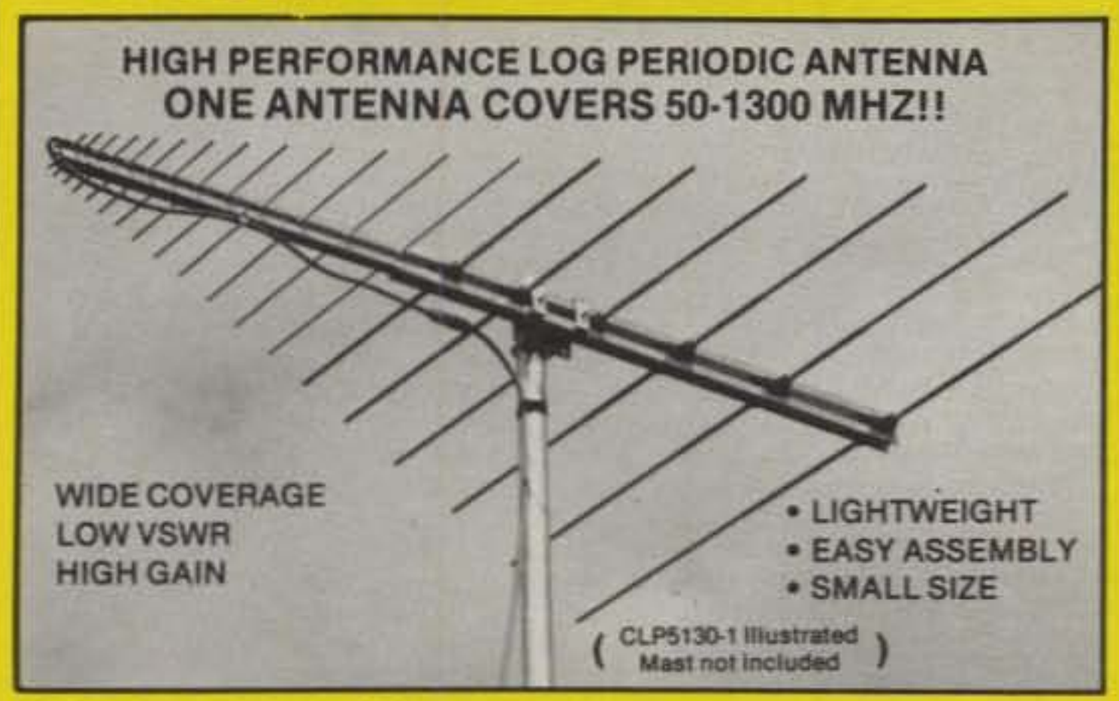
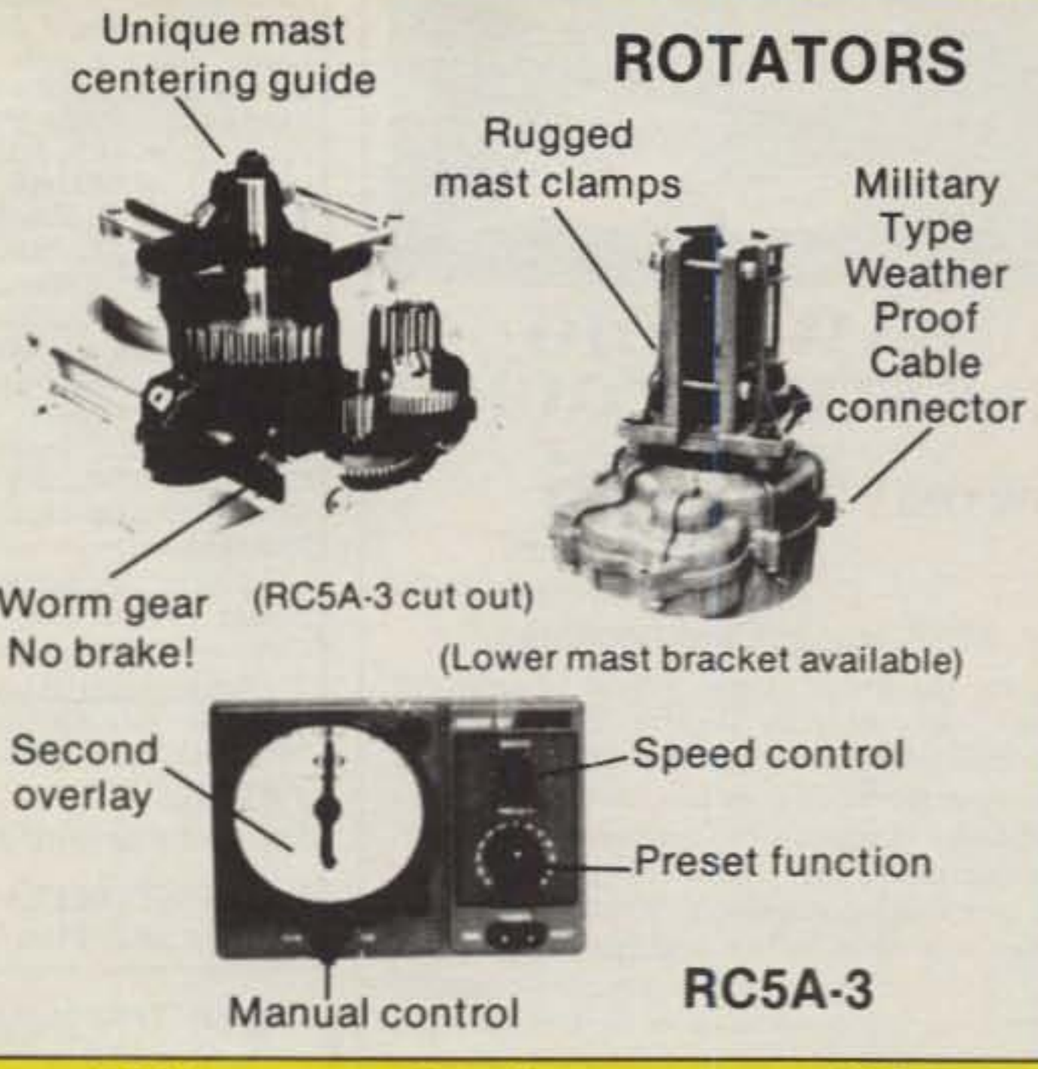
CREATE A GREAT SIGNAL THIS SUMMER!



CLP5130-1 50-1300 MHz 25 el. 500W 6′ Boom $239 + shipping
CLP5130-2 105-1300 MHz 20 el. 500W 4′6″ Boom $139 + shipping

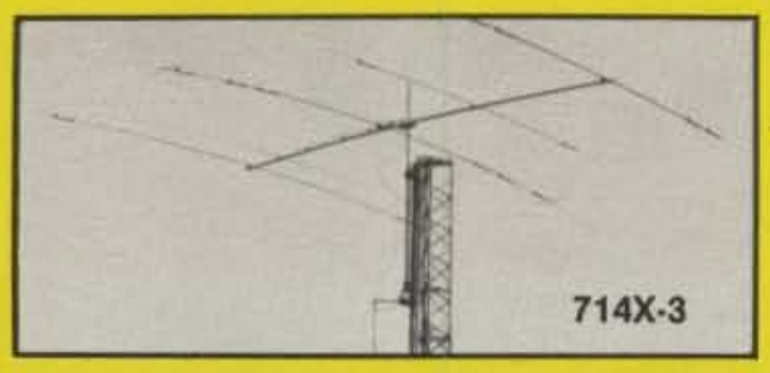
Operate on 6m, 2m, 1¼m, 70cm, 900 MHz and 1.2 GHz using only one antenna and one feedline. No tuning is required and the VSWR is 2:1 or less across the entire frequency range with excellent forward gain. The boom is made of high quality aluminum and the elements are precut for easy assembly. Each model can be mounted for either vertical or horizontal polarization. Create VHF/UHF log periodics are great for the amateur bands, scanners and numerous other applications.

ROTATORS



RC5-1	10 sq. ft.	**$251**
RC5-3	10 sq. ft. preset	**$328**
RC5A-2	25 sq. ft.	**$399**
RC5A-3	25 sq. ft. preset	**$459**
RC5B-3	35 sq. ft. preset	**$736**

All rotators will fit most towers. Please call for additional information.

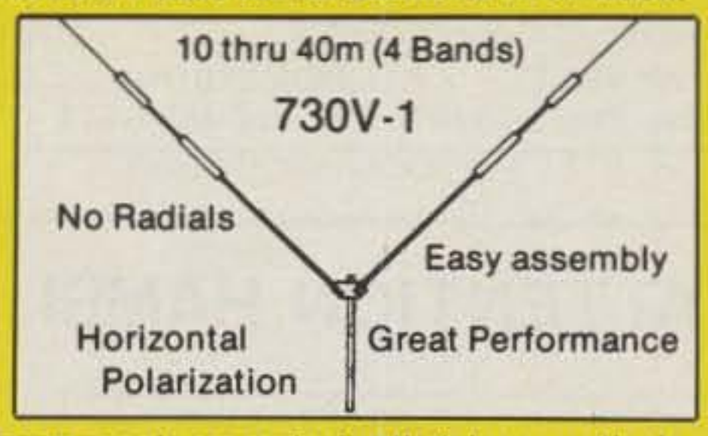


714 Series Tribanders
15-20-40 Meters
On One Boom!

Model	Elements 40-20-15	Boom Length	Longest Element	Turning Radius	Wgt. Lbs.	Power PEP	Price
714T	2/4/4	28′6″	43′	25′3″	71	2 kw	$574.
714X	3/4/4	32′5″	44′	26′2″	75	2 kw	$762.
714T-3	2/4/4	28′6″	43′	25′3″	75	3 kw	$707.
714X-3	3/4/4	32′5″	44′	26′2″	80	3 kw	$928.

(Prices include balun)

730V-1 DIPOLE!



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Model	Freq MHz	El.	Boom Length	Longest El.	Turning Radius	Wgt. Lbs.	Power	Price
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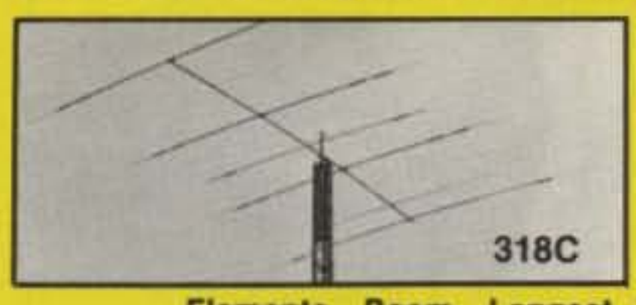
CL10DX	28.00	6	30′6″	18′½″	16′1″	33	2 kw	$310.
CY154	21.00	6	40′8″	24′3″	24′3″	58	3 kw	$205.
CL15DX	21.00	4	18′8″	24′5″	15′5″	21	2 kw	$559.
CL20	14.00	4	30′9″	36′8″	36′8″	58	3 kw	$495.



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318C	5/5/5	29′10″	31′1″	21′	58	2 kw	$643.
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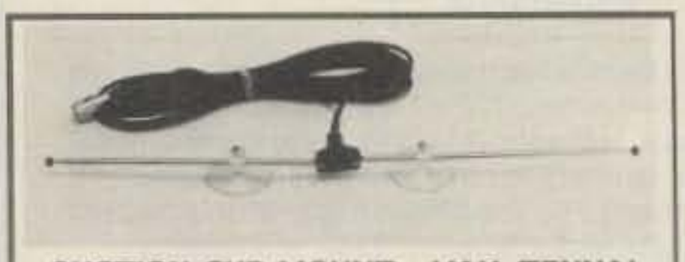

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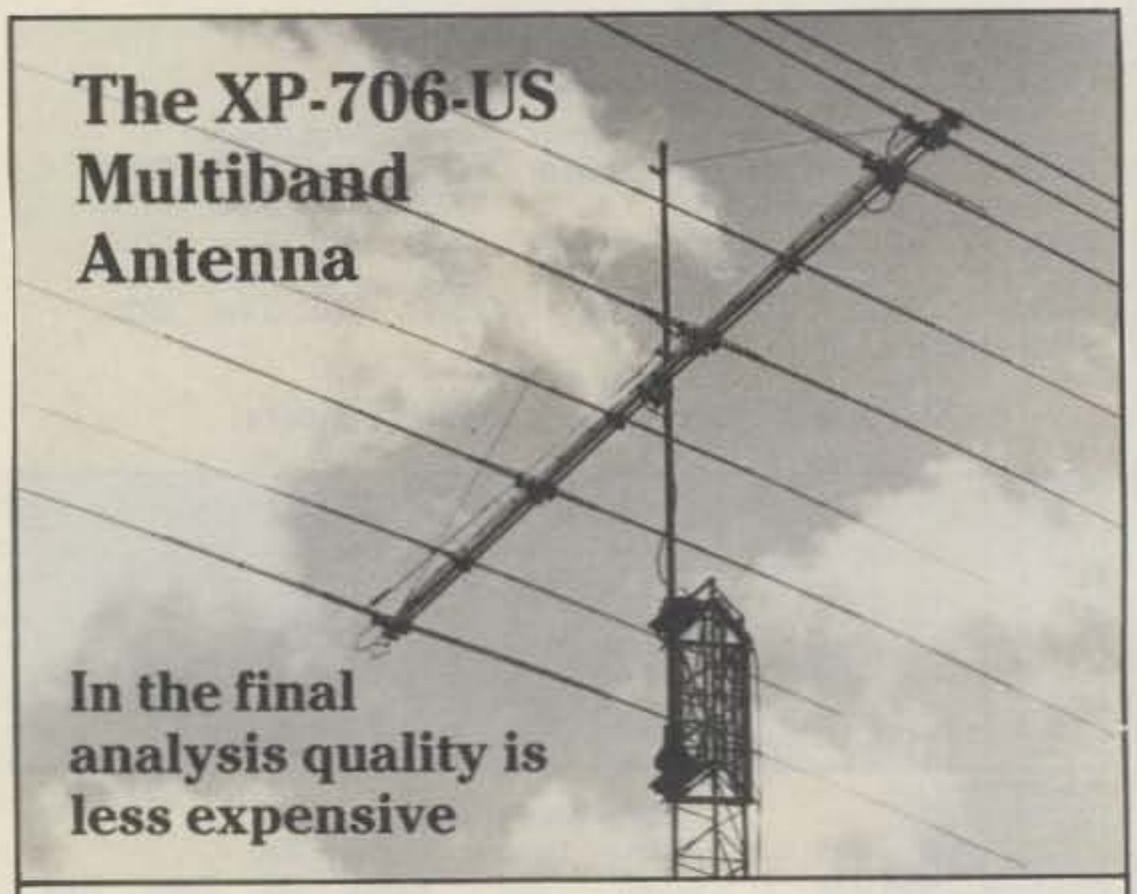

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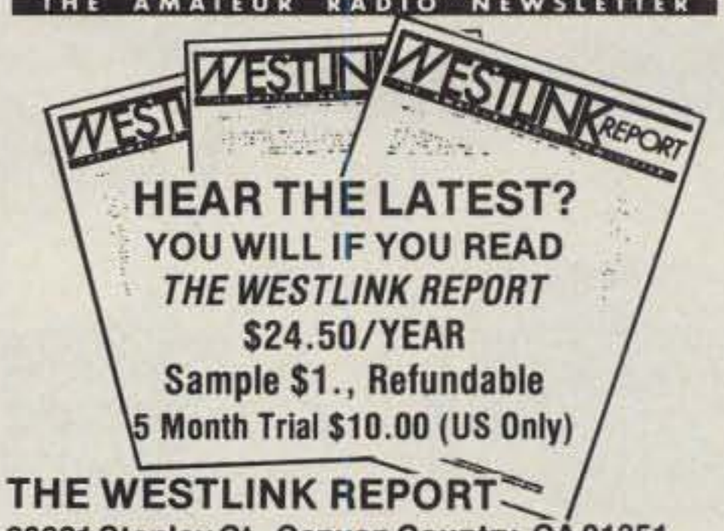

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VHF, CQ, QST, 73, Ham Radio Magazines for sale. 1/3 original price plus postage, 1950-1983. Some CQ's have hardback covers by year. Contact W5IUT, 512-433-4826.

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1920 HAM RADIO: My book "A Radio Journal" tells the story of my pioneer days in radio with photos and anecdotes about famous people I worked with. Send $9.90 to W9CRC, 1011 Linda Drive, Kokomo, IN 46902.

WANTED: Collins MM-1 microphone. State price and condition. R.W. Parker, Box 6020, Lawrenceville, NJ 08648.

WANTED: OS-8 OSCILLOSCOPE with power supply, housing and connectors. N4RLD, Mike Rivera, 1519 N. Fant, Anderson, South Carolina 29621 (803-261-3999).

RECEIVERS, NC-188 $60, NC-300 $75, SX-62A $95, S-40 $45, S-81 $25, R-48 speaker $45, HT-40 $40, HA-5 VFO $30. K6KZT, 2255 Alexander, Los Osos, CA 93402.

KENWOOD TR7400A $135, Heath HD1410 Keyer $50, Realistic PRO2021 Scanner $150. Ed Doran, KA9KOB, Route 2 Box 7, Barry, IL 62312 (217-335-2013).

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WANTED: SONY ICF-S11W AM/FM micro-sized, shirt-pocket radio with built-in speaker. Steve, WA1DFL, 617-284-2881, or 617-289-9200 x136.

WANTED: 1987 Callbook, Hallicrafters PM-23 Speaker. Q.R. Galbraith, K5TVC, 4303 Kingsway, Farmington, NM 87401.

Would I Again?

(from page 24)

finishing three weekend contests in a row you can almost make intelligence out of a blinking light.

"Hey, Doc," I shouted, "your light is talking to me. It must be a foreign language, though, because it really isn't making a lot of sense, just sending random letters, you know?" I didn't really expect an answer to the question, as I became amused with the light bulb that sent code kind of like a recent CE3 in the 10 meter contest whom I had to wait for in a pile-up as I tried to decipher his call.

"Anyway, back to this CQ thing. If you don't know exactly what it means, why do you sit there and send it?" Doc asked. I started to chuckle as I thought about that, and mumbled something about that's the way everybody else does it. "Well, do you ever talk to anyone interesting with this thing of yours?" he asked. Realizing the difficulty of trying to explain radio contesting any further to someone who doesn't know the hobby, I thought I'd tell him about some of my more meaningful contacts.

"Oh sure, Doc. Why just the other day I was talking to Mr. Christian on Pitcairn Island! You remember *Mutiny on the Bounty*, don't ya, Doc?" He looked excited now, so I continued. "And before that I was talking to King Hussein right there in the comfort of my home." Doctor Bendover looked very serious now as he explained that he wanted me to pay a visit to his associate across the hall. "But, he's a psychiatrist, Doc, and I've got this terrible crook in my neck," I countered.

"Yes, I know, John, but sometimes neck pain can be caused from places other than the lower regions of the back, and I am really getting indications that this is one of those times."

To date, my back still hasn't fully recovered from the three weekends in a row. I never did get to see the other doctor, as I fell asleep in one of the chairs in his waiting room. I guess I was just too tired to go through another inquisitive ordeal from one of the masters of medicine. When I awoke from my nap the place was dark and I just wandered on home. The best part about the entire day was the nap in the waiting room. That chair was soooooo comfortable. Much more so than the one that *used to be* at my radio desk. I simply *love* my new "Contest Operators Chair" from the local medical supplies dealer. Why didn't I think of that chair before? Why did I put myself through all that discomfort? After all, where else other than in front of our radios have we ever spent so much time in one seat without moving? CQ

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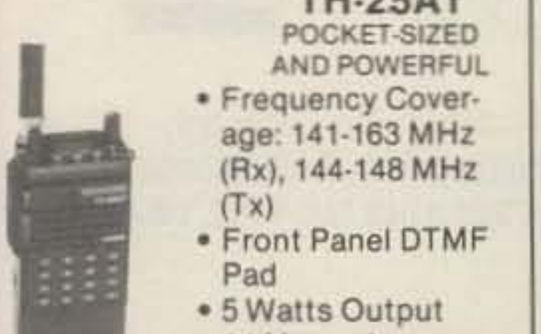

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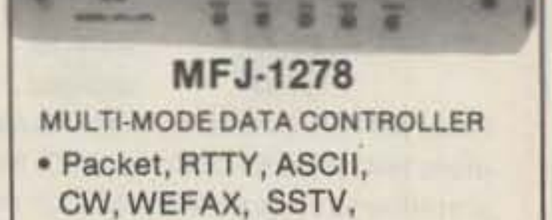

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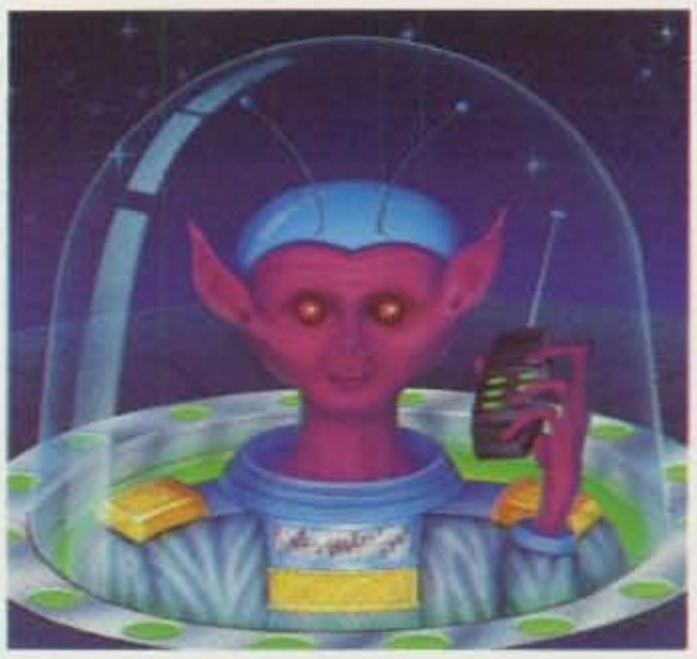

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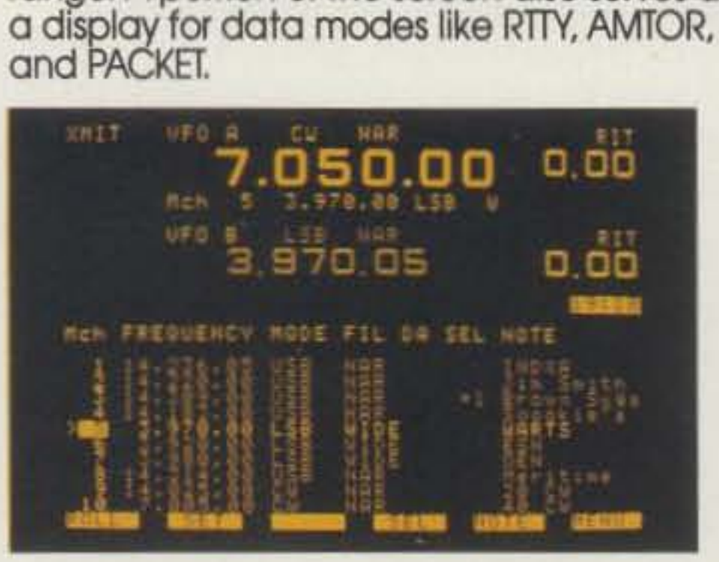

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