

ICD 08241

# Amateur Radio

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**CQ WW DX Contest  
1988 CW Results  
... page 13**

**All-Time Records  
... page 60**



THE RADIO AMATEUR'S JOURNAL



# KENWOOD

...pacesetter in Amateur Radio

Good  
for Satellite  
Digital QSOs

## Matching Pair

Look for  
FUJI  
and  
PHASE III-C

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

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

- **Highly stable dual digital VFOs.**  
The 10 Hz step, dual digital VFOs offer excellent stability through the use of a TCXO (Temperature Compensated Crystal Oscillator).
- **Large fluorescent multi-function display.**  
Shows frequency, RIT shift, VFO A/B, SPLIT, ALERT, repeater offset, digital code, and memory channel.
- **40 multi-function memories.**  
Stores frequency, mode, repeater offset, and CTCSS tone. Memories are backed up with a built-in lithium battery.



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Programmable band and memory scan (with channel lock-out). "Center-stop" tuning on FM. An "alert" function lets you listen for activity on your priority channel while listening on another frequency. **A Kenwood exclusive!**
- **RF power output control.**  
Continuously adjustable from 2 to 25 watts.

- **Automatic mode selection.**  
You may select the mode manually using the front panel mode keys. Manual mode selection is verified in International Morse Code.
- **All-mode squelch.**
- **High performance noise blanker.**
- **Speech processor.**  
For maximum efficiency on SSB and FM.
- **IF shift.**
- **"Quick-Step" tuning.**  
Vary the tuning characteristics from "conventional VFO feel" to a stepping action.
- **Built-in AC power supply.**  
Operation on 12 volts DC is also possible.
- **Semi break-in CW, with side tone.**
- **VS-1 voice synthesizer (optional)**  
More TS-711A/811A information is available from authorized Kenwood dealers.



#### Optional accessories.

- IF-10A computer interface
- IF-232C level translator
- CD-10 call sign display
- SP-430 external speaker
- VS-1 voice synthesizer
- TU-5 CTCSS tone unit
- MB-430 mobile mount
- MC-60A, MC-80, MC-85 deluxe desk top microphones
- MC-48B 16-key DTMF, MC-43S UP/DOWN mobile hand microphones
- SW-200A/B SWR/power meters:  
SW-200A 1.8-150 MHz  
SW-200B 140-450 MHz
- SWT-1 2-m antenna tuner
- SWT-2 70-cm antenna tuner
- PG-2U DC power cable

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

## KENWOOD

KENWOOD U.S.A. CORPORATION  
2201 E. Dominguez St., Long Beach, CA 90810  
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NEW!

## Affordable DX-ing!

### TS-140S

HF transceiver with general coverage receiver.

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

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



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

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

#### Optional Accessories:

- **AT-130** compact antenna tuner • **AT-250** automatic antenna tuner • **HS-5/HS-6/HS-7** headphones • **IF-232C/IF-10C** computer interface
- **MA-5/VP-1** HF mobile antenna (5 bands)
- **MB-430** mobile bracket • **MC-43S** extra UP/DOWN hand mic. • **MC-55** (8-pin) goose neck mobile mic. • **MC-60A/MC-80/MC-85** desk mics.
- **PG-2S** extra DC cable • **PS-430** power supply
- **SP-41/SP-50B** mobile speakers • **SP-430** external speaker • **TL-922A** 2 kW PEP linear amplifier (not for CW QSK) • **TU-8** CTCSS tone unit
- **YG-455C-1** 500 Hz deluxe CW filter, **YK-455C-1** New 500 Hz CW filter.



### TS-680S

All-mode multi-bander

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



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

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# KENWOOD

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220 MHz  
TH-315A  
Here Now!

## This HT Has it All!

### TH-215A/315A/415A Full-featured Hand-held Transceivers

Kenwood brings you the greatest hand-held transceiver ever! More than just "big rig performance," the new TH-215A for 2 m, TH-315A for 220 MHz, and TH-415A for 70 cm pack the most features and the best performance in a handy size. And our full line of accessories will let you go from hamshack to portable to mobile with the greatest of ease!

- **Wide receiver frequency range.** Receives from 141-163 MHz. Includes the weather channels! Transmit from 144-148 MHz. Modifiable to cover 141-151 MHz (MARS or CAP permit required).
- **TH-315A covers 220-225 MHz, TH-415A covers 440-449.995 MHz.**
- **5, 2.5, or 1.5 W output, depending on the power source.** Supplied battery pack (PB-2) provides 2.5 W output. Optional NiCd packs for extended operation or higher RF output available.
- **CTCSS encoder built-in.** TSU-4 CTCSS decoder optional.
- **10 memory channels store any offset, in 100-kHz steps.**
- **Odd split, any frequency TX or RX, in memory channel "0"**
- **Nine types of scanning!** Including new "seek scan" and priority alert. Also memory channel lock-out.
- **Intelligent 2-way battery saver circuit extends battery life.** Two battery-saver modes to choose, with power saver ratio selection.
- **Easy memory recall.** Simply press the channel number!
- **12 VDC input terminal for direct mobile or base station supply operation.** When 12 volts applied, RF output is 5 W! (Cable supplied!)
- **New Twist-Lok Positive-Connect locking battery case.**
- **Priority alert function.**
- **Monitor switch to defeat squelch.** Used to check the frequency when CTCSS encode/decode is used or when squelch is on.



- **Large, easy-to-read multi-function LCD display with night light.**
- **Audible beeper to confirm keypad operation.** The beeper has a unique tone for each key. DTMF monitor also included.
- **Supplied accessories:** Belt hook, rubber flex antenna, PB-2 standard NiCd battery pack (for 2.5 W operation), wall charger, DC cable, dust caps.



#### Optional Accessories:

- PB-1: 12 V, 800 mAH NiCd pack for 5 W output
- PB-2: 8.4 V, 500 mAH NiCd pack (2.5 W output)
- PB-3: 7.2 V, 800 mAH NiCd pack (1.5 W output)
- PB-4: 7.2 V, 1600 mAH NiCd pack (1.5 W output)
- BT-5 AA cell manganese/alkaline battery case
- BC-7 rapid charger for PB-1, 2, 3, or 4
- BC-8 compact battery charger
- SMC-30 speaker microphone
- SC-12, 13 soft cases
- RA-3, 5 telescoping antennas
- RA-8B StubbyDuk antenna
- TSU-4 CTCSS decode unit
- VB-2530: 2m, 25 W amplifier (1-4 W input)
- LH-4, 5 leather cases
- MB-4 mobile bracket
- BH-5 swivel mount
- PG-2V extra DC cable
- PG-3D cigarette lighter cord with filter



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 Lew McCoy, W1ICP, Technical Representative  
 Peter O'Dell, WB2D, Special Projects Editor

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 Chod Harris, VP2ML, DX  
 Dave Ingram, K4TWJ, OSCAR & Antiques  
 George Jacobs, W3ASK, Propagation  
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 Steve Katz, WB2WIK, VHF/UHF  
 Frederick O. Maia, W5YI, FCC Correspondent  
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 Adrian Weiss, K8EEG/0, QRPp  
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 Hal Keith, Illustrator  
 Larry Mulvehill, WB2ZPI/VK5AAY, Photographer

A publication of



CQ Communications, Inc.  
 76 North Broadway  
 Hicksville, NY 11801-2953 USA.

Offices: 76 North Broadway, Hicksville, NY 11801.  
 Telephone: 516 681-2922. FAX (516) 681-2926. CQ  
 (ISSN 0007-893X) is published monthly by CQ Com-  
 munications Inc. Second Class postage paid at  
 Hicksville, NY and additional offices. Subscription  
 prices: Domestic—one year \$19.95, two years \$38.00,  
 three years \$57.00; Canada/Mexico—one year \$22.00,  
 two years \$42.00, three years \$63.00; Foreign—one  
 year \$24.00, two years \$46.00, three years \$69.00; For-  
 eign Air Mail—one year \$77.00, two years \$152.00,  
 three years \$228.00. Entire contents copyrighted CQ  
 Communications Inc. 1989. CQ does not assume re-  
 sponsibility for unsolicited manuscripts. Allow six  
 weeks for change of address. Printed in the United  
 States of America.  
 Postmaster: Please send change of address to CQ  
 Magazine, 76 North Broadway, Hicksville, NY 11801.



# The Radio Amateur's Journal

**ON THE COVER:** Get those fingers limbered up; it's almost CQ  
 WW DX CW Contest time again. Results on the 1988 bash begin on page 13. Photo by  
 Larry Mulvehill, WB2ZPI.



OCTOBER 1989

VOL. 45, NO. 10

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# Zero Bias

## AN EDITORIAL

**W**hen I recently wrote about the difference between tradition and nostalgia, little did I realize how quickly it would hit home. I discovered that I was quite nostalgic during a recent trip to Newington for the rededication of W1AW. Dick and I went to the ceremony, which also commemorated the 75th anniversary of the ARRL.

Having grown up in amateur radio with a certain image of W1AW, cutting my Novice teeth on their code practice sessions and visiting there occasionally over the years, I had this image of what W1AW is and should be. At the ceremony W1AW was described as "the premier amateur radio station, the most well-known ham station in the world." I could believe that—that is, up until July 20, 1989.

My image of W1AW consisted of this quaint building, always in need of some repair, and stocked with a mix of homebrew and commercial amateur gear which operated all the time. For about 50 years the ARRL counted on and was served admirably by this mix of gear, antennas, and guest operators. When there was an emergency or catastrophic event, W1AW drew amateur radio focus and attention to it. For all these years the job at hand was getting done.

Primarily, the job at hand is and was code practice sessions, bulletins, and a wonderful display of amateur radio for visitors. This was the premier station in the premier hobby, and people of all ages could see and take part in the wonderful world of amateur radio. Thankfully, there haven't been too many crises or world tragedies taking place, so W1AW's main function for 50 or so years could be considered public relations, and very effective PR at that.

Initially, when talk first started about rebuilding W1AW, I was contacted by the League to tell me about some of their plans. This was quite a courtesy, and was done to differentiate the new plans from previous plans for a proposed museum. As some of you may recall, I did take the League to task over the museum idea, especially in light of the state of the hobby. Without a doubt, the building needed work and in some areas extensive work. It was easy to see where some improvements could be made, and yes, with all of the goodies counted in, the price could have been in the \$250,000 range for everything.

Financially, I guess at that time the League could have paid for it, but they elected to have member participation in this great undertaking. All sorts of titles of clubs were created to honor amateurs and groups who donated large amounts. Different clubs for different amounts. It sort of resembled some of the activities of a few TV evangelists. Well, it was a lot

of work, and a lot of changes. And it amounted to a lot more money than anyone anticipated, and it still isn't finished.

The rededication ceremony brought a lot of people to Newington that day, and all of us were looking forward to seeing the new W1AW, our premier station. The speeches were the right length, and everyone who spoke was eloquent in their praise and their sense of historical perspective of what these past 50 years have represented to amateur radio. Then came the ribbon-cutting ceremony and the tour groups of the new, updated facility. This is the point at which nostalgia took over for me, and suddenly something seemed wrong or seemed to be missing.

Obviously, the building was not large enough to have everyone there enter or tour at the same time, so small groups were let in periodically led by a guide who explained what we were seeing and how it fit in with what was yet to come. The small anteroom, the usual entrance to the building, was redone very nicely. The guide started the tour by showing us the little plaques that will be affixed to the wall showing the various club members who contributed larger amounts of money to the project. Maybe it was the way it was said or just the concept itself that reminded me of something associated with the PTL Club, except in this case it was "Pay The League."

The next display was a drawing of the future antenna installation, which was "computer designed" and which will be built by a leading antenna manufacturer. We were told that these antennas would be "one off," meaning that they would not be available to anyone else and that they were not going to be manufactured commercially. Simply, one of each would exist.

The manufacturer mentioned is quite reputable and makes a very good product. I felt like asking what was wrong with his regular product line or the product line of other leading antenna manufacturers. Obviously, what was being inferred is that regular amateur radio antennas that we all use aren't good enough or efficient enough or well made enough for the rough job at W1AW. It was as if the "mission" of W1AW is greater than amateur radio and too important to trust to the stuff that the rest of us use.

Once inside the hollowed area of "mission control" you can't help but be impressed by all the Harris equipment. Try as I might, I couldn't recall anyone winning a contest, going on a DXpedition, or achieving Honor Roll status with Harris equipment. I couldn't even remember seeing a picture published anywhere of any station involved with handling emergency traffic using Harris equipment. I

could be mistaken, but the name is not generally associated with amateur gear.

Along the outside wall are three glass-cubicle-type offices. Actually, they look like little store fronts from some cute little boutiques. These are or will be operating areas and are outfitted with very nicely made operating desks. One area is for Kenwood equipment, one is for Ten-Tec gear, and the third operating position will be shared by ICOM and Yaesu. All that seemed to be missing were a few mannequins showing the latest in swimwear or fall fashions. These little "display cases" evidently were to show the provincial, simplistic toys that amateurs play with. Obviously, real folks use Harris when they want to be sure.

Everything was beautifully done and pristine. It was all there, and yet it wasn't all there for me. There was not even one piece of gear from the prestigious lab and workshop located just across the parking lot in ARRL Headquarters. Nothing. Not even one project from our *Handbook*, or all of those wonderful articles in *QST* over the years. Not one dinky SWR bridge or Transmatch graced any operating position, and certainly not the Harris console. There was nothing amateur about the whole thing, and I'll bet it even comes with a service contract.

So I guess the sadness for me or the disappointment lies in the fact that all those marvelous products we see advertised in our amateur radio magazines, including antennas, just aren't good enough to make it in big-time amateur radio. It's been disappointing to learn that there's no one individual or group of people up at Headquarters who could design or even build something that could be used in the new W1AW.

Somehow, something is wrong or went wrong or is going wrong. What I saw is not really amateur radio or what used to represent amateur radio. The old hew and cry about amateur radio being a very expensive hobby is nonsense compared to the image portrayed by the new W1AW. If this facility, premier though it may be, is held out as an amateur radio station, then the hobby is exorbitant and only affordable by the likes of Donald Trump or Malcolm Forbes.

What is being proffered is that current amateur gear is unreliable, inefficient, and, frankly, too cheap. Although the stuff may have held up for the past 50 years through all sorts of adversity, it just isn't good enough anymore. The "mission" of W1AW couldn't have changed that drastically that a VOA was required or that it deserves coverage in our sister publication *PopCom* as Radio Newington.

For a very expensive radio station it sure sends out the wrong message about

(continued on page 119)



# INTRODUCING AEA's NEW ANTENNAS



6-meter and 2-meter moonbounce installation. Four 6M-2WL, four 2M-5WL and one 432-13WL antennas in array on self-supporting 89-foot US tower at N7ML.



2M-18XXX installation at N7KQK.

The superior engineering designs, quality and high performance that AEA built its reputation on are now available in its dynamic new line of antennas. Developed and manufactured by Mike Staal K6MYC, president of M<sup>2</sup> Enterprises and co-founder of KLM antennas, the product line includes an assortment of 2-meter, 6-meter and 440 MHz antennas and accessories for fixed or portable applications. AEA/M<sup>2</sup> antennas are already recognized for their superior performance by many moonbouncers.

**Features.** AEA's new antenna line features computer-optimized antennas with the highest gain for boom-length attainable.

Other features include:

- Machined aluminum driven element housing with built-in "N" connector and O-ring seals including access cover
- Silicone dielectric gel in the cavities to withstand inclement weather
- Parasitic elements insulated through the boom on most units for long-term performance and reliability
- Electronically tuned balun combined with unique driven element design to produce symmetrical patterns
- Swaged and tapered boom plus solid rod elements to reduce windload
- Low windload overhead dacron boom support
- Flexible boom-to-mast mounting for mechanical balance
- Ideal for multiple antenna arrays.

**Accessories.** To compliment the antenna line, AEA also offers various "H" frame support packages. The MT-3000 heavy-duty elevation mechanism and controller for tilting up multiple yagi arrays. Also welded aluminum power dividers for coupling multiple antennas.

For further information, see your local AEA authorized dealer, or call AEA at (206)775-7373.

| Model    | 6M-5  | 6M-2WL | 6M-2.5WL | 2M-5WL | 2M-18XXX | 2M-6WLHD | 2M-CP14 | 2M-CP22 | EB-144 | 430-16 | 432-13WL | EB-432 |
|----------|-------|--------|----------|--------|----------|----------|---------|---------|--------|--------|----------|--------|
| Elements | 5     | 9      | 11       | 17     | 18       | 20       | 14      | 22      | N/A    | 16     | 39       | N/A    |
| Gain     | 9.4   | 12.4   | 13.0     | 15.0   | 15.3     | 16.0     | 10.0    | 12.1    | 1.0    | 14.3   | 18.0     | 1.0    |
| Boom     | 15'9" | 39'6"  | 50'4"    | 33'    | 36'      | 41'4"    | 9'10"   | 18'     | N/A    | 10'    | 30'3"    | N/A    |
| Weight   | 11/14 | 31/40  | 38/47    | 13/15  | 14/16    | 30/37    | 6/8     | 12.5/15 | 1.5/3  | 4/5    | 12/13    | 1.3/3  |
| Windload | 2.0   | 5.0    | 5.9      | 2.7    | 2.9      | 6.1      | 1.1     | 2.5     | N/A    | 0.82   | 2.5      | N/A    |
| F/B      | 12    | 25     | 22       | 22     | 25       | 22       | 20      | 20      | N/A    | 20     | 22       | N/A    |

Gain - dBd, gain over a dipole. Boom - Length, feet and inches.  
 Weight - Weight in pounds, antenna weight/shipping weight.  
 Windload - Windload area in square feet. F/B - Front-to-back ratio, dB.  
 6M - Six meters. 2M - Two meters. WL - Wavelength.  
 HD - Heavy-duty. CP - Circularly polarized. EB - Eggbeater.

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**Advanced Electronic Applications, Inc.**  
 2006-196th St. SW/P.O. Box 2160  
 Lynnwood, WA 98036



# Announcing

•**Mail Call 1989** - Send holiday greetings to U.S. servicemen and women in the States and abroad. Mail Call combines greetings from thousands of members and distributes them. For more information on this national, nonprofit program in its 14th year, send your name, address, and first-class stamp to Mail Call, Box 988, St. Robert, MO 65583 (mention CQ).

•**Middlesex, CT ARS VE Exams** - Exams are scheduled in Portland, Connecticut for October 10, November 18, and December 12. Pre-register by calling Ed Kerns, KN9Y, at 203-342-3400. Walk-ins also allowed.

•**Scouts Jamboree-on-the-Air** - Amateurs and Boy and Girl Scouts will exchange name, location, Scout rank, and other hobbies on October 21-22 on any amateur frequency. World Scout calling frequencies are SSB 3.940, 7.290, 14.290, 21.360, 28.350; CW 3.590, 7.030, 14.070, 21.140, 28.190, plus RTTY, SSTV, and packet. Call or answer "CQ Jamboree." Look for K2BSA and HB9S. For more information, contact The ARRL, 225 Main St., Newington, CT 06111. (Also see this month's Contest Calendar column.)

•**Kuwait Peace & Friendship Games Championship** - The Kuwait ARS will sponsor this contest from 0000Z Oct. 30 to 2400Z Nov. 12. It is open to amateurs and SWLs. Contacts on any band and mode from 3-30 MHz. Must contact two different Kuwait stations or make one contact with the Kuwait ARS station (9K2RA). Submit certified copy with date and time (GMT) of contact; callsign of station contacted; frequency and mode; serial station of Kuwait station logbook; plus 5 IRCs or US \$3.00. For certificate, send application to: Award Manager 9K2MJ, Kuwait Amateur Radio Society, P.O. Box 5240 Safat, 13053 Safat, Kuwait (telephone 965-533-3762, FAX 965-5311188).

•**Additional Special Events for October are:**

**W1AF**, from Harvard Wireless Club Anniversary, Cambridge, MA; Harvard Wireless Club; 0000Z Oct. 14 to 2400Z Oct. 15; General portion of 80-15 meters phone and CW, Novice part of 10 meters. For QSL

send SASE to Harvard Wireless Club, W1AF, 6 Linden St., Cambridge, MA 02138.

**K3IOG**, from Beltsville Agricultural Research Center, Beltsville, MD; Laurel Maryland ARC; 1300-2100Z Oct. 21; phone 7.240, 14.240, 21.340, 28.340, 147.540, CW 14.055. For photo certificate send QSL and no. 10 SASE to Laurel ARC, Box 3039, Laurel, MD 20708.

**K3PZN**, from Fire Prevention Week, Westminster, MD; Carroll County ARC; Oct. 8-14; 25-30 kHz from bottom of General phone bands 80-15 and Novice/Tech portion of 10 meters phone. For certificate send QSL, contact number, and SASE to Carroll County ARC, P.O. Box 2099, Westminster, MD 21157.

**W3USS/portable**, from the Blessing of the Fleet, St. Clement's Island, MD; Capitol Hill ARS; Oct. 7-8; 3.825, 7.220, 14.240, 21.300, 28.405 MHz, packet 145.030 MHz, local repeater 146.550 MHz. Send all QSLs with SASE via W4WG.

**K4AIF**, from the Devil's Courthouse, Transylvania County, Brevard, NC; Transylvania County ARC; 2100Z Oct. 31 to 0500Z Nov. 1; SSB 3.860, 14.295, 50.150, 144.2, 432.15, and FM simplex 223.5. For certificate send SASE to K4AIF, Dick Gustafson, 302 Wilson Dr., Brevard, NC 28712.

**N4ALE**, from anniversary of double-barrel cannon, Athens, GA; Athens Radio Club; Oct. 14-15; lower portion of the General 80-15 and Novice 10 meter CW and SSB bands. For QSL send QSL and SASE to Ed Riddle, N4ALE, F-24, Country Corners, Hwy 29, Athens, GA 30606.

**WD4EIZ**, from Fort Payne, AL; DeKalb County ARC; Oct. 18; 7.240, 14.260, 21.325, 28.350. For certificate send QSL and no. 10 SASE to Ray Goggans, WD4EIZ, 1612 Fruit Farm Rd., Fort Payne, AL 35967.

**WB4ZPI**, from Seventh Anniversary Wiregrass Antique Car Club, Dothan, AL; Wiregrass ARC; 1500-2100Z (check with the club for date in Oct.); phone 7.240, 14.260, 21.325, 28.425, CW 7.130, 21.130, plus or minus QRM. For QSL send SASE to Wiregrass ARC, P.O. Box 958, Dothan, AL 36302.

**N5CAF**, CAF Air Show, Harlingen, TX; South Texas ARS; 1500-0000Z Oct. 14 and 15; SSB 14260, 21360,

28460. Listen for operation from the aircraft. For photo QSL send QSL and SASE to Dr. David Woolweaver, K5RAV, 2210 S. 77 Sunshine Strip, Harlingen, TX 78550.

**AA5HF**, from Carthage, Panola County, TX; Carthage ARS; 1400-2200Z Oct. 21; General phone bands plus Novice/Tech 10 meter phone at 28.400 MHz and CW at 14.028 MHz. For certificate send no. 10 SASE, QSL, and contact number to: (for phone) Mark, AA5HF, Rt. 4 Box 166-X, Carthage, TX 75633; (for CW) Lee, W5QLA, 106 South Gaston St., Carthage, TX 75633.

**WM50**, from Whole Enchilada Fiesta, Las Cruces, NM; Billy the Kid Chapter of Ten-Ten International; 1500-2200Z Oct. 7; SSB, CW, and packet on VHF, suggested frequency 28.365 MHz, plus other HF bands. For certificate send \$1.00 to The Billy the Kid Chapter of Ten-Ten International, P.O. Box 274, Fairacres, NM 88033.

**W8TO**, from Columbus Day Special Event, Columbus, OH; Columbus ARA; 1500Z Oct. 7 to 0300Z Oct. 8, and 1500-2400Z Oct. 8; SSB 7.240, 14.340, 21.375, 28.500 MHz (plus or minus 10 kHz). Certificates, QSLs, plaques available. Contact with SASE Roger Dzwonczyk, WB2EIG, 283 East Longview Ave., Columbus, OH 43202.

**WB8ZVS**, National Fire Prevention Week, Clarksburg, WV; Stonewall Jackson ARA and Local 89 of Clarksburg Fire Fighters Union; 1200-2300Z Oct. 8; lower portion of General 80 and 40 meter phone bands. For certificate send QSL, contact number, and SASE to SJARA, P.O. Box 752, Clarksburg, WV 26302.

**WB8XR/B**, from Cedar County; Davenport Radio Amateur Club; 0001Z Oct. 21 to 2000Z Oct. 22; County Hunter Nets and down 10 kHz 80-10 meters SSB, CW on request. QSL SASE to Callbook address. DX QSLs sent following week via buro.

**W9CET**, from Topeka, KS to celebrate the 50th anniversary of *The Wizard of Oz*; Kaw Valley ARC; 1400Z Oct. 14 to 2300Z Oct. 15; General portion of the 20 and 75 meter bands and Novice/Tech portion of the

(Continued on page 8)

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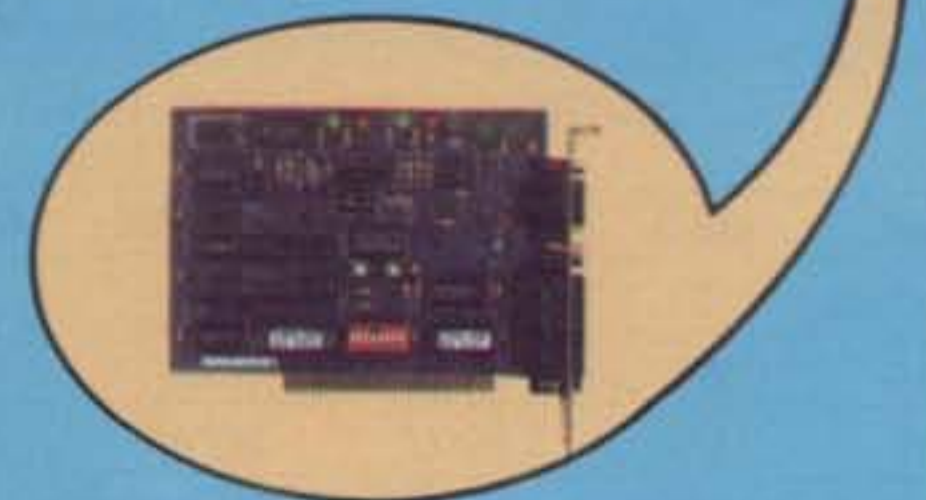
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The Tiny, Tough and Terrific Alinco DR-510T, 2m/70 cm FM Dual Band Mobile Transceiver has been specially designed to condense maximum performance and operating convenience into an ultra compact package. An impressive array of features give maximum flexibility in mobile installations.

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**2-Year Limited Factory Warranty**



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#### DR-410T Coming Soon

- 70cm FM Mobile Transceiver
- 440-450 Mhz
- 35 Watts Hi / 5 Watts Low



## Announcing (from page 6)

10 meter band. For QSL send QSL and SASE to KA@BNL, Sherry Langston, 1919 Adams #62, Topeka, KS 66607.

**W0CET and K1SSN**, from Topeka, KS, and Groton, CT, celebrating the commissioning of the *USS Topeka* naval Sub; Kaw Valley ARC; 1300-2200Z Oct. 21; 14.250 and 28.350. For certificate for working either or both stations, send SASE to KA@BHO, 2931 Tutbuty Tr. Rd., Topeka, KS 66614.

**W0CS**, from Beaver Island, Mississippi River; Clinton Iowa ARC; 1400-2200Z Oct. 7; SSB 3.875, 7.275, 14.260, 21.375, 28.400. For certificate send no. 10 SASE to Ed Shaw, P.O. Box 329, Comanche, IA 52730 (letters must be postmarked by Dec. 30).

**W0GKP**, from the club's anniversary, Duluth, MN; Arrowhead Radio Amateur Club; Oct. 14-15; lower SSB portion of 80-10 meter General bands and 10 meter Novice SSB. For certificate send QSL and SASE to Randy Welsand, WJ0L, 6319 Sherbourne St., Duluth, MN 55807.

**KE0JI**, from Amateur Radio Sell Nebraska Day, Norfolk, NE; Elkhorn Valley ARC; 1500-0300Z Oct. 14; suggested frequencies on bands 80-10 and 6 me-

ters are 28.470, 21.320, 14.270, 7.270, 3.870, 50.270 plus 2 meters at 146.730. For certificate send QSL and SASE to Roy Barkhuff, KE0JI, 1701 Skyline Dr., Norfolk, NE 68701.

•The following hamfests, etc., are slated for October:

Oct. 1, **Rome, Georgia Hamfest**, Rome Civic Center, Rome, GA. Contact T.J. Freeman, NC4G, 26 Conn St. SE, Rome, GA 30161 (404-232-2830).

Oct. 1, **JARFEST 89**, Benson, North Carolina American Legion Complex. Call 919-934-0486, or 894-5479.

Oct. 1, **Springfield Hamfest**, Springfield, OH. Contact Springfield Independent Radio Assn., P.O. Box 523, Springfield, OH 45501 (SASE).

Oct. 1, **Chicago ARC Open House**, 5801 N. Pulaski Rd., Chicago, IL. Contact Dean at 312-869-HAMS, or George at 312-545-3622.

Oct. 1, **Lake County ARC Hamfest**, Hammond National Guard Armory, Hammond, IN. Contact Ken Brown, WD9HYF, 918 Chippewa, Crown Point, IN 46307, or call 219-663-5035.

Oct. 1, **Yonkers ARC Ham Fair**, Yonkers Municipal Parking Garage, Yonkers, NY. Contact YARC, P.O. Box 378, Centuck Station, Yonkers, NY 10710 (914-963-1021).

Oct. 7, **13th Annual Mid-Atlantic VHF Conference**, Warrington Motor Lodge, Warrington, PA. Contact Pat Cawthorne, WB3DNI, 215-672-5289.

Oct. 7, **Tri-State ARA Hamfest & Computer Fair**, Huntington Civic Center, Huntington, WV. Contact TARA Hamfest, P.O. Box 4120, Huntington, WV 25729.

Oct. 7-8, **Biloxi Ham/Swapfest**, Point Cadet Plaza, at the foot of the Biloxi/Ocean Springs Bridge, MS. Contact Edward L. Byrd, KA5VFU, 18316 Landon Rd., Gulfport, MS 39503 (601-832-3249).

Oct. 8, **Pack Rats Hamarama 89**, Bucks County Drive-In Theater, Warrington, PA. Contact Pat Cawthorne, WB3DNI, 215-672-5289.

Oct. 8, **HamFair 89**, Lansing Civic Arena, Lansing, MI. Contact Rowena Elrod, KA8OBS, 111 Lancelot Place, Lansing, MI 48906 (517-482-9650).

Oct. 8, **Huntington, IN Hamfest**, PAL Club, Huntington, IN. Contact Jim Covey, KC9GX, 1752 Kocher St., Huntington, IN 46750.

Oct. 8, **Great Salt Plains Hamfest**, Community Building, south side of Great Salt Plains lake, near Cherokee, OK. Contact WB0UVN.

Oct. 14, **FORX ARC Hamfest**, Grand Forks Civic Auditorium, Grand Forks, ND. Contact Rod Klug, KE0A, 701-780-9478.

Oct. 14, **Radio Amateurs of Greater Syracuse Hamfest**, New York State Fairgrounds, east of Thruway Exit 39 on Route 690. Contact Ed Swiatkowski, WA2URK, 315-487-3417.

Oct. 14-15, **Palm Beach County Hamfest**, Fairgrounds, West Palm Beach, FL. Contact Palm Beach Repeater Assn. Hamfest, P.O. Box 461, Lake Worth, FL 33460.

Oct. 14-15, **Mem-Fest 89**, Pipkin Building, Mid-South Fairgrounds, Memphis, TN. Contact Clayton Elam, K4FZJ, 20 So. Cooper, Memphis, TN 38104 (901-274-4418 days). (VE exams.)

Oct. 15, **Northwest Ohio ARC Hamfest**, Allen County Fairgrounds, Lima, OH. Contact WD8BND, P.O. Box 211, Lima, OH 45802, or call 419-647-6613. (VE exams.)

Oct. 15, **Columbia ARA Hamfest**, Howard County, Maryland Fairgrounds. Contact C.R. Whetstone, WA3YOH, 211 Clarendon Ave., Baltimore, MD 21208, or call 301-486-2609.

Oct. 15, **Kettle Moraine RAC Ham, Computer, Video Fest**, Waukesha County Exposition Center, Waukesha, WI. Contact KMRA Club, P.O. Box 411, Waukesha, WI 53187(SASE).

Oct. 15, **Hall of Science ARC Hamfest**, New York Hall of Science parking lot, Flushing Meadow Park, Queens, NY. Contact Steve Greenbaum, WB2KDG, 718-898-5599 (evenings). (VE exams, contact WI2G, 718-847-0155.) (Rain date Oct. 22.)

Oct. 15, **Shore Area Ham & Computer Fest**, Allaire Airport, Wall Township, NJ. Contact Al Jackson, NK2O, P.O. Box 635, Eatontown, NJ 07724 (201-922-8121). (VE exams.)

Oct. 21, **Triangle East ARA Hamfest**, Moose Lodge, Smithfield, NC. Contact Kirk Ellis, P.O. Box 255, Smithfield, NC 27577 (919-965-9577, from 5:30 to 9:30 PM).

Oct. 21, **Tri-Cities Hamfest**, Appalachian Fairgrounds, Gray, TN. Contact Tri-Cities Hamfest, P.O. Box 3682 CRS, Johnson City, TN 37602.

Oct. 22, **Tradefest 89**, Yezzi Field, Bensalem, PA. Contact Steve, 215-752-1202. (VE exams.)

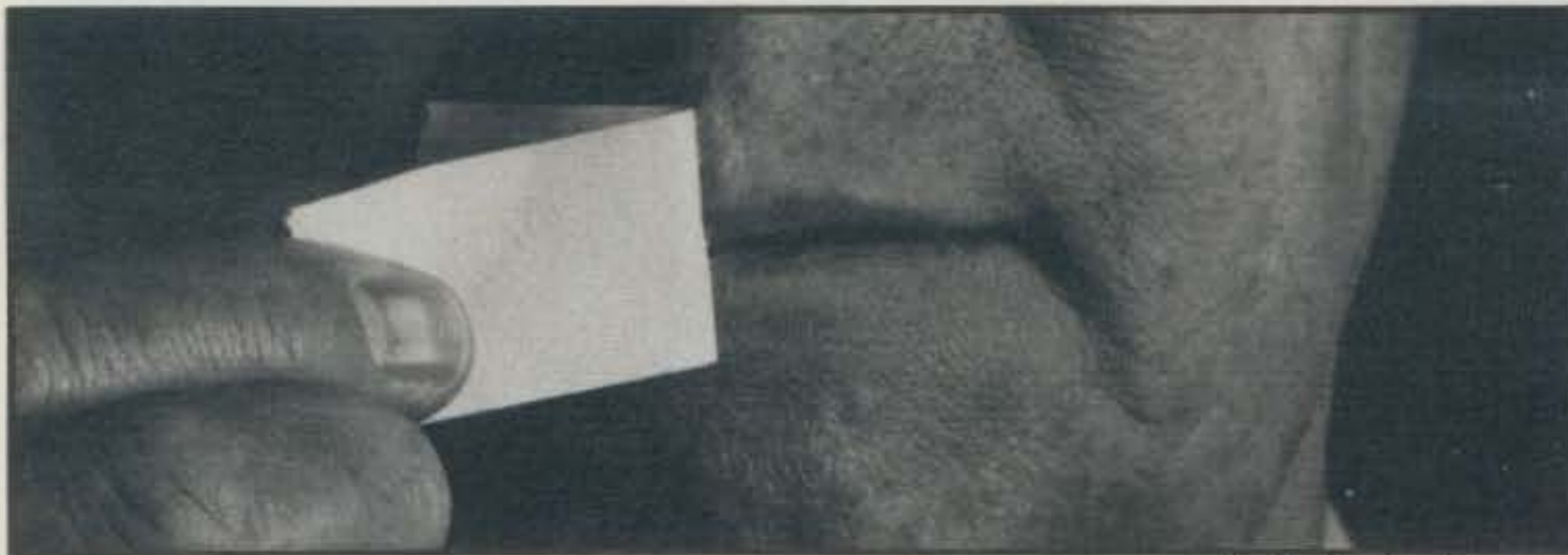
Oct. 22, **Kalamazoo Hamfest**, Kalamazoo Central High School, Kalamazoo, MI. Contact Gary Hazelton, KB8PL, 616-624-1110. (VE exams.)

Oct. 28, **Hamfest Minnesota & Computer Expo**, Hennepin Technical College, Brooklyn Park, MN. Contact Hamfest Minnesota & Computer Expo, P.O. Box 5598, Hopkins, MN 55343 (612-474-1529).

Oct. 28-29, **Hamfest Chattanooga Amateur Radio & Computer Convention**, Chattanooga-Hamilton County Convention and Trade Center, Chattanooga, TN. Contact Hamfest Chattanooga, P.O. Box 3377, Chattanooga, TN 37404. (VE exams.)

Oct. 29, **Heart of Ohio Hamfest**, Marion County Fairgrounds Coliseum, Marion, OH. Contact Ed Margraff, KD8OC, 1989 Weiss Ave., Marion, OH 43302 (614-382-2608).

Nov. 17, **17th Annual Southeast Asia Net Convention**, Singapore. Contact Seanet 89, c/o Singapore Amateur Radio Transmitting Society, Robinson Rd., P.O. Box 2728, Singapore, 9047 for more details.



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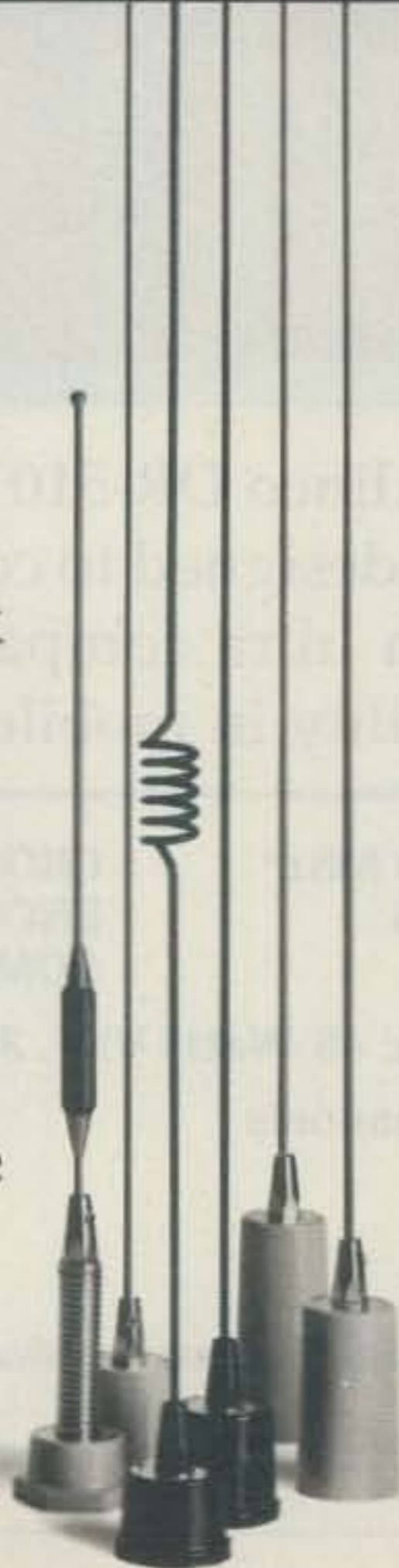


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Engineered with the most advanced electronic technology, the Tiny, Tough and Terrific DJ-500T features two methods of Frequency Selection, Encode/Decode Subaudible Tones and a Single memory - 16 Digit Auto Dialer and the following plus:

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2m FM Transceiver

- ▶ 3 Watts/Standard
- ▶ 6.5 Watts/Optional

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- ▶ 5 Watts/Optional

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Sixty-two programmable memories that store

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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 with optional synthesized voice board installed.

Rear panel controls are provided to adjust the VOX, cw monitor level and tone, and SSB

sidetone monitor level. Switching is provided to control conventional linear amplifiers and of course, high speed switching for QSK linears, such as the Titan or the Hercules II. Other rear panel inputs and outputs for transverters, FSK (170 Hz shift), fixed level audio out, audio in, external speaker, aux dc jack and provision for the optional RS-232 control interface. An absolute delight for the all mode operator.

The Paragon is the result of a three year engineering effort. 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.



## The Classic CORSAIR II...

Unique in all the world, the CORSAIR II is the only ham transceiver available that uses a crystal mixed, permeability tuned oscillator. The ability of this scheme to reject strong adjacent signals and to dig out weak signals under the most adverse conditions is legendary. The 95 dB of dynamic range is all useable!

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can control transmit, receive or transceive. Selectivity is enhanced with a 16 pole crystal ladder filter and pass band tuning. The 50+ dB notch filter virtually eliminates carrier type interference. An eight pole audio filter is standard and the I-F filters are selectable independent of mode for superior operation on the digital modes.

The transmitter is well known for outstanding audio quality on SSB and QSK CW performance is

simply beyond comparison. All ham bands are covered, 160 through 10 meters with WWV at 10 MHz. The front panel is a thoughtful and spacious arrangement with only the controls that you need.

If your number one priority is outstanding performance on the ham bands, and simplicity is still a virtue, you may be the kind of purist who deserves the classic CORSAIR II.

## Add Satellite Communications To Your HF Station



Model 2510 B

The Model 2510 B, mode B, satellite station is a 70 cm, 10 watt SSB and CW transmitter with a super-sensitive, low noise, 2 meter to 29 MHz receive converter. The receive conversion idea takes advantage of the excellent selectivity and sensitivity that you already have in your HF station. Frequency tuning is with the PTO in the 2510B and the transmitter automatically tracks the receive frequency for "transceive" operation. "Split" operation is also provided. Two bands are included for full coverage of Oscar 10 and Oscar 13.

The Model 2410 is an all mode, broadband, 100 watt, 70 cm amplifier that adds 10 dB of gain to your up-link signal. Tx/Stby control can be hard-wired or automatic when the drive signal is present. Primary power is 12 to 14 Vdc at 20 amps.



Model 2410





## TITAN: A Gallon And A Half Out! (5.68 Liters)

The TITAN has it all! 1500 watts output with ease, all legal bands 160 through 15 meters including MARS frequencies (10 meters after owner mod), lightning fast QSK for full break-in CW or the digital modes and a two speed blower for quiet operation on SSB. This awesome performance from a 17 lb desk top amplifier is made possible by a pair of Eimac® 3CX800A7 ceramic triodes and an external 45 lb power supply that is an absolute "horse."

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The low drive requirement of the TITAN (65 watts for 1500 watts output, typical) makes life much nicer for your exciter too. This is especially comforting when operating keydown modes such as RTTY. Two product review articles have been published, see QST April 1986, CQ February 1986.

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Mobile or Base—Solid State



## Hercules II No Tune 550 Watt HF Amplifier

The HERCULES II, Model 420, is an amplifier design that offers a combination of unique features that can only be achieved using modern solid state technology. Instant on, 12 - 14 Vdc operation, no-tune broadband final and compact size. General coverage operation from 1.8 to 22 MHz (to 29.999 MHz with authorized modification). Add to that lightning fast QSK cw, remote control, superb linearity and a low drive requirement. Outstanding!

The HERCULES II will interface nicely with virtually all transceivers. The front panel includes an analog multi-meter for collector current, voltage, forward power and SWR. A 10 element LED bar-graph display indicates peak output power. Band selection is made from the front panel switch or remotely controlled through a rear panel connector. Accessories are available for mobile remote control and automatic band tracking when using a Paragon. A front panel speaker is built-in.

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## Two KW Antenna Tuner

The latest version of the highly regarded Ten-Tec antenna tuner is now the Model 238. The 238 has been re-styled to match our transceivers and looks great in your shack, whether your layout is "look alike" or "mix and match." This tuner adds a great deal of versatility. It will load virtually any unbalanced (coax fed or long wire) antenna. The high power balun is built in as standard which allows the use of balanced feeders also. Full coverage from 1.6 to 30 MHz. The modified "L" network will tame an SWR of at least 10:1, any phase angle, without false load problems. The lighted slide rule dial and calibrated tuning knob skirts make it possible to log settings and quickly QSY to the same frequency and antenna, without going through the tuning process again. Lighted multi-meter reads power in two ranges, plus SWR. A great way to operate all bands, including WARC and MARS, with something less than a world-class antenna farm.

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

BY LARRY BROCKMAN\*, N6AR/4, AND BOB COX\*\*, K3EST/6

It is well past midnight now, and Arnold has lost all sense of his original plan. The fingers are working feverishly to a frenzy of high-speed CW. QSOs, more QSOs per minute than Arnold thought were possible, are ringing in his ears. Indeed, Arnold plugs on with his tenth contact in just 5 minutes. What phenomenal conditions! Yes, he just can't afford to miss any of the CQ WW this year. Arnold has made his decision—it will be all 48 hours or bust.

He had told himself before the contest that this is just a hobby, and not to get lured into sitting at the radio all weekend. He could control himself, he was sure. Just listen for a while carefully, and then make a few select contacts; that was his plan. He would be in there like a frog on a bug—snag the good juicy stuff and then be out of it. Arnold was going to use the surgical approach. But in the first minutes of the contest he wavered. There was a 28 MHz opening the likes of which Arnold had never heard before; 3W8CW, BY4SZ, YB0ARA, HS0A, VS6UP, etc., and all of them were as loud as a local! And then there was the switch to 15 meters. Wow, what a crop of Pacific DX in amongst the Africans and South Americans. He couldn't just quit like that after a few minutes on 10. He had to at least try his luck on 15. Of course, it was the same way on 20, 40, and 80 later. And so, Arnold had faltered in his resolve. He had tasted a "hot fudge sundae." He had fallen prey once again to the mighty CQ WW DX Contest, the "Olympics" of all operating events.

Arnold continued on in his new found bliss with fantastic fingers flying on the key and headphones fused to his ears. As Arnold surrendered completely to this temptation, he shed the frustrations and pressures of his normal world and became consumed in an escape from reality. For in that 48 hours of contesting—no matter how exhausting the time spent, no matter how frustrating the pileups, no matter how belligerent it all seemed—Arnold truly forgot his troubles. What welcome therapy and terrific relief the CQ WW Contest is!

Actually, a huge contingent of Arnolds from all over the world rallied to the 1988 call for participation. Over 40,000 calls appeared in more than one log in our computerized data base, more than ten to one in ratio to the number of logs received. These congregated to do battle in a variety of categories. Yet everyone who entered was a sure winner due to the absolutely fabulous propagation conditions on all bands. Some of you winners do deserve special recognition, as 31 world-wide and 6 USA all-time records were set. Here are the details.

\*12041 Walker Pond Rd., Winter Garden, FL 34787

\*\*1816 Poplar Lane, Davis, CA 95616



This year's top worldwide single operator was FY5YE, operated by Ville, OH2MM (bottom), shown here with station owner Mario (top).

## The All-Band Results

In an encore performance, FY5YE, operated by Ville Hiilesmaa, OH2MM, swept away his own 1987 World and South American records (8.2 M) with a phenomenal 9.6 M points. Ville was followed by Glenn Rattmann, K6NA, operating at HC5M. Glenn's 8.8 M was well above the old world record, and despite a 140 contact advantage, Ville carried the day with his fine multiplier total. Jim Neiger, N6TJ, returned again for guest operation at D44BC, and posted his best effort ever at 7.4 M for a third-place finish, followed closely at 7.3 M by John Laney, K4BAI, who did 8P9HT—good enough for a new North American All-Band record, too. Meanwhile, JE1JKL returned to KC6CS this year to earn a fine 4.9 M points and set a new Oceania Continental record, besting the seven-year-old mark of N6BT/AH0. Top honors in Europe went to Phil Goetz, N6ZZ, at CT2NH. Phil's 4.68 M eradicated I4IND's one-year-old European record, adding a second Continental All Band, all-time record to the 5B4TI Asian mark Phil set last year. Phil was followed by TF3WW, manned by OH4NRC. Iceland is such a tough place to compete from, too.

In the USA there was a complete sweep of the top six by the northeast, with Greg, W1KM, amassing an impressive 4.47 M points. Randy, K5ZD, was second from K3TUP. Randy's multiplier of 609 was 32 more than Greg's, but that wasn't enough to compensate for Greg's extra 200 contacts. The band-by-band breakdown tells us that the low bands were the difference in the QSO count.

Frank Bogataj, YU3BC, set a new QRP World record with a great 1.24 M. He was followed by some strong USA finishes by WA2HZR (890 K) and NX7K (865 K). Congratulations on all those tough QRP QSOs!

In the quest for the combined SSB/CW All-Band Single Operator trophy, it was a three-way race among Martti Laine, Jim Neiger, and Ville Hiilesmaa, but Martti Laine, troubled in the CW contest by a transceiver failure early on Sunday morning, pulled it out. Congratulations on two fantastic efforts from the Madeira Islands, Martti.

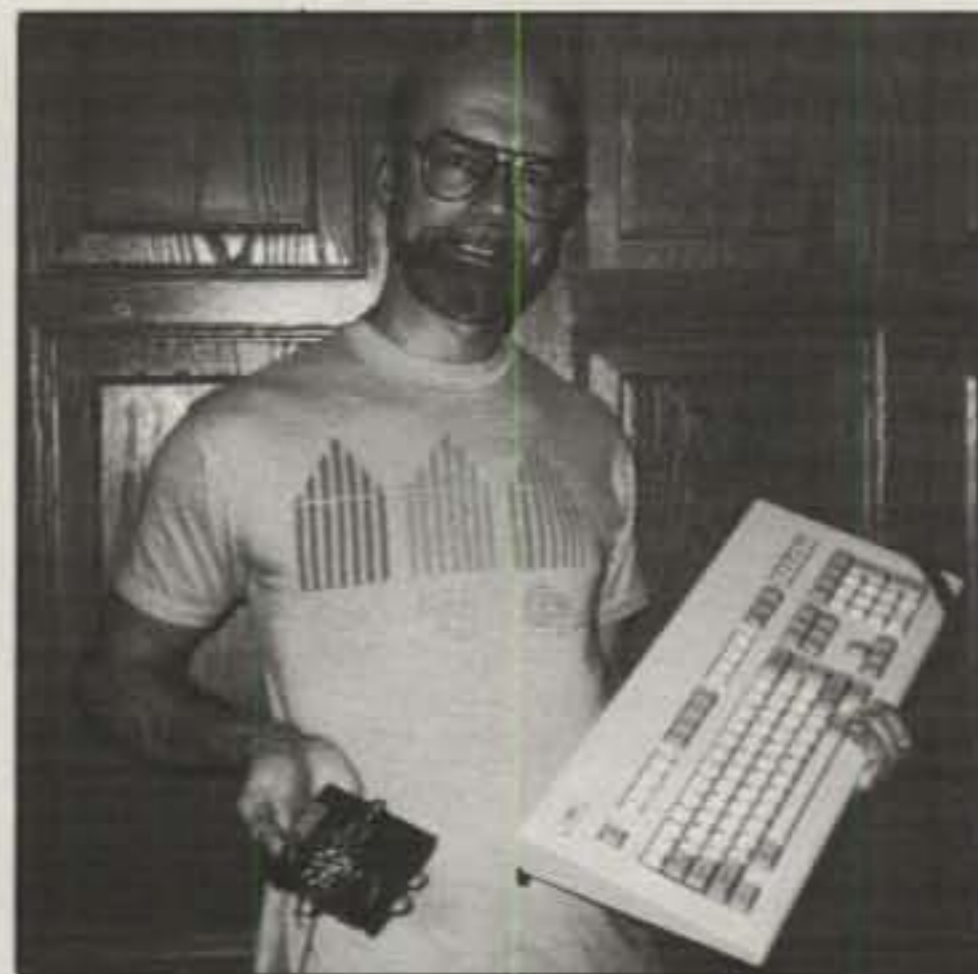
## Single Band Categories

An incredible 21 records fell this year in the single band categories, with new World records being set on all of the bands except 20 meters. In fact, balance was a key to this year's propagation, with all six bands providing great propagation over most of the world.

Bahri, TA2BK, led the low-band forces with 163 K on 160 meters, followed by HB9AMO (topping his own European record) with 111 K. The USA winner was K5UR once more, who squeaked out a tough 13 K, down from his earlier scores because of relatively poor stateside 160 meter conditions. KX6DC, operated by NZ8B, gave Oceania its new Continental record of 42 K, topping perennial 160 meter enthusiast KH6CC.

The standard for 3.5 MHz was set by Jeff Briggs, K1ZM, who hammered out 809 K from NP4A to capture a new World and North American record. He was followed by EA8XS at 546 K, good enough for a new African record. W1FV prevailed Stateside, with a fabulous 225 K, while Akim, YU1YV, using the call 4N1A, won the top European slot with 247 K. What a signal Akim has on 80 meters in the States!

Seven MHz top honors and World and South American records go to Jose, YV5ANT, for his YX5A effort, the first ever station to break the 1



Phil Goetz, N6ZZ, shown here, is the holder of two all-band continental records—Europe, for this year's CT2NH effort, and Asia, for last year's 5B4TI effort.



M point barrier on 7 MHz CW. OH7JT/CT9 was very close behind, as his 904 K topped the old 1983 African record set by EA7TL/9 by almost 3 to 1. Dov, 4Z4DX, has a new Asian record with a fine 859 K. Meanwhile, I3JSS led the Europeans with 582 K, followed closely by YT0A and LZ1V at 553 K and 509 K, respectively. Bill, K2EK, wiped out K1OX's old Stateside mark with a great 520 K effort, followed by N2DT and WB8JBM with strong Stateside single band scores.

Twenty meter scores were noticeably down this year on the international front, possibly an indication of the indecision all of us competitors faced with virtually every HF band open at

sunrise and sunset. Nevertheless, Chris Burger, ZS6BCR, found 832 K enough to win it world-wide. Chris was followed by NY2M/KH2 at 765 K, and Al Slater, G3FXB, at 709 K. The USA winners were Conrad, N5CR, with 474 K and Bob, K2HFX, with 411 K.

This year marked the return of long, lucrative 10 and 15 meter openings to just about everywhere. On 15 Jorge, CX8BBH, piled up a remarkable 1.496 M for new World and South American records, pressed by fellow South Americans ZY5ZBA and 9Y4VU. LZ1KDP, operated by Todar, LZ2AX, captured the European honors this year with 752 K, followed by three Yugoslavians—YT6AA, YT3AA, and

4N2E, in that order. K3RV/4 (682 K), and K4XS (615 K), operated by WC4E, finished in a tight one/two fashion in the USA. By the way, Aki, JA5DQH, captured a new Asian 21 MHz record with a 624 K score.

The 28 MHz competition was hot and heavy, with many folks taking advantage of the good conditions. YV7QP, using 4M7A, did it again this year for the second year in a row, with a fine 1.145 M and a new World and South American record. ZY5EG was second at 1.04 M, in a close race with new Oceania record-holder KD7P/KH2 (1.037 M). VS6UP was third and established a new Asian record with 712 K. The USA leader was ARRL's K1ZZ with 538 K, a

## CW TROPHY WINNERS AND DONORS

### SINGLE OPERATOR, ALL BAND

#### World

**HC5M** (Opr. Glenn Rattmann, K6NA)  
Donor: W2AB Memorial (Albert Kahn, K4FW)

#### World QRPp

**Frank Bogataj, YU3BC**  
Donor: Gene Walsh, N2AA

#### U.S.A.

**Gregory M. Cronin, W1KM**  
Donor: Frankford Radio Club

#### Canada

**John Sluymmer, VE6OU/3**  
Donor: Canadian DX Association

#### Caribbean/Central America

**8P9HT** (Opr. John T. Laney, III, K4BAI)  
Donor: Peter Monroe, WB1DQC

#### Europe

**CT2NH** (Opr. Philip Goetz, N6ZZ)  
Donor: Edward Bissell, W3AU

#### Africa

**D44BC** (Opr. James Neiger, N6TJ)  
Donor: Gordon Marshall, W6RR

#### Asia

**Tatsuya Sasaki, JH7WKQ**  
Donor: Japan CQ Magazine

#### Japan

**Akira Asai, JA8RWU**  
Donor: Japan Crazy Contesters Club

#### Oceania

**Joel Chalmers, KG6DX**  
Donor: Maui Amateur Radio Club

#### South America

**FY5YE** (Opr. Ville Hiilesmaa, OH2MM)  
Donor: YV5AAZ Memorial (Venezuela DX Club)

### SINGLE OPERATOR, SINGLE BAND

#### World—28 MHz

**ZY5EG** (Opr. Peter Sprengel, PY5CC)  
Donor: Joel Chalmers, KG6DX

#### World—21 MHz

**CW8B** (Opr. Jorge Camboni, CX8BBH)  
Donor: N5JJ Memorial  
(Don Busick, K5AAD)

#### World—14 MHz

**Chris R. Burger, ZS6BCR**  
Donor: W2JT Memorial  
(New Jersey DX Association)

#### World—7 MHz

**YX5A** (Opr. Jose Castejon Lara, YV5ANT)  
Donor: Alex M. Kasevich, VP2MM

#### World—3.5 MHz

**NP4A** (Opr. Jeff Briggs, K1ZM)  
Donor: Fred Capossela, K6SSS

#### U.S.A.—14 MHz

**Conrad Romberg, N5CR**  
Donor: Northern Illinois DX Association

#### U.S.A.—7 MHz

**Bill Gioia, K2EK**  
Donor: Jan Perkins, N6AW

#### Canada (14 MHz)

**Dave Goodwin, VE2ZP**  
Donor: Canadian Amateur Radio Federation

#### Europe

**LZ1KDP** (Opr. Todar Ivanov, LZ2AX)  
Donor: Southern New England DX Club

#### Japan—21 MHz

**Akito Nagi, JA5DQH**  
Donor: DX Family Foundation

### MULTI-OPERATOR, SINGLE TRANSMITTER

#### World

**VP2MW** (Opr. AA5DX, KM5R, WQ5W)  
Donor: Anthony Susen, W3AOH

#### USA

**K1AR** (Opr. K1AR, K1EA, K1GQ, K1VR, KC1F)  
Donor: Doug Zwiebel, KR2Q

#### Canada

**VE7ZZZ** (Opr. VE7ARS, VE7AV, VE7DP, VE7EME, VE7SK)  
Donor: Eastern Canadian DX Association

#### Europe

**HG5A** (Opr. HA5AWH, HA5BNL, HA5FM, HA5GF, HA5IW, HA5LN, HA5MK, HA5ML, HA7RY, HA5WE)  
Donor: K3AO Memorial (Friends of K3AO)

### MULTI-OPERATOR MULTI-TRANSMITTER

#### World

**PJ1B** (Opr. K2SB, K2SS, K2TW, K3EST, K3VW, KT3Y, N2AA, N3ED, N3RD, N4RV, PJ9EE, W2GD, W3UM, WA3LRO)  
Donor: Hazard Reeves, K2GL Memorial

#### USA

**W3LPL** (Opr. W3LPL, AI3M, K3RA, KA1GD, KF3P, N8II, ND3A, NW5E, W3EKT, WA8MAZ, WB3FSB, WB3JRU, WD4AXM)  
Donor: Jim Rafferty, N6RJ

#### Europe

**OL8A** (Opr. OK2FD, OK3CBU, OK3CDV, OK3CGP, OK3CMV, OK3CQR, OK3CSQ, OK3CUM, OK3CZM, OK3EA, OK3EY, OK3GB, OK3GI, OK3JW, OK3LU, OK3LZ, OK3NA, OK3NY, OK3PA, OK3RM, OK3TAP, OK3TPV, OK3YEC, OK3YX, OK3ZAF)  
Donor: Finnish Amateur Radio League

### CONTEST EXPEDITIONS

#### World—Single Operator

**EL7U** (Opr. Jorma Saloranta, OH2KI)  
Donor: Yankee Clipper Contest Club

#### World—Multi-Operator

**P40V** (Opr. AI6V, AJ6V, K7RIE, K7SS, K7WA, K7XX, KE7V, KQ2M, N6IG, N7NG, NB6G, NV6Z, W4ETO, W7WJ, WA6AUE)  
Donor: Bill Schneider, K2TT

### SPECIAL SINGLE OPERATOR AWARDS

**World—Single Band, Combined SSB/CW**  
**Martti Laine, CT9BZ**

Donor: Yuri Blanarovich, VE3BMV/W2

#### World—All Band, Most QSOs, CW

**HC5M** (Opr. Glenn Rattmann, K6NA)  
Donor: KV4AA Memorial  
(The 14270 kHz Group)

### CLUB

#### World—SSB/CW

**Frankford Radio Club**  
Donor: CQ Magazine

#### Non-USA—SSB/CW

**Rhein-Ruhr DX Club**  
Donor: N6AUV Memorial  
(Northern California Contest Club)



# 1988 CQ WORLDWIDE DX CONTEST

## WINNERS

The operators at right (by 80/40M operating positions) and below (by high band positions) pushed P40V to an all-time SSB record of nearly 20,000 QSOs and 50 million points.



After winning the world and smashing the old SSB record by 7 million points, this group decided to return to Aruba for the CW contest. They anchored the CW crew (below) to nearly 39 million points—eclipsing the old CW record by over 50%!



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## BAND-BY-BAND BREAKDOWN—TOP ALL BAND SCORES

Number groups indicate: QSO's/Zones/Countries on each band.

### WORLD TOP SINGLE OPERATOR, ALL BAND

| Station | 160       | 80        | 40         | 20         | 15         | 10         |
|---------|-----------|-----------|------------|------------|------------|------------|
| FY5YE   | 149/12/37 | 302/17/60 | 554/21/68  | 1403/30/88 | 1067/31/98 | 1993/31/91 |
| HC5M    | 37/10/13  | 221/18/38 | 1089/29/71 | 1297/34/84 | 1292/33/85 | 1747/25/85 |
| D44BC   | 163/12/31 | 164/16/42 | 477/26/69  | 1072/24/67 | 1269/30/88 | 1722/28/77 |
| 8P9HT   | 158/9/16  | 604/22/61 | 747/22/64  | 1203/27/70 | 1583/31/77 | 1295/28/68 |
| EL7U    | 76/11/35  | 127/19/46 | 512/27/67  | 1248/33/83 | 704/31/83  | 1422/30/85 |
| P40GO   | 44/13/20  | 280/16/45 | 527/20/54  | 814/33/69  | 1252/28/74 | 1698/29/78 |
| SU1ER   | 7/4/6     | 395/11/40 | 910/19/56  | 617/32/80  | 1252/31/78 | 1338/27/72 |
| PZ/N3JT | 5/2/5     | 232/17/42 | 334/15/36  | 1107/32/74 | 1606/27/74 | 1549/27/70 |
| 5H1HK   | —/—/—     | 102/12/24 | 559/24/55  | 1269/33/83 | 1036/34/73 | 1350/27/72 |
| CT3BZ   | 207/12/40 | 416/14/52 | 904/21/60  | 898/29/65  | 585/24/62  | 961/23/62  |

### USA TOP SINGLE OPERATOR, ALL BAND

| Station | 160      | 80        | 40        | 20         | 15        | 10        |
|---------|----------|-----------|-----------|------------|-----------|-----------|
| W1KM    | 39/12/30 | 402/22/60 | 617/31/79 | 590/37/98  | 579/28/79 | 410/26/75 |
| K3TUP   | 38/13/30 | 143/22/60 | 410/28/74 | 528/37/107 | 547/34/85 | 759/33/86 |
| K1CC    | 45/13/31 | 364/20/60 | 506/23/71 | 506/32/81  | 771/28/76 | 356/25/67 |
| K1TO    | 48/13/37 | 220/17/54 | 292/28/73 | 590/40/102 | 736/33/96 | 359/26/70 |
| N2LT    | 29/10/21 | 106/17/47 | 537/31/78 | 316/33/88  | 581/32/90 | 713/32/84 |
| K3ZO    | 29/11/28 | 151/21/58 | 491/32/79 | 280/38/94  | 579/33/93 | 581/31/90 |
| W9RE    | 25/10/21 | 96/19/50  | 343/28/67 | 405/37/93  | 623/34/89 | 659/31/77 |
| N5AU    | 31/13/22 | 77/17/37  | 309/30/73 | 489/37/96  | 502/35/96 | 598/31/86 |
| K300    | 46/11/28 | 253/20/60 | 294/24/57 | 365/32/81  | 589/30/87 | 514/28/83 |
| N6BV/1  | 42/8/27  | 172/16/48 | 458/24/67 | 410/36/94  | 451/28/82 | 538/29/82 |

### WORLD TOP MULTI-OPERATOR SINGLE-TRANSMITTER

|        |           |           |             |             |            |             |
|--------|-----------|-----------|-------------|-------------|------------|-------------|
| VP2MW  | 99/9/20   | 232/18/53 | 1148/25/73  | 1533/36/107 | 1650/34/93 | 1306/29/80  |
| PJ2X   | 40/9/14   | 682/20/66 | 905/24/69   | 1081/36/98  | 1546/32/94 | 1004/31/81  |
| RL1P   | 167/10/48 | 382/18/60 | 1132/36/104 | 931/39/111  | 619/39/103 | 1260/34/107 |
| UL8LYA | 75/14/42  | 492/22/71 | 1013/36/100 | 1196/40/100 | 648/36/102 | 654/37/100  |
| HG5A   | 353/12/54 | 931/21/72 | 873/36/103  | 842/40/118  | 908/40/114 | 1123/38/108 |
| LZ9A   | 277/17/64 | 516/21/69 | 775/37/106  | 986/40/124  | 909/40/117 | 893/38/111  |

### USA TOP MULTI-OPERATOR SINGLE-TRANSMITTER

|        |          |           |            |            |            |            |
|--------|----------|-----------|------------|------------|------------|------------|
| K1AR   | 44/14/42 | 407/26/76 | 931/35/107 | 741/40/135 | 630/35/111 | 571/35/105 |
| N3RS   | 36/11/35 | 229/23/76 | 896/35/99  | 452/40/120 | 630/35/108 | 479/31/99  |
| N4WW   | 35/12/33 | 287/18/61 | 413/29/77  | 918/39/117 | 699/36/99  | 460/34/95  |
| K8AZ   | 34/15/31 | 165/20/60 | 421/34/87  | 650/40/128 | 719/34/110 | 502/34/105 |
| K5NA/2 | 51/16/46 | 199/20/56 | 583/33/93  | 522/40/124 | 562/33/99  | 578/33/100 |
| WM5G   | 25/12/18 | 106/24/51 | 451/34/103 | 443/40/127 | 489/39/128 | 571/33/115 |

### WORLD TOP MULTI-OPERATOR MULTI-TRANSMITTER

|       |           |            |             |             |             |             |
|-------|-----------|------------|-------------|-------------|-------------|-------------|
| PJ1B  | 717/17/65 | 1447/24/82 | 3119/37/133 | 3791/40/140 | 2997/39/134 | 2850/37/117 |
| P40V  | 317/16/42 | 1555/27/84 | 2867/33/113 | 3443/39/140 | 3382/39/142 | 2569/38/130 |
| KP2A  | 608/20/63 | 1549/22/86 | 2905/36/117 | 3622/39/134 | 3743/40/124 | 2771/34/107 |
| EA9EA | 672/16/69 | 1466/24/88 | 2354/34/99  | 3572/40/136 | 2447/39/109 | 2694/37/115 |
| HD8EX | 389/17/30 | 1281/26/67 | 2324/33/84  | 2617/39/113 | 3638/38/116 | 3169/32/95  |
| OL8A  | 702/17/70 | 1715/28/89 | 2047/38/124 | 2394/40/133 | 1896/38/119 | 1919/39/123 |

### USA TOP MULTI-OPERATOR MULTI-TRANSMITTER

|        |           |           |             |             |             |             |
|--------|-----------|-----------|-------------|-------------|-------------|-------------|
| W3LPL  | 152/18/52 | 624/26/82 | 1205/35/107 | 1029/40/141 | 1212/37/119 | 1165/38/123 |
| NR5M   | 69/20/31  | 291/27/59 | 794/36/100  | 1232/40/147 | 946/38/122  | 1021/35/117 |
| K1ST   | 57/13/34  | 330/22/71 | 968/35/106  | 1085/40/136 | 831/35/102  | 519/34/98   |
| K4JPD  | 58/16/35  | 322/26/68 | 683/32/98   | 804/40/132  | 783/36/105  | 1025/37/115 |
| K4VX/8 | 55/16/30  | 189/23/62 | 660/36/100  | 1004/40/134 | 903/37/106  | 879/35/111  |
| N1CQ   | 107/16/47 | 366/24/72 | 782/34/105  | 1082/39/124 | 867/34/94   | 512/29/90   |

new USA high, followed by W4XJ and W0ZV. The European competition was close, with all top slots separated by less than 100 K. It was RB5VK, EA7TH, and YT7WW, in that order.

Bob Winters, KD7P, is the 1988 winner of the combined SSB/CW Single Band Trophy for his operations at KH2. Congratulations, Bob.

### Multi-Operator Winners

The Multi-Single category continued to enjoy healthy growth this year. A Caribbean team at VP2MW led the way with 9 M, followed very closely by the team at PJ2X, which set a new South American record. Meanwhile, the boys at RL1P and UL8LYA fought it out from the Kazakh for third and fourth place with scores of about 8 M. In Europe the HG5A crew took the prize with 7.775 M, a new record. They were pressed by LZ9A at 7.455 M and IO4IND at 6.7 M. John Dorr's K1AR team blew away the Stateside competition with 7.37 M. A group of five in the 5 M region trailed them, including N3RS, N4WW, K8AZ, and K5NA/2.

The world-class Multi-Multi category provided us with a fierce competition of goliaths, as PJ1B (38.4 M), P40V (35.4 M), KP2A (32.3 M), EA9EA (31.8 M), and HD8EX (27.5 M) all wrangled incredible efforts, in that order. PJ1B emerged as the new all-time World and South American record holder, while KP2A captured a new North American record. Likewise, EA9EA set a new African mark. We almost forgot to mention the new European record set by OL8A in Multi-Multi, with a great 18 M. They were hotly pursued by UP8A. Both of these teams managed a zone multiplier in excess of 200. Wow!

### Club Competition

The club competition this year continued to



Jan, G3WVG, is shown operating GW4BLE, one of the top all-band European entries this year.

feature the battle between the Frankford Radio Club and the Yankee Clipper Contest Club. The FRC emerged as the winner with a fantastic 226 M compared to the YCCC's 204 M. The Potomac Valley Radio Club, the Southern California Contest Club, and the North Texas Club rounded out the top five domestic clubs. Two large West German clubs fought it out in the non-US club arena, with the Rhein-Ruhr DX Club taking the prize with 75 M compared to the Bavarian Contest Club's 65 M. The two large Lithuanian Clubs—Northern Lithuania DX Group and Kaunas Polytechnik Institute—and the Osaka University ARC rounded out the top five.

Only one entry was received in the Team Contesting area for the CW mode, and that was for "Team Japonica," consisting of 5H1HK (Opr. JE3MAS), KH0/JE1CKA, KC6CS (Opr. JE1JKL), JH7WKQ, and EL2FY (Opr.

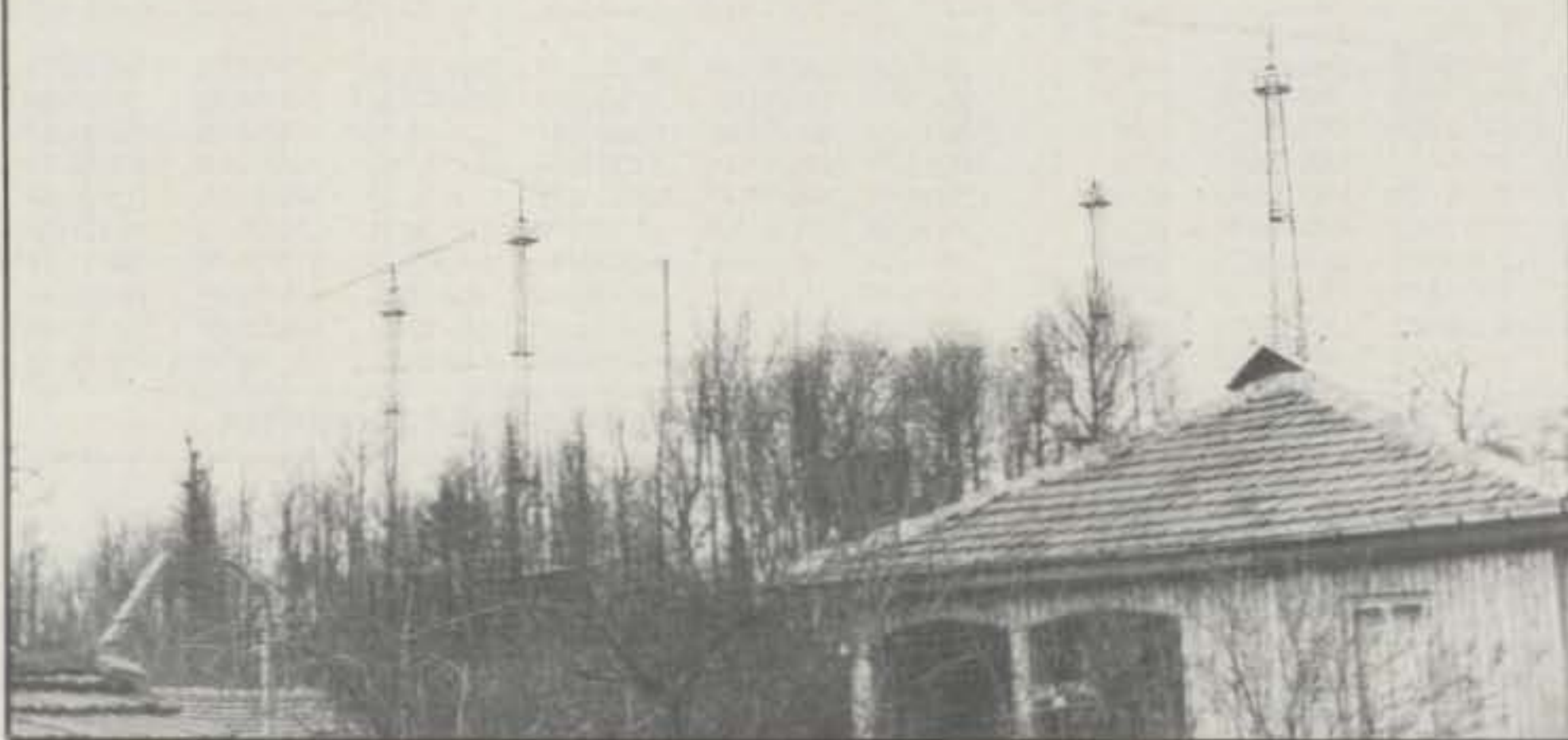
JA1XAF). Congratulations on a fine 18 M total. How about some competition next year from the Finns and the Americans?

### Some Special News

We did a lot of special checks on the top six in the Multi-Multi and Single Operator categories this year as part of our computerized log-checking process. The checks included determination of unique rates by band, and the analysis of the unique data, followed by cross-checks and other techniques. This special processing took many hours of our time, and was performed as fairly and equitably as we know how. It's particularly tough to do when some of the top entrants don't send us their log on a disk—even though they do send us a nice computerized printout of the log, thereby necessitating manual entry of the data. In some cases we had to enter 15,000 calls. It's interesting that some of the guys who have been talking the loudest about cooperation on log evaluations are the same guys who didn't send their log data on disks! However, the CQ organization is committed to the highest of standards, so we manually entered all the top logs if we had no other recourse. We wanted a uniform procedure applied just to make sure that nobody was hiding anything from us.

A careful comparison of the final results with the high-claimed scores will show that virtually all of the top logs were affected by the above process. Indeed, lots of potential errors were found, and many of these were confirmed with the crosschecks and other techniques, resulting in some significant score reductions. Despite all of this work, only one change in relative position was identified. For all those concerned, you can be assured that all of our findings will be held in the strictest confidence, as it should be.





The boys at LZ9A, also LZ2KTS, sported this fine set of antennas—6 elements each on 10, 15, and 20, and 4 elements on 40.

In order to minimize the problems in building our computerized data base for checking in future years, we have given more thought to the matter of disk submission than what we discussed last month. Although we can't process a rule change for 1989, we will process one for 1990. What we have decided on is a rule

change to the log submission requirement. The rule now states that an original or a photocopy of the original log is required, and that dupe (or crosscheck) sheets are required when more than 200 contacts are made on a band. Strictly speaking, computerized log listings do not comply with this rule anyway.



## USA QRM

Conditions not as good as on Phone . . . N2RM. We could have used more operators, but all had good fun . . . K4VX/0. Burned up the 40M beam; broke most everything else . . . W8BI. Lots of fun by all . . . K4JPD. Packet helped find multipliers and the computer duped well, at last . . . K6ZM. Very high noise from the power lines . . . WB8K. Working zone 34 on 40-M . . . WF4G. Worked VQ9QM on the second call . . . W4DEC. Wish I had more time for the contest . . . W4YN. Why not switch weekends each year . . . W4XJ. Where were all the VKs? . . . K4LTA. Wait till next year with a new beam and amp . . . KC4W. Operated with the beam stuck north . . . W4KM. No 2 M, no Packet, no Software—felt like John Henry . . . AA4S. I elected to operate the Senior Citizen's band—28 MHz; work all day, sleep all night . . . W4OO. Having a comfortable chair to sit in is contest happiness . . . KX4S.

Had a shot at WAZ but missed it . . . N4MO. Glad to see DX stations identifying more often . . . W3VT/4. First time in contest . . . K6ETM/4. First CQ WW with a decent antenna—great fun . . . N4ZR. FB propagation; too many dupes . . . W4WKQ. Extremely surprised to see LP open so well . . . K4PQL. Conditions were great—worked BY, YB, 3W8, and HS0 in 8 minutes . . . N4TO. Big thrill to work KH6AT on 160 . . . WA4CUG. Best CW contest conditions I've ever heard . . . N6AR. Almost 73 years old, but still enjoy it . . . W4GTS. This contest is really awesome—I love it . . . AD5Q. Many thanks to all the guys in Asia for the exciting multipliers . . . WM5K. Had 9 inches of rain during the first day . . . N5AU. First score over 1 meg, great contest . . . N5AW. Worked VQ9QM as my last contact in the test for number 231 . . . N6IBP. Working the 5H1 . . . W6MFC.

Worked Europe long path on 40 with a vertical . . . N6OM. Working a 9Q5 within the last half hour of the contest was my biggest thrill . . . KD6GC. Worked 3W8CW on a QRZ on 10 meters . . . W6MWW. Very happy to work SU1ER to complete my 15 M WAZ . . . W6JTI. The quality of operators seemed very good throughout . . . K6SIK. Sunday morning there was much long delayed echoing on Midwest signals . . . WA6TKT. Propagation was disappointing, especially following the Phone test . . .

WB6MBF. My last contest was as JY9RL—what a difference back as a W6 . . . W6RCL. Missed some good openings with limited time . . . AC6H. I didn't call CQ once . . . W6PM. Hospitalized Sunday but no contest suites available at hospital . . . N6OU. Having a QTH on a 2000 foothill is worth 20 dB . . . W6PU. Great to work through the East Coast curtain . . . K6ZUR. First time to participate . . . W6IFC.

First real contest using great real time logging system (K1EA); weekends should be changed . . . W6YA. Excellent band conditions . . . NE6I. Contesting is no fun with the flu . . . K6CSL. Contest more enjoyable with computer logging (KT5X) . . . N1EE/6. Beat W6 old record . . . W6QHS. At 77 I'm getting too old for this . . . N6AN. All bands overcrowded, and more so this year . . . K6DR. Accomplished long-term goal—WAZ and DXCC in one weekend . . . N6GG. More zones active in CW than SSB—that's a switch . . . K1IU. Installed the tower, antenna, and rotor in the 9 hours prior to the contest . . . K1IR. On-line computing—the way to go . . . W3MA. The Northeast packet wins! Time to operate single op/single band or quit . . . N4WW. Worked SU1ER on 40 meters . . . W6BA. Next year bigger antennas up higher . . . N6IC. We smelled something burning for an hour; then the power supply died . . . W6REC.

Half way through the second day I discovered the traps had filled with water . . . WA8LLY/6. Biggest thrill was not signing 3D2XX . . . W6SZN. Nothing closer than 20,000 miles was coming through on Sunday morning . . . KO7N. Had fun just playing around . . . WB9JKI. Lost many hours on Saturday due to multiple amplifier failures . . . KR0U. Worked HS0A and 3W8CW in zone 26 but couldn't find zones 17 and 18! . . . K7QQ. Worked 4 BYs on 40 . . . W7AYY. Will return with real antennas next year . . . N0AX/7. WAZ in 48 hours and 116 DXCC countries . . . N7TT. The bloody woodpecker now pretty much wipes out 40 meters from midnight till an hour past sunrise . . . A17B. Should have done 20 meter single band—20 was great . . . WA7BPI. May the bird of paradise fly up the woodpecker's nose . . . K5MM/7. Just pileup fodder this weekend, but still had fun . . . K7LXC. JA's down and couldn't run Europe . . . K7GM.

How about a separate classification for low power? . . . N7HUS.

Therefore, a change is needed to allow for the submission of computer-generated logging data. The rule change will state that a computerized log listing and/or a computerized alphabetical sort of the log data will be accepted in lieu of a copy of the original or a dupe sheet provided the computerized listing is accompanied by a disk, and that ASCII format is required. Failure to submit the disk with a computerized log master will be grounds for disqualification. Of course, a copy of an original log will continue to be acceptable, provided it is accompanied by a manual crosscheck sheet as required.

## Parting Comments

This year we expanded the contest committee significantly to account for increases in log submissions and the substantial computerized log-checking process that we initiated several years ago. Our hard-working crew deserves recognition from the participants for the tough job they do—burning lots of midnight oil long after most of you have forgotten about the contest except for the expectation of the results. That crew includes Pat, WA8YVR; Dave, K2SS; Doug, K1DG; John, K1AR; Bill, W2RQ; John, KE7V; Richard, K5NA/2; Ed, N3ED; Fred, AD6C; Jan, N6AW; Glenn, K6NA; Homer, K7RA; Jim, W7EJ; Gene, N2AA; Mike, W9RE; John, K2VV; and Doug, KR2Q.

The days are growing shorter here in the Northern Hemisphere. The bands are growing livelier and livelier. Rumors are rampant on plans for the big one—the 1989 CQ World-Wide DX Contest. As you read this magazine, the Phone event may even be upon us! See you all in the middle of it.

73, Larry, N6AR, and Bob, K3EST



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|--------------------------------------|------------|--------------------------------------|------------|---------------------------------------|------------|
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| HC5M                                 | 8,849,300  | K3TUP                                | 4,311,720  | TF3WW                                 | 3,606,304  |
| D44BC                                | 7,407,750  | K1CC                                 | 3,915,620  | F6BEE                                 | 3,312,240  |
| 8P9HT                                | 7,323,030  | K1TO                                 | 3,849,115  | GW4BLE                                | 2,788,668  |
| EL7U                                 | 6,690,750  | N2LT                                 | 3,757,462  | UP3BP                                 | 2,697,081  |
| P40GO                                | 6,569,485  | K3ZO                                 | 3,731,904  | G3MXJ                                 | 2,513,302  |
| SU1ER                                | 6,134,568  | W9RE                                 | 3,487,232  | YU3BO                                 | 2,491,129  |
| PZ/N3JT                              | 6,013,985  | N5AU                                 | 3,323,400  | OZ1LO                                 | 2,412,775  |
| 5H1HK                                | 5,627,686  | K3OO                                 | 3,191,900  | G4BUO                                 | 2,348,919  |
| CT3BZ                                | 5,495,616  | N6BV/1                               | 3,170,260  | YT3L                                  | 2,205,198  |
|                                      |            |                                      |            |                                       |            |
| 28 MHz                               |            | 28 MHz                               |            | 28 MHz                                |            |
| 4M7A                                 | 1,145,375  | K1ZZ                                 | 537,568    | RB5VK                                 | 469,336    |
| ZY5EG                                | 1,041,054  | W4XJ                                 | 340,445    | EA7TH                                 | 455,259    |
| KD7P/KH2                             | 1,037,608  | W0ZV                                 | 331,976    | YT7WW                                 | 412,596    |
| VS6UP                                | 712,597    | W6YA                                 | 293,591    | YT3W                                  | 395,354    |
| CE3DNP                               | 671,574    | W1WEF                                | 277,815    | YT2O                                  | 392,490    |
| K1ZZ                                 | 537,568    | W6QHS                                | 268,125    | G3LNS                                 | 375,777    |
|                                      |            |                                      |            |                                       |            |
| 21 MHz                               |            | 21 MHz                               |            | 21 MHz                                |            |
| CW8B                                 | 1,496,556  | K3RV/4                               | 682,362    | LZ1KDP                                | 752,623    |
| ZY5ZBA                               | 1,045,304  | K4XS                                 | 615,884    | YT6AA                                 | 688,889    |
| 9Y4VU                                | 1,001,607  | W1RM                                 | 591,038    | YT3AA                                 | 580,808    |
| N7DF/NH2                             | 983,268    | KW8N                                 | 509,878    | 4N2E                                  | 501,552    |
| HK1KXA                               | 769,600    | N2PP                                 | 470,304    | OH6MCW                                | 480,951    |
| LZ1KDP                               | 752,623    | W1NG                                 | 449,536    | EA7KW                                 | 477,195    |
|                                      |            |                                      |            |                                       |            |
| 14 MHz                               |            | 14 MHz                               |            | 14 MHz                                |            |
| ZS6BCR                               | 832,524    | N5CR                                 | 474,084    | G3FXB                                 | 708,724    |
| NY6M/KH2                             | 765,872    | K2HFX                                | 411,300    | OH7MA                                 | 534,691    |
| G3FXB                                | 708,724    | N4MO                                 | 254,475    | UR2RDO                                | 510,416    |
| EA8BPW                               | 681,458    | N6GG                                 | 243,036    | YU7AV                                 | 496,987    |
| PY5ZBA                               | 573,144    | W1RR                                 | 203,635    | IT9GSF                                | 484,846    |
| OH7MA                                | 534,691    | WA1FCN                               | 186,538    | G3TXF                                 | 422,408    |
|                                      |            |                                      |            |                                       |            |
| 7 MHz                                |            | 7 MHz                                |            | 7 MHz                                 |            |
| YX5A                                 | 1,001,578  | K2EK                                 | 520,086    | I3JSS                                 | 582,250    |
| OH7JT/CT9                            | 904,038    | N2DT                                 | 399,765    | YT0A                                  | 553,833    |
| P40R                                 | 874,240    | WB8JBM                               | 306,372    | LZ1V                                  | 509,472    |
| 4Z4DX                                | 859,392    | KD2RD                                | 282,535    | RU1DZ                                 | 489,167    |
| FM5BH                                | 609,235    | W6PU                                 | 190,060    | YT7A                                  | 410,256    |
| I3JSS                                | 582,250    | KB0G                                 | 176,624    | HG3DXC                                | 362,984    |
|                                      |            |                                      |            |                                       |            |
| 3.5 MHz                              |            | 3.5 MHz                              |            | 3.5 MHz                               |            |
| NP4A                                 | 808,640    | W1FV                                 | 225,150    | 4N1A                                  | 247,020    |
| EA8XS                                | 516,390    | K1NA                                 | 140,192    | YT3AW                                 | 121,595    |
| 4N1A                                 | 247,020    | W0GD/8                               | 90,748     | YT3FO                                 | 118,940    |
| W1FV                                 | 225,150    | W4NL                                 | 45,982     | DL3HAH                                | 118,243    |
| K1NA                                 | 140,192    | W5WMU                                | 39,250     | UR2QD                                 | 117,728    |
| YT3AW                                | 121,595    | W9WAQ                                | 25,200     | OH7UE                                 | 116,919    |
|                                      |            |                                      |            |                                       |            |
| 1.8 MHz                              |            | 1.8 MHz                              |            | 1.8 MHz                               |            |
| TA2BK                                | 163,605    | K5UR                                 | 13,568     | HB9AMO                                | 111,245    |
| HB9AMO                               | 111,245    | KG4W                                 | 12,213     | SP3BQ                                 | 89,712     |
| SP3BQ                                | 89,712     | K4TEA                                | 10,266     | IK2DVG                                | 76,788     |
| IK2DVG                               | 76,788     | KD9SV                                | 6,800      | CT1AOZ                                | 66,439     |
| CT1AOZ                               | 66,439     | NA2M                                 | 5,520      | UR2RGN                                | 59,520     |
| UR2RGN                               | 59,520     | N6LL                                 | 5,430      | OK1FCW                                | 55,809     |
|                                      |            |                                      |            |                                       |            |
| Multi-Operator<br>Single Transmitter |            | Multi-Operator<br>Single Transmitter |            | Multi-Operator<br>Single Transmitter  |            |
| VP2MW                                | 9,041,590  | K1AR                                 | 7,370,285  | HG5A                                  | 7,775,904  |
| PJ2X                                 | 8,948,660  | N3RS                                 | 5,648,296  | LZ9A                                  | 7,455,056  |
| RL1P                                 | 8,360,528  | N4WW                                 | 5,277,350  | IO4IND                                | 6,719,762  |
| UL8LYA                               | 7,816,200  | K8AZ                                 | 5,063,990  | HG1S                                  | 6,678,636  |
| HG5A                                 | 7,775,904  | K5NA/2                               | 5,013,162  | OK5R                                  | 6,474,595  |
| LZ9A                                 | 7,455,056  | WM5G                                 | 4,341,104  | UQ1GWW                                | 6,434,300  |
|                                      |            |                                      |            |                                       |            |
| Multi-Operator<br>Multi-Transmitter  |            | Multi-Operator<br>Multi-Transmitter  |            | Multi-Operator<br>Multi-Transmitter   |            |
| PJ1B                                 | 38,415,760 | W3LPL                                | 12,804,154 | OL8A                                  | 18,653,778 |
| P40V                                 | 35,368,065 | NR5M                                 | 9,796,680  | LX8A                                  | 18,476,400 |
| KP2A                                 | 32,325,150 | K1ST                                 | 7,989,630  | UP8A                                  | 13,750,580 |
| EA9EA                                | 31,764,460 | K4JPD                                | 7,853,620  | PA6DX                                 | 10,770,554 |
| HD8EX                                | 27,503,400 | K4VX/0                               | 7,785,450  | Y34K                                  | 9,862,128  |
| OL8A                                 | 18,653,778 | N1CQ                                 | 7,623,036  | YT2R                                  | 8,820,408  |

(Haven't you heard about our QRP category?—ed.). Had a great time until Murphy struck; where do you find 6146's on Sunday morning? ... K7RA. Called QRL and had 9Q5UN call me ... N7RO. Band conditions were very good except for VK/ZL ... K7UOT. Almost fell off my chair when FR4FA/J answered my CQ on 10 ... N8CXX. Big thrill having 9Q5UN and 9V1OK answer consecutive CQs near the end—both double multipliers ... K8CC. Good contest—only lost one amplifier and one keyer ... WD8LLD. 5U7/TU4BR called me in the contest on 80 ... W00CD/8. Next year send some of the redundant P4/PJ expeditions to someplace rare, like ZL ... K8MR. Nice to have decent conditions on 10 meters ... KF8K. Spent 2200-2350 just prior to the contest repairing the long wire ... N8AGU. Spent half the contest fixing my T4XB ... WB8YJF.

The kilowatts thwarted my attempt at JT1T for zone 23, but I bagged 23 actual zones ... W8YGR. VQ9QM answered my CQ on 15 meters ... WB8HDD/4. Worked HS0A for a new one 2 minutes before the end of the contest ... WA8YTM. Some stations are stingy with their calls ... W9GXR. S7 to 40 over QRN level from the power company was on for over 30 hours ... K9QVB. Not a whole lot of activity from South America or the Pacific Isles—could have been really great with more participation ... WA9EKA. Never thought I'd see the day when I'd work a 3W in a contest and not have it count for a new one ... W9SC. My favorite contest; one of these days I'm going to operate the whole thing ... W9SU. Missing most of Saturday and Sunday mornings doesn't help ... NE9U. Great to get back into contesting after several years of other priorities ... N4RR/9. Great run of JAs on both 10 and 15 meters ... KA9OKH.

Found A35KK calling CQ with few takers, with a massive US pileup to Africa just a few kHz up ... NJ9Z. Extremely bad QRN the first night and heavy rain static the second night ... W9WAQ. Band kind of flat—not many DX stations on 160 meters ... KD9SV. Worked an HD8 on 80 meters—only during the CQ WW! ... WA00UI. Worked first VK on 80 meters ... W0RXL. Lots of fun, but where did the South Americans go? ... KJ0B. Have worked with receiving loops for 10 years now—finally getting them to work well ... W0UO. Finally worked VU on 40 meters—that's tough from North Dakota ... WB0O. A lot of fun even if I'm not a big gun ... K9AY/0. Turned on the radio and amp Friday night to warm up and the whole room started to shake; thought I had an equipment problem but it was only an earthquake ... KQ1V. Gotta learn how to set those alarm clocks ... KM3T (Opr. K1VR). I am a Novice class operator—thanks to all who put up with my shaky attempt at high speed CW ... KA1RPO.

Could hear Europe strong on 80 meters at 20 Z, but couldn't work them before 24 Z ... K1NA. Great fun with G5RV antenna ... W1WAI. 9Q5NW did not believe I was only using 5 watts ... W4DEC. 80 meters was slow, but managed 29 countries and 12 zones with 2.9 watts ... AA2U. Real QRPers don't own beam antennas ... W1HUE. Bringing DXCC total to 104 using 5 watts and a random wire ... W5TB. Making it through another 48 hours without any sleep ... K2HFX. "QRL?" means in 30 microseconds I'm going to call CQ here ... K2EK. Higher QSO rate with 200 watts in the Novice band than with a gallon below ... N2KW. Great way to sharpen skills after years of CW inactivity ... KM2P. Looks like I'll have to start learning to like computers for next year's test ... KD2RD. Worked China, Viet Nam, and Taiwan in the last half hour ... K2WK. 39 zones and 110 countries in a weekend with a vertical—wow! ... N2UN.

I found out that it is possible to operate on CW while holding my 3-month-old son ... KR2J. Felt like a wire man in a great forest of aluminum ... N2NT. Had a 3 AM backyard fire dance after the 160 meter tower matcher exploded ... NM2Y/3. A 3W8 on 15 calling CQ with no takers—the world has ended ... N3CXV. Why couldn't my illness wait until the contest was over? ... K3UA. Wasted 30 minutes and couldn't crack TK5EL pileup—5 minutes later he answered my CQ ... K3SA. The contest is a lot more fun from W1 than W6 ... N6BV/1. Hard to decide what to do when so many bands are open at the same time ... K3ZO.

## DX QRM

Very fine contest ... YO2AQB. Conditions were not as good as in Phone ... OH6YF. The ground plane is not good enough to keep the pile ups ... OH4NSG. NP4A was 20 over 9 at 10 AM on 3.5 MHz ... 4N1A. At last worked zones 40 and 31 on 7 MHz ... YT7A. My first WW—working with a computer is very exciting ... YO3FBE. Nice to be called by VK6HD, YB8AX/0, and PY1RO on 160 ... SP3BQ. Although I had many things to do at home, I couldn't be out of the major contest of the year ... SV1NA. It sure helps to have an XYL that helps with the post contest duping ... W9LT/10. Poor conditions on 10 and 15 prevented us from breaking the Canadian MS record ... VE7ZZZ. The pileups were incredible ... VP2MW. First effort in Multi-Single in a CW contest—first time Murphy stayed away in a contest ... AT0N. Heavy snow noise, so it was



no good on the low bands . . . *JA8YBY*. Hope to see you in the 1989 CQ WW from XW . . . *3W8CW*.

After last year and this year we know where Murphy spends his vacations . . . *PJ2X*. Worked ten American districts . . . *DU1KWT*. Sorry so little time, but my horse died and I spent 12 hours digging the grave . . . *KH6CC*. Get those CBers off of 10 meters . . . *9Q5DX*. Had good luck with some European DX on 160 . . . *ZL1AIZ*. Illegal use of 28 MHz, especially in VS6 and YB, will ruin our internationally exclusive allocations . . . *VS6UP* (Op. *KB7G*). Poor operating techniques by European operators caused me to QRT after 2 hours . . . *TN4NW* (Op. *N4NW*). Improving since last year, but not enough . . . *EL7U*. Set up the antenna a few minutes before the contest in a driving rain . . . *TA2BK*. Nothing special this trip; same room, same antenna, mounted to same tree after five years . . . *ZK1TB* (Op. *W7TB*). So many AC power failures I tried to use the car battery, but no way . . . *EL2FY* (Op. *JA1XAF*).

Never heard zones 1, 2, and 40 . . . *ZS5S*. Don't know why old men indulge in a racket like this . . . *ZL1AYO*. I returned to Belau as I announced in the '87 QRM . . . *KC6CS* (Op. *JE1JKL*). Any recognition for the most dupes on a single band? . . . *VK5AGX*. Still recovering from the

3D2XX operation . . . *AX8XX*. Ten meter conditions were too good! . . . *KD7P/NH2*. Thanks to all the Americans who did well to copy my dipole on 80 M . . . *V85DA*. Wonder if anyone else worked 3W8CW on five bands? . . . *HL9JZ*. Heard lots of Europe, but almost no answers . . . *A35KK* (Op. *SM7PKK*). 1958 was my first year in India; trying again in 1988 at 73 years of age . . . *VU2AJ*. Heard both VO2WL and TI2CF but couldn't work them for all zones . . . *NY6M/KH2*. Woodpecker was a real nuisance . . . *YB3ASQ*. QSO rate was so low my paddle bearing rusted solid . . . *ZL1AIH*. See you next year from Khartoum as 6T2EE . . . *SU1EE* (Op. *WA9INK*).

This was my 261st contest . . . *VK2APK*. Six percent dupes and I gave my call with every QSO! . . . *N7DF/NH2*. OM Murphy didn't show up . . . *AT0Z* (Op. *VU2ZAP*). I resisted the telephone—consequently, I didn't get a C3 multiplier on any band! . . . *C31IHJ*. Found out after the contest that the antenna feed to the Yagi was loose . . . *CT1DKG*. I only made about 520 QSOs in the contest because the power supply for my power amp blew out on Sunday morning . . . *DF1LX*. I was surprised working DXCC on 10 M in 24 hours . . . *DK5WL*. This contest is the best in the World! . . . *DL1TH*. Although I'm no big gun, I had lots of fun . . . *DL2OBF*.

## USA CLUB SCORES

|                                      |             |
|--------------------------------------|-------------|
| Frankford Radio Club                 | 225,948,064 |
| Yankee Clipper Contest Club          | 204,223,888 |
| Potomac Valley Radio Club            | 99,563,971  |
| Southern California Contest Club     | 56,917,883  |
| North Texas Contest Club             | 52,362,427  |
| Dixie DXers                          | 52,166,149  |
| Mad River Radio Club                 | 43,811,328  |
| Southeastern DX Club                 | 40,781,911  |
| Northern California Contest Club     | 27,874,632  |
| Central Florida DX Association       | 26,186,115  |
| San Diego DX Club                    | 23,154,650  |
| Texas DX Society                     | 19,308,360  |
| Carolina DX Association              | 18,287,768  |
| Western Washington DX Club           | 17,267,478  |
| Society of Midwestern Contesters     | 15,589,025  |
| Willamette Valley DX Club            | 14,827,585  |
| Overlook Mountain ARC                | 14,254,910  |
| Northern California DX Club          | 11,864,950  |
| Hoosier Contesters                   | 9,265,628   |
| Mississippi Valley DX & Contest Club | 8,847,000   |
| Minnesota Wireless Association       | 8,596,218   |
| Southern California DX Club          | 8,444,451   |
| Kansas City DX Club                  | 8,287,322   |
| South Florida DX Association         | 8,110,171   |
| Rochester DX Association             | 7,836,616   |
| South Jersey Radio Association       | 7,224,357   |
| Eastern Iowa DX Association          | 7,119,918   |
| Legion of Indy DXers                 | 6,789,680   |
| Southwest Ohio DX Association        | 6,491,888   |
| Grand Mesa Contesters                | 6,350,408   |
| Boiled Owls of New York              | 4,751,493   |
| Rubber Circle Contest Club           | 4,079,699   |
| Western Pennsylvania DX Club         | 3,352,872   |
| Meriden ARC                          | 2,931,183   |
| Redwood Empire DX Association        | 2,714,380   |
| New Mexico Big River Contesters      | 2,708,212   |
| Central Arizona DX Association       | 2,357,036   |
| Mile High DX Association             | 2,325,068   |
| Utah Contest Club                    | 2,307,813   |
| Colorado Contest Conspiracy          | 1,953,789   |
| Long Island DX Association           | 1,877,180   |
| Nashua Area ARC                      | 1,758,883   |
| Greater Milwaukee DX Association     | 1,603,272   |
| Albany Radio Club                    | 1,581,162   |
| Fox Cities ARC                       | 1,481,642   |
| Woodbridge Wireless Inc              | 1,444,564   |
| Western New York DX Association      | 1,167,354   |
| Alamo DX Amigos                      | 1,088,892   |
| Metrocrest ARS                       | 1,077,131   |
| Murphy's Marauders                   | 1,000,634   |
| Metro DX Club                        | 926,233     |
| Ohio Valley ARA                      | 855,462     |
| North Florida DX Association         | 851,700     |

|                                   |         |
|-----------------------------------|---------|
| Florida West Coast DX Ring        | 713,790 |
| Red "A" Rangers                   | 684,762 |
| Northern Illinois DX Association  | 599,169 |
| Northern Ohio DX Association      | 582,756 |
| Arrowhead Radio Amateur Club      | 541,508 |
| Four Lakes ARC                    | 466,412 |
| Inland Empire DX Association      | 372,217 |
| Calumet Amateur Radio Enthusiasts | 367,973 |
| Fox River Radio League            | 361,380 |
| Utica ARC                         | 348,206 |
| DX Association of Connecticut     | 294,359 |
| Dade Radio Club                   | 152,964 |
| Stark DX Association              | 114,912 |
| Hamfesters RC                     | 113,208 |
| Fresno ARC                        | 92,118  |
| Tyler Amateur Radio Club          | 66,130  |
| Congo Valley ARC                  | 4,420   |

## DX CLUB SCORES

|                              |            |
|------------------------------|------------|
| Rhein-Ruhr DX Association    | 75,193,017 |
| Bavarian Contest Club        | 65,340,168 |
| Northern Lithuania DX Group  | 54,812,356 |
| Kaunas Polytechnic Institute | 26,517,551 |
| Osaka University ARC         | 20,072,724 |
| Araucaria DX Group           | 19,436,442 |
| Viimsi Radio Club            | 10,164,535 |
| Kiev ICAE Radio Club         | 7,968,836  |
| CDXC Contest Team            | 7,847,677  |
| OECU ARC                     | 7,324,404  |
| Maui Amateur Radio Club      | 6,671,970  |
| Hokaido University ARC       | 6,505,458  |
| SP DX Club                   | 6,461,600  |
| Hill Top Ham Club            | 5,585,248  |
| Leningrad City Club          | 4,711,068  |
| South German DX Group        | 4,356,178  |
| U DX Club                    | 3,694,464  |
| YU DX Club                   | 3,534,330  |
| Fraser Valley DX Club        | 3,370,320  |
| Lithuanian Contest Group     | 1,886,967  |
| Tallin Radio Club            | 1,804,543  |
| Uruguay DX Club              | 1,650,381  |
| Shakhty Radio Club           | 1,509,178  |
| Winnipeg DX Club             | 1,274,918  |
| Grupo Argentina de CW        | 1,243,562  |
| Shizuoka DX Group            | 1,154,954  |
| Kiev Radio Club              | 1,020,558  |
| PZK                          | 981,471    |
| Ehime Radio Club             | 875,704    |
| The Bullmertz                | 710,656    |
| Riga Radio Club              | 444,069    |
| Voroshilovgrad Radio Club    | 183,998    |
| Les Nouvelles DX Group       | 89,543     |



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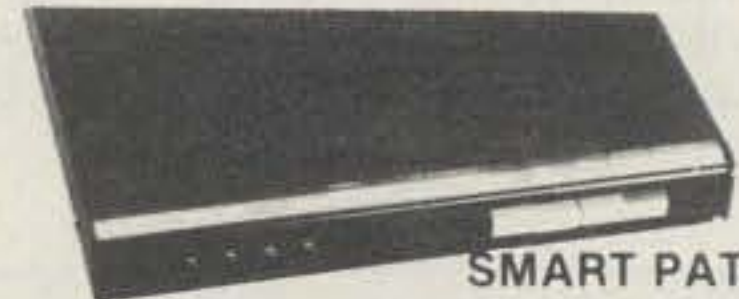
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Although amassing an impressive 3.16 M, K1RU placed just fifth in the tough W1 call area, not even enough for the USA top 10. Just what do you have to do?

3W8!! Unfortunately I had no chance on 80 M ... DL2HBX. First time I ever worked US stations on 80; great conditions on 10 ... DL3YBM. No problems with the station, no problems with the contest, and no problems with the wife ... DL9OE. Diaz metros—Lascondiciones fueron absolutamente fantasticas! ... EA3ALV.

The maximum score for me in this contest in many years, even with a quarter-wave antenna indoors ... EA4BV. I am now 72 years old and don't have the stamina for very long sessions ... EI4N. Wonderful contest, wonderful conditions ... F1JCB. More than 105 countries on 10 M in 12 hours—that's the WW test, thanks ... F6AUS. A good Saturday, a poor Sunday, but the best score ever for me ... F6IRF. Very enjoyable weekend ... G3ESF. Back to the drawing board on antennas ... G3GGS. Now have a beam, though only a duobander, but what a difference ... G3NKS. Great to get all 40 zones on 14 MHz ... G3TXF. Started dozing on Sunday morning when I should have been looking for multipliers ... G4BUO. It really made my day being called by 3W8CW ... G4CNY. Look, Mom, no pencil; real time computer logging was fun! ... NL7DU.

Had to knock ice off the antenna to bring the SWR down ... KL7UR. Eighteen consecutive years in the best CW contest ... HR1AT (Thank you, Antonio.—ed.) One big 48 hour continuous thrill ... VP5U (Op. K3IPK). Used a string tied to my amplifier's sticky antenna relay to "fix" it during stubborn operation ... VO1NA. Thanks for the good courtesy when I asked for directional calls ... VE2LJ. My last contact at 2359Z was 4S7EA for a zone sweep ... VE2ZP. Low bands were the worst in recent memory ... VE3IY. A few watts from the loaded, short dipole got me lots of DX from the apartment ... VE3SMA. Fun to warm up the old DX-100 and HQ-170 on 160 M ... VE3HCT. I'll be back ... VE6SWL. Operating portable from the Honeymoon Hotel for our 25th anniversary—not enough time for the radio ... W7DRA/VE7. We were amazed at the ultra-high CW speed of 3W8CW—we couldn't copy any letters for several minutes ... JH1YHS.

Good conditions on all bands ... PA6DX. We tried a new antenna for this contest; will try much better antennas in 1989 ... JA0ZRY. Fine contest; big score; hope good enough for #1 in Japan ... JA6YCU. We were located on the east side of the rock at sea level, so we could only work North America via long path ... ZB2/GW3NYY. We enjoyed it very much ... JR1ZTT. It's hard to reclaim the wasted effort of over 1000 duplicate QSOs ... HD8EX. (What's your call?—ed.) Biggest thrill was learning we were close in score to W3LPL ... NL7G. Nice to work 5BDXCC in one weekend ... LX8A. We almost gave up on the Thursday before when the wind tore down the 20 M and 40 M beams and 7 operators could not reach Ceuta due to the terrific storm ... EA9EA. Good activity on 28 MHz ... RZ3DZ. Conditions were very, very bad ... UA1PAO. Bad propagation, I believe ... RV6AF.

See you next year ... RC2AR. Enjoyed operating from my own shack—lots of fans, DXers, QRM ... RW3AH. Many USA stations made fine DXpeditions, but getting QSLs from them is a big problem ... UP2BZ. Snow and strong QRN on 80 ... RR2RW. Ten was really open! Seven new countries; hope to meet you in the next contest ... UR2RHF. First test to run at 79 QSOs in one hour ... G4UOL. It was great; 28 MHz was open for the first time since I became a ham 4 years ago ... G4ZME. Had 46 years QRT from 1937 to 1983, so I'm relatively a novice in contest terms ... G6QQ. Found that it helped to disconnect the doorbell and telephone ... G0CGV. My arm got tired; I must be getting old (what

will they think down at the pub?) ... GI4BBV. My first single op CQ contest. I learned a lot! Great fun! ... GW4BLE (Op. G3WVG). The contest got me back onto the code speed which I had to use to get my license a few years ago ... HB9DCQ.

It was funny, on a CQ call, a KH0 came in ... HB9KC. My antenna, a Telrex TM30, is 25 years old and still doing well ... HB9ZY. Very high QRM, but it was fun ... OY9JD. Bad luck—worked 3W8CW twice on the same band; what a dupe ... OZ1BIZ. Tried my new antenna and found it OK (7 MHz vertical on supermarket metal roof) ... PA3BNT. Exciting contest this time: entered the contest with no children but with a chance of finishing with a son or daughter. "It" happened the weekend after the contest ... PA3BUD. First time I ever made over 1000 QSOs in the contest ... PA3CWL. First contest and I'm definitely infected by the "contest-kick-virus" forever; during the last few hours my fingers started to "tap dance" ... PA3FCD. I left my heart in TF ... TF3WW (Op. OH4NRC). Spent 30 minutes calling W's long path on 40, but no replies ... ZB2/G4FRE. No more all band efforts for me—way too much work for one guy ... 4U1TU (Op. WA2TMP).

XE0DX called us in the last minute of the contest for our 40th zone on 40 meters ... UR1RWX. Operators were all school children ages 13-15 ... UZ3AYT. Very fine propagation on 7 and 28 MHz; even with our special call we still had lots of duplicates ... RL1P. We'll grow bigger for the next one—much more fun from UL7 than plain UA9 ... UL8LYA (Op. UW9AR). Conditions not so good ... JF1SEK. It was a nice exercise for my fist and ears ... JH1QDB. Wonderful world on 21 MHz ... JE1CTA. It was just a warmup for the next CQ WW ... JH3PRR/1. Many DX stations picked up my weak 20 watt signal ... JA4ENN/1. The band conditions were excellent, so I enjoyed it much in spite of my dipole antenna ... JH1NHY. My first operation with my left hand; until now I sent code with my right hand ... JA1YWG. Used homebrew electronic keyer ... JH1AOU. I could hear USSR zones and other signals, but I couldn't get QSOs ... JK1ZIL.

Top band QSOs are very difficult from Japan ... JR1EBE. Very exciting, will operate again ... JA2ODV. My home call is W1END; be here for the '89 test also ... 7J2AAF. My business kept me very busy, so there was no time for the competition ... JA2WZ. I got sick during the contest and was in the hospital for 6 hours ... JF2HPA. Thanks to HP1AC, 9Q5VM, and 5H1HK ... JE3ZFS. I over-rested—the CQ WW contest requires 48 hours continuous operation, and that is so hard for me ... JH4NMT. I had a QSO with zone 34 for the first time and made WAZ ... JE4CIL. Big blocks of W's against the Caribbean—a little window is requested by many, many JAs ... JA4ATV. The first day conditions were very good, but the second day was not so good ... JA4CUU. I got a new JA record—see you next year on all bands ... JA5DQH. I really enjoyed the big CQ WW Contest, as usual ... JE6JRY.

November 27 was poor for Europe ... JA6WHC. I like the low bands—thanks for the contest ... JA6GGD. My home call is KD7H; I enjoyed working the contest from this side of the Pacific ... 7J7AAM. Nothing especially! ... JG7JBZ. It was the first time I was ever called on 160 by North American stations ... JA7UMT. Enjoyed this test with my GP antenna ... JA8AJE. 3W8DX was not so hard to QSO ... JH8RGQ. Good conditions, but very tired ... JH8YCT.

## STATION OPERATORS Multi-Operator Single Transmitter

**AK1L & KA1X.** AX3VT: VK3VT, VK3CGH. **AT0N:** VU2JX, VU2NTA, VU2WAP. **BY1PK:** Wang Guo Xiang, Gong Ke Lu, Chen Ping, Yon Pi Dong, Chen Si Dong, Tong Xiao Yong. **BY4SZ:** Xu Gennan, Zhao Jiren, Gao Jun, Jin Qingfen, Chen Shiwei. **CT3FN:** DK3KD, DL1EK. **DF0RR:** DL7APU, DL7AEN, DL7AKC, DL7UX, DL7ON, DL7SI, DL6YCG, DJ0GK. **DK20Y & DL6MAO.** DK0MM: DJ9CB, DL4FJ, DJ7IK, DJ8WL. **DK0TZ:** DJ5AI, DL1SBF, DF3SV, DL4880 & DJ8RR, DJ2YA, DL0ER & DL1EFD, DF5EN, DK7FP, DL9XY, DL0LR: DJ5LE, DF4PM, DJ7PT, DL6RE, DF4WY, DJ3ZX. **DL0WU:** DJ4AX, DL8DAS, DL1HX, DJ8SW, DJ2YE. **DX1CW:** DU1CJC, DU1CWT, DU1EFS, 4F1ARC, 4F1BYN, 4F1DMD, 4F1FP, 4F1FZ. **EA3RCL:** Club. **F5IN & F6ARC,** F6IWW, FD1LGE. **F6ENV:** Club. **FF6KPO:** F6DZD, F6ETI, F6EUX, F6IFI, F6IPW. **GW8GT:** GW8BIC, GW4JBO, GW3KYA, GW4LXO, GW5NF, GW3NNS, G30AY, G4PKT, G3SQX, GW4TTU. **HA1KRR:** HA1ZZ, HA1DRR, HA1XU, HA1XO, HA1ZV, HA1ZN. **HA3KHC:** Nemeth, Tardi, Nemeth. **HA5KGT/7:** HA7XO, HA5BMS, HA5WU. **HA6KNG:** HA6IOB, HA6OA, HA6NG, HA6OO, HA6OI, Dekany. **HA6KNX:** HA6OD, HA6NW, Szucs, Locsei. **HA6KVB:** Bocsi, Dienes, Gulyas, Virag, Nagy, Peto. **HABKCK:** Lulacs, HA8ZO, HA8VK. **HABKLE:** HA8LC, HA8LM, HA8LO, HA8MK, HA8MM, HA8NNN, HA8OB, HA8VN.

**HB4FE:** HB9APJ, HB9BEY, HB9CHY, HB9IQ, HB9MPU, HB9PJM. **HB9CIP & HB9ALM,** HB9BLO, HB9CAT, HB9DDY, HB9YC. **HB9GT:** HB9BTI, HB9CKL, HB9CMX, HB9COH, HB9CVQ. **HG11S:** HA1AG, HA1AH, HA1DAC, HA1DAE, HA1SV, HA1TD, HA1TJ, Szoboszlai. **HG5A:** HA5AWH, HA5BNL, HA5FM, HA5GF, HA5IW, HA5LN, HA5MK, HA5ML, HA7RY, HA5WE. **HG6N:** HA6ND, HA6NF, HA6NQ, HA6NY, HA6ON, HA6OO, HA6PX, HA6YG. **HG80:** HA8IE, HA8JP, HA8JV, HA8KQX, HA8LKE, HA8PG. **HG9R:** HA9OA, HA9PP, HA9PV, HA9RU, HA9SU, HA9TA. **HG0D:** HA8DU, HA8DR, HA8HG, HA8NR, HA8IP, HA8HV, HA8IL, HA8ER. **HS0A:** JA8JCJ, JK1RJQ, JR2BNF, K2BA, N9TG, SP5DDJ. **I2VXJ & I1XPO,** I1ZEU, IK4BDZ, IK2EGL, K2VJ. **ID4IND:** I4LEC, I4TJE, I4VEO, I4YRW, IK4CZF, I4EAT, IK4EWK, I4IND, I4LCK. **JA3YBF:** JF4FUF, JJ2ICA, JJ3IMX, KGS, JN1DPL, J03VUZ. **JA3YKC:** JF3VXV, JG3MRT, JG3WON, JG6VTM, JI3ERV, JK3GAD, JL3HEY, JR5PDJ. **JA4YJA:** JG6PAF, JJ3LJU, JM3ILK, JR4KTO, J03PGL. **JA5YAV:** JA5MVU, JH5PHC, JJ2FCL, JR5UBE. **JA7YAA:** JE7HLZ, JH8ORW, JJ3CNL, JN1VYN. **JA8YBY:** JE8BR0, JH8GFB, JH8PNE, JH8WBR, J01DFG, JR8DHA, JR8OFE. **JE2YHS:** JA20LJ, JA2XZL, JE2WVB, JF2KPH, JF2POF, JG2NUD, JI2XUT, JJ2CEE, JR2JVR.

**JE2YRD:** JA7RHJ, JF3ECC, JF3VZU, JH1KRC, JI2KVV, JI3JGJ, JR2SCJ, JR2SQU. **JE6ZIH:** JA60JG.



JF6DEA, JF6TMH, JG6CVO, JR6GKT, Narumi. **JH8ZCD**: JE8DGG, JF8HOP, JF8MZL, JR8DHA, JR8OXT, JT1T: JT1BJ, Khosbayan. **K1AR** & **K1EA**, K1GQ, K1VR, KC1F. **K2SG** & **WA2SRQ**. **K3PA** & **K3YL**. **K5NA/2** & **K5KG**, KU2Q, NU2L, WB2Q. **K6VI** & **W6VO**. **K8AZ** & **K3TUP**, K8NZ, N8AA, N8ATR, N8DMM, W8CAR, W8KIC, W8DIXE. **K8NN/8** & **N8COP**. **K9UWA** & **K9LA**, KA9A, KR9U, KR9V, N9H. **K0HLB** & **N8LM**, W0MHS. **K83HH** & **NG1W**. **K83MM** & **K3IE**, N3ARK. **KL7RA** & **AL7CQ**, AL7HC, AL7IF. **K07N** & **K7DBV**, N0XX, W7IL, WA7TDZ, WJ7R, WJ7S. **KR0U** & **KT3M**, W1XE, W0KEA. **KS3F** & **NE3F**. **KX60I** & **KX6GL**, **KX6HE**. **LZ1A**: LZ1FA, LZ1LZ, LZ1RF. **LZ1KNP**: Ilija, Vlado. **LZ1KPG**: Club. **LZ1KRC**: Kasmir, Asen, Vasil. **LZ1KSF**: Club. **LZ1KVF**: Club. **LZ1KVZ**: LZ1GC, LZ1NK. **LZ2KSO**: Steve, Lubo, Zlatko. **LZ9A**: LZ2CC, LZ2DF, LZ2HE, LZ2II, LZ2PD, LZ2UA, LZ2UU, LZ1-P-54, LZ2-E-41, LZ2-E-72. **N2BA** & **K8HVT**, N2AZS, W2VJN. **N3BNA** & **KD3CN**, N3ENR. **N3HW** & **N3RW**. **N3RS** & **K3JG**, N3NA, W3XU. **N4WW** & **AA4NA**, K0LUZ. **N6IC** & **AD6C**, K6JHC, N6SUL, N6VR. **N6VV** & **K6PJY**, K6XV. **NA3K** & **K3NL**, NM3W.

**NF6S** & **KF6VU**, N6SKF. **OH1AF**: OH1CN, OH1EB, OH1EH, OH1HS, OH1LI, OH1MRD, OH1NOA, OH1NSJ, OH1XT. **OH2AQ**: OH2BCI, OH2BQW, OH2BUQ, OH2MAZ, OH2MEF, OH2NRV. **OH2BAH**: Club. **OH3AT**: OH3MP, OH3NXN. **OH6AP**: OH6NIO, OH6XA. **OH8TA**: OH8DD, OH8MCT, OH8NR, OH8NUP, OH8WM, OH8ZZ. **OK1KHK**: Club. **OK1KLV**: Club. **OK1KQJ**: OK1AYP, OK1DC, OK1DXS, OK1ICM, OK1IMP, OK1IMR, OK1RR. **OK1KSL**: Club. **OK1KSZ**: Club. **OK1KZD**: Club. **OK10FK**: Club. **OK10FM**: Club. **OK10RA**: Club. **OK1OSB/P**: OK1DPF, OK1DXX, OK1FOU, OK1FUN. **OK2KDS**: Club. **OK2KLI**: Club. **OK2KOD**: OK2BDI, OK2BGR. **OK2KUB**: Club. **OK3KGO**: Club. **OK3KUN**: Club. **OK3KYH**: Club. **OK5R**: OK1ADM, OK1ADS, OK1ALW, OK1AWZ, OK1DIM, OK1RI. **OL4A**: OK1AAU, OK1AEZ, OK1AII, OK1APJ, OK1CF, OK1WC, OK1WT. **ON6AH** & **ON4GO**, ON5IQ, ON6MH, ON7PC, ON6QR, ON7ZV. **PA3ACA** & **PA3ALP**, PA3BLU, PA3BWD, PA3CAL, PA3ELX, PA3ERC, PD0MCL, PE1LWN, PE1LZZ, NL-9447. **PA0KHS** & **PA3ADJ**, PA3ENJ, PA3EYZ. **PJ2X**: K1XM, K2WR, K02HE, K01F. **RB4EXF**: A. Berezhnoj, A. Jurchenko, V. Antonovich, R. Dashko. **RB4WU**: S. Topolnik, V. Goltsman. **RL1P**: UL7PL, UL7PAE, UL7PCZ, UL7PEZ, RL7PKN, RL8PY, RL8PZ. **RZ6AYD**: RA6AOS, UA6-101-355, UA6BGL. **SK5DB**: SM5API, SM5CRV, SM5CXN, SM5DGA, SM5IRV, SM5LRM, SM5PAX, SM5PEY.

**SK5EU**: SM0DRD, SM5GLC, SM4KWO, SM5LZM, SM5ODQ, SM70UU, SM5PHU. **SP3GEM**: Club. **SP5KVV**: SP5MXZ, SP5DAU, SP5RDZ. **SP5PBE**: SP5ANJ, SP5ELA, SP5FKW, SP5GIQ, SP5LCT. **SP5PWK**: SP5AUC, SP5LXT, SP5BYF, SP5GKM. **SP9PDF**: Club. **SP9PZF**: SP9JZT, SP9MAL, SP9MZU, SP9MZW, SP9MZY, SP9MZS, SP9LAS, SP9LAB. **UB3IWA**: UB5IFZ, UB5IML, UB5IOL. **UB4IZA**: UB3IJZ, UB5ITC, UB5ILM, UB5-073-342. **UB3JWW**: UB3JM, UB4JCF, UB5JIM, UB4JDF, UB4JJR. **UB4EXN**: O. Zakharrenchko, S. Kireev, V. Tunduk. **UB4EZA**: V. Bublienick, V. Rozshko, A. Cherginets. **UB4FWC**: Club. **UB4FWH**: RB5FH, UB5FDG. **UB4FXX**: A. Sorokin, W. Kurales. **UB4IWI**: UB5IHS, RB5IGO, RB5IRG. **UB4IZH**: UB4IIQ, UB5IDG. **UB4LWY**: UB5-077-1960, UB5LJC, UB5-077-1859. **UB4LZA**: UY5DV, UB5LEE, UB5LSL. **UB4MWU**: UB5MBM, UB5-059-431. **UB4NWA**: UB5-057-558, UB5NCO. **UB4OYA**: Club. **UB4SWB**: UB5NO, RB5X, RB5SB. **UB4TWL**: Club. **UB4VWM**: S. Kassov, A. Manannikov, A. Zhuralkov. **UB4WZA**: UB5WCX, UB5WGR. **UB4WZB**: Petrenko, Pozigun. **UB4XWB**: UB5XBV, UT5QG, UB5-062-33. **UC1AWB**: RC2AZ, UC2AA, UC2AAX, UC2ADX, UC2AAV, UC2AAB, A. Kosarev. **UC1AWC**: A. Kabask, L. Burdin, W. Gorbatowski, O. Kiryanov.

**UC1CWB**: UC2CEF, UC2CBV, UC2-009-23. **UC1WWE**: I. Linkevich, A. Chertkov, A. Sandov. **UL8BWW**: UL7BY, UL7BB, UL7BN, UL7BJ, UL7BU, UL7BO, UL7-016-389. **UL8CWC**: V. Korshunov, R. Ismaelov. **UL8CWW**: UL7CT, UL7CDQ, UL7-028-270. **UL8GWB**: V. Ivanov, I. Goncharenko, V. Pticy. **UL8LYA**: UL7LEN, UL7LER, UL7LEZ, UL7LD, RA9AD, UL7LT, UW9AR. **UP1BFX**: Club. **UP1BXL**: RP2BFL, R. Zoderka. **UP1BXM**: UP2BON, UP2-038-1172. **UP1BYC**: UP2BTA, UP2CY, UP2-038-2504. **UP1BYK**: UP2BFY, UP2BJV. **UP1BYL**: Club. **UP1BZG**: UP2BCO, UP2QA, UP2BCW, UP2BCT, UP2BRJ, UP2-038-439. **UQ1GWW**: UQ2GAG, UQ2OC, UQ2GJR, RQ2GG, UQ2GDW, UQ2-037-116, UQ2-037-83. **UQ1GWZ**: UQ2-037-290, UQ2-037-521. **UQ0A**: UQ2GKL, UQ2GM, RQ2GN, UQ2GID, UQ2-037-466. **UR1RWX**: UR2RRR, UR2RJ, UR2RDJ, UR2RHF, UR2RMC, UR2RNG, UR2RME, UR2RNA, UR2RNT, UR2RNX. **UT4UWL**: UT5UKE, UT5ULI. **UT4UXW**: UT4UZ, UT5UGR, UB5CGN. **UZ1AWD**: UA1-169-2392, UA1-169-2391, UA1-169-2418. **UZ1AWQ**: A. Timofeev, E. Onistenchko, S. Dolzenkov. **UZ1AWT**: UA1ALZ, UA1-169-010, UA1ANA, V. Michailov. **UZ1NWF**: UN1-088-302, UN1NBN, UN1-088-24. **UZ1TWS**: RA1TE, UA1TAF. **UZ2FWA**: UQ2PP, UA2CY, UA2FF.

**UZ2FWN**: N. Stryuk, I. Stryuk. **UZ3AXX**: RZ3DR, RW3DD, UA3-170-79, UA3AQW, UA3DSP, RA3DUU, UA3-170-210. **UZ3AYT**: Club. **UZ3DXC**: OK1AGE/UA3, OK2BWW, OK3IA, RA3DX, RW3DX, SP5MNP. **UZ3QYA**: Alexey, Alex. **UZ3XWB**: RA3XA, UA3-127-200, UA3-127-216, UA3-127-204. **UZ3XWM**: UA3XFL, UA3XCQ, UA3XCM. **UZ4AXN**: UA4ADG, UA4ABS, UA4AHT, UA4AGF. **UZ4FXA**: UA4FMO, UA4-248-666, UA4-148-723, UA4-148-473. **UZ4WVB**: B. Baranov, I. Gaboilov, A. Nekrosov, A. Korotaev. **UZ6HWA**: UA6HSV, UV6HSI, UA6-108-3033. **UZ6HXW**: W. Chernetchenko, L. Belolapotkov, L. Kovaljov. **UZ6LWZ**: Club. **UZ9QWM**: UA9QO, UA9-134-128, UA9QFN. **UZ9SWY**: UA9SA, UA9SAW, UA9SDR, UA9SDW, UA9SCJ, UA9SJJ, UA9SM, UA9TS, UA9TX, UA9TZ. **UZ9UWK**: Club. **UZ9UZI**: UA9URR, RA9UCC, RV9UER. **UZ9WVB**: UA9WQK, UA9-084-2031, UV9WR, UA9-084-1535, UA9-084-2007. **UZ9XWV**: UA9-090-1053, UA9-090-747, UA9-090-1088, UA9-090-1058, UA9XC. **UZ9YXI**: A. Putincev, D. Selivanov, A. Firsov. **UZ9YXL**: Club. **UZ9AWB**: RA0AFI, UA0-103-9, UA0-103-73. **UZ0KWI**: UA0KK, UA0KB. **UZ0QWA**: UA0QDL, UA0QN, UA0QBB, UA0QAS. **UZ0QWT**: UA0-038-1621, Stepan, UA0QEJ. **UZ0SXF**: UA0-124-404, UA0SNR, UA0-124-044.

**UZ0UWE**: UW0UQ, UA0VF, UA0UY, UA0US, RA0UAR. **UZ0WWP**: RW0WR, UA0WWFA. **VE2UMS**: VE2AKZ, VE2BLX, VE2FFE, VE2GDA, VE2GXS, VE2HMB, VE2ICU, VE2LIB, VE2LPS, VE2PMP. **VE3SPC**: VE3CUI, VE3ERT, VE3GND, VE3KON, VE3KZM, VE3MCK, VE3MVD, VE3NBE, VE3PUA. **VE6AO**: VE6AMR, VE6CIZ, VE6CJZ, VE6CTY, VE6EY, VE6JO, VE6KC, VE6LES, VE6PY. **VE7ZZZ**: VE7ARS, VE7AV, VE7DP, VE7EME, VE7SK. **VO2WL**: K3TM, N830. **VP2MW**: AA5DX, KMSR, WQ5W. **VU2IIT**: VU2MAQ, VU2TER. **VU2TEC**: VE2TEL, VU2WXZ, VU2WZY, VU2ZMZ. **W2UI** & **N3KR**. **W3GG** & **K3YGU**, K03JH, K51G. **W5ASP** & **K5MA**, K5RVK, K5VWW, N5CJQ, N5EA, W5VAH, W5VWN. **W5EHM** & **AA5BT**, K65KI. **W6BA** & **N6AV**, N6AW. **W6OAT** & **WX5S**. **W6REC** & **N6TIB**. **W7DG**: K7WF, KA7BLA, N7JXC, N7JXD, WA7ILC. **W7TJ** & **K7GS**, N67P, NQ7M, WA7EGA. **W7ZR** & **Vladimir**. **WBRLX** & **K8KR**, NQ8I. **WA4CTC** & **K8UNP**. **WB8PHI** & **K3JT**, W8SJJ, W8PAF. **WB9JKI** & **K9MFI**. **WM5G** & **K5MR**, K5RX, K5SXO, K09Y, KR8Y, NJ5N. **WJ60** & **WG6P**. **XE0DX**: K5JX, K5TSQ, W5VX. **Y3SL**: Y26IL, Y33TL, Y33UL, Y33VL, Y26WL, Y33ZL. **YB8ARA** & **K5VT**, N7BG. **YT2D** & **YT2HX**, YT2SW, Dario, Gal, Goran, Zronka. **YT3T**: YT3AM, YU3BQ, YU3DE, YT3EW, YU3HP, YT3NA.

**YU2CCJ**: Mike, Pero, Zlatko. **YU3AI** & **YU3BM**, YU3EO, YU3MM. **YU3DRL**: YT3FF, YU3VS. **ZC4ZR**: W6KG, W6QL. **3W8CW**: HA5MY, HA5PP, HA5WA. **4N1W**: YU7DR, YU2EU, YU7FN, YU7LL, YU1MM, YU1NZV, YU1SV. **4N2D**: YU2CQ, YT2DU, YU2DZ, YU2FK, YT2VM, YU2WQ, Ante, Bobo, Dado, Leo, Luksa, Mato, Tomy, Vido. **4N4D**: Boris, Edi, Salih, Tom. **4N4K**: YU4MH, YU4MV, YU4RS-4776, YU4XA.

## Multi-Operator Multi-Transmitter

**DF2RG** & **DF7MV**, DJ10J, DJ4YS, DL7MAE. **DF0DX**: DF4EN, DF8AE, DF9VB, DK2ZD, DK4OK, DL1SBR, DL1YAW, DL2SAX, DL4YBM, DL6YDE. **DL0KF**: DF3LZ, DF6LI, DJ2BV, DJ3UL, DJ4FZ, DJ6TN, DJ7SW, DJ8HB, DK9AV, DL4LBK, DL8PY. **EA9EA**: EA1AK, EA3KU, EA4DAE, EA4DAS, EA4EFK, EA4KR, EA4MY, EA5BM, EA5BRA, EA5FWU, EA7ALG, EA7TL, EA9EO, EA9EU, EA9GK. **HD8EX**: AA6T, DL7AV, N6RZ, N6TU, W6NV, W6SHD. **JA1YAD**: JH0LFE, JH0NZN, JH0SPE, JH5GHM, JH9AMJ, JI2GUT, JO1BMV, JO1IDL, JO1RUR, JP1JFG, JP1NWZ. **JA2YKA**: JE2JCU, JE2VBZ, JE4LIK, JE7BIZ, JF2DIJ, JF2HPN, JF2PZH, JF2UTL, JG2VTD, JJ2FAU, JJ2BJF, JK1GRI, JK2CZL, JK2GYO, JL2KRD, JL2TZC, JM2CVT, JM2FZO, JM2RBE, JR0IPB, JR2GMC, JR7OMD. **JA6YCU**: JA6BXA, JA6CNO, JA6VZB, JE6IGP, JE6UWK, JE6UWU, JF6MND, JF6TAC, JH6SOR, JI6DUE, JI6EDY, JJ6PXB, JJ6XZG, JK6LCY, JR6IQI. **JA9YBA**: JA9LNL, JA9OTX, JA9QWJ, JA9VDA, JH0CAZ, JH9VSF, JA9-10148. **JABZRY**: JH0ILL, JH5XDD, JH9COQ, JP1G00, JP1NOM, JO1OTD, JR0BQD, JR0TGT, JR4LIL, N Inukai. **JE1YEM**: JA0QPG, JH1IZR, JI1MUG. **JH1YHS**: JF1MIA, JH1UAE, JR7GGG. **JR1ZTT**: JE7PNN, JF3NRI, JF7WED, JN1MSO, JO1CEA, JP1MWB, JP1NIR, JR4WKV, JR5PMI, JR5RMW. **K1RX** & Packet. **K1ST** & **K1FWE**, K1MNS, N1ATN, NB1H, NK1K, NI8L, Q1IHN, WA1TFH. **K2TD** & **WB2YOF**.

**K4JPD** & **AA4LU**, K4XR, K4HZ, N4FD, N6BFM, NQ4I, W8CNL. **K4VX/8** & **K4XU**, K9BGL, K9FD, N9JF, NS8Z, N4CC, W08G. **K6ZM** & **AK6T**, K16EZ, N60P, N66L, NP4IW, WR6R. **KA1KPH** & **NCOC**, Packet. **KP2A** & **AA6RX**, K0RF, K2NA, K6XO, K08SD, K07V, KY7M, N2IC, N6DX, N6VI, NP2E, W0JLC, W6RGG. **KQ20** & **K2NJ**, KU2C, NR2H. **KY1H** & **KB1W**, KR1R, KS1N, KT10, NB1Y, NJ1F, NJ1T, NS1M, NT2X, W1BS. **LX8A**: DF3CB, DF4RD, DF6RI, DF7RX, DJ0IP, DJ1US, DJ2BW, DJ3TF, DK5PD, DK7PE, DK8ED, DK8FD, DK9IP, DL1HCM, DL1MAJ, DL1VJ, DL2NBU, DL3NCI, DL4NAC, DL4ZBK, DL5MAE, DL5RDO, DL5UF, DL6FBL, DL6RAI, DL7MAT, DL8NB, DL8OH, DL9RDL, LA1PBA, LA4DCA, LX1JP, LX1MK, LX1RO, LX1WW, Angela, Thomas. **N1CQ** & **DL7AEY**, K1BW, K8GL, KC1Q, K02SX, KI2P, KM1P, NS1I, W1CJL. **N2RM** & **N2MR**, WM2H. **N6ND** & **K6JYO**, K6STI, KA6SAR, KI6MS, KI7KM, K26E, N6CW, NI6W, W6KUT, WA60TU. **N0XA** & **AB0X**, K0UAA, K0VBU, K08U, NX0I. **NF2L** & **K2BU**, KY2T, N3RG. **NK1F** & Packet. **NL7G** & **KL7DM**, KL7HF, KL7HFA, KL7PJ, KL7U, KL7Y, NL7GP, WL7E. **NR5M** & **AD00**, AK5B, K2TNO, K2UA, K5GA, K5GN, K5LZO, K5RC, KE5IV, K65U, KN5H, K25M, N5IVF, NT5D, W5XZ, W85N.

**OH1AA**: OH1CO, OH1LD, OH1LF, OH1GI, OH1HD, OH1JD, OH1KO, OH1SV, OH1SY, OH1WR, OH1WZ. **OL8A**: OK2FD, OK3CBU, OK3CDV, OK3CGP, OK3CMV, OK3CQR, OK3CSQ, OK3CUM, OK3CZM, OK3EA, OK3YEC, OK3GB, OK3GI, OK3JW, OK3LU, OK3LZ, OK3NA, OK3NY, OK3PA, OK3RM, OK3TAP, OK3TPV, OK3YEC, OK3YX, OK3ZAF. **PA6DX**: PA0CLN, PA0COR, PA0JMH, PA0LVB, PA0VAJ, PA3AAV, PA3ABA, PA3BAS, PA3BFM, PA3CEE, PA3CEF, PA3CTM, PA3CVM, PA3DFT, PA3DQW, PA3DWD, PA3ETY. **PA0BV**: A16V, A16V, K7RIE, K7SS, K7WA, K7XX, KE7V, KQ2M, N6IG, N7NG, N86G, NV6Z, W4ETO, W7WJ, WA6AUE. **PJ1B**: K2SB, K2SS, K2TW, K3EST, K3VW, KT3Y, N2AA, N3ED, N3RD, N4RV, PJ9EE, W2GD, W3UY, WA3LRO. **UP1BZO**: UP2BFN, UP2BKZ, UP2BMT, UP2BMX, UP2BNC, UP2BQ, UP200, UP2NK, UC2IAP, UP2-038-346, UP2-038-728, UP2-038-1751. **UP8A**: UP2BAW, UP2BIG, UP2BIL, UP2BRF, UP2PAJ, UW3AA. **W3GM** & **AA4II**, K3ND, K3OA, K6ANP, N2EA, N2ZR, W3BGN, W3FV. **W3LPL** & **A13M**, K3RA, KA1GD, KF3P, N8II, ND3A, NW5E, W3EKT, WA8MAZ, WB3FSB, WB3JRU, WD4AXM. **WB8I**: K80KC, N8BJQ, N9AG, W8DN, W8FN, W8ILC, W8OK, WD9CNF. **WB8IH/9** & **K0FVF**, KM00, N8BSH, N89C, W0UC, WA0RBW, WA0SVR. **WB8K** & **K6YSE**, N8DCJ, W8CZM, W8JGU, WA8RCN. **Y34K**: Y23EK, Y23FK, Y24UK, Y25ZO, Y27FN, Y37XJ, Y42LK, Y42MK. **YT2R**: YU2DQ, YU2HO, YU2IQ, YU2MP, YU2MY, YU2NJ, YU2OG, YU2OH, YT2FI. **ZB2/GW3NYY** & **K1RBY**.



Don Guido, HC8GR, of the Association DX-ED, provided a rustic volcano-top QTH for the gang at HD8EX. The tough hombres behind the key were (left to right) Lloyd, AA6T; Tom, DL7AV; Oliver, W6NV; Bruce, N6TU; Dave, N6RZ; and Rob, WB6SHD.



**WORLD TOP 10 QRPP**  
(5 W Input)  
All Band

|           |           |           |         |
|-----------|-----------|-----------|---------|
| 1. YU3BC  | 1,241,286 | 6. KR2Q   | 565,128 |
| 2. WA2HZR | 889,913   | 7. JI1CBF | 549,917 |
| 3. NX7K   | 865,171   | 8. HA1XR  | 480,690 |
| 4. VP2EQ  | 808,920   | 9. G4ELZ  | 466,272 |
| 5. RB5IIU | 797,056   | 10. UD6DF | 421,553 |

**TEAM CONTESTING**

Team Japonica by 5H1HK (Opr. JE3MAS), KH0JE1CKA, KC6CS (Opr. JE1JKL), JH7WKQ, and EL2FY (Opr. JA1XAF) 18,154,582.

Number groups after call letters denote following: Band (A = all), Final Score, Number of QSOs, Zones, and Countries. Certificate winners are listed in boldface.

**CW RESULTS**  
**SINGLE OPERATOR**  
**NORTH AMERICA**

**United States**

|             |     |           |      |     |     |
|-------------|-----|-----------|------|-----|-----|
| W1KM        | A   | 4,466,557 | 2632 | 156 | 421 |
| K1CC        |     | 3,915,610 | 2548 | 141 | 386 |
| K1TD        |     | 3,849,115 | 2245 | 157 | 432 |
| N6BV/1      |     | 3,170,260 | 2071 | 141 | 400 |
| K1RU        |     | 3,166,800 | 2016 | 144 | 402 |
| K1VR        |     | 2,564,992 | 1893 | 121 | 343 |
| (Opr. KM3T) |     |           |      |     |     |
| KG1D        |     | 1,483,299 | 1245 | 111 | 300 |
| W1WAI       |     | 1,446,192 | 1057 | 126 | 358 |
| N4XR/1      |     | 1,378,236 | 929  | 139 | 377 |
| W1FJ        |     | 1,331,512 | 987  | 127 | 345 |
| K2SX/1      |     | 1,037,700 | 818  | 123 | 327 |
| W1MX        |     | 989,825   | 812  | 121 | 304 |
| W1MK        |     | 982,220   | 1063 | 94  | 224 |
| K1WJL       |     | 903,260   | 814  | 109 | 271 |
| W1BIH       |     | 851,160   | 861  | 106 | 240 |
| K3FN/1      |     | 848,331   | 669  | 128 | 323 |
| W1AX        |     | 751,729   | 643  | 112 | 295 |
| N1ELN       |     | 710,073   | 715  | 101 | 250 |
| W1BR        |     | 672,920   | 665  | 116 | 244 |
| W2AX/1      |     | 595,296   | 590  | 96  | 255 |
| KA1DWX      |     | 588,245   | 600  | 99  | 244 |
| W1XN        |     | 355,911   | 471  | 85  | 182 |
| K1CLN       |     | 295,960   | 387  | 86  | 194 |
| AB1U        |     | 236,903   | 348  | 75  | 166 |
| N1RC        |     | 202,725   | 329  | 63  | 160 |
| W1FM        |     | 145,036   | 266  | 72  | 130 |
| K1VKO       |     | 142,606   | 233  | 76  | 150 |
| K1YRP       |     | 130,134   | 323  | 39  | 99  |
| K1SA        |     | 115,564   | 232  | 58  | 115 |
| WA1UAR      |     | 95,228    | 193  | 61  | 118 |
| N1DC        |     | 94,308    | 199  | 51  | 123 |
| NO1I        |     | 79,520    | 175  | 52  | 108 |
| N1AU        |     | 78,120    | 156  | 64  | 116 |
| K1ZZJ       |     | 59,360    | 149  | 48  | 92  |
| W3WDX/1     |     | 32,450    | 103  | 46  | 72  |
| W0RSG/1     |     | 19,646    | 81   | 36  | 58  |
| W1CNU       |     | 7,024     | 76   | 15  | 35  |
| W1GG        |     | 6,954     | 42   | 22  | 39  |
| K1ZZ        | 28  | 537,568   | 1235 | 34  | 123 |
| W1WEF       |     | 277,815   | 731  | 31  | 92  |
| K1UD        |     | 219,252   | 617  | 30  | 91  |
| W1PH        |     | 60,705    | 221  | 26  | 69  |
| K1IK        |     | 58,824    | 160  | 24  | 62  |
| KQ1V        |     | 29,241    | 130  | 21  | 60  |
| KA1RPO      |     | 22,605    | 156  | 18  | 37  |
| W1RM        | 21  | 591,038   | 1235 | 36  | 127 |
| W1NG        |     | 449,526   | 1013 | 37  | 117 |
| K1XA        |     | 417,745   | 1021 | 36  | 109 |
| KM1X        |     | 315,392   | 855  | 33  | 95  |
| K1EF1       |     | 215,560   | 545  | 34  | 102 |
| WB1DXD      |     | 187,000   | 639  | 26  | 74  |
| W1RR        | 14  | 203,635   | 510  | 38  | 101 |
| WA1FCN      |     | 186,538   | 458  | 39  | 100 |
| W1YN        |     | 107,210   | 263  | 40  | 102 |
| K1KI        |     | 18,312    | 117  | 21  | 35  |
| K2MN/1      |     | 6,248     | 49   | 12  | 32  |
| W1PLJ       |     | 319       | 10   | 4   | 7   |
| W1GIH       | 7   | 82,062    | 292  | 25  | 72  |
| AA1M        |     | 12,750    | 89   | 10  | 41  |
| WB1AEL      |     | 12,320    | 79   | 16  | 39  |
| W1FV        | 3.5 | 225,150   | 691  | 30  | 84  |
| K1NA        |     | 140,192   | 468  | 27  | 77  |
| W1AB        | 1.8 | 2,146     | 30   | 9   | 20  |
| N2LT        | A   | 3,757,462 | 2289 | 155 | 408 |
| N2MM        |     | 2,705,547 | 1819 | 143 | 376 |
| N2ZL        |     | 2,358,240 | 1586 | 150 | 360 |
| N2NT        |     | 2,161,905 | 1500 | 132 | 373 |
| KZ2S        |     | 2,140,000 | 1707 | 116 | 312 |

|             |     |           |      |     |     |
|-------------|-----|-----------|------|-----|-----|
| K2LE        | **  | 1,752,661 | 1263 | 133 | 346 |
| W2REH       | **  | 1,658,853 | 1206 | 136 | 333 |
| W1GD/2      | **  | 1,261,800 | 1072 | 110 | 300 |
| W2GGE       | **  | 1,219,509 | 996  | 118 | 305 |
| AB2E        | **  | 1,033,728 | 959  | 107 | 277 |
| W2XL        | **  | 891,616   | 894  | 104 | 248 |
| K2QAR       | **  | 883,596   | 763  | 109 | 293 |
| KN2Q        | **  | 717,360   | 855  | 75  | 219 |
| N2UN        | **  | 651,525   | 623  | 105 | 260 |
| WA2VYA      | **  | 603,684   | 584  | 112 | 257 |
| K2BK        | **  | 567,630   | 623  | 93  | 225 |
| NQ2D        | **  | 562,542   | 557  | 107 | 259 |
| W2HG        | **  | 455,107   | 503  | 100 | 223 |
| K2YGM       | **  | 391,840   | 440  | 90  | 220 |
| K2FL        | **  | 389,597   | 457  | 88  | 211 |
| K2OWE       | **  | 378,750   | 421  | 89  | 214 |
| WF2W        | **  | 375,380   | 493  | 84  | 190 |
| W2TZ        | **  | 362,152   | 539  | 65  | 167 |
| KF2D        | **  | 334,313   | 410  | 91  | 202 |
| K3JGJ/2     | **  | 330,000   | 436  | 79  | 185 |
| K2PS        | **  | 327,033   | 442  | 79  | 182 |
| W2KHQ       | **  | 260,750   | 365  | 73  | 177 |
| K2PH        | **  | 256,563   | 353  | 80  | 181 |
| N2AIF       | **  | 235,224   | 316  | 84  | 180 |
| KD2YP       | **  | 214,316   | 291  | 88  | 174 |
| KT2D        | **  | 202,587   | 320  | 69  | 162 |
| KA2AOT      | **  | 200,548   | 267  | 88  | 189 |
| W2GKZ       | **  | 198,843   | 304  | 73  | 164 |
| WA2IKL      | **  | 198,050   | 300  | 77  | 156 |
| WA2UDT      | **  | 185,472   | 294  | 74  | 150 |
| W2AWF       | **  | 157,030   | 263  | 57  | 148 |
| KW2J        | **  | 140,700   | 259  | 67  | 134 |
| WA2ORX      | **  | 136,990   | 232  | 63  | 143 |
| WA2ASQ      | **  | 124,605   | 228  | 63  | 132 |
| KC2KU       | **  | 82,641    | 175  | 53  | 110 |
| WA2VZO      | **  | 82,100    | 289  | 28  | 72  |
| WA2C        | **  | 79,514    | 171  | 58  | 108 |
| W2FUI       | **  | 60,048    | 152  | 46  | 93  |
| K2SWZ       | **  | 56,573    | 161  | 48  | 91  |
| NA2Q        | **  | 56,544    | 143  | 54  | 98  |
| KC2TA       | **  | 35,420    | 138  | 41  | 74  |
| AG2S        | **  | 35,092    | 105  | 45  | 79  |
| W2PHT       | **  | 32,274    | 115  | 33  | 66  |
| N2KA        | **  | 27,250    | 89   | 34  | 75  |
| N2WK        | **  | 21,156    | 86   | 26  | 60  |
| WB2K        | **  | 19,344    | 71   | 41  | 63  |
| W2JEK       | **  | 2,340     | 27   | 15  | 21  |
| N2KW        | 28  | 227,304   | 609  | 32  | 100 |
| K2MFY       | **  | 128,904   | 365  | 32  | 91  |
| KC2X        | **  | 118,826   | 381  | 30  | 76  |
| WB2YQH      | **  | 86,358    | 270  | 28  | 83  |
| KB2NU       | **  | 46,369    | 179  | 26  | 63  |
| WB2DND      | **  | 27,840    | 121  | 24  | 56  |
| N2PP        | 21  | 470,304   | 1109 | 37  | 107 |
| K2WK        | **  | 315,792   | 783  | 35  | 101 |
| N2DTW       | **  | 168,840   | 497  | 30  | 90  |
| K2HFX       | 14  | 411,300   | 950  | 38  | 112 |
| KC2FD       | **  | 74,592    | 369  | 19  | 55  |
| K2EK        | 7   | 520,086   | 1244 | 37  | 110 |
| N2DT        | **  | 399,765   | 950  | 36  | 109 |
| KD2RD       | **  | 282,535   | 826  | 29  | 92  |
| KM2P        | **  | 162,722   | 503  | 31  | 87  |
| K3GYS/2     | **  | 7,956     | 58   | 16  | 35  |
| W2FR        | 3.5 | 23,146    | 117  | 19  | 52  |
| NA2M        | 1.8 | 5,520     | 45   | 14  | 32  |
| K3TUP       | A   | 4,311,720 | 2425 | 167 | 442 |
| (Opr. K5ZD) |     |           |      |     |     |
| K3ZO        | **  | 3,731,904 | 2111 | 166 | 442 |
| K3OO        | **  | 3,191,900 | 2061 | 145 | 396 |
| N3AD        | **  | 3,050,415 | 2212 | 125 | 352 |
| K3NA        | **  | 2,369,134 | 1742 | 131 | 348 |
| K3UA        | **  | 2,276,274 | 1452 | 153 | 393 |
| N3CXV       | **  | 2,033,848 | 1490 | 135 | 337 |
| NM2Y/3      | **  | 1,879,080 | 1555 | 119 | 301 |
| K3ZZ        | **  | 1,653,771 | 1334 | 118 | 309 |
| W3GRF       | **  | 1,571,724 | 1181 | 126 | 336 |
| W3UJ        | **  | 1,104,100 | 1058 | 89  | 273 |
| AA3B        | **  | 1,048,730 | 920  | 109 | 289 |
| W3GU        | **  | 1,006,206 | 873  | 112 | 290 |
| K3MD        | **  | 980,658   | 930  | 103 | 259 |
| N6CQ/3      | **  | 903,190   | 867  | 104 | 258 |

|          |    |           |      |     |     |
|----------|----|-----------|------|-----|-----|
| W3OV     | ** | 898,391   | 836  | 114 | 263 |
| N3LR     | ** | 895,208   | 884  | 107 | 246 |
| K3TEJ    | ** | 736,164   | 728  | 98  | 265 |
| K3NW     | ** | 682,864   | 613  | 110 | 282 |
| K3SA     | ** | 583,745   | 622  | 89  | 224 |
| W3HVQ    | ** | 540,540   | 527  | 86  | 200 |
| W3FG     | ** | 424,125   | 467  | 98  | 227 |
| WB2EKK/3 | ** | 366,163   | 445  | 88  | 201 |
| W3NZ     | ** | 357,588   | 417  | 96  | 212 |
| W3EVW    | ** | 345,300   | 414  | 99  | 201 |
| K3NZ     | ** | 322,834   | 442  | 77  | 177 |
| W3FW     | ** | 285,384   | 393  | 89  | 175 |
| N03B     | ** | 282,494   | 371  | 82  | 192 |
| KQ3F     | ** | 261,016   | 390  | 78  | 158 |
| N3AM     | ** | 247,164   | 344  | 80  | 178 |
| W3VZ     | ** | 232,932   | 359  | 70  | 166 |
| WB3AVN   | ** | 230,307   | 347  | 71  | 160 |
| K3II     | ** | 210,231   | 346  | 56  | 157 |
| KW3F     | ** | 207,315   | 291  | 85  | 170 |
| N3WW     | ** | 190,624   | 306  | 71  | 153 |
| N3II     | ** | 183,310   | 282  | 75  | 155 |
| W3EAN    | ** | 147,042   | 277  | 54  | 135 |
| K3ZA     | ** | 120,350   | 253  | 49  | 253 |
| W3HVM    | ** | 98,875    | 204  | 60  | 115 |
| W3QIR    | ** | 53,361    | 134  | 51  | 96  |
| W3AP     | ** | 48,664    | 122  | 58  | 96  |
| W3CPB    | ** | 29,295    | 109  | 36  | 69  |
| W3FOE    | ** | 12,240    | 72   | 23  | 37  |
| NK3U     | ** | 10,281    | 58   | 27  | 42  |
| W3CEI    | ** | 3,564     | 40   | 11  | 22  |
| W3AZ     | 28 | 140,970   | 433  | 30  | 81  |
| WA3LFY   | ** | 132,594   | 488  | 27  | 71  |
| WA3EOP   | ** | 6,536     | 61   | 12  | 36  |
| K3WUW    | 21 | 182,192   | 531  | 31  | 87  |
| KC3X     | ** | 153,625   | 426  | 34  | 91  |
| W8FJ/3   | 7  | 173,799   | 489  | 33  | 90  |
| K3BSY    | ** | 58,030    | 298  | 21  | 49  |
| N6AR/4   | A  | 3,106,488 | 1874 | 159 | 415 |
| WZ4F     | ** | 3,043,194 | 1975 | 156 | 383 |
| KM9P/4   | ** | 2,952,100 | 1914 | 145 | 385 |











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| 1130 RG213/U 95% shield mil spec NCV jkt.....  | .39  |
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| 1705 RG142B/U dbl silver shld, teflon ins..... | 1.50 |
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| 1450 RG174/U 50 ohm .100" od mil spec.....     | .14  |

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| UG21DS N plug for RG8,213,214 Silver.....        | 3.35   |
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| UG146A SO239 to N plug adapter, teflon.....      | 6.50   |
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| SO239AM UHF chassis mt receptacle, Amphenol..... | .89    |
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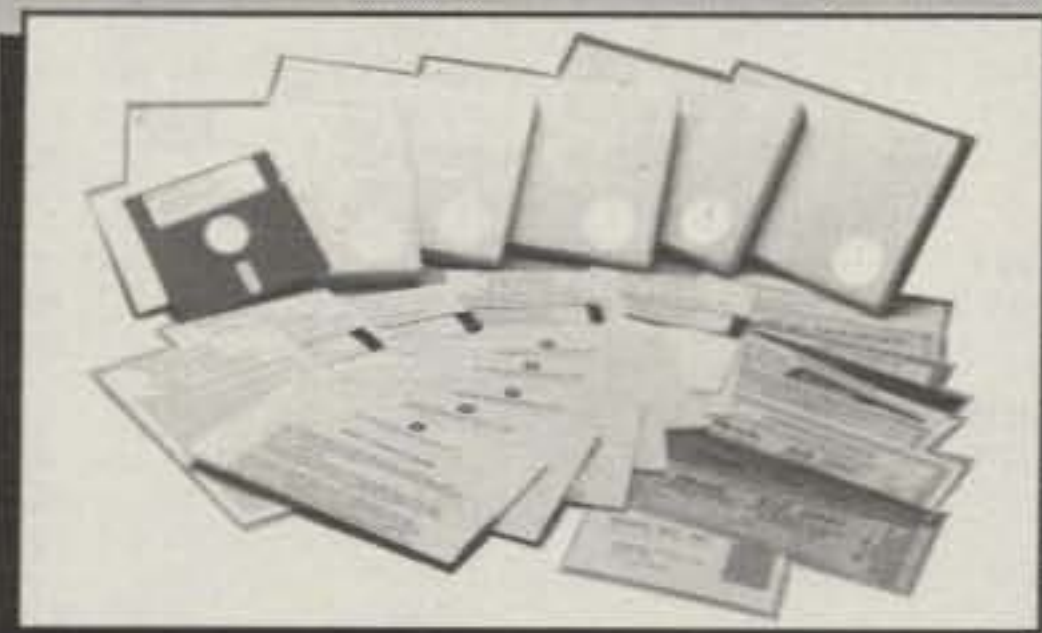
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|---------|-----|---------|-----|----|----|-------------------------|-----|-----------|------|-----|---------------|
| Y32VK   | "   | 40,992  | 143 | 50 | 72 | Y230D                   | "   | 1,035     | 45   | 4   | 19            |
| Y24GB/A | "   | 40,920  | 126 | 55 | 65 | Y24HM                   | "   | 540       | 31   | 5   | 15            |
| Y39ZH   | "   | 39,852  | 369 | 43 | 65 | Y340L/A                 | "   | 195       | 15   | 2   | 11            |
| Y24SH/A | "   | 36,300  | 155 | 41 | 69 | <b>Gibraltar</b>        |     |           |      |     |               |
| Y23SF/A | "   | 35,964  | 224 | 29 | 82 | ZB2                     |     |           |      |     |               |
| Y56WG   | "   | 34,131  | 99  | 56 | 75 | /G4FRE                  | 7   | 22,649    | 251  | 14  | 57            |
| Y24SG   | "   | 34,080  | 119 | 40 | 56 | <b>Greece</b>           |     |           |      |     |               |
| Y22BK   | "   | 32,307  | 154 | 35 | 54 | SV1RP/2                 | 14  | 279,433   | 1267 | 31  | 102           |
| Y31JA   | "   | 32,011  | 105 | 48 | 71 | SV1NA                   | 1.8 | 6,204     | 134  | 8   | 34            |
| Y22IH   | "   | 28,854  | 102 | 46 | 80 | <b>Hungary</b>          |     |           |      |     |               |
| Y54TO   | "   | 27,144  | 98  | 48 | 68 | HABHW                   | A   | 724,850   | 1103 | 109 | 241           |
| Y26ML   | "   | 27,144  | 150 | 30 | 57 | HABDD                   | "   | 235,848   | 432  | 82  | 166           |
| Y38ZM   | "   | 26,299  | 85  | 49 | 70 | HA1SL                   | "   | 204,102   | 502  | 59  | 148           |
| Y78VL   | "   | 24,696  | 159 | 28 | 44 | HA3FO/1                 | "   | 111,045   | 259  | 62  | 103           |
| Y41ZH   | "   | 23,016  | 111 | 35 | 49 | HA7ML                   | "   | 88,543    | 346  | 38  | 41            |
| Y21EA   | "   | 21,216  | 100 | 40 | 62 | HA8IR                   | "   | 62,491    | 210  | 45  | 98            |
| Y23CM   | "   | 19,760  | 92  | 34 | 61 | HA4YK                   | "   | 36,207    | 264  | 19  | 62            |
| Y32ZD   |     |         |     |    |    | HA8RJ                   | 28  | 162,261   | 598  | 32  | 89            |
| /Y32KI  | "   | 19,266  | 130 | 23 | 55 | HA8UD                   | "   | 145,034   | 431  | 37  | 90            |
| Y34PB   | "   | 17,892  | 107 | 31 | 40 | HA3GJ                   | "   | 2,772     | 34   | 14  | 19            |
| Y36YM   | "   | 17,394  | 160 | 18 | 60 | HA4XX                   | 21  | 215,586   | 783  | 35  | 91            |
| Y24KB/A | "   | 14,490  | 68  | 36 | 54 | HA7UI                   | "   | 151,690   | 647  | 30  | 80            |
| Y53XN/P | "   | 13,923  | 81  | 31 | 32 | HA1CC                   | "   | 63,665    | 355  | 26  | 59            |
| Y230H/A | "   | 11,880  | 79  | 25 | 29 | HA3HE                   | 14  | 29,376    | 231  | 20  | 48            |
| Y26MH/A | "   | 11,431  | 65  | 31 | 40 | HG3DXC                  | 7   | 362,984   | 1456 | 35  | 101           |
| Y23XD/A | "   | 11,023  | 113 | 21 | 52 |                         |     |           |      |     | (Opr. HA4XT)  |
| Y24JB   | "   | 10,787  | 110 | 17 | 50 | HA5NG                   | "   | 88,704    | 554  | 24  | 72            |
| Y25DA   | "   | 10,730  | 58  | 33 | 41 | HA3PT                   | "   | 84,164    | 506  | 23  | 68            |
| Y22DK/A | "   | 10,706  | 79  | 23 | 30 | HA6NL                   | 3.5 | 106,925   | 875  | 16  | 75            |
| Y31XN   | "   | 10,368  | 73  | 24 | 40 | HA6PX                   | 1.8 | 31,806    | 486  | 13  | 49            |
| Y24YH   | "   | 10,004  | 58  | 25 | 36 | <b>Iceland</b>          |     |           |      |     |               |
| Y58ZA   | "   | 8,175   | 41  | 36 | 39 | TF3WW                   | A   | 3,606,304 | 4102 | 105 | 311           |
| Y66ZF   | "   | 7,910   | 83  | 23 | 47 |                         |     |           |      |     | (Opr. OH4NRC) |
| Y25GH/A | "   | 7,592   | 52  | 24 | 28 | TF3SD                   | 21  | 23,332    | 143  | 20  | 56            |
| Y62QH   | "   | 7,436   | 51  | 22 | 30 | OH4NS/TF                | 14  | 64,859    | 448  | 23  | 56            |
| Y53ED   | "   | 7,350   | 73  | 17 | 18 | <b>Ireland</b>          |     |           |      |     |               |
| Y23WO   | "   | 6,555   | 51  | 23 | 34 | EI4N                    | A   | 85,560    | 307  | 37  | 87            |
| Y77YH   | "   | 6,552   | 112 | 9  | 43 | <b>Isle of Man</b>      |     |           |      |     |               |
| Y23JF/A | "   | 6,270   | 92  | 15 | 40 | GD4UOL/A                | A   | 615,600   | 1431 | 74  | 226           |
| Y22HF   | "   | 5,760   | 46  | 25 | 35 |                         |     |           |      |     | (Opr. G4UOL)  |
| Y36VM   | "   | 5,742   | 44  | 19 | 39 | <b>Italy</b>            |     |           |      |     |               |
| Y75YL   | "   | 5,565   | 37  | 22 | 31 | IBZUY                   | A   | 936,540   | 1410 | 99  | 231           |
| Y26WM/A | "   | 5,460   | 42  | 22 | 38 | IKBEJN                  | "   | 211,370   | 919  | 67  | 163           |
| Y66VF   | "   | 5,445   | 72  | 24 | 31 | IK2AHB                  | "   | 207,045   | 472  | 71  | 144           |
| Y26DM/A | "   | 5,220   | 58  | 14 | 22 | IK0FEC                  | "   | 69,913    | 213  | 49  | 102           |
| Y25IJ   | "   | 4,400   | 44  | 16 | 34 | IK2AIT                  | "   | 65,219    | 263  | 42  | 79            |
| Y310N   | "   | 4,176   | 31  | 21 | 27 | IK3HHY                  | "   | 37,080    | 108  | 37  | 53            |
| Y580A   | "   | 4,140   | 44  | 17 | 27 | IK3HXF                  | "   | 12,240    | 88   | 25  | 26            |
| Y390H   | "   | 3,978   | 32  | 23 | 28 | IK4GNK                  | "   | 10,150    | 116  | 17  | 53            |
| Y53XM   | "   | 3,471   | 71  | 11 | 28 | IV3JWR                  | 28  | 197,768   | 1040 | 34  | 84            |
| Y56SG   | "   | 3,225   | 27  | 17 | 26 | I1BAY                   | "   | 174,915   | 645  | 31  | 86            |
| Y53VL   | "   | 3,180   | 40  | 14 | 16 | W9LT/10                 | "   | 128,592   | 571  | 30  | 80            |
| Y28WG/A | "   | 3,015   | 25  | 20 | 25 | IO3VJW                  | 21  | 304,051   | 1022 | 33  | 98            |
| Y65LN   | "   | 1,700   | 22  | 16 | 18 | IK2GSN                  | "   | 289,845   | 1019 | 35  | 96            |
| Y26LG   | "   | 1,519   | 17  | 14 | 17 | IK0ADY                  | 14  | 12,688    | 164  | 15  | 46            |
| Y41UF   | "   | 1,500   | 33  | 10 | 20 | I3JSS                   | 7   | 582,259   | 1860 | 32  | 105           |
| Y72XG   | "   | 380     | 14  | 6  | 4  | IK2DVG                  | 1.8 | 76,788    | 728  | 16  | 63            |
| Y32KE   | 28  | 168,168 | 512 | 37 | 95 | I3VHO                   | "   | 36,499    | 482  | 15  | 50            |
| Y21VF/A | "   | 159,075 | 600 | 30 | 75 | <b>ITU Geneva</b>       |     |           |      |     |               |
| Y39TF   | "   | 152,375 | 542 | 31 | 84 | 4U1ITU                  | A   | 739,53    | 1298 | 84  | 213           |
| Y41FL   | "   | 44,506  | 241 | 26 | 51 | <b>Luxembourg</b>       |     |           |      |     |               |
| Y22LE   | "   | 42,126  | 174 | 28 | 74 | LX2PA                   | A   | 44,660    | 164  | 50  | 90            |
| Y43TD   | "   | 37,050  | 210 | 25 | 50 | LX2AA                   | 14  | 34,804    | 282  | 19  | 58            |
| Y33WJ   | "   | 26,400  | 177 | 22 | 38 | <b>The Netherlands</b>  |     |           |      |     |               |
| Y25NA/A | "   | 24,616  | 130 | 26 | 42 | PABINA                  | A   | 840,708   | 1059 | 97  | 266           |
| Y25MG/A | "   | 17,447  | 104 | 24 | 49 | PA3CWL                  | "   | 528,699   | 1016 | 86  | 223           |
| Y630I   | "   | 15,437  | 178 | 15 | 28 | PA8UV                   | "   | 223,960   | 490  | 67  | 153           |
| Y87VL   | "   | 13,986  | 82  | 21 | 42 | PA3CJP                  | "   | 212,676   | 461  | 63  | 159           |
| Y21XH/A | "   | 11,180  | 63  | 25 | 40 | PA3ACC                  | "   | 153,900   | 426  | 51  | 129           |
| Y51YJ   | "   | 10,300  | 76  | 22 | 28 | PA3BUD                  | "   | 132,867   | 312  | 56  | 133           |
| Y23JA/A | "   | 9,853   | 80  | 21 | 38 | PA8SKP                  | "   | 58,344    | 203  | 44  | 99            |
| Y37EO   | "   | 8,645   | 48  | 24 | 41 | PA3BTH                  | "   | 30,952    | 118  | 51  | 77            |
| Y27PN/P | "   | 8,151   | 53  | 23 | 34 | PA3BNH                  | "   | 26,544    | 177  | 29  | 55            |
| Y21UL   | "   | 7,258   | 74  | 16 | 22 | PA3BBP                  | "   | 14,418    | 63   | 40  | 49            |
| Y42WB   | "   | 4,180   | 41  | 14 | 30 | PA3CAU                  | "   | 10,907    | 126  | 25  | 48            |
| Y21NM/A | "   | 2,580   | 32  | 14 | 16 | PA8YN                   | "   | 8,322     | 98   | 16  | 22            |
| Y52XF   | "   | 1,936   | 41  | 9  | 13 | PA3DKX                  | "   | 6,630     | 67   | 38  | 58            |
| Y26KL   | "   | 832     | 18  | 7  | 9  | PA3CCF                  | "   | 6,120     | 36   | 24  | 36            |
| Y37ZE   | 21  | 80,892  | 328 | 29 | 78 | PA3CNI                  | "   | 3,850     | 77   | 22  | 28            |
| Y22IC   | "   | 77,896  | 315 | 29 | 75 | PA3AMA                  | "   | 1,404     | 18   | 11  | 15            |
| Y24XA   | "   | 58,520  | 274 | 25 | 63 | PA3CXC                  | 28  | 111,996   | 473  | 31  | 77            |
| Y21JH   | "   | 25,404  | 140 | 25 | 48 | PA3FCD                  | "   | 63,080    | 310  | 27  | 68            |
| Y34RG   | "   | 10,200  | 99  | 18 | 32 | PA3EWM                  | "   | 56,727    | 235  | 31  | 68            |
| Y21CL   | "   | 9,782   | 63  | 21 | 46 | PA2REH                  | 21  | 163,488   | 730  | 29  | 75            |
| Y83ZN   | "   | 5,382   | 84  | 13 | 26 | PA8PLN                  | 14  | 7,152     | 97   | 12  | 36            |
| Y87PL/P | "   | 4,480   | 56  | 10 | 22 | PA3BNT                  | 7   | 20,033    | 164  | 67  | 299           |
| Y37WK   | "   | 1,566   | 24  | 14 | 15 | PA3E0B                  | "   | 8,883     | 92   | 11  | 36            |
| Y48YN   | 14  | 141,858 | 703 | 31 | 80 | PA8TA                   | 3.5 | 7,089     | 87   | 12  | 39            |
| Y26SO   | "   | 19,360  | 126 | 24 | 56 | PA8DIN                  | "   | 6,063     | 124  | 8   | 35            |
| Y21EF   | "   | 13,736  | 99  | 20 | 48 | <b>Northern Ireland</b> |     |           |      |     |               |
| Y22CF   | "   | 10,036  | 134 | 14 | 38 | GI48BV                  | A   | 350,208   | 562  | 71  | 217           |
| Y23HN   | "   | 6,950   | 98  | 12 | 38 | <b>Norway</b>           |     |           |      |     |               |
| Y24FH   | "   | 4,448   | 58  | 13 | 19 | LA7MFA                  | A   | 843,557   | 1326 | 95  | 252           |
| Y72XM   | "   | 2,744   | 55  | 9  | 19 | LA8YN                   | "   | 254,978   | 425  | 80  | 161           |
| Y23BF   | "   | 1,470   | 21  | 12 | 18 | LA9HFA                  | "   | 193,578   | 365  | 71  | 160           |
| Y44WA   | "   | 1,008   | 40  | 6  | 18 | LA1T                    | "   | 140,679   | 359  | 68  | 135           |
| Y92ZL   | "   | 64      | 8   | 3  | 5  |                         |     |           |      |     | (Opr. LA48Q)  |
| Y56SF   | 7   | 27,072  | 200 | 21 | 51 | <b>Poland</b>           |     |           |      |     |               |
| Y32EE   | "   | 26,250  | 202 | 19 | 56 | SP9GDB                  | A   | 228,182   | 469  | 78  | 293           |
| Y23ZF   | "   | 6,450   | 70  | 14 | 36 | SP9BBH                  | "   | 198,121   | 511  | 59  | 158           |
| Y25ZN   | 3.5 | 11,139  | 200 | 9  | 38 | SP3HC                   | "   | 164,250   | 361  | 65  | 160           |
| Y23GB   | "   | 8,096   | 139 | 11 | 35 | SP8AOJ                  | "   | 157,724   | 377  | 61  | 111           |
| Y21AL   | "   | 5,148   | 119 | 8  | 28 | SP3BEJ                  | "   | 155,039   | 416  | 59  | 138           |
| Y21UH   | "   | 2,960   | 63  | 9  | 31 | SP9NSV                  | "   | 151,432   | 385  | 61  | 123           |
| Y24KG   | "   | 2,226   | 37  | 10 | 32 | SP9EEE                  | "   | 92,236    | 285  | 53  | 133           |
| Y23KF   | 1.8 | 12,324  | 218 | 9  | 43 | SP2BME                  | "   | 71,610    | 224  | 51  | 103           |
| Y47YM   | "   | 5,676   | 132 | 6  | 37 | SP8FNA                  | "   | 45,453    | 117  | 57  | 82            |
| Y27QH   | "   | 4,477   | 124 | 5  | 32 | SP9CTW                  | "   | 29,352    | 107  | 42  | 62            |
| Y21IF   | "   | 1,248   | 53  | 3  | 21 | SP3JUN                  | "   | 28,240    | 182  | 29  | 51            |

### SINGLE OP ZONE WINNERS

| Zone | Call     | Score     | Zone | Call     | Score     |
|------|----------|-----------|------|----------|-----------|
| 1    | NL7DU    | 139,555   | 21   | HZ1HZ    | 1,914,938 |
| 2    | VE2LJ    | 438,840   | 22   | AT0Z     | 425,024   |
| 3    | K5MM/7   | 2,160,000 | 23   | JT1BR    | 215,968   |
| 4    | W9RE     | 3,487,232 | 24   | VS6UP    | 712,597   |
| 5    | W1KM     | 4,466,557 | 25   | JH7WKQ   | 2,398,674 |
| 6    | XE1OH    | 1,356,005 | 26   | No Entry |           |
| 7    | K0KJ/HP1 | 484,133   | 27   | KC6CS    | 4,906,470 |
| 8    | 8P9HT    | 7,323,030 | 28   | YC3HVM   | 1,064,350 |
| 9    | FY5YE    | 9,574,096 | 29   | VK8AV    | 803,400   |
| 10   | HC5M     | 8,849,300 | 30   | VK2APK   | 452,228   |
| 11   | ZY5ZBA   | 1,045,354 | 31   | AH6AZ    | 1,655,970 |
| 12   | CE1IDM   | 1,208,704 | 32   | ZL3GO    | 2,286,384 |
| 13   | CW8B     | 1,496,556 | 33   | CT3BZ    | 5,495,616 |
| 14   | CT2NH    | 4,683,500 | 34   | SU1ER    | 6,134,568 |
| 15   | UP3BP    | 2,697,081 | 35   | D44BC    | 7,407,750 |
| 16   | UA3RAR   | 1,886,624 | 36   | 9Q5DX    | 1,853,697 |
| 17   | RL7AB    | 2,333,658 | 37   | 5H1HK    | 5,627,686 |
| 18   | UA9MX    | 858,942   | 38   | ZS6BCR   | 832,524   |
| 19   | UA0LH    | 489,311   | 39   | FH5EF    | 1,012,813 |
| 20   | 4Z4DX    | 859,342   | 40   | TF3WW    | 3,606,304 |

|        |   |        |     |    |     |          |    |           |      |     |             |        |   |         |     |    |    |
|--------|---|--------|-----|----|-----|----------|----|-----------|------|-----|-------------|--------|---|---------|-----|----|----|
| LA6PB  | " | 57,600 | 227 | 42 | 102 | Portugal |    |           |      |     |             | EA2IA  | " | 131,768 | 508 | 33 | 71 |
| LA6MY  | " | 44,880 | 198 | 35 | 101 | CT2NH    | A  | 4,683,500 | 4081 | 146 | 405         | EA3CAC | " | 109,434 | 700 | 24 | 45 |
| LA9PEA | " | 29,375 | 156 | 33 | 92  |          |    |           |      |     | (Opr. N6ZZ) | EA5FMJ | " | 87,045  | 352 | 32 | 73 |
| LA9RFA | " | 16,936 | 86  | 31 | 42  | CT1DKG   | 28 | 126,658   | 871  | 23  | 60          | EA7CJM | " | 74,165  | 378 | 27 | 64 |
| LA1IE  | " | 15,604 | 75  | 31 | 63  | CT4DX    | 7  | 12,204    | 122  | 12  | 42          | EA4AYX | " | 19,966  | 118 | 24 | 43 |
|        |   |        |     |    |     |          |    |           |      |     |             |        |   |         |     |    |    |



|                   |     |           |      |        |     |         |     |         |     |        |     |                  |     |           |      |        |     |         |     |         |      |               |     |                                 |      |           |      |     |     |
|-------------------|-----|-----------|------|--------|-----|---------|-----|---------|-----|--------|-----|------------------|-----|-----------|------|--------|-----|---------|-----|---------|------|---------------|-----|---------------------------------|------|-----------|------|-----|-----|
| <b>Wales</b>      |     |           |      | UA1AFM | **  | 221,490 | 665 | 59      | 155 | UQ26N  | 21  | 65,326           | 360 | 25        | 64   | UY5JC  | **  | 39,438  | 164 | 43      | 83   | YB6ZES        | **  | 441,097                         | 817  | 64        | 117  |     |     |
| GW48LE            | A   | 2,788,668 | 2592 | 117    | 336 | RA3AOD  | **  | 156,800 | 402 | 60     | 164 | UQ2CR            | **  | 28,860    | 223  | 19     | 46  | UT4UW   | **  | 39,114  | 134  | 48            | 75  | (Opr. YB6NOX)                   |      |           |      |     |     |
| (Opr. G3WVG)      |     |           |      | UA4AHA | **  | 156,615 | 572 | 48      | 149 | UQ1GXY | **  | 24,417           | 220 | 19        | 42   | RB5IF  | **  | 38,482  | 119 | 56      | 86   | YB8ATB        | **  | 387,072                         | 614  | 76        | 140  |     |     |
| GW3GWX            | 1.8 | 4,551     | 101  | 7      | 34  | UA3AB   | **  | 151,998 | 358 | 73     | 158 | UQ2GEC           | 14  | 15,028    | 100  | 22     | 61  | RB5HT   | **  | 36,630  | 146  | 44            | 67  | (Opr. PABLOU)                   |      |           |      |     |     |
| <b>Yugoslavia</b> |     |           |      | UA4NCI | **  | 142,635 | 406 | 55      | 130 | UQ2GIP | 7   | 40,255           | 273 | 22        | 46   | UB4LAT | **  | 36,344  | 138 | 44      | 74   | YB2FEA        | **  | 213,447                         | 459  | 66        | 103  |     |     |
| YU380             | A   | 2,491,129 | 2058 | 139    | 388 | RA3VA   | **  | 105,120 | 321 | 53     | 127 | UQ2GNL           | 3.5 | 40,235    | 469  | 15     | 50  | RB5FN   | **  | 34,870  | 125  | 43            | 67  | (Opr. YU3EA)                    |      |           |      |     |     |
| YT3L              | **  | 2,205,198 | 1752 | 156    | 426 | UA320Y  | **  | 104,580 | 304 | 53     | 113 | UQ2PJ            | **  | 31,868    | 400  | 12     | 50  | UB5IPH  | **  | 31,707  | 147  | 37            | 80  | YC8TSU                          | 28   | 94,050    | 363  | 45  | 59  |
| (Opr. YU3EF)      |     |           |      | UA4NZ  | **  | 101,493 | 324 | 58      | 131 | UQ2GGE | **  | 17,355           | 166 | 13        | 52   | UB5SDP | **  | 28,220  | 160 | 32      | 51   | YB7HB         | 21  | 28,644                          | 124  | 31        | 46   |     |     |
| YU7BJ             | **  | 958,665   | 1183 | 110    | 285 | UZ3TG   | **  | 95,885  | 289 | 48     | 103 | UQ2GBJ           | **  | 10,017    | 145  | 12     | 41  | RB5VL   | **  | 25,350  | 123  | 42            | 88  | YCBUNC                          | **   | 21,050    | 199  | 20  | 30  |
| YU3QI             | **  | 858,648   | 846  | 131    | 325 | RA4HW   | **  | 94,168  | 395 | 42     | 116 | UQ2GOV           | **  | 4,747     | 60   | 12     | 35  | UB4EL   | **  | 23,426  | 93   | 41            | 65  | YB3ASQ                          | 7    | 87,192    | 411  | 26  | 46  |
| YT7KW             | **  | 435,200   | 819  | 93     | 227 | UA4ANZ  | **  | 90,147  | 286 | 56     | 143 | UQ2GFU           | 1.8 | 9,856     | 200  | 7      | 37  | UB00Z   | **  | 17,112  | 108  | 30            | 63  | YB7KD                           | **   | 5,520     | 63   | 17  | 23  |
| YU7SF             | **  | 370,077   | 680  | 83     | 198 | UA6HSN  | **  | 87,531  | 321 | 47     | 116 | <b>Lithuania</b> |     |           |      |        |     |         |     |         |      | UB5MPPD       | **  | 15,664                          | 118  | 27        | 61   |     |     |
| YU1WR             | **  | 321,966   | 606  | 80     | 199 | UA4NBH  | **  | 79,296  | 254 | 62     | 106 | UP3BP            | A   | 2,697,081 | 2208 | 152    | 391 | UB5EIT  | **  | 14,440  | 92   | 29            | 66  | KHB                             |      |           |      |     |     |
| YU7LS             | **  | 129,355   | 320  | 65     | 140 | RW3DC   | **  | 79,023  | 289 | 47     | 112 | UP2BSP           | **  | 1,123,005 | 1273 | 112    | 331 | UB5SBF  | **  | 5,390   | 34   | 23            | 32  | /JE1CKA                         | A    | 3,581,912 | 3112 | 128 | 261 |
| YU3SB             | **  | 48,620    | 303  | 22     | 46  | UA3LAR  | **  | 77,580  | 161 | 70     | 110 | UP3BU            | **  | 1,044,100 | 1313 | 109    | 285 | UB4RWW  | **  | 3,318   | 35   | 18            | 24  | <b>Marshall Islands</b>         |      |           |      |     |     |
| YU1PJ             | **  | 45,347    | 135  | 52     | 85  | RW3AL   | **  | 71,672  | 164 | 58     | 78  | UP3BO            | **  | 784,824   | 1019 | 111    | 313 | RB5ICY  | **  | 1,344   | 32   | 10            | 18  | KX6DC                           | 1.8  | 42,723    | 297  | 22  | 25  |
| YT7WW             | 28  | 412,596   | 1049 | 38     | 119 | UA3RE   | **  | 63,063  | 268 | 44     | 99  | UP2BO            | **  | 717,649   | 1167 | 95     | 258 | RB5VK   | 28  | 469,336 | 1484 | 36            | 100 | (Opr. NZ8B)                     |      |           |      |     |     |
| YT3W              | **  | 395,354   | 1051 | 38     | 109 | UA3ICJ  | **  | 58,842  | 177 | 58     | 104 | UP2BDW           | **  | 521,300   | 757  | 97     | 228 | UB5ZAL  | **  | 253,400 | 811  | 35            | 105 | <b>New Zealand</b>              |      |           |      |     |     |
| (Opr. YU3EF)      |     |           |      | UA4AO  | **  | 54,020  | 222 | 43      | 105 | UP2BDF | **  | 395,469          | 747 | 82        | 209  | UB2VA  | **  | 253,368 | 781 | 36      | 100  | ZL3GQ         | A   | 2,286,384                       | 1716 | 149       | 307  |     |     |
| YU2NW             | **  | 393,120   | 1048 | 38     | 102 | UA1OFT  | **  | 48,160  | 200 | 43     | 97  | UP2BDR           | **  | 283,248   | 396  | 95     | 241 | UB5BZ   | **  | 59,800  | 267  | 31            | 73  | ZL1AIZ                          | **   | 455,464   | 552  | 108 | 181 |
| YT20              | **  | 392,490   | 1038 | 38     | 109 | RV6AF   | **  | 43,921  | 144 | 60     | 107 | UP3BA            | **  | 200,634   | 549  | 72     | 166 | RB5RF   | **  | 40,392  | 164  | 32            | 70  | ZL1AYD                          | 28   | 52,500    | 294  | 21  | 39  |
| (Opr. YU20B)      |     |           |      | UA6LFQ | **  | 40,504  | 192 | 34      | 88  | UP3BY  | **  | 105,554          | 440 | 47        | 131  | UB5ZR  | **  | 32,572  | 250 | 21      | 47   | ZL1BSG        | 21  | 58,504                          | 283  | 24        | 47   |     |     |
| 4N4C              | **  | 311,190   | 944  | 36     | 102 | UA3DGA  | **  | 40,135  | 207 | 34     | 81  | UP2BF            | **  | 61,244    | 350  | 34     | 88  | UB5VF   | **  | 1,330   | 26   | 10            | 9   | ZL2MM                           | **   | 6,372     | 63   | 16  | 20  |
| YU3BU             | **  | 271,054   | 797  | 38     | 95  | UA3RNI  | **  | 39,445  | 206 | 32     | 83  | UP2BLA           | **  | 59,400    | 379  | 28     | 82  | UB5PCU  | **  | 92,208  | 399  | 29            | 73  | ZL1AIH                          | 3.5  | 5,226     | 51   | 17  | 22  |
| YU3M              | **  | 232,050   | 730  | 37     | 93  | UA6HPK  | **  | 27,804  | 147 | 21     | 63  | UP2BOS           | **  | 67,697    | 341  | 32     | 101 | UB5SQK  | **  | 63,940  | 375  | 29            | 63  | <b>Philippines</b>              |      |           |      |     |     |
| YU3QU             | **  | 99,408    | 343  | 34     | 80  | UA3UCD  | **  | 23,875  | 167 | 40     | 85  | UP3BC            | **  | 67,080    | 374  | 34     | 96  | RB5IOV  | **  | 57,009  | 354  | 25            | 68  | DU3AAL                          | 28   | 34,202    | 238  | 19  | 30  |
| YT6AA             | 21  | 688,889   | 1857 | 38     | 120 | RA10AK  | **  | 22,425  | 120 | 27     | 48  | UP2BHA           | **  | 50,286    | 329  | 30     | 72  | UB5YR   | **  | 53,530  | 223  | 29            | 77  | DU3BAA                          | 21   | 37,418    | 408  | 25  | 28  |
| YT3AA             | **  | 580,808   | 1495 | 39     | 119 | UA3OPA  | **  | 15,810  | 104 | 30     | 55  | UP2PCF           | **  | 27,416    | 148  | 28     | 64  | UB5KW   | **  | 34,204  | 212  | 18            | 50  | DU1KWT                          | 14   | 9,639     | 122  | 13  | 14  |
| 4N2E              | **  | 501,552   | 1577 | 35     | 109 | UA3QCT  | **  | 15,130  | 72  | 33     | 52  | UP2BRT           | **  | 6,576     | 91   | 16     | 32  | UB5VW   | **  | 32,261  | 171  | 20            | 47  | K4SXT                           |      |           |      |     |     |
| YU1DW             | **  | 331,680   | 1189 | 33     | 87  | UA4QK   | **  | 14,045  | 163 | 14     | 39  | RP2BJZ           | **  | 2,520     | 55   | 9      | 33  | UB5JS   | **  | 29,925  | 207  | 24            | 51  | /DU3                            | 7    | 123,487   | 468  | 29  | 62  |
| 4N2B              | **  | 13,281    | 102  | 17     | 40  | RA3QR   | **  | 9,675   | 53  | 32     | 43  | UP2BU            | 28  | 138,250   | 439  | 33     | 92  | UB5TJ   | **  | 19,389  | 140  | 20            | 49  | <b>Southern Cook Islands</b>    |      |           |      |     |     |
| (Opr. YT2IK)      |     |           |      | RA3WZ  | **  | 8,268   | 101 | 17      | 36  | UP2BZ  | **  | 82,806           | 333 | 30        | 81   | UB5INT | **  | 13,545  | 109 | 16      | 29   | ZK1TB         | A   | 595,002                         | 889  | 105       | 157  |     |     |
| YU7AV             | 14  | 496,987   | 1408 | 39     | 124 | RA3TAG  | **  | 8,176   | 69  | 22     | 34  | UP2BBF           | **  | 16,660    | 100  | 24     | 44  | RB5JUS  | **  | 12,825  | 123  | 16            | 29  | (Opr. W7TB)                     |      |           |      |     |     |
| YU3VQ             | **  | 180,933   | 770  | 33     | 90  | UA6YHR  | **  | 7,502   | 45  | 26     | 36  | UP2BH            | 21  | 120,375   | 410  | 33     | 92  | UT5UDI  | **  | 4,641   | 79   | 7             | 14  | <b>Tonga Islands</b>            |      |           |      |     |     |
| YU3TW             | **  | 22,792    | 180  | 22     | 52  | UV6LIX  | **  | 7,410   | 46  | 25     | 40  | UP2BDU           | **  | 70,215    | 353  | 26     | 67  | UB5AJP  | **  | 1,482   | 32   | 8             | 11  | A35KK                           | A    | 516,272   | 1100 | 72  | 92  |
| YU4CYL            | **  | 3,648     | 114  | 12     | 20  | UV6AGF  | **  | 3,672   | 40  | 14     | 25  | UP2BMQ           | **  | 47,104    | 239  | 28     | 64  | UB5LST  | 14  | 83,334  | 502  | 30            | 72  | (Opr. SM7PKK)                   |      |           |      |     |     |
| YT8A              | 7   | 553,833   | 1733 | 37     | 112 | UA3TGO  | **  | 2,025   | 32  | 12     | 15  | UP2BAT           | **  | 42,328    | 220  | 21     | 67  | UB5MTM  | **  | 52,716  | 239  | 31            | 61  | <b>Western Caroline Islands</b> |      |           |      |     |     |
| YT7A              | **  | 410,256   | 1543 | 35     | 109 | UW4CN   | **  | 363     | 16  | 4      | 11  | UP2BF            | **  | 15,953    | 151  | 18     | 35  | UB5XCU  | **  | 44,361  | 270  | 29            | 64  | KC6CS                           | A    | 4,906,470 | 4053 | 137 | 273 |
| (Opr. YU70A)      |     |           |      | RA3QA  | **  | 96      | 4   | 4       | 4   | UP2BEI | 14  | 146,013          | 677 | 33        | 86   | UB5VWR | **  | 11,524  | 100 | 20      | 47   | (Opr. JE1JKL) |     |                                 |      |           |      |     |     |
| YU3JZ             | **  | 109,150   | 473  | 30     | 88  | UA3DJY  | 28  | 110,660 | 417 | 30     | 80  | UP2BLF           | **  | 115,692   | 716  | 27     | 66  | UB4MWR  | **  | 11,270  | 169  | 13            | 33  | <b>SOUTH AMERICA</b>            |      |           |      |     |     |
| YU5FU             | **  | 86,104    | 472  | 26     | 68  | RA3LB   | **  | 99,066  | 425 | 31     | 83  | UP2AG            | **  | 13,440    | 126  | 18     | 46  | UB5SBR  | **  | 1,917   | 25   | 13            | 14  | <b>Argentina</b>                |      |           |      |     |     |
| YZ1Z              | **  | 50,320    | 491  | 18     | 56  | UA6BPM  | **  | 79,388  | 498 | 25     | 64  | UP2BB            | **  | 10,854    | 858  | 18     | 36  | RB5MA   | 7   | 180,195 | 766  | 33            | 90  | LU1EWL                          | A    | 409,696   | 612  | 85  | 151 |
| YU7FT             | **  | 31,608    | 238  | 20     | 52  | RA6LE   | **  | 16,720  | 131 | 18     | 42  | UP2SA            | 7   | 46,526    | 315  | 26     | 60  | UB5CDX  | **  | 29,722  | 190  | 20            | 57  | AY4F                            | 28   | 431,664   | 1576 | 26  | 66  |
| YU4E2C            | **  | 28,224    | 448  | 15     | 48  | RA3PZ   | 21  | 125,396 | 541 | 32     | 84  | UP2BKT           | 3.5 | 34,782    | 430  | 12     | 54  | UT5UGN  | **  | 11,440  | 99   | 16            | 39  | LU4AE                           | **   | 127,010   | 658  | 20  | 45  |
| 4N1A              | 3.5 | 247,020   | 1170 | 26     | 89  | UA3ABT  | **  | 100,233 | 502 | 29     | 82  | UP2CT            | **  | 29,524    | 370  | 12     | 49  | RB5HB   | **  | 7,616   | 73   | 15            | 41  | LU1ICX                          | 21   | 216,535   | 583  | 34  | 93  |
| (Opr. YU1YV)      |     |           |      | UA4PBN | **  | 78,106  | 414 | 31      | 67  | UP2BIC | **  | 26,226           | 305 | 12        | 50   | RB5RZ  | **  | 6,486   | 81  | 12      | 35   | LU2FFV        | **  | 47,871                          | 204  | 25        | 56   |     |     |
| YT3AW             | **  | 121,595   | 1464 | 19     | 64  | UA3YAD  | **  | 59,787  | 320 | 29     | 62  | UP2DT            | **  | 16,758    | 236  | 13     | 44  | UB4AR   | **  | 504     | 25   | 5             | 13  | LU1DHI                          | **   | 14,041    | 97   | 13  | 36  |
| (Opr. YT3AW)      |     |           |      | RA4POC | **  | 49,610  | 350 | 23      | 59  | UP2BHK | **  | 5,049            | 121 | 7         | 26   | UB7VA  | 3.5 | 79,704  | 666 | 10      | 62   | LU6DLK        | **  | 5,958                           | 77   | 13        | 26   |     |     |
| YT3FO             | **  | 118,940   | 755  | 21     | 74  | UW6NU   | **  | 28,835  | 215 | 24     | 49  | UP2BKA           | **  | 3,531     | 43   | 11     | 22  | UB5EPV  | **  |         |      |               |     |                                 |      |           |      |     |     |



|                              |     |           |              |
|------------------------------|-----|-----------|--------------|
| <b>Peru</b>                  |     |           |              |
| OA4ZV                        | A   | 1,414,446 | 1529 104 215 |
| OA4BR                        | "   | 42,297    | 107 14 11    |
| <b>Surinam</b>               |     |           |              |
| PZ/N3JT                      | A   | 6,013,985 | 4833 120 301 |
| <b>Trinidad &amp; Tobago</b> |     |           |              |
| 9Y4VU                        | 21  | 1,001,607 | 2465 34 103  |
| <b>Uruguay</b>               |     |           |              |
| CW8B                         | 21  | 1,496,556 | 3112 40 122  |
| (Opr. CX8BBH)                |     |           |              |
| CX8CG                        | 14  | 290,577   | 986 33 68    |
| <b>Venezuela</b>             |     |           |              |
| 4M7A                         | 28  | 1,145,375 | 3073 36 89   |
| (Opr. YV7QP)                 |     |           |              |
| YV5HVS                       | "   | 68,880    | 421 15 41    |
| YV4ABR                       | 21  | 257,256   | 1027 26 62   |
| YX5A                         | 7   | 1,000,578 | 2506 33 101  |
| (Opr. YV5ANT)                |     |           |              |
| YV10B                        | 1.8 | 34,959    | 278 14 29    |

**MULTI-OPERATOR SINGLE TRANSMITTER NORTH AMERICA**

|                      |           |      |         |
|----------------------|-----------|------|---------|
| <b>United States</b> |           |      |         |
| K1AR                 | 7,370,285 | 3324 | 185 576 |
| K10G                 | 3,499,624 | 1955 | 162 455 |
| K1IU                 | 1,525,510 | 1025 | 148 370 |
| AK1A                 | 1,397,046 | 1114 | 117 317 |
| K1IR                 | 1,304,384 | 1003 | 125 333 |
| AK1L                 | 812,000   | 807  | 99 251  |
| K1TR                 | 614,505   | 621  | 112 243 |
| KA1CB                | 503,923   | 473  | 111 262 |
| W1XS                 | 427,200   | 429  | 106 250 |
| NC1M                 | 415,496   | 482  | 88 223  |
| N1TZ                 | 134,216   | 216  | 71 151  |
| KA1CLV               | 73,748    | 146  | 56 123  |
| KT1D                 | 22,550    | 82   | 41 69   |
| W1JR                 | 14,976    | 59   | 41 55   |
| K5NA/2               | 5,013,162 | 2495 | 175 518 |
| N2BA                 | 4,328,164 | 2394 | 163 463 |
| K2SG                 | 1,905,080 | 1364 | 135 350 |
| WB2P                 | 929,040   | 590  | 156 404 |
| W2UI                 | 542,724   | 530  | 93 231  |
| N2EA                 | 45,628    | 140  | 43 79   |
| N3RS                 | 5,648,296 | 2722 | 175 537 |
| K3WW                 | 3,193,697 | 1798 | 164 447 |
| W3GG                 | 2,591,372 | 1690 | 149 383 |
| K3PA                 | 2,546,171 | 1606 | 147 404 |
| KB3MM                | 1,520,694 | 1091 | 131 355 |
| W3MA                 | 1,502,961 | 1107 | 132 339 |
| N3BNA                | 1,021,380 | 835  | 124 311 |
| KZ3H                 | 1,005,784 | 718  | 144 350 |
| N3RR                 | 869,415   | 705  | 139 308 |
| K3UEI                | 858,912   | 810  | 109 259 |
| NN3Q                 | 854,904   | 835  | 106 252 |
| W3UJ                 | 822,906   | 775  | 108 270 |
| W3NX                 | 760,158   | 701  | 118 262 |
| K3YGU                | 751,320   | 732  | 106 254 |
| NA3K                 | 600,402   | 588  | 107 256 |
| A13E                 | 521,284   | 500  | 104 257 |
| W3GN                 | 513,360   | 493  | 124 244 |
| W3KV                 | 497,710   | 493  | 106 249 |
| KS3F                 | 497,274   | 454  | 123 279 |
| KB3HH                | 475,160   | 625  | 83 197  |
| K3ND                 | 350,960   | 354  | 128 248 |
| NI3P                 | 242,784   | 308  | 91 197  |
| N3HW                 | 211,792   | 342  | 63 154  |
| N3GB                 | 133,977   | 219  | 71 142  |
| K3RL                 | 125,442   | 212  | 73 134  |
| WA3LJZ               | 120,170   | 215  | 65 132  |
| N4WW                 | 5,277,350 | 2612 | 168 482 |
| WA4CTC               | 1,851,568 | 1312 | 139 357 |
| W8ZF/4               | 1,783,520 | 1092 | 159 409 |
| K4PI                 | 1,649,700 | 1036 | 162 402 |
| N4VZ                 | 1,515,000 | 1048 | 132 368 |
| K4MF                 | 1,192,480 | 885  | 134 330 |
| K0HLB/4              | 877,680   | 783  | 115 299 |
| W4LVM                | 463,335   | 464  | 107 238 |
| AA4DO                | 186,534   | 273  | 94 164  |
| W54G                 | 121,636   | 237  | 71 117  |
| AK0M/4               | 28,808    | 95   | 38 66   |
| WA4KIL               | 25,410    | 85   | 44 61   |
| AA2X/4               | 12,716    | 67   | 22 46   |
| K4KUZ                | 1,870     | 19   | 16 18   |
| WM5G                 | 4,341,104 | 2085 | 182 542 |
| W5ASP                | 1,617,084 | 1169 | 136 347 |
| W5EHM                | 178,425   | 280  | 72 153  |
| W5BE                 | 77,140    | 162  | 47 86   |
| N6VV                 | 2,090,000 | 1469 | 157 343 |
| W6BA                 | 1,937,430 | 1344 | 155 340 |
| N6IC                 | 1,560,075 | 1205 | 150 315 |
| W6REC                | 1,019,466 | 916  | 143 263 |
| NF6S                 | 677,950   | 748  | 119 206 |
| K6VI                 | 674,928   | 708  | 108 219 |
| N6JV                 | 476,788   | 494  | 124 222 |
| W6OAT                | 347,480   | 336  | 130 235 |
| WJ6O                 | 323,565   | 407  | 97 168  |
| K6MA                 | 181,373   | 299  | 91 136  |
| AD6E                 | 141,351   | 311  | 64 95   |
| W6BIP                | 95,040    | 305  | 32 78   |
| KE6WL                | 32,736    | 91   | 47 77   |
| WA8LLY/6             | 23,421    | 77   | 45 66   |

|        |           |      |         |
|--------|-----------|------|---------|
| WX6M   | 20,909    | 86   | 44 59   |
| W6SZN  | 17,672    | 66   | 39 55   |
| K07N   | 3,405,324 | 2386 | 156 342 |
| W7TJ   | 1,557,936 | 1649 | 120 229 |
| W7DG   | 630,294   | 886  | 100 158 |
| WA7G   | 391,210   | 480  | 111 179 |
| W7ZR   | 273,735   | 416  | 95 142  |
| W7ZI   | 109,416   | 200  | 76 118  |
| KA7CSE | 34,254    | 173  | 43 56   |
| N7OT   | 3,496     | 30   | 19 19   |
| K8AZ   | 5,063,990 | 2491 | 177 521 |
| WB8PHI | 897,600   | 831  | 113 261 |
| W8FN   | 200,353   | 263  | 91 190  |
| WB9JKI | 615,092   | 593  | 114 253 |
| K9UWA  | 455,895   | 519  | 101 206 |
| KK9V   | 453,264   | 1023 | 36 116  |
| KR0U   | 1,489,278 | 1307 | 134 279 |
| W0RLX  | 1,368,425 | 1161 | 140 291 |
| K8NN/0 | 549,814   | 611  | 108 206 |
| W0CP   | 297,910   | 351  | 114 196 |

|               |           |      |         |
|---------------|-----------|------|---------|
| <b>Alaska</b> |           |      |         |
| KL7RA         | 3,465,605 | 3401 | 132 275 |
| <b>Canada</b> |           |      |         |
| VO2WL         | 1,318,900 | 2168 | 88 187  |
| VE2UMS        | 199,356   | 601  | 58 90   |
| VE3SPC        | 205,254   | 473  | 61 120  |
| VE6AO         | 391,428   | 1053 | 64 102  |
| VE7ZZZ        | 3,295,416 | 2802 | 155 337 |

|                   |           |      |         |
|-------------------|-----------|------|---------|
| <b>Mexico</b>     |           |      |         |
| XE8DX             | 5,420,040 | 4909 | 140 325 |
| <b>Montserrat</b> |           |      |         |
| VP2MW             | 9,041,590 | 5968 | 151 426 |

**AFRICA**

|                         |           |      |        |
|-------------------------|-----------|------|--------|
| <b>Madieras Islands</b> |           |      |        |
| CT3FN                   | 2,586,418 | 2770 | 89 225 |

**ASIA**

|                       |           |      |         |
|-----------------------|-----------|------|---------|
| <b>China</b>          |           |      |         |
| BY1PK                 | 1,924,790 | 2687 | 100 210 |
| BY4SZ                 | 438,102   | 1104 | 81 102  |
| <b>British Cyprus</b> |           |      |         |
| ZC4ZR                 | 1,345,274 | 1494 | 86 227  |
| <b>India</b>          |           |      |         |
| AT0N                  | 1,208,546 | 1501 | 101 210 |
| VU2IIT                | 441,512   | 782  | 88 153  |
| VU2TEC                | 165,912   | 479  | 43 81   |

|                 |           |      |         |
|-----------------|-----------|------|---------|
| <b>Japan</b>    |           |      |         |
| JE2YRD          | 4,355,448 | 2926 | 164 355 |
| JE2YHS          | 790,050   | 1209 | 91 138  |
| JA3YBF          | 2,468,626 | 2039 | 140 289 |
| JA3YKC          | 2,362,262 | 1920 | 147 287 |
| JA4YJA          | 1,535,694 | 1514 | 116 245 |
| JA5YAV          | 447,640   | 634  | 95 165  |
| JE6ZIH          | 2,036,953 | 1953 | 129 244 |
| JA7YAA          | 3,241,050 | 2181 | 170 357 |
| JA8YBY          | 3,187,698 | 1763 | 164 334 |
| JH8ZCD          | 17,582    | 109  | 28 31   |
| <b>Mongolia</b> |           |      |         |
| JT1T            | 590,178   | 1335 | 56 111  |
| <b>Thailand</b> |           |      |         |
| HS8A            | 3,888,108 | 3525 | 134 310 |
| <b>Viet Nam</b> |           |      |         |
| 3W8CW           | 7,125,608 | 5677 | 163 369 |

**U.S.S.R. ASIATIC**

|                       |           |      |         |
|-----------------------|-----------|------|---------|
| <b>Asiatic Russia</b> |           |      |         |
| UZ9SWY                | 6,107,033 | 3425 | 173 474 |
| UZ9WWB                | 593,761   | 847  | 81 190  |
| UZ9UWK                | 351,604   | 583  | 80 164  |
| UZ9YXI                | 160,360   | 400  | 48 104  |
| UZ9UZL                | 32,736    | 142  | 28 60   |
| UZ9YXL                | 30,162    | 232  | 24 42   |
| UZ9QWM                | 27,675    | 152  | 20 55   |
| UZ9XWV                | 17,716    | 72   | 45 58   |
| UZ9OWA                | 2,620,304 | 2505 | 144 277 |
| UZBAWB                | 1,078,798 | 1595 | 75 176  |
| UZBQWT                | 1,061,100 | 1226 | 108 210 |
| UZBUWE                | 654,360   | 995  | 86 194  |
| UZBKWI                | 625,485   | 1207 | 64 121  |
| UZBSXF                | 359,658   | 586  | 91 170  |
| UZBWWP                | 2,576     | 57   | 14 14   |
| <b>Kazakh</b>         |           |      |         |
| RL1P                  | 8,360,528 | 4491 | 176 533 |
| UL8LYA                | 7,816,200 | 4078 | 185 515 |
| UL8GWB                | 2,922,048 | 2220 | 137 319 |
| UL8BWW                | 2,107,894 | 1816 | 120 323 |
| UL8CWW                | 1,320,564 | 1580 | 94 222  |
| UL8CWC                | 3,765     | 44   | 22 39   |

**EUROPE**

|                 |           |      |         |
|-----------------|-----------|------|---------|
| <b>Belgium</b>  |           |      |         |
| ON6AH           | 1,653,624 | 2220 | 103 283 |
| <b>Bulgaria</b> |           |      |         |
| LZ9A            | 7,455,056 | 4356 | 193 591 |
| LZ1KVZ          | 2,071,380 | 2002 | 145 425 |
| LZ1A            | 2,094,400 | 2585 | 125 315 |
| LZ2KSQ          | 1,136,037 | 1672 | 96 233  |
| LZ1KSF          | 993,168   | 1426 | 109 254 |
| LZ1KNP          | 649,295   | 1077 | 103 252 |
| LZ1KRC          | 178,135   | 839  | 32 83   |
| LZ1KPG          | 110,047   | 283  | 63 136  |
| LZ1KVF          | 50,224    | 140  | 54 118  |

|                       |           |      |         |
|-----------------------|-----------|------|---------|
| <b>Czechoslovakia</b> |           |      |         |
| OK5R                  | 6,474,595 | 3955 | 179 540 |
| DL4A                  | 5,520,270 | 3564 | 174 505 |
| OK1KQJ                | 2,098,080 | 1811 | 147 417 |
| OK1KSL                | 1,276,992 | 1436 | 113 319 |
| OK2KOD                | 964,782   | 1210 | 116 287 |
| OK2KLI                | 643,680   | 971  | 97 263  |
| OK1OFM                | 548,098   | 788  | 103 255 |
| OK1KZD                | 348,920   | 751  | 75 169  |
| OK1KSZ                | 288,477   | 571  | 80 161  |
| OK3KGQ                | 240,329   | 668  | 61 150  |
| OK2KUB                | 151,200   | 307  | 71 181  |
| OK1ORA                | 132,864   | 341  | 55 118  |
| OK3KUN                | 37,534    | 196  | 33 65   |
| OK1DFK                | 32,200    | 196  | 36 64   |
| OK1KLV                | 30,622    | 188  | 26 35   |
| OK1OSB/P              | 25,272    | 215  | 24 80   |
| OK2KDS                | 24,948    | 134  | 38 61   |
| OK1KHK                | 13,184    | 104  | 23 31   |
| OK3KYH                | 1,950     | 42   | 14 25   |

|                                    |           |      |         |
|------------------------------------|-----------|------|---------|
| <b>Federal Republic of Germany</b> |           |      |         |
| DL4BBO                             | 3,202,714 | 2503 | 145 393 |
| DL0WU                              | 2,705,844 | 2421 | 141 368 |
| DK0MM                              | 2,325,887 | 1865 | 153 424 |
| DK2OY                              | 1,966,518 | 1647 | 141 408 |
| DF0RR                              | 1,675,600 | 1790 | 126 346 |
| DL0ER                              | 1,011,752 | 1299 | 91 265  |
| DL0LR                              | 870,495   | 1114 | 108 285 |
| DK0TZ                              | 156,342   | 345  | 68 145  |

|                |           |      |         |
|----------------|-----------|------|---------|
| <b>Finland</b> |           |      |         |
| OH1AF          | 4,082,238 | 2976 | 165 504 |
| OH2AQ          | 2,313,290 | 2237 | 132 358 |
| OH2BAH         | 2,256,390 | 2218 | 141 408 |
| OH6AP          | 1,238,720 | 1508 | 113 282 |
| OH8TA          | 1,094,852 | 1546 | 92 242  |
| OH3AT          | 38,480    | 196  | 41 89   |

|               |           |      |         |
|---------------|-----------|------|---------|
| <b>France</b> |           |      |         |
| F5IN          | 5,673,122 | 4090 | 167 470 |
| FF6KPK        | 889,840   | 1835 | 66 179  |
| F6ENV         | 18,291    | 101  | 22 45   |

|                                   |           |      |         |
|-----------------------------------|-----------|------|---------|
| <b>German Democratic Republic</b> |           |      |         |
| Y35L                              | 3,229,221 | 3099 | 139 405 |

|                |           |      |         |
|----------------|-----------|------|---------|
| <b>Hungary</b> |           |      |         |
| HG5A           | 7,775,904 | 5030 | 187 570 |
| HG1S           | 6,678,636 | 5063 | 168 468 |
| HG6N           | 6,166,544 | 3976 | 175 513 |
| HA0KLE         | 5,578,002 | 3935 | 183 536 |
| HG8Q           | 5,085,829 | 3718 | 182 531 |
| HG9R           | 3,925,628 | 3324 | 163 465 |
| HG0D           | 3,545,076 | 2668 | 170 498 |
| HA1KRR         | 2,279,506 | 2575 | 122 324 |
| HABKCK         | 1,777,272 | 1961 | 132 365 |
| HA8KVK         | 1,598,400 | 1882 | 119 313 |
| HA6KVB         | 1,029,889 | 1510 | 99 242  |
| HA6KNG         | 872,400   | 1482 | 88 212  |
| HA3KHC         | 403,788   | 1020 | 62 169  |
| HA6KNX         | 329,061   | 577  | 78 173  |
| HA5KGT/7       | 23,150    | 341  | 43 92   |

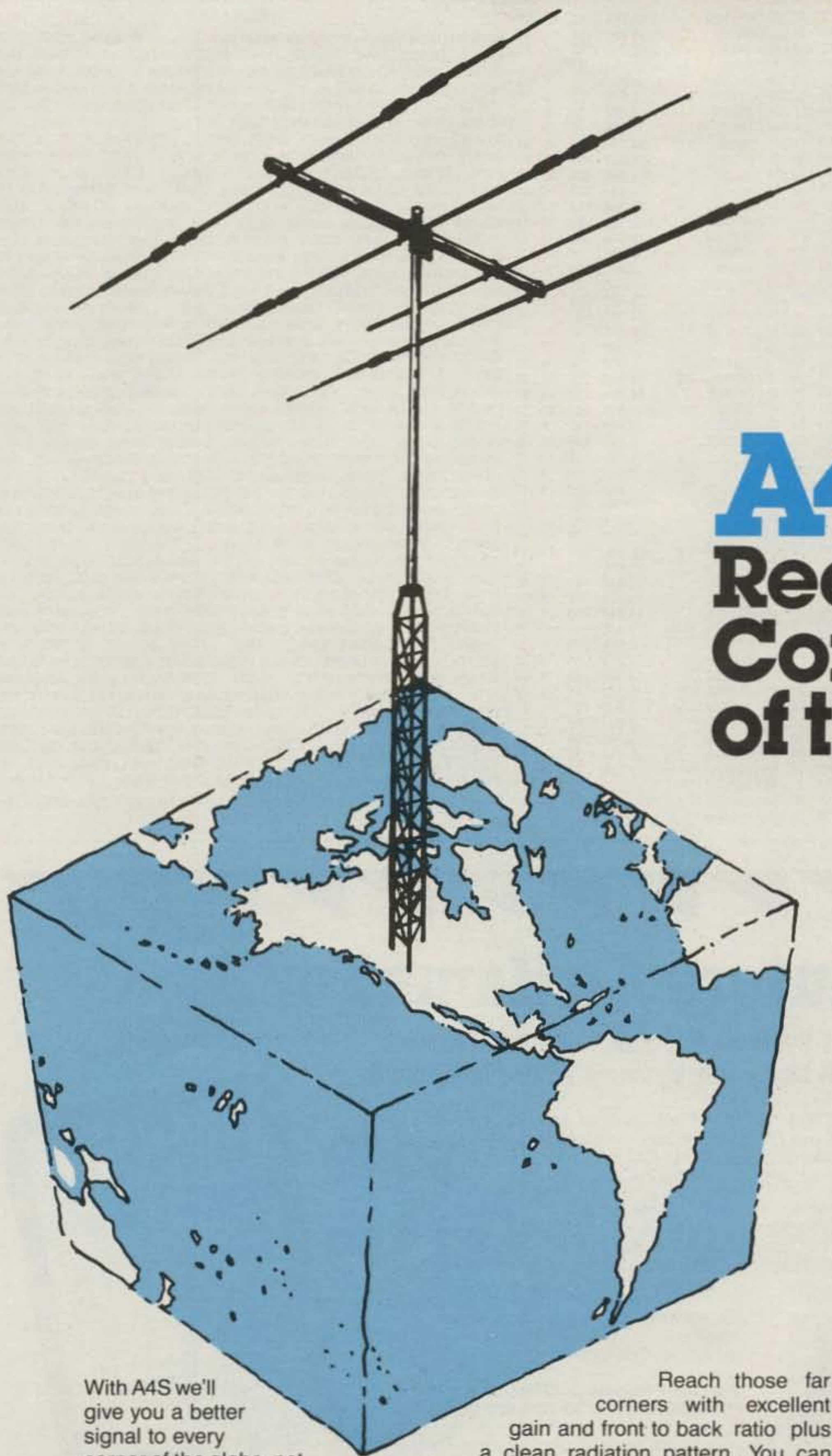
|              |           |      |         |
|--------------|-----------|------|---------|
| <b>Italy</b> |           |      |         |
| IO4IND       | 6,719,762 | 4035 | 183 535 |
| I2VXJ        | 3,886,300 | 3048 | 147 403 |

|                        |           |      |        |
|------------------------|-----------|------|--------|
| <b>The Netherlands</b> |           |      |        |
| PA0KHS                 | 1,297,800 | 2030 | 96 254 |
| PA3ACA                 | 669,080   | 1098 | 92 252 |

|               |           |      |         |
|---------------|-----------|------|---------|
| <b>Poland</b> |           |      |         |
| SP3GEM        | 4,943,857 | 3245 | 179 530 |
| SP5PBE        | 1,794,043 | 2353 | 112 285 |
| SP5KVV        | 1,388,244 | 1611 | 123 306 |
| SP9PZF        | 578,886   | 1072 | 91 203  |
| SP9PDF        | 264,000   | 460  | 86 530  |
| SP5PWK        | 61,576    | 665  | 79 184  |

|              |       |    |      |
|--------------|-------|----|------|
| <b>Spain</b> |       |    |      |
| EA3RCL       | 1,058 | 45 | 6 17 |





# A4S

## Reach Every Corner of the Globe

With A4S we'll give you a better signal to every corner of the globe, not by changing its shape, but by improving the performance of your ham station.

A4S has all of the features that you expect from a premium 20-15-10 meter beam, with high power precision tuned traps, optimum element spacing on a rugged 2" diameter boom, high strength fiberglass insulators and all stainless steel hardware.

Reach those far corners with excellent gain and front to back ratio plus a clean radiation pattern. You can also corner 40 meters with a simple add-on kit.

Specifications: Forward gain and front to back ratio excellent, power rating 2KW PEP, boom length 18', longest element 32', turn radius 18.4', wind load 5.5 ft, weights 37 lbs.

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FAX 603-627-1764



| QRP     |   |           |              | WB6JMS  |    |         |           |
|---------|---|-----------|--------------|---------|----|---------|-----------|
| YU3BC   | A | 1,241,286 | 1295 114 329 | UA3DAT  | "  | 23,976  | 113 37 71 |
| WA2HZR  | " | 889,913   | 870 102 251  | W6YVK   | "  | 19,592  | 113 30 32 |
| NX7K    | " | 865,171   | 884 122 227  | VE7CKF  | "  | 17,894  | 177 26 20 |
| VP2EQ   | " | 808,290   | 1783 58 152  | UA9UUD  | "  | 16,170  | 98 26 40  |
| RB5IU   | " | 797,056   | 1067 111 305 | OK1DRQ  | "  | 15,921  | 97 28 59  |
| KR20    | " | 565,128   | 592 95 239   | K1EDA/6 | "  | 14,580  | 103 32 28 |
| J11CBF  | " | 549,917   | 697 112 169  | N6NF    | "  | 24,508  | 96 27 29  |
| HA1XR   | " | 480,640   | 821 90 230   | UW4NN   | "  | 12,040  | 70 24 46  |
| G4ELZ   | " | 466,272   | 790 67 221   | W5TB    | "  | 11,952  | 53 21 51  |
| UD6DFF  | " | 421,553   | 563 89 202   | N8COA   | "  | 10,647  | 66 39 52  |
| HB9ADD  | " | 408,444   | 607 86 217   | Y03AIS  | "  | 9,768   | 51 30 34  |
| YU2TY   | " | 390,111   | 561 90 237   | Y25SA   | "  | 10,440  | 176 9 51  |
| UB5WAB  | " | 348,986   | 553 97 222   | SP5SDA  | "  | 8,515   | 61 25 40  |
| SM5CCT  | " | 316,848   | 680 78 198   | UA3TT   | "  |         |           |
| K1CGJ   | " | 312,760   | 402 82 198   | /RF8F   | "  | 6,420   | 37 27 33  |
| N1AFC   | " | 287,698   | 442 66 160   | Y03BDP  | "  | 4,250   | 65 12 38  |
| W8MHK/1 | " | 258,054   | 377 76 170   | GD3HDL  | "  | 3,666   | 78 7 32   |
| NC80    | " | 255,277   | 360 91 162   | EA8UP   | "  | 3,525   | 48 7 18   |
| UA6LIG  | " | 252,237   | 694 61 188   | JE7DOT  | "  | 2,583   | 42 11 10  |
| 4X1IF   | " | 236,028   | 488 56 122   | UA1NCC  | "  | 2,232   | 64 7 24   |
| UP2BFE  | " | 234,972   | 649 61 183   | DJ5KX   | "  | 2,208   | 39 10 14  |
| SM8DJZ  | " | 218,784   | 474 69 189   | G3DOP   | "  | 2,048   | 85 14 30  |
| UQ2GMR  | " | 194,997   | 541 60 149   | VE7EKS  | "  | 1,540   | 38 12 8   |
| JA7AS   | " | 170,918   | 341 79 108   | WB8B    | "  | 493     | 11 9 8    |
| UA4YBR  | " | 145,908   | 388 73 179   | CX7CO   | 28 | 153,825 | 500 31 74 |
| IS8LYN  | " | 130,491   | 349 48 131   | UL7ACI  | "  | 79,695  | 431 16 47 |
| KZ1L    | " | 128,444   | 231 56 141   | J01CRA  | "  | 76,076  | 295 34 57 |
| W1HUE   | " | 119,274   | 226 60 133   | W5VGX   | "  | 65,472  | 261 26 62 |
| PA3ELD  | " | 116,023   | 412 46 111   | AA4M/6  | "  | 50,020  | 214 27 55 |
| NU4B    | " | 114,369   | 208 66 135   | LZ1ON   | "  | 46,656  | 265 26 55 |
| Y21NE   | " | 112,216   | 428 40 126   | AK5E    | "  | 41,022  | 165 25 61 |
| Y54WM/P | " | 111,589   | 312 64 137   | Y05KLE  | "  | 36,722  | 245 19 42 |
| PABADT  | " | 109,480   | 354 42 98    | UA9FGJ  | "  | 33,796  | 187 17 51 |
| Y05BQ   | " | 109,068   | 327 59 124   | N9AW    | "  | 25,331  | 124 24 49 |
| Y02AGB  | " | 106,774   | 749 58 139   | G3VMY   | "  | 23,055  | 193 19 34 |
| Y23TL   | " | 101,970   | 294 57 108   | OK1CZ   | "  | 20,800  | 137 23 41 |
| DK4CU   | " | 96,612    | 308 47 119   | UB5ZEL  | "  | 14,481  | 137 14 37 |
| JR4GPA  | " | 86,250    | 248 48 77    | G3CWL   | "  | 8,855   | 107 14 21 |
| UB4IM   | " | 70,684    | 278 45 119   | RA9XDO  | "  | 8,352   | 79 7 29   |
| IBKHP   | " | 70,528    | 261 43 109   | UA9XAB  | "  | 6,401   | 65 10 27  |
| Y26JD   | " | 62,177    | 303 29 68    | JABGVS  | "  | 5,772   | 57 18 21  |
| UV3TD   | " | 52,682    | 213 39 103   | DJ6TK   | "  | 2,242   | 32 13 25  |
| UC2WAO  | " | 48,314    | 246 28 70    | NO1E    | "  | 1,232   | 24 9 13   |
| LA1XDA  | " | 42,582    | 221 35 106   | W4DEC   | 21 | 39,185  | 161 25 60 |
| W6LC    | " | 35,802    | 128 41 61    | UL7JGX  | "  | 36,498  | 198 22 55 |
| VE1NH   | " | 31,320    | 187 25 47    | UB4LCB  | "  | 31,500  | 294 17 43 |
| UA8UAG  | " | 29,750    | 216 34 51    | UA9SG   | "  | 31,171  | 216 19 42 |
| UQ2GSW  | " | 27,874    | 305 19 58    | OK1DKR  | "  | 26,767  | 181 23 48 |
| DL4GBR  | " | 27,280    | 148 24 38    | UR2CR   | "  | 25,916  | 245 18 44 |
| UA4LAF  | " | 24,521    | 164 28 84    | UA3DPX  | "  | 19,093  | 151 19 42 |
|         |   |           |              | UA9XGI  | "  | 16,368  | 141 13 31 |
|         |   |           |              | EA1GT   | "  | 18,524  | 235 13 31 |

| CHECK LOGS   |         |         |          |
|--|---------|---------|----------|
| Our thanks to the following stations who sent in check logs: | CT1YH   | DJ3VC   | DK50S    |
|  | EA1BFZ  | EA1CYL  | EA4EDU   |
|  | EA5AGD  | EA5TD   | EA6VQ    |
|  | EA7ATE  | EA7EZJ  | EA7KN    |
|  | EA7OI   | EA8UP   | EC7DMU   |
|  | GI5TK   | HA1CC   | HA1UB    |
|  | HA3KHM  | HABXX   | HG8LP    |
|  | HK3DDD  | I1VTX   | I7ALE    |
|  | JA2YEF  | JA3UWB  | JE4MYI   |
|  | KS7V    | LA4IAA  | LA4KQ    |
|  | LA4NE   | LA5LT   | LA5SAA   |
|  | LA7AFA  | LA7XCF  | LA8CE    |
|  | LA9OI   | LA9PCA  | LA8EW    |
|  | LU2FFY  | LZ1DF   | LZ1HX    |
|  | LZ1HY   | LZ1IA   | LZ1IT    |
|  | LZ1KIA  | LZ1QV   | LZ1VQ    |
|  | LZ2KAC  | N4RM    | NZ8R     |
|  | OH1FJ   | OH1FS   | OH2BMH   |
|  | OH2FO   | OH2KQ   | OH3NWC   |
|  | OH3TY   | OH4RR   | OH5PT    |
|  | OH6BG   | OH6NEQ  | OH6NH    |
|  | OH6QP   | OH6UC   | OH7QR    |
|  | OK1AYU  | OK1FGU  | OK1MNV   |
|  | OK1US   | OK2BMA  | OK2BWX   |
|  | OK2BZ   | OK2KNJ  | OK2PNN   |
|  | OY7ML   | OZ1BUR  | OZ1CARM  |
|  | OZ1EUO  | OZ1FGS  | OZ1IQC/A |
|  | OZ1JLX  | OZ1JMN  | OZ1JNR   |
|  | OZ1JSZ  | OZ2JI   | OZ2RH    |
|  | OZ3Q    | OZ4RS   | OZ5MJ    |
|  | OZ5PA   | OZ5UR   | OZ7BW    |
|  | OZ7JQ   | OZ7L    | PA3ERV   |
|  | PY1AJK  | PY1QO   | PY3CJI   |
|  | PY3OL   | PY3TD   | PY6BG    |
|  | RA1WT   | RA3AGN  | RA3ALA   |
|  | RA3ATM  | RA3AUC  | RA3DN    |
|  | RA3DOL  | RA3EA   | RA3EF    |
|  | RA3VR   | RA3YC   | RA4CG    |
|  | RA4NBG  | RA4NBZ  | RA4NDM   |
|  | RA4PR   | RA4SAE  | RA4YM    |
|  | RAGAAW  | RAGAAN  | RAGAUI   |
|  | RAGAUY  | RAGLBP  | RA9UNR   |
|  | RB4IKA  | RB4MYC  | RB5CB    |
|  | RB5QRM  | RF6FKG  | RHBAA    |
|  | RO5OW   | RT4UA   | RV4LA    |
|  | RV6AB   | RV9CFP  | RV9US    |
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|  | RZ0CZ   | RZ3DM   | RZ9OWA   |
|  | SM3CBR  | SM3CVM  | SM3OPZ   |
|  | SM3QJ   | SM4AQH  | SM4ASI   |
|  | SM5APS  | SM5FNU  | SM5FUG   |
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|  | SM7CUY  | SM7DY   | SM8CMH   |
|  | SM8CSX  | SM8KCO  | SN78BYT  |
|  | SP2BRN  | SP2FAP  | SP2GUV   |
|  | SP2MHB  | SP2US   | SP2UUU   |
|  | SP2ZFJ  | SP3AGE  | SP3CDO   |
|  | SP3GVX  | SP3JIA  | SP3LWO   |
|  | SP4BY   | SP4EA   | SP4GDC   |
|  | SP4JWR  | SP4NKK  | SP5BKA   |
|  | SP5DYO  | SP5ENA  | SP5GQX   |
|  | SP5ILO  | SP6ANY  | SP6LTF   |
|  | SP7GAQ  | SP8GSC  | SP8JMA/A |
|  | SP9DAE  | SP9PPP  | SP9PT    |
|  | TU2KC   | TU4CO   | UA1AUA   |
|  | UA1CT   | UA1OB   | UA1OIB   |
|  | UA1OIZ  | UA1OLL  | UA1000   |
|  | UA1WES  | UA1ZD   | UA3ACJ   |
|  | UA3ACM  | UA3AGW  | UA3AIF   |
|  | UA3DCX  | UA3DFV  | UA3DLU   |
|  | UA3DNR  | UA3DQS  | UA3ECJ   |
|  | UA3EDH  | UA3IAK  | UA3ICX   |
|  | UA3IDT  | UA3LDU  | UA3NEM   |
|  | UA3PTW  | UA3QIP  | UA3QNV   |
|  | UA3RAG  | UA3RB   | UA3RF    |
|  | UA3RJ   | UA3RMW  | UA3RNM   |
|  | UA3RU   | UA3XBY  | UA3XGM   |
|  | UA4AFT  | UA4AMT  | UA4CDL   |
|  | UA4HRZ  | UA4HVW  | UA4LC    |
|  | UA4NDF  | UA4NEZ  | UA4NF    |
|  | UA4PJA  | UA4PMO  | UA4PNL   |
|  | UA4YAQ  | UA4YS   | UA4YZ    |
|  | UA6AUT  | UA6JD   | UA6JW    |
|  | UA6LDF  | UA6UBR  | UA6VY    |
|  | UA6WAV  | UA6YAV  | UA6YFW   |
|  | UA9AKW  | UA9CAQ  | UA9CVJ   |
|  | UA9JH   | UA9LBI  | UA9MAC   |
|  | UA9MCM  | UA9ODP  | UA9OHR   |
|  | UA9OO   | UA9OS   | UA9UTW   |
|  | UA9UY   | UA8ABB  | UA8DA    |
|  | UA8KBC  | UA8QCA  | UA8ZC    |
|  | UA8ZDK  | UA8ZDN  | UB1RR    |
|  | UB4JWZ  | UB4LM   | UB4WWS   |
|  | UB5CAD  | UB5CDF  | UB5ES    |
|  | UB5EVN  | UB5LW   | UB5JX    |
|  | UB5KDD  | UB5MEC  | UB5PCS   |
|  | UB5QGD  | UB5QJA  | UB5QMX   |
|  | UB5VKK  | UB5ZAL  | UB5ZKG   |
|  | UB5ZY   | UC1AWZ  | UC2AV    |
|  | UC2CAV  | UC2LB   | UC2LR    |
|  | UF6FJ   | UH8ED   | UL7BW    |
|  | UL7EAR  | UL7EZ   | UL7PE    |
|  | UL7TJ   | UL7TX   | UL8GAK   |
|  | UL8LWA  | UM8MGM  | U04OWX   |
|  | U05OAL  | U05ODA  | U02GCV   |
|  | U02GLO  | UQ2GLW  | UQ2GLY   |
|  | UQ2GT   | UT4UB   | UT4UH    |
|  | UT5UCK  | UT5UFI  | UV3DN    |
|  | UV4CD   | UV6ANA  | UV6ARL   |
|  | UV6AY   | UV6HLC  | UV6UA    |
|  | UV9CAF  | UW10R   | UW3AD    |
|  | UW3AO   | UW3DM   | UW3PK    |
|  | UW3PN   | UW4CU   | UW6AA    |
|  | UW9AO   | UW9SL   | UZ1AXB   |
|  | UZ1NWD  | UZ1OWJ  | UZ1QWK   |
|  | UZ3DWX  | UZ3YWH  | UZ4SWN   |
|  | UZ9MRZ  | UZ8AB   | UZ8AM    |
|  | UZ8DWD  | UZ8KWT  | UZ8OXU   |
|  | VE1ACK  | VE28IF  | VE30TL   |
|  | VE7COP  | VE7DTA  | VU2IN    |
|  | W2GFF   | W4DGJ   | W9YCN    |
|  | WF4G    | Y21AE   | Y21BC    |
|  | Y21DG   | Y21DG/A | Y21G0    |
|  | Y21IC   | Y21OR/A | Y21UD    |
|  | Y21XF/A | Y22DG   | Y22JD    |
|  | Y22JF   | Y22MC/P | Y22PF    |
|  | Y22TO   | Y22UB   | Y22YJ    |
|  | Y23EF/A | Y23LG   | Y23LM    |
|  | Y23PF   | Y23UL   | Y24EA    |
|  | Y24FH   | Y24HJ   | Y24SL/A  |
|  | Y24WJ   | Y24XD   | Y25FI    |
|  | Y26BL/A | Y26FO   | Y26GN    |
|  | Y26WL   | Y27BN   | Y27GL    |
|  | Y27IO   | Y27K0   | Y28TO    |
|  | Y31KJ/P | Y33TL   | Y33UL    |
|  | Y36SG   | Y37ZB   | Y37ZM    |
|  | Y39SL   | Y43RJ   | Y44ZN    |
|  | Y45RJ   | Y53UL   | Y54JL    |
|  | Y54ZA   | Y57ZL   | Y59OA    |
|  | Y59VA   | Y61XM   | Y74XG    |
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# CQ REVIEWS:

## The Kenwood TS-790A All-Mode VHF/UHF/OSCAR Transceiver

BY DAVE INGRAM\*, K4TWJ

**O**ur continuously expanding interest in VHF/UHF and satellite operations truly reflects both present and future trends in amateur radio, and new rigs like Kenwood's TS-790A make those activities a sheer delight. This all-mode transceiver covers the 2 meter and 70 cm bands, it includes extended-coverage reception for public-service and weather band monitoring, and installing its optional UT-10 RF module adds 1.2 GHz band operation. Some of this rig's noteworthy features are 60 memories, main-dial or front-key-pad frequency selection, automatic call-up of proper mode according to frequency, any transmitter offset and PL tone, several scan modes, IF shift, narrow CW filter, SSB speech processor, and much more. This radio is loaded for bear!

Although not highlighted in magazine advertisements, the TS-790A is also factory-supplied as a full-duplex transceiver ready for OSCAR satellite action. You can transmit or "uplink" on 70 cm, for example, and simultaneously listen for your "downlink" on 2 meters (or vice-versa if you are running Mode J rather than Mode B)—a vital requirement for knowing when and how well you are "getting into" a particular satellite. The TS-790A can be used fixed or mobile, and it is destined to stay in vogue for several years. If you are in the market for a deluxe upper-band rig, check out this new gem from Kenwood. It is super-nice!

### Overview

The TS-790A is enclosed in a dark-gray cabinet measuring 5¼"H × 13½"W × 14½"D and weighs approximately 20 pounds. It has a built-in top-mounted speaker that works with the rig's duplexed receivers, separate rear-panel RF connectors are used on each band, and the TS-790A's DC power socket is identical to those used on the TS-440, 430, 140, 130, etc. If you presently have one of those cables with its six pin plug installed in your car, going mobile with the TS-790A is a snap. Likewise, your HF rig's



Kenwood's new TS-790A is an impressive-performance, all-mode, and full-duplex transceiver ready for FM, mountaintopping, and OSCAR satellite action.

AC supply (PS-50 or PS-430) will work fine with the TS-790A for home operations. This transceiver's RF power output is approximately 40 watts on 2 meters, 30 watts on 70 cm, and 10 watts on 23 cm.

The TS-790A's front panel may seem slightly complex at first glance, but after a few minutes' familiarization, it is surprisingly easy to understand and use. That does not mean you can switch on and operate this rig like a three-knob FM mobile unit, however. Its all-new designs definitely require operating manual coaching!

A triple-display area is included in the panel's top section. It shows the main receiver's frequency and operating parameters in the middle, its S/Power/ALC meter on the left, and the sub-receiver's details on the right. A clever bar-graph S-meter is also included in that sub-receiver display. Separate volume and squelch controls are used with the main and sub-receivers. Their selection can be toggled with the front **MAIN/SUB** button, and "main" is also the transmit band. Since two signals emanating from one speaker can be confusing at times, an audio attenuator or **MUTE** button is located above each band's volume control. The TS-790A can also be switched to regular single-band operation by simply selecting

identical main and sub-bands. The sub-receiver and display then switch **OFF**.

Receiver incremental tuning (RIT) and IF shift are featured for superb SSB operations, along with a mike gain and RF output control just like HF rigs. The TS-790A's split (SSB/FM) personality, however, is evidenced by its **CH-Q** button beside the main tuning knob. When pressed or when the FM mode is selected, a noticeable "whunk!" is heard. The TS-790A's main knob then exhibits detent (click-click) tuning. Shift to SSB or press the **CH-Q** button again (another "whunk!"), and the TS-790A switches back to smooth/analog tuning. Dial drag is then adjustable, just like it is on the TS-440 or TS-140. Clever!

The front keypad serves three different functions, depending on which keys are pressed and their sequence of use. Press the **ENT** key, and you can enter operating frequencies directly on the keypad. Press the **F** key and you can activate any function marked above a key. Finally, directly press any key and you activate its main (marked) function. Keypad selections thus handle everything from FM tuning steps and tone selections to scanning parameters and satellite transponder tracking choices. The keypad obviously

\*Eastwood Village No. 1201 So., Rt. 11, Box 499, Birmingham, AL 35210



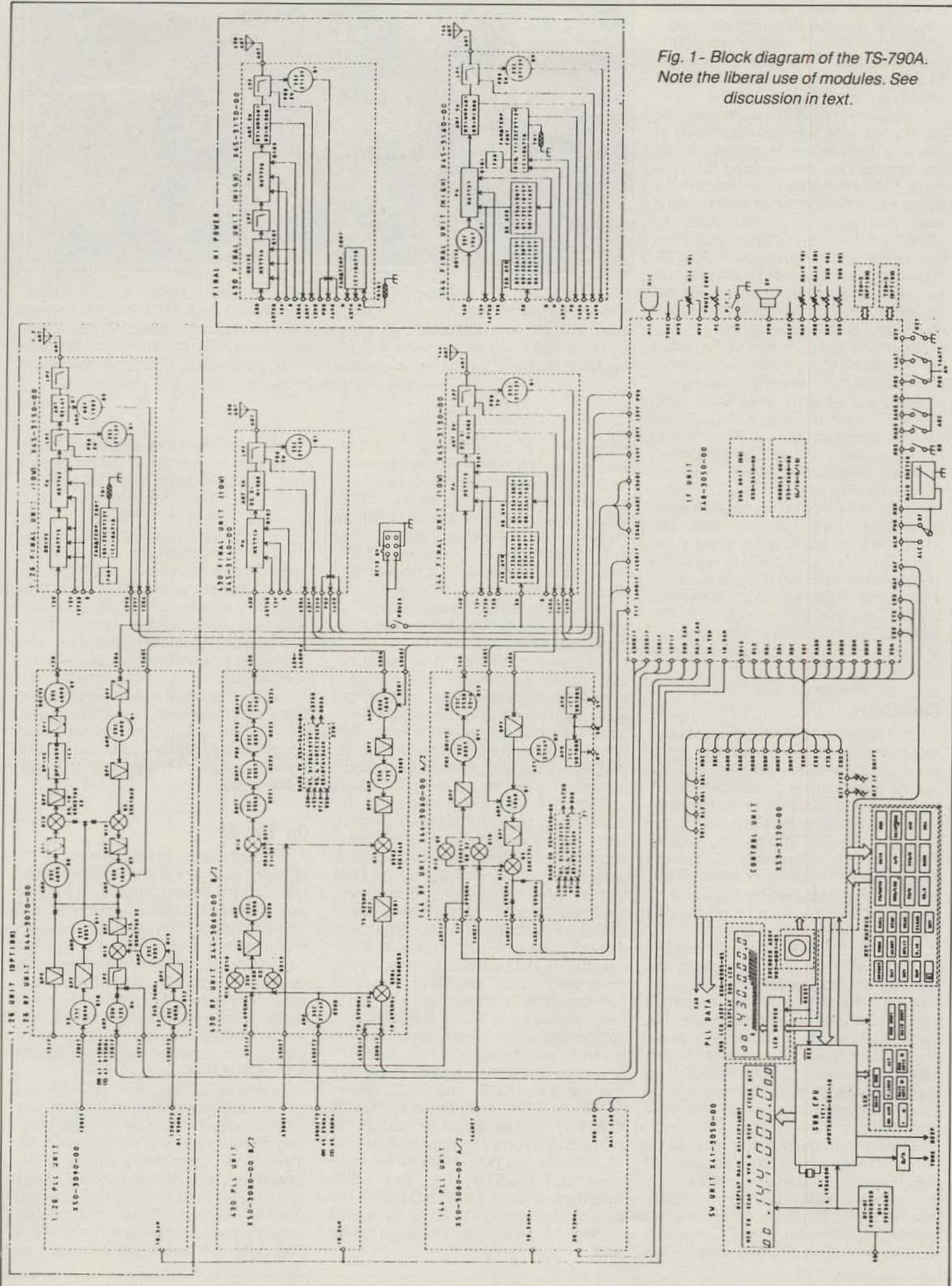


Fig. 1 - Block diagram of the TS-790A. Note the liberal use of modules. See discussion in text.



does not include a DTMF tone-encoding feature for autopatching (lest we need a gearshift on the rig's side to select keypad functions!). An optional MC-48B DTMF mike, however, is available for that operation.

Several chrome buttons on the front panel's left side warrant discussion at this time. First, separate receiver RF attenuator buttons are included for each band. They are handy when you are listening to a strong weather station and a weak SSB signal on another band, or when "tweaking" an OSCAR setup. That also needs further explanation. The TS-790A's receiver(s) is not super-sensitive for weak-signal work. Thus, an external GaAsFET preamp is heartily recommended for satellite operations.

Now don't panic at that statement. I am not saying the TS-90A's receiver is poor. Indeed not! I am simply saying satellite signals are quite weak and a good GaAsFET preamp is vital for successful satellite communications. When a preamp is added "in front" of a receiver, however, neighborhood noise levels can rise unnecessarily high. The TS-790A's RF attenuator, audio mute/attenuator, noise blanker, and IF shift are then used to reduce noise levels without degrading signal strengths. I am proud to report the TS-790A performs beautifully in this area. After some "knob twisting," it can pull signals right out of the noise. The TS-790A is a very impressive radio, especially if you seriously pursue mountaintopping or satellites.

## Circuitry

As I have pointed out in previous equipment reviews, overlooking any unit's block diagram is an effective and unbiased means of technical evaluation. Keeping that thought in mind and referring to fig. 1, let's thus consider some points of the TS-790A's inner beauty. First, you will notice this rig is more "modularized" than most transceivers. In fact, it even includes modules (like RF amplifying devices) within modules (like the '430 or 144 MHz final unit[s]).

The basic TS-790A can be divided into roughly eight modules for simplicity: the 430 PLL, RF and high-power sections, the 144 PLL, RF and final unit, the control unit (left bottom in fig. 1), and the IF unit. The upper 1.26 PLL, RF, and final units are optional. With those preliminaries understood, let's now trace the TS-790A's 2 meter receive path. We will begin in the block diagram's middle—at the "144 ant" point.

Signals from the 2 meter antenna go through the low-pass filter, into the **ANT SW**, then drop down to the module's output terminal, **14RA**. They continue on to the RF unit's Bandpass Filter, and into the RF amplifier—Q1, a 3SK104R. Amplified signals then proceed through an-



The TS-790A set up and ready for OSCAR 13 Mode B operation. Note the main frequency (transmit) is 435.500 MHz and the sub-(receive) frequency is 145.900 MHz. Note also the illuminated "SUB" LED indicating the main knob tunes 2 meters. Pressing the keypad's "SAT"/4 key shifts the 435 MHz/uplink frequency to match. Accidentally swapping main and sub-frequencies also places an external GaAsFET preamp in serious jeopardy (see text).

other filter and into mixer Q3. The 144 MHz PLL's output (144HET) is mixed with the 2 meter signal at this point, producing a downconverted IF signal on 10.695 MHz. It leaves the IF module as **145RIF** on the block diagram and is directed to the main IF unit module's terminal **145RIF**. This module handles all IF amplification, signal selection and detection, and audio amplifying. Its resultant audio is output at the right-side terminal **SP-0**, and goes to the loudspeaker.

Let's now trace the 70 cm transmit path. Beginning at the microphone input in the block diagram's lower right sector, audio is directed into the IF unit. It is eventually output at the top left terminal **TIF**. Within the previously mentioned IF unit, the signal passed through a balance modulator to null the carrier and through an SSB filter. Notice also the control-unit module's output signal is directed to (and heterodyned within) the IF unit to produce a selected-frequency output signal at the **TIF** terminal. This signal proceeds to the 144RF unit board (TIF terminal), "normals through" that module, and is output on its **43TIF** terminal. It then proceeds to the 430 RF unit at terminal **43TIF**. The 10.695 MHz signal is directed to balance mixers Q218 and Q219, through a bandpass filter and amplifier, and is then heterodyned up to 70 cm in mixer Q214. Notice this mixer's heterodyne input is derived from the 430 PLL unit (430HET). The resultant signal is then processed through buffer Q221 and Q222, drivers Q223 and Q224, and passed to the 430 final unit module. When looking at the block diagram, mentally "jump over" the 10 watt section (X45-3140) to the high-power unit (X45-3170). The signal is thus amplified by driver Q107 and power amplifier (module) Q109. It then moves through the antenna switch and to the **430 ANT**.

Looking in the block diagram's lower left section, we see the VFO module. Notice this unit directs an output signal (SSM of control unit) to "SBC" of the IF unit. This signal is directed to mixers within the IF unit for selecting desired frequencies. The overall concept thus is one of full modularization, a unique technique we will probably see used more in the future. I do not see any earth-shaking advantages or disadvantages in these modularized designs. In some cases, they can streamline troubleshooting. Conversely, however, full module replacement is noticeably more expensive than changing discrete components. Overall, however, the TS-790A's circuitry seems quite straightforward and understandable, with probably a half-million parts in this mid-sized cabinet!

## On The Air

Although using the deluxe-featured TS-790A for general FM and repeater activity seems a mite extravagant, it is a good way to become familiar with the rig and begin this discussion. Actually, I suspect many readers will purchase a TS-790A basically for local FM use and never really get around to chasing tropo DX or working satellites with the rig. No offense intended, however. Having those assets ready for future station expansions is a classic excuse we all use for owning deluxe-style rigs. Enjoy!

Needless to say, the TS-790A has every imaginable FM operating feature. That includes automatic FM mode selection when you tune a repeater-coordinated range, selectable tuning steps, smooth or detent tuning, standard repeater splits preprogrammed, and more. Popular FM "Alert" and "Call" channel capabilities are also featured in the TS-790A. The rig's VHF reception extends from





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PS-15 20A external power supply ..... 175.00 159<sup>95</sup>  
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AT-500 500W 9-band auto. ant. tuner ... 589.00 519<sup>95</sup>  
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140.0 to 164.995 MHz, so you can easily monitor NOAA weather forecasts and public-service activities while listening to friends on local repeaters. If you live near a coastal area, checking marine FM channels in the 156 to 158 MHz range is also quite interesting. The TS-790A's ability to simultaneously monitor two bands for openings is yet another asset you will love during VHF contests. This new Kenwood transceiver is one rig destined to see plenty of action in setups everywhere!

Satellite operations really put an all-mode transceiver through its paces, and since I "wrote the book on satellites," so to speak (two books, in fact!), I was a logical rig-reviewing choice. The TS-790A delivered surprisingly good SSB and CW performance for weak-signal and OSCAR activities. It is not the ultimate satellite

station, but that unit exists only in our imaginations (a 200 watt output, GaAsFET-equipped, full-duplex transceiver with built-in AC supply and 6 inch square dimensions!

First, the TS-790A's dual VFOs are quite convenient for multimode activities. You can use one VHF/UHF VFO pair for FM and one pair for SSB/CW operation in a "quick change" manner. The rig's receive and transmit status LEDs are also put to good use during OSCAR work. With two receivers and a CW sidetone going at once, it is sometimes tricky to know when you are actually transmitting. Those LEDs really help! The key to knowing which band you are transmitting on, incidentally, is looking at the main (rather than sub) frequency dial and checking that band's RF output connector. Watch those areas when assembling

and/or checking out a new OSCAR station. One slip in band selection (that is, one wrong punch of the MAIN/SUB button), and you can quickly zap a prized GaAsFET receiving preamp.


The TS-790A's receiver is good for terrestrial communications, but you will need a high-gain/low-noise GaAsFET preamp "in front of it" for serious OSCAR work. I used a Lunar preamp, and it made a significant difference. The TS-790A's continuously adjustable RF output is very handy if you use an external power amplifier for transmitting. Otherwise, you will need to run the rig "wide open" and hope your ERP is sufficient for OSCAR 13 operation. Getting into this new satellite is more difficult than OSCAR 10 was, regardless of any opinions stating otherwise. The TS-790A's speech processor favorably increases average SSB output, but it is also easily overdriven if the mike gain is too high. Use an external wattmeter or scope when adjusting the mike gain, and you will easily spot its optimum setting.

My first days of operation on OSCAR 13 with the TS-790A were a rollicking success. I worked several DX stations and the XF4L DXpedition to Revilla Gigedo! The secret, however, was my like-new antenna system (18-element uplink, 16-element downlink) and my operating between anomalous counts 225 and 250. The satellite is very close to earth during that time; thus, it "hears" well and relays a fairly good signal back to earth. Its signal was so strong at that time (S-2), that I could even copy it without a GaAsFET preamp. That definitely was not the case a few days later when I tried to work OSCAR 13 around anomalous counts 125 to 130. I could barely hear it with the TS-790A and preamp straining, and even my full CW output (40 watts) could not "hit" the bird. No way!

If you have worked OSCAR 13, these signal comparisons and anomalous references describe exactly what the TS-790A will or will not do. It is superb, but it is not a miracle worker. If the TS-790A had been available when OSCAR 10 was thriving, it would have been the hottest-selling item in amateur radio. Maybe our upcoming Phase IV satellites will restore the thrill of space communications.

### Conclusion

All aspects considered, Kenwood's TS-790A is a very impressive and exciting all-mode transceiver. Its full-duplex capability makes satellite operations great, and its SSB/CW frills are ideal for tropo DXing. If you are looking for a deluxe all-in-one-cabinet rig for high band operation, this one is a gem.

Retail price of the TS-790A is \$1999.95. For more information, contact Kenwood Communications, 2201 E. Dominguez Street, Long Beach, CA 90801-5745. 

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Announcing

# The 1990 CQ World-Wide 160 Meter DX Contest

**CW: January 26-28**  
**Starts: 2200 GMT Fri.**

**SSB: February 23-25**  
**Ends: 1600 GMT Sun.**

**H**ere is your chance to run up your state and country totals in a very short time. We can expect activity from all 50 states and over 100 countries on both CW and Phone. Pacific DX is encouraged to transmit 1907-1912 kHz and specify a listening frequency. WVE transmission there usually gets no answer and makes lots of enemies.

**Classes:** Single and multi-operator. Use of packet, a spotting net, or a logging assistant makes you multi-op. Use of a computer does not.

**Exchange:** RS(T) and state for USA, area for Canada. Only DX stations with unusual prefixes should send the usual one, or a country abbreviation. It's good insurance for those prefixes often confused by bad handwriting, such as OK/DK, OL/DL, etc. Stations omitting this information for non-multiplier QSOs will not receive credit for them.

**Scoring:** Contacts with stations in own country, 2 points. Contacts with stations in other countries in same continent, 5 points. Contacts with stations in other continents, 10 points. Maritime mobile points determined by location. All Canadian QSOs count 5 points for USA and vice versa.

**Multiplier:** Each U.S. state (48), Canadian area (13), DX country, and maritime mobile. KH6 and KL7 are considered countries, but not also states. *No one may count USA or Canada* as a country multiplier. Canadian areas: VO1, VO2, NB, NS, PEI, VE2, VE3, VE4, VE5, VE6, VE7, NWT, Yukon. ARRL and WAE country lists and WAC boundaries are the standards.

**Final Score:** Total QSO points times the sum of all multipliers (States + VE areas + DX countries + Maritime mobiles).

**Penalties:** Three additional contacts may be deleted for each unacknowledged duplicate or unverifiable contact removed from the log. A second multiplier may be removed for each one lost by the above action.

**Disqualification:** You may be disqualified for violation of your country amateur radio regulations, unsportsmanlike conduct, or claiming excessive duplicate or

false multiplier contacts. If the corrected score without penalties shrinks more than 3% from that claimed, disqualification will be considered.

**Awards:** Certificates to the top scorers in each class for each state, Canadian area, and DX country. In close races, also to runners-up. Also the following plaques with donating sponsors indicated.

|                          | Single Operator |                |
|--------------------------|-----------------|----------------|
|                          | CW              | SSB            |
| World<br>(N5JJ Memorial) | K5AAD           | K5AAD          |
| USA                      | K4TEA           | K4JRB          |
| Zone 3                   | KM4MG           | N4ONI          |
| Zone 4                   | K5NA            | KC4MJ & KM4IH  |
| Zone 5                   | WA4CUG          | K4ODL          |
| Europe                   | K4UEE           | N4NX           |
| Africa                   | K4SB            | WB4ZNH         |
| Oceania                  | K4TKM/6         | K4DLI & KB4SSS |
| Asia                     | NE4S            | W4LVM          |
| South America            | K4JAG           | KL7JAR/4       |

|       | Multi-Operator |                      |
|-------|----------------|----------------------|
|       | CW             | SSB                  |
| World | N4RJ           | Southeastern DX Club |

Sample log and summary sheets may be obtained from CQ by sending a large SASE with sufficient postage to cover your request. You can make up your own, 40 contacts per page, columns for GMT, exchanges, multiplier, and points. Show the multiplier and its sequential number only the first time it is worked. Please don't write on the back of the pages. Dupe sheets are requested for logs over 200 QSOs. They should check the total QSO claim. Computer alphabetized sheets are especially welcome.

Include a summary sheet with your entry showing the scoring and other essential information. Include a printed name and mailing address, and a signed declaration that all rules have been observed. Mailing deadline for CW entries is February 28, and March 31 for the SSB section.


Send logs to 160 Meter Contest Director Donald McClenon, N4IN, 3075 Florida Avenue, Melbourne, FL 32904 USA. They may also be sent to CQ 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801. Please indicate CW or SSB on the envelope.



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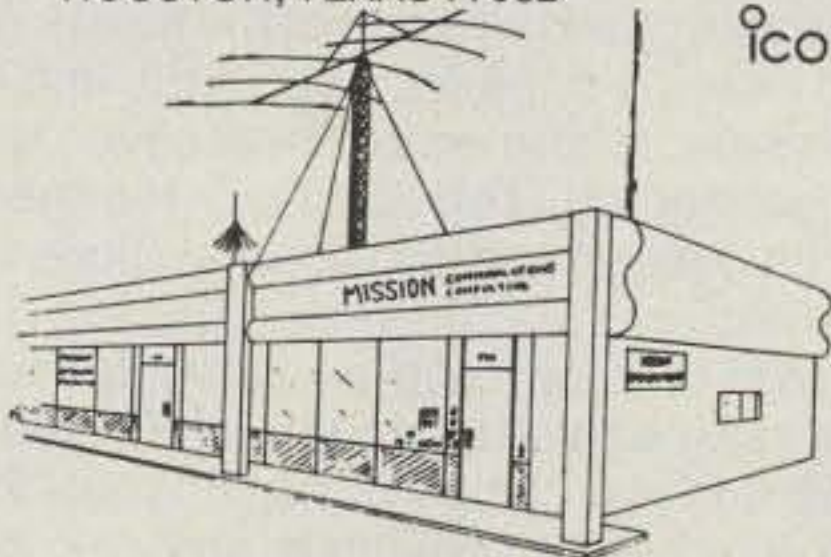
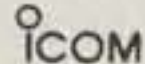
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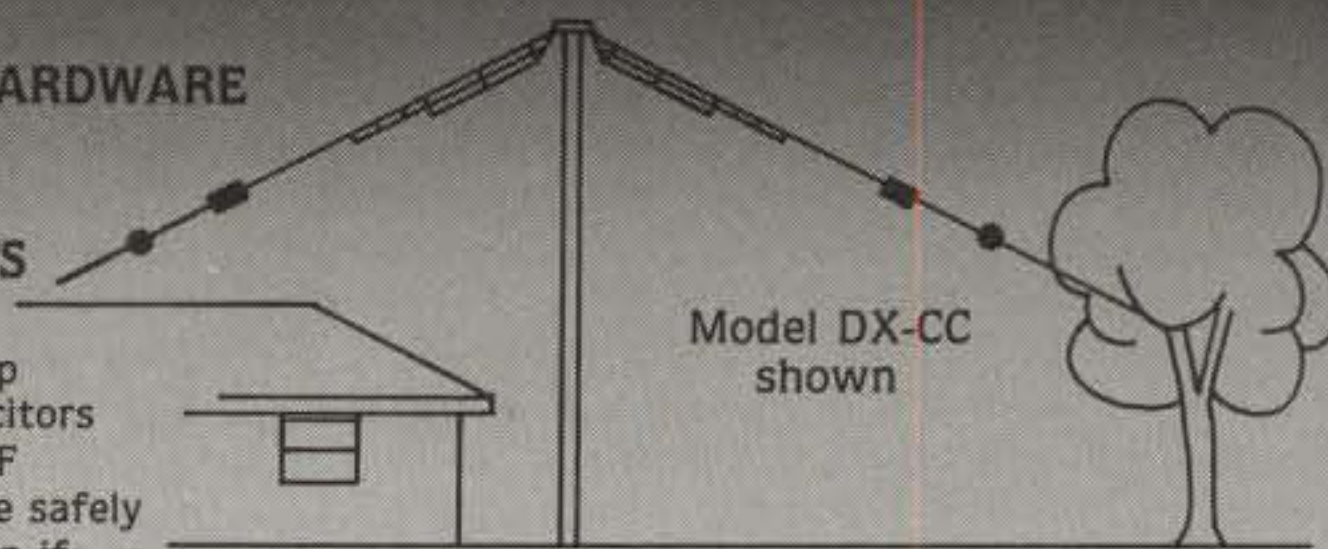
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| CA-2X4FX | 146 MHz<br>446 MHz            | 4.5dB<br>7.2dB            | 200W        | 5' 11" | BASE/REPEATER |
| CA-2X4M  | 140-155 MHz<br>440-460 MHz    | 4.5dB<br>7.0dB            | 150W        | 5'     | MOBILE        |
| CA-2X4SR | 146 MHz<br>446 MHz            | 3.8dB<br>6.2dB            | 150W        | 3' 4"  | MOBILE        |
| CX-901   | 146 MHz<br>446 MHz<br>1.2 GHz | 3.0dB<br>6.0dB<br>8.4dB   | 150W        | 3' 6"  | BASE/REPEATER |
| CX-801   | 146 MHz<br>446 MHz<br>1.2 GHz | 3.0dB<br>6.8dB<br>9.6dB   | 100W        | 3' 3"  | MOBILE        |
| CA-630TN | 146 MHz<br>446 MHz<br>1.2 GHz | 2.15dB<br>2.15dB<br>5.5dB | 150W<br>50W | 1' 5"  | MOBILE        |

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CIRCLE 54 ON READER SERVICE CARD



**Obverse, reverse, converse . . . something is turning around the wonderful world of packet radio and making everyone notice all sorts of new and exciting possibilities.**

## The Converse Node

BY BUCK ROGERS\*, K4ABT

**A** time for rejoicing is here, and it is one of those things which I must pass on to the reader so that you can enjoy it also.

A few issues back I talked about the many ways in which packet is improving and the formats for level 3 and 4 that are beginning to appear.

Around the first of this year I got into QSOs on 28.205 LSB at 1200 BPS, and many times I would use the "AZSE" node in southeast Arizona to connect to BISBEE and exit another port to the NJ7P BBS. One afternoon I decided to pull a node list from AZSE node (called "Node Nock 'in'"), when I noticed a new node callsign in the node list. The callsign was N700 (not zero zero), and the alias ID of "CONF" was attached to it. Well, as you can guess, curiosity got the best of me, and I made a dive for "the new kid on the block."

I issued a connect request from AZSE to CONF and received an immediate connect. I waited for a moment, as we normally do, before pulling a node list. Since the call was in a node list, the assumption that it was a node was an automatic reflex to me. I had the **CONNECTED to CONF** on my screen, so I issued an **N** to download the node list. Much to my surprise I received the following statement:

**Connected to CONF. NODE, Type /H for help.\*\*\***

What could I lose? I tell all my readers to try everything in the BBSes, mailboxes, PBBses, etc., so I decided to take my own advice and "Go for it!" Bingo! This is the menu that came back to my screen.

Commands may be abbreviated. Commands are:

|                         |  |
|-------------------------|--|
| <b>/?</b>               | Print help information                   |
| <b>/BYE</b>             | Terminate the convers session            |
| <b>/CHANNEL n</b>       | Switch to channel n                      |
| <b>/EXIT</b>            | Terminate the convers session            |
| <b>/HELP</b>            | Print help information                   |
| <b>/INVITE user</b>     | Invite user to join your channel         |
| <b>/MSG user text</b>   | Send a private message to user           |
| <b>/QUIT</b>            | Terminate the convers session            |
| <b>/WHO</b>             | List all users and their channel numbers |
| <b>/WRITE user text</b> | Send a private message to user           |

"Wow, what is this?" I asked myself. I felt that I was into something new, and the thought of finding that maybe TAPR or someone else had implemented some new and mysterious gadget for packet sent a thrill of a sort through me. I read the commands in the menu, and I noticed that a few of them were duplications of others. I needed to find out for myself if they indeed performed the same function(s).

There were three commands which looked as if they would

disconnect me, so I chose the second one and issued the **/BYE**. Sure enough . . . Bye Bye, and I was disconnected. I reconnected to the nodes, and then to CONF, and this time I issued an **/EXIT**. You guessed it—DISCONNECTED. Well, I tried the **/QUIT**. Yep, I'm outta here.

Regaining my composure (I knew everyone else was watching my efforts and laughing his or her head into a spin at my ejections from that inanimate object.), I continued with the command list. I felt the best thing to do was select the most logical of the commands and execute it. I entered a **/WHO**, and to my pleasure and embarrassment there was a list of seven stations who were already connected. The list indicated there were five stations on circuit 0 (zero) and two other stations on circuit 20.

Circuits? I wonder . . . I didn't wonder long, as suddenly there was a callsign on my screen and a sentence which read, "Hello, Buck. Type a **/C 20** and you can join us on channel 20. Now I was really getting interested—channels and circuits, and this was just for openers.

That afternoon I met Jack, Bill, and some others who soon joined us. I asked Jack what this system was, what kind of computer it was running on, and was it something like the cluster software that I had written about a few months back.

I was later to learn that it is called the CONVERSE NODE and it is from **NORD<LINK**. It is an EPROM that is installed into the TAPR II clones in much the same manner as "THENET" EPROMS are installed, and no computer is involved in the system except when it is initially set up. In short, this CONVERSE NODE was a stand-alone system with no moving parts, except for the relay in the transceiver antenna switching.

I lost contact with those guys in the shuffle as I made ready for the Dayton HamVention. I remember that one of the gents took my address and was going to send the software to me, but he may have lost it or he too was in a rush preparing for Dayton. In any case, I've been unable to make contact with that node since.

Dayton came and went. I asked several friends at Dayton about this thing called the CONVERSE or CONF node. I wasn't having any luck at all. Nevertheless, I was determined to locate the CONVERSE node. I told the local packeteers in Georgia about it, and the interest was high, to say the least. It was as if they were all trying to find my long-lost toy. Wayne, WD4LYV, was poking into all the BBSes (landline and packet BBSes); David, WD4JKH, was on the prowl looking for it; and I was on the phone calling Germany.

### I Had To Have One

Most of you know how addicted I am to packet, and if a new gadget comes along for packet, I want it! It took some looking, asking, reading, and searching, and soon I was receiving disks, EPROMs, and letters from several different directions.

It was well worth the wait. Georgia now has a CONVERSE

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

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

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

Has 6-position antenna switch and a teflon wound balun with ceramic feedthru insulators for balanced lines. 10 3/4 x 4 1/2 x 14 7/8 inches. Add \$10.00 s/h.

## MFJ's smallest Versa Tuner

**MFJ-901B** \$59.95



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

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

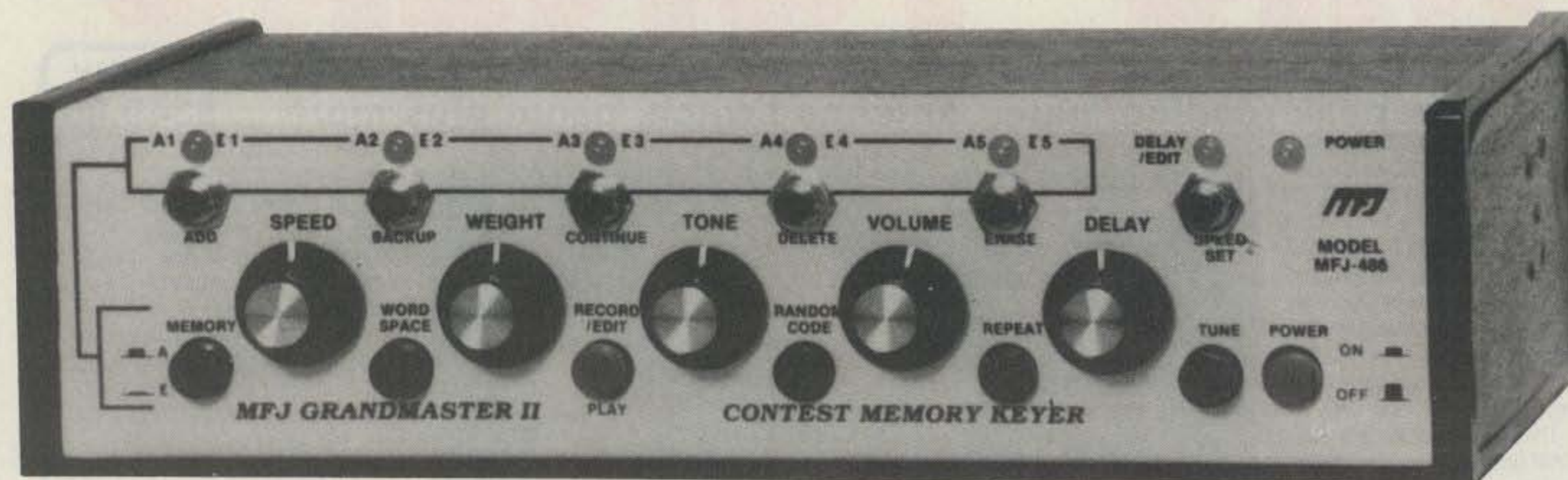
**FOR YOUR NEAREST DEALER OR TO ORDER**  
**800-647-1800**

• 1 year unconditional guarantee • 30 day money back guarantee (less s/h) on orders from MFJ • Free catalog • Add \$5.00 s/h (except as noted)



# MFJ Grandmaster Memory Keyer™

More than user-friendly . . . it's really easy-to-use



MFJ-486

**\$189<sup>95</sup>**

Made in U.S.A.

**Simple** . . . intuitive . . . you instantly know which knob to turn, what button to press. It's unmistakable.

**That's** the MFJ Grandmaster concept -- more than user friendly . . . it's really easy to use.

**There's** no keypad, no complex keystroke sequences to confuse you.

**The** new MFJ-486 Grandmaster Memory Keyer™ gives you the best of both worlds -- all the features you'll ever need and the easy-to-use MFJ Grandmaster concept.

### Exclusive CW Word Processor™

**MFJ's** exclusive CW Word Processor™ lets you change a message in memory without having to rekey it all in.

**Special** function keys make it simple to move around within any message, insert, delete and change your message until it's just the way you want it.

**With** other memory keyers you have to erase an entire message and rekey it all in to make even the smallest change.

### Combine messages into other messages

**The** MFJ-486 lets you combine frequently used messages into other messages.

**You** can store QTH, rig/antenna, QSL info and other comments in separate memories.

**Then** you can easily build a new message by keying in memory numbers wherever you want that info in your message.

### MFJ's Custom-Speed™ Control

**Customize** your speed control to fit you!

**By** pressing the Speed Set button, you can set your slowest speed to start at 4, 5, 6 -- any speed up to 20 WPM -- and your fastest speed is 20 to 100 WPM.

**Matching** CW speed to a QSO is best done by ear as you adjust a speed knob.

**With** keypads you have to figure out the exact speed of your contact and then go through an awkward keystroke sequence.

**That's** why matching speed with a

keypad is so demanding.

**Without** MFJ's Custom-Speed™, a wide range speed control is very hard to use because the *slightest* touch causes radical speed changes.

### Built-in CW Course

**The** MFJ-486 gives you a well-organized three step CW course for upgrading and teaching.

**The** first step gives you random five character groups. After you learn the letters you can add punctuation.

**The** second step gives you random 1-8 character groups for real-world code practice.

**The** third step gives you an infinite number of random plain English QSOs in the same format as FCC ham license tests.

**When** you can copy these random QSOs, you're ready to pass your test and upgrade!

**You** also get Farnsworth option, answer-replay to check your copy, punctuation on/off and earphone jack for private practice.

### Remote Control . . . for memories and function keys

**The** MFJ-77 remote control lets you control your message memories and CW Word Processor™ function keys at your key paddle for only . . . \$19.95.

**It's** a lot more useful than a remote that gives you no editing functions and only lets you control a few memories.

### MFJ Keyers are used year after year

**Not** so long ago there was a glut of keypad keyers. They were novel, and a lot of hams spent their money.

**But** because they were hard to use they ended up in drawers and closets.

**They** were soon no longer made.

**Most** original MFJ keyers are still being used -- day after day and year after year.

**Why?** Because they're easy-to-use. And that's why more new MFJ keyers are being put on-the-air today than ever.

### More for your money

**To** make it really easy-to-use, it cost more to build the MFJ Grandmaster.

**It** just takes more hardware -- knobs to turn, buttons to press, LEDs to show

you what's going on. Plus it takes more labor, more software, more everything.

**It's** a real bargain compared to cheaper-to-build but harder-to-use keypad keyers.

### Plus More . . .

**You** get over 8000 characters in 10 soft-partitioned memories -- far more than you'll ever need.

**You also get** . . . lithium battery backup, automatic serial numbering, automatic message repeat, beaconing, A or B type iambic keying, manual or automatic word spacing, speaker, earphone jack, easy-to-use front panel controls for speed, volume, tone, weight and delay, tune control, powerful Z-80 microprocessor plus much more. 9x2 1/2x6 inches. Use 12-15 VDC or 110 VAC with MFJ-1312, \$12.95.

### One Full Year No Matter What™ Guarantee

**You** get MFJ's full one year no matter what™ guarantee.

**That** means MFJ will repair or replace your MFJ-486 (at our option) no matter what happens to it for a full year.

**Others** give you a 90 day limited warranty.

**What** do you do after 90 days when it burns up. Or before 90 days when they say, "Sorry, your limited warranty doesn't cover that?"

**Why** take chances when MFJ gives you no matter what protection for one full year?

### Don't struggle with keypads -- enjoy the easy-to-use MFJ Grandmaster

**Don't** struggle with a hard-to-use keypad and complicated keystroke sequences.

**Choose** the memory keyer that's really easy-to-use and has all the features you'll ever need - the new MFJ-486 Grandmaster.

**Get** yours today . . . you'll love it!

Nearest Dealer/Orders: 800-647-1800

**MFJ**

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FAX: 601-323-6551; Include s/h

MFJ . . . making quality affordable



# MFJ gives you all 9 digital modes and keeps on bringing you state-of-the-art advances . . . while others offer you some digital modes using 3 year old technology

MFJ-1278  
\$279<sup>95</sup>



No three year old technology at MFJ! Using the latest advances, MFJ brings you 9 exciting digital modes and keeps on bringing you state-of-the-art advances. You get tons of features other multi-modes just don't have.

## Only MFJ gives you all 9 modes

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

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

## The best modem you can get

Extensive tests in *Packet Radio Magazine* prove the MFJ-1278 modems gives better copy with proper DCD operation than all other modems tested.

## New Easy Mail™ Personal Mailbox

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

## 20 LED Precision Tuning Indicator

MFJ's unequaled tuning indicator makes it really easy to work HF packet stations.

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

Just tune your radio to center a single LED and you're precisely tuned in to within

## MFJ Packet Radio



MFJ-1274  
\$159<sup>95</sup>  
MFJ-1270B  
\$139<sup>95</sup>

MFJ-1270B super clone of TAPR's TNC-2 gives you more features than any other packet controller -- for \$139.95.

You can double your fun by operating VHF and HF packet because you get high performance switchable VHF/HF modems.

You get the Easy Mail™ Personal Mailbox with soft-partitioned memory so you and your ham buddies can leave messages for each other 24 hours a day.

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

A new KISS interface lets you run TCP/IP. They also come NET ROM compatible -- no modification needed!

You also get 32K RAM, one year unconditional guarantee and a free 110 VAC power supply (or use 12 VDC).

For dependable HF packet tuning, the

10Hz - and it shows you which way to tune!

## New MFJ technology prevents collisions: gets packets through faster

MFJ's new Anti-Collision technology gets packets through faster, more reliably.

How? Automatic random transmit delays prevent packet collisions.

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

## Multi-Gray Level FAX/SSTV Modem

You'll enjoy natural looking pictures that only multiple gray levels can give you.

MFJ's new built-in modem gives you the only multi-mode with multiple gray levels.

## Only MFJ can transmit FAX

Most packet stations can receive FAX.

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

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

## Full Featured Contest Memory Keyer

Only the MFJ-1278 lets you plug in a key-paddle so you can use it as a memory keyer.

You get programmable CW message memories that you can link and repeat, auto serial numbering, weight control, beeping, random CW generator and more.

## One FREE Upgrade!

When you buy your MFJ-1278 today, you don't have to miss new modes and

## MFJ Video Digitizer

Here's Aimee from the MFJ order desk. This unretouched picture was shot directly from a VGA monitor. We digitized Aimee with a camcorder, MFJ "Picture Perfect" Video Digitizer and IBM compatible computer.



Create fascinating digitized snapshots you can transmit with your MFJ-1278 of anything you can point your camcorder at!

The MFJ-1292 "Picture Perfect" Video Digitizer connects your video camera to your IBM compatible computer so you can capture digitized video snapshots on disks.

You get a plug-in card for your computer and a versatile software package with instructions for only ... \$199.95.

As an added bonus you get a handy Contrast and Brightness Control unit that you can conveniently place near your keyboard for fine tuning your pictures.

MFJ-1274 gives you a high resolution tuning indicator that's accurate to within 10 Hz -- and it's only \$20.00 more.

CIRCLE 27 ON READER SERVICE CARD

features that come out tomorrow.

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

## Plus more . . .

Plus you get . . . 32K RAM, free AC power supply, KISS, true DCD, independent printer port, lithium battery backup, RS-232 and TTL serial ports, standard 850 Hz RTTY shift, socketed ICs, tune up command, software selectable dual radio ports and more --all in a sleek 9½ x 9½ x 1½ inch cabinet.

## Get on the air instantly Just plug it all in

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

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

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

## No Matter What™ Guarantee

You get the best guarantee in ham radio -- a full one year unconditional guarantee.

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

## Get 9 new ways of having fun

Don't settle for 3 year old technology.

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

Get 9 new ways of having fun today!

## Packet Pictures

Transmit and receive high resolution EGA and CGA color pictures via packet with MFJ picture passing software.

Beautiful color pictures are automatically received, saved to disk and "painted" to screen.

Pictures are compressed as they are transmitted - so you get true high speed picture passing.

You can save to disk any CGA picture you can see on your screen.

You can set up your own picture bulletin board and exchange pictures with others - even if you're not there.

Let's help spread picture passing throughout the world and create a new world standard. Get this powerful new software for only ... \$9.95.

MFJ-1288 works with virtually any packet radio controller and IBM compatible computer. It's included free in the MFJ-1284 IBM Starter Pack.

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Include shipping and handling

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node on the air. We are now building more links to it on 145.650 MHz. The 145.650 LAN is making available the use of the CONVERSE node for weather advisories, DX announcements, NETs, and roundtables.

As you might have noticed in the CONVERSE node command table, there are means to "Invite a user from another channel/circuit to join your QSO or roundtable." There is the command to **show WHO** is signed on to the node. The forward slash (/) precedes each command. This tells the node the immediate letter(s) following the / are to be interpreted and executed as a command. Go back and review the commands, because very soon you will be using these same commands in your area. I just issued a /W, and the list in fig. 1 was returned to me from CONVERSE node "ABTNET."

As soon as I'm able to communicate with Frank and Georg, DL8ZAW and DF2AU, I'll get the rest of the documentation and pass it along to you. For now, I can tell you that it is easy to construct your own CONVERSE node. First you will need to locate the code for the CONVERSE node. Next you will need to load your favorite disk utilities program(s) and edit the disk so that the code will contain your callsign, SSID, and the alias/ID that you wish to use for your CONVERSE node. If the disk that contains your code is similar to the one I used, you should edit the following locations.

Decimal 0059 through 0064 are the locations for up to six letters of the callsign. Location (decimal) 0065 is where you will edit the disk sector to read the SSID that you want the callsign to display. In decimal locations 0066 through 0071 are the locations that you may edit the disk to reflect your alias call of your CONVERSE node.

Since a form of "bit-shifting" is used to add the SSID, it will be necessary to enter the SSID as a HEX or the letter which represents the hex number. Don't despair. Fig. 2 is a list of the hex numbers, and the letters or symbols they represent.

As a matter of personal preference, I enter the ASCII mode

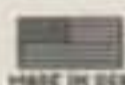
| User   | Circuit        | Channel |
|--------|----------------|---------|
| WA4QAS | —              | 0       |
| WB4OLD | —              | 0       |
| N5BCH  | ABY1:W4MM-1    | 0       |
| N4QVC  | ABT8:K4ABT-8   | 0       |
| WA4M   | ABT8:K4ABT-8   | 0       |
| N4TOS  | ABT8:K4ABT-8   | 9       |
| K4XA   | ABY1:W4MM-1    | 9       |
| N4NAU  | ALA5:WB4GNA-5  | 9       |
| WD4LYV | ABT11:K4ABT-11 | 255     |
| K4ABT  | —              | 255     |
| WB4RHO | RHO2:WB4RHO-2  | 255     |
| N4QLB  | ALA1:WB4GNA-1  | 255     |
| WD4DKA | ABT8:K4ABT-8   | 255     |
| N4PRJ  | RHO1:WB4RHO-1  | 255     |

Fig. 1- The list of current users of ABTNET Converse node. Note the node has the capability for 255 connections and 255 channels (we hope it never reaches full). Channel 9 is used at the Emergency and Weather Watch advisory channel. Channel 12 is used for a "DX notification channel."

| SSID        | HEX | Letter to enter<br>(rev. apostrophe) |
|-------------|-----|--------------------------------------|
| 0 (no SSID) | 60  | '                                    |
| 1           | 62  | b                                    |
| 2           | 64  | d                                    |
| 3           | 66  | f                                    |
| 4           | 68  | h                                    |
| 5           | 6A  | j                                    |
| 6           | 6C  | l                                    |
| 7           | 6E  | n                                    |
| 8           | 70  | p                                    |
| 9           | 72  | r                                    |
| 10          | 74  | t                                    |
| 11          | 76  | v                                    |
| 12          | 78  | x                                    |
| 13          | 7A  | z                                    |
| 14          | 7C  |                                      |
| 15          | 7E  | ~ (Tilde)                            |

Fig. 2- This list will provide the two-digit HEX code or the letter represented by the HEX code. If your utility allows the entry to be made in ASCII, then use the lower-case letters in the last column.

**SGC**

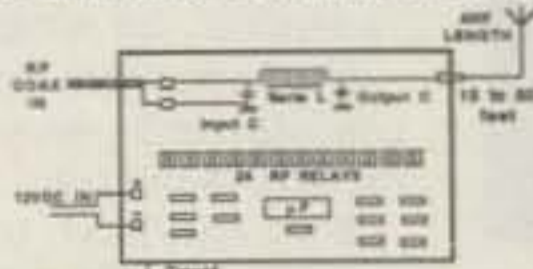


## AT LAST!

AN ANTENNA COUPLER THAT WILL LOAD THE PROVERBIAL

## 'WET STRING'\*

And, the *Smartuner* (tm) is fully automatic. It requires nothing more than RF from your rig and 12 VDC from the intelligent switch CPU. When it "sees" a new frequency it takes 2-3 seconds to find a low SWR for your transmitter. How? During this time, it switches 64 input and 32 output capacitors plus 256 inductance combinations in a pi-network. That's over a half-million different ways to ensure a perfect match for your ham rig. Even more important, it remembers the frequency and the tuning values. The next time you transmit on this band, the *Smartuner* re-selects these values in less than 10 ms.



Still skeptical? Write Gordon West, WB6NOA, for his "Best Coupler Ever Tested" review of the SGC Model SG-230 *Smartuner*. Or, better yet, send \$10 (refundable with purchase) for a copy of the instruction manual.

\*salt water please!

**Special  
Ham Price:  
\$525.00**



Write Gordon West, WB6NOA, for his "Best Coupler Ever Tested" Reviews of the SG-230 Coupler and the name of your nearest dealer.

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P.O.Box 3526, 98009. Telex: 328834. Fax: 206-746-6384 Tel: (206) 746-6310

of my utilities disk editor and make the changes. This way I am using the letters or symbol listed in the column that says "Letter to enter." If you wish to count the two-digit numbers and letters, then it is just as easy to enter the SSID as a "hexadecimal" number.

Save the edits or update the disk to reflect the changes, dump it into your EPROM burner, and start looking for a recent TAPR II. This EPROM will also work in the AEA PK-80, California Digital TNC-2, MFJ-1270B, MFJ-1274, PAC-COMM Tiny 2, Micro TWO, TNC-200, AIWA APX-25, and TASCOC TNC-20.

Be sure you have backups of all the programs you are editing. The reason may be obvious if you fail to edit in the correct locations.

You will be editing the first portion of the program code, so be on the lookout for the callsign and ID locations.

As I wrap up this bonus "Packet User's Notebook" tonight, I'm looking at something that makes it all seem worthwhile. As many of you have experienced, there is something missing when you are always connected one-on-one. Here is the opening to a new camaraderie that we have been missing. I am watching stations who not long ago never connected to one another. Now they are connecting to the CONVERSE node and having fun with their packet hobby—talking to one another *en mass*.





# OPTOELECTRONICS



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### Hand Held Series Frequency Counters and Instruments

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

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

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

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# RENO RADIO

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160-10 Meter Transceiver with Optional Modules  
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 FEX-767-6—6 Meter Module  
 FEX-767-7A—440-450 MHz Module  
 FEX-767-7B—430-440 MHz Module



### FT-757 GX MARK II

100 Watt, All Mode HF Favorite

### FT-747 GX

100 Watt, Price/Performer

### FT-736R

SSB, CW, FM on 2 meters and 70 cm Plus Optional Modules  
 FEX-736-50—50 MHz Module  
 FEX-736-220—220 MHz Module  
 FEX-736-1.2—1.2 GHz Module

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## RECEIVERS

### FRG-9600

60-905 MHz Coverage  
 USB, LSB, CW, AM, FM



### FRG-8800

150 kHz to 30 MHz  
 Optional 118-174 MHz VHF Converter  
 USB, LSB, CW, AM, FM

## MOBILES

### FT-212R

2 Meter FM, 45 Watts with Optional "Answering Machine" Feature



### FT-712R

440 MHz, FM, 35 Watts with Same Option as FT-212R

### FT-290R MARK II

25 Watts, 2 Meter, SSB, CW, FM

### FT-790 R/II

430-450 MHz, 25 Watts, SSB, CW, FM

# YAESU

### FT-690R/II

6-meter, 10 watts, SSB, CW, FM

### FT-4700 RH

Dual Band—2 Meters/70cm—FM with Optional Remote Panel/Controller to Keep Transceiver Under Seat or in Trunk. 50 Watts/40 Watts 70cm

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## HAND HELDS

### FT-411

2 Meter "Sophisticated" HT

### FT-811

440 MHz Feature Loaded HT

### FT-23R

Mini 2 Meter

### FT-33R

Mini 220 MHz

### FT-73R

Mini 440 MHz

### FT-470

2 Meter/70cm FM, 2.3 Watt Output Loaded with Features



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### FL-7000

160-15 Meter Coverage. 1200 Watts Output, Built-in Power Supply, Automatic Antenna Matching, a Fast Turnaround for Break-in CW, HF Packet and AMTOR.



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G-5600B - Heavy Duty AZ-EL Rotators for OSCAR or Moonbounce



### G-1000DX

### G-800SDX

### G-800S

### G-400RC

Reliable Antenna Rotators for Different Needs

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MO-1B8 Deluxe Desk Microphone

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# Awards

a monthly feature by  
DOROTHY JOHNSON, WB9RCY

## NEWS OF CERTIFICATE AND AWARD COLLECTING

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

**Norman F. Wasson, W6NNV**  
**USA-CA All Counties #589, All CW**  
**11-1-88**

"I want to tell you that my certificate for USA-CA All Counties #589 is beautiful, and I'm very proud to display it to all my friends. I have it in a gold frame in my den. Now I am working the counties a second time, but not with as much pressure as I in the first time around.

"I thought that going after USA-CA All Counties would tide me over during the lull in DX activity around 1979-80, but I never thought it would bring so many new, great friends. I have met many very nice, warm-hearted people through County Hunting. They are all just grand people.

"I started in radio the last year in grammar school, 1932, building my first short-wave receiver, a three-tube TRF from a diagram in *Short Wave Crafting*. I used to sit up all hours tuning in the Kukoboro bird laughing over Australia's shortwave station VKZME when I was only eleven years old. I guess that's when the DX bug bit me. They didn't work counties in those days, but I managed to get my ticket in 1934 and have enjoyed ham radio all the years since.

"During World War II, I spent 3½ years in the U.S. Navy teaching Radio at Texas A & M, where I was Radioman First Class. Later I moved to Chicago for the U.S. Navy Special Advanced Radio School at the Great Lakes Naval Training Center. At the end of the war I came home and got a job with the local gas company, earning 50 cents per hour. I stayed with the company 40 years and ended up in the Video Production Department of Southern California Gas Company. I have been retired a little over four years now, and am really enjoying the retired life. I am married and have three grown children—two boys and a girl—with 7 grandchildren from 15 years to 4 years of age. My wife, Suzi, is not ham radio oriented. She says she 'just can't stand all of those squeaks and squawks.' Sometimes when there is a new county showing on the net, I sort of know what she means, from the sounds of the calls.

"Radio has certainly made a grand leap from what it was when I first tuned my three-tube TRF, what with the fabu-



ARS W6NNV with Norm, USA-CA All Counties #589, at the controls.

lous and endless array of equipment we now enjoy. I'm looking forward to many more years of enjoyment and would say to any of the younger set, 'Jump in and get into radio. It's the best hobby ever.' At least that's what I've found.—73, Norm, W6NNV"

### Awards Issued

Harry Brundridge, NF0X, stuck with his brass pounding, put his paperwork together, and on 6-3-89 claimed an All CW endorsement to his USA-CA All Counties #245, received on 8-28-79. Nice going, Harry.

Keith M. Retzer, W7KEU, completed all of his paperwork and claimed USA-CA All Counties #620, USA-CA 3000 #651, USA-CA 2500 #726, USA-CA 2000 #792, USA-CA 1500 #880, and USA-CA 1000 #1069, Mixed, dated 6-6-89.

Howard G. Byers, KD4ZJ, took a double step to the finish line, receiving USA-CA All Counties #621, and USA-CA 3000 #652, All SSB Mobiles, dated 6-13-89.

Paul T. Antos, WB2ABD, made a clean sweep of it by claiming USA-CA All Counties #622, USA-CA 3000 #653, USA-CA 2500 #727, USA-CA 2000 #793, USA-CA 1500 #881, USA-CA 1000 #1071, and USA-CA 500 #2340, Mixed, dated 6-19-89.

Joe M. Chambers, KF5AT, put the finishing touches on his records and received USA-CA All Counties #623, Mixed, dated 6-19-89.

Barbara A. Baum, N3DRO, claimed USA-CA All Counties #624 and USA-CA 3000 #654, All SSB; and backed that up with USA-CA 2500 #728, USA-CA 2000 #795, USA-CA 1500 #882, USA-CA 1000 #1072, and USA-CA 500 #2342, All 80 Meters SSB, all dated 6-24-89.

Bill Nash, W0OWY, did it all in one big leap and claimed USA-CA All Counties #625, USA-CA 3000 #655, USA-CA 2500

#729, USA-CA 2000 #796, USA-CA 1500 #883, USA-CA 1000 #1073, and USA-CA 500 #2343, Mixed, dated 6-24-89.

William D. Tillett, WT4S, also made a clean sweep of it and received USA-CA All Counties #626, USA-CA 3000 #656, USA-CA 2500 #730, USA-CA 2000 #797, USA-CA 1500 #884, USA-CA 1000 #1074, and USA-CA 500 #2344, All SSB, dated 6-26-89.

Robert F. Imhof, AG2K, filed a completely filled Record Book good for USA-CA All Counties #627, USA-CA 3000 #657, USA-CA 2500 #731, USA-CA 2000 #798, USA-CA 1500 #885, and USA-CA 1000 #1075, All SSB, dated 6-29-89. Robert's application also qualified him for an All SSB endorsement to his USA-CA 500 #2056 dated 9-7-85.

Wilbur Lewis, K0OJG, updated his good record and received USA-CA 3000 #650, Mixed, dated 6-3-89.

Elemer A. Bielek, HA9RE, added a gold seal to his certificate by claiming USA-CA 2000 #794, Mixed, dated 6-20-89, #1 to Hungary.

Dr. Miklos Danko, HA8XX, took a good step toward his goal by claiming USA-CA 1000 #1068, Mixed, dated 6-2-89.

Heikki Tomminen, OH3JF, filed his application and received USA-CA 1000 #1070, and USA-CA 500 #2339, All CW, dated 6-16-89.

### USA-CA Special Honor Roll

Harry L. Brundridge, NF0X  
All Counties #245, Endorsed All CW  
6-3-89

Keith M. Retzer, W7KEU  
All Counties #620, Mixed, 6-6-89

Howard G. Byers, KD4ZJ  
All Counties #621, All SSB Mobiles  
6-13-89

Paul T. Antos, WB2ABD  
All Counties #622, Mixed, 6-19-89

Joe M. Chambers, KF5AT  
All Counties #623, Mixed, 6-19-89

Barbara A. Baum, N3DRO  
All Counties #624, All SSB, 6-24-89

Bill Nash, W0OWY  
All Counties #625, Mixed, 6-24-89

William D. Tillett, WT4S  
All Counties #626, All SSB, 6-26-89

Robert F. Imhof, AG2K  
All Counties #627, All SSB, 6-29-89

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| W7KEU  | 651 | WB2ABD | 881  |
| KD4ZJ  | 652 | N3DRO  | 882  |
| WB2ABD | 653 | W0OWY  | 883  |
| N3DRO  | 654 | WT4S   | 884  |
| W0OWY  | 655 | AG2K   | 885  |
| WT4S   | 656 |        |      |
| AG2K   | 657 |        |      |
| 2500   |     | 1000   |      |
|        |     | H8XX   | 1068 |
|        |     | W7KEU  | 1069 |
| W7KEU  | 726 | OH3JF  | 1070 |
| WB2ABD | 727 | WB2ABD | 1071 |
| N3DRO  | 728 | N3DRO  | 1072 |
| W0OWY  | 729 | W0OWY  | 1073 |
| WT4S   | 730 | WT4S   | 1074 |
| AG2K   | 731 | AG2K   | 1075 |
| 2000   |     | 500    |      |
| W7KEU  | 792 | N8GSF  | 2337 |
| WB2ABD | 793 | G4SEF  | 2338 |
| HA9RE  | 794 | OH3JF  | 2339 |
| N3DRO  | 795 | WB2ABD | 2340 |
| W0OWY  | 796 | WB9HPR | 2341 |
| WT4S   | 797 | N3DRO  | 2342 |
| AG2K   | 798 | W0OWY  | 2343 |
|        |     | WT4S   | 2344 |

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

### USA-CA 500 certificates went to:

- Robert R. Anderson, N8GSF, USA-CA 500 #2337, All CW, 6-12-89.
- R.J. (Roger) Jenkinson, G4SEF, USA-CA 500 #2338, All SSB, 6-16-89.
- Heikki Tamminen, OH3JF, USA-CA 500 #2339, All CW, 6-16-89.
- Paul T. Antos, WB2ABD, USA-CA 500 #2340, Mixed, 6-19-89.
- Charles Wm. Lenhart, WB9HPR, USA-CA 500 #2341, Mixed, 6-19-89.
- Barbara A. Baum, N3DRO, USA-CA 500 #2342, All 80M SSB, 6-24-89.
- Bill Nash, W0OWY, USA-CA 500 #2343, Mixed, 6-24-89.
- William D. Tillett, WT4S, USA-CA 500 #2344, All SSB, 6-26-89.

### Awards Available

**Minden Muhlenkreis Award.** The Minden amateur radio club, DOK N12, of the DARC issues this 40th anniversary award to all licensed radio amateurs and SWLs for contacts since January 1, 1989. All bands and modes are allowed, but each station only once. Club station DL0MI is a must and counts 8 points on all bands. EU stations need 24 points; DX stations need 16 points.

**Point values.** Members of N12: 4 on SW, 5 on VHF, 6 on UHF/SHF. The neighboring DOKs, N22 and N52: 2 on SW, 3 on VHF, 4 on UHF/SHF.

Send GCR list and DM 10 or 10 IRCs to the award manager, Jurgen Kopplitz, DG4YCY, Postbox 1236, D-4925 Kalletal 1, West Germany.

**Hints:** The club station is QRV every Wednesday at 1900Z on the 3.5 and the 14.0 MHz bands, and on Sunday at 1000Z on 3.65 MHz.

The award is 30 by 40 cm in size, two-color, 110g paper.

**DIG (Diploma Interests Group Germany) Award Program.** The top decorations of the DIG are the DIG Trophy, the DIG CW Plaque, the DIG VHF Plaque, and the DIG Trophy 1000. All applications for these awards are to be sent to Hans-Peter Gunther, DL9XW, Am Strampel 22, D-4460 Nordhorn, West Germany. The application must name the award applied for and be accompanied by a GCR list and the required fee.

**DIG Trophy.** The DIG Trophy can be claimed only once by licensed radio amateurs and SWLs who prove to be in possession of at least four different DIG Diplomas (EU-PX-A, IAPA, TMA, W-DIG-M, WDXS, WGLC or WGLC-VHF, 1,000,000, DIG 77, Familia) and 500 points with QSLs from DIG members. Every DIG member counts only once with his DIG number, without restriction in bands, expedition calls, mode of operation, or QSO dates. The DIG Trophy is a wall sign of massive brass, with green patina.

**DIG CW Plaque.** The DIG CW Plaque can be claimed only once by licensed radio amateurs and SWLs who prove to be in possession of at least three different DIG CW awards (Familia, WGLC, EU-PX-A, 1,000,000, IAPA, DIG 77, W-DIG-M, WDXS) and 250 points with QSLs from DIG members. Every DIG member counts only once with his DIG number,

without restriction in bands, expedition calls, or QSO dates. All contacts must be in CW only by both ops. The DIG CW Plaque is a wall sign of massive brass colored red/gold.

**DIG VHF Plaque.** The DIG VHF Plaque can be claimed only once by licensed radio amateurs and SWLs who can prove to be in possession of at least three different DIG VHF Awards (WGLC-VHF, EU-PX-A-VHF, 1,000,000-VHF, DIG 77-VHF, W DIG M-VHF) and 250 points with QSLs from DIG members. Every DIG member counts only once with his DIG number, without restriction in bands, expedition calls, or QSO dates. All contacts must be made on VHF/UHF bands only by both ops. The DIG VHF Plaque is a wall sign of massive brass, colored blue/gold.

**General rules for the DIG Trophy and both DIG Plaques.** All QSLs from licensed DIG members count for one point, except that holders of a DIG Trophy and DIG Plaques (specially marked in the DIG member list) count two points. The QSL from DIG club stations DL0DIG, DF0DIG, DK0DIG, OE1XDC, and PI4DIG count three points. There are no differences among mobile, fixed, or portable stations. If a DIG member operates in another country or with another call, these QSLs count, too. DIG members must have the DIG sign printed or stamped on their QSLs, or must have mentioned their DIG number. The fee for each of these awards is 25 DM or 40 IRCs. The DIG trophy and the DIG plaques will be sent to applicants after engraving the callsign.

The DIG member list is published in the first quarter of each year, and can be requested from the DIG Secretary, Eberhard Warnecke, DJ8OT, P.O. Box 101244, D-5620 Velbert 1, West Germany. Four IRCs are required.

**DIG Trophy 1000.** This highest award of the DIG can be applied for by all licensed radio amateurs who prove to be in possession of all DIG diplomas in the highest class, the DIG Trophy and both DIG Plaques. He must prove additionally to be in possession of QSLs from at least 1000 DIG members. No QSLs, no fee. Applications may be sent to Hans-Peter Gunther, DL9XW, Am Strampel 22, D-4460 Nordhorn, West Germany.

**Worked German Large Cities (WGLC).** The WGLC award may be applied for by all licensed radio amateurs and SWLs who prove contacts with radio amateurs in German large cities (more than 100,000 inhabitants). The award is available in three classes.

Class 3: DX stations, 10 towns; EU stations, 20 towns.

Class 2: DX stations, 20 towns; EU stations, 40 towns.

Class 1: DX stations, 30 towns; EU stations, 60 towns.

Each city can be counted only once. The award is available for contacts on all



Minden Muhlenkreis Award offered by the Minden Amateur Radio Club, West Germany.



shortwave bands and all modes (mixed) or for contacts only on CW (CW award). All contacts on and after 1 January 1962 count for this award. Apply with GCR list (no QSLs) and fee of 7 DM or 10 IRCs to the award manager, Bernd Muller, DK7ZT, Weitershauser Str. 11, D-3550 Marburg, West Germany.

**Worked German Large Cities on VHF (WGLC-VHF).** The WGLC-VHF award may be applied for by all licensed radio amateurs and SWLs. It is available in three classes.

- Class 3: 20 town-points.
- Class 2: 30 town-points.
- Class 1: 40 town-points.

The conditions for WGLC apply, but only VHF contacts are valid. A QSO on the 144 MHz band counts one point. A contact on the 435 MHz, or higher, band counts three points. Apply with GCR list (no QSLs) and fee of 7 DM or 10 IRCs to the same award manager as for WGLC—DK7ZT.

The following German large cities count for WGLC and WGLC-VHF: Aachen, Augsburg, Bergisch-Gladbach, Berlin, Bielefeld, Bochum, Bonn, Bottrop, Braunschweig, Bremen, Bremerhaven, Darmstadt, Dortmund, Dusseldorf, Duisburg, Erlangen, Essen, Frankfurt/Main, Freiburg, Furth, Gelsenkirchen, Göttingen, Hagen, Hamburg, Hamm, Hannover, Heidelberg, Heilbronn, Herne, Hildesheim, Kaiserslautern, Karlsruhe, Kassel, Kiel, Koblenz, Köln, Krefeld, Leverkusen, Ludwigshafen, Lubeck, Mainz, Mannheim, Monchengladbach, Mulheim/Ruhr, München, Münster, Neuss, Nürnberg, Oberhausen, Offenbach, Odenburg, Osnabrück, Paderborn, Pforzheim, Recklinghausen, Regensburg, Remscheid, Rheydt, Saarbrücken, Salzgitter, Siegen, Solingen, Stuttgart, Trier, Ulm, Wanne-Eickel, Wiesbaden, Wilhelmshaven, Witten, Wolfsburg, Würzburg, Wuppertal.

**DIG Diplom 77.** The DIG Diplom 77 is recognized by DARC. It is necessary to have worked (heard) 77 DIG members in at least 7 different countries, but only 7 × 7 (= 49) DIG members in the applicant's own country, after 1 January 1977. The award is available for contacts on CW only (CW award), mixed (modes and bands), on the VHF/UHF bands only (VHF award), and for SWLs (heard contacts). Apply with GCR list (no QSLs) and fee of 7 DM or 10 IRCs to the award manager, Heinz Louis, DK4KW, Oberforstbacher Strasse 419, D5100 Aachen, West Germany.

**Worked DIG Members (W-DIG-M).** The W-DIG-M Award is available to all licensed radio amateurs and SWLs who prove contacts with DIG members as follows.

Class 3: DX stations work 15 DIG members; EU stations work 50 DIG members.

Class 2: DX stations work 30 DIG members; EU stations work 75 DIG members.

Class 1: DX stations work 50 DIG members; EU stations work 100 DIG members.

All QSLs of DIG members listed in the DIG member list and the new DIG members publicized on the DIG nets are valid for this award. Expedition calls do not count additionally; either the home call or the expedition call is valid.

The award is available for contacts on all shortwave bands and modes (mixed) or for contacts on CW only (CW award) or for contacts on the VHF/UHF bands only (VHF award). There are stickers for working 100 additional DIG members, up to 2000 (SASE or SAE plus 1 IRC). Apply with GCR list (no QSLs) along with fee of 7 DM or 10 IRCs to the award manager, Werner

Theis, DH1PAL, Tilsiter Strasse 16, D-5350 Euskirchen, West Germany.

**International Airport Award (IAPA).** The IAPA is an award recognized by the DARC and is available to all licensed radio amateurs and SWLs who prove contacts with licensed radio amateur stations in 50 different cities with an international airport. Only one contact counts from the applicant's country. All six continents must be worked. Only contacts with fixed stations on or after 1 January 1973 are valid. The award is available for contacts on all shortwave bands and modes (mixed) or for contacts only on CW (CW award). Apply with GCR list (no QSLs) and fee of 7 DM or 10 IRCs to the

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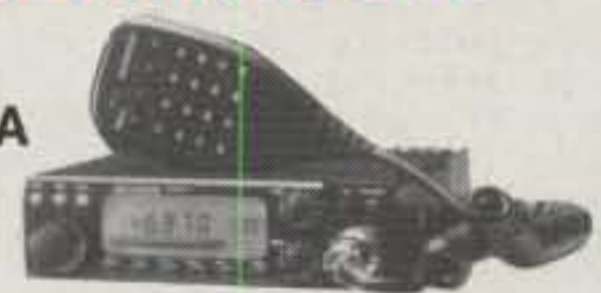


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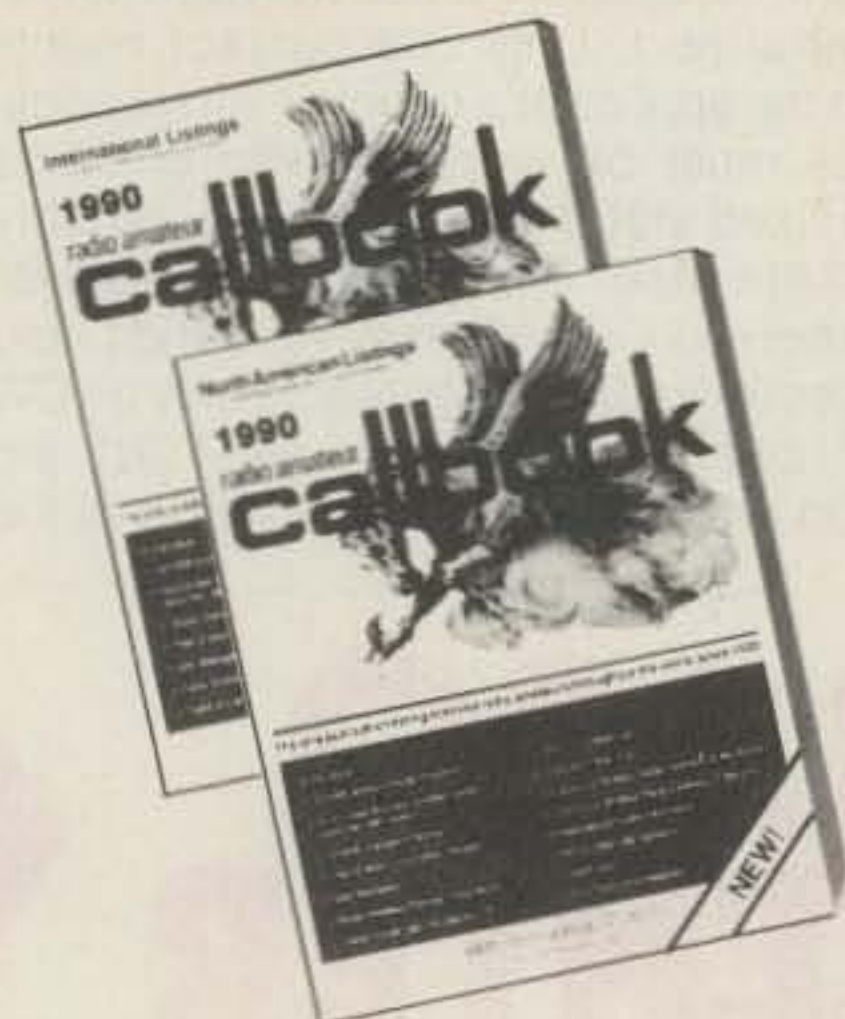
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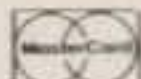
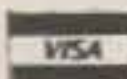
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| DJ8OT | 27-11-70 | 80   | Velbert  | 5620                     |
|       |          |      |          | Total at least 1,000,000 |

Table 1 - For the One Million Award, postal code numbers must be listed as shown in the example here, and must add up to at least 1,000,000.

award manager, Walter Hymmen, DL8JS, P.O. Box 1925, D-4980 Bunde, West Germany.

**Two Mode Award (TMA).** The TMA is an award that is recognized by the DARC and is available to all licensed radio amateurs and SWLs. All contacts on or after 1 January 1962 are valid. Work 50 different countries on CW, including Germany and all six continents, and work those same 50 countries on phone. The DXCC countries list determines the valid countries. Send GCR list (no QSLs) and fee of 7 DM or 10 IRCs to the award manager, Heinz Louis, DK4KW, Oberforstbacher Strasse 419, D-5100 Aachen, West Germany.

**European Prefixes Award (EU-PX-A).** The EU-PX-A is recognized by the DARC and may be applied for by all licensed radio amateurs and SWLs who can prove contacts with 100 European stations with different prefixes. Prefixes in the sense of these rules (like WPX) are, for example, DL1, DL2, etc.; DJ1, DJ2, etc.; F1, F2, etc.; EA1, EA2, etc.; I1, IN3, IV3, etc.; OZ1, OZ2, etc.; YU1, YU2, etc.; HB4, HB9, HB0, etc.; UA1, UA2, etc.; all prefixes of European Russian Stations; and all special prefixes in Europe. All prefixes listed in the WAE and/or the DXCC country list are valid.

The diploma is available for contacts on all bands and modes (mixed) or for contacts only on CW (CW award) or for contacts on the VHF/UHF bands only (VHF award). Stickers are available for an additional 50 prefixes. Send GCR list (no QSLs) and fee of 7 DM or 10 IRCs (stickers, SASE only) to the award manager, Alfons Niehoff, DJ8VC, Emst Hase Weg 6, D-4407 Emsdetten, West Germany.

**One Million Award (1,000,000).** The 1,000,000 award is recognized by the DARC and may be applied for by all licensed radio amateurs and SWLs who prove contacts with radio amateurs in towns with different postal code numbers (zip codes) in the Federal Republic of Germany. The sum of the different postal code numbers must be at least 1,000,000. Each postal code number may be used only once. Postal code numbers with less than four digits are to be completed with zeros to four-digit numbers—e.g., 41 = 4100. The postal code numbers must be listed in numerical order in the application (see Table 1).

The award is available for contacts on

all shortwave bands and modes (mixed) or for contacts on CW only (CW award) or for contacts on the VHF/UHF bands only (VHF award). There are no additional stickers. Send GCR list (no QSLs) and fee of 7 DM or 10 IRCs to the award manager, Dieter Petring, DL1YCA, Bruderstrasse 52, D-4972 Lohne 2, West Germany.

**Familia Award.** The Familia Award is sponsored by the Diploma Interests Group Germany (DIG) and will be delivered to all licensed radio amateurs and SWLs who meet the following conditions.

The applicant has to prove the accumulation of 100 points based on contacts after January 1, 1980. All contacts with at least two licensed amateurs of the same family count one point for each contact. The diploma is available for contacts only on CW, in mixed modes and bands, and on VHF bands only. Send GCR list (no QSLs) and fee of 7 DM, \$3.00 US, or 10 IRCs to the award manager, Heinz Lewis, DK4KW, Oberforstbacher Strasse 419, D-5100 Aachen, West Germany.

**Worked DX Stations (WDXS).** The WDXS is a diploma recognized by the DARC and may be applied for by all licensed radio amateurs and SWLs who prove contacts with radio amateur stations on or after 1 January 1964 as follows.

Class 4: DX stations work 200 EU stations inclusive of 10 contacts on 80/40 M; EU stations work 200 DX stations inclusive of 20 contacts on 80/40 M.

Class 3: DX stations work 500 EU stations inclusive of 25 contacts on 80/40 M; EU stations work 500 DX stations inclusive of 50 contacts on 80/40 M.

Class 2: DX stations work 1000 EU stations inclusive of 50 contacts on 80/40 M; EU stations work 1000 DX stations inclusive of 50 contacts on 80/40 M.

Class 1: DX stations work 2000 EU stations inclusive of 100 contacts on 40 M, and 20 contacts on 80 M; EU stations work 2000 DX stations inclusive of 100 contacts on 40 M, and 20 contacts on 80 M.

The diploma is available for contacts on all shortwave bands and modes (mixed) or for contacts on CW only (CW award). Send GCR list (no QSLs) and fee of 7 DM or 10 IRCs to the award manager, Walter Hymmen, DL8JS, P.O. Box 1925, D-4980 Bunde, West Germany.

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73, Dorothy, WB9RCY

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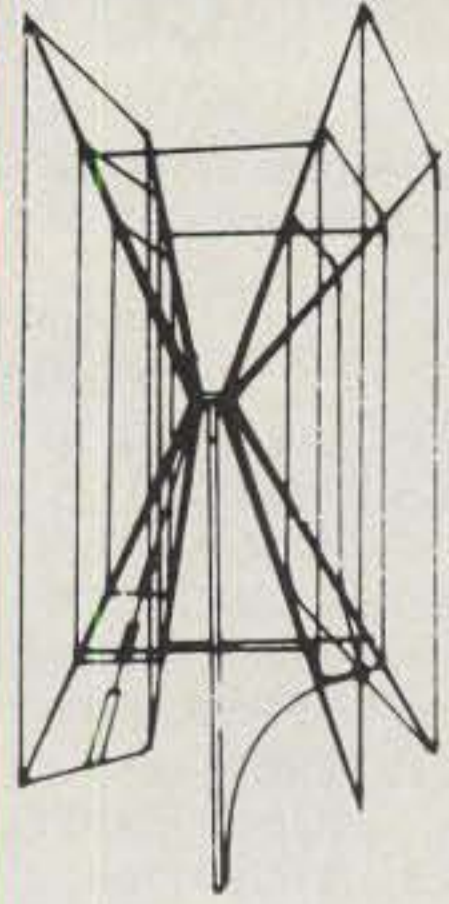
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# CQ World-Wide DX Contest All-Time Phone Records

BY FREDERICK CAPOSSELA, K6SSS

In the records listed below, boldface listings denote world records. Number groups after calls are: year of operation, total score, contacts, zones, and countries. All-band and Multi-Operator records include a band-by-band breakdown of the world leader in each category.

## Single Operator/Single Band WORLD RECORD HOLDERS

|     |               |           |       |    |     |
|-----|---------------|-----------|-------|----|-----|
| 1.8 | UG7GWO('87)   | 255,852   | 1,327 | 12 | 57  |
| 3.5 | P40R('87)     | 552,786   | 1,628 | 23 | 91  |
|     | (Opr. K4UEE)  |           |       |    |     |
| 7.0 | EA8RCT('87)   | 859,362   | 1,959 | 32 | 115 |
|     | (Opr. OH2MM)  |           |       |    |     |
| 14  | VP2KAA('81)   | 2,011,185 | 4,186 | 37 | 150 |
| 21  | ZP8Y('88)     | 2,525,791 | 4,442 | 38 | 155 |
|     | (Opr. ZP5JCY) |           |       |    |     |
| 28  | VP2ET('88)    | 2,423,880 | 5,137 | 37 | 143 |
|     | (Opr. K5RX)   |           |       |    |     |

### AFRICA

|     |                |           |       |    |     |
|-----|----------------|-----------|-------|----|-----|
| 1.8 | EA8AK('82)     | 34,220    | 201   | 12 | 46  |
| 3.5 | CT3BZ('79)     | 235,113   | 772   | 22 | 87  |
| 7.0 | EA8RCT('87)    | 859,362   | 1,959 | 32 | 115 |
|     | (Opr. OH2MM)   |           |       |    |     |
| 14  | CR6WW('74)     | 1,058,446 | 2,152 | 35 | 132 |
| 21  | EL2AV('81)     | 1,404,936 | 3,087 | 35 | 117 |
| 28  | OH2MM/CT3('79) | 1,827,150 | 4,068 | 37 | 113 |

### ASIA

|     |               |           |       |    |     |
|-----|---------------|-----------|-------|----|-----|
| 1.8 | UG7GWO('87)   | 255,852   | 1,327 | 12 | 57  |
| 3.5 | UW9AF('83)    | 222,192   | 554   | 19 | 53  |
| 7.0 | JA8IXM('86)   | 316,382   | 794   | 37 | 109 |
| 14  | RF0FWW('87)   | 1,447,128 | 2,894 | 40 | 147 |
|     | (Opr. UF6FFF) |           |       |    |     |
| 21  | 4S7AAG('81)   | 918,925   | 2,897 | 38 | 137 |
|     | (Opr. OH2BCP) |           |       |    |     |
| 28  | JH1AJT('88)   | 1,421,070 | 2,409 | 38 | 163 |

### EUROPE

|     |             |           |       |    |     |
|-----|-------------|-----------|-------|----|-----|
| 1.8 | LZ2CJ('84)  | 107,818   | 1,319 | 13 | 61  |
| 3.5 | IK5BAF('88) | 270,704   | 1,238 | 27 | 85  |
| 7.0 | SP3RBR('88) | 505,440   | 1,529 | 35 | 118 |
| 14  | TF3CW('88)  | 1,791,840 | 4,107 | 34 | 126 |
| 21  | YT3AA('88)  | 1,423,275 | 3,020 | 39 | 136 |
| 28  | YU3ZV('88)  | 1,541,603 | 3,219 | 39 | 134 |

### NORTH AMERICA

|     |               |           |       |    |     |
|-----|---------------|-----------|-------|----|-----|
| 1.8 | VE3BMV('86)   | 52,240    | 662   | 14 | 26  |
| 3.5 | VE3BMV('85)   | 383,040   | 1,629 | 25 | 89  |
| 7.0 | VP2ET('85)    | 850,795   | 2,295 | 31 | 124 |
|     | (Opr. K5RX)   |           |       |    |     |
| 14  | VP2KAA('81)   | 2,011,185 | 4,186 | 37 | 150 |
| 21  | V22A('86)     | 1,789,470 | 4,075 | 37 | 140 |
|     | (Opr. WB7RFA) |           |       |    |     |
| 28  | VP2ET('88)    | 2,423,880 | 5,137 | 37 | 143 |
|     | (Opr. K5RX)   |           |       |    |     |

### OCEANIA

|     |               |           |       |    |     |
|-----|---------------|-----------|-------|----|-----|
| 1.8 | KH6CC('85)    | 45,984    | 484   | 13 | 19  |
| 3.5 | T32AF('85)    | 222,768   | 1,064 | 23 | 49  |
| 7.0 | T32AF('84)    | 677,844   | 2,045 | 34 | 80  |
|     | (Opr. KH6UR)  |           |       |    |     |
| 14  | ZM1BIL('83)   | 1,334,232 | 2,635 | 38 | 136 |
| 21  | AH0AB('82)    | 1,923,840 | 4,509 | 36 | 108 |
|     | (Opr. JA3DOC) |           |       |    |     |
| 28  | KD7P/NH2('88) | 2,309,304 | 4,885 | 38 | 123 |

### SOUTH AMERICA

|     |               |           |       |    |     |
|-----|---------------|-----------|-------|----|-----|
| 1.8 | YV2IF('84)    | 18,291    | 172   | 14 | 25  |
| 3.5 | P40R('87)     | 552,786   | 1,628 | 23 | 91  |
|     | (Opr. K4UEE)  |           |       |    |     |
| 7.0 | 9Y4VU('84)    | 700,488   | 1,718 | 28 | 110 |
| 14  | P40SS('87)    | 1,792,056 | 3,570 | 35 | 133 |
|     | (Opr. K2SS)   |           |       |    |     |
| 21  | ZP8Y('88)     | 2,525,791 | 4,442 | 38 | 155 |
|     | (Opr. ZP5JCY) |           |       |    |     |
| 28  | LT8WW('88)    | 1,930,500 | 3,632 | 38 | 142 |
|     | (Opr. LU6ETB) |           |       |    |     |

## Single Operator/All Band

|     |              |            |       |     |     |
|-----|--------------|------------|-------|-----|-----|
| AF  | CT9BZ('88)   | 12,743,190 | 6,886 | 157 | 497 |
|     | (Opr. OH2BH) |            |       |     |     |
| AS  | EX6F('84)    | 6,362,000  | 4,648 | 113 | 387 |
| EU  | OH0MM('88)   | 6,544,684  | 4,727 | 149 | 473 |
|     | (Opr. OH2MM) |            |       |     |     |
| NA  | HI8PGG('81)  | 9,009,721  | 7,190 | 131 | 392 |
|     | (Opr. N1GL)  |            |       |     |     |
| O   | YJ0RY('88)   | 8,970,328  | 6,429 | 144 | 370 |
|     | (Opr. OH1RY) |            |       |     |     |
| SA  | 9Y4TT('88)   | 12,340,132 | 7,150 | 151 | 436 |
|     | (Opr. NQ4I)  |            |       |     |     |
| QRP | PJ2FR('87)   | 3,171,166  | 3,212 | 100 | 234 |
|     | (Opr. K7SS)  |            |       |     |     |

### WORLD RECORD

| Station    | Band         | Contacts     | Zones      | Countries  |
|------------|--------------|--------------|------------|------------|
|            | 1.8          | 124          | 10         | 37         |
| CT9BZ      | 3.5          | 175          | 22         | 64         |
| (1988)     | 7.0          | 608          | 24         | 83         |
| 12,743,190 | 14.0         | 2,358        | 37         | 107        |
|            | 21.0         | 926          | 30         | 97         |
|            | 28.0         | 2,695        | 34         | 109        |
|            | <b>Total</b> | <b>6,886</b> | <b>157</b> | <b>497</b> |

## Multi-Operator/Single Xmtr.

|    |             |            |       |     |     |
|----|-------------|------------|-------|-----|-----|
| AF | EA8AGD('88) | 17,172,672 | 8,203 | 157 | 547 |
| AS | RG6G('82)   | 12,276,352 | 6,012 | 156 | 558 |
| EU | IR4LCK('88) | 13,157,568 | 6,182 | 184 | 678 |
| NA | NP4A('82)   | 14,953,818 | 8,772 | 174 | 585 |
| O  | AH0B('88)   | 8,608,600  | 6,163 | 143 | 330 |
| SA | 9Y4W('82)   | 16,775,034 | 8,097 | 158 | 540 |

### WORLD RECORD

| Station    | Band         | Contacts     | Zones      | Countries  |
|------------|--------------|--------------|------------|------------|
|            | 1.8          | 64           | 9          | 36         |
| EA8AGD     | 3.5          | 164          | 15         | 64         |
| (1988)     | 7.0          | 387          | 24         | 74         |
| 17,172,672 | 14.0         | 2,478        | 37         | 121        |
|            | 21.0         | 1,565        | 36         | 124        |
|            | 28.0         | 3,545        | 36         | 128        |
|            | <b>Total</b> | <b>8,203</b> | <b>157</b> | <b>547</b> |

## Multi-Operator/Multi-Xmtr.

|    |            |            |        |     |     |
|----|------------|------------|--------|-----|-----|
| AF | EA8CR('77) | 21,351,898 | 10,290 | 153 | 544 |
| AS | EW6V('82)  | 18,746,136 | 10,100 | 142 | 544 |
| EU | UP8A('88)  | 23,092,600 | 12,362 | 183 | 641 |
| NA | VP2KC('79) | 37,770,012 | 17,767 | 175 | 677 |
| O  | KH6XX('79) | 21,990,252 | 10,989 | 184 | 494 |
| SA | P40V('88)  | 49,347,430 | 18,065 | 189 | 746 |

### WORLD RECORD

| Station    | Band         | Contacts      | Zones      | Countries  |
|------------|--------------|---------------|------------|------------|
|            | 1.8          | 338           | 17         | 43         |
| P40V       | 3.5          | 1,504         | 26         | 97         |
| (1988)     | 7.0          | 2,063         | 32         | 125        |
| 49,347,430 | 14.0         | 4,884         | 38         | 164        |
|            | 21.0         | 4,867         | 38         | 159        |
|            | 28.0         | 4,409         | 38         | 158        |
|            | <b>Total</b> | <b>18,065</b> | <b>189</b> | <b>746</b> |



# CQ World-Wide DX Contest All-Time C.W. Records

## Single Operator/Single Band

### WORLD RECORD HOLDERS

|     |                            |           |       |    |     |
|-----|----------------------------|-----------|-------|----|-----|
| 1.8 | TA2BK('88)                 | 163,605   | 880   | 11 | 55  |
| 3.5 | NP4A('88)<br>(Opr. K1ZM)   | 808,640   | 2,243 | 31 | 102 |
| 7.0 | YX5A('88)<br>(Opr. YV5ANT) | 1,000,578 | 2,506 | 33 | 101 |
| 14  | P40N('86)<br>(Opr. N4PN)   | 1,477,905 | 3,138 | 37 | 122 |
| 21  | CW8B('88)<br>(Opr. CX8BBH) | 1,496,556 | 3,112 | 40 | 122 |
| 28  | 4M7A('88)<br>(Opr. YV7QP)  | 1,145,375 | 3,073 | 36 | 89  |

### AFRICA

|     |                             |           |       |    |     |
|-----|-----------------------------|-----------|-------|----|-----|
| 1.8 | EA8AK('82)                  | 75,768    | 385   | 15 | 51  |
| 3.5 | EA8XS('88)<br>(Opr. OH5XT)  | 516,390   | 1,649 | 24 | 81  |
| 7.0 | OH7JT/CT9('88)              | 904,038   | 2,195 | 35 | 103 |
| 14  | EA8ID('87)<br>(Opr. DK3GI)  | 1,212,384 | 2,336 | 39 | 134 |
| 21  | 5H3BH('87)<br>(Opr. SM0AJU) | 1,098,810 | 2,542 | 38 | 107 |
| 28  | FR0MM('79)                  | 978,012   | 2,590 | 36 | 90  |

### ASIA

|     |                            |         |       |    |     |
|-----|----------------------------|---------|-------|----|-----|
| 1.8 | TA2BK('88)                 | 163,605 | 880   | 11 | 55  |
| 3.5 | ZC4DX('87)<br>(Opr. 4Z4DX) | 430,560 | 1,318 | 29 | 88  |
| 7.0 | 4Z4DX('88)                 | 859,392 | 2,129 | 36 | 108 |
| 14  | 4X0U('82)                  | 735,504 |       |    |     |
| 21  | JA5DQH('88)                | 624,470 | 1,413 | 40 | 114 |
| 28  | VS6UP('88)<br>(Opr. KB7G)  | 712,597 | 2,322 | 36 | 91  |

### EUROPE

|     |                             |         |       |    |     |
|-----|-----------------------------|---------|-------|----|-----|
| 1.8 | HB9AMO('88)                 | 111,245 | 751   | 20 | 75  |
| 3.5 | UA2FGA('87)                 | 403,686 | 1,918 | 30 | 93  |
| 7.0 | YU3ZV('87)                  | 709,104 | 2,012 | 38 | 120 |
| 14  | DK3GI('86)                  | 822,024 | 2,006 | 39 | 129 |
| 21  | LZ1KDP('88)<br>(Opr. LZ2AX) | 752,623 | 2,101 | 37 | 110 |
| 28  | DK3GI('79)                  | 592,848 | 1,584 | 31 | 101 |

### NORTH AMERICA

|     |                            |           |       |    |     |
|-----|----------------------------|-----------|-------|----|-----|
| 1.8 | K5UR('85)                  | 47,005    | 219   | 25 | 60  |
| 3.5 | NP4A('88)<br>(Opr. K1ZM)   | 808,640   | 2,243 | 31 | 102 |
| 7.0 | VP2KAA('83)<br>(Opr. N4PN) | 837,366   | 2,461 | 30 | 104 |
| 14  | VP2KAA('80)<br>(Opr. N4PN) | 1,244,782 | 3,111 | 37 | 117 |
| 21  | VP2KAC('80)<br>(Opr. N4RJ) | 1,075,407 | 2,955 | 36 | 105 |
| 28  | KV4FZ('79)                 | 653,072   | 2,384 | 32 | 87  |

### OCEANIA

|     |                           |           |       |    |     |
|-----|---------------------------|-----------|-------|----|-----|
| 1.8 | KX6DC('88)<br>(Opr. NZ8B) | 42,723    | 297   | 22 | 25  |
| 3.5 | VR3AH('76)                | 178,560   | 956   | 24 | 40  |
| 7.0 | KH6XX('84)                | 427,230   | 1,424 | 33 | 68  |
| 14  | NY6M/KH2('88)             | 765,872   | 1,717 | 38 | 113 |
| 21  | N7DF/NH2('88)             | 983,268   | 2,838 | 35 | 82  |
| 28  | KD7P/NH2('88)             | 1,037,608 | 2,456 | 38 | 105 |

### SOUTH AMERICA

|     |                            |           |       |    |     |
|-----|----------------------------|-----------|-------|----|-----|
| 1.8 | YV3AGT('85)                | 147,588   | 591   | 21 | 63  |
| 3.5 | P40R('86)<br>(Opr. K4UEE)  | 576,725   | 1,682 | 25 | 90  |
| 7.0 | YX5A('88)<br>(Opr. YV5ANT) | 1,000,578 | 2,506 | 33 | 101 |
| 14  | P40N('86)<br>(Opr. N4PN)   | 1,477,905 | 3,138 | 37 | 122 |
| 21  | CW8B('88)<br>(Opr. CX8BBH) | 1,496,556 | 3,112 | 40 | 122 |
| 28  | 4M7A('88)<br>(Opr. YV7QP)  | 1,145,375 | 3,073 | 36 | 89  |

## Single Operator/All Band

|     |                             |           |       |     |     |
|-----|-----------------------------|-----------|-------|-----|-----|
| AF  | 9Q5NW('87)<br>(Opr. N6AA)   | 7,586,300 | 4,768 | 150 | 385 |
| AS  | 5B4TI('87)<br>(Opr. N6ZZ)   | 5,816,907 | 3,949 | 126 | 387 |
| EU  | CT2NH('88)<br>(Opr. N6ZZ)   | 4,683,500 | 4,081 | 146 | 405 |
| NA  | 8P9HT('88)<br>(Opr. K4BAI)  | 7,323,030 | 5,590 | 139 | 356 |
| O   | KC6CS('88)<br>(Opr. JE1JKL) | 4,906,470 | 4,053 | 137 | 273 |
| SA  | FY5YE('88)<br>(Opr. OH2MM)  | 9,574,096 | 5,548 | 142 | 442 |
| QRP | YU3BC('88)                  | 1,241,286 | 1,295 | 114 | 329 |

### WORLD RECORD

| Station   | Band | Contacts | Zones | Countries |
|-----------|------|----------|-------|-----------|
|           | 1.8  | 149      | 12    | 37        |
| FY5YE     | 3.5  | 382      | 17    | 60        |
| (1988)    | 7.0  | 554      | 21    | 68        |
| 9,574,096 | 14.0 | 1,403    | 30    | 88        |
|           | 21.0 | 1,067    | 31    | 98        |
|           | 28.0 | 1,993    | 31    | 91        |
| Total     |      | 5,548    | 142   | 442       |

### Multi-Operator/Single Xmtr.

|    |               |            |       |     |     |
|----|---------------|------------|-------|-----|-----|
| AF | EA8AGD('87)   | 9,816,540  | 5,763 | 144 | 426 |
| AS | RG6G('82)     | 10,394,658 | 5,355 | 166 | 511 |
| EU | HG5A('88)     | 7,775,904  | 5,030 | 187 | 570 |
| NA | NP4A('82)     | 11,648,565 | 6,881 | 168 | 515 |
| O  | KD7P/KH2('84) | 4,487,665  | 3,375 | 159 | 296 |
| SA | PJ2X('88)     | 8,948,660  | 5,257 | 152 | 422 |

### WORLD RECORD

| Station    | Band | Contacts | Zones | Countries |
|------------|------|----------|-------|-----------|
|            | 1.8  | 172      | 15    | 35        |
| NP4A       | 3.5  | 589      | 23    | 73        |
| (1982)     | 7.0  | 1,342    | 28    | 92        |
| 11,648,565 | 14.0 | 1,270    | 36    | 108       |
|            | 21.0 | 1,547    | 34    | 106       |
|            | 28.0 | 1,961    | 32    | 101       |
| Total      |      | 6,881    | 168   | 515       |

### Multi-Operator/Multi-Xmtr.

|    |            |            |        |     |     |
|----|------------|------------|--------|-----|-----|
| AF | EA9EA('88) | 31,764,460 | 13,210 | 190 | 616 |
| AS | EW6V('82)  | 14,702,688 | 8,001  | 159 | 504 |
| EU | OL8A('88)  | 18,653,778 | 10,673 | 200 | 658 |
| NA | KP2A('88)  | 32,325,150 | 15,198 | 191 | 631 |
| O  | AH0C('83)  | 6,877,750  | 5,164  | 149 | 302 |
| SA | PJ1B('88)  | 38,415,760 | 14,921 | 194 | 672 |

### WORLD RECORD

| Station    | Band | Contacts | Zones | Countries |
|------------|------|----------|-------|-----------|
|            | 1.8  | 717      | 17    | 65        |
| PJ1B       | 3.5  | 1,447    | 24    | 83        |
| (1988)     | 7.0  | 3,119    | 37    | 133       |
| 38,415,760 | 14.0 | 3,791    | 40    | 140       |
|            | 21.0 | 2,997    | 39    | 134       |
|            | 28.0 | 2,850    | 37    | 117       |
| Total      |      | 14,921   | 194   | 672       |



# KENWOOD



**NEW Top-of-the-Line TS-940S HF Transceiver**  
 • 100% Duty Cycle  
 • 40 Memory Channels  
**CALL FOR SPECIAL PRICES!!**



**TS-440S NEW!**  
**CALL FOR SPECIAL SALE PRICE**



**TS-140S**  
**CALL FOR SPECIAL SALE PRICE**



**TS-711A TS-811A**  
**CALL FOR SPECIAL PRICE**



**TM-721A**  
**CALL FOR SPECIAL PRICE**



**TR-751A**  
**All Mode 2m Mobile**



**COMPACT 2M FM Mobile**

**TM 2570A (70W) TM3530A (25W)**  
**TM 2550A (45W) TM231A (50W)**  
**TM 2530A (25W)**

**CALL FOR SPECIAL PRICE**



**TH-75A**  
 2m/70cm  
 Dual Band  
 HT

**TH215A**  
 2m HT XCVR  
 TH-25AT, TH-45AT,  
 TH-205AT  
**ALSO IN STOCK**

**CALL FOR SALE PRICES!**

# ICOM



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



**IC-765 New HF XCVR**  
 • Built-In Automatic Antenna Tuner & Power Supply  
 • 99 Memories • 100W Output  
 • General Coverage Receiver  
 • Band Stacking Registers  
**CALL FOR SPECIAL PRICE**



**IC-735 Ultra Compact XCVR**  
**With General Coverage Receiver**  
**CALL FOR SPECIAL PRICE!**



**IC-725 Ultra Compact HF XCVR**  
 • 26 Memories w/Band Stacking Registers  
 • USB/LSB/CW, AM Receive Optional Module for AM Transmit and FM TX/RX  
 • 160-10M Operation • 100W Output  
 • Receive 30 kHz-33 MHz  
**CALL FOR SPECIAL PRICE**



**IC-2GAT**  
 2 meter HT  
 RX 138-174 MHz  
 TX 140-150 MHz  
 7 Watts

**IC-32AT**  
 Super  
 Dualband  
 FM HT

• 5 Watts on Both Bands  
 • RX 138-174 MHz  
 440-450 MHz  
 • Stores Standard & Odd Offsets  
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## ASTRON POWER SUPPLIES

Heavy Duty-High Quality-Rugged-Reliable

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

| Model | Cont. Amps | ICS Amps | Price |
|-------|------------|----------|-------|
| RS4A  | 3          | 4        | \$49  |
| RS7A  | 5          | 7        | 59    |
| RS12A | 9          | 12       | 79    |
| RS20A | 16         | 20       | 99    |
| RS20M | 16         | 20       | 119   |
| RS35A | 25         | 35       | 159   |
| RS35M | 25         | 35       | 179   |
| RS50A | 37         | 50       | 229   |
| RS50M | 37         | 50       | 249   |

# YAESU



**FT 767 GX HF/VHF/UHF**  
**CALL FOR SALE PRICE**



**FT-757GX/II**  
**CALL FOR SPECIAL SALE PRICE!**



**FT-736R**  
**New All Mode Base Transceiver**  
**CALL FOR SPECIAL PRICE—**  
**SAVE \$\$\$!**



**FT-411 NEW**  
 2 meter HT  
 • 49 Memories  
 • 2.3 to 5 Watts  
 • Extended Rec.

**FT-470**  
 2m/70cm  
 Dual Band

• 42 Memories  
 • DTMF Autodialer  
 • 2.3-5 Watts  
**CALL FOR SPECIAL PRICES**



**FT 23R 2m HT**  
**FT 73R 70 cm HT**  
 • compact size  
 • 10 memories  
 • up to 5W output W/FNB 11  
**CALL FOR SALE PRICES!**

## AMERITRON



| Model  | LIST     | Model | LIST   |
|--------|----------|-------|--------|
| AL80A  | \$985.00 | ATR15 | 380.00 |
| AL84   | 479.00   | RCS4  | 134.50 |
| AL1200 | 1825.00  | RCS8V | 134.50 |
| AL1500 | 2370.00  |       |        |

**CALL FOR SPECIAL SALE PRICES!**



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

| Model | Band | In-Out  | List Price |
|-------|------|---------|------------|
| 2-23  | 2M   | 2-30W   | \$112.00   |
| 2-217 | 2M   | 2-170W  | \$299.00   |
| 2-117 | 2M   | 10-170W | \$299.00   |
| 2-417 | 2M   | 45-170W | \$299.00   |
| 3-22  | 220  | 2-20W   | \$112.00   |
| 3-211 | 220  | 2-110W  | \$299.00   |
| 3-312 | 220  | 30-120W | \$264.00   |

**CALL FOR SALE PRICES**

# TOT



**PARAGON**  
 General Coverage HF Transceiver  
 Microprocessor Controlled Multi-Scan  
 62 Memories

**List \$2,245.**  
**CALL FOR SPECIAL SALE PRICE**

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

**List Price \$2,245.**  
**CALL FOR SALE PRICE**



**TITAN**  
**HF Linear Amplifier**  
 1500 Watts Output Full QSK  
 160-15 Meters Pair of EIMAC 3CX800A7  
**List \$2,685 CALL FOR SPECIAL PRICE**

# AEA



**PK-232 Packet Controller** ..... CALL  
**144 MHz Isopole** ..... CALL  
**440 MHz Isopole** ..... CALL  
 Other AEA products also in stock call!!!

# Kantronics



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

# MFJ



**NEW Model MFJ-986 3KW Tuner**  
 Only \$239.95

**1278 Multi Mode TNC** ..... \$239.95  
**1270B TNC Unit** ..... \$129.95  
**202/204 Antenna Bridges** ..... \$59.95/\$79.95  
**250 Oil Load** ..... \$49.95  
**260/262 Dry Loads** ..... \$29.95/\$69.95  
**407/422 Elect. Keyers** ..... \$69.95/\$119.95  
**901/941D Tuners** ..... \$59.95/\$99.95  
**949D/989 Tuners** ..... \$139.95/\$299.95

# NYE VIKING



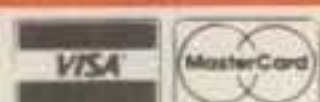
**MBV-A 3KW Tuner**  
 • Low Pass Pi-Network Tuning  
 • Built-in Antenna Switch/Balun  
**List Price \$675 CALL TODAY TO SAVE \$**

# NEL TECH LABS



**DVK-100 Digital Voice Keyer**  
 • Built-in Auto Repeat Function  
 • Fully Compatible With All Xcvrs  
**CALL FOR SPECIAL PRICE**

**FREE SHIPPING-UPS SURFACE ORDER 1-800-272-3467**  
 (Continental USA) (most items, except towers/antennas) **TOLL FREE** Texas, Alaska & for information call 1-(214)-422-7306



(Prices & Availability Subject To  
 Change Without Notice)

# TEXAS TOWERS

Div. of Texas RF Distributors Inc., 1108 Summit Ave., Suite 4 • Plano, Texas 75074

Mon-Fri: 9 am-5pm  
 Sat: 9 am-1pm



# ANTENNA/TOWER SALE!



**hy-gain**

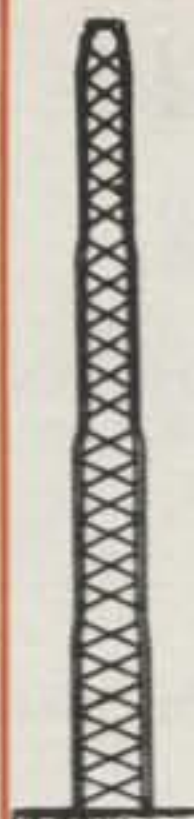
## CRANKUP SALE!

All Models Shipped  
Factory Direct—  
Freight Paid\*!

- Check these features:
- All steel construction
  - Hot dip galvanized after fabrication
  - Complete with base and rotor plate
  - Totally self-supporting—no guys needed

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

Masts—Thrust Bearings—  
Other Accessories Available  
—Call! Prices Shown Are  
Your Total Delivered Price  
In Continental U.S.A.!



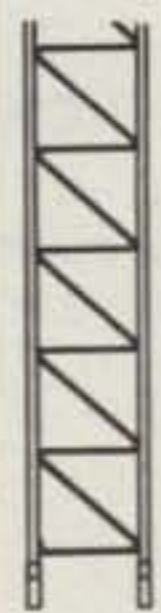
## ROHN Self Supporting Towers On SALE! FREIGHT PREPAID

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

| Model  | Height | Ant Load* | Weight | Delivered Price* |
|--------|--------|-----------|--------|------------------|
| HBX40  | 40 ft  | 10 sq ft  | 228    | \$449            |
| HBX48  | 48 ft  | 10 sq ft  | 303    | \$589            |
| HBX56  | 56 ft  | 10 sq ft  | 385    | \$699            |
| HDBX40 | 40 ft  | 18 sq ft  | 281    | \$569            |
| HDBX48 | 48 ft  | 18 sq ft  | 363    | \$689            |

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

## ROHN Guyed Tower Packages



- World Famous Rohn Quality and Dependability
- Rugged high wind survival provides safe installation
- Multi purpose towers satisfy a wide range of needs
- Complete packages include: guy hardware, turnbuckles, guy assemblies, concrete base, rotor plate and top section per manufacturers specs.

Packages shown below are rated for 70 mph wind zone. 90 mph wind zone packages slightly higher. All tower packages shipped freight collect from our Plano, TX warehouse, in stock for prompt delivery.

| Model | 25G   | Model 45G | Model 55G |
|-------|-------|-----------|-----------|
| 50'   | \$849 | \$1229    | \$1549    |
| 60'   | 939   | 1389      | 1939      |
| 70'   | 999   | 1719      | 2159      |
| 80'   | 1199  | 1869      | 2369      |
| 90'   | 1289  | 2039      | 2579      |
| 100'  | 1369  | 2199      | 2989      |
| 110'  | 1449  | 2459      | 3209      |
| 120'  | 1669  | 2619      | 3429      |

**US TOWER CORPORATION**

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

Check these features:

- ✓ All steel construction
- ✓ Hot dipped galvanized
- ✓ Totally self-supporting—No guys needed

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

**CALL FOR SALE PRICES!**

| Model      | Min.Ht. | Max.Ht. | Ant Load* | Sale price |
|------------|---------|---------|-----------|------------|
| MA40 mast  | 21'     | 40'     | 10 sq ft  | \$629      |
| MA550 mast | 22'     | 50'     | 10 sq ft  | 999        |
| TX438      | 22'     | 38'     | 18 sq ft  | 919        |
| TX455      | 22'     | 55'     | 18 sq ft  | 1385       |
| TX472      | 23'     | 72'     | 18 sq ft  | 2279       |
| HDX555     | 22'     | 55'     | 30 sq ft  | 2079       |
| HDX572     | 23'     | 72'     | 30 sq ft  | 3559       |

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

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

**RG-213U**

\$ .39/ft \$379/1000 ft.  
Up to 600 ft via UPS

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

**RG-8X**

\$ .22/ft \$209/1000 ft.

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

**9086**

\$ .45/ft \$439/1000 ft.

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

**HANDLINE/HELIX®**

Lowest Loss for VHF/UHF!

1/2" Alum. w/poly Jacket ..... \$ .79/ft.  
1/2" LDF4-50 Andrew Helix® ..... \$1.99/ft.  
1/4" LDF5-50 Andrew Helix® ..... \$4.99/ft.

Select connectors below  
Helix® is a Registered Trademark of the Andrew Corp.

| Cable Type | Imped. | 10MHz | 30MHz | 150MHz | 450MHz |
|------------|--------|-------|-------|--------|--------|
| RG-213/U   | 50     | .6    | .9    | 2.3    | 5.2    |
| RG8X       | 52     | .8    | 1.2   | 3.5    | 5.8    |
| 9086       | 50     | .4    | .84   | 1.7    | 3.1    |
| 1/2" Alum  | 50     | .3    | .5    | 1.2    | 2.2    |
| 1/2" Helix | 50     | .2    | .4    | .9     | 1.6    |
| 1/4" Helix | 50     | .1    | .2    | .5     | .9     |

**HELIX® CONNECTORS**

| Cable Type  | UHF FML | UHF MALE | N FML | N MALE |
|-------------|---------|----------|-------|--------|
| 1/2" Helix® | \$29    | \$29     | \$29  | \$29   |
| 1/4" Helix® | \$55    | \$55     | \$55  | \$55   |

Amphenol Silver PL259 ..... \$1.50  
UG218 N Male ..... \$3.50  
9086/9913 N Male Connector ..... \$4.95

**ANTENNA WIRE & ACCESSORIES**

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

**VAN GORDEN**

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

**ALPHA DELTA**  
DX-A 160-80-40 Sloper ..... \$49

**CUSHCRAFT**

A3 3-el Tribander .....  
A4S 4-el Tribander Beam w/S.S. Howre .....  
A743 & A744, 30/40 mtr KIT for the A3 & A4 .....  
R4 20-10 mtr Vertical .....  
AP8 80-10 mtr Vertical .....  
AV5 80-10 mtr Vertical .....  
D40 40 mtr Dipole .....  
40-2CD 2-el 40 mtr Beam .....  
A50-5 5-el 6 mtr Beam .....  
215 WB NEW 15-el 2 mtr Beam .....  
230 WB NEW 30-el 2 mtr Beam .....  
4218 XL 18-el 2 mtr Beam .....  
3219 19-el 2 mtr Beam .....  
424B 24-el 432 MHz Beam .....  
ARX2B 2 mtr Vertical .....  
CALL FOR SPECIAL PRICES!

**hy-gain**

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

**HUSTLER**

68TV 80-10 mtr Vert \$149 58TV 80-10 mtr Vert \$129  
48TV 40-10 mtr Vert \$99 G7-144 2-mtr Base \$129  
G6-144B 2-mtr Base \$89

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

Bumper Mounts - Springs - Folding Masts in Stock!

**BUTTERNUT ELECTRONICS CO**

HF6VX 80-10m Vertical \$159.95 Delivered

- Full Legal Power
- Highest Q Tuning Circuits

HF2V 80-40m Vertical \$149.95 Delivered

- Full Legal Power
- Automatic Band Switching

Accessories:

RMK II Roof Mtg. Kit ..... \$59.95  
STR II Stub-Tuned Radials ..... \$39.95  
TBR160 160m Coil Kit ..... \$59.95  
30m Add-on Kit ..... \$39.95  
17/12m Add-on Kit ..... \$39.95

FREE UPS on ACCESSORIES when purchased with antenna

**HF5B "Butterfly" 20-10m Compact Beam \$259.95**

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

FREE UPS Shipping in Continental USA

**MIRAGE/KLM**

KT34A 4-el Broad Band Triband Beam ..... \$419  
KT34XA 6-el Broad Band Triband Beam ..... \$619

**ROTORS**

Alliance HD73 (10.7 sq. ft. rating) ..... \$129.95  
Alliance U110 (3 sq. ft. rating) ..... \$49  
Telex CD 4511 (8.5 sq. ft. rating) ..... \$Call  
Telex HAM 4 (15 sq. ft. rating) ..... \$Call  
Telex Tailtwister (20 sq. ft. rating) ..... \$Call  
Telex HDR300 Heavy Duty (25 sq. ft. rating) ..... \$Call

**ROTOR CABLE**

Standard 8 cord cables \$.25/ft. (vinyl jacket 2-#18 & 6-#22 ga)

Heavy Duty 8 Cond cable \$.45/ft (vinyl jacket 2-#16 & 6-#18 ga)

**ROHN GUYED TOWER SECTIONS**

10 FT. STACKED SECTIONS

20G ..... \$54.50 45G ..... \$153.50  
25G ..... \$65.50 55G ..... \$197.50

**ALL ACCESSORIES IN STOCK—CALL**

**ROHN FOLDOVER TOWERS**

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

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

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

**TOWER/GUY HARDWARE**

3/16 EHS Guywire (3990 lb rating) ..... \$15/ft  
1/4 EHS Guywire (6650 lb rating) ..... \$18/ft  
5/16 EHS Guywire (11,200 lb rating) ..... \$29/ft  
5/32 7 x 7 Aircraft Cable (2700 lb rating) ..... \$15/ft  
3/16 CCM Cable Clamp (3/16" or 5/32") ..... \$4.45  
1/4 CCM Cable Clamp (1/4" Cable) ..... \$5.55  
1/4 TH Thimble (fits all sizes) ..... \$4.45  
3/BEE (3/8" Eye & Eye Turnbuckle) ..... \$6.95  
3/BEJ (3/8" Eye & Jaw Turnbuckle) ..... \$7.95  
1/2 x 9EE (1/2" x 9" Eye to Eye Turnbuckle) ..... \$9.95  
1/2 x 9EJ (1/2" x 9" Eye & Jaw Turnbuckle) ..... \$10.95  
1/2 x 12EE (1/2" x 12" Eye & Eye Turnbuckle) ..... \$12.95  
1/2 x 12EJ (1/2" x 12" Eye & Jaw Turnbuckle) ..... \$13.95  
5/8 x 12EJ (5/8" x 12" Eye & Jaw Turnbuckle) ..... \$16.95  
3/16" Preformed Guy Grip ..... \$2.49  
1/4" Preformed Guy Grip ..... \$2.99  
6" Diam - 4 ft Long Earth Screw Anchor ..... \$19.95  
500 D Guy Insulator (5/32" or 3/16" Cable) ..... \$1.99  
502 Guy Insulator (1/4" Cable) ..... \$3.49  
5/8" Diam - 8 ft Copper Clad Ground Rod ..... \$12.95

**PHILLYSTRAN GUY CABLE**

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

**GALVANIZED STEEL MASTS**

Heavy Duty Steel Masts 2 in OD - Galvanized Finish

| Length     | 5 FT | 10 FT | 15 FT | 20 FT |
|------------|------|-------|-------|-------|
| 12 in Wall | \$29 | \$49  | \$69  | \$89  |
| 18 in Wall | \$49 | \$89  | \$129 | \$149 |
| 25 in Wall | \$69 | \$129 | \$189 | \$249 |

**ORDER TOLL FREE 1-800-272-3467**

Texas, Alaska & for information 1 (214) 422-7306

**TEXAS TOWERS**

Mon-Fri: 9 am-5pm  
Sat: 9 am-1pm



Div. of Texas RF Distributors Inc., 1108 Summit Ave., Suite 4 • Plano, Texas 75074

(Prices & Availability Subject To Change Without Notice)

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



# CQ World-Wide DX Contest All-Time U.S.A. Records

BY FREDERICK CAPOSSELA, K6SSS

Tabulated below are the record-high scores achieved by U.S. Contesters in the CQ World Wide DX Contest. Number groups following calls and bands are: year of operation, total score, contacts, zones, and countries.

## PHONE

### Single Operator/Single Band

|     |                          |           |       |    |     |
|-----|--------------------------|-----------|-------|----|-----|
| 1.8 | WB9HAD('87)              | 27,181    | 157   | 23 | 54  |
| 3.5 | K7SS('86)                | 217,038   | 828   | 31 | 91  |
| 7.0 | W7RM('85)<br>(Opr. W7WA) | 243,270   | 813   | 31 | 71  |
| 14  | K1OX('85)<br>(Opr. KC1F) | 1,131,328 | 2,176 | 36 | 140 |
| 21  | K3RV/4('88)              | 1,270,478 | 2,298 | 39 | 148 |
| 28  | W0ZV('88)                | 1,145,368 | 2,158 | 39 | 142 |

### Single Operator/All Band

| Station        | Band         | QSOs         | Zones      | Countries  |
|----------------|--------------|--------------|------------|------------|
|                | 1.8          | 16           | 7          | 10         |
| KC1F<br>(1988) | 3.5          | 225          | 18         | 58         |
|                | 7.0          | 102          | 18         | 58         |
| 6,429,808      | 14.0         | 968          | 36         | 125        |
|                | 21.0         | 723          | 33         | 102        |
|                | 28.0         | 1,527        | 34         | 117        |
|                | <b>Total</b> | <b>3,561</b> | <b>146</b> | <b>470</b> |

### Multi-Operator/Single Xmtr.

| Station        | Band         | QSOs         | Zones      | Countries  |
|----------------|--------------|--------------|------------|------------|
|                | 1.8          | 27           | 11         | 24         |
| N2RM<br>(1988) | 3.5          | 242          | 17         | 63         |
|                | 7.0          | 82           | 23         | 73         |
| 6,923,136      | 14.0         | 614          | 37         | 126        |
|                | 21.0         | 1,120        | 37         | 126        |
|                | 28.0         | 1,293        | 36         | 131        |
|                | <b>Total</b> | <b>3,378</b> | <b>161</b> | <b>543</b> |

### Multi-Operator/Multi-Xmtr.

| Station         | Band         | QSOs         | Zones      | Countries  |
|-----------------|--------------|--------------|------------|------------|
|                 | 1.8          | 141          | 16         | 52         |
| W3LPL<br>(1988) | 3.5          | 415          | 22         | 75         |
|                 | 7.0          | 330          | 28         | 93         |
| 16,092,951      | 14.0         | 1,571        | 39         | 159        |
|                 | 21.0         | 1,710        | 38         | 146        |
|                 | 28.0         | 2,310        | 37         | 156        |
|                 | <b>Total</b> | <b>6,477</b> | <b>180</b> | <b>681</b> |

## CW

### Single Operator/Single Band

|     |             |         |       |    |     |
|-----|-------------|---------|-------|----|-----|
| 1.8 | K5UR('85)   | 47,005  | 219   | 25 | 60  |
| 3.5 | W1FV('87)   | 270,692 | 790   | 28 | 90  |
| 7.0 | K2EK('88)   | 520,086 | 1,244 | 37 | 110 |
| 14  | K2VV('85)   | 655,046 | 1,567 | 35 | 107 |
| 21  | K3RV/4('88) | 682,362 | 1,385 | 39 | 128 |
| 28  | K1ZZ('88)   | 537,568 | 1,235 | 34 | 123 |

### Single Operator/All Band

| Station        | Band         | QSOs         | Zones      | Countries  |
|----------------|--------------|--------------|------------|------------|
|                | 1.8          | 39           | 12         | 30         |
| W1KM<br>(1988) | 3.5          | 402          | 22         | 60         |
|                | 7.0          | 617          | 31         | 79         |
| 4,466,557      | 14.0         | 590          | 37         | 98         |
|                | 21.0         | 579          | 28         | 79         |
|                | 28.0         | 410          | 26         | 75         |
|                | <b>Total</b> | <b>2,637</b> | <b>156</b> | <b>421</b> |

### Multi-Operator/Single Xmtr.

| Station        | Band         | QSOs         | Zones      | Countries  |
|----------------|--------------|--------------|------------|------------|
|                | 1.8          | 44           | 14         | 42         |
| K1AR<br>(1988) | 3.5          | 407          | 26         | 76         |
|                | 7.0          | 931          | 35         | 107        |
| 7,370,285      | 14.0         | 741          | 40         | 135        |
|                | 21.0         | 630          | 35         | 111        |
|                | 28.0         | 571          | 35         | 105        |
|                | <b>Total</b> | <b>3,324</b> | <b>185</b> | <b>576</b> |

### Multi-Operator/Multi-Xmtr.

| Station         | Band         | QSOs         | Zones      | Countries  |
|-----------------|--------------|--------------|------------|------------|
|                 | 1.8          | 152          | 18         | 52         |
| W3LPL<br>(1988) | 3.5          | 624          | 26         | 82         |
|                 | 7.0          | 1,205        | 35         | 107        |
| 12,804,154      | 14.0         | 1,029        | 40         | 141        |
|                 | 21.0         | 1,212        | 37         | 119        |
|                 | 28.0         | 1,165        | 38         | 123        |
|                 | <b>Total</b> | <b>5,387</b> | <b>194</b> | <b>624</b> |

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|  |  |
|--|--|
| <p><b>Controller Features</b></p> <ul style="list-style-type: none"> <li>*Change variables remotely from touchtones or Packet</li> <li>*Unlimited voice vocabulary!</li> <li>*Alarm Clock, auto execute</li> <li>*Individual 4 digit user codes</li> <li>*Disk &amp; Printer logging of users, tel #'s, lapsed time</li> <li>*18 Rotating Polite ID's</li> <li>*16 External relay controls</li> <li>*2-tone &amp; sub tone Paging</li> <li>*CW Practice with voice</li> <li>*Security mode, T.tone mute</li> <li>*Voice announces each user call sign when logging on</li> </ul> | <p><b>Autopatch &amp; Reverse</b></p> <ul style="list-style-type: none"> <li>*1000 (18 digit) tel #'s stored</li> <li>*Quick dial &amp; quick answer</li> <li>*Directed, general page</li> <li>*Selected restricted patch</li> <li>*Telephone control input</li> </ul> <p><b>Dual Combined Remotes</b></p> <ul style="list-style-type: none"> <li>*18 Macro/Scan memories</li> <li>*Scan up/down; 100Hz steps</li> <li>*Monitor &amp; lock modes</li> <li>*Operate splits, combine HF &amp; VHF radios as Dual VFO's</li> <li>*Automatic mode selection</li> <li>*Talking S Meter; Voltmeter</li> <li>*Voice Beacon rotating msg.</li> </ul> |
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|  |  |  |
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| <p><b>Computer Control</b><br/>YAESU FT-727R</p> <p>C64 OR IBM Mini Cat</p> <p>Allows H.T. to scan 100 Channels &amp; programs</p> <p>H.T. for field use! Digital "S" Meter; comment fields; auto resume &amp; delay; Scan Lock-outs; Loads FT727 in 15 sec. Hardware, cables, &amp; disk included for C64 or IBM</p> <p>Model 727 \$49.95</p> | <p><b>Touchtone Decoder</b><br/>4 digit sequence; &amp; QUAD expansion 4 relay option</p> <p>2"x3" TSDQ</p> <p>8/20 V &amp; audio in; Field Program 50,000 Codes; Mom. &amp; Latching; DPDT Relay; Wrong digit reset; LED for digit valid &amp; latch; inc. 24 Pin connector</p> <p>QUAD option adds: four 2 Amp. relays; 5 digit master on/off control for each relay.</p> <p>TSDQ \$89.95 QUAD \$99.95</p> | <p><b>Decode-A-Pad</b><br/>Touchtone to RS232 300 Baud Interface</p> <p>12V 12V C64 SWITCHER<br/>Crystal 60Hz<br/>9VAC 5V. 2A.<br/>C64 &amp; 1541<br/>DCPS \$129.95</p> <p>Use with all computers<br/>Decodes 16 touchtones<br/>Includes Basic program</p> <p>DAP \$ 99.95</p> |
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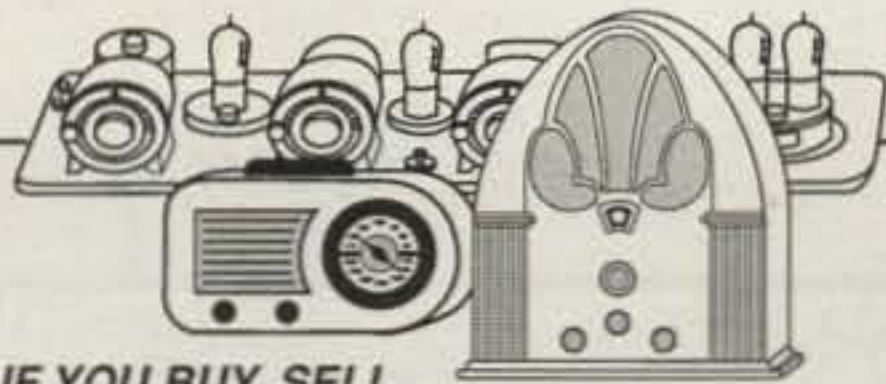
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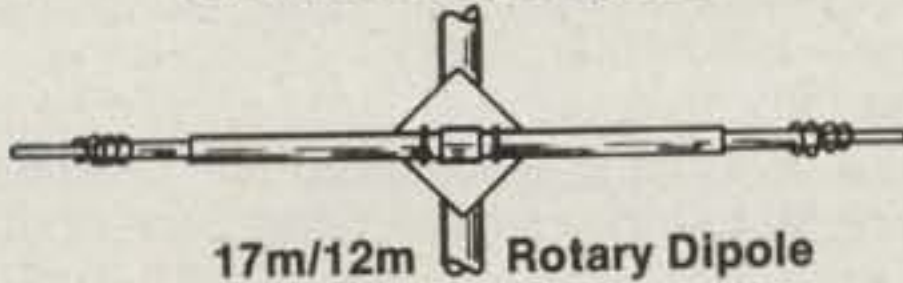
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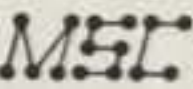
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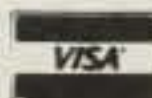
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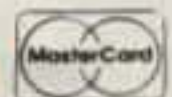
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CIRCLE 151 ON READER SERVICE CARD



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

### South Pacific Map and More

**M**y April 1985 column reported the availability of an excellent map of the South Pacific. Many amateurs obtained a copy of this map and we found it to be very useful. This map shows the locations, political status, and 200 mile exclusive economic zone of American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Hawaii, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis/Futuna, and Western Samoa. Small island groups are shown within the previously listed larger groups. These include Austral, Chesterfield, Gambier, Gilbert, Marquesas, New Georgia, Phoenix, and Society Islands.

The name of this map is "Pacific Island Nations and Their 200 Mile Exclusive Economic Zones." The current issue is dated January 1989. It is jointly produced by the State of Hawaii and the Pacific Basin Development Council. The overall dimensions of this map are 23 by 31 inches, and the image area (what it can be trimmed to) is 19 $\frac{3}{4}$  by 27 $\frac{3}{4}$  inches.

If you want to obtain a single free copy of this map, you can request it from the State of Hawaii Information Office, Department of Business and Economic Development, P.O. Box 2359, Honolulu, Hawaii 96804.

#### Russian Phrases For Amateur Radio

Len Traubman, W6HJK, offers a 20-page booklet (title above) to promote communications between Russian- and English-speaking amateurs. Commonly used English-language words and phrases are listed in Russian, with pronunciation help. The Russian-language alphabet, common Russian first names, code characters, numerals, and phonetics are included in Len's booklet, along with tips about addressing mail to Russian amateurs. There is no fixed fee for this useful booklet, but I believe a contribution is appropriate.

#### Amateur Radio Phrases In Ten Foreign Languages

Common phrases are available in Dutch, French, German, Hungarian, Norwegian, Polish, Russian, Spanish, Swed-



*This is 15-year-old Lee Nuguit, N4TMK, of Port Charlotte, Florida. Lee shares this station with his father, Eddie, KC4FKM. Lee enjoys working DX on 10 meters. He was talking with a South American amateur when his Dad snapped this picture. Their station includes a Hallicrafters FPM-300, Yaesu 101-B, Yaesu 101-E, Azden 5000, Kenwood TH-215A, Cushcraft 124-WB antenna, and a dipole. Lee plays basketball at school and became interested in amateur radio due to Civil Air Patrol (CAP) radio activity.*

ish, and Yugoslavian. Separate lists make it easy to find desired phrases. Special code symbols exist for letters and character combinations used in foreign-language alphabets. These unique code symbols are covered in "C.W. Into Foreign Languages," which is sold at \$7.00 (ppd) by C.W. Publications, P.O. Box 2571, Station A, London, Ontario N6A 4G9, Canada.

#### DX QSL Managers Directory

Fred Smith, WB4KCL, publishes a list of more than 18,000 DX QSL managers. Basic data extends back to 1979, with selected items retained prior to 1979. Foreign and domestic (U.S.A.) managers of DX QSL cards are listed in this 300-plus page book. Most entries include information receipt dates, which is often helpful. Multiple managers for the same DX call signs are listed, if they are known. The "DXer's QSL Manager Directory" is available for \$17.95 to Canadian, Mexican, and U.S.A. addresses. That price includes all supplements Fred issues during the year. His address is 27 Princess Gillian Court, Fredericksburg, VA 22405.

#### DX News-Sheet

Geoff Watts, G3FKM, is the editor of

the "DX News-Sheet," which is published and distributed by the Radio Society of Great Britain (RSGB). This newsletter is printed about 50 times per year, and it is normally mailed Wednesdays. These newsletters are airmailed to overseas destinations, such as America. If you want information about subscribing to the "DX News-Sheet," you should send your request to RSGB, c/o Tim Charles, G4EZA, Lambda House, Cranborne Road, Potters Bar, Hertfordshire, EN6 3JE, England. The basic cost is a little more than one dollar per issue, including postage. The May 1989 issue of CQ contains information about five other DX newsletters. A free reprint of that article is available to anyone who requests it and furnishes a self-addressed stamped envelope.

#### DX IS!

Hugh Cassidy's (Cass, WA6AUD) excerpts from "The West Coast DX Bulletin" have been published in a book that can be purchased from Charles Allen, W5DV, 1000 North Walnut Avenue, #202, New Braunfels, TX 78230. The price is \$7.50 per copy to U.S. addresses, postpaid. This book is "must" reading for amateurs who are just getting started working DX. Cass was elected to the DX Hall of Fame.

#### DJ9ZB DX World Guide

Franz Langner, DJ9ZB, publishes a 360-page book filled with information that is useful to anyone who works DX. The text is supported by more than 1000 illustrations. The title of this book is *Funk-Technik-Berater*, which is shortened to *FTB*. All material is printed in both German and English. An English-German cross-reference list is included, plus CQ and ITU zone maps, QSL bureau addresses, prefixes cross-reference list, worldwide city locators, and a list that relates lesser-known locations to associated DXCC countries (such as Gan being one of the Maldive Islands).

The bulk of *FTB* consists of a single page on each DXCC country, arranged alphabetically. The country's name, common prefix, and ITU prefix allocation are stated, plus any previous variations of the same information. CQ and ITU zones are listed, plus the country's capital, area, licensing authority, national amateur radio society, and continent.

The order identification is FTB 3, DM

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93535-1802



42. The price is \$25 (U.S.), which includes shipping fees. The address is Franz Langer, P.O. Box 1128, D-7570 Baden-Baden, West Germany, Europe.

### International DX Assn.

If you are interested in promoting DX operation, you should consider joining the International DX Association, Incorporated (INDEXA). Membership cost \$12 (35 IRCs) per year or \$100 (290 IRCs) lifetime. Licensed husband and wife teams can join as lifetime members at \$125 (363 IRCs). Lifetime memberships may be paid in four quarterly installments within one year. INDEXA publishes a newsletter four times per year. The INDEXA net meets on 14236 kHz at 2330 UTC every day, except Wednesday. Listen for VP2MO, N3CBH, KA3HXO, N6AHV, NS6B, W6CNA, and others. INDEXA offers a lapel pin (\$5), rubber stamp (\$5), and T-shirt (\$8 domestic, \$10 DX) to its members. All three items show the INDEXA logo. If you are interested, you should request additional data and an application from Henry R. Denton, KF4NO, INDEXA Secretary, P.O. Box 241345, Charlotte, NC 28224.

### ZL1AMO

Ron Wright, ZL1AMO, sends QSL

cards to confirm contacts he made with the following DX callsigns during the indicated dates. Ron's address is 28 Chorley Avenue, Auckland 8, New Zealand.

|           |                 |
|-----------|-----------------|
| A35EA     | Mar. 1985       |
| A35EA     | Feb.-Mar. 1986  |
| FW0BX     | Oct. 1984       |
| H44RW     | Apr.-May 1981   |
| VK4ANS/LH | July 1981       |
| VK9AB     | Oct. 1987       |
| VK9XI     | Sept.-Oct. 1986 |
| YJ8RW     | Nov.-Dec. 1981  |
| YJ0ARW    | June 1987       |
| ZK1CQ     | Aug. 1979       |
| ZK1CQ     | Apr. 1982       |
| ZK3RW     | Mar. 1986       |
| ZK9RW     | Oct. 1983       |
| ZL1AMO/C  | Mar.-Apr. 1983  |
| ZL7AMO    | May-June 1984   |
| ZL8AMO    | Mar. 1984       |
| ZL9AMO    | Feb. 1988       |
| 3D2RW     | Sept. 1982      |
| 5W1CW     | Nov. 1985       |
| 5W1CW     | Mar.-Apr. 1986  |

### QSL Manager F6AJA

J.M. Duthilleul, F6AJA, is the QSL manager for the DX QSL cards listed in this article for the indicated operating dates. The F6AJA address is 515 rue de Petit Hem, F-59870 Bouvignies, France.

|                              |  |
|------------------------------|--|
| BY1PK (F2JD/<br>Gerard only) | 29 Sept. 1987 (0715-0828Z)                     |
| C31MD                        | CQ WW phone 1984                               |
| FD1HVQ/GLE                   | 16-17 August '85 (Glenan Islands, IOTA EU94)   |
| FF1LQU                       | 1987, WPX code                                 |
| FG0BKZ/FS7                   | Dec. 1981 & Mar.-Apr. 1984                     |
| FG0HVL                       | June 1983                                      |
| FG0HVL/FS                    | June 1983                                      |
| FG0HVM                       | June 1983                                      |
| FG0HVM/FS                    | June 1983                                      |
| FG/F2JD                      | 17-19 Mar. 1989 (Iles des Saintes, IOTA NA114) |
| FJ5BL                        | Jan.-Mar. 1988                                 |
| FJ0A                         | see F6CYV                                      |
| FM0HVL                       | June 1983 & June 1984                          |
| FM0HVM                       | June 1983                                      |
| FP/F2JD                      | Dec. 1986                                      |
| FS9TI                        | see F6CYV                                      |
| FV6NDX                       | 1986 contest                                   |
| FV6NDX/BAT                   | 9-12 Aug. 1986 (Batz Isl., IOTA EU105)         |
| FV6NDX/RE                    | 1-6 July 1986 (RE Isl., IOTA EU32)             |
| FV7NDX                       | 1987 contest                                   |
| FV7NDX/GRA                   | 10-11 Nov. 1987 (Ile Grande, DIFM MA16)        |
| FV7NDX/MAR                   | 12-14 June 1987 (Marcouf Isl., IOTA EU81)      |
| FV7NDX/RE                    | 29 June to 6 July 1987 (RE Isl., IOTA EU32)    |
| FV8NDX                       | 1988 contest                                   |
| FV8NDX/NOI                   | 1-19 Aug. 1988 (Noirmoutier, IOTA EU64)        |



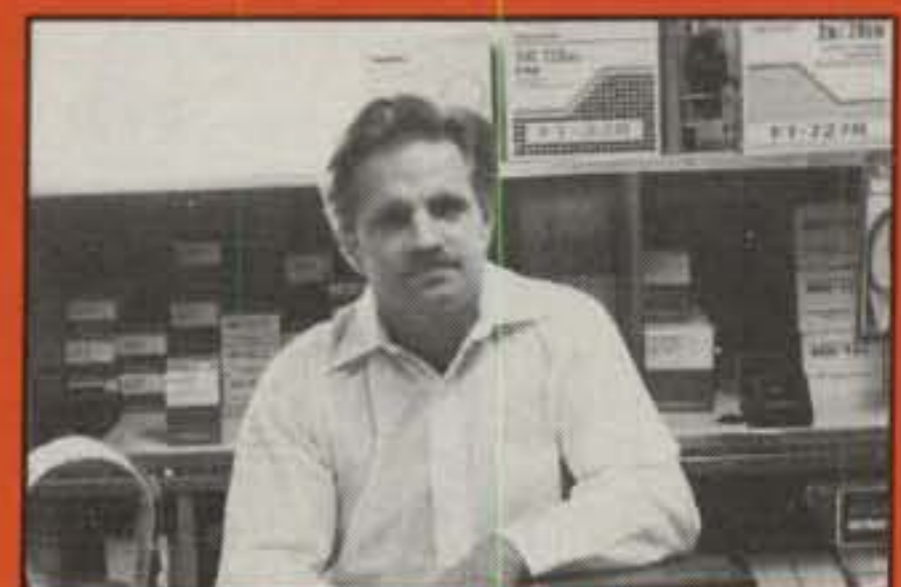
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 FV8NDX/RE 5-20 July 1988 (RE Island, IOTA EU32)  
 FV9NDX 1989 contest  
 FY0HVL June 1983 & June 1984  
 FY0HVM June 1983  
 F2JD/A6 Jan.-Mar. 1988  
 F2JD/J6L Oct. 1988 thru Mar. 1989  
 F2JD/J7 Oct. 1988 thru Mar. 1989  
 F6AXN/MAR 8-9 Mar. 1986 (Marcouf Isl., IOTA EU81)  
 F6BBJ/MAR 8-9 Mar. 1986 (Marcouf Isl., IOTA EU81)  
 F6CWT/MAR 8-9 Mar. 1986 (Marcouf Isl., IOTA EU81)  
 F6CYV using FJ0A, FS9TI (Tintamarre Isl.), TW4O, TW6A (1988 WPX), T5YD, 6O1YD

F6EDF/MAR 8-9 Mar. 1986 (Marcouf Isl., IOTA EU81)  
 F9IE/MAR 8-9 Mar. 1986 (Marcouf Isl., IOTA EU81)  
 J79JD Oct. 1988 to Mar. 1989  
 TG9/F2JD June-July 1988  
 TK5BL/FS 1-2 Jan-Feb. 1987  
 TR8CR 22 July 1987  
 TR8JD 1982-84  
 TR8YL 1982-84  
 TR0AB 14-15 Jan. & 11-12 Feb. 1984 (Banie Isl., IOTA AF43)  
 TW4O see F6CYV  
 TW6A see F6CYV  
 TW7C 1987 WPX Phone  
 TW0A 1987 WPX Phone  
 TW0B 1987 WPX Phone  
 T5YD see F6CYV  
 VP2M/F2JD Oct. 1988 to Mar. 1989  
 3C3CR 10-16 July 1987  
 6O1YD see F6CYV

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Don passed away during 1985, and most of his site is being used as a luxury home division. However, the city of Rancho Palos Verdes took 30,000 square feet of this property as a park to be "devoted to the preservation and perpetuation of the positive influences of amateur radio." The city will only provide a 4500 square foot museum building and site. Everything else must be provided by the Don Wallace Radio Ranch Foundation, Inc. A modern station will be active at the museum, and there are plans to have it used to supplement the ARRL's W1AW transmissions. We must contribute \$300,000 to pay for the interior features before the city will build the museum. Tax-deductible contributions are needed immediately.

Any amateur who makes a donation of at least \$1000 becomes a member of the W6AM Kilowatt Club. The address is 30930 Hawthorne Boulevard, Rancho Palos Verdes, CA 90274. This is a unique opportunity to have an amateur radio museum to be shared with the general public.

## Two-Way Radio License Data

Action Data Processing, Inc. maintains a data base of all two-way radio licenses issued by the FCC. If you have a need for such non-amateur information, you could request a copy of their advertising flyer by writing to 817 Silver Spring Avenue, Silver Spring, MD 20910. Their telephone number is 301-587-0558. License data is available on diskette, computer magnetic tape, computer printout, or mailing labels. Frequency and callsign searches are also available. Chuck Palmer can expedite service.



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| IC-475A/H 25/75w All Modes          | 1399./1599. | Call \$ |
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| TM-621 2m/220, FM, Mobile      | 729.95    | Call \$ |
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## A Simple Approach To The Packet Commands— Part II

It is not my intention to break out each TNC and the commands associated with it. For the most part, these commands, except for the feature commands, are universal. We will cover each definition in the order in which it appears under the designated function group heading. In addition, we will cover only those commands which are directly associated with packet. This is not a command table for AMTOR or other digital modes. We will cover AMTOR in a separate article next month.

For now let's continue with Part II of the "simple approach to the packet commands." Here are the command syntax headings that are divided into seven function groups.

1. Asynchronous Commands
2. Special Character Commands
3. Identification Commands
4. Link Control Commands
5. Monitor Commands
6. Timing Commands
7. Feature Commands

The related commands syntax will be covered under each of the headings along with the function of that command.

### ASYNCHRONOUS COMMANDS

#### 8BITCONV

*Function:* Useful when transferring files or sending control codes that use binary letters and numbers. When this command is set to **ON**, bit seven is allowed to be transmitted in the converse mode.

This command is useful when transmitting control or non-ASCII characters. All eight bits are transmitted from the terminal to the distant station as if the packet controller were in the transparent mode.

If long binary files are to be transmitted to a distant station, the "TRANSPARENT" mode will be more forgiving with file transfers. Terminal parity can be set to none while using the transparent mode.

#### ABAUD

*Function:* This is the common acronym derived from the "AutoBAUD" routine. The ABaud is used to establish the terminal-to-TNC baud rate.

Most of the TAPR II and clones use external DIP switches to set the terminal-to-TNC baud rate. **PLEASE BE SURE THE TNC IS OFF WHEN CHANGING ANY OF THESE DIP SWITCH SETTINGS.**

The AutoBaud begins the search at 300 BPS. In some TNCs it is activated by entering an asterisk (\*) during the auto-baud search routine. The search will display:

"PRESS \* TO SET BAUD RATE"

When this message is displayed, you have about 2 seconds to depress the asterisk (\*). Once you have the baud rate set and your callsign entered, at the cmd: prompt you should type:

AB <space> (baudrate) <enter>

The Hbaud rate represents the "on air" speed (see Hbaud). With the data terminal speeds increasing, it is best to choose a terminal program which will support speeds 1200 BPS and above. The principal reason for doing so is because you may find yourself trying to operate 2400 BPS Hbaud over the air, yet the terminal display is falling behind because the terminal will not display the incoming information as fast as it is being received.

#### AUTOLF

*Function:* Sends linefeed to terminal after carriage return.

When this command(s) is turned on, the TNC will automatically add a linefeed after the carriage return is pressed, or if a carriage return is present in the file being transferred.

#### BKONDEL

*Function:* This command defines the method of character deleting.

When **BKONDEL** is **OFF**, the back slash ( $\frac{3}{4}$ ) will echo to the display or screen when a character is deleted. When **ON**, a backspace-space-backspace is echoed to the display. Many operators leave this command "ON."

#### Echo

*Function:* Allows viewing local keyboard entries.

If local keyboard characters are not appearing on the screen, set this command to **ON**. If double characters appear each time a key is pressed, set this command **OFF**. **Echo** is most often set to **OFF**

when the terminal program has "DU-PLEX" set to **HALF**, and **ON** when "DU-PLEX" is set to **FULL**.

#### SCREEnl

*Function:* The numerical value entered with this command will set the format of the screen width from 0 to 255 letters or characters.

Many terminals display in an 80-column format. Thus, the reason for the default of 80. If your terminal display has fewer than 80 characters, you can format the screen length to match the screen or column width. If your terminal display is automatically formatted or given a line-feed and carriage return, simply set the **SCREENL** to zero (0). This is the case with terminals using MFJXFER, MFJCOM, MFJMULTI.COM, or PACFILE.

#### Flow

*Function:* Prevents incoming (received) packets from interfering with those packets being typed or entered. (NOTE: When using split-screen terminal software, set **FLOW OFF**.)

If this command is **ON**, the local keyboard entries will not be affected by incoming packets. Once a keyboard entry is made, the terminal will stop any display of incoming messages or packets. When text is entered, the terminal will allow the incoming packet(s) to be displayed.

#### PARITY

*Function:* Parity sets the data parity for terminal-to-computer data flow.

The controller will only send serial output with eight databits and one stop bit. By setting the parity, you are defining the disposition of the eighth bit.

#### TRFLOW

*Function:* When **ON**, TRFlow provides software flow control in the transparent mode. The settings of START and STOP determine the type of flow control.

#### TXFLOW

*Function:* Enables hardware flow control when in transparent mode.

When **ON**, the XFlow determines the flow control that is used during the transparent mode. If **FLOW** is **OFF**, software flow control is not used. The XON and XOFF characters are used when XFLO is **ON**.

506 Pheasant Ridge Drive, Warner Robins,  
GA 31088



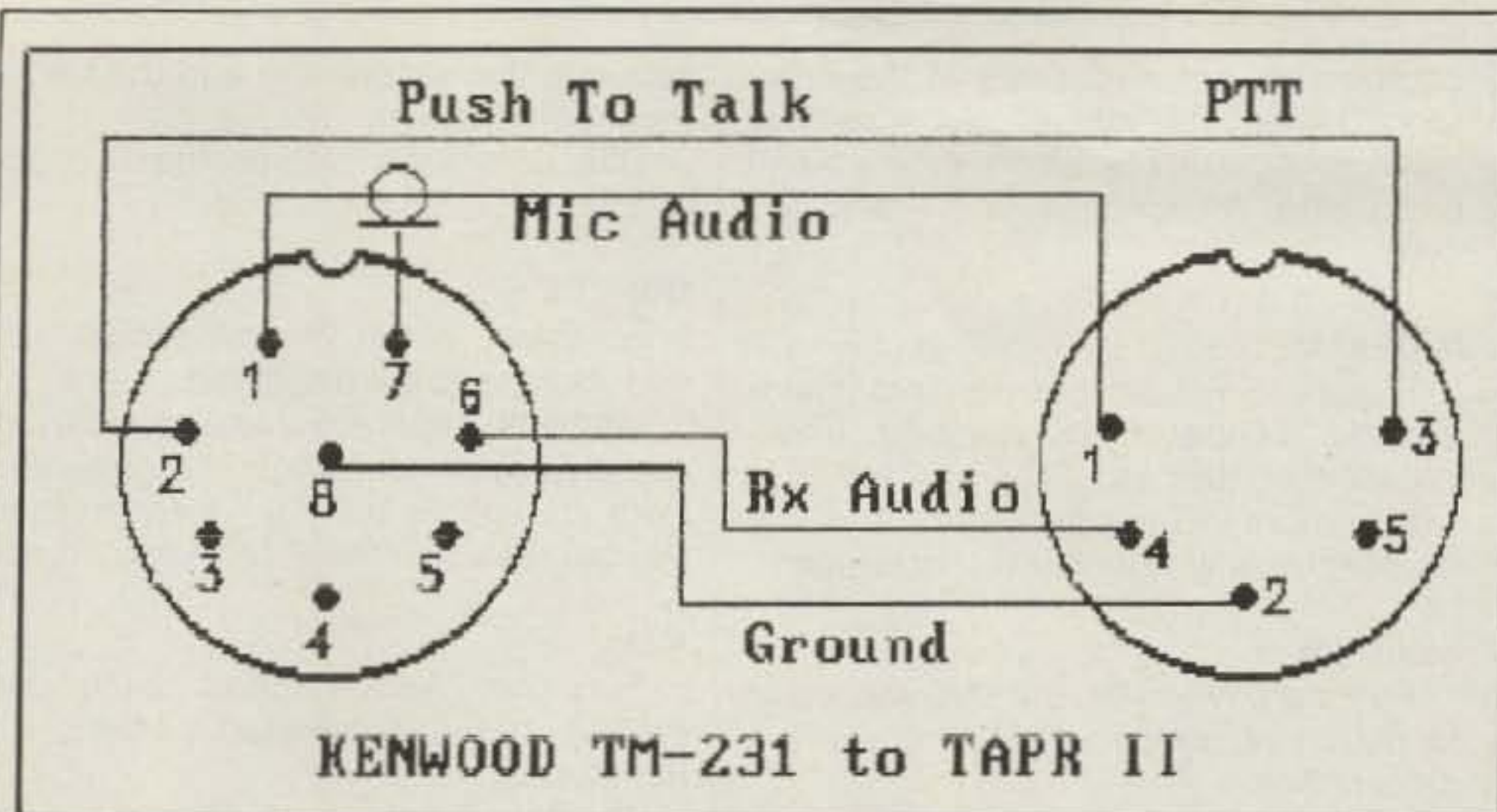


Fig. 1- For the notebook, Kenwood TM-231 to TAPR II or clone.

should be open so no data will be lost when the command is invoked.

## IDENTIFICATION COMMANDS

### BEACON

*Function:* Beacon timing intervals after  $n \times 10$  seconds.

*Options:* **EVERY** & **AFTER**.

A value of zero will turn the beacon **OFF** (not a bad idea, with today's channel congestion). Each increment of one is equal to 10 seconds in most controllers.

Because of overcrowding, beacons are beginning to be frowned on, except when used to make important announcements.

If the option **EVERY** is used (Beacon **EVERY**), then a beacon will be sent  $n \times 10$  seconds. If the option **AFTER** is used (Beacon **AFTER**), the beacon will be sent **ONCE** after the specified interval of no link or digipeat activity.

### MYCALL

*Function:* To install your callsign into the controller for station identity.

The callsign is the first input after you establish communications with the controller. This gives the controller an identity, and establishes a way for other stations to connect to your station.

An SSID from 0 to 15 can be added to the callsign to distinguish between controllers which you may have on other bands or locations.

### MYALIAS

*Function:* Alias callsign for digipeating.

This command is usually used for a shortened callsign for nodes and digipeaters. In most applications, the **myALIAS** will reflect the local airport identifier.

The digi call for MACON, Georgia is MCN, which is the local airport ID for the Macon, Georgia airport. The "myALIAS" for my local digi is ABT8, and reflects a part of my callsign. The alias is either selected to make the digi call easy to remember, or for the geographical location.

### HID

*Function:* Issues an ID every 9.5 minutes when digipeating.

When **ON**, an identification packet is sent every 9.5 minutes if the station is in use as a digipeater, and provided that packets are being digipeated through your station. If the **HID** is **OFF**, then the IDs will not be sent regardless of use. The command "**ALIAS**" should be **ON** to be useful.

## LINK CONTROL COMMANDS

### AX25L2V2

*Function:* This command provides compatibility between the older version of AX.25 and the new level 2 of the AX.25 protocol.

When **ON**, the TNC will automatically

### XFLOW

*Function:* Enables software flow control for converse mode, when **ON**.

When **XFLOW** is **ON**, the terminal should respond to the flow control characters that are entered as **XON** and **XOFF**. When the **XFLOW** is **OFF**, the controller will respond to hardware flow control only—e.g., **CTS** and **RTS**.

## SPECIAL CHARACTER COMMANDS

### CANLINE

*Function:* As defaulted, it is **CTRL-X**, and with this action the current line being typed in will be canceled.

This command character can be changed by entering a new command character following the **CANLINE** command. This command is not often changed, and is usually left as defaulted.

### COMMAND

*Function:* **CTRL-C** which is used to return to the command mode from the converse or transparent mode.

Since all references are made to the **CONTROL C**, it is good to leave the default character as is.

### CANPAC

*Function:* The **CTRL-Y** cancels a packet or a terminal output from the buffer.

This character function is executed from the command mode.

### DELETE

*Function:* Back space character.

Issues a backspace when the — "back space" key is depressed.

### SENDPAC

*Function:* Carriage return will cause packet to be sent.

The default character should be used, since HEX \$0D is the Carriage Return. This allows a packet to be formed and sent each time the carriage return is pressed in the converse mode.

### START

*Function:* **CTRL-Q** restarts printing after **CTRL-S**.

This control character will restart display or printing of incoming packets after they are halted by a **CTRL-S**. **CTRL-S** is the stop character.

### STOP

*Function:* **CTRL-S** will stop output to the screen or printer.

Sometimes used with software handshaking, this command is most often used to hold the packets in the TNC buffer while the terminal or computer is off-line doing other tasks. The buffer of the terminal or computer should be open when the start character (usually **CTRL-Q**) is invoked following the return of the computer to packet operation. Otherwise, all data will be scrolled off the screen and lost.

### STREAMSW

*Function:* This command selects the character to be used in switching between streams or ports of the controller.

The selected character can be passed in the converse mode and will be ignored in the transparent mode and will continue through the controller as data. If you wish to change streams while in the transparent mode, you must return to the command mode to do so.

### XOFF

*Function:* The **XOFF** command will stop data flow from the controller.

This command is used to stop packets from the controller to the terminal or computer. The start character will resume data flow.

### XON

*Function:* **CTRL-Q** restarts terminal data flow.

When the **CONTROL Q** is enabled, the controller to terminal data flow will resume. The computer or terminal buffer



adapt to the version being used by a connecting station. Most packet controllers allow digipeating using AX.25, level 2 and version 2.

#### CONOK

*Function:* Defaulted **ON**, the TNC will automatically acknowledge a connect request.

If the **CONOK** is turned **OFF**, connect requests from other stations will not be acknowledged and a DM (disconnect message/busy) will be sent to the requesting station. A message "connect request from XXXXX" will be output to the terminal.

#### CONMODE

*Function:* This command determines the mode your controller will be in, following a connect.

This command selects the mode of the TNC if the **NOmode** command is **OFF**. When **ON**, the controller will automatically enter the converse or transparent mode. This will depend on the setting of the command, either **CONVERSE** or **TRANSPARENT**.

#### CONVERSE

*Function:* Sets the packet controller into converse mode, when connected.

Converse has no default. It is an immediate command. By typing a **K** or **CONV** at the cmd: prompt, the controller will go to the **CONVERSE** mode. Once in the **CONVERSE** mode, a carriage return will force a packet to be sent.

#### TRANSPARENT

*Function:* To enter the transparent mode.

The transparent mode allows the sending and receiving of binary and control characters without affecting the operation of the controller. Some control characters will lock up the controller if sent in the **CONVERSE** mode. This problem is alleviated when in the **TRANSPARENT** mode.

#### DIGIPEAT

*Function:* Default **ON** allows digipeating by other stations.

This is part of the foundation of packet radio. The ability to store and forward packets and communicate over long distances is what packet is based upon.

The **DIGIPEAT** command is defaulted **ON**, which allows your station to be used as a relay or digital repeater (digipeater). By using several stations to "digipeat" via, we are able to send data over long paths, even at VHF and UHF frequencies.

Each station listed in the digipeat or via list will be used as a "stepping stone" to the next station until the packet has made its journey. Up to eight stations may be included in the list.

Many digipeaters are located on high hills, buildings, and mountains, but most "digis" are located in our ham shack. A

computer is not necessary at the unattended digipeater site, except when it is being configured or maintenance is being performed. A digipeater is a "simplex" system.

#### MAXFRAME

*Function:* Establishes the maximum allowed number of outstanding, unacknowledged frames.

Maximum value is between 1 and 7. A frame is usually 128 characters in length.

#### NEWMODE

*Function:* When **ON**, the TNC will return to command mode when it receives a disconnect.

When **ON**, the TNC will return to command mode when it receives a disconnect. If more than one connect exists, the controller will return to the command mode only if it is on the selected stream of the disconnect.

#### RETRY

*Function:* Retry may be set to n times. n = 0 to 15, with 0 being infinite tries. Default is 15.

FRAMES are transmitted n times before a "retried out" occurs. The time between tries is determined by FRack.

#### USERS

*Function:* **USERS** is used to determine the number of streams that can allow a connect.

This command may be given any value between 0 and 26. This value specifies the number of streams that are available for connects. If **USERS** is set to 3, then a connect request will connect to the lowest available channel/stream A, B, or C. If all three streams are busy, then a <DM> packet will be issued to the requesting station.

A "connect request" and callsign of the requesting station will appear on the screen of the terminal.

#### MONITOR COMMANDS

##### HEADERLN

*Function:* To insert a carriage return

between the header line and the text of monitored packets.

This command causes the text and header line to be separated.

#### MONITOR

*Function:* When **ON**, all packet data and addresses are displayed.

When **ON**, all packet data and addresses are displayed. Callsigns are separated from the text by the ">" (greater than) symbol. See also the **MC ON** command.

#### MALL

*Function:* As defaulted, both connected and unconnected packets are monitored.

The **MALL** command determines the category of monitored packets. This is the setting used if you wish to communicate as a group. The **MALL** command is also handy for running some types of diagnostics.

#### MCON

*Function:* **MCON OFF**, the controller will monitor only connected stations in the connected state.

To monitor packets from stations other than the station you are connected to, set **MCon ON**. This command is active when connected.

#### MCOM

*Function:* When **ON**, this command will allow monitoring of all frame control sequences and numbering.

This command is active when the **MONITOR** command is **ON**. This command will allow monitoring of all frame control sequences and numbering such as <I> frames, unnumbered information frames <UI>, disconnects <D>, unnumbered acknowledge <UA>, disconnect messages <DM>, and connect requests <C>.

#### MRPT

*Function:* This command displays the calls from the origination and destination station in the monitor mode.

When **ON**, all paths to and from originating or destination stations will be dis-

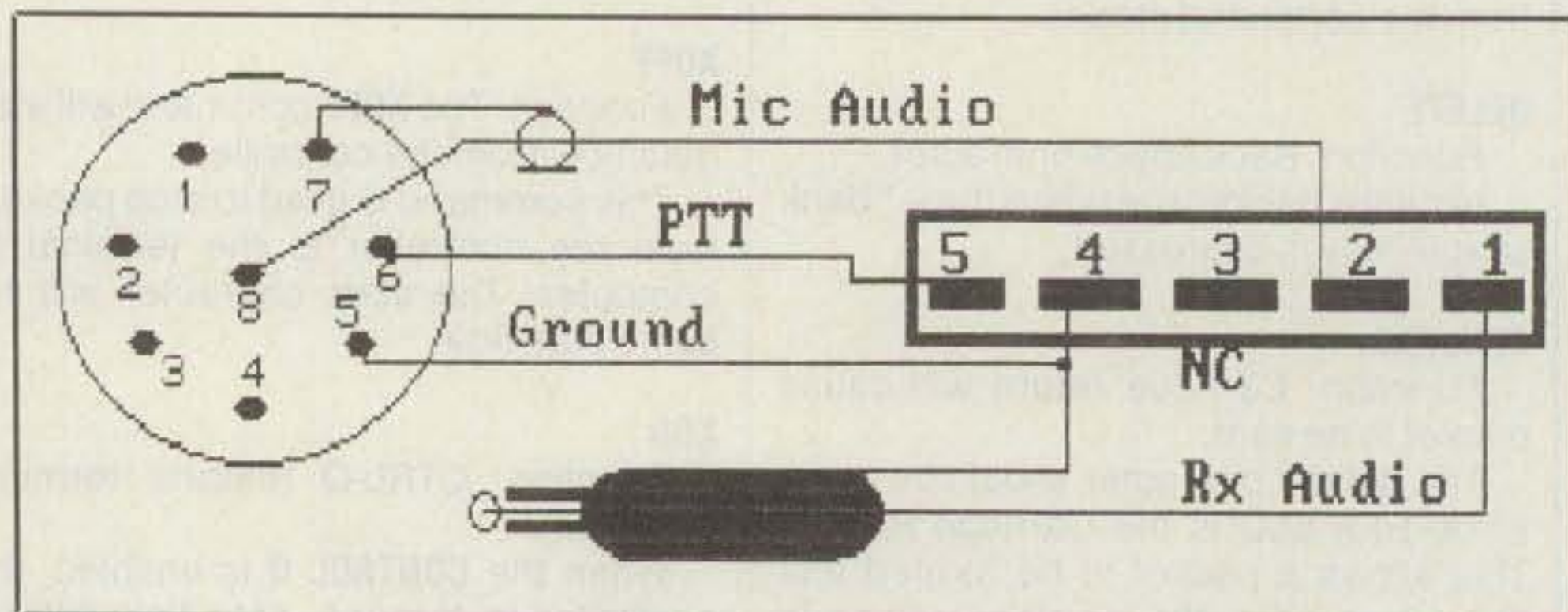


Fig. 2- AEA PK-232 to Yaesu 757GXII, for the notebook.



played. When this command is **OFF** it will display only the calls from the origination and destination stations. The **MONitor** command should be **ON**.

## TIMING COMMANDS

### AXDELAY

*Function:* **AXDelay** is the period the controller will wait in addition to the time set by the **TXDelay**.

This command is time in addition to the **TXDelay** setting. **AXDelay** is used in conjunction with voice repeaters which are used to pass packet data.

This command is most often used when slow relay switching of voice repeaters is employed for use with packet.

### AXHANG

*Function:* Specify the necessary "HANG TIME" of voice repeater which is used in packet service.

If the repeater squelch tail is long, it is not necessary to wait **AXDelay** time after keying the transmitter if the transmitter is still transmitting.

### CHECK

*Function:* To set the period before checking for connection or timeout.

Where  $n = 0$ ,  $n$  may be set any value between 0 and 30, with each increment specifying 10 second intervals. When  $n$  is set to a number larger than zero, a periodic "check" packet will be sent to the connected station to ensure connectivity. If no response, a time-out and disconnect will occur.

### CMDDTIME

*Function:* Used to set the "transparent" escape time interval.

**CMDDTIME** may be configured to any value from 1 to 15, with each increment being 1 second. The escape characters must be entered three times, within

**CMDDTIME** of each other to enter the command mode from the transparent mode. A guard time of **CMDDTIME** is added after the last escape character entry is made. Any entry during this latter **CMDDTIME** will abort the escape to command mode.

### DWAIT

*Function:* Used to set the period after a packet is heard on the channel before keying the transmitter.

Where  $n = 0$  to 255 in 10 millisecond intervals, **DWait** can be set to wait  $n * 10$ ms after hearing the last packet activity on the channel.

### FRACK

*Function:* The period to wait for ACK, after transmitting.

Where  $n = 1$  to 15 in 1 second intervals. The controller will wait "FRack" seconds before transmitting again. If the number of tries are exceeded as speci-

fied in "REtry," the operation is aborted. Abbreviation of "FRame ACKnowledge."

### HBAUD

*Function:* This command establishes the actual baud rate setting for the on-the-air, "station to station" communications.

This is the actual baud rate setting for the on-the-air, "station to station" communications. This baud rate has no relation to the terminal-to-TNC baud rate. The **Hbaud** is selective since we are restricted for some unclear reasons to 300 baud on frequencies below 28 MHz.

This is the reason the packet hobby is more popular on the VHF frequencies. 1200 baud was the popular speed to use above 28 MHz. However, 2400 BPS is rapidly becoming the buzz-word for VHF and UHF packet operation.

### RESPTIME

*Function:* Sets the delay period in 100 ms intervals before keying the transmitter to send an acknowledgement.

The number specified for **RESPTIME** may be set between 0 and 255, with each increment representing 100 milliseconds. This setting then becomes the "minimum" delay period before an acknowledgement packet is sent.

This command may run concurrent with **DWait** and other random delays which are in effect.

### TXDELAY

*Function:* Sets the period between actual transmitter turn-on (PTT activate) and the beginning of data flow.

The **TXDelay** command tells your controller how long to wait (in  $n * 10$  milliseconds) after keying the transmitter, before it begins sending valid data. Below I have listed some **TXDelay** settings for various types of packet stations and radios.

Crystal-controlled radios with diode switching, **TXD 28**.

Synthesized radios, **TXD 35**.

Radios with electro-mechanical relay, **TXD 45**.

Radios with external power amplifier, **TXD 55**.

## FEATURE COMMANDS

### CTEXT

*Function:* This command is used to enter connect text. To activate, set **CMSG ON**.

Connect text may be entered as any combination of letters and numbers. The connect text can be used to give directions, announcements, or instructions—e.g., Buck is not here at the moment; you may leave a message in the K4ABT mailbox.

### MHEARD

*Function:* This command is used to view a list of the 15 or more most recent stations that were heard by your station. The command is issued by you, from the command mode, and displayed on your terminal.

The **MHeard** command is issued at the command prompt to display the most recent stations heard by your station.

There are other commands not covered here that are of equal importance to those just covered. Time and space do not permit expanding on all TNC commands. As I mentioned last month in Part I, there are some controllers with special commands that number well over 200.

Because of limited space, I elected to cover only the "cream" of the packet commands, and these are the ones we have just studied. As time goes on and you become more proficient with your TNC, you will no longer need to study these commands, but for now, keep this issue of the "Packet User's Notebook" nearby for ready reference.

Until next month, Happy Packeting!

73, de Buck4ABT

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A LOOK AT THE SHACK FROM BOTH ENDS OF THE COAX

## From the Mailbag—Part II

Last month we unzipped the mailbag for some reader comments on a variety of familiar antenna subjects—the G5RV, T2FD, EDZ, and limited-space antennas. We also noted several books worthy of addition to the well-appointed hamshack bookshelf, and we examined several software items of interest: EZCODE, ProComm Plus, DX Window, and Skycom. We also shared some thoughts on the merits of QRP (low power) operation.

This month it's back to the mailbag. Let's dig in, focusing this month on a difficult subject: deed restrictions on your property that may adversely affect your enjoyment of amateur radio.

### From the W8FX Mailbag

In last December's column we ran a short commentary on the touchy subject of real-estate deed restrictions. As we noted then many amateurs have found such restrictions on their homes to be a sad fact of life, especially in new home subdivisions. As they've found, often belatedly, many subdivisions, especially those featuring higher-priced homes, have restrictions placed by real-estate developers or homeowners' associations that forbid certain things, including some or all outdoor antennas.

Deed restrictions are contained in a document recorded when your tract is built. They may impose limitations on how you can use your property, intending to protect the neighborhood by requiring all property owners to meet various minimum requirements. The covenants are a real blow against the amateur who, as a result, may not be able to use his own property for installation of even a very modest "antenna farm."

Today not only single-family homes are affected by the restrictive covenants, but more and more townhouses, duplexes, condominiums, retirement communities, and apartments are placing restrictions on the aesthetic appearance of their buildings.

These restrictions promise to become an even greater problem than restrictions on antennas by local governments. Little can be done, it seems, since the FCC's prohibition of excessive local governmental restrictions on antennas doesn't seem to apply in private home sale situations. The ARRL is trying to persuade builders not to ban antennas outright—a difficult task—and the FCC may or may not take an interest in the thorny problem.

**K3SRO's Deed Restriction Fight.** Robert N. Wilderman, K3SRO, has been the route on this problem, and his experience is sobering. In response to the December column Bob wrote us a lengthy letter along with several legal documents. In his view now is the time for amateurs with the help of the ARRL and the FCC to pass legislation to prevent builders from plac-

ing unreasonable restrictions and bans on antennas.

Extracting from Bob's letter, "Your article has touched on a very important but little talked-about subject. Deed restrictions are becoming a real threat to hams everywhere in the United States: it is no longer limited to any one particular geographical location."

Bob had a very personal experience with the problem which ultimately resulted in a court order to remove his 50 foot tower from his property. He was sued not by neighbors, but rather by a local real-estate developer to take down his tower and tribander, even though he had an approved building permit for the antenna from the township in which he lived!

In Bob's case, which occurred in the early 1980s, the developer chose to enforce a covenant (deed restriction) which required that "no . . . tower, pole, or antenna . . . be erected on any lot [that] protrude(s) more than 15 feet above the highest part of said roof structure." In his legal defense, Bob asserted that his situation was a "selective enforcement" by the developer, who allegedly ignored numerous other neighborhood covenant violations such as flagpoles and basketball supports. While Bob ultimately lost his case, he was nevertheless one of the "lucky amateurs" who was still allowed to place his antenna on the roof of his home or a building, as long as it conformed to the covenants.

Bob's message is that you shouldn't worry

only about zoning ordinances and building permits when installing an antenna system. You need to carefully check your deed and title to your land to see if there are any protective covenants that might affect your tower or antenna installation. These restrictions, which may be a part of the land and deed for up to 25 years (and renewable by residents of your housing development) should be found in the title search when you buy your home.

Checking first is especially important, since when you close on your house, you're given constructive notice that the covenants exist. Thus, you effectively waive some of your civil rights, such as freedom to use your own property as you see fit, and freedom of speech, when you sign on the dotted line. Violation of any one or more of the covenants could result in litigation against you similar to that experienced by Bob, which required him to expend large sums to fight a proceeding that sought nothing less than his having to dismantle his prized antenna system.

Bob notes that he recently has looked for homes without such restrictions in his area of southeastern Pennsylvania, where the average cost of homes is pushing into the \$200,000 region, and he's not found a single home development that will allow amateur-radio-type towers or antennas on the ground or on the roof.

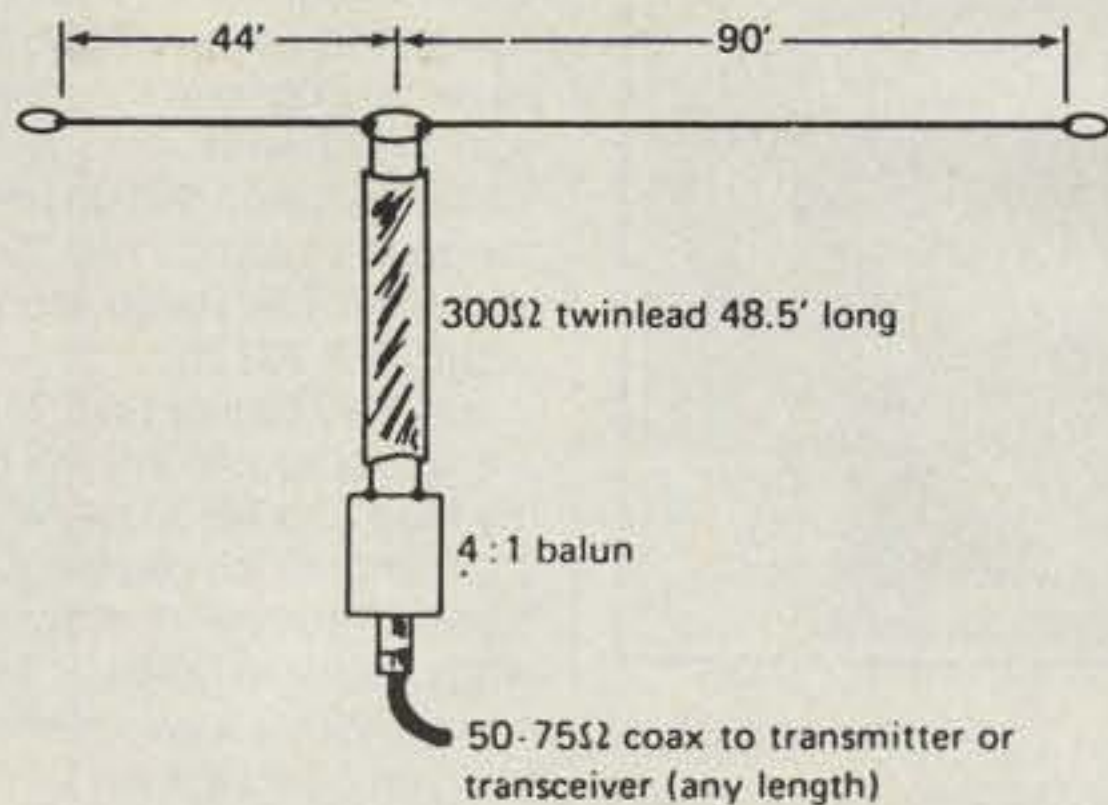
**More on Deed Restrictions de WA2FXE.** George Hamilton, Jr., WA2FXE, told us that while visiting friends on Florida's west coast, he visited



The cat's out of the bag now with Bob Branch, K7KI's sneaky twin-flagpole phased HF verticals. Bob says that deed restrictions aren't all that bad. (Photo courtesy K7KI)

317 Poplar Drive, Millbrook, AL 36054





(A) FLATTOP AND FEEDING ARRANGEMENTS

Typical VSWR vs. Frequency (mHz) for grove dipole.

|       |     |     |     |     |     |     |     |     |     |     |     |     |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Freq. | 1.8 | 1.9 | 3.5 | 3.6 | 3.7 | 3.8 | 3.9 | 4.0 | 7.0 | 7.1 | 7.2 | 7.3 |
| VSWR  | 2.5 | 2.5 | 1.3 | 1.4 | 1.3 | 1.3 | 1.4 | 1.3 | 1.5 | 1.2 | 1.1 | 1.1 |

|       |      |      |      |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|------|------|------|
| Freq. | 14.0 | 14.2 | 14.3 | 21.0 | 21.2 | 21.4 | 28.0 | 28.5 | 29.0 | 29.5 |
| VSWR  | 2.7  | 2.4  | 2.0  | 3.5  | 1.8  | 1.2  | 3.0  | 1.8  | 2.5  | 1.9  |

(B) SWR PROFILE, BY BAND

Fig. 1- The modified Windom here was designed and built by Bob Grove, WA4PYQ, and described in *The Monitoring Times* of May-June 1983. It is designed to give a good account of itself on 80, 40, 20, 15, and 10 meters, with 160 tossed in as a bonus.

several newer communities and found that deed restrictions were quite prevalent; they even affected his host's home. While some property changes and additions typically are allowed, the basic rule seems to be to forbid anything—such as certain fences, vehicles, signs, or structures—that might distort the development's overall attractive and uniform, pristine appearance.

George sent us a newspaper clipping that detailed the case of a New Port Richey amateur who was ordered by a judge to remove his antenna from the rear of his home to comply with his development's deed restrictions, covenants that were being aggressively enforced against him by the local homeowners' association.

At issue was a 22 foot vertical antenna that ran up the back of his home and rose about 4 feet above it. Interestingly, the amateur's deed restrictions didn't specifically prohibit antennas, unless the antenna might be considered a structure or exterior addition. The amateur and his lawyer argued that the antenna wasn't a clear-cut violation, but the association singled out the amateur for prosecution. This was done even though there was no neighborhood RFI from his station; other possibly "infringing structures," such as flagpoles, were ignored.

**Another View de KJ7I.** Bob Branch, KJ7I, notes that he too is burdened by deed restrictions in his Arizona development. While these restrictions prohibit all above-ground wiring and antennas, he's found a way around them. Apparently flagpoles are okay in his tract, so he's re-defined his antennas to be flagpoles.

Bob says he installed a phased vertical antenna, a Western Electronics model, made up to do double duty as dual flagpoles. Bob enclosed a color photo that shows twin flags flying proudly over his verticals. Says Bob, "All the neighbors like my flags proudly waving in the breeze!"

What can be done about such restrictions? Probably not much, since you can't usually decline to accept the restrictions and still get the house or condo you want to buy, or move into the apartment that's otherwise "just right." However, on rare occasions a developer may waive the restrictions to make a sale or a homeowners' association may make a concession. However, neighbors can still sue to enforce the rules, making it likely that the amateur who installs his antennas under such conditions may not be able to keep them up for good.

Probably all you can do is search for a home in an older area where the deed restrictions are minimal or nonexistent. As several readers have pointed out, an active amateur purchasing a home in an area that has aggressively enforced restrictions is asking for some big-time headaches.

At the bottom line, look before you leap!

**Modified Windom Results de WB4M.** In the March column we passed on construction details of a modified Windom design by Bob Grove, WA4PYQ, described in *The Monitoring Times* of May-June 1983. It's similar to the currently popular "Carolina Windom."

In the basic Windom design, the antenna is simply a half-wave flat-top at the lowest operating frequency which is fed at a point about 15% from the center with a singlewire feeder of convenient length. Modern versions substitute 300-600 ohm twinlead, openwire line, or ladderline for the original singlewire feeder.

The Windom promotes a fairly acceptable match to parallel conductor feedline on all even harmonically related bands, such as 80, 40, 20, and 10 meters. However, the Windom doesn't do much for someone who wants to operate on 15 meters, since the even harmonic relationship isn't there on 15.

One solution WA4PYQ proposed, after doing considerable pruning and on-the-air test-

ing, was the modified design shown in fig. 1. It makes use of a 134 foot flat-top which is fed through a short length of 300 ohm twinlead and a 4:1 balun transformer. Coaxial cable of any convenient length is used for the main run to the hamshack. Bob also found that he could get acceptable results on 160 meters with the antenna as shown.

"Buddy" Ashley, WB4M, reported that he built the antenna essentially as described in the March column, using an unpruned 50 foot length of RG-8 coax between the transceiver and the 4:1 balun. He tried it both as an inverted Vee and as a slightly sloping dipole, the latter configuration being dictated by his tower height and location in relation to other available supports which prevented him from getting the flat-top perfectly horizontal. Bob reports good all-around results with both versions, though with some variation in SWR depending on the exact positioning of the antenna legs.

Though many readers have reported good results with the Windom, be aware of the inherently "unbalanced" nature of the antenna, which the balun may not be able to correct and which may even introduce some oddball loading situations on some bands. Don't be surprised if you need to prune the coax length or use an antenna tuner to get your solid-state transceiver to transfer power to the antenna on certain bands.

## Antenna Potpourri

**AAE Quads.** Alabama Amateur Electronics offers a new cubical quad, a 6-element model for 2 meter operation. Claimed gain is over 12 dBd, with a front-to-back ratio of more than 24 dB and a beamwidth of plus or minus 4 degrees. The 50 ohm quad has a boom length of 5 feet, a very short turning radius of 32.5 inches, and a weight of 4 lbs. Usable bandwidth is said to be from 144-148 MHz, with typical SWR less than 1.2:1. The lightweight antenna makes use of fiberglass spreaders and boom and 14-gauge insulated stranded wire for the elements.

Not a kit, AAE boasts tool-free installation and an average initial setup time of 45 minutes. The Q-144-6 antenna (fig. 2) is priced at \$89.95; a similar 3-element model, the Q-144-3, is \$49.95. For more information contact Jay Ross, AB4MX, Bill Levey, WA4FAT, or George Boyd, N4NIV, at Alabama Amateur Electronics, 3164 Cahaba Heights Rd., Birmingham, AL 35243.

**Which Cable?** In another amateur publication, a reader brings attention to the fact that with some coax, such as the popular low-loss foam RG-8X cable, coax feeding of some multiband antennas such as the G5RV can cause problems. This is because on some bands the G5RV becomes a voltage-fed antenna, even when a matching stub and balun are used. As a result, SWR is high and resultant high voltages on the coax can cause it to be damaged. RG-8X has a maximum RMS voltage rating of around 300 volts.

Interestingly, a better choice under such conditions, at least for short runs and low power, may be the higher loss but higher voltage rated (1900V RMS) RG-58 or heavy-duty cables such as RG-8 or RG-213 (both with 5,000 volt ratings). But don't use a foam version of RG-8, which has much lower RMS voltage ratings in the 600 volt region.

**New Radio Works Baluns.** Jim Thompson, W4THU, of The Radio Works, sent us a note



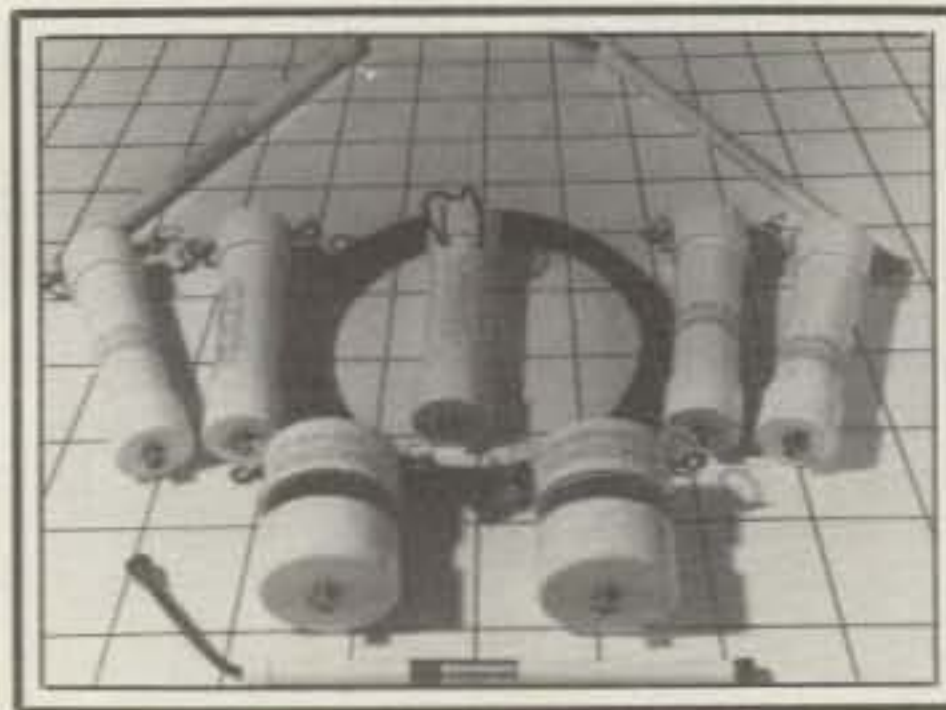
about the high-power baluns he's added to his product line. Although Jim's line focuses on the antennas themselves, he sells an extensive array of baluns, ten at least count, for a variety of applications.

According to Jim, he has three high-power models with 4:1 ratios. The B4-1.5K is a general-purpose, saturation-resistant 80-10 meter ferrite core balun; next up the line is the B4-2K, a wideband L-C compensated ferrite-toroid balun. A third model, the B4-2KX, is a twin toroid core, L-C compensated "current-type" © or "I-Balun" © that is said to achieve unusually good output balance along with a very wide operating bandwidth.

There are five models in the 1:1 balun line, all of the current type. The three C-series baluns (C1-2K, C75-2K, and C75-4K models) are designed for retrofit applications in wire antennas and beams from 160 through 10 meters. Bob notes that the latter two are 75 ohm models, made specifically for use with the matching sections commonly found in delta-loop and cubical-quad designs. The C1-2K is suitable to replace the "coil of coax" choke balun used with some beams. Two other 1:1 models are available, the 50 ohm B1-2K and B1-4K, current-type baluns with very large, saturation-resistant ferrite cores. (The B-series baluns are filled with foam to keep the weather out, while the C-series models are fully potted with a plastic filler.)

Bob offers two special purpose models, the RemoteBalun © and a Line Isolator ©. The current-type, twin-core 1:4 Remote Balun facilitates getting openwire or ladderline into the hamshack. It is mounted outside, where it is connected to the parallel line to the antenna; a short length of low-loss coax connects the balun to the station transmatch. The 4K-LI Line Isolator is a special-purpose current-type balun designed to be located near the transmitter and intended to help prevent problems from RF feedback in the shack. It is designed to be used with transmatches that do not accommodate balanced feedlines.

According to Bob, the chief advantage of the current-type balun is its tolerance to load imbalance and variations. Conventional baluns tend to be adversely affected by variations



A sampling of the wide variety of baluns offered by Jim Thompson, W4THU, of The Radio Works. Ten models, all for HF use, complete the line. (Photo courtesy The Radio Works)

in load impedance and balance, often resulting in decreased system balance, increased losses, and relatively poor line isolation. The current-type baluns are said to be capable of maintaining system balance even under less-than-ideal conditions.

A glance at Bob's catalog also shows that he's added several new antennas, including two new versions of the Carolina Windom ©, a



Here's a close-up of MFJ's new MFJ-264 UHF/VHF/HF 1.5 KW compact dry dummy load which is described in the text. It's said to be usable as high as 750 MHz. (Photo courtesy MFJ Enterprises, Inc.)

$\frac{1}{2}$ -wavelength loop, a couple of novel wire verticals, and several SWL antennas. Bob's 55-page catalog is an antenna experimenter's delight filled with lots of interesting antenna ideas; his balun design philosophy also makes for good reading. The \$2.00 catalog is available from The Radio Works, Box 6159, Portsmouth, VA 23703.

**New MFJ Dummy Load.** MFJ has come up with a neat-appearing 1.5 KW compact "dry" dummy load, the MFJ-264, which retails for about \$110 and which can be used up to 650 MHz or higher. The new dummy is said to handle 100 watts for 10 minutes or 1500 watts for 10 seconds. SWR is low—claimed to be 1.1:1 at 30 MHz and below 1.3:1 at 650 MHz, though it's usable up to 750 MHz.

For more information, contact MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762.

## Software Topix

**Yagi Design.** John Devoldere, ON4UN/AA4OI, who is well known for his book *Low Band DXing* (published by the ARRL in 1987) sent us a copy of his new antenna design program, Yagi Design, for the IBM PC and compatibles.

In writing to us, John decries the fact that popular Yagi handbooks publish dimensions of Yagis that ignore or downplay element diameters and other physical parameters, and which as a result cause actual performance (maximum gain and front-to-back or F/B ratio) to shift way off the intended design frequency. He also cites the fact that most commercially available Yagis also are compromise designs, and that many amateurs look incorrectly to SWR measures as the sole gauge of antenna performance.

As John notes, before computer programs were used to design Yagis, they were often optimized by the cut-and-try method to produce good SWR and F/B bandwidth, particularly since SWR and the F/B ratio were much easier to measure than forward gain. As a result, many manufacturers produced Yagis that were excellent performers only in those areas where performance could be measured by most amateurs, such as SWR.

Later, when the first computer antenna design programs came about, engineers usually modeled on a single "spot" frequency, with little attention being given to bandwidth aspects—the behavior of the antenna off the design frequency. More recently, with faster computers and better modeling algorithms such as MININEC, more attention is being given to bandwidth aspects.

Putting all this together, John, along with Roger Vermet, ON6WU, wrote Yagi Design to tackle the problem of achieving successful Yagi performance, taking into account bandwidth and practical mechanical considerations. Holding the view that building a good performing Yagi is neither black magic nor a secret art, at the heart of the program is an exhaustive database containing over 100 different Yagi designs ranging from two to six elements. These generic designs have been modeled with various well-proven modeling programs and verified on full- or small-scale models.

The program takes you through all the steps necessary for Yagi design, starting with making a selection from the antenna database and continuing all the way to determining the re-

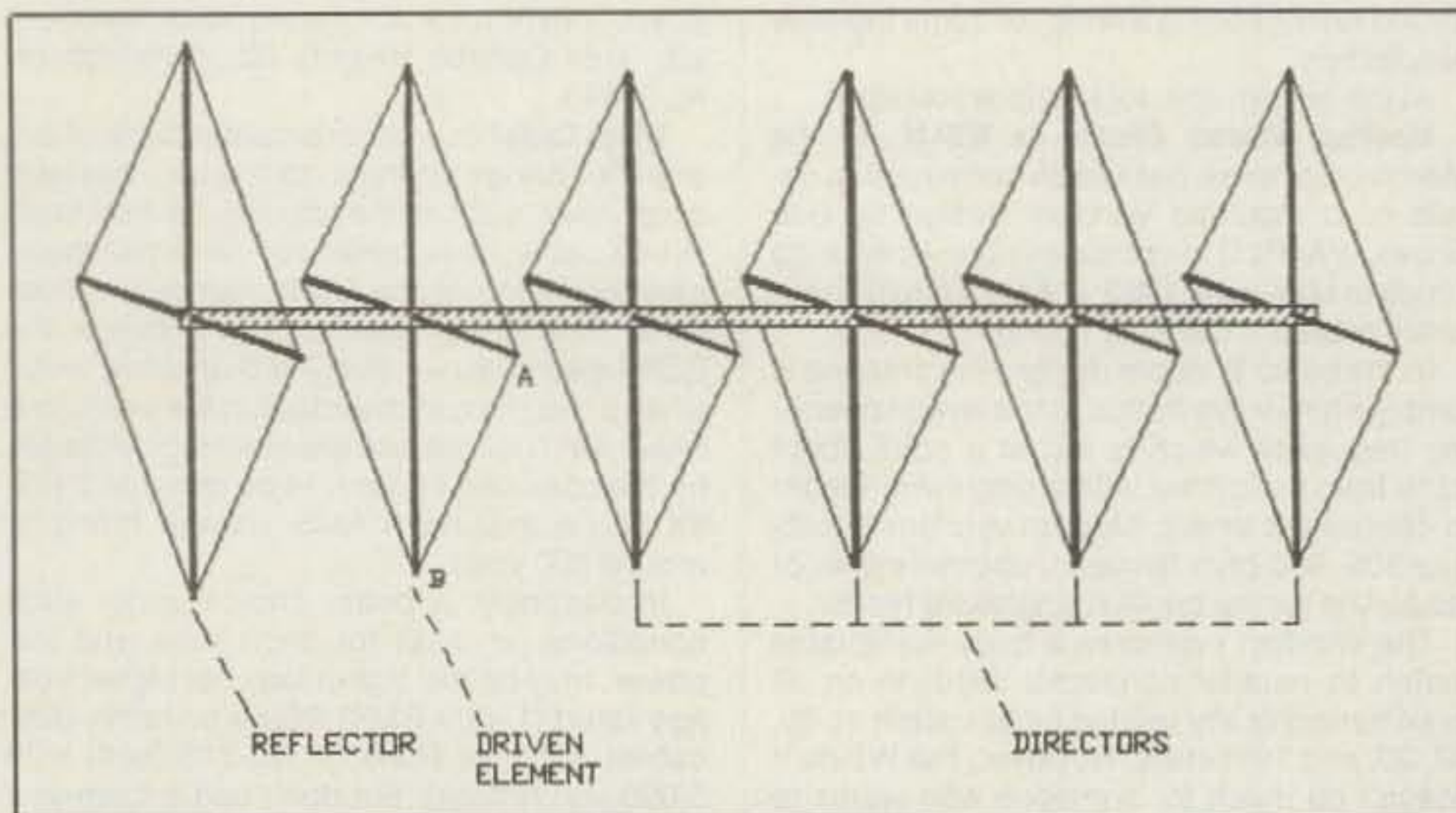


Fig. 2—Shown here is a sketch of the Q-144-6 six-element, 2 meter quad offered by Alabama Amateur Electronics. Forward gain greater than 12 dBd and a F/B ratio of over 24 dB are claimed. HF quads should also be available by the time you read this.



YAGI DESIGN

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ed. 890601

1. READ/PRINT INTRODUCTION.
  2. PRINT DATA BASE.
  3. ANALYSE DATA BASE.
  4. SELECT DESIGN.
  5. CONVERT WAVELENGTHS TO DIMENSIONS.
  6. ELEMENT TAPER.
  7. MATCHING SYSTEMS.
  8. CONVERTING DIMENSIONS.
  9. CONVERT TAPERED ELEMENTS.
  10. WIND AREA YAGI.
  11. ELEMENT STRENGTH.
  12. MAST CALCULATION.
  13. FEEDLINE ANALYSIS.
  14. OPTIMIZE GAMMA/OMEGA.
  15. MECHANICAL YAGI BALANCE.
  16. YAGI WAVE-ANGLE (SINGLE AND STACK).
- ?
0. QUIT.  
 ENTER YOUR CHOICE

Fig. 3- Shown here is a "screen dump" of the ON4UN IBM PC Yagi Design program's main menu. The 14 menu choices offer a wide range of electrical and mechanical design options.

quired mechanical strength of the elements and the supporting mast. Virtually every electrical and mechanical design aspect is covered in considerable detail.

The package is intended to solve often-ignored design problems such as element taper and element-to-boom clamp configuration; structural strength and wind/ice loading; overall mechanical "balance"; antenna matching (Gamma, Omega, and Delta); required strength of the antenna mast; feedline analysis (focusing on loss and SWR); element length conversion for frequency scaling; radiation angle; and more. A full-fledged Smith chart routine and several utilities are included.

The program's 100-Yagi database is especially noteworthy, as it contains all of the critical dimensional and performance data. There is a choice for almost any antenna builder's preferences, ranging from short to long booms, low- to high-Q designs, and gain-optimized to F/B-optimized designs. For easy identification and reference, most of the database designs have been given girls' names.

In addition to the generic database, you can also build your own database of up to 100 different custom designs. You can import design data from other antenna modeling programs, such as the MN and YO design programs offered by Brian Beezley, K6STI, which we have discussed previously in the column.

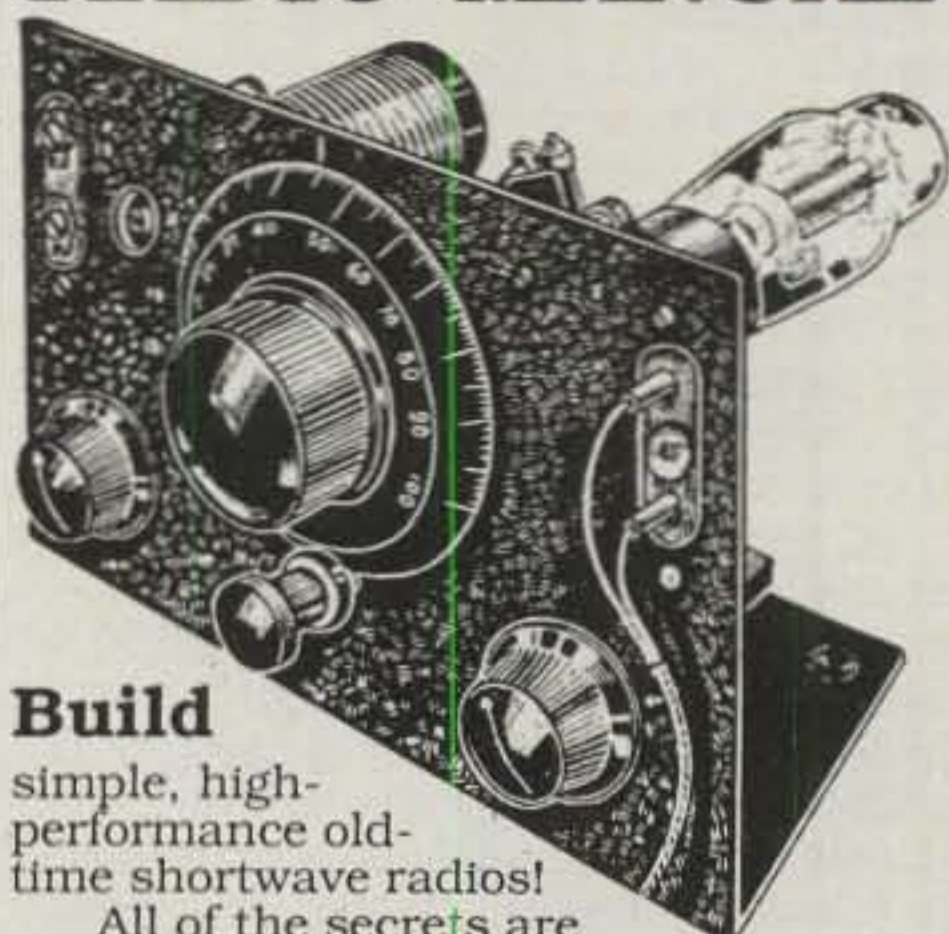
The easy-to-use Yagi Design program comes complete with documentation that includes a complete description of the program, several detailed technical discussions, an example design case, and a detailed review of the Yagi database selections. The program is available on either 3 1/2 inch or 5 1/4 inch diskette for \$75. Stateside orders are being handled by Bill Jorden, K7KI, 6861 Kenanna Place, Tucson, AZ 85704; overseas distribution is taken care of by the author, John Devoldere, ON4UN, 215 Poelstraat, B9220 Merelbeke, Belgium. Presently the program is available only in IBM-PC format, but an Apple Macintosh version is planned for the near future.

Fig. 3 shows the Yagi Design main menu, while fig. 4 is an example of one of the designs

| DESIGN #  | 11       | ELEMENTS: 3 | NAME: W2PV310       | BOOM: 0.275 WVL |          |         |                |
|---|----------|-------------|---------------------|-----------------|----------|---------|----------------|
| FREQ.   | GAIN     | F/B         | RESIST              | REACT.          | SWR      | FOM     |                |
| -1.5%   | 7.6      | 13.6        | 23.4                | -14.6           | 2.1      | 7.9     | ANT. Q = 30    |
| -1.0%   | 7.7      | 16.6        | 22.3                | -10.0           | 1.7      | 8.7     |                |
| -0.5%   | 7.8      | 19.7        | 20.8                | -4.9            | 1.3      | 9.5     | SWR BW = 2.2 % |
| 0.0%  | 7.9      | 22.0        | 19.0                | 0.7             | 1.0      | 10.2    |                |
| +0.5%   | 8.1      | 23.8        | 16.9                | 6.8             | 1.4      | 10.0    | F/B BW = 1.9 % |
| +1.0%   | 8.2      | 21.6        | 14.8                | 13.6            | 2.2      | 9.2     |                |
| +1.5%   | 8.4      | 16.9        | 12.8                | 20.8            | 3.5      | 7.5     |                |
| ELEMENT   | LENGTH   | POSITION    | PHYSICAL BOOMLENGTH |                 |          |         |                |
| REFLECTOR   | 0.495310 | -.137540    | 28 Mhz ->           | 2.90 m.         | OR       | 9.5 ft  |                |
| DRIV. EL.   | 0.485980 | 0.000000    | 24 Mhz ->           | 3.31 m.         | OR       | 10.8 ft |                |
| DIR # 1   | 0.462570 | 0.137540    | 21 Mhz ->           | 3.89 m.         | OR       | 12.8 ft |                |
| DIR # 2   | 0.000000 | 0.000000    | 18 Mhz ->           | 4.55 m.         | OR       | 14.9 ft |                |
| DIR # 3   | 0.000000 | 0.000000    | 14 Mhz ->           | 5.83 m.         | OR       | 19.1 ft |                |
| DIR # 4   | 0.000000 | 0.000000    | 10 Mhz ->           | 8.15 m.         | OR       | 26.7 ft |                |
|   |          |             | 7 Mhz ->            | 11.62 m.        | OR       | 38.1 ft |                |
| EL. LENGTHS ARE FOR EL. DIAM. OF .0010527 WAVELENGTHS (7/8 INCH ON 14.2 MHz). |          |             |                     |                 |          |         |                |
| S = SELECT THIS DESIGN  |          |             | C = CONTINUE        |                 | M = MENU |         |                |

Fig. 4- Typical Yagi design database printout. Depicted here are the essential data elements of a 3-element, W2PV-designed, 10 meter Yagi, as contained in the Yagi Design program's antenna database. About 100 designs are included with the program, and you can develop your own designs if you wish.

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in the database (a 3-element, 10 meter W2PV Yagi).

**PC Tools Deluxe V5.0.** Twice in previous columns we've taken note of PC Tools, a comprehensive IBM PC utility package from Central Point Software. Early versions of PC Tools were basically direct competitors to powerful disk utilities such as The Norton Utilities.

However, over the past several years, PC Tools has evolved into a multipurpose package with much broader application. The current Deluxe 5.0 version includes three major sub-packages: PC Tools Utilities™, PC Backup, and PC Tools Desktop™. The new product is much more than a simple set of disk utilities.

PC Tools Utilities, at the heart of the package, is a complete utility package including a DOS shell, file and disk recovery, disk optimization, and a file security system. The utilities package includes PC Shell, a powerful DOS shell that provides all of the critical DOS maintenance commands you need to efficiently manage your system; the Mirror/Rebuild programs, which offer protection against accidental erasure or formatting of your hard disk; PC-Cache, designed to speed up hard and floppy disk access by storing the most frequently used information in your PC's memory; the Compress application, used to optimize your hard disk's performance by checking for and correcting file fragmentation; PC Format, an upgraded replacement for the DOS FORMAT.COM program; and PC Secure, a file encrypting and decrypting program that also allows you to compress your files up to 60%.

PC Tools Desktop™ is a complete desktop organizer that works with a mouse, has pull-down menus with movable and resizable windows, and includes full color control. The desktop uses about 40K of memory; you can run it as a memory-resident application or as a standard DOS application. The desktop incorporates several major applications, including a wordprocessor, an outliner, databases, an appointment scheduler, a communications ter-

minal, a macro editor, a clipboard, three different calculators, and various utilities.

The third major component is the hard-disk backup module, PC Backup. It's a stand-alone application that makes fast and reliable backups of your hard disk. Some special features include optional file compression prior to backup, support of a variety of backup media, and a capability to estimate the number of disks and the time required for the backup.

As we've mentioned before in examining earlier versions of PC Tools, this integrated package of "do almost anything" disk management tools and miscellaneous goodies is, without a doubt, one of the best utility software values you can find for your PC. Earlier versions have been selected as a coveted *PC Magazine* "Editor's Choice," and for good reason. Maybe this latest incarnation will rake in similar honors as "the best getting better."

I should mention that in early versions of PC Tools, the documentation left something to be desired. Now, however, Central Point has more than made amends, providing three separate user's manuals that amply cover the three main sub-packages. Now the docs range in size from 66 pages for the backup utility to 202 pages for the utilities and 269 pages for the desktop manager.

The PC Tools package is designed for the IBM PC, XT, AT, PS/2, or compatible clones running DOS 3.0 or higher. This slick program is priced at \$79 from Central Point Software, 15220 N.W. Greenbrier Pkwy. #200, Beaverton, OR 97006.

**Soft-Control.** This is a software management program for various Kenwood transceivers and receivers, including the TS-440S, 940S, 711S, 811S, and 711/811 combination, and the R-5000 receiver.

The program basically lets your PC talk to your radio, giving you a means to control the radio from the computer. Most everything you can do from the radio's front panel can be done from the program using single-key commands.

In addition to complete radio control and display from the PC, the program also offers complete memory channel management, menu-driven operation, and the ability to save and restore memory channel data files to disk.

The Soft-Control software requires MS-DOS 2.1 or higher, at least 128K system RAM, a single floppy disk drive, and an RS-232 serial port on the computer. Appropriate Kenwood hardware interfaces also are required. Depending on the specific radio used, versions are priced from \$49.95 to \$89.95. Contact Rad-Com, P.O. Box 1166, Pleasanton, CA 94566.

**Two from Software Systems Consulting Group.** Seems that everyone who's anyone is getting into "FAX" these days. Even CQ's home office in New York now has a FAX number (516-681-2926, just in case you want to FAX in your next subscription renewal). Anyway, some guys on the West Coast have taken steps to ensure that amateurs are not left out of the FAX revolution. They've come up with PC HF FAX.

Their \$99 FAX offering is a complete facsimile reception system for the IBM PC, especially intended for high-resolution WEFAX weather map reception. The program includes software, a 50-page reference manual, a tutorial tape cassette, and a demodulator and interface cable. Unlike more expensive TNC decoders, it displays images in gray scale or in a lively "pseudo color." According to SSC, the menu-driven software is easy to learn and operate, and it is compatible with most common hardware configurations.

In addition to 384K RAM, a color adapter on the computer (CGA, EGA, or Hercules card) is required. However, no external decoder box is required; the FSK is actually built inside the DB-25, 25-pin plug at the end of the supplied cable.

A second SSC product is PC Slow Scan Television, billed as a complete slow-scan station for the IBM PC. The program lets you save images to disk and recall them for review or retransmission. The program also allows you to print out hard copy on most popular dot-matrix printers.

Interestingly, no video camera is required. SSC provides utility software routines to let you transmit any image you see on your display. Formats supported include 8, 17, and 34 second black-and-white, and 12, 24, 36, 48, and 72 second color; all color images display in black and white.

The \$149.95 package includes an SSTV FSK demodulator, SSTV FSK modulator, digital signal processing software, image capture utilities, a 60-page instruction manual, and a tutorial cassette with sample images. An IBM PC or compatible computer with 640K RAM and graphics card (CGA, EGA, VGA, or Hercules) is required, as are serial and parallel ports on your PC. A printer is optional.

For more information on either product, contact Software Systems Consulting Radio Group, 1303 S. Ola Vista, San Clemente, CA 92672.

## Wrapping It Up

That's all for this time, gang. Join us next time for more Antennas & Accessories topics of current interest. See you then.

*Overheard:* Anytime you want to demonstrate something in the shack to non-ham visitors, the number of problems encountered is directly proportional to the number of guests.

73, Karl, W8FX

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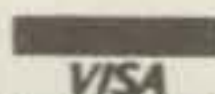
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# Contest Calendar

a monthly feature by  
JOHN DORR, K1AR

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

### CQ World-Wide CW—An Historical Perspective

It's something we have all become used to—CQ World-Wide Contests during the last complete weekends of October and November. However, that wasn't the case for the first CQ WW CW Contest. In fact, if you had begun operating that CQ WW during the traditional Thanksgiving weekend, you would have been a lonely contender indeed. Not only did the inaugural event occur on November 5th, 1948 (well known to most of us now as the ARRL SS weekend), but our logs would have been significantly reduced on the basis of starting two hours early. For reasons unknown, the early CQ WW Contests began at 0200Z. Although the CQ WW began in a strange manner by today's measure, no one will dispute the forward thinking of Herb Becker, W6QD, who commented in 1952 that "judging by the comments on the logs, it appears the boys really like this type of contest." Remember that thought when you're unable to find a clear frequency during your 10 meter morning run this year.

Whereas the SSB analysis showed little dominance by any individual/station (with the exception of the N2AA/K2GL multi-multi efforts), the early CW years were controlled by two stations, W4KFC and W3GRF, who combined to win the USA Single Operator, All Band Category 15 times. While ole man 'KFC is sorely missed, I'm happy to say that Lenny Chertok, W3GRF's distinctive fist can still be heard in many contests today. Congratulations, Lenny. Your accomplishments have been noted by many!

The CW DX entrants have had their share of notoriety, being led by the accomplishments of Dick Norton, N6AA, who has amassed an incredible seven World Single Operator, All Band victories, including a six of seven year run (1980-86). The early years were curiously controlled by several Israeli stations who won six out of the first nine World Single Operator, All Band attempts (1948-56).

A rare event is to witness a U.S. entry simultaneously win their category at the World-class level. This CW accomplishment has only been achieved 14 times in all of the major categories combined and has the esteemed membership of W2HJR/K2GL, W4KFC, W4KVX, W1BIH, W3AOH, W3AU, W6SZY, and W2PV. Jim Law-

#### Calendar of Events

|                   |                             |
|-------------------|-----------------------------|
| Oct. 1            | OMARC Midnight Special      |
| Oct. 7-8          | IRSA World Radio Champ.     |
| Oct. 7-8          | California QSO Party        |
| Oct. 7-8          | VK/ZL Oceania SSB Contest   |
| Oct. 7-8          | Iberoamericano Contest      |
| Oct. 7-8          | Wyoming QSO Roundup         |
| Oct. 8            | RSGB 21/28 MHz Phone        |
| Oct. 8-9          | Illinois QSO Party          |
| Oct. 11-13        | YLRL Anniversary CW Party   |
| Oct. 14-15        | Pennsylvania QSO Party      |
| Oct. 14-15        | VK/ZL Oceania CW Contest    |
| Oct. 14-15        | Kentucky QSO Party          |
| Oct. 15           | RSGB 21 MHz CW Contest      |
| Oct. 21-22        | Boy Scout Jamboree On Air   |
| Oct. 25-27        | YLRL Anniversary SSB Party  |
| <b>Oct. 28-29</b> | <b>CQ WW DX SSB Contest</b> |
| Nov. 4-6          | ARRL CW Sweepstakes         |
| Nov. 10-12        | Japan Intern'l. DX Contest  |
| Nov. 11           | Australian Ladies ARA       |
| Nov. 11-12        | European RTTY Contest       |
| Nov. 11-12        | Montana QSO Party           |
| Nov. 18-20        | ARRL SSB Sweepstakes        |
| <b>Nov. 25-26</b> | <b>CQ WW DX CW Contest</b>  |
| Dec. 1-3          | ARRL 160 Meter Contest      |
| Dec. 9-10         | ARRL 10 Meter Contest       |
| Dec. 10           | ARCI QRP CW Sprint          |

son's final 1981 multi-multi effort was the last to meet the mark.

Today's contest results have taken a marked turn to the upside in sophistication. The pioneering years simply listed the callsign, countries, zones, and final score. There were no charts, breakdowns, continental leader boxes, or other analysis that pervades today's writeups. Imagine having your score left out of the results due to lack of space as many were in 1953! Another striking difference in those days was the inclusion of single-band scores alongside the final results for all band entries from the same station. It was commonplace to see the same callsign listed four or five times in the same set of results.

One final point I couldn't resist pointing out was the difficulty the committee had in managing the CQ WW Awards Program in the early years. Distribution of awards has always been a time-consuming and tedious task. The CQ WW 1953 results specifically noted the delay of the 1951 certificates. Fortunately, that problem is behind us now (although I possess several original 1957 blanks if you still want to catch up—hi).

#### How High is the Highest Score?

Have you ever wondered what the real limit is to your contest score? Bob Cox, K3EST, took a stab at answering that question by analyzing the recently reported 1988 CQ WW SSB results. Imagine taking the best of everyone's log and computing a fictitious score as shown in fig. 1.

That's not bad for a casual weekend of ham radio contesting. By the way, Bob also compared his "imaginary result" to the two multi-multi giants, P40V and PJ1B. The result showed the spectacular performance of each station. When all the dust settled, the final P40V/PJ1B scores were respectively 90.1% and 84.2% of the imaginary mark. You just can't do much better than that!

#### October Contest Events

This month features the undisputed leader of all State Parties, the California QSO Party (October 7-8). Not only are high QSO totals possible (e.g., KVØI made over 1000 contacts last year from Nebraska), but as you will see by reading the contest announcement some of the awards are truly unique.

A special favorite of mine is the VK/ZL affair. Make an effort to work some of the guys in this one. Contest operating is waning "down under," and this event is

| Band                            | QSOs         | Zones        | Countries    |
|---------------------------------|--------------|--------------|--------------|
| 160                             | 738 (UP8A)   | 20 (K5UR)    | 56 (IV3PRK)  |
| 80                              | 1504 (P40V)  | 27 (IK5BAF)  | 97 (P40V)    |
| 40                              | 2063 (P40V)  | 38 (IR4LCK)  | 125 (P40V)   |
| 20                              | 4884 (P40V)  | 39 (several) | 166 (KP2A)   |
| 15                              | 4878 (KP2A)  | 40 (YC2UKM)  | 161 (N5AU)   |
| 10                              | 5137 (VP2ET) | 40 (IR4LCK)  | 163 (JH1AJT) |
| <b>Total:</b>                   | <b>19204</b> | <b>204</b>   | <b>768</b>   |
| <b>Estimated Pts/QSO = 2.93</b> |              |              |              |
| <b>Final Score: 54,692,223</b>  |              |              |              |

Fig. 1—K3EST's fictitious score. Not bad for casual operating!

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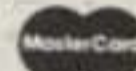
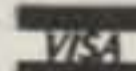
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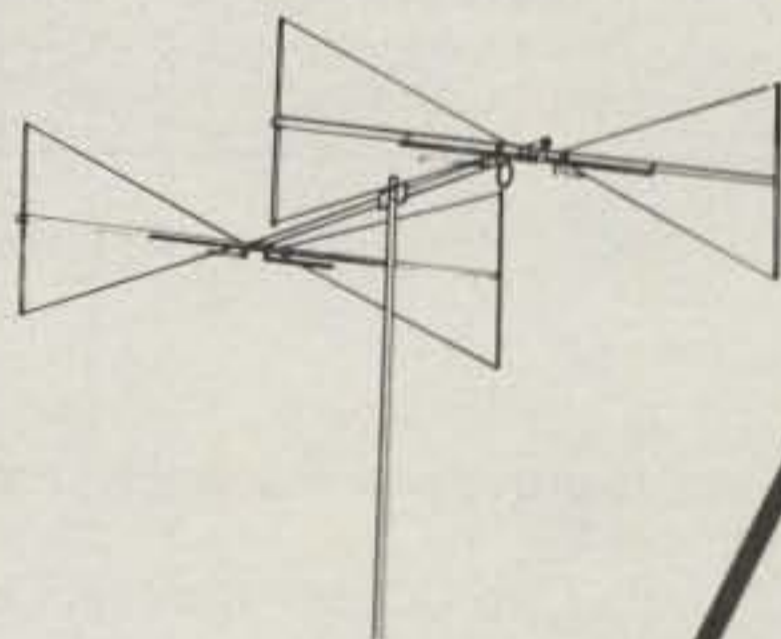
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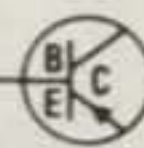
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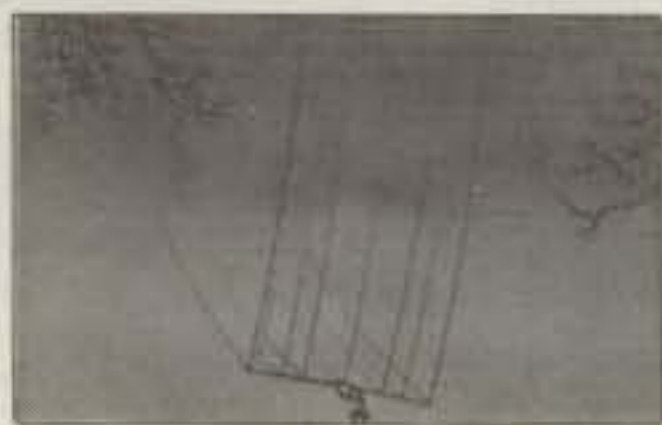
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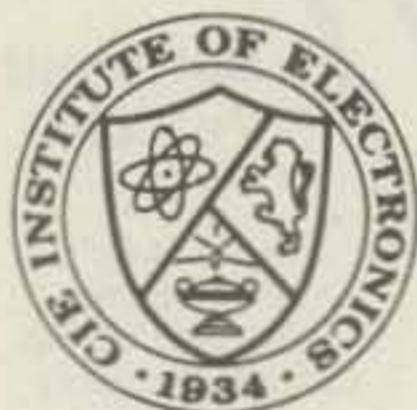
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### Year Quote

- 1948 "The first CW winner has set a record that may be all but impossible for subsequent contestants to top."
- 1949 "East Coast DX men take full advantage of greater activity in Europe than any other continent."
- 1951 "4X4BX with 444,216 points was the world's highest. Rig uses 813 with 125 watts input and SX-28/SX-71 receivers."
- 1952 "It appears that the multiple operators' section is becoming more popular . . . it's good to have another operator around to crack you on the back of neck if you start to fall asleep."
- 1954 "It is hoped that participants in future events will relieve the Committee by using standard reporting forms."
- 1955 "Single Operator W2HJR (K2GL), with W3GRF at the key, is King for 1955."
- 1957 "The Top Ten looks like a battle of the East Coast giants."
- 1957 "The graveyard known as 11 meters was only productive to the multiplier seekers. K6OPI stuck it out to win a certificate with 361 points."
- 1958 "Contesting is a bit difficult if you have a husband who wants to be provisioned or to use the rig on his own account—JT1YL."
- 1962 "Our experiment of trying to increase activity in Central America and the Caribbean didn't work out. The reaction to the rule change allowing 2 points for contacts with North America was about equally divided."
- 1963 "Our hearts were not in this one; the news of the tragic death of our President a few hours before the start of the contest . . ."
- 1964 "The Committee is considering imposing a penalty where duplicates exceed a percentage of your total contacts."
- 1965 "This was the year of the dit, dit, dit, dit, dit; dah, dit; dah, dit instead of the longer double nine . . . who started this anyway? It sure caught on like wildfire."
- 1966 "We made an estimate of the weight of this year's contest logs and arrived at a figure of over 250 pounds."
- 1968 "I still insist that the frequency cutbacks (incentive licensing) that went into effect the day before the contest had a marked effect on the participation from US hams—W1WY."
- 1970 "We do not go along with the reasoning that the lack of activity from the Caribbean and Central America is due to our 2 point scoring system."
- 1972 "Not much in the way of soapbox comments, just the run of the mill . . . guess CW men are not too vocal."
- 1974 "You're in for some real competition when WN2SJK (now KQ2M) and WN9MMR drop the "N" from their calls."
- 1976 "Operating on generator power in the Santa Cruz mountains, we averaged 57 QSOs per gallon—K6QZ."
- 1977 "My age overwhelmed my experience—N3RS."
- 1980 "The 'other score' was 540 cigarettes, 23 beers, 1/2 liter cognac, 1/2 liter whiskey, 15 liters milk, and 2 liters champagne—EA3AKD."
- 1982 "Busted eardrums, bad noise, lousy coffee . . . as usual, had a ball—WD9BBI."
- 1984 "It had to happen sooner or later . . . one of the boxes of logs was lost by the carrier in transit to the CQ WW log checker."
- 1986 "The recent passing of K2GL, W2PV, and W6AM made us reflect . . . giving us some good, old-fashioned determination. To many, their example provided training for all of us . . ."

Table I - Notable quotes, CQ WW CW Contest results.

one way to prove how much fun contesting can be.

Of course, no October Contest Calendar is complete without stating the obvious, the CQ World-Wide DX Contest. This year proves to be especially exciting as conditions peak, and many will be taking part in the newly created Single Operator, Unlimited Category. The list of anticipated contest expeditions is too long to list here, but rest assured that this year's affair will be unlike any other—48 hours of constant excitement!

### A Legacy Ends

As I mentioned in my first column, there are few mediums contesters possess to communicate their ideas and opin-

ions. One of those vehicles has been the long-running *National Contest Journal*. For six years Randy Thompson, K5ZD, has carried the editorial role of the *NCJ* and can be credited with being one of the primary reasons the publication has grown to be a major international voice for contesting around the world.

Effective with the September/October issue, Tom Taormina, K5RC, has returned to the helm and will assume Randy's duties. Tom is no stranger to contesting, having either won or participated in several contest efforts in the 1970s and 80s. The staff of CQ wishes both of you the best of luck, and we want to express our appreciation for your contributions to amateur radio and contesting. You can contact Tom at P.O. Box 800228, Houston, TX 77280-0228.



## Some Parting Thoughts

Next month's column should prove to be enlightening as I disclose the results of the August Contest Ethics Survey. If you haven't mailed your response yet, there is still time (October 1st deadline), so please take a few moments and join in the fun.

I recently received a letter from W8IQ, who raised a good point regarding contest results. Many of the contest announcements *CQ* magazine receives do not specify the method for participants to receive final results. In the future, please try to indicate this detail in the announcements you send to me. Additionally, I am more than willing to print a summarized listing of contest results (space permitting), so feel free to include them with your correspondence.

As I complete this month's column, I am making my final plans for the *CQ* WW SSB Contest. Hope to see all of you in a few short weeks. Remember, the deadline for the January column is November 1st.

73's, John, K1AR

## OMARC Midnight Special

0300-0400Z Sat., Oct. 1, 20 M SSB  
0400Z-0500Z Sat., Oct. 1, 40 M CW

This is the second year the OMARC is sponsoring the Midnight Special, a short and fun operating event. Any station is eligible to participate with the emphasis placed on maximizing your total QSOs (no contest multiplier).

**Bands:** 14250-14270, 20 Meter SSB, and 7030-7050, 40 Meter CW.

**Exchange:** Name and the number of current USA Counties confirmed (send "001" if you don't know your current total).

**Scoring:** Total number of valid QSOs. Only one QSO per station per band/mode is allowed.

**Club Competition:** Include the name of your club on the final summary sheet. You must be a member in good standing of your local club.

Send summary sheet, logs, and dupe sheets to: Bob Schwenk, W2XL, 133 Clifton Avenue, Kingston, NY 12401. The final deadline is November 1st.

## IRSA World Radio Championship

Phone: Oct. 7 CW: Oct. 8  
0000Z to 2400Z, Sat. & Sun.

This is the fourth time around for the International Radiosport Association's championship contest scheduled in a very saturated weekend of contest activity in October.

It's a worldwide-type contest with a wide assortment of multipliers. Phone and CW are separate contests on differ-

## CQWW SSB vs CW Ratio of Winning S/O All Band Scores

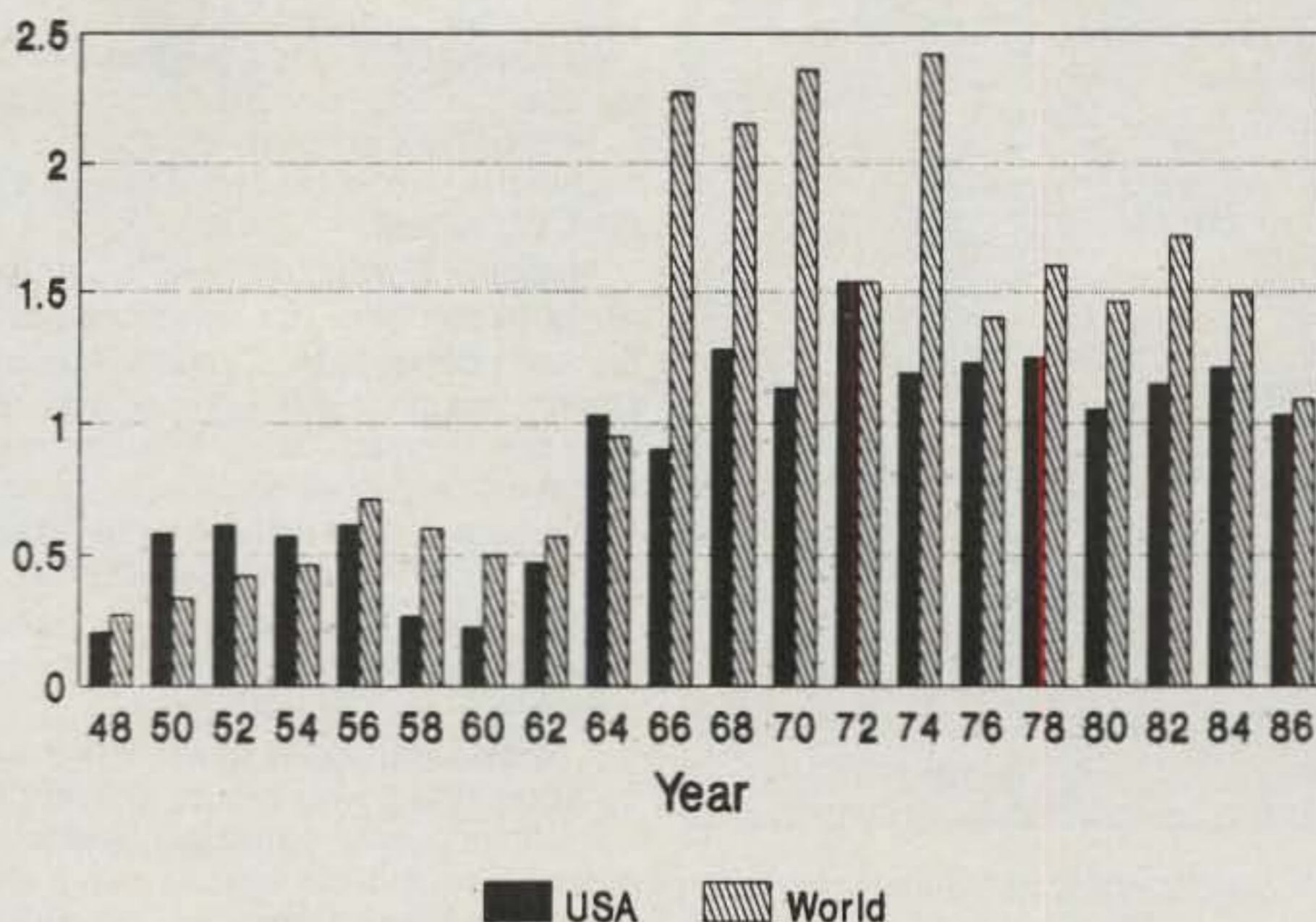


Fig. 2- Graphic illustration comparing ratio of SSB to CW winning Single Operator scores (USA and World). Notice how CW dominated the early years (1948-1962).

| Year | Single Op |           | Multi-Single |           | Multi-Multi |            |
|------|-----------|-----------|--------------|-----------|-------------|------------|
|      | Call      | Score     | Call         | Score     | Call        | Score      |
| 1948 | W4KFC     | 277,780   | W2IQG        | 289,680   |             |            |
| 1949 | W4KFC     | 310,184   | W6SZY        | 291,110   |             |            |
| 1950 | W4KFC     | 153,901   | W6GAL        | 135,222   |             |            |
| 1951 | W4KFC     | 198,195   | W6AM         | 104,012   |             |            |
| 1952 | W8JIN     | 215,259   | W8WZ         | 238,368   |             |            |
| 1953 | W4KFC     | 338,517   | W6AM         | 212,128   |             |            |
| 1954 | W4KFC     | 308,812   | W4KVX        | 214,200   |             |            |
| 1955 | W2HJR     | 517,030   | W6AM         | 299,472   |             |            |
| 1956 | W4KVX     | 654,088   | W6DFY        | 561,660   |             |            |
| 1957 | W4KFC     | 821,763   | W6RW         | 1,171,088 |             |            |
| 1958 | W8JIN     | 586,767   | K2GL         | 2,009,280 |             |            |
| 1959 | W3GRF     | 388,010   | W1BIH        | 527,945   | W3AOH       | 1,031,360  |
| 1960 | W4YHD     | 513,720   | W6GHM/6      | 400,425   | W3AOH       | 1,049,104  |
| 1961 | W4KFC     | 645,663   | W9YT         | 208,302   | W3MSK       | 1,405,767  |
| 1962 | W3GRF     | 445,884   | W1BIH        | 426,075   | W3MSK       | 1,043,415  |
| 1963 | W3GRF     | 712,640   | W6RW         | 526,960   | W3MSK       | 1,304,797  |
| 1964 | W3GRF     | 578,993   | WA6SBO       | 589,937   | K2GL        | 1,826,046  |
| 1965 | W4KFC     | 847,314   | W2PCJ        | 769,834   | K2GL        | 2,513,448  |
| 1966 | W3GRF     | 1,004,450 | W3MVB        | 905,472   | K2GL        | 3,760,848  |
| 1967 | K1DIR     | 1,087,674 | W3WJD        | 1,589,841 | W3MSK       | 4,063,920  |
| 1968 | W3GRF     | 1,024,125 | K1DIR        | 1,729,408 | W3MSK       | 4,560,038  |
| 1969 | W4YHD     | 1,002,160 | W9EXE        | 930,510   | W4BVV       | 4,403,785  |
| 1970 | K1KTH     | 1,632,480 | W3WJD        | 2,259,075 | W4BVV       | 5,552,352  |
| 1971 | W1FBY     | 1,163,160 | K6EBB        | 1,000,282 | W4BVV       | 3,655,613  |
| 1972 | W3WJD     | 1,527,500 | K1DIR        | 1,985,310 | W3AU        | 5,031,982  |
| 1973 | W3LPL     | 1,069,265 | K6EBB        | 1,139,007 | W3AU        | 3,394,016  |
| 1974 | W1BGD/2   | 1,133,847 | K4GSU        | 1,601,024 | W3AU        | 3,623,116  |
| 1975 | W3LPL     | 1,003,055 | W6OUN        | 1,033,518 | W3AU        | 2,890,680  |
| 1976 | W3LPL     | 1,538,284 | AA5LES       | 2,246,989 | W3WJD       | 4,165,749  |
| 1977 | W3LPL     | 1,693,956 | N4AR         | 2,131,746 | W2PV        | 4,318,650  |
| 1978 | W3RJ      | 2,186,948 | N3RS         | 2,887,920 | N2AA        | 5,073,642  |
| 1979 | K1AR      | 2,635,224 | K5RC         | 4,148,784 | N2AA        | 8,542,056  |
| 1980 | K1AR      | 2,830,730 | N4AR         | 3,324,672 | N2AA        | 9,071,199  |
| 1981 | K1GQ      | 3,276,768 | N4AR         | 4,564,350 | W2PV        | 10,431,729 |
| 1982 | K1AR      | 2,762,383 | K5RC         | 3,768,871 | N2AA        | 9,724,050  |
| 1983 | W1KM      | 2,699,775 | K1GQ         | 3,712,412 | N2AA        | 7,812,341  |
| 1984 | N2LT      | 2,192,028 | K5RC         | 3,221,384 | N2AA        | 6,315,520  |
| 1985 | K1AR      | 3,397,905 | K1KI         | 3,477,100 | N2AA        | 8,770,631  |
| 1986 | W1KM      | 3,029,832 | N4WW         | 4,176,612 | N2AA        | 7,558,965  |
| 1987 | K1EA      | 3,961,980 | K1GQ         | 5,524,602 | W3LPL       | 10,289,144 |

Table II- USA Winners—Single/Multi-Operator CQ WW CW.



| Single Op  |        |         |   |
|------------|--------|---------|---|
| Call       | # Wins |         |   |
| W4KFC      | 9      | W6RW    | 2 |
| W3GRF      | 6      | K1KI    | 1 |
| K1AR       | 4      | K1GL    | 1 |
| W3LPL      | 4      | W2IQG   | 1 |
| W1KM       | 2      | W2PCJ   | 1 |
| W4YHD      | 2      | W3MVB   | 1 |
| W8JIN      | 2      | N4WW    | 1 |
| K1DIR      | 1      | W4KVX   | 1 |
| K1EA       | 1      | AA5LES  | 1 |
| K1GO       | 1      | W6DFY   | 1 |
| K1KTH      | 1      | W6GAL   | 1 |
| W1FBY/W1XT | 1      | W6GHM/6 | 1 |
| W1BGD/2    | 1      | W6OUN   | 1 |
| W2HJR/K2GL | 1      | W6SZY   | 1 |
| N2LT       | 1      | WA6SBO  | 1 |
| W3RJ       | 1      | W8WZ    | 1 |
| W3WJD/N3RS | 1      | W9EXE   | 1 |
| W4KVX      | 1      | W9YT    | 1 |

| Multi-Single |        |             |        |
|--------------|--------|-------------|--------|
| Call         | # Wins | Multi-Multi | # Wins |
| K4GSU/N4AR   | 4      | Call        |        |
| W3WJD/N3RS   | 3      | K2GL/N2AA   | 11     |
| K5RC         | 3      | W3MSK/W3AU  | 9      |
| W6AM         | 3      | W4BVV       | 3      |
| K1DIR        | 2      | W2PV        | 2      |
| K1GO         | 2      | W3AOH       | 2      |
| W1BIH        | 2      | W3LPL       | 1      |
| K6EBB        | 2      | W3WJD/N3RS  | 1      |

Table III - CQ WW CW USA Winner Tally.

ent days. Scores, however, can be combined for special awards in certain categories.

Single operator stations are limited to 22 hours out of the 24-hour contest period. The 2-hour off period may be taken in one or two periods. Multi-stations can operate the full 24 hours.

Use all six bands, 1.8-28 MHz (no WARC bands).

**Classes:** High power, 1000 watts. Low power, 100 watts. And QRP, 5 watts. Single operator, single and all band. Multi-operator, single and multi-transmitter. Club competition and SWL.

**Exchange:** RS(T) and a progressive QSO number starting with 001.

**Points:** Two for each completed contact in the phone contest. Three if it's in the CW contest.

**Multiplier:** Each DXCC country and call areas in the following countries worked on each band: USA, Canada, Australia, Brazil, Japan, USSR Europe, and Asia. Also one for each of the land, maritime, aeronautical mobile groups. Stations operating out of their call area must identify area of operation (i.e., VE3BMV/W2).

**Final Score:** Total QSO points from all bands times the total multiplier from all bands.

**Awards:** Certificates to winners in each category and power group, in every participating country, call areas, and mobile group. The station having the highest combined score from each country will receive a free one-year subscription to *Radiosporting* magazine. There are also a dozen championship plaques in several categories for both phone and CW winners.

**Log Instructions:** Phone and CW are separate contests and require separate logs. Indicate the multiplier only the first time it is worked on each band. Do not use a sep-

arate sheet for each band, except for multi-operator multi-transmitter stations, who should keep separate logs and QSO numbering for each band. Logs must be checked for duplicate contacts and multipliers, and off periods clearly marked. Entries with more than 200 contacts must include a QSO dupe sheet.

There are many detailed operating instructions for the different classes. I strongly recommend that you send a large SAE and one "green stamp" or 3 IRCs for a sample contest-form kit (*Radiosporting*, P.O. Box 282, Pine Brook, NJ 07058).

You are encouraged to submit your log regardless of your score; they are useful for checking purposes. A one-year subscription to *Radiosporting* will be awarded to the 10 stations selected by a drawing from the logs received.

Logs must be received by December 31st by the Contest Chairman, Walt McGugan, W3FG, P.O. Box 7, Odenton, MD 21113-0007 USA.

### Iberoamericano Contest

2000Z Sat. to 2000Z Sun., Oct. 7-8

Organized by "Seccion Territorial de URE del Valles Oriental" and by "CQ Radio Amateur de Boixareu Editores," this contest will be sponsored every year the weekend before October 12th to commemorate the anniversary of the discovery of America. This is a phone-only contest with the emphasis on Latin-American areas.

**Classes:** Single operator and multi-operator, single transmitter; both Latin-American and non Latin-American. Single operator EC (EA novice), QRP, less than 5 watts output, and SWL.

**Exchange:** RS plus a progressive QSO number (001, etc.).

**Bands:** All six bands, 1.8 through 28 MHz, SSB only.

**Points:** Latin-American stations score one point per QSO. Non-Latin-Americans, 3 points per QSO with Latin-Americans, 1 point with other non-Latin-Americans.

**Multiplier:** Latin-Americans use the DXCC list. Non-Latin-Americans use the following country list: CE, CO, CP, CR, CT, CX, C3, C9, DU, EA, HC, HI, HK, HP, HR, HT, KP4, LU, OA, PY, TG, TI, XE, YS, YV, ZP, 3C, and dependencies.

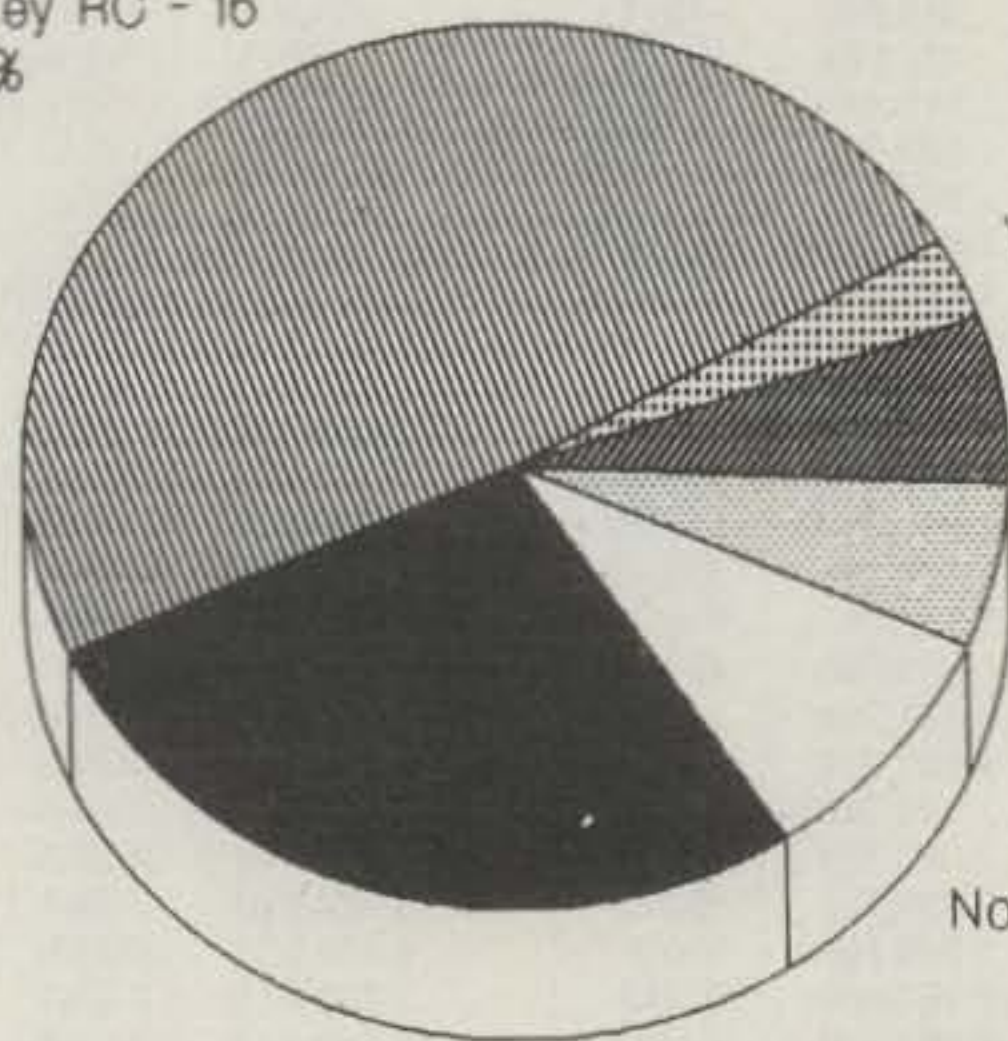
**Final Score:** Total QSO points from all bands times the sum of multipliers from all bands.

**SWL:** Same rules apply to SWL entries. The same station cannot be logged more than 15% of the total logged. And the same station can only be logged again after 5 other entries.

**Penalties:** Taking credit for excessive duplicate contacts, and violation of rules and amateur radio regulations could result in disqualification.

## CQWW USA Contest Clubs # of Winning Years (1955-1987)

Potomac Valley RC - 16  
48%



Yankee Clip. CC - 1  
3%

No. Calif. CC - 2  
6%

So. Calif. DXC - 2  
6%

No. Jersey DXA - 3  
9%

Frankford RC - 9  
27%

Fig. 3 - Shown here are the leading USA contest clubs from 1955-1987. Note that the Potomac Valley Radio Club leads here by a wide margin.





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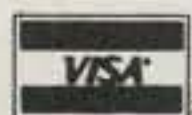
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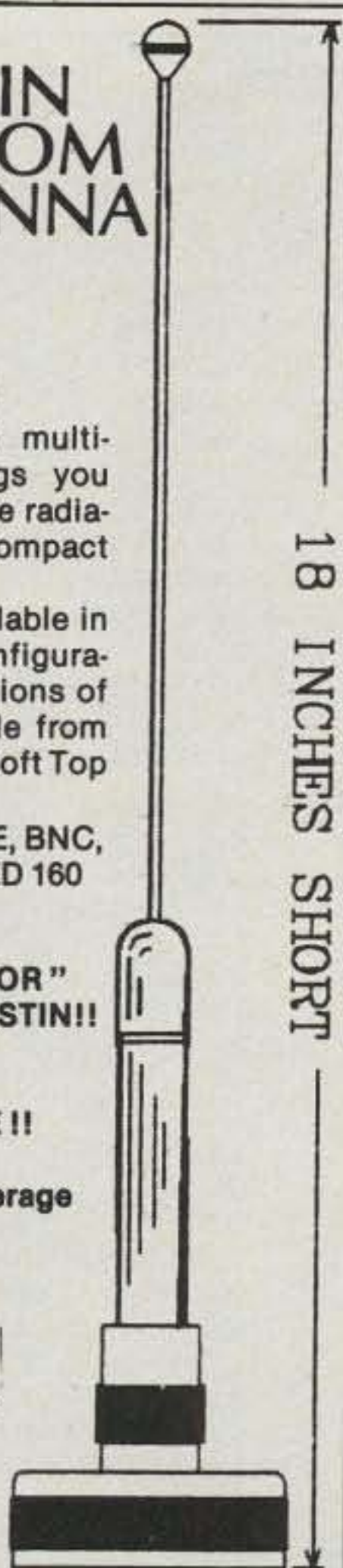
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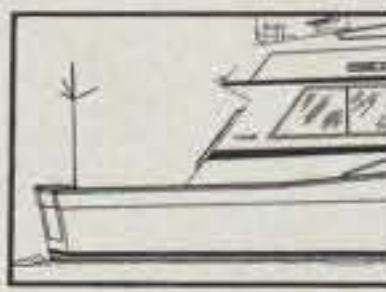
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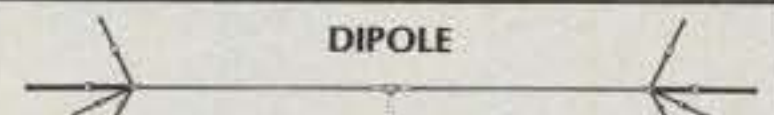
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|----------|-----------|----------|
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| 2 Meter  | 10 M IF   | 75.00    |
| 2 M (HP) | 10 M IF   | 95.00    |
| 220 MHz  | 10 M IF   | 95.00    |
| 435 MHz  | 10 M IF   | 110.00   |
| 1691 MHz | 137.5 MHz | 330.00   |

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| 2 Meter  | T/R Switch    | 75.00    |
| 220 MHz  | T/R Switch    | 85.00    |
| 137 MHz  | (weather sat) | 75.00    |
| 1691 MHz | (weather sat) | 250.00   |

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|          |                    |          |
|----------|--------------------|----------|
| 137 MHz  | 5XY-137            | \$ 90.00 |
|          | Circ. Pol. Harness | 20.00    |
| 2 Meter  | 10XY-2M            | 85.00    |
|          | Circ. Pol. Harness | 20.00    |
| 435 MHz  | 70-MBM28           | 65.00    |
|          | 70-MBM48           | 95.00    |
|          | 70-MBM88           | 135.00   |
| 900 MHz  | DY20-900           | 94.00    |
| 1268 MHz | 1268-LY            | 65.00    |
| 1296 MHz | 1296-LY            | 65.00    |
| 1691 MHz | 1691-LY            | 75.00    |

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**Awards:** Certificates will be issued to the highest scores in each DXCC country. Participating certificates will go to non-Latin-American stations making 50 or more QSOs. There are plaques for overall winning scores showing at least 4 hours of operation and 100 or more QSOs.

Mailing deadline for entries is November 30th to: X-Concurso Iberoamericano, Gran Via de les Corts Catalanes, 594, 08007 Barcelona, Spain.

### Wyoming QSO Roundup

0000-2359Z Sat.-Sun., Oct. 7-8

One of the attractive aspects of QSO parties is the opportunity they provide for you to work rare U.S. states. This year's Wyoming QSO Roundup is being sponsored by the University of Wyoming Amateur Radio Club and is no exception. The contest follows the usual QSO party rules in which Wyoming stations can work each other and stations outside of the state.

**Exchange:** Non-Wyoming stations send RS(T) and State/Province/DXCC Country. Wyoming stations send RS(T) and County.

**Scoring:** A station may only be worked once per band/mode category for QSO credit (e.g., 20 meter QSOs with the same station on CW, SSB, and RTTY count as three valid contacts). Non-Wyoming stations use band/mode counties as multipliers. Wyoming stations use the same plus states, provinces, and DXCC countries. Scoring is computed by total valid QSOs times multiplier.

**Bands:** All bands are encouraged (excluding WARC frequencies) with CW lower band edge plus 50 kHz, SSB upper band edge minus 50 kHz. Novice CW sub-band edge plus 25 kHz, and Novice SSB on 28390 kHz.

**Awards:** All awards will be determined by a committee of the UWARC and will include certificates for top scorers in a variety of categories. Certificates of participation will be awarded to all entries submitting a large SASE.

Logs and entry forms should be post-marked by November 8, 1989 and sent to Bill Stacy, K7EY, 1912 Custer Street, Laramie, WY 82070.

### California QSO Party

1600Z Sat. to 2200Z Sun., Oct. 7-8

This year's party is again being sponsored by the Northern California Contest Club. All efforts are being made to activate all CA counties and make this the most successful of all state parties.

Operating time is limited to 24 out of the 30-hour contest period for single operator stations. Multi-operators may use the full 30 hours. Off times must be at

| Year | Single Op |           | Multi-Single |            | Multi-Multi |            |
|------|-----------|-----------|--------------|------------|-------------|------------|
|      | Call      | Score     | Call         | Score      | Call        | Score      |
| 1948 | GI6TK     | 452,454   | ZL4GA        | 152,590    | —           | —          |
| 1949 | PA0UN     | 343,728   | W6SZY        | 291,110    | —           | —          |
| 1950 | 4X4RE     | 369,075   | CN8EG        | 316,257    | —           | —          |
| 1951 | 4X4BX     | 444,216   | ZC4XP        | 250,677    | —           | —          |
| 1952 | 4X4RE     | 577,250   | TA3AA        | 327,988    | —           | —          |
| 1953 | 4X4RE     | 497,458   | ET2US        | 239,121    | —           | —          |
| 1954 | 4X4DX     | 597,065   | W4KVX        | 221,200    | —           | —          |
| 1955 | W2HJR     | 517,030   | HA5KBA       | 326,899    | —           | —          |
| 1956 | 4X4BX     | 752,346   | KH6CBP       | 448,762    | —           | —          |
| 1957 | W4KFC     | 821,763   | W6RW         | 1,171,088  | —           | —          |
| 1958 | CN8JX     | 973,912   | K2GL         | 2,009,280  | —           | —          |
| 1959 | CN8JX     | 1,156,232 | W1BIH        | 527,945    | DJ3JZ       | 1,091,832  |
| 1960 | UA9DN     | 1,114,695 | UB5KAB       | 637,980    | W3AOH       | 1,049,104  |
| 1961 | 7G1A      | 1,177,893 | VK5NQ        | 709,000    | DJ3JZ       | 1,451,437  |
| 1962 | HL9KH     | 1,142,748 | CX2CO        | 1,103,721  | 4X9HQ       | 1,681,988  |
| 1963 | 5A1TW     | 871,750   | VK5NO        | 945,248    | CX2CO       | 1,456,380  |
| 1964 | PY4OD     | 796,740   | YV9AA        | 1,046,025  | K2GL        | 1,826,046  |
| 1965 | VR2EW     | 2,499,536 | ET3USA       | 1,071,213  | K2GL        | 2,513,448  |
| 1966 | ZD8J      | 1,597,726 | 4L7A         | 2,209,266  | K2GL        | 3,760,848  |
| 1967 | ZD8J      | 1,616,673 | 4L3A         | 3,084,536  | PJ3CC       | 5,527,788  |
| 1968 | KV4FZ     | 1,947,456 | DL0KF        | 1,969,830  | PJ0CC       | 8,258,787  |
| 1969 | 9Y4AA     | 3,088,968 | UA9KAX       | 1,904,408  | PJ0CW       | 9,333,884  |
| 1970 | ZS3AW     | 2,098,466 | 4M5ANT       | 2,657,892  | PJ0FC       | 11,586,428 |
| 1971 | KH6RS     | 2,382,520 | UK9ABA       | 2,355,506  | PJ9JT       | 5,517,824  |
| 1972 | ZD3Z      | 3,504,492 | PJ2VD        | 2,400,664  | CW3AA       | 5,679,260  |
| 1973 | ZD3X      | 5,085,806 | PJ1AA        | 2,493,304  | W3AU        | 3,394,016  |
| 1974 | KH6RS     | 2,738,904 | OD5IQ        | 3,970,912  | PJ9JT       | 9,753,500  |
| 1975 | EA8CR     | 3,295,997 | FY7AK        | 4,197,364  | W3AU        | 2,890,680  |
| 1976 | KP4AST    | 3,725,836 | PJ9MM        | 3,698,545  | UK9AAN      | 4,859,348  |
| 1977 | 9Y4VT     | 4,697,304 | 4L6M         | 6,095,824  | KP4EAJ      | 7,177,275  |
| 1978 | CT3BZ     | 5,135,104 | RF6F         | 5,866,744  | EA8CR       | 17,734,970 |
| 1979 | EA8AK     | 4,005,050 | NP4A         | 7,982,576  | PJ2CC       | 20,045,952 |
| 1980 | 9Y4VT     | 6,166,945 | RG6G         | 9,720,528  | NP4A        | 17,627,820 |
| 1981 | 9Y4VT     | 5,803,776 | P41E         | 8,059,296  | W2PV        | 10,431,729 |
| 1982 | 9Y4VT     | 6,929,450 | NP4A         | 11,648,565 | P42E        | 23,295,408 |
| 1983 | 9Y4VT     | 7,153,434 | HH2VP        | 7,208,271  | RW9A        | 8,035,971  |
| 1984 | 9Y4VT     | 5,595,040 | FY0GA        | 7,617,235  | EA9CE       | 9,170,984  |
| 1985 | EA9IE     | 5,731,360 | V3A          | 5,068,554  | RF3V        | 12,666,192 |
| 1986 | 9Y4VT     | 8,191,246 | KP4BZ        | 7,922,868  | KP2N        | 17,480,855 |
| 1987 | FY5YE     | 8,201,163 | EA8AGD       | 9,816,540  | KP2A        | 25,019,982 |

Table IV- World Winners—Single/Multi-Operator CQ WW CW.

least 15 minutes and clearly indicated in the log.

The same station may be worked on each band and mode, and CA stations may contact other in-state stations for QSO and multiplier credit. CA mobiles may be worked in each county change.

**Exchange:** QSO no. and QTH. County for CA stations; state, province, or DX country for others.

**Scoring:** Two points for phone contacts; 3 points on CW.

**Multiplier:** CA stations use states (50) and VE call areas (8). VO/VE1-7 and VY1/VE8. Out-of-state use CA counties (maximum of 58).

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

**Frequencies:** 160 meters through 2 meters, except WARC bands. CW—1805 and 50 kHz up from band edge. Phone—1815, 3850, 7230, 14250, 21300, 28500. Novice—10 kHz up from edge of Novice bands and 28495.

Try CW on the half hours, 147.54 at 2000, 0000, 0400Z, 160 at 0500Z, and 80 at 0300 and 0700Z.

**Awards:** Certificates to the highest scoring single operator in each state, province, and country. Also each CA county and stations scoring 100 or more QSOs.



*Yours truly, K1AR, presenting the 1987 USA Single Op/All Band CW CQ WW trophy to Ken Wolff, K1EA, at the 1988 Dayton Hamvention. K1EA is widely known for his unequalled contributions to computer contest logging techniques.*

Trophies galore. Single operator, top three out-of-state, and CA top three. Also CA county expedition, and the WA6VEF special award for the CA station making the most CW QSOs. Multi-single and multi-multi winners in CA and county expedition. And the CA mobile team making the most QSOs. A Special Award of a refreshing local product goes to the top 20



| Single Op     |        | Multi-Single  |        | Multi-Multi   |        |
|---------------|--------|---------------|--------|---------------|--------|
| Continent     | # Wins | Continent     | # Wins | Continent     | # Wins |
| Africa        | 13     | North America | 10     | North America | 11     |
| South America | 10     | South America | 9      | South America | 10     |
| Asia          | 8      | Asia          | 9      | Asia          | 3      |
| North America | 4      | Africa        | 4      | Africa        | 2      |
| Oceania       | 3      | Europe        | 4      | Europe        | 2      |
| Europe        | 2      | Oceania       | 4      | Oceania       | 0      |

Table V- Continental Winner Tally, World—CQ WW CW.

single operators in CA and 20 out of state. And to the top-scoring Novice/Tech entry, both in CA and out of state.

Include a summary sheet showing the scoring, etc., a dupe sheet if you make more than 200 QSOs, and a large SASE for a copy of the results.

Mailing deadline is November 15th and entries go to: NCCC c/o Gary Caldwell, WA6VEF, P.O. Box 8014-56, Blaine, WA 98230.

A contest paperwork packet containing log, summary sheet, contest records, county abbreviations, and Special Awards List is available by sending a large SASE to WA6VEF.

### VK/ZL/Oceania DX Contest

SSB: Oct. 7-8 CW: Oct. 14-15  
1000Z Saturday to 1000Z Sunday

This is the 54th year of the VK/ZL contest. The following rules are for overseas stations.

A maximum of 12 hours operating time is permitted in the 24-hour contest period, to be taken in one-hour blocks based on the "even hour to even hour" (1000Z to 1100Z/1300Z to 1500Z, etc.) in minimum periods of one hour. (SSB and CW are separate contests.)

Use all bands, 1.8-28 MHz, except WARC bands.

Oceania stations can work anyone. The rest of the world can work VK, ZL, and Oceania stations only. The same station may be worked on each band for QSO and multiplier credit.

**Exchange:** RS(T) plus a three-figure QSO number starting with 001.

**Points:** Two points per QSO for everyone.

**Multiplier:** Each VK/ZL/O prefix worked on each band.

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

**Awards:** Special large, color certificates to top scorers in each country and to each continental winner. A participation certificate to all on request (1 IRC, please).

There is an SWL section. Only VK/ZL/O stations are logged. Call of station being worked and RS(T) being sent must be reported. Scoring same as above but both SSB and CW scores are combined for final score (maximum total of 24 hours).

Use a separate log sheet for each band and underline each new VK/ZL/O prefix as it is worked on each band. Include a summary sheet showing the scoring and other essential information, and the usual signed declaration that all rules and regulations have been observed.

This year logs go to the new Contest Manager, Frank Beech, VK7BC, 37 Nobelius Drive, Legana 7277 Australia, and they must be received no later than February 15, 1990 (December 11, 1989 for VK/ZL).

### RSGB 21/28 MHz SSB Contest

0700 to 1900 GMT Sunday, Oct. 8

It's the world working the British Isles on 21 and 28 MHz.

The same station may be worked on each band for QSO and multiplier credit. There are a total of 49 prefixes available on each band. Following are the rules for areas other than the British Isles.

**QSY Rule:** All stations who QSY from one band to the other and make a scoring contact may not change bands again for a period of at least 10 minutes after the last contact on the original band (this does not apply to SWLs).

**Sections:** Single operator and multi-operator, both bands only, and SWL.

**Exchange:** RS report plus a progressive QSO number starting with 001.

**Scoring:** Each contact with a B.I. station is worth 3 points. Multiply total QSO points from each band by the sum of B.I. prefixes worked on each band (maximum of 49 per band). The GB prefix does not count for QSO or multiplier.

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

**Awards:** Certificates to the three leading overall winners, and at the discretion of the committee, to the leading station in each country. Both for transmitting and SWL.

There is also an SWL section. Only B.I. stations are to be logged. Scoring is the same as indicated above. The same call sign may appear once only in every three contacts, except when the logged station is a new multiplier.

**Awards:** Overseas stations will be awarded certificates to the leading station in each country and the leading sta-

tion in the multi-operator section, and to the SWL winner in each country. The first, second, and third overall winners will also receive certificates of merit.

Separate log sheets are required for each band. Include a summary sheet showing the scoring, prefixes worked, and a signed declaration that rules and regulations have been observed.

Logs must be received by December 5th. This year they go to: RSGB Contest Committee, P.O. Box 73, Lichfield, Staffs. WS13 6UJ England.

### Illinois QSO Party

1800Z Sun. to 0200Z Mon., Oct. 8-9

This is the 27th anniversary of the Illinois QSO Party sponsored by the Radio Amateur Megacycle Society. It's a shorty, only 8 hours long.

Stations may be worked once per band and mode, and IL stations can contact other in-state stations for QSO and multiplier credit.

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

**Scoring:** One point for phone contacts, 2 points if on CW. Illinois stations multiply total QSO points by (states + provinces + IL counties + maximum of 5 countries) worked. Additional DX QSOs count for points but not multiplier.

Others use IL counties for their multiplier (maximum of 102).

Illinois mobiles add 200 points to final score for each county from which 10 or more QSOs were made.

All stations earn an extra multiplier for every eight QSOs made with the same county.

**Frequencies:** CW—3550, 7050, 14050, and 30 kHz above bottom edge of Novice subbands for CW and 28390 for phone. SSB—3890, 7290, 14290. Other bands may also be used.

**Awards:** Certificates to the top 10 scoring IL fixed stations, 5 IL mobiles, winners in each state, province, country, and the highest club/team aggregate score. A plaque goes to the top-scoring Illinois station.

**Logs:** Indicate band and mode, circle each new multiplier, and IL mobiles must indicate each county change. Stations with over 100 QSOs must submit a dupe sheet.

A summary sheet showing the scoring and the usual signed declaration is also requested.

Mailing deadline for logs is November 7th to: RAMS, c/o Joe LeKostaj, WB9GOJ, 9134 Ewing Ave., Evanston, IL 60203.

### YLRL Anniversary Party

CW: Oct. 11-13 SSB: Oct. 25-27  
1400Z-0200Z, Wed.-Fri.

This is the 50th annual party run by the



YL Radio League. It is open to all YL's around the world. Activity will be found on all bands, 10 through 80 meters, and will be between YLs only.

CW and SSB are separate contests and require separate logs. A station may be worked *once on each band* for contest credit. Operation is limited to 24 out of the 36-hour contest period. Be sure to indicate off periods in your log.

**Exchange:** QSO no., RS(T), and QTH; U.S. state, VE province, or DX country.

**Scoring:** One point per QSO between stations within the U.S. and Canada (including Alaska and Hawaii). Two points for contacts with stations in other areas.

DX YLs score 2 points for QSOs with the U.S. and Canada and with other continents, but 1 point with stations in own continent.

**Final Score:** Multiply total QSO points from all bands by the sum of states, provinces, and DX countries worked.

There is a low-power bonus multiplier of 1.25 for stations using 100 watts or less on CW and 200 watts PEP on SSB. Multiply final score by 1.25 if applicable.

For each duplicate contact removed from your log there is a penalty of 3 additional and equal contacts removed from your log.

**Frequencies:** CW—3555, 7055, 14055, 21135, 28195. SSB—3955, 7255, 14265, 21395, 28595 (plus or minus 15 kHz). Look in DX portions of band on 40 and 80 meters.

**Awards:** Certificates to winning scores in each district, province, and DX country, and first, second, and third place overall winners. There are cups and plaques for YLRL members in North America and DX countries, and two special awards for the highest combined CW and SSB scores.

Include a summary sheet with your entry showing the scoring and other essential information. Logs must be in their original form, no carbon copies.

Your entry must be received by December 2nd, and this year logs go to: Carol Shrader, W14K, 4744 Thoroughgood Dr., Virginia Beach, VA 23455.

### Pennsylvania QSO Party

1600-0500Z Sat.-Sun., Oct. 14-15  
1300-2200Z Sun., Oct. 15

This is the 32nd annual party sponsored by the Nittany ARC of State College, PA. The same station may be worked on each band and mode for QSO points. PA stations may also work other in-state stations for QSO and multiplier credit, and mobiles in each county change. Novice stations must identify.

**Exchange:** QSO number and County for PA, ARRL section for others.

**Scoring:** One point for SSB contacts, 1.5 points for CW, 2 points if on 80 or 160. PA stations multiply total by (ARRL

### Bernie Welch, W8IMZ CQ Contest Hall of Fame

On 18 June 1989 B. W. "Bernie" Welch, W8IMZ, became the fifth inductee in the Contest Hall of Fame. Bernie has been active in contesting for over 30 years and associated with *CQ* magazine contests for the majority of that time. Bernie was a member of the *CQ* WW Contest Committee for many years, and then took over as Director of the *CQ* WPX Contest in 1972, a position he held until his retirement in 1983. From 1983 to the present he has been the Contest Advisor for *CQ* magazine. During his tenure as WPX Contest Director, Bernie was the driving force behind the growth of the WPX SSB Contest, and was responsible for the addition of the CW WPX Contest in 1979 and the *CQ* 160 meter SSB Contest. As Director, Bernie unselfishly devoted hundreds of hours each year to checking and cross-checking logs, compiling the results, promoting the contest at every opportunity, and handling certificates and plaques. All of this was done without the aid of the sophisticated word-processing and log-checking/scoring programs in use today.

Bernie has been a member of many DX and contest expeditions throughout Europe and the Caribbean and was an operator on the 1976 *CQ* WW World Champion VP5M team. When he was not expeditioning, Bernie was an active participant in all

major *CQ* and ARRL contests, usually finishing at or near the top in the eighth district.

Bernie was also the founder of the popular contest forum at the Dayton Hamvention and served as its moderator for nine years. The forum has grown to be the second largest at Dayton and possibly the largest strictly contest forum anywhere.

In recent years Bernie has opened his station to many young contesters who were just getting started. Not only has he offered the use of his fine station, but he has offered much valuable advice on operating techniques and propagation characteristics, as well as constant encouragement and some pretty good food.

In addition to his contest duties, Bernie has served as a *CQ* DX Award checkpoint for many years. When he is not contesting, Bernie has found the time to make both the *CQ* and ARRL DXCC Honor Roll and to work WAZ and 5 Band DXCC.

Throughout his long contesting career Bernie has always done his best to promote amateur radio contesting wherever he has gone, and he has presented many programs on contesting for various radio clubs and hamfests throughout the country.

Through his unselfish efforts as WPX Director, his operating achievements, and his love of contesting, Bernie has made a positive impact on amateur radio contesting and is richly deserving of position number five in the *CQ* Contest Hall of Fame.



Attending the presentation of the *CQ* Contest Hall of Fame plaque on Father's Day were (left to right, front) WD6CTL, W8ILC, W8IMZ, N8BJQ (representing *CQ* magazine), and (back) W9UI, WB8MRU, and WN8RQC. (Photo by WB8MRU)

sections + PA counties + 1 DX country), total of 143 possible. Others use PA counties for their multiplier (total of 67 possible).

Mobiles add 500 points for each county operated from with a minimum of 10 QSOs. Mobiles on a county line give one QSO number, but get credit for two multipliers.

QRP stations multiply their score by 2, Novice/Tech by 3.

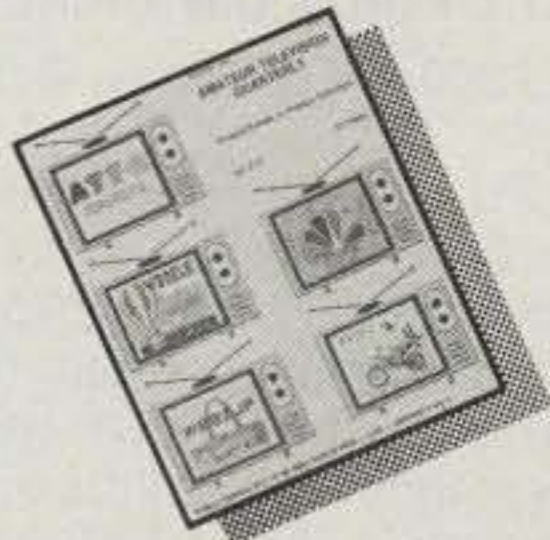
Final score is total points times multipliers.

**Frequencies:** CW—1810 and 40 kHz up from bottom of each CW band. SSB—1850, 3980, 7280, 14280, 21380, 28580. Novice—10 kHz up from bottom of each Novice band and SSB on 10 meters. Mobile—5 kHz below listed frequencies. Try 160 at 0300Z.

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QRP, and Novice/Tech. Certificates to winners in each PA county, ARRL section, DX country, and club entry (minimum of 3 members/20 QSOs per log). An impressive trophy program is available including a Club Trophy (members must reside within 175 mile radius), and Medium/Small Club Gavel (less than 75 members). In addition, there are 12 plaques available for winners in eastern and western PA, out-of-state, PA and out-of-state Novice, Multi-Single, Mobile, Portable, Central and Western Time Zones, NARC winner, and QRP.

Include a summary sheet with your entry showing the scoring, a check list of counties and sections worked, and a dupe sheet if you make 100 or more contacts. There is a severe penalty of 100 points deducted for each dupe that has not been removed.

Official log forms are recommended, and samples are available from K3SO. Send 50¢ for a copy of the results (no SASE).

Mailing deadline for all entries is November 15th to: James Trennepohl, K3SO, 1763 Princeton Dr., State College, PA 16803.

## Kentucky QSO Party

1500-0300Z Sat.-Sun., Oct. 14-15  
1500-2400Z Sun., Oct. 15

This year's party is sponsored by the Kentucky Colonel's Amateur Radio Club. Stations can be worked once per band and mode. KY stations can work each other or out-of-state QSOs. Participants may enter one of the following categories: KY fixed, KY portable, KY mobile, and non-KY.

**Exchange:** RS(T) and State/Province/County (county for KY stations only).

**Scoring:** Two points for CW QSO and 1 point for SSB. Multipliers are KY counties (120 maximum), states, provinces, and DXCC countries. Stations with less than 200 watts multiply their scores by 1.5. All stations that work five members of the KCARC will receive 200 bonus points. Portable/Mobile stations receive an additional multiplier of the number of counties from which they operate.

**Awards:** Plaques are available for top non-KY stations, KY fixed, KY mobile, and KY portable. Certificates will be distributed to winners in each State/Province/Country and top fixed station in each KY county. In addition, special certificates will be awarded to all stations that contact at least five KCARC members. To receive the certificate, list the club members on a separate sheet and have the application signed by an official of your local club, enclosing \$1.00 for postage.

Send summary sheet, logs, and dupe sheet (if more than 200 QSOs) to: Kentucky Colonel's Amateur Radio Club, P.O. Box 9781, Bowling Green, KY 42102-

9781. Deadline is November 30th and enclose an SASE for final results.

## RSGB 21 MHz CW Contest

0700 to 1900 GMT Sunday, Oct. 15

Like the 21/28 MHz Phone Contest, the activity in this one is between the British Isles and the rest of the world. Competition is limited to single operator stations only. There is a separate QRP section in which power input must not exceed 10 watts, and there is also an SWL section.

The following rules are for areas other than the British Isles.

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

**Scoring:** Each contact with a B.I. station is worth three points. Multiply total QSO points by the number of B.I. prefixes worked (G2, G3, GD3, etc.). A maximum of 49 is possible. (GB does not count for QSO or multiplier.)

Unmarked duplicate contacts for which credit has been taken will be penalized ten times the points claimed. Logs containing more than five unmarked duplicates will be disqualified.

Only British Isles stations are to be logged by overseas SWLs. The same call may be reported only once in every three contacts, unless the logged station is a new multiplier. Scoring is the same as above.

**Awards:** Certificates to the three leading overall winners, and at the discretion of the committee, to the leading station in each country. Both for transmitting and SWL.

Include a summary sheet with a list of prefixes worked, station description, the usual signed declaration, and your name and address in block letters.

Logs must be received by December 31st and they go to: RSGB Contest Committee, P.O. Box 73, Lichfield, Staffs. WS13 6UJ, England.

## Scouts Jamboree On The Air

0001 Sat. to 2400 Sun., Local Time,  
Oct. 21-22

This is the 32nd annual Jamboree sponsored by the World Scout Bureau. This is not a contest, but an opportunity for Scouts or anyone interested in Scouting to get together on the air and exchange greetings and information.

Scouts of course will set up their own stations, but amateurs can invite members of Scout units or individuals to visit their stations or clubs to see how ham radio operates.

Any authorized frequencies may be used. The following frequencies are suggested as calling spots, and once a contact has been established, move to another frequency. CW—3590, 7030, 14070, 21140, 28190 kHz. Phone—3740,



3940, 7090, 14290, 21360, 28990 kHz.

No specific exchange, no scoring, and no logs are required, but participating stations are requested to send a report of their activity to their National Organizer. In the US they can be sent to: JOTA Coordinator, International Division BSA, 1325 Walnut Hill Lane, Irving, TX 75038-3096.

### ARCI QRP Fall CW Contest

1200Z Sat. to 2400Z Sun., Oct. 21-22

This is the fall edition of the QRP Amateur Radio Club International. This year's activity will be found on CW only. Participants are limited to 24 hours out of the 36-hour contest period.

**Exchange:** RST and state, province, or country. Members will include their number; non-members their power output.

**Scoring:** Contacts with members, 5 points. Non-members, 2 points if in same continent, 4 points if in a different continent. The same station may be worked on each band for QSO and multiplier credit.

There is a power output bonus: 0 to 1 watt— $\times 10$ ; 1 to 5 watts— $\times 7$ . Over 5 watts check log only.

The following bonus multipliers are also available: solar or wind power— $\times 2$ ; battery power— $\times 1.5$ . Must be used for duration of contest. And a bonus on each band if homebrew equipment is used, 2000 if a transmitter, 3000 if a receiver, and 5000 if a transceiver (maximum of 5000 per band).

**Multiplier:** Each state, VE province, and DX country worked on each band.

**Final Score:** Total QSO points from all bands  $\times$  (states + provinces + countries)  $\times$  power bonus  $\times$  power type if any + homebrew bonus.

**Frequencies:** 1810, 3560, 7040, 14060, 21060, 28060, 50060. Novice—3710, 7110, 21110, 28110.

**Awards:** Entries may be single or all band. Certificates to the top ten scores overall; to the top score on each band for single band entries; and to the top scores in each state, province, and DX country. There is a team category, 2 to 5 members, with a certificate to the highest scoring team.

Use a separate log sheet for each band. Include a summary sheet showing the scoring, equipment description, and other essential information. Include a large SASE for a copy of the results. It is suggested you send a large SASE to K5VOL for official log forms.

Logs must be received by November 9th and go to: QRP ARCI Manager, Red Reynolds, K5VOL, 835 Surrise Road, Lake Zurich, IL 60047.

### Classic Radio Exchange

2000Z Sun. to 0400Z Mon., Sept. 24-25

This is the fall edition of this unusual

event. The format is still the same as it has been for the past years. Object is to restore and operate older equipment with like-minded hams, not required in the exchange, but a distinct advantage in the scoring.

A classic radio is any equipment at least 10 years old.

The same station may be worked on each band and each mode, and with different equipment combinations. Non-contesters may be worked for credit also.

**Exchange:** Name, RS(T), QTH, receiver and transmitter type, and other interesting conversation.

**Scoring:** Multiply total QSOs by total number of receivers, transmitters, state/provinces/countries worked on each band and mode. Multiply that total by your Classic Multiplier, the total age of all receivers and transmitters used. Three QSOs minimum per unit. Multiply age by two if gear is a transceiver. If equipment is homebrew, count it as a minimum of 25 years old, unless its actual construction date is older.

**Frequencies:** CW—60 kHz up from low edge of band. Phone—3880, 7290, 14280, 21380, 28320. Novice/Tech.—3720, 7120, 21120, 28120, 28320.

**Awards:** Certificates and appropriate memorabilia are awarded for highest scores, longest DX, exotic equipment, best excuses, and other unusual achievements.

Send logs, comments, anecdotes, pictures to Jim Hanlon, W8KGI, 5560 Linworth Road, Columbus, OH 43235. Include a large SASE for copy of newsletter with results.

### CQ World-Wide DX Contest

Phone: Oct. 28-29 CW: Nov. 25-26  
0000Z Saturday to 2400Z Sunday

Complete rules were published in last month's issue. This year's CQ WW includes two new rule changes. First, the CQ WW Contest Committee has voted to eliminate the two-year rule for trophies. Second, there is a new category—Single Operator, Unlimited—that has been created in response to the growing interest in packet radio and DX spotting. Please read the rules carefully for a more complete explanation of these changes.

A few awards have been eliminated or picked up by new donors. The detailed trophy list can be found in the rules announcement. Furthermore, all CQ WW trophies are now produced locally by CQ magazine, which should improve award consistency and delivery in the future.

You are again reminded to study the disqualification clause. Penalties for taking credit for duplicate contacts and other infractions have been clearly defined. You not only risk a deduction in your score, but also possible disqualification.

Repeating the deadline, all entries must be postmarked NO LATER than December 1, 1989 for the phone section, and January 15, 1990 for the CW section. An extension may be granted if requested in writing to the Contest Committee.

Again this year all logs must be sent directly to: CQ World-Wide DX Contest, 76 North Broadway, Hicksville, NY 11801 U.S.A. Be sure to indicate Phone or CW on the envelope.

ICOM ICOM ICOM ICOM ICOM ICOM



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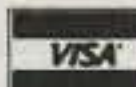


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## THE SCIENCE OF PREDICTING RADIO CONDITIONS

### DX Contest Special

The 1989 CQ World-Wide DX Contest will be held on the following dates:

Phone: 0000 UTC Saturday, Oct. 28 to  
2400 UTC Sunday, Oct. 29

CW: 0000 UTC Saturday, Nov. 25 to  
2400 UTC Sunday, Nov. 26

For the 39th consecutive year this month's propagation column is devoted to special forecasts for both the Phone and CW contest weekends. The accuracy of the 38 previous contest forecasts is in excess of 90 percent!

#### Greatest Contest Ever?

As the present sunspot cycle continues to head towards what seems to be an unprecedented high level of activity, the National Geophysical Data Center at Boulder, Colorado is forecasting a smoothed sunspot number of approximately 186 for the 1989 contest period. This would be the second highest level of solar activity ever to occur during a CQ DX contest. The highest occurred during the contest of 1957, when the smoothed sunspot number was 200. So, unless nature should unleash a radio storm, this year's contest may at least be the second best in the history of radio, and taking into account the advancement in the state of equipment and activity, it may well be the best every held to date!

A long-range CQ day-to-day forecast based primarily on the 27-day recurrence tendencies of geomagnetic and ionospheric conditions indicates that there is a high probability that conditions during the CQ WW DX Phone Contest weekend of October 28-29 will be at least Low Normal with a fairly good chance that they will climb to High Normal, so expect what may turn out to be a record breaker. An updated forecast for the contest weekend will be given as a bulletin at the beginning of next month's column. The November issue of CQ should reach most subscribers before the phone contest weekend.

See the Last Minute Forecast box in this column for additional information concerning expected day-to-day conditions during October.

11307 Clara Street, Silver Spring, MD  
20902

#### LAST MINUTE FORECAST

Day-to-Day Conditions Expected for October 1989

| Propagation Index .....                            | Expected Signal Quality |     |     |     |
|--|-------------------------|-----|-----|-----|
|  | (4)                     | (3) | (2) | (1) |
| Above Normal: 4, 6, 14, 31                         | A                       | A   | B   | C   |
| High Normal: 5, 9, 12-13, 15,<br>19-20, 27, 29-30  | A                       | B   | C   | C-D |
| Low Normal: 1, 3, 7-8, 11,<br>16-18, 22-23, 26, 28 | B                       | C   | D   | D-E |
| Below Normal: 2, 10, 21, 24                        | C                       | C-D | D-E | E   |
| Disturbed: 25                                      | 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 October 1st, fair-to-poor (C-D) on the 2nd, good-to-fair (B-C) on the 3rd, excellent (A) on the 4th, good (B) on the 5th, etc. Good-to-fair conditions are expected on October 28th, the first day of the CQ WW DX Contest, improving to good (B) on October 29.

#### Unprecedented Solar Activity Continues

The Royal Observatory of Belgium reports a monthly mean sunspot number of 196 for June 1989. This is the highest monthly median reported to date for Cycle 22. Daily levels ranged from a low of 130 on June 7th to a high of 265 on the 16th. This results in a 12-month running smoothed sunspot number of 137 centered on December 1988. A smoothed sunspot number of 185 is forecast for this month by the National Geophysical Data Center.

There was a corresponding increase in the 10.7 cm solar flux level for June. The Algonquin Radio Observatory at Ottawa, Ontario reports a monthly mean of 247. The level soared to 335 on June 15.

#### Band-By-Band Conditions

The following is a band-by-band summary of DX propagation conditions expected from mid-October through mid-December, and centered on the 1989 Contest periods.

**10 Meters:** Best conditions in years expected. Good, solid openings should be possible to just about every corner of the world during the daylight hours, and the band should remain open to southern and tropical regions well into the early evening. Openings towards Europe and in a generally easterly direction should peak an hour or two before noon, while those towards South America and Africa are expected to peak during the early afternoon hours. Optimum conditions towards the Far East, Australia, Southeast Asia, etc., are forecast for the late afternoon and early evening hours. Expect exceptionally strong signal levels on most openings, especially if conditions should rise to High or Above Normal.

**15 Meters:** Fantastic might well describe DX conditions expected on 15 meters! Excellent propagation conditions should exist from shortly after sunrise through the early evening hours, and possibly to as late as midnight. Look for a peak on 15 meters towards a particular geographical area about an hour or so after the peak has occurred to the same geographical area on 10 meters. Expect good, solid openings to all areas of the world, with exceptionally strong signals most of the time. This should be the best band for DX openings during most of the daylight hours, but it could be a toss-up with 10 meters during the afternoon.

**20 Meters:** DX openings should be possible on this band just about around-the-clock. Conditions should peak from about an hour or two after sunrise, and again during the late afternoon and early evening hours. Expect to work into most areas of the world between sunrise and sunset. Excellent openings should be possible to many areas of the world well into the hours of darkness as well. When conditions are High or Above Normal, expect 20 meters to remain open for worldwide DX during most of the night. Look for long-path openings for about an hour or so after sunrise and again for an hour or so before local sunset. Signal levels are expected to be exceptionally strong during



| Time  | Time  | Areas to which good openings are expected   |
|-------|-------|---|
| 00-03 | 08-11 | SE Asia, Far east, South Pacific, New Zealand, Australasia, Antarctica  |
| 03-06 | 11-14 | South Pacific, New Zealand, Australasia   |
| 06-09 | 14-17 | Central and South Asia, SE Asia, Far East, South Pacific, New Zealand, Australasia, Europe, Caribbean, Central America, and Northern Countries of South America |
| 09-12 | 17-20 | Far East, Caribbean, Central America  |
| 12-15 | 20-23 | Western & Central Europe, North Africa  |
| 15-18 | 23-02 | Europe, Africa, Caribbean, Central America, South America   |
| 18-21 | 02-05 | Africa, Central & South Asia, South Pacific, New Zealand, Caribbean, Central America, South America   |
| 21-24 | 05-08 | Far East, South Pacific, New Zealand  |

Table 1 - Sample 20 meter single-band work plan for western USA QTH.

peak periods of propagation. If you plan to operate on a single band during the contest, this should be it!

**40 Meters:** The band should open first for DX towards Europe and in a generally easterly direction during the late afternoon hours, and steadily improve towards evening. During the hours of darkness expect good DX openings to most parts of the world. Signals should peak from an easterly direction about midnight, and from a westerly direction just after sunrise. Conditions towards the south should be excellent throughout the nighttime period. When conditions are no better than Low Normal, 40 meters is likely to be the

best band for DX openings during the hours of darkness. When conditions are High or Above Normal, this honor will be shared between 40 and 20 meters.

**80 Meters:** This should be a good band for DX openings to many areas of the world during the hours of darkness and into the sunrise period. The band should peak towards Europe and in a generally easterly direction around midnight. For openings in a generally westerly direction, expect a peak just after sunrise. The band should remain open towards the south throughout most of the night. Propagation on this band is quite similar to that expected on 40 meters, except signals will be somewhat weaker on the average, noise levels a bit higher, and the period for band openings in a particular direction a bit shorter.

**160 Meters:** Expect some DX openings on this band during the hours of darkness and into the sunrise period. Signals tend to peak at *local sunrise* at the more easterly terminal of a particular path. Greater ionospheric absorption, higher levels of static, and the lower power levels used on this band should result in generally noisy and weak DX openings, but some good ones should be possible. Look for openings towards Europe and towards south from the eastern half of the USA, and towards the south, the Far East, Australasia, and the South Pacific from the western half of the country. Other DX openings should also be possible. The best propagation aid for this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path.

### Contest Work Charts

The DX Propagation Charts on the following pages show the times when each amateur band 10 through 160 meters is expected to open from the United States to the major areas of the world. The information contained in the charts can easily be reorganized into more convenient types of operational work plans, or operating schedules, which can serve as valu-

able guides during the contest. Experience gained during previous contests has shown that such plans can be extremely useful in piling up contacts and points with a minimum of wasted time.

Table 1 is an example of one of several type plans that can be devised. It is a single-band operational work schedule for 20 meters, which shows the times when propagation conditions are expected to be optimum to various areas of the world (propagation index 3 or 4), for each three hour period throughout the day. A Pacific time zone QTH has been chosen for this example, but similar plans can be devised for other time zones and other bands.

The CQFCST computer program developed by Jack Baldwin, VE7RG, is ideal for rearranging the CQ DX Propagation Charts into work plans to meet specific operating habits. Other versions of Table 1 for use during the contest can readily be developed from this program. The program is available as shareware directly from Jack Baldwin at the following address: VE7RG, 2423 W. Tucana Street, Tucson, AZ 85745. Be sure to provide Jack with an MS-DOS formatted disk and IRCs for sufficient return postage.

### Do-It-Yourself Forecasting

If you have a modem-equipped personal computer, you can obtain a wealth of updated daily summaries of solar and geophysical activity and a daily HF propagation summary and forecast (updated every six hours) directly from the NOAA Space Environmental Services Center (SESC) bulletin board in Boulder, Colorado. Information about a variety of other useful SESC services and products is also posted on the board.

The SESC bulletin board is in operation 24 hours each day. Modem-equipped PCs can access the system by dialing (303) 497-5000. Either 300 or 1200 baud can be used. Protocol is the standard 8-bit data word with one stop bit and no parity. There is no charge for the data that can be obtained from the SESC bulletin board, but the telephone call is not toll-free. This bulletin board can provide the most comprehensive real-time propagation data concerning solar and geomagnetic conditions available during the contest period.

Fig. 1 can be used with the updated values of geomagnetic activity ( $A_p$  or  $K$  figures) and the latest reading of solar flux available from SESC to determine real-time day-to-day conditions, in terms of Disturbed, Below Normal, Low Normal, High Normal, or Above Normal. If you do not have a modem-equipped computer, the latest geomagnetic and solar flux levels can be obtained from National Bureau of Standards Radio Station WWV broadcasts at 18 minutes past each hour. These broadcasts are transmitted simultaneously on 2.5, 5, 10, 15, and 20 MHz.

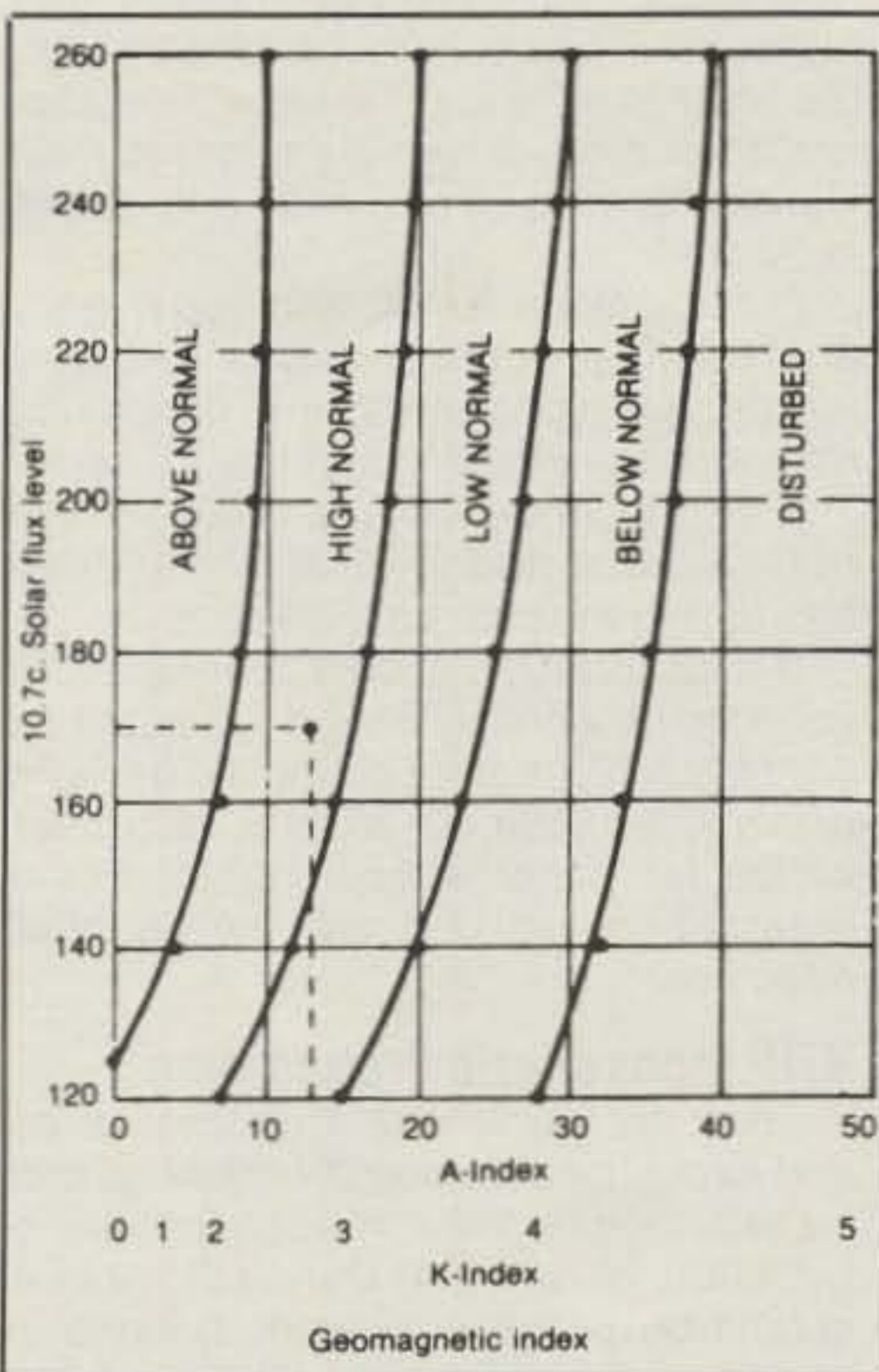


Fig. 1 - Intersection of given values of solar flux and geomagnetic activity determine expected HF ionospheric propagation conditions. (Example: Solar flux is 170 and A-index is 13; expect High Normal condition.)



They contain the latest available geomagnetic Ap and K figures, as well as the 10.7 cm solar flux level and short-term forecast of expected conditions. The same information can be obtained at any time by calling (303) 497-3235 (collect calls will not be accepted).

WWVH, located on the Island of Kauai, Hawaii, has resumed broadcasts of geophysical alerts at 45 minutes past each hour on frequencies of 2.5, 5, 10, and 15 MHz, with its signal audible throughout the Pacific Oceania area and further into other parts of the world, depending upon radio propagation conditions. These augment the same alert broadcasts from WWV, which can be heard throughout the Western Hemisphere and other parts of the world as well. Both WWV and WWVH solar alert broadcasts are updated every three hours beginning at 0000 UTC, and they contain the latest information concerning geomagnetic and solar conditions, as well as radio-storm warning data. Alert data is also available at any time by calling the "on-duty forecaster" at SESC at (303) 497-3171.

Several good computer programs are available for supplementing band-opening predictions contained in the CQ DX Propagation Charts appearing on the following pages. A simple-to-use program requiring no special graphics or color is MINIPROP.3™. This program, for use with an IBM-PC or a clone, was written as shareware by Sheldon Shallon, W6EL, and produces a wealth of useful propagation data, including predictions for around-the-clock short- and long-path band openings between path terminals located anywhere in the world. The program also produces sunrise and sunset times, grayline times and bearings, and great-circle distances and bearings. A special feature of the program is the *DX Compass*, which for any location at a specific time will show the MUF in all directions at 30 degree intervals.

MINIPROP.3™ is well-prompted, self-explanatory, and easy to use. Details for its availability can be obtained directly from: Sheldon C. Shallon, W6EL, 11058 Queensland Street, Los Angeles, CA 90034.

Base(2) Systems (2534 Nebraska Street, Saginaw, MI 48601) has produced a trio of very useful propagation programs. BAND AID™, for example, is intended for IBM and clone PCs, with color/graphic cards. At the heart of the program is the propagation forecasting module, which makes it possible to predict band-opening conditions between any two points on earth. The results can be presented in either tabular or graphical form. Distance and bearings between stations are also provided, as are sunrise/sunset times and grayline data.

The program also includes several other very useful features such as a UTC

time-conversion table, a list of 10 and 20 meter beacon stations, a QSL databank, and a list of authorized amateur bands by class of license. The program also contains a world map that can be used to display the location of any station. The program is menu-driven, can be customized for your location, and is easy to use.

Base(2) Systems also produces a program called MUF PLOT™, which is designed for use with Commodore and Apple II computers. While not as comprehensive as BAND AID™, it can be used for band-opening predictions.

The third Base(2) product, which was introduced during 1988, is called MUF-MAP™. This is the most advanced propagation program that I have seen for radio amateur use. Its graphics are superb, and band openings are displayed on a world map in a manner previously only available in very advanced professional programs. It is also possible to produce a *MufMovie* with the program. This is a series of map-presented band openings in which solar flux, time of day, and date can be varied, and then presented frame after frame for comparison, much like a movie. Despite its being an advanced program, it is menu-driven and easy to use.

More complete details and pricings are available directly from Base(2) Systems. MUFMAP™ is only available for IBM-PC and clone computers.

Another excellent program which previously was only available for Commodore 64 and 128 owners, but which has recently also come out in an IBM-PC version, is the Super DX Edge™. In addition to calculating the MUF and great-circle bearings and distances between any two locations, the program gives a detailed graphical presentation of grayline conditions. It lets you see the shape and position of the grayline on keystroke command displayed on a high-resolution world map. At the same time you can see the area of the world in daylight and the part in darkness. If you do not have a computer, a slide-rule version of the DX Edge™ is available. This version calculates the grayline, but does not produce propagation band openings. For additional information and pricing data for both the Super DX Edge™ and the DX Edge™, write directly to Xantek, P.O. Box 834, Madison Square Station, New York, NY 10159.

An excellent propagation program for Apple Macintosh computers is called MacTrak™, which is also known as Satellite Helper™ as well as DX Helper™. These programs present an hour-to-hour graphical presentation of Maximum Usable Frequency (MUF) versus time between any two points on earth. A Muf/Map display depicts the areas of the world that are open for a particular band. The programs also contain a wealth of useful in-

formation for satellite tracking and DX hunting. Additional information and pricing for these programs can be obtained directly from MacTrak™ Software, P.O. Box 1590, Port Orchard, WA 98366.

Lee Wical, KH6BZF, puts out an excellent weekly newsletter full of interesting propagation information and containing advanced forecasts of HF and VHF ionospheric openings. Write directly to KH6BZF at 45-601 Luluku Road, CRT No. 4411, Kane 'Ohe, Hawaii 96744-1854 for more complete details, availability, and pricing. Enclose an SASE for reply.

If you do not already have a copy of the *Shortwave Propagation Handbook* by myself and Theodore J. Cohen, N4XX, then you might want to get one to read before the contest begins. Copies are still available from the CQ Book Shop, 76 North Broadway, Hicksville, NY 11801 for \$9.95 postpaid (plus \$2.00 shipping and handling).

## Radio Storm

If Mother Nature should play a trick and produce a radio storm during the contest periods, expect conditions to drop to Below Normal or Disturbed to many areas of the world, depending on the storm's severity. The storm's influence will generally extend outwards from the polar regions, the more severe the storm becomes. Under storm conditions, expect considerably fewer openings on 10, 15, and 20 meters, with weaker signals, increased fading, flutter fading, and higher noise levels. Paths passing through the polar regions and the upper latitudes are often more adversely affected than signals coming from mid and lower latitudes.

Conditions on 40, 80, and 160 meters are likely to become erratic as well. During certain types of storms, conditions may actually improve at times for openings on all bands towards southern and tropical areas, and on 40, 80, and 160 meters during the hours of darkness.

If a radio storm should develop, concentrate on working trans-polar paths on 10, 15, and 20 meters during the daylight hours. Check the 40, 80, and 160 meter bands for possible openings to some areas of the world during the hours of darkness.

## VHF Ionospheric Propagation

Solar activity is now high enough so that exceptionally good DX openings can be expected on the 6 meter band during the hours of daylight. During October it should be possible to work stations in most areas of the world where this band is allocated for amateur use. Although the DX Charts contained in this month's column do not include the 6 meter band directly, 6 meter DX openings can be expected at those times and to those areas of the world where 10 meter openings are shown with a propagation index greater



than 3. Generally speaking, check for openings from the eastern half of the USA towards Europe and the east before noon, and towards Africa an hour or so after noon. Best chance for 6 meter DX openings towards the Caribbean and Central and South America from all areas of the USA should be during the afternoon hours. Look for openings towards the Far East, the South Pacific area, New Zealand, and Australasia during the late afternoon hours. These openings will favor stations located in the western half of the USA, but some openings should extend considerably eastward. There will be lots of DX surprises in store for the 6 meter band during the next six months, with a good chance for some new DX records to be established.

Trans-continental and 6 meter openings over shorter distances are also expected to increase dramatically during October and the fall, winter, and early spring months, with conditions likely to peak during the afternoon hours.

A major meteor shower, which could produce meteor-reflection-type ionospheric openings on the VHF bands, is expected October 20-22. Called *Orionids*, the shower should reach peak intensity at about 7 PM EST on October 21, with an hourly meteor count of approximately 25. Peaks in minor meteor showers are expected on October 3 and 12.

Auroral activity generally increases during October, and an increase in auroral-scatter-type VHF openings can be expected. There is also the likelihood for increased short-skip sporadic-E propagation resulting from expected auroral activity, particularly on 10 and 6 meters. The best time to check for such openings is when conditions on the HF bands are expected to be Below Normal or Disturbed, as shown in the Last Minute Forecast appearing at the beginning of this column.

### CW Contest Forecast

This month's DX Propagation Charts are valid for both the phone and the CW sections of the contest. Be sure to keep them handy for use during next month's CW section as well. Short-Skip Propagation Charts for use during October appeared in last month's column.

Experience from the past 38 contest years has shown that DX Contests are excellent periods in which to test the accuracy of prediction and forecast methods used in this column. Contests generate a large amount of activity in every corner of the world and on all HF bands. Previous results and observations have helped considerably in improving the accuracy of this column. Comments concerning the 1989 contest and the accuracy of these forecasts and predictions would be appreciated, and should be sent directly to W3ASK at P.O. Box 1714, Silver Spring, MD 20902. *Good luck in the contest!*  
73, George, W3ASK

| October 15 - December 15, 1989<br>Time Zone: EST (24-hour time)<br>EASTERN USA TO: |   |   |  |   |
|--|---|---|--|---|
|  | 10 Meters   | 15 Meters   | 20 Meters  | 40/80 Meters  |
| Western & Central Europe & North Africa  | 06-07 (1)<br>07-08 (3)<br>08-13 (4)<br>13-14 (3)<br>14-15 (1)   | 06-07 (1)<br>07-08 (3)<br>08-14 (4)<br>14-15 (3)<br>15-16 (2)<br>16-17 (1)  | 04-06 (2)<br>06-09 (4)<br>09-10 (3)<br>10-12 (2)<br>12-14 (3)<br>14-18 (4)<br>18-20 (3)<br>20-22 (2)<br>22-00 (1)<br>00-02 (2)<br>02-04 (3)              | 16-17 (1)<br>17-18 (2)<br>18-20 (3)<br>20-01 (4)<br>01-02 (3)<br>02-03 (2)<br>03-04 (1)<br>19-21 (1)*<br>21-23 (2)*<br>23-01 (3)*<br>01-02 (2)*<br>02-03 (1)* |
| Northern Europe & European USSR  | 06-07 (1)<br>07-08 (2)<br>08-09 (3)<br>09-11 (4)<br>11-12 (2)<br>12-13 (1)  | 06-07 (1)<br>07-08 (3)<br>08-13 (4)<br>13-14 (3)<br>14-15 (1)   | 04-06 (1)<br>06-07 (2)<br>07-09 (3)<br>09-11 (2)<br>11-17 (3)<br>17-19 (4)<br>19-21 (3)<br>21-23 (2)<br>23-01 (3)<br>01-04 (2)                           | 17-19 (1)<br>19-02 (2)<br>02-04 (1)<br>20-03 (1)*   |
| Eastern Mediterranean & Middle East  | 07-08 (1)<br>08-09 (3)<br>09-13 (4)<br>13-14 (3)<br>14-15 (1)   | 06-07 (1)<br>07-08 (3)<br>08-10 (4)<br>10-13 (3)<br>13-15 (4)<br>15-16 (3)<br>16-17 (2)<br>17-18 (1)              | 07-12 (1)<br>12-15 (2)<br>15-17 (3)<br>17-22 (4)<br>22-00 (3)<br>00-01 (2)<br>01-03 (1)  | 18-20 (1)<br>20-22 (2)<br>22-00 (3)<br>00-01 (2)<br>20-00 (1)*  |
| Western Africa   | 06-07 (1)<br>07-12 (3)<br>12-16 (4)<br>16-17 (3)<br>17-18 (2)<br>18-19 (1)  | 04-05 (1)<br>05-07 (2)<br>07-14 (3)<br>14-20 (4)<br>20-22 (3)<br>22-00 (2)<br>00-01 (1)                           | 03-04 (3)<br>04-06 (2)<br>06-13 (1)<br>13-15 (2)<br>15-17 (3)<br>17-03 (4)   | 18-22 (1)<br>22-01 (2)<br>01-03 (1)<br>00-03 (1)*   |
| Eastern & Central Africa   | 07-08 (1)<br>08-09 (2)<br>09-12 (3)<br>12-15 (4)<br>15-16 (3)<br>16-17 (2)<br>17-18 (1)                           | 06-07 (1)<br>07-09 (3)<br>09-13 (2)<br>13-15 (3)<br>15-18 (4)<br>18-19 (3)<br>19-22 (2)<br>22-00 (1)              | 03-05 (2)<br>05-09 (1)<br>12-14 (1)<br>14-16 (2)<br>16-17 (3)<br>17-01 (4)<br>01-03 (3)  | 19-22 (1)<br>22-00 (2)<br>00-01 (1)<br>22-00 (1)*   |
| Southern Africa  | 07-08 (1)<br>08-10 (3)<br>10-14 (4)<br>14-16 (3)<br>16-17 (2)<br>17-18 (1)  | 06-08 (1)<br>08-11 (2)<br>11-13 (3)<br>13-16 (4)<br>16-18 (3)<br>18-20 (2)<br>20-22 (1)                           | 06-09 (1)<br>11-14 (1)<br>14-15 (2)<br>15-17 (3)<br>17-21 (4)<br>21-02 (3)<br>02-05 (2)  | 18-19 (1)<br>19-22 (2)<br>22-23 (1)<br>19-21 (1)*   |
| Central & South Asia   | 08-09 (1)<br>09-10 (2)<br>10-11 (1)<br>20-22 (1)  | 07-08 (1)<br>08-10 (2)<br>10-11 (1)<br>18-20 (1)<br>20-22 (2)<br>22-00 (1)  | 06-07 (1)<br>07-09 (3)<br>09-10 (2)<br>10-11 (1)<br>18-20 (1)<br>20-21 (2)<br>21-23 (3)<br>23-00 (2)<br>00-01 (1)  | 18-21 (1)<br>06-08 (1)  |
| Southeast Asia   | 10-12 (1)<br>12-14 (2)<br>14-15 (1)<br>17-18 (1)<br>18-20 (2)<br>20-21 (1)  | 09-10 (1)<br>10-12 (2)<br>12-13 (1)<br>17-18 (1)<br>18-19 (2)<br>19-21 (3)<br>21-22 (2)<br>22-23 (1)              | 02-06 (1)<br>06-09 (2)<br>09-11 (1)<br>18-21 (2)<br>21-23 (1)  | 18-20 (1)<br>05-07 (1)  |
| Far East   | 08-10 (1)<br>16-17 (1)<br>17-18 (2)<br>18-20 (3)<br>20-21 (1)   | 08-09 (1)<br>09-11 (2)<br>11-12 (1)<br>16-17 (1)<br>17-18 (2)<br>18-19 (4)<br>19-20 (3)<br>20-21 (2)<br>21-22 (1) | 00-04 (2)<br>04-06 (1)<br>06-07 (2)<br>07-09 (3)<br>09-10 (2)<br>10-11 (1)<br>16-18 (1)<br>18-20 (2)<br>20-00 (3)  | 04-05 (1)<br>05-07 (2)<br>07-08 (1)<br>05-07 (1)*   |
| South Pacific & New Zealand  | 09-12 (1)<br>12-14 (2)<br>14-16 (3)<br>16-19 (4)<br>19-20 (3)<br>20-21 (2)<br>21-22 (1)                           | 08-09 (1)<br>09-11 (2)<br>11-15 (1)<br>15-17 (2)<br>17-18 (3)<br>18-20 (4)<br>20-21 (3)<br>21-23 (2)<br>23-00 (1) | 13-19 (1)<br>19-21 (2)<br>21-22 (3)<br>22-02 (4)<br>02-04 (3)<br>04-07 (2)<br>07-10 (3)<br>10-13 (2)   | 00-02 (1)<br>02-03 (2)<br>03-07 (3)<br>07-08 (2)<br>08-09 (1)<br>03-04 (1)*<br>04-07 (2)*<br>07-08 (1)*   |
| Australasia  | 08-09 (1)<br>09-11 (2)<br>11-12 (1)<br>14-16 (1)<br>16-17 (2)<br>17-18 (3)<br>18-19 (4)<br>19-20 (2)<br>20-21 (1) | 07-08 (1)<br>08-11 (2)<br>11-16 (1)<br>16-17 (2)<br>17-18 (3)<br>18-20 (4)<br>20-22 (3)<br>22-23 (2)<br>23-00 (1) | 07-08 (3)<br>08-10 (4)<br>10-11 (3)<br>11-12 (2)<br>12-14 (1)<br>17-19 (2)<br>21-23 (1)<br>23-00 (2)<br>00-01 (3)<br>01-03 (4)<br>03-04 (3)<br>04-07 (2) | 03-05 (1)<br>05-07 (2)<br>07-08 (1)<br>05-07 (1)*   |
| Caribbean, Central America & Northern Countries of South America                   | 07-08 (2)<br>08-11 (4)<br>11-13 (3)<br>13-18 (4)<br>18-19 (3)<br>19-20 (2)<br>20-21 (1)                           | 06-07 (1)<br>07-08 (3)<br>08-11 (4)<br>11-13 (3)<br>13-20 (4)<br>20-21 (3)<br>21-23 (2)<br>23-01 (1)              | 07-09 (4)<br>09-11 (3)<br>11-14 (2)<br>14-16 (3)<br>16-02 (4)<br>02-03 (3)<br>03-06 (2)<br>06-07 (3)   | 18-19 (1)<br>19-21 (3)<br>21-04 (4)<br>04-06 (2)<br>06-07 (1)<br>19-21 (1)*<br>21-03 (2)*<br>03-05 (1)*   |

|   |  |   |   |   |
|---|--|---|---|---|
| Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay | 06-07 (1)<br>07-09 (4)<br>09-11 (3)<br>11-15 (2)<br>15-16 (3)<br>16-20 (4)<br>20-21 (2)<br>21-22 (1) | 06-07 (1)<br>07-09 (4)<br>09-11 (3)<br>11-15 (2)<br>15-17 (3)<br>17-22 (4)<br>22-23 (3)<br>23-00 (2)<br>00-01 (1) | 06-08 (2)<br>08-11 (1)<br>14-16 (1)<br>16-17 (2)<br>17-19 (3)<br>19-02 (4)<br>02-03 (3)<br>03-05 (2)<br>05-06 (3) | 20-23 (1)<br>23-04 (2)<br>04-06 (1)<br>23-04 (1)* |
| McMurdo Sound Antarctica                                    | 16-17 (1)<br>17-19 (2)<br>19-20 (1)  | 15-17 (1)<br>17-18 (2)<br>18-21 (3)<br>21-22 (2)<br>22-23 (1)   | 16-18 (1)<br>18-21 (1)<br>21-22 (2)<br>22-03 (3)<br>03-05 (2)<br>05-07 (1)<br>07-09 (2)<br>09-10 (1)              | 00-06 (1)   |

### Time Zones: CST & MST (24-hour time) CENTRAL USA TO:

|   | 10 Meters  | 15 Meters  | 20 Meters   | 40/80 Meters  |
|---|--|--|---|---|
| Western & Southern Europe & North Africa  | 06-07 (1)<br>07-08 (3)<br>08-11 (4)<br>11-12 (3)<br>12-13 (2)<br>13-14 (1)                           | 06-07 (1)<br>07-08 (3)<br>08-12 (4)<br>12-13 (3)<br>13-14 (2)<br>14-15 (1)   | 03-06 (1)<br>06-08 (3)<br>08-12 (2)<br>12-14 (3)<br>14-16 (4)<br>16-18 (3)<br>18-20 (2)<br>20-00 (1)<br>00-03 (2)                           | 17-18 (1)<br>18-20 (2)<br>20-23 (3)<br>23-01 (2)<br>01-02 (1)<br>19-20 (1)*<br>20-23 (2)*<br>23-00 (1)* |
| Northern & Central Europe & European USSR | 06-07 (1)<br>07-08 (2)<br>08-10 (3)<br>10-11 (2)<br>11-12 (1)  | 06-07 (1)<br>07-08 (3)<br>08-11 (4)<br>11-12 (3)<br>12-13 (2)<br>13-14 (1)   | 02-06 (1)<br>06-07 (2)<br>07-09 (3)<br>09-11 (2)<br>11-16 (3)<br>16-17 (4)<br>17-19 (3)<br>19-20 (2)<br>20-22 (1)<br>22-02 (2)              | 18-20 (1)<br>20-23 (2)<br>23-01 (1)<br>20-23 (1)*   |
| Eastern Mediterranean & Middle East       | 07-08 (1)<br>08-09 (2)<br>09-12 (3)<br>12-13 (2)<br>13-14 (1)  | 06-07 (1)<br>07-08 (2)<br>08-11 (3)<br>11-12 (3)<br>12-13 (3)<br>13-14 (2)<br>14-15 (1)  | 06-07 (1)<br>07-09 (2)<br>09-11 (1)<br>11-13 (2)<br>13-16 (3)<br>16-18 (4)<br>18-20 (3)<br>20-22 (2)<br>22-00 (1)                           | 17-19 (1)<br>19-22 (2)<br>22-23 (1)<br>20-22 (1)*   |
| Western Africa                            | 06-07 (1)<br>07-11 (3)<br>11-15 (4)<br>15-16 (3)<br>16-17 (2)<br>17-18 (1)                           | 05-06 (1)<br>06-10 (2)<br>10-14 (3)<br>14-18 (4)<br>18-19 (3)<br>19-21 (2)<br>21-22 (1)  | 05-12 (1)<br>12-15 (2)<br>15-17 (3)<br>17-23 (4)<br>23-01 (3)<br>01-05 (2)  | 17-19 (1)<br>19-21 (2)<br>21-22 (1)<br>19-21 (1)*   |
| Eastern & Central Africa                  | 07-09 (1)<br>09-11 (2)<br>11-15 (3)<br>15-16 (2)<br>16-17 (1)  | 06-07 (1)<br>07-12 (2)<br>12-15 (3)<br>15-17 (4)<br>17-18 (3)<br>18-20 (2)<br>20-21 (1)  | 06-14 (1)<br>14-16 (2)<br>16-19 (3)<br>19-21 (4)<br>21-23 (3)<br>23-00 (2)<br>00-02 (1)   | 20-00 (1)<br>21-23 (1)*   |
| Southern Africa                           | 07-08 (1)<br>08-09 (2)<br>09-11 (3)<br>11-14 (4)<br>14-15 (3)<br>15-16 (2)<br>16-17 (1)              | 06-07 (1)<br>07-10 (2)<br>10-12 (3)<br>12-15 (4)<br>15-17 (3)<br>17-18 (2)<br>18-20 (1)  | 06-13 (1)<br>13-15 (2)<br>15-17 (3)<br>17-20 (4)<br>20-23 (3)<br>23-02 (2)<br>02-04 (1)   | 18-19 (1)<br>19-21 (2)<br>21-22 (1)<br>19-21 (1)*   |
| Central & South Asia                      | 07-08 (1)<br>08-10 (2)<br>10-11 (1)<br>18-19 (1)<br>19-21 (2)<br>21-22 (1)                           | 06-07 (1)<br>07-10 (2)<br>10-11 (1)<br>17-18 (1)<br>18-19 (2)<br>19-21 (3)<br>21-22 (2)<br>22-23 (1)                           | 04-06 (1)<br>06-07 (2)<br>07-09 (3)<br>09-10 (2)<br>10-11 (1)<br>17-18 (1)<br>18-19 (2)<br>19-21 (3)<br>21-23 (2)<br>23-02 (1)<br>02-04 (2) | 18-20 (1)<br>06-08 (1)  |
| Southeast Asia                            | 07-08 (1)<br>08-09 (2)<br>09-10 (3)<br>10-11 (2)<br>11-13 (1)<br>15-16 (1)<br>16-19 (2)<br>19-20 (1) | 07-08 (1)<br>08-09 (2)<br>09-10 (3)<br>10-12 (2)<br>12-13 (1)<br>16-17 (1)<br>17-18 (2)<br>18-20 (3)<br>20-21 (2)<br>21-22 (1) | 06-07 (1)<br>07-10 (2)<br>10-12 (1)<br>18-19 (1)<br>19-21 (2)<br>21-23 (1)  | 04-07 (1)   |
| Far East                                  | 15-16 (1)<br>16-19 (3)<br>19-20 (2)<br>20-21 (1)   | 08-10 (1)<br>15-16 (1)<br>16-17 (3)<br>17-19 (4)<br>19-20 (3)<br>20-21 (2)<br>21-22 (1)  | 04-05 (1)<br>05-07 (2)<br>07-09 (3)<br>09-10 (2)<br>10-11 (1)<br>17-19 (1)<br>19-20 (2)<br>20-22 (3)<br>22-23 (2)<br>23-00 (1)              | 02-03 (1)<br>03-07 (2)<br>07-09 (1)<br>03-06 (1)*   |
| South Pacific & New Zealand               | 09-12 (1)<br>12-13 (2)<br>13-15 (3)<br>15-18 (4)<br>18-19 (3)<br>19-20 (2)<br>20-21 (1)              | 08-11 (1)<br>11-13 (3)<br>13-16 (2)<br>16-17 (3)<br>17-20 (4)<br>20-21 (3)<br>21-22 (2)<br>22-23 (1)                           | 11-17 (1)<br>17-18 (2)<br>18-20 (3)<br>20-01 (4)<br>01-03 (3)<br>03-07 (2)<br>07-09 (4)<br>09-10 (3)<br>10-11 (2)<br>11-12 (2)              | 23-01 (1)<br>01-02 (2)<br>02-07 (3)<br>07-08 (2)<br>08-09 (1)<br>00-02 (1)*<br>02-07 (2)*<br>07-08 (1)* |



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### HOW TO USE THE DX PROPAGATION CHARTS

1. Use Chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8 KP4, KG4 and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9 and 0 areas; the Western USA Chart in the 6 and 7 areas, and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 Meters) for a particular DX region, as shown in the left hand column of the Charts. An \* indicates the best time to listen for 160 meter openings.

3. The *propagation index* is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of *days* during the month on which the opening is expected to take place as follows:

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

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

4. Time shown in the Charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M. etc. Appropriate *standard* time is used, *not* GMT. To convert to GMT, add to the times shown in the appropriate chart 8 hours in PST Zone, 7 hours in MST Zone, 6 hours in CST Zone, and 5 hours in EST Zone. For example, 13 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 04 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts c.w., or 1 kw, p.e.p. on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 db gain above these reference levels, the *propagation index* will increase by one level for each 10dB loss, it will lower by one level.

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

|  |   |  |  |   |
|--|---|--|--|---|
| Australasia  | 08-09 (1)<br>09-11 (2)<br>11-13 (1)<br>13-15 (2)<br>15-16 (3)<br>16-18 (4)<br>18-19 (3)<br>19-20 (2)<br>20-21 (1) | 06-08 (1)<br>08-09 (3)<br>09-11 (2)<br>11-12 (1)<br>16-18 (1)<br>18-19 (2)<br>19-20 (4)<br>20-21 (3)<br>21-22 (2)<br>22-23 (1) | 06-07 (2)<br>07-09 (4)<br>09-10 (3)<br>10-11 (2)<br>11-12 (1)<br>15-17 (1)<br>20-22 (1)<br>22-00 (2)<br>00-04 (3)<br>04-06 (1) | 02-04 (1)<br>04-07 (2)<br>07-08 (1)<br>03-04 (1)*<br>04-06 (2)*<br>06-07 (1)*                           |
| Caribbean, Central America & Northern Countries of South America | 06-07 (1)<br>07-08 (3)<br>08-10 (4)<br>10-12 (3)<br>12-17 (4)<br>17-18 (3)<br>18-19 (2)<br>19-20 (1)              | 05-06 (1)<br>06-07 (2)<br>07-08 (3)<br>08-10 (4)<br>10-13 (3)<br>13-18 (4)<br>18-19 (3)<br>19-21 (2)<br>21-23 (1)              | 06-07 (3)<br>07-09 (4)<br>09-11 (3)<br>11-14 (2)<br>14-16 (3)<br>16-00 (4)<br>00-02 (3)<br>02-06 (2)                           | 18-19 (1)<br>19-21 (3)<br>21-03 (4)<br>03-05 (2)<br>05-07 (1)<br>19-21 (1)*<br>21-02 (2)*<br>02-05 (1)* |
| Peru, Bolivia, Paraguay, Brazil, Chile, Argentina, & Uruguay     | 06-07 (1)<br>07-08 (3)<br>08-10 (4)<br>10-14 (3)<br>14-17 (4)<br>17-18 (3)<br>18-19 (2)<br>19-20 (1)              | 05-06 (1)<br>06-07 (2)<br>07-09 (3)<br>09-13 (2)<br>13-15 (3)<br>15-20 (4)<br>20-21 (3)<br>21-23 (2)<br>23-00 (1)              | 04-06 (1)<br>06-08 (2)<br>08-14 (1)<br>14-16 (2)<br>16-18 (3)<br>18-00 (4)<br>00-02 (3)<br>02-04 (2)                           | 19-21 (1)<br>21-01 (2)<br>01-03 (1)<br>03-04 (2)<br>04-06 (1)<br>21-05 (1)*                             |
| McMurdo Sound, Antarctica  | 07-08 (1)<br>08-09 (2)<br>09-10 (1)<br>17-18 (1)<br>18-20 (2)<br>20-21 (1)  | 06-07 (1)<br>07-09 (2)<br>09-10 (1)<br>14-16 (1)<br>16-18 (2)<br>18-22 (3)<br>22-23 (2)<br>23-00 (1)                           | 06-08 (2)<br>08-09 (1)<br>16-18 (1)<br>18-20 (2)<br>20-02 (3)<br>02-04 (2)<br>04-06 (1)  | 23-05 (1)   |

### October 15 - December 15, 1989 Time Zone: PST (24-hour time) WESTERN USA TO:

|   | 10 Meters   | 15 Meters  | 20 Meters   | 40/80 Meters                                      |
|---|---|--|---|---|
| Western & Southern Europe & North Africa  | 06-07 (1)<br>07-08 (2)<br>08-11 (3)<br>11-12 (2)<br>12-13 (1) | 06-07 (1)<br>07-08 (2)<br>08-10 (3)<br>10-12 (4)<br>12-13 (2)<br>13-14 (1) | 05-06 (1)<br>06-08 (2)<br>08-10 (1)<br>10-12 (2)<br>12-14 (4)<br>14-16 (3)<br>16-18 (2)<br>18-20 (1)<br>23-01 (2) | 18-20 (1)<br>20-22 (2)<br>22-00 (1)<br>19-23 (1)* |
| Central & Northern Europe & European USSR | 07-08 (1)<br>08-10 (2)<br>10-11 (1)                           | 06-07 (1)<br>07-08 (2)<br>08-10 (3)<br>10-11 (2)<br>11-12 (1)              | 05-07 (1)<br>07-09 (3)<br>09-10 (2)<br>10-14 (1)<br>14-17 (3)<br>17-19 (2)<br>19-23 (1)<br>23-02 (2)<br>02-03 (1) | 18-20 (1)<br>20-22 (1)<br>22-23 (1)<br>19-22 (1)* |

|  |   |  |  |   |
|--|---|--|--|---|
| Eastern Mediteranean & Middle East                               | 07-08 (1)<br>08-10 (2)<br>10-11 (1)   | 06-07 (1)<br>07-08 (2)<br>08-10 (3)<br>10-11 (2)<br>11-12 (1)  | 06-07 (1)<br>07-10 (2)<br>10-14 (1)<br>14-16 (2)<br>16-18 (1)<br>18-20 (2)<br>20-22 (1)<br>00-02 (1)                           | 18-22 (1)<br>06-08 (1)  |
| Western Africa   | 06-07 (1)<br>07-08 (2)<br>08-11 (3)<br>11-13 (4)<br>13-15 (3)<br>15-16 (2)<br>16-17 (1)   | 05-06 (1)<br>06-07 (2)<br>07-13 (3)<br>13-16 (4)<br>16-17 (3)<br>17-18 (2)<br>18-19 (1)  | 05-10 (1)<br>10-14 (2)<br>14-15 (3)<br>15-20 (4)<br>20-22 (3)<br>22-02 (2)<br>02-03 (1)  | 18-19 (1)<br>19-21 (2)<br>21-22 (1)<br>19-21 (1)*   |
| Eastern & Central Africa   | 07-08 (1)<br>08-10 (2)<br>10-14 (3)<br>14-15 (2)<br>15-16 (1)   | 06-08 (1)<br>08-12 (2)<br>12-16 (3)<br>16-17 (2)<br>17-19 (1)  | 06-14 (1)<br>14-16 (2)<br>16-22 (3)<br>22-23 (2)<br>23-00 (1)  | 18-21 (1)<br>06-08 (1)  |
| Southern Africa  | 07-08 (1)<br>08-10 (3)<br>10-14 (4)<br>14-15 (3)<br>15-16 (2)<br>16-17 (1)  | 06-10 (1)<br>10-12 (2)<br>12-13 (3)<br>13-16 (4)<br>16-17 (3)<br>17-19 (2)<br>19-21 (1)  | 06-12 (1)<br>12-14 (2)<br>14-16 (3)<br>16-19 (4)<br>19-22 (3)<br>22-01 (2)<br>01-03 (1)  | 17-19 (1)<br>19-20 (2)<br>20-21 (1)<br>06-08 (1)<br>18-19 (1)*  |
| Central & South Asia   | 16-17 (1)<br>17-19 (3)<br>19-20 (1)<br>07-09 (1)  | 16-17 (1)<br>17-19 (3)<br>19-20 (2)<br>20-21 (1)<br>07-09 (1)  | 06-07 (1)<br>07-09 (3)<br>09-10 (2)<br>10-11 (1)<br>16-17 (1)<br>17-19 (3)<br>19-21 (2)<br>21-22 (1)                           | 17-19 (1)<br>04-09 (1)  |
| Southeast Asia   | 08-09 (1)<br>09-10 (3)<br>10-11 (4)<br>11-12 (3)<br>12-13 (2)<br>13-14 (1)<br>14-15 (2)<br>15-17 (4)<br>17-18 (3)<br>18-19 (2)<br>19-20 (1) | 07-08 (1)<br>08-11 (3)<br>11-12 (2)<br>12-15 (1)<br>15-17 (3)<br>17-19 (2)<br>19-21 (3)<br>21-22 (2)<br>22-23 (1)              | 06-07 (1)<br>07-08 (2)<br>08-10 (3)<br>10-11 (2)<br>11-12 (1)<br>19-22 (1)<br>22-01 (2)<br>01-03 (3)<br>03-06 (2)              | 02-03 (1)<br>03-06 (2)<br>06-08 (1)<br>03-06 (1)*   |
| Far East   | 13-14 (1)<br>14-15 (3)<br>15-19 (4)<br>19-20 (3)<br>20-21 (2)<br>21-22 (1)  | 07-08 (1)<br>08-09 (2)<br>09-11 (3)<br>11-13 (2)<br>13-15 (3)<br>15-17 (2)<br>17-19 (4)<br>19-20 (3)<br>20-21 (2)<br>21-22 (1) | 06-07 (1)<br>07-08 (2)<br>08-10 (4)<br>10-12 (3)<br>12-14 (2)<br>14-18 (1)<br>18-20 (2)<br>20-21 (3)<br>21-23 (4)<br>23-02 (3) | 23-01 (1)<br>01-05 (2)<br>05-07 (3)<br>07-08 (1)<br>01-05 (1)*<br>05-06 (2)*<br>06-07 (1)*              |
| South Pacific & New Zealand                                      | 08-09 (1)<br>09-10 (2)<br>10-19 (4)<br>19-21 (3)<br>21-23 (2)<br>23-00 (1)  | 07-08 (1)<br>08-11 (4)<br>11-18 (3)<br>18-00 (4)<br>00-02 (3)<br>02-03 (2)<br>03-04 (1)  | 11-18 (1)<br>18-19 (2)<br>19-21 (3)<br>21-04 (4)<br>04-07 (3)<br>07-09 (4)<br>09-10 (3)<br>10-11 (2)                           | 21-22 (1)<br>22-00 (2)<br>00-07 (3)<br>07-08 (2)<br>08-09 (1)<br>22-00 (1)*<br>00-06 (2)*<br>06-07 (1)* |
| Australasia  | 09-11 (1)<br>11-12 (2)<br>12-14 (4)<br>14-18 (3)<br>18-20 (4)<br>20-21 (3)<br>21-22 (2)<br>22-23 (1)  | 07-08 (1)<br>08-12 (3)<br>12-14 (2)<br>14-18 (1)<br>18-20 (2)<br>20-21 (3)<br>21-00 (4)<br>00-01 (3)<br>01-02 (2)<br>02-03 (1) | 18-20 (1)<br>20-22 (2)<br>22-00 (3)<br>00-04 (4)<br>04-07 (3)<br>07-09 (4)<br>09-10 (3)<br>10-12 (2)<br>12-14 (1)              | 02-03 (1)<br>03-04 (2)<br>04-07 (3)<br>07-08 (1)<br>03-04 (1)*<br>04-06 (2)*<br>06-07 (1)*              |
| Caribbean, Central America & Northern Countries of South America | 06-07 (1)<br>07-08 (3)<br>08-10 (4)<br>10-12 (3)<br>12-16 (4)<br>16-17 (3)<br>17-18 (2)<br>18-19 (1)  | 05-06 (1)<br>06-07 (2)<br>07-10 (4)<br>10-13 (3)<br>13-18 (4)<br>18-19 (3)<br>19-21 (2)<br>21-22 (1)                           | 06-07 (3)<br>07-09 (4)<br>09-10 (3)<br>10-13 (2)<br>13-15 (3)<br>15-23 (4)<br>23-01 (3)<br>01-06 (2)                           | 18-19 (1)<br>19-21 (3)<br>21-02 (4)<br>02-05 (2)<br>05-06 (1)<br>19-21 (1)*<br>21-02 (2)*<br>02-05 (1)* |
| Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay      | 06-07 (1)<br>07-13 (3)<br>13-17 (4)<br>17-18 (3)<br>18-19 (2)<br>19-20 (1)  | 05-06 (1)<br>06-07 (2)<br>07-09 (3)<br>09-13 (2)<br>13-15 (3)<br>15-20 (4)<br>20-22 (3)<br>22-00 (2)<br>00-01 (1)              | 13-14 (1)<br>14-16 (2)<br>16-18 (3)<br>18-23 (4)<br>23-01 (3)<br>01-03 (2)<br>03-05 (1)<br>05-07 (2)<br>07-09 (1)              | 20-22 (1)<br>22-04 (2)<br>04-05 (1)<br>22-04 (1)*   |
| McMurdo Sound, Antarctica  | 07-08 (1)<br>08-09 (2)<br>09-10 (1)   | 06-07 (1)<br>07-09 (2)<br>09-10 (1)  | 16-18 (1)<br>18-20 (2)<br>20-04 (3)  | 00-05 (1)   |

\* Indicates best time to listen for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a Propagation Index of (2), or higher. F-2 layer DX openings on 6 Meters may occur at the same times and over the same paths shown with a Propagation Index of (4) under the 10 Meter column.



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|--|--|-------------|--------------------------|---------------------|---------------------|---------------------|--------|--------|----|-----------------------|----|--------|----------------|----|---------------------|----|--------|-----|----|---------------------|----|---------|----|----|---------------------|----|-----------------|----|---------|---------------------|----|--------|----|---------------------|-------------|---------|--------|----|----|-----------------|---------------------|----|
| <p><b>RM-A SERIES</b></p>  <p><b>MODEL RM-35M</b></p>     | <p><b>19" X 5 1/4" RACK MOUNT POWER SUPPLIES</b></p> <table border="1"> <thead> <tr> <th>MODEL</th> <th>Continuous Duty (Amps)</th> <th>ICS* (Amps)</th> <th>Size (IN) H x W x D</th> <th>Shipping Wt. (lbs.)</th> </tr> </thead> <tbody> <tr> <td>RM12A</td> <td>9</td> <td>12</td> <td>5 1/4 x 19 x 8 1/4</td> <td>16</td> </tr> <tr> <td>RM-35A</td> <td>25</td> <td>35</td> <td>5 1/4 x 19 x 12 1/2</td> <td>38</td> </tr> <tr> <td>RM-50A</td> <td>37</td> <td>50</td> <td>5 1/4 x 19 x 12 1/2</td> <td>50</td> </tr> </tbody> </table> <p>• Separate Volt and Amp Meters</p> <table border="1"> <tbody> <tr> <td>RM-35 M</td> <td>25</td> <td>35</td> <td>5 1/4 x 19 x 12 1/2</td> <td>38</td> </tr> <tr> <td>RM-50 M</td> <td>37</td> <td>50</td> <td>5 1/4 x 19 x 12 1/2</td> <td>50</td> </tr> </tbody> </table>  | MODEL       | Continuous Duty (Amps)   | ICS* (Amps)         | Size (IN) H x W x D | Shipping Wt. (lbs.) | RM12A  | 9      | 12 | 5 1/4 x 19 x 8 1/4    | 16 | RM-35A | 25             | 35 | 5 1/4 x 19 x 12 1/2 | 38 | RM-50A | 37  | 50 | 5 1/4 x 19 x 12 1/2 | 50 | RM-35 M | 25 | 35 | 5 1/4 x 19 x 12 1/2 | 38 | RM-50 M         | 37 | 50      | 5 1/4 x 19 x 12 1/2 | 50 |        |    |                     |             |         |        |    |    |                 |                     |    |
| MODEL  | Continuous Duty (Amps)   | ICS* (Amps) | Size (IN) H x W x D      | Shipping Wt. (lbs.) |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RM12A  | 9  | 12          | 5 1/4 x 19 x 8 1/4       | 16                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RM-35A   | 25   | 35          | 5 1/4 x 19 x 12 1/2      | 38                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RM-50A   | 37   | 50          | 5 1/4 x 19 x 12 1/2      | 50                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RM-35 M  | 25   | 35          | 5 1/4 x 19 x 12 1/2      | 38                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RM-50 M  | 37   | 50          | 5 1/4 x 19 x 12 1/2      | 50                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| <p><b>RS-A SERIES</b></p>  <p><b>MODEL RS-7A</b></p>      | <table border="1"> <tbody> <tr> <td>RS-4A</td> <td>3</td> <td>4</td> <td>3 3/4 x 6 1/2 x 9</td> <td>5</td> </tr> <tr> <td>RS-5A</td> <td>4</td> <td>5</td> <td>3 1/2 x 6 1/8 x 7 1/4</td> <td>7</td> </tr> <tr> <td>RS-7A</td> <td>5</td> <td>7</td> <td>3 3/4 x 6 1/2 x 9</td> <td>9</td> </tr> <tr> <td>RS-10A</td> <td>7.5</td> <td>10</td> <td>4 x 7 1/2 x 10 3/4</td> <td>11</td> </tr> <tr> <td>RS-12A</td> <td>9</td> <td>12</td> <td>4 1/2 x 8 x 9</td> <td>13</td> </tr> <tr> <td>RS-20A</td> <td>16</td> <td>20</td> <td>5 x 9 x 10 1/2</td> <td>18</td> </tr> <tr> <td>RS-35A</td> <td>25</td> <td>35</td> <td>5 x 11 x 11</td> <td>27</td> </tr> <tr> <td>RS-50A</td> <td>37</td> <td>50</td> <td>6 x 13 3/4 x 11</td> <td>46</td> </tr> </tbody> </table>   | RS-4A       | 3                        | 4                   | 3 3/4 x 6 1/2 x 9   | 5                   | RS-5A  | 4      | 5  | 3 1/2 x 6 1/8 x 7 1/4 | 7  | RS-7A  | 5              | 7  | 3 3/4 x 6 1/2 x 9   | 9  | RS-10A | 7.5 | 10 | 4 x 7 1/2 x 10 3/4  | 11 | RS-12A  | 9  | 12 | 4 1/2 x 8 x 9       | 13 | RS-20A          | 16 | 20      | 5 x 9 x 10 1/2      | 18 | RS-35A | 25 | 35                  | 5 x 11 x 11 | 27      | RS-50A | 37 | 50 | 6 x 13 3/4 x 11 | 46                  |    |
| RS-4A  | 3  | 4           | 3 3/4 x 6 1/2 x 9        | 5                   |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-5A  | 4  | 5           | 3 1/2 x 6 1/8 x 7 1/4    | 7                   |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-7A  | 5  | 7           | 3 3/4 x 6 1/2 x 9        | 9                   |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-10A   | 7.5  | 10          | 4 x 7 1/2 x 10 3/4       | 11                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-12A   | 9  | 12          | 4 1/2 x 8 x 9            | 13                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-20A   | 16   | 20          | 5 x 9 x 10 1/2           | 18                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-35A   | 25   | 35          | 5 x 11 x 11              | 27                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-50A   | 37   | 50          | 6 x 13 3/4 x 11          | 46                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| <p><b>RS-M SERIES</b></p>  <p><b>MODEL RS-35M</b></p>     | <ul style="list-style-type: none"> <li>• Switchable volt and Amp meter</li> </ul> <table border="1"> <tbody> <tr> <td>RS-12M</td> <td>9</td> <td>12</td> <td>4 1/2 x 8 x 9</td> <td>13</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Separate volt Amp meters</li> </ul> <table border="1"> <tbody> <tr> <td>RS-20M</td> <td>16</td> <td>20</td> <td>5 x 9 x 10 1/2</td> <td>18</td> </tr> <tr> <td>RS-35M</td> <td>25</td> <td>35</td> <td>5 x 11 x 11</td> <td>27</td> </tr> <tr> <td>RS-50M</td> <td>37</td> <td>50</td> <td>6 x 13 3/4 x 11</td> <td>46</td> </tr> </tbody> </table>   | RS-12M      | 9                        | 12                  | 4 1/2 x 8 x 9       | 13                  | RS-20M | 16     | 20 | 5 x 9 x 10 1/2        | 18 | RS-35M | 25             | 35 | 5 x 11 x 11         | 27 | RS-50M | 37  | 50 | 6 x 13 3/4 x 11     | 46 |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-12M   | 9  | 12          | 4 1/2 x 8 x 9            | 13                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-20M   | 16   | 20          | 5 x 9 x 10 1/2           | 18                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-35M   | 25   | 35          | 5 x 11 x 11              | 27                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-50M   | 37   | 50          | 6 x 13 3/4 x 11          | 46                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| <p><b>RS-S SERIES</b></p>  <p><b>MODEL RS-12S</b></p>     | <ul style="list-style-type: none"> <li>• Built in speaker</li> </ul> <table border="1"> <tbody> <tr> <td>RS-7S</td> <td>5</td> <td>7</td> <td>4 x 7 1/2 x 10 3/4</td> <td>10</td> </tr> <tr> <td>RS-10S</td> <td>7.5</td> <td>10</td> <td>4 x 7 1/2 x 10 3/4</td> <td>12</td> </tr> <tr> <td>RS-12S</td> <td>9</td> <td>12</td> <td>4 1/2 x 8 x 9</td> <td>13</td> </tr> <tr> <td>RS-20S</td> <td>16</td> <td>20</td> <td>5 x 9 x 10 1/2</td> <td>18</td> </tr> </tbody> </table>  | RS-7S       | 5                        | 7                   | 4 x 7 1/2 x 10 3/4  | 10                  | RS-10S | 7.5    | 10 | 4 x 7 1/2 x 10 3/4    | 12 | RS-12S | 9              | 12 | 4 1/2 x 8 x 9       | 13 | RS-20S | 16  | 20 | 5 x 9 x 10 1/2      | 18 |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-7S  | 5  | 7           | 4 x 7 1/2 x 10 3/4       | 10                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-10S   | 7.5  | 10          | 4 x 7 1/2 x 10 3/4       | 12                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-12S   | 9  | 12          | 4 1/2 x 8 x 9            | 13                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| RS-20S   | 16   | 20          | 5 x 9 x 10 1/2           | 18                  |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| <p><b>VRM/VS-M SERIES</b></p>  <p><b>MODEL VS-35M</b></p> | <ul style="list-style-type: none"> <li>• Separate Volt and Amp Meters • Output Voltage adjustable from 2-15 volts</li> <li>• Current limit adjustable from 1.5 amps to Full Load</li> </ul> <table border="1"> <thead> <tr> <th></th> <th colspan="3">@ 13.8VDC @ 10VDC @ 5VDC</th> <th>@ 13.8V</th> <th></th> </tr> </thead> <tbody> <tr> <td>VS-20M</td> <td>16</td> <td>9</td> <td>4</td> <td>20</td> <td>5 x 9 x 10 1/2</td> <td>20</td> </tr> <tr> <td>VS-35M</td> <td>25</td> <td>15</td> <td>7</td> <td>35</td> <td>5 x 11 x 11</td> <td>29</td> </tr> <tr> <td>VS-50M</td> <td>37</td> <td>22</td> <td>10</td> <td>50</td> <td>6 x 13 3/4 x 11</td> <td>46</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Variable rack mount power supplies</li> </ul> <table border="1"> <tbody> <tr> <td>VRM-35M</td> <td>25</td> <td>15</td> <td>7</td> <td>35</td> <td>5 1/4 x 19 x 12 1/2</td> <td>38</td> </tr> <tr> <td>VRM-50M</td> <td>37</td> <td>22</td> <td>10</td> <td>50</td> <td>5 1/4 x 19 x 12 1/2</td> <td>50</td> </tr> </tbody> </table> |             | @ 13.8VDC @ 10VDC @ 5VDC |                     |                     | @ 13.8V             |        | VS-20M | 16 | 9                     | 4  | 20     | 5 x 9 x 10 1/2 | 20 | VS-35M              | 25 | 15     | 7   | 35 | 5 x 11 x 11         | 29 | VS-50M  | 37 | 22 | 10                  | 50 | 6 x 13 3/4 x 11 | 46 | VRM-35M | 25                  | 15 | 7      | 35 | 5 1/4 x 19 x 12 1/2 | 38          | VRM-50M | 37     | 22 | 10 | 50              | 5 1/4 x 19 x 12 1/2 | 50 |
|  | @ 13.8VDC @ 10VDC @ 5VDC   |             |                          | @ 13.8V             |                     |                     |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| VS-20M   | 16   | 9           | 4                        | 20                  | 5 x 9 x 10 1/2      | 20                  |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| VS-35M   | 25   | 15          | 7                        | 35                  | 5 x 11 x 11         | 29                  |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| VS-50M   | 37   | 22          | 10                       | 50                  | 6 x 13 3/4 x 11     | 46                  |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| VRM-35M  | 25   | 15          | 7                        | 35                  | 5 1/4 x 19 x 12 1/2 | 38                  |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |
| VRM-50M  | 37   | 22          | 10                       | 50                  | 5 1/4 x 19 x 12 1/2 | 50                  |        |        |    |                       |    |        |                |    |                     |    |        |     |    |                     |    |         |    |    |                     |    |                 |    |         |                     |    |        |    |                     |             |         |        |    |    |                 |                     |    |

\*ICS—Intermittent Communication Service (50% Duty Cycle 5 min. on 5 min. off)

CIRCLE 62 ON READER SERVICE CARD



## NEWS OF COMMUNICATION AROUND THE WORLD

**Bouvet!**

**T**he second most wanted country on the DX bands may be available this December, thanks to the efforts of some Norwegian amateurs. Einer Enderud, LA1EE, Erling Wiig, LA6VM, and Kaare Pedersen, LA2GV have formed a group called Club Bouvet to mount a serious DXpedition to this isolated Antarctic island. Licensing and landing permission are in hand, and the operators have an excellent track record, as they staged the highly successful Peter I Island trip in 1987.

The main problem is funding. The cost of the trip is estimated at \$200,000, of which at least half must come from amateurs, as the group was not able to obtain government funding.

Bouvet was discovered in 1739 by the Frenchman Jean-Baptiste Lozier Bouvet. Bouvet was searching for the large land mass presumed to lie in the far south, and he thought the part of Bouvet Island that he spotted through the fog was this southern continent. He was not able to land.

Bouvet was next visited in 1808 by an Englishman, James Lindsay, who was also unable to land. Lindsay did determine that Bouvet was an island, however. The first landing on Bouvet was in 1822, when an American sealing expedition collected about 200 seal skins.

The continuous fog and cloud cover and less-than-accurate navigation at the time meant the island was being lost and rediscovered on a regular basis. In 1825 another Englishman, George Norris, claimed what he thought was a previously unknown island for England. It wasn't until 1898 that the accurate location of the island was confirmed by a German expedition.

A Norwegian Antarctic expedition in 1927-28 not only landed on the island, but established a small depot at one of the few possible landing sites, which they named Ny Sandefjord after Norway's whaling center. On December 1, 1927 the group claimed the island for Norway. However, it was two years later before England finally gave up its claim to Bouvet.

The next year the Norwegians returned to set up a weather post on the island only to find that high seas had wiped out the hut put there the previous year. The Norwegians made several more trips



The LA-DX-Group includes some of the Club Bouvet members. From left, sitting: Arne, LA8CJ; Rusty, W6OAT (president of the Northern California DX Foundation); Einer, LA1EE/3Y1EE. Standing: Bjarne, LA4HF (president of the LA-DX-Group); Trond, LA8XM (vice president of the LA-DX-Group); and Erling, LA6VM. (LA4LN photo)

to the island in later years and established huts at various spots around the island. They set up an automatic weather station on Bouvet in 1977 and spent two months on the island in 1978-79.

Bouvet lies at 3 degrees, 21 minutes east longitude, and 54 degrees, 25 minutes south latitude, more than 2,000 miles from Capetown, South Africa, the nearest inhabited land. The island consists of a volcano that reaches up to 2500 feet. It's only about 5 by 3 miles in size and is almost completely covered by ice. Landing is extremely difficult, as steep cliffs ring the island plus heavy seas make even the few beaches treacherous. Waves heights up to 30 feet are common in the area, and even after the DXpeditioners land, they will have to face hostile seals and sea lions, as well as endure the smell of penguin droppings. The weather on Bouvet is terrible, with heavy fog most of the time. Average temperature is -1 degree Celsius.

The last time Bouvet was on the amateur bands was nearly 11 years ago when 3Y1VC made about 1000 QSOs. During

the past ten years Bouvet has crept up the most wanted countries list, until it inched ahead of Burma (whoops, I mean Myanmar) in 1988. Four out of five DXers need a contact with Bouvet.

Club Bouvet has a very difficult task ahead of them, not the least of which is to raise the \$100,000 needed. Each operator has advanced a considerable sum personally, and the Northern California DX Foundation will doubtless assist, but the group will need funds from every available source to make the trip a reality. Persons donating funds may ask to be placed on the Club Bouvet mailing list to receive first-hand information on the trip's progress. Send your donations to Box 88, N-1361 Billingstadsletta, Norway.

### The Strange Case Of Diego Garcia

Diego Garcia is the largest atoll in the Chagos Archipelago, which comprises the British Indian Ocean Territory. The United States leases the island from the British government to serve as a military

P.O. Box 50, Fulton, CA 95439



## The WPX Program

### Mixed

1405 ..... I2EOW 1406 ..... WQ6X

### SSB

2074 ..... IK0JMS 2076 ..... YU7SF  
2075 ..... XE1KH

### CW

2589 ..... OZ1JNR

### VPX

259 ..... OZ-DR-2044

### Endorsements

Mixed: 450 I2EOW, 500 VE3OMM, I2EOW, 550 I2EOW, VE7CXN, 600 I2EOW, 650 I2EOW, 700 CT3CU, I2EOW, 750 CT3CU, IW3OW, 800 CT3CU, I2EOW, WB8AAX, 850 I2EOW, WB8AAX, 900 YU7DR, I2EOW, WB8AAX, 950 YU7DR, K9BQL, I2EOW, WB8AAX, 1000 YU7DR, I2EOW, WB8AAX, 1050 CT1YH, I2EOW, WB8AAX, 1100 CT1YH, I2EOW, 1150 I2EOW, JA4ESR, 1200 I2EOW, IS0MVE, W5AWT, JA4ESR, KS3F, 1250 I2EOW, IS0MVE, W5AWT, JA4ESR, 1300 I2EOW, W5AWT, JA4ESR, 1350 WB8ZRL, OK3IF, W5AWT, 1400 WB8ZRL, OK3IF, W5AWT, SM6ID, 1450 W5AWT, SM6ID, 1500 WE2L, SM6ID, 1750 WA4QMQ, 1800 WA4QME, 1850 WA4QMQ, I8RFD, 1900 I8RFD.

SSB: 350 NK0S, IK0JMS, XE1KH, I6DQE, 400 NK0S, XE1KH, I6DQE, 450 NK0S, XE1KH, I6DQE, 500 NK0S, XE1KH, I6DQE, WB8AAX, 550 G0DZS, I6DQE, WB8AAX, 600 I6DQE, 650 LU8DWN, G4SDJ, I6DQE, 700 LU8DWN, NE8Q, I6DQE, 750 LU8DWN, K3ZPG, 800 LU8DWN, G4SDJ, 850 K9BQL, 1150 WB8ZRL, 1450 WE2L, 1650 WA4QMQ, 1700 WA4QMQ, 1750 WA4QMQ, 1800 I1JSB, 1850 I1JSB, 1900 I1JSB, 1950 SM3EVR, 2000 SM3EVR, 2700 K2POA, 2850 ZL3NS.

CW: 350 DL5XAS, PA3DXO, 400 PA3DXO, 450 VE3OMM, PA3DXO, 500 PA3DXO, 550 ONL-2169, PA3DXO, 600 VS6UW, PA3DXO, 650 W9IAL, 700 JA3ARM, WB8AAX, 750 JA3ARM, WB8AAX, 800 WB8ZRL, WB8AAX, 850 WB8AAX, 900 WA4QMQ, OZ4RS, WB8AAX, 1000 G4SSH, IS0MVE, 1050 K4MF, IS0MVE, 1100 K4MF, 1250 W9PWW.

10 Meters: K4MF, VE1ACK, I6DQE, YU7SF  
15 Meters: CT1YH, I6DQE  
20 Meters: CT1YH, I6DQE, PA3DXO  
40 Meters: CT1YH, I6DQE  
80 Meters: I6DQE  
160 Meters: YU7SF

Asia: CT1YH, K4MF, JE3CYH, I6DQE  
Africa: K4MF, JA4ESR, K7CU  
No. America: NK0S, JE3CYH, CT1YH, OZ4RS, I6DQE  
So. America: K4MF, YU7SF  
Europe: CT1YH, I6DQE, PA3DXO  
Oceania: YU7DR, K4MF, YU7SF

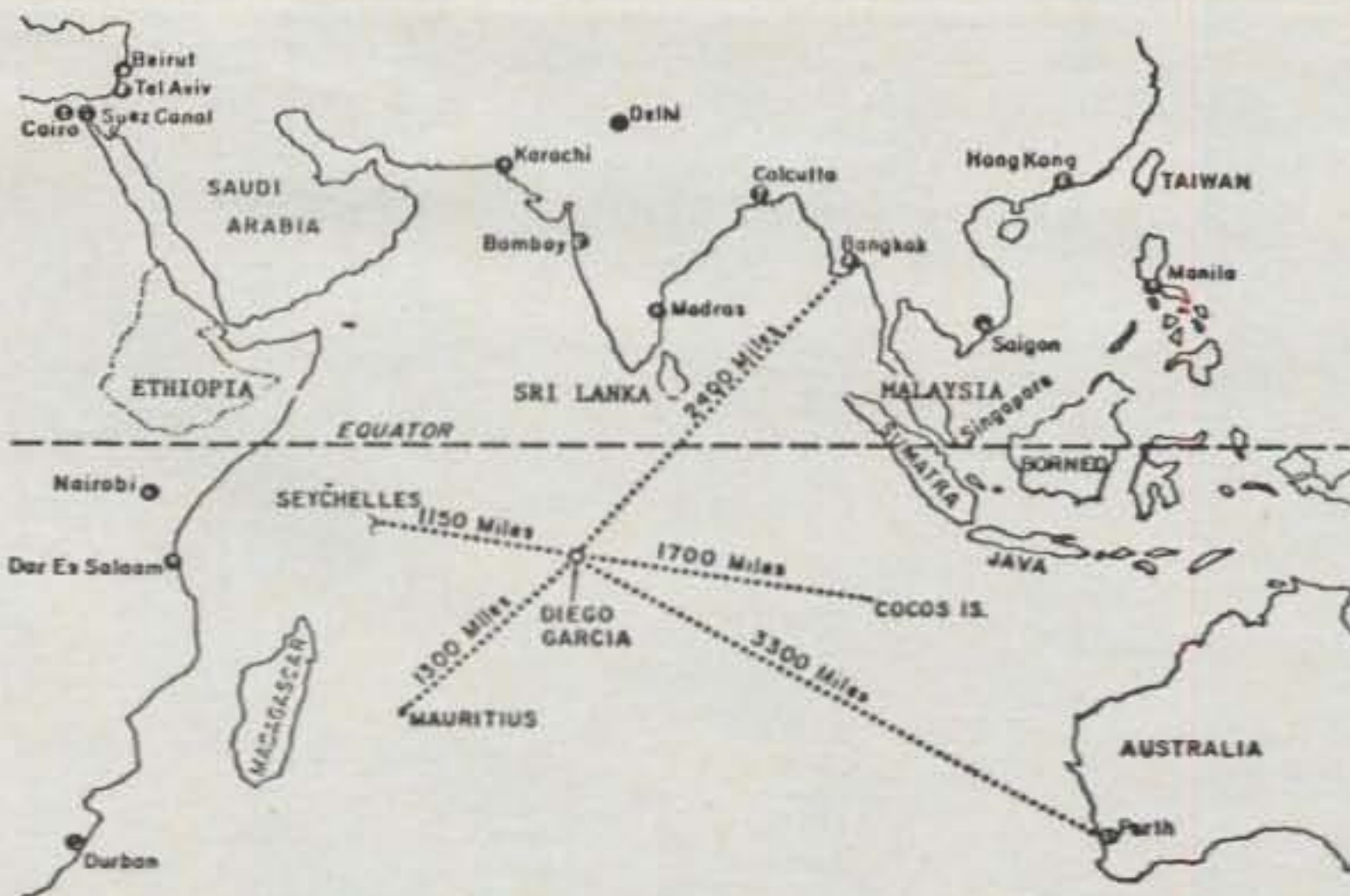
Award of Excellence: F6BVB

Award of Excellence with 160 Meter Endorsement: F6BVB

Award of Excellence Plaque Holders: G4BUE, N3ED, LU3YLW4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SM0DJZ, DK5AD, WD9IC, W3ARK, LA7JO, VK4SS, K6JG, N4MM, I8YRK, W4CRW, SM0AJU, K5UR, K6XP, N5TV, K2VV, VE3XN, W6OUL, DL1MD, DJ7CX, DL3RK, WB4SIJ, SM6DHU, N4KE, I2UIY, DL7AA, ON4QX, WA8YTM, YU2DX, OK3EA, I4EAT, OK1MP, N4NO, ZL3GO, VK9NS, DE0DXM, DK4SY, UR2\*\*, AB90, FM5WD, I2DMK, W4BQY, I0JX, SM6CST, VE1NG, I1JQJ, WA1JMP, PY2DBU, H18LC, KA5W, K0JN, W4VQ, KF20, K3UA, HA8UB, W8CNL, K7LJ, W1JR, F9RM, W5UR, WB8ZRL, SM3EVR, CT1FL, K2SHZ, UP1BZZ, W8RSW, WA4QMQ, EA7OH, K2POF, DJ4XA, IT9TQH, W8ILC, K2POA, N6JV, W2HG, ONL-4003, VE7DP, K9BG, W5AWT, KB0G, F6BVB, W4BQY.

Award of Excellence Plaque Holders with 160 Meter Endorsement: W4BQY, W5UR, N4NO, W8RSW, N4KE, I2UIY, W8ILC, W1BWS, NN4Q, G4GUE, LU3YLW4, I4EAT, VE7WJ, W9NUF, N4NX, VK9NS, DE0DXM, VE7IG, K9BG, AB90, FM5WD, SM0DJZ, DK5AD, SM6CST, I1JQJ, W3ARK, H18LC, KA5W, UR2\*\*, VE3XN, K6XP, LA7JO, W4VQ, K6JG, K3UA, HA8UB, W4CRW, N4MM, K7LJ, SM0AJU, KF20, SM3EVR, K5UR, UP1BZZ, OK1MP, N5TV, K2POF, W8CNL, DJ4XA, IT9TQH, DL9RK, N6JV, ONL-4003, W1JR, W6OUL, W5AWT, KB0G.

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.



## Diego Garcia

SCALE IN NAUTICAL MILES

The atoll of Diego Garcia in the Chagos archipelago.

base in the Indian Ocean, but the island remains under the control of Great Britain, including amateur radio licensing. Hence the VQ9 prefix.

The island consists of an oblong atoll about 7 miles long, surrounding a deep lagoon. The "town" is a military base with amenities such as a swimming pool, hamburger stand, and a bar that serves only beer. There are no women on the atoll. Non-military personnel usually stay aboard their ship anchored in the lagoon and get ashore via a ferry. The last ferry leaves the island at 11:30 PM local time.

The amateur radio license reflects the fact that most visitors to the island will not be able to spend much time on land. The license authorizes establishing and using

an amateur sending and receiving station at the amateur wireless station facility ashore or at the licensee's shipboard address. In other words, the license specifically equates operating from land or from a ship anchored in the lagoon. Since civilian personnel who work a normal 8 to 5 day on the ship can only spend a couple of hours a day on land, many amateurs do much of their operating from aboard their ship.

Unfortunately, rule 8 of the basic DXCC rules states: "All stations must be 'land stations.' Contacts with ships and boats, anchored or underway, and airborne aircraft cannot be counted [for DXCC credit.]" Thus an amateur operating from aboard a ship anchored in the



## CQ DX Awards Program

### SSB

1696 ..... K1MIZ 1698 ..... 18DVJ  
1697 ..... NC9T 1699 ..... KA5TTQ

### CW

755 ..... NC9T

### SSB Endorsements

|     |            |     |                |
|-----|------------|-----|----------------|
| 320 | DL9OH/321  | 310 | NA5W/312       |
| 320 | I8AA/321   | 310 | W8ILC/QRPp/312 |
| 320 | DJ9ZB/320  | 310 | K1MIZ/310      |
| 320 | OK1MP/320  | 300 | SM6CST/305     |
| 320 | YU1HA/320  | 300 | W6MFC/304      |
| 310 | N6AR/318   | 300 | IK8CNT/300     |
| 310 | W8ILC/318  | 275 | VE6PW/293      |
| 310 | YS1GMV/318 | 275 | KB1JU/291      |
| 310 | I4EAT/315  | 275 | 18DVJ/283      |
| 310 | KB8DB/315  | 250 | NI5D/250       |
| 310 | K9IW/314   | 200 | NC9T/240       |
| 310 | K0GT/313   | 200 | WA0VBW/212     |
| 310 | SV1ADG/312 | 200 | TF5BW/208      |

### CW Endorsements

|     |            |     |           |
|-----|------------|-----|-----------|
| 320 | DL1PM/320  | 300 | K9IW/309  |
| 320 | SM6CST/320 | 275 | DJ2PJ/286 |
| 310 | K6LEB/317  | 250 | KR9F/256  |
| 310 | N6AR/317   | 200 | NN7A/207  |
| 310 | K1MEM/316  | 150 | NC9T/152  |
| 310 | OK1MP/314  |     |           |

Total number of active countries is 321. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an SASE is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.

## 5 Band WAZ

As of July 1, 1989, 233 stations have attained the 200 zone level.

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

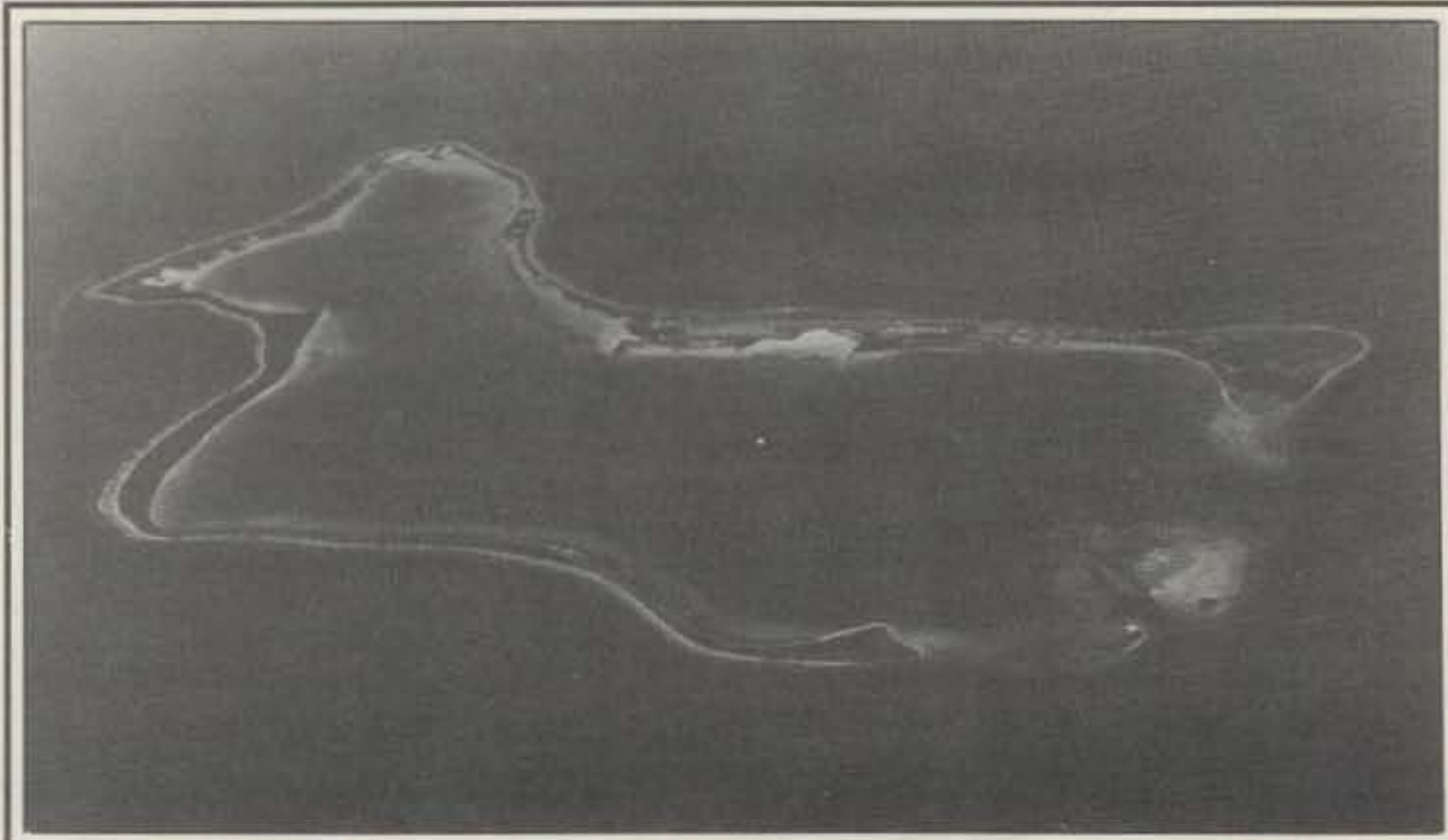
N4CC  
SM7CRW  
YT7DX  
G3XTT  
YU1EXY  
SM6BGG  
JH1XYR

The top contenders for 5 Band WAZ are:

- |                |                |
|----------------|----------------|
| 1. N4WW, 199   | 12. NS7Z, 198  |
| 2. W0JLC, 199  | 13. K7UR, 198  |
| 3. SP9PT, 199  | 14. PY7ZZ, 198 |
| 4. K6YRA, 199  | 15. K6SIK, 198 |
| 5. SP6CZ, 199  | 16. VE7DX, 198 |
| 6. K9GX, 199   | 17. I8IGS, 198 |
| 7. AA4V, 199   | 18. PY1OL, 198 |
| 8. SP6JCY, 199 | 19. W0PGI, 198 |
| 9. K2UU, 199   | 20. NY2E, 198  |
| 10. KB0U, 199  | 21. K1VKO, 198 |
| 11. HA8XX, 198 |                |

584 Stations have attained the 150 Zone level, as of July 1, 1989.

Applications and reprints of the latest rules may be obtained by sending a self-addressed stamped envelope (65 cents) size 4 1/2 x 9 1/2 to the WAZ Manager, Leo Huijsman, 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.



Diego Garcia from the air. If you look closely, you can see ships anchored in the lagoon. "Town" is at the right.

Diego Garcia lagoon cannot be counted for DXCC credit for the island, despite the explicit statement on the license that the British authorities consider shipboard operation to be equivalent to land-based operation.

In May Joe Foss, W1HZZ, operated AMTOR from Diego Garcia using the call-sign VQ9ZZ. He used his ship's rig, the American Kestrel, as there was no AMTOR gear in the amateur station ashore. He made up his QSL card to reflect the two possible station locations, and checked the appropriate box to indicate whether the operation was from the ship or ashore. The DXCC desk will not accept any of the AMTOR contacts made from the ship for DXCC credit, due to rule 8.

When questioned about exceptions to DXCC rules, DXCC administrator Don Search, W3AZD, states: "The Board of Directors has told us to enforce the rules as written. There are no provisions in the DXCC rules for exceptions." Of course, exceptions have been made to the DXCC



Peter, OH1RY, plans to operate from Vanuatu as YJ0RY in the CQ WW SSB this year, before moving over to Conway Reef. (VP2ML photo)

| Expected Callsign | Entry Class | Op               | QSL Route   | DX Bulletin |
|-------------------|-------------|------------------|-------------|-------------|
| VP2MU             | M/S         | N8MK             | ?           | —           |
| YJ0RY             | S/A         | OH1RY            | OH1RY       | 492         |
| 3D2VV             | S/A         | OH2BAZ           | OH2BAZ      | 492         |
| VK9LV (LH)        | M/S         | KD2EU, K1JB      | KD2EU       | 493         |
| J3(?)             | several     | many             | as directed | 493         |
| V44QQ             | M/S         | W9QQ, K2DOX      | W9QQ        | 496         |
| V44(?)            | M/S         | WB2P, K3IPK      | unknown     | 496         |
| AH2BE/KH9         | M/S         | many             | KA6V        | 497         |
| GJ6UW             | M/S         | Chiltern DX Club | unknown     | 497         |
| CT3(?)            | S/A         | SM5GMG           | unknown     | 499         |
| VP2VCW            | M/S         | KT6V, N6CW       | N6CW        | 499         |

Table 1 - DXpeditions scheduled for the CQ WW SSB Contest as of July. The last column indicates the issue of "The DX Bulletin" in which more information can be found.



## The WAZ Program

### 10 Meter Phone

|     |        |     |        |
|-----|--------|-----|--------|
| 333 | SM7CRW | 336 | WA6SLO |
| 334 | AA4AH  | 337 | W8FDI  |
| 335 | K4KUZ  |     |        |

### 15 Meter Phone

|     |        |     |       |
|-----|--------|-----|-------|
| 286 | W4UW   | 288 | CT1TM |
| 287 | WA6SLO |     |       |

### 20 Meter Phone

|     |        |     |        |
|-----|--------|-----|--------|
| 753 | WA8SXM | 757 | WZ5I   |
| 754 | CE7ZK  | 758 | GM4UZY |
| 755 | KA1PHQ | 759 | JO1TTB |
| 756 | XE1AMS |     |        |

### 40 Meter Phone

|    |        |    |       |
|----|--------|----|-------|
| 56 | SM7CRW | 57 | CT1TM |
|----|--------|----|-------|

### 10 Meter CW

|    |      |
|----|------|
| 67 | W1GL |
|----|------|

### 15 Meter CW

|     |       |     |       |
|-----|-------|-----|-------|
| 152 | AA4KT | 153 | W6OKX |
|-----|-------|-----|-------|

### 20 Meter CW

|     |       |     |          |
|-----|-------|-----|----------|
| 328 | W8SEY | 329 | NY6M/KH2 |
|-----|-------|-----|----------|

### 40 Meter CW

|     |        |     |       |
|-----|--------|-----|-------|
| 104 | W0JLC  | 106 | AA6XX |
| 105 | SM6MCW |     |       |

### All Band WAZ

#### SSB

|      |        |      |        |
|------|--------|------|--------|
| 3368 | JR1RGV | 3374 | NX4B   |
| 3369 | KE4UC  | 3375 | XE1KS  |
| 3370 | VE3ZN  | 3376 | DL9ZAL |
| 3371 | PY1OL  | 3377 | KB8RJ  |
| 3372 | OZ6WN  | 3378 | W7NEJ  |
| 3373 | YV1CP  | 3379 | NM5Y   |

#### Phone/CW

|      |        |      |        |
|------|--------|------|--------|
| 6577 | LX2EL  | 6587 | JA6VOV |
| 6578 | G4ZYQ  | 6588 | JA1NIR |
| 6579 | K9EC   | 6589 | HB9KT  |
| 6580 | JA4ATV | 6590 | N6CGB  |
| 6581 | JJ3JL  | 6591 | XE3ABC |
| 6582 | WS7W   | 6592 | W8AKS  |
| 6583 | NC9T   | 6593 | W7NEJ  |
| 6584 | PA3CNI | 6594 | WB6AFJ |
| 6585 | JA9TSI | 6595 | WA9YYY |
| 6586 | JH7DIS |      |        |

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rules, such as Baldwin's Reef (Minami Torishima), but that was at the demand of the then General Manager (now Executive Vice President) of the ARRL.

Given the wording of the license for Diego Garcia operation, should the ARRL make an exception to rule 8 for VQ9 contacts? If you agree, send a letter to ARRL's Executive Vice President Dave Sumner, K1ZZ, asking for the exception, and send a copy to this writer at Box 50, Fulton, CA 95439.

## DX Gatherings in October

On October 1st the Radio Society of Great Britain (RSGB) holds their National HF Convention at the Belfry Hotel in Milton Common, Oxford. Among the DX

## The WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with CQ master prefix list. Scores are based on the current prefix total regardless of an operator's all-time count. Honor Roll must be up-dated annually by addition to, or to confirm present total. If no up-date, file will be placed into "inactive" until next up-date. Lifetime Honor Roll fee \$2.00 (U.S.) for each mode, with no fees required for up-dates.

### MIXED

|      |        |      |        |      |        |      |        |     |           |
|------|--------|------|--------|------|--------|------|--------|-----|-----------|
| 3696 | YU2AA  | 2128 | SM7TV  | 1645 | KL7AF  | 1292 | I2EOW  | 981 | I2EAY     |
| 3519 | F9RM   | 2087 | YU7SF  | 1638 | K8LJG  | 1241 | K7CU   | 966 | K1BAZ/DV1 |
| 3181 | K2VV   | 2077 | W9NUF  | 1601 | SM0AJU | 1229 | JA6GWU | 950 | F1HWP     |
| 2931 | W2NC   | 2018 | K9BG   | 1583 | W8UMR  | 1214 | A18S   | 947 | YU2GIJ    |
| 2845 | K6JG   | 2008 | SM3EVR | 1567 | I1POR  | 1205 | K5DB   | 947 | K9BQL     |
| 2750 | VE3XN  | 1999 | K5UR   | 1538 | HA8XX  | 1205 | YU7DR  | 929 | VE3NUP    |
| 2657 | K6XP   | 1987 | 4X4FU  | 1538 | IT9TOH | 1203 | YU1GR  | 911 | I5ZTC     |
| 2656 | W4BQY  | 1981 | IN3ANE | 1534 | W4UW   | 1201 | W9IL   | 901 | YU7RU     |
| 2557 | N4MM   | 1964 | DJ4XA  | 1524 | K2POF  | 1190 | DF6EZ  | 884 | WA4WIN    |
| 2507 | N6JV   | 1918 | PY4OD  | 1514 | WE2L   | 1173 | KC8CC  | 859 | OE1KJW    |
| 2499 | W9DWO  | 1910 | W0SFU  | 1509 | W6OUL  | 1143 | I0AOF  | 841 | W9IAL     |
| 2430 | PY1APS | 1908 | HA0DU  | 1494 | YU2CQ  | 1140 | NE6I   | 840 | YU3PG     |
| 2412 | WA8YTM | 1895 | KA5W   | 1472 | NN4Q   | 1127 | PY2DBU | 840 | YU1PJ     |
| 2403 | K0BLT  | 1841 | I2MQP  | 1468 | K2OLG  | 1120 | JA1WJ  | 802 | W5ASP     |
| 2388 | EA2IA  | 1810 | IT9QDS | 1435 | YU1SZ  | 1109 | YU3NU  | 778 | W4WKQ     |
| 2373 | I2PJA  | 1806 | YU2NA  | 1421 | N8BJQ  | 1102 | KS0Z   | 773 | KS3L      |
| 2300 | YU1AB  | 1802 | KF2O   | 1414 | N2AIF  | 1102 | DF4ZL  | 750 | KC7EM     |
| 2290 | YU7BCD | 1756 | I2DMK  | 1407 | SM6CST | 1098 | 5H3RB  | 742 | K5IC      |
| 2252 | N9AF   | 1752 | N6AW   | 1403 | AB9O   | 1096 | G4OBK  | 728 | K6UXO     |
| 2242 | I8YRK  | 1743 | SM6DHU | 1402 | WB8ZRL | 1081 | K3UA   | 715 | NX9H      |
| 2185 | YT7AC  | 1736 | YT3AA  | 1400 | AC2J   | 1041 | CT1QF  | 711 | RB5MP     |
| 2134 | N2AC   | 1654 | I1EEW  | 1380 | YT7WW  | 1008 | W0JIE  | 710 | W6LC      |
| 2131 | I6SF   | 1652 | N6JM   | 1302 | 4N7ZZ  |      |        | 618 | IK2ECN    |

### SSB

|      |        |      |        |      |        |      |        |     |           |
|------|--------|------|--------|------|--------|------|--------|-----|-----------|
| 3444 | F9RM   | 1741 | EA2IA  | 1371 | N5TV   | 1102 | AG2K   | 832 | I3ZSX     |
| 3216 | I0ZV   | 1738 | WF4V   | 1307 | I1POR  | 1083 | I8LEJ  | 818 | WB6SRK    |
| 2754 | ZL3NS  | 1725 | ZP5JCY | 1301 | KL7AF  | 1050 | K8LJG  | 805 | W5ILR     |
| 2746 | K2VV   | 1720 | WA4QMQ | 1298 | CT1BY  | 1021 | WA2FKF | 803 | LU8DWN    |
| 2650 | K6JG   | 1701 | K5UR   | 1291 | IT9TOH | 1002 | ZS6BCR | 801 | N6CGB     |
| 2624 | K2POA  | 1635 | W9NUF  | 1290 | PY4OD  | 993  | KS0Z   | 794 | NE6I      |
| 2440 | CT1UA  | 1615 | W3ARK  | 1283 | IK5ACO | 985  | XE1XF  | 783 | K3UA      |
| 2371 | I2PJA  | 1558 | G4CHP  | 1277 | EA4KJ  | 983  | G4SDJ  | 757 | IK7DBB    |
| 2362 | K6XP   | 1556 | CT1FL  | 1270 | PY4OY  | 982  | IK8GCS | 744 | IK0EIM    |
| 2358 | VE1YX  | 1528 | KF2O   | 1241 | I2EOW  | 981  | DK8WQ  | 699 | I7UNX     |
| 2323 | N4MM   | 1525 | KC8YM  | 1231 | SM6DHU | 962  | WB6GFJ | 698 | VU2SMN    |
| 2300 | I0AMU  | 1521 | KA5W   | 1229 | LU8ESU | 960  | HK6BER | 683 | YC7DF     |
| 2219 | W0YDB  | 1515 | DJ4XA  | 1218 | SM0AJU | 950  | F1HWP  | 674 | KB4HU     |
| 2208 | WD8MGQ | 1506 | G4CPJ  | 1217 | I2TZJ  | 950  | KB0C   | 666 | G4OBU     |
| 2122 | CT1NH  | 1496 | I1EEW  | 1212 | KD9OT  | 947  | I2WZX  | 661 | K0PVI     |
| 2092 | I4ZSQ  | 1482 | W4UW   | 1200 | AB9O   | 917  | IK2DUU | 657 | W5AWT     |
| 2077 | I6ZJC  | 1450 | XE1OX  | 1200 | F6BVB  | 911  | W6OUL  | 650 | WM5G      |
| 2019 | W4BQY  | 1437 | K5RPC  | 1196 | N6FX   | 908  | N2AIF  | 641 | CT1CIR    |
| 1999 | I8YZP  | 1433 | EA8AKN | 1176 | N2AC   | 902  | K3IXD  | 639 | KA0ZFX    |
| 1965 | I8YRK  | 1418 | EA3AOC | 1163 | NN4Q   | 901  | NK2H   | 633 | SM6CST    |
| 1925 | WA8YTM | 1414 | YU2NA  | 1161 | KE6KT  | 881  | IT9JKY | 618 | CT1DIZ    |
| 1846 | I2MQP  | 1405 | I8KCI  | 1158 | PY4VX  | 860  | CX6BZ  | 613 | NM5Y      |
| 1846 | YU7BCD | 1404 | CT4UW  | 1141 | KC8CC  | 860  | WN5MBS | 613 | K1BAZ/DV1 |
| 1816 | W9DWO  | 1401 | WE2L   | 1132 | WB8ZRL | 859  | I8ZNU  | 607 | K5HT      |
| 1809 | NJQC   | 1394 | HA8XX  | 1114 | I8WYD  | 854  | IT9ONV | 600 | IT9CUE    |
| 1805 | I4CSP  | 1390 | I5ZJK  | 1103 | CT1AHU | 838  | K9BQL  |     |           |

### CW

|      |        |      |        |      |        |      |        |     |           |
|------|--------|------|--------|------|--------|------|--------|-----|-----------|
| 2748 | K2VV   | 1773 | WA8YTM | 1215 | VE1ACK | 1085 | W6OUL  | 821 | WB8ZRL    |
| 2543 | WA2HZR | 1757 | I1YRL  | 1212 | I7PXV  | 1051 | OH3TQ  | 799 | EA5AR     |
| 2458 | N6JV   | 1746 | 4X4FU  | 1205 | I8YRK  | 1024 | NN4Q   | 798 | G4OBK     |
| 2405 | ON4QX  | 1609 | N4MM   | 1193 | W9PWM  | 1019 | HA5LZ  | 790 | NE6I      |
| 2223 | VE7CNE | 1639 | PY4OD  | 1190 | W1WAI  | 1008 | G3VQZ  | 781 | G4UOL     |
| 2191 | N4NO   | 1619 | W9NUF  | 1188 | KF2O   | 1002 | G4SSH  | 763 | OE1KJW    |
| 2128 | W3ARK  | 1583 | K5UR   | 1166 | T14SU  | 1000 | DL2HBX | 758 | K1BAZ/DV1 |
| 2117 | K6JG   | 1538 | DJ4XA  | 1146 | N2AIF  | 988  | OK1CZ  | 750 | W0JIE     |
| 2074 | W9DWO  | 1534 | N4YB   | 1144 | F6HKD  | 957  | VE4CE  | 749 | G4MVA     |
| 2059 | W4BQY  | 1508 | JH3CXL | 1143 | SM0AJU | 915  | SM5DAC | 731 | YU3PV     |
| 2037 | G2GM   | 1459 | IT9VDQ | 1138 | YU2NA  | 914  | NF5Z   | 704 | K6UXO     |
| 2002 | K6XP   | 1456 | KA7T   | 1134 | EA7OH  | 898  | OZ5UR  | 684 | W5AWT     |
| 1976 | YU7SF  | 1455 | I2DMK  | 1134 | K8LJG  | 891  | HA8XX  | 659 | W9IAL     |
| 1900 | N2AC   | 1303 | KA5W   | 1129 | YU2CQ  | 868  | K3UA   | 642 | IS0FIC    |
| 1874 | EA2IA  | 1300 | N6FX   | 1112 | YU3NU  | 865  | EA1AK  | 619 | PY4WS     |
| 1867 | I6SF   | 1285 | SM6CST | 1106 | IT9TOH | 848  | I2EAY  | 616 | VS6UW     |
| 1852 | YU7BCD | 1261 | SM6DHU | 1106 | LA9XG  | 838  | JJ1FSK | 611 | WE2P      |
| 1831 | LZ1XL  | 1251 | KL7AF  | 1095 | DJ1YH  | 837  | YU2GIJ | 602 | 4X6DK     |
| 1779 | OZ5EV  |      |        |      |        |      |        |     |           |

events scheduled are a talk on HF Yagi antennas by John Devoldere, ON4UN, a forum sponsored by the Chiltern DX Club, and slides shows of several DXpeditions, including the Marquesas and Astral Is-

land trip, XF4L Revillegigedo, and 3D2CR Conway Reef. More information is available from the RSGB at Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE, England, or from Don





Members of the Zilan DX Club in the USSR. From left sitting UW4CF, UW4CW, and UA4CO; standing UA4CC, UA4CX, and RA4CA.



At the Visalia Hamfest in April of this year Martti Laine, OH2BH, was presented with CQ's prestigious Contest Hall of Fame plaque for his well-known accomplishments in and contributions to amateur radio contesting.

Field, G3XTT, whose telephone number is 0734-724192.

The Polish DXers will celebrate the 30th anniversary of their SP DX Club on October 7-8 in Krakow. Visitors should contact Henryk Zwolski, SP9JPA, at P.O. Box 606, Krakow 1, Poland for more details.

Looking a little further ahead, the 17th annual Southeast Asia Net Convention will be held November 17-19 at the Century Park Sheraton Hotel in Singapore. Delegates from countries throughout the area are expected to attend. On the program is a demonstration of Teleview (an interactive information system), a tour of 9V1SC at the Singapore Science Center, and technical papers. Registration is Sing \$160 (US \$85). Contact SEANET via the Singapore Amateur Radio Transmitting Society (SARTS), Robinson Road, P.O. Box 2728, Singapore 9047.

And, although not a DX gathering but rather a milestone this month, October 1, 1989 marks the 10th anniversary of the deletion of the Panama Canal Zone from the DXCC list. The existing KZ5 stations started signing HP1X (Pacific) or HP2X (Atlantic) prefixes, and contacts with them counted for Panama, not Canal Zone. (Thanks to Jim Miller, ex-KZ5JM, for this note.)

### The CQ WW SSB Contest

The CQ WW SSB test October 28-29 is a great opportunity for DXers to pick up new countries and new band-countries. The contesters typically activate many semi-rare spots and are looking for as many contacts as possible. With the superb band conditions we expect this year, the CQ WW SSB should be a bonanza for DXers. (One possible problem: Contesters aren't very interested in getting your QSL card, and some DXpeditions are poor QSLers.) With that warning in mind, Table I shows some of the CQ WW SSB DXpeditions that were scheduled by July.

### QSL Information

1Z9B to KA6V  
3B8FP to KN2N  
3B9FR to F6FNU  
3D2MB to VE7YL  
3D2RW to ZL1AMO  
3D2XV to VK2BCH  
4G1A to DX1CW  
4L1NV to RA1NA  
4N4CX to YU4EXA  
4N5C to YU5DRS  
4X1AD to KC4MJ  
5H3TW to K3ZO  
5H3ZW to IK8DOI  
6W6JX to F6FNU  
6W7FZ to DK6ZZ  
6Z2BN to K5HUT  
6Z2DK to G3OCA  
6Z2FO to KN4F  
6Z2FV to KA9FWV  
6Z2WK to G3OCA  
7J6CAS to KE7PL  
7X4AN to DJ2BW  
8P6JW to K2QIE  
9H3KL to HA8UB  
9H3KN to HA8ZC  
9H3KO to HA8ZC  
9K2CS to AA5BL  
9K2KP to W4AEN  
9K2YA to OE6EEG  
9M2AX to JA5DQH  
9M6HF to WE2K  
9Q5DX to KQ3S  
9Q5UN to OH3GZ  
9V1QX to K2QBV  
9X5KP to W4IEN  
A22AA to A22CQ  
A22BW to DK3KD  
ATB to W8XM  
BV2A to K2CM  
BV2FA to DJ9ZB  
C380XA to F6AUS  
C48A to 5B4MF  
C53AT to VE3AT  
C53JNC to VE3JNC  
CE3/JH1FNS to JH1FNS  
CH3XN to VE3XN  
CI7GRN to VE7IG  
CN6BLS to CN8LS  
CN8ST to F2CW  
CT5BLV to CT1BLV  
CU8SM to CU1EZ  
CY8BAB to VE1CBK  
D44AB to WA5KYY  
D66JL to AK1E  
EC9JB to EA9IB  
EF7PFM to EC7DEB  
EJ1D to EI6EW  
FD1JYD/VE8 to F6IGX  
FH5EF to F6EZV  
FK8FU to NA5U

F08AQ to FD1JMH  
F08VO to N6VO  
F05LQ to F6CEE  
F05LZ to FO4LZ  
FP/K1RH to K1RH  
FP/KU2W to KU2W  
FR4FD to F6FYA  
F5SR to W7EJ  
FS5T to AI7B  
FT4ZE to F2CW  
FW/KABOMX to VE7YL  
FW/N4DD to VE7YL  
FY5FA to F6GNG  
FY89AN to FY5AN  
G88FLA to G3XTT  
G84JUL to KE2AE  
HC5VR to HC5AI  
HI8W to HI8WPC  
HL9JT to WX4O  
HL9TF to WB0TUL  
HV3SJ to I0DUD  
HZ1AB to K8PYD  
HZ1HZ to N7RO  
IABA to IK8DOI  
IG90NU to I0YKN  
IJ7/I7LMR to I7PXV  
IJ7/IK7BDN to I7PXV  
J52US to WABJOC  
J73EH to WA4WIP  
J79T to W5EW  
JW9DAA to LA9DAA  
JX7DFA to LA2KD  
JY5CI to G4WFZ  
JY9SR to W3FYT  
K1BAZ/DV1 to K1BAZ  
KC3EK/BV to KC3EK  
KG4UN to K8UNP  
KG6SL to WA6AHF  
KH3/KN8E to K9UIY  
KH6LW/KH7 to KH6JEB  
KN8E/KH3 to K9UIY  
KX6HE to K2CL  
NH6RT/KH8 to JH4IFF  
NR3J/HR3 to K9APW  
O05VT to HB9CRV  
OH88DA to OH2BDA  
OH8NAW to OH1NX  
OX/OZ1LQH to OZ1LLC  
OX/OZ3ACO to OZ1LLC  
OY/G3MCN to G3MCN  
P29CG to WB9SVK  
P29MD to KE0KR  
P29PL to VK9NS  
P29SR to WB6IOQ  
P48P to N1CIX  
P48YL to HB9CUY  
PA0GAM/9L to PA0GIN  
RA8T/UZ90WM to UA9ABA  
RF6FO to UF6FFF  
RI10A to UI80AA

R180A to UI80AA  
RJ7R to UJ8JQC  
RQ7W to UQ1GWW  
RZ6AWL/UF60 to RW6AC  
S79D to WB4YZU  
SM7CRW to W3HNC  
SN8POL to SP5PAU  
SP9PEY to SP9HMF  
SU1EE to WA9INK  
SU1EK to W2QUV  
SV5/DJ4GJ to DJ4GJ  
T28AA to N4FJL  
T28RW to ZL1AMO  
T38BC to ZL2QW  
T32AB to N7YL  
T32AF to K7EHI  
T5CT to K4CAI  
T5MF to I2MQP  
TE5T to TI4SU  
TI28EV to W4ZD  
TJ1MW to N4MUJ  
TK5EL to F6FNU  
TL8RM to F6FNU  
TT8CW to F2CW  
TV7E to F6HUJ  
U5WF/UB9P to UB5WE  
UA8BEZ/UA10 to UA9MA  
UA10IL to UA9MA  
UA10T to UB5KW  
UA90WM/RA8T to UA9OBA  
UD6DKW to W3HNC  
UL7GX/UL7C to UL7GX  
UL8I/UZ9SWD to UA9SAW  
UM8NC to F6FNU  
UM8NU to F6FNU  
UR8RWH to UR2RE  
US4P to KD7IK  
UY8ILK to RB4IYB  
UY7ILK to UB5IAL  
UY8ILK to RB5IUI  
UY9ILK to UY5EG  
UZ2FWA to UA2FM  
VE2EXX to KC8JH  
VK9AE to KD2EU  
VK9LV to K1JB  
VQ2AC to K8BSOF  
VP2EXX to KC8JH  
VP2MQ to W3ZFE  
VP2VDX to KT6V  
VP2VM to KW1K  
VP5/W4NPX to W4NPX  
VP5D to W3HNC  
VP5LJ to WN5K  
VP8BWT to G4ZYR  
VP8WA to WA4JQS  
VP9WA to WA9JQS  
VQ9AA to N2BRX  
VQ9DM to N5DM  
VQ9DA to W7KNT

VQ9TC to N0JCV  
VR6ID to KB6ISL  
VR6TC to W6HS  
VS6CT to KA6V  
VS6DT to VS6ER  
VS6DX to WA4BCO  
VU2GI to N2HOS  
VU2WAP to WA2YMX  
VU2ZAP to W3HNC  
VY9CCA to VE1DH  
W3WKP/VP9 to W3WKP  
WA4ZEL/JW to LA8PF  
XF4F to WA3HUP  
XX9KA to KC9V  
Y73SOP to Y42DA  
Y89GST to Y56ZJ  
Y89ZCD to YD0VGH  
YJ8JS to N4EVS  
YS1GMV to W3HNC  
YZ1U to YU1XA  
ZC4BS to G4KIV  
ZD8SE to G3XKR  
ZD9BV to W4FRU  
ZF2AH to WA6VNR  
ZF2DR to K5RQ  
ZM8AAH to W0RPK  
ZS8MI to ZS6PT  
ZV7AA to PT7AA  
9M6MA to Hassan, Box 12647, Kota Kinabalu, Sabah, Malaysia 88829  
CE8DFL to Box 7, Easter Island, Chile  
CE8FFD to Box 4, Easter Island, Chile  
EV1AN to Alex, Box 225, Petrozavodsk, 185034, USSR  
HS8B to P.O. Box 2008, Bangkok, Thailand  
RA30UU/UQ to Box 269, Moscow 121354  
RW3QA/RM3M to Box 97, Voronezh, 394053  
TA30 to Box 963, Izmar, Turkey  
UA9AB to P.O. Box 17, Troitsk 457100, USSR  
UA9XK to Sergej, P.O. Box 44, Uchta, 169400, USSR  
UR3RA to P.O. Box 806, Tallinn 200051, USSR  
VK8RG to SD/AV Field Office M, Box 89, San Francisco, CA 96369  
VU2TTC to Box 54, Pingo, 5602, India  
ZD7VC to Box 5, St. Helena, South Atlantic





### ARRL To Petition For Code-Free Amateur Class

*"It was a very difficult issue for the Board to deal with because there were strongly held views at opposite ends of the spectrum. There were a number of proposals for different things. We started out with the committee report and proceeded from there to discuss various amendments to it. There had been many other options considered informally during the preliminaries. People should be reassured that the Board gave this subject very, very deep and careful consideration in order to find something that would simultaneously achieve the objective of those who desire a codeless license . . . while making the package something that should be completely acceptable to those who do not share that view."*

Dave Sumner, K1ZZ  
ARRL Executive Vice President

**D**irectors of the American Radio Relay League held their second Board meeting of 1989 in Windsor Locks, Connecticut on July 21 and 22. Acting on recommendations of their no-code study committee, the directors agreed that the time had come to support a class of amateur radio operator license which did not require knowledge of Morse code.

A special blue-ribbon no-code panel had been appointed by ARRL President Larry E. Price, W4RA, in January to explore the implications of a no-code amateur license. That committee consisted of representatives from the ARRL leadership, the amateur radio industry, individual amateurs at large, and the presidents of the Quarter Century Wireless Association and Canadian Radio Relay League as a liaison to their organizations.

The study committee reviewed a wealth of input from interested individuals and amateur radio clubs, as well as information it had requested from International Amateur Radio Union (IARU) member societies in other countries which already have a code-free class of amateur license. The committee submitted their report to the ARRL Executive Committee on April 1. The Executive

Committee authorized publication of the report in the May issue of *QST* and referred it to the full Board of Directors for consideration during its July 21-22 meeting.

Basically, the code-free license committee recommended that a new class of license be created similar to the requirements of the Technician class but without the 5 WPM code requirement. To obtain this license, an applicant would be required to pass the present test Element 2 (Novice) and Element 3A (Technician) written examinations under the three examiner VEC System. To upgrade further, the applicant need only pass the Novice code (Element 1A) examination at five words per minute, which also must be administered through the VEC System. The no-code committee recommended no-code licensees receive distinctive call signs from the 2 x 3 format "NA#" prefix block. Privileges accorded to the new code-free class would be those now allowed to the Technician except only limited 2 meter digital privileges at 144.9 to 145.1 MHz. The panel suggested the new class be named "Technician," with present Technicians being called "Technician Plus" for Tech plus code.

#### Action By The ARRL Board

The directors were in basic, but not total agreement. By a vote of nine to six the ARRL directors agreed to a proposal to be presented to the FCC in the form of a petition for rulemaking. The directors agreed that the petition should incorporate the following points:

1. A codeless license should be recommended.
2. Examination should consist of questions from the existing Elements 2 and 3A question pools, plus additional questions, including ones related to Morse code.
3. License examinations to be given for the new class of license should be administered by the established [accredited] volunteer examiners—i.e., the three examiner VEC System.
4. There should be an upgrade path to the present Technician license by way of the 5 words-per-minute code test administered solely through the established VE/VEC System.
5. Callsigns should assigned from the Group "D" callsign blocks—i.e., the two-by-three format callsigns now assigned

to new Novice licensees without distinction.

6. Privileges will be all modes/emissions at 220 MHz and above.

7. Power should be limited to 250 watts PEP output.

8. The licensee shall not be the control operator of a repeater or an auxiliary station.

9. The name of the license shall be called "Communicator."

The above basic parameters represent the hammered out version of the proposal. There were directors who were totally against it and would not vote for any type of code-free license at all. Others were as liberal as the Canadian version, which looks toward unlimited no-code amateur privileges above 30 MHz. The nine points represent a compromise developed over some 2½ hours on Saturday afternoon, July 22. Some directors felt that the Commission should issue a Notice of Inquiry requesting further information, particularly from people who were not amateurs. Several directors noted that little input had been received from the unlicensed general public.

#### Deliberations By The League

The directors felt that regular Group "D" callsigns should be issued so newcomers could easily blend into the existing amateur community. There was a strong desire not to create two different amateur radio groups—one made up of people licensed under the existing structure and a second one developed through the codeless license route. "The majority of the Board felt that a distinctive callsign would 'brand' new licensees as being different," Sumner said. "They wanted to 'mainstream' Communicator licensees."

No directors supported the Technician/Technician-Plus titles suggested by the no-code committee. They thought it was too confusing. The term "Specialist" was considered, but the directors settled on the name "Communicator," since it more accurately described the anticipated activity of code-free licensees. "The FCC has already programmed that name into their computer systems from an earlier proceeding. They have a [software] slot already set up . . . let's go with it," a director suggested.

To preserve the credibility and integrity of the proposed "Communicator"

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





## AMIGA- commodore CHIPS... PARTS... UPGRADES

|                       |                        |
|-----------------------|------------------------|
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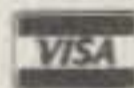
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class, the directors felt it important that it fall under the three examiner VEC System which is perceived as being more reliable. Communicator applicants will be asked questions related to the Morse code to instill in them that it is indeed a basic part and tradition of amateur radio. It is unclear, however, whether candidates will be tested on code character recognition. "You could fail every one of those questions," Sumner told us, "and still pass the element. It won't be a code requirement in disguise."

Although the ARRL study committee suggested a 30-question written test, the directors did not further address the examination to be administered. A 25 watt power limit was considered and rejected as not being adequate for satellite communication.

"While we agreed that we need additional 6 meter activity," one director told us, "we have a lot of fear about TVI at a time when we need public support to make it all work. There are too many Channel Two's. We don't want to create an 'image' problem or intensify the pressure for 'quiet hours.' We plan a campaign to educate the public about ham radio... who we are, what you can do, and why you should be one, too." The League's desire is to use the new Communicator class to promote amateur radio to those who may never have considered the desirability of becoming an amateur radio operator.

"We held out 2 meters to give newcomers something to shoot for," our director source said. "It is a juicy band and hopefully they will want to upgrade to get on with all their buddies. We did not go along with the [no-code committee] recommendation to give no-code licensees 2 meter digital privileges because the packet people said it was already getting crowded. We also want to open up packet activity in other bands."

To code-free proponents Sumner said, "I hope that the degree of consideration and discussion that was given to the various possible ways of implementing this by the board will reassure them that the Board was genuinely trying to find something that would achieve their objective. I hope that everyone that supports the concept of a codeless license will get behind this design... even if it doesn't have everything in it that they might have wanted to see. If a consensus can be established among those who support the concept... the prospects for early adoption would be very good."

"To those who oppose the concept, I think that the Board has tried to address their concerns and to provide some reassurance that the Board is doing its best to preserve the essence of Amateur Radio in a changing world. I am very proud of the Board for what it has done. Without exception, the Board members acted as statesmen on this issue. It is our intention

to move as quickly as possible to file the petition for rulemaking." Sumner said the goal is for League counsel Chris Imlay, N3AKD, to submit the petition within a matter of weeks.

## Amateur Radio License Fees Proposed

The House Energy and Commerce Committee has voted a 12.6 percent across-the-board increase for the FCC's so-called "cost of regulation" fees. The fees detailed in the FCC Budget Reconciliation Provisions apply to applications for licensing or paperwork processing in just about every radio service. There is a parallel move afoot in the Senate Communication Subcommittee, and the American Radio Relay League is closely monitoring both of these. The League is, of course, dismayed that the subject of amateur license fees has been raised so suddenly and without opportunity for public input.

The \$42 million generated by the fees would not go to the Commission directly, but to the Treasury to reduce the deficit. The fees range from \$30 for many routine actions to \$70,000 for application for authority to launch and operate a communications satellite.

The Amateur Radio Service, currently exempt from FCC fees because of its noncommercial, public-service use, would begin a \$30 fee for new licenses, modifications, renewals, reciprocal permits, and renewal or modification of club, RACES, or military recreation station licenses. Collection of the fee would present a burden to the amateur community since all applications for new and upgraded licenses now pass through volunteer examiners before forwarding to the FCC. VEs could be required to collect the fee for the government.

General Mobile Radio Service fees stay at \$30. CB radio, which does not require licensing, is not affected. Fines for violating FCC rules would increase in many cases from the standard \$500 to a whopping \$6,000.

The House budget bill includes fines for obscene and indecent telephone communications. This provision is primarily aimed at so-called "Dial-A-Porn" messages. Although we have not seen the wording, it is believed the rider might also apply to amateur radio communications. The Supreme Court recently upheld the banning of "obscene" telephone messages, but said restricting access to "indecent" phone calls violates the First Amendment.

## Britain's No-Code License

Tony Smith, G4FAI, is a London, England journalist who writes a monthly "Reporting Amateur Radio" column in the British magazine *Everyday Electronics*. He also authors the "Morse Report" for *Amateur Radio* magazine.



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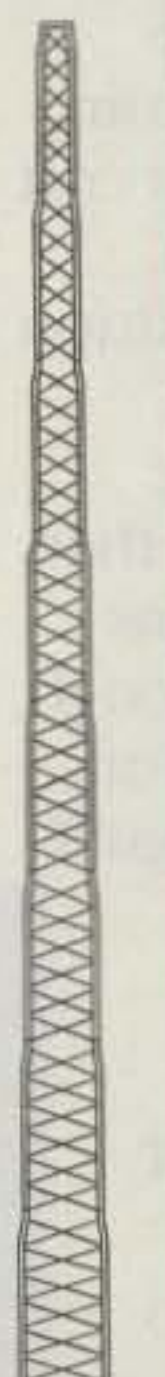
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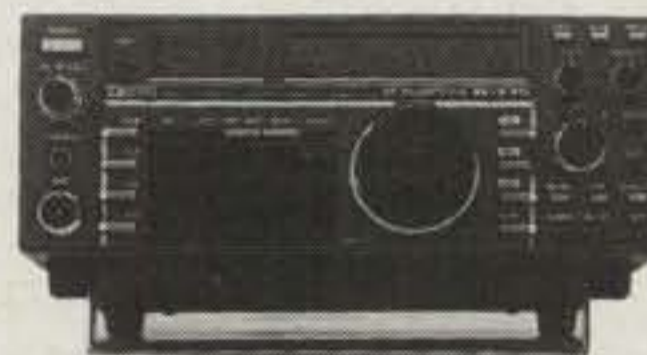
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The United Kingdom has had a no-code amateur license class for some 25 years. Great Britain does not, however, have an entry-level Novice license class. I wrote to Tony to learn more about their Class B code-free license class and how it has affected their Amateur Radio Service. The following is his unedited response. Keep in mind that Smith is a "Morse man" (as he calls it) and current chairman of the European CW Association.

### History

Before 1964, all British amateurs were required to use CW on the amateur bands for one year before being allowed to use telephony. That year a new no-code license was introduced which allowed operation on frequencies 420 MHz and above.

In 1968 the 2 meter band, 144-146 MHz, was released to holders of the no-code license, and in 1986 50 MHz also became available. In the same year no-code licensees were allowed to send Morse code on the air as part of their preparation for the amateur Morse test if they wished to upgrade to a full all-bands license.

### Present License

Under present regulations there are just two general types of license in the UK (United Kingdom). The "Class A" requires successful completion of the *Radio Amateurs Examination (RAE)*, plus a 12 WPM Morse sending and receiving test. This license gives access to all amateur bands with all approved modes.

The "Class B" license requires a pass in the same examination, but no Morse test, and licensees have access to all bands, except those below 30 MHz. When "B" licensees operate a station under the license and supervision of an "A" licensee this restriction does not apply. Class "B"ers can transfer to class "A" by taking and passing the Morse test.

### Examinations

The RAE is set by an academic body, the Ci-

ty and Guilds of London Institute (CGLI), and the examinations are held at colleges and other centres twice yearly throughout the UK and overseas. The contents of the examination are supervised by an advisory group comprising members representing the CGLI, Radio Society of Great Britain (RSGB), Department of Trade and Industry (DTI), plus various professional and educational bodies. Since 1986, the Morse test has been administered by the RSGB throughout the UK on behalf of the DTI, the country's licensing body.

### Numbers

When the "B" license was first introduced, take-up was slow, and by 1968 fewer than one thousand of the new licenses had been issued. In the following year, resulting from the availability of 2 meters, numbers increased by nearly 50%, and by 1970 the annual increase in Class "B" licenses was greater than that of class "A." This trend has continued to the present day, although many class "B"ers do go on to take the Morse test and transfer to class "A."

A big boost for amateur radio numbers was experienced as a result of the UK CB boom in the early 80s. Many of the new CBers, experiencing radio communication for the first time, were attracted by the wider opportunities offered by amateur radio and came into the hobby mainly as class "B" licensees.

Probably as a result of that boom, in 1984 the actual number of class "B" licenses in the UK exceeded the number of class "A" licenses. The latest figures (June 1989) show a reversal of the trend with 31,905 class "A" and 26,819 class "B." According to the DTI, this is due to more class "B"ers now transferring to class "A."

### Taken For Granted

Whatever apprehension there was back in 1964 about issuing VHF licenses without Morse qualifications, most UKL amateurs today take the system for granted, although there remains a feeling in some circles that

somehow class "B" is inferior to class "A."

Class "B" has resulted in VHF/UHF operation becoming a major part of the UK amateur radio scene with activities taking place over the whole spectrum. The RSGB has a Microwave Committee, a VHF Committee, a VHF Contest committee, and runs an annual VHF convention usually covering the more serious aspects of experimentation and operation.

While undoubtedly the greatest activity by class "B" operators is on channelised 2 meter FM, most other modes are also used and data-comms is a popular growth area. (*Editor's note: Data-comms is computer-to-computer packet radio.*) There are currently well over 100 mailboxes in operation with new authorisations going through at the rate of about four a week. It should be remembered, however, that VHF/UHF is not the exclusive domain of class "B," and many class "A" operators use these bands as well.

### Need To Recruit

Most newcomers come into the hobby via the class "B" license, nearly always declaring their intention to "go on to take the Morse." Despite the current trend, many abandon this intention and remain on the higher frequencies. For some this is because Morse presents an insurmountable barrier, but others clearly find the specialisation of VHF and higher to their liking and have no wish to operate on the HF bands.

As in the USA, opinion is frequently expressed in the UK amateur press that the Morse test is outmoded and serves no useful purpose. "If there was no Morse test at all," it is said, "plenty more young people would come into amateur radio." The purpose of this report is not to argue on this subject, but suffice to say that in the UK there seems little likelihood at present of further liberalization of the existing no-code route into amateur radio.

Like the FCC, the DTI recognizes and abides by the stipulation in the International Radio Regulations requiring licensed amateurs operating below 30 MHz to prove a certain proficiency in sending and receiving Morse. No matter what people want, and how they argue, this situation is unlikely to change overnight!

### RSGB Concern

Undoubtedly, without the class "B" license, the UK amateur population would be much smaller than it is today, but this fact has done little to allay the anxiety of the RSGB about the future of amateur radio.

Despite the availability of a no-code entry in Britain, the Society shares the concern of the ARRL and others about the failure of amateur radio to attract bright young newcomers (it has less than 200 members under the age of 18). It too attaches great importance to recruiting many more amateurs as the greatest safeguard for the future.

The RSGB's answer under Project YEAR (Youth into Electronics via Amateur Radio) is to promote the idea of a new Novice license with an easier entrance examination—and a 5 WPM Morse test! This would be a low-cost entry to the hobby involving home-construction of QRP equipment from approved kits. Operation is suggested on designated HF, VHF, and UHF bands, mainly on CW, but possibly with other modes. More on this later when firm proposals are put to the DTI.

(Signed: Tony Smith, G4FAI, 1 Tash Place, New Southgate, London N11 1PA, England)

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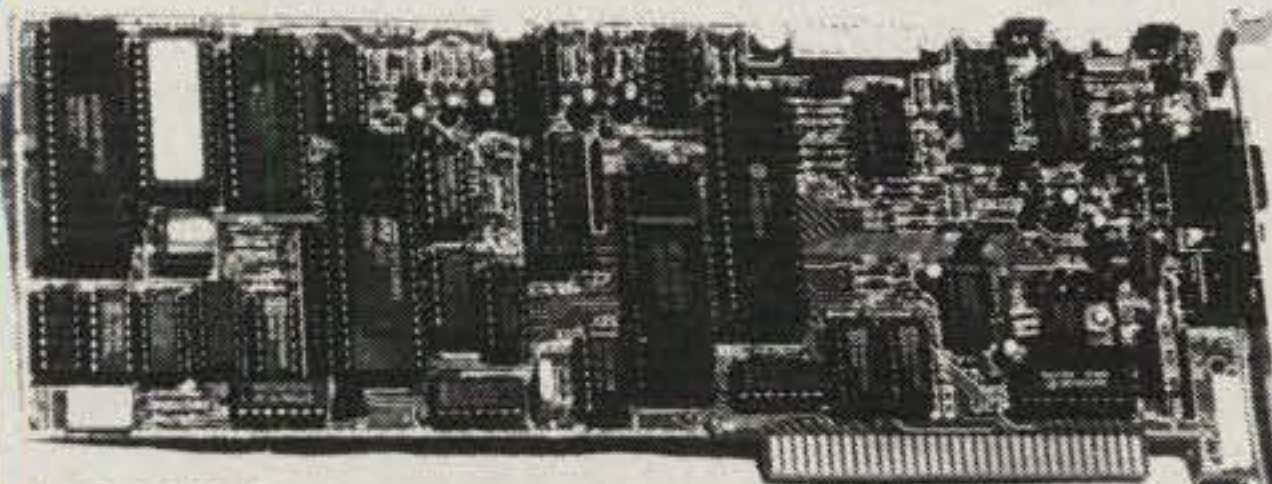
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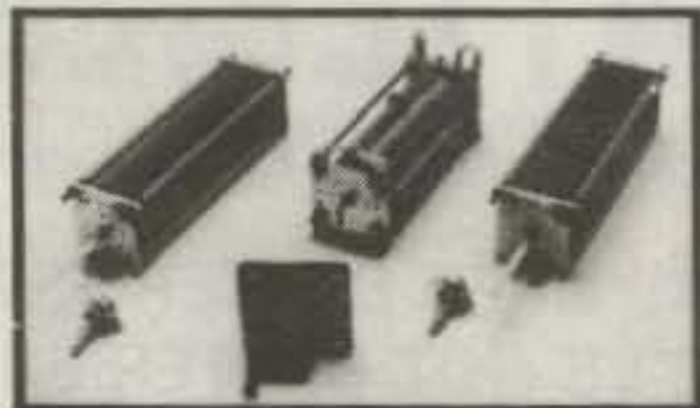
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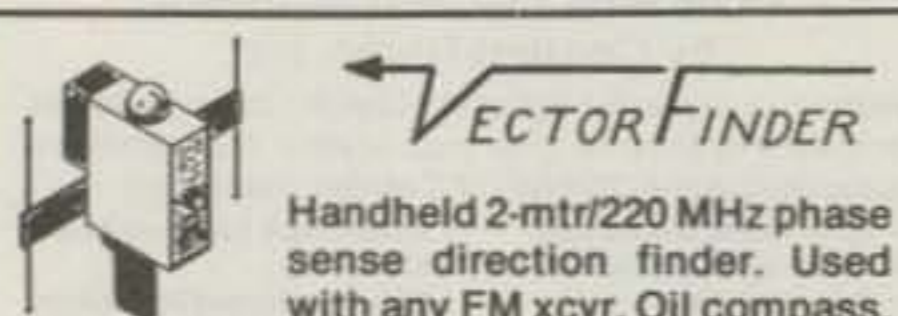
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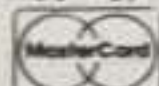
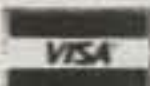
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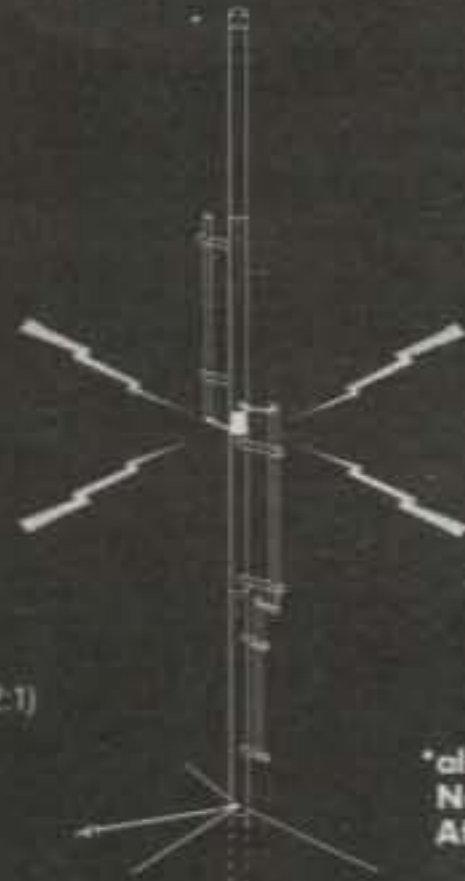
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**Zero Bias**  
(from page 4)

amateur radio and amateur radio products. Perhaps the League would be satisfied with only one page of advertising in QST each month—Harris Corp. After all, what else is there? I guess it was the amount of overkill and the total lack of sensitivity to amateurs and amateur radio equipment manufacturers plus their dealers, all of whom are struggling to keep this hobby and industry alive, that makes me feel angry over this travesty.

I wouldn't be surprised to find out that this tribute to unreality comes in closer to \$600,000 when all is added up. It's no longer amateur radio, but simply a device designed to foster self-perpetuation. It would seem that the station and the organization have gotten bigger aspirations than their constituency and will survive even if there is no constituency. Perhaps a future addition to W1AW should be a bomb-proof geodesic dome over the building and antenna installation just in case, as we used to say, "The Balloon Goes Up." W1AW could keep going even after a direct hit and after the rest of us were gone, atomized. We could get a collection going by the end of the year. Who knows? Some of you might want to kick in \$1,000 to join the Fermi Club or even \$10,000 to get into the Oppenheimer Club. Your plaques could actually be ceramic heat shields for the dome.

In the end, the ARRL got their museum.

The artifacts in fact haven't yet cooled from their travels down the assembly line. For what is displayed *in situ* are the dinosaurs of today. The crude remnants enjoyed by the masses are on display, and if you must, you may operate them.

While I'm sure that much will be publicized in the pages of QST on the rededication ceremony and the capabilities of the new W1AW, history will mark July 20, 1989 as the official transition period from homebrew/appliance operator to total commercial operation.

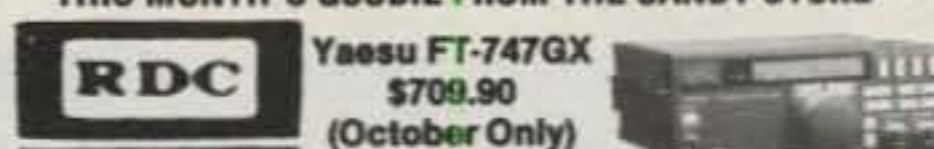
Well, there's something wrong, and it bothers me. It bothers me that there's not one little cubicle set aside for homebrew gear, or another for an average station, not necessarily the top-of-the-line amateur gear (although top of the line obviously isn't that great anymore). It bothers me that someone up in Newington had a "great idea," and nobody there thought about the message it was sending to the rest of us. Maybe it doesn't bother you and maybe it shouldn't, and maybe I don't see "the big picture," but it seems to me akin to the government spending \$1,000 for a \$10 hammer when all they want to do is drive in some nails.

So while my mind conjures up the next steps of uniformed tour guides, red, white, and blue smocked operators, plus an ancillary gift shop with theme park to follow, to me, W1AW has left the ranks of amateur radio and all that it means.

I'll really miss it.

73, Alan, K2EEK

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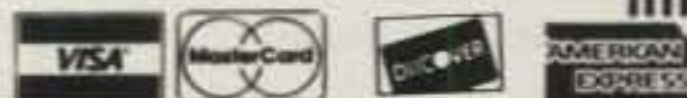
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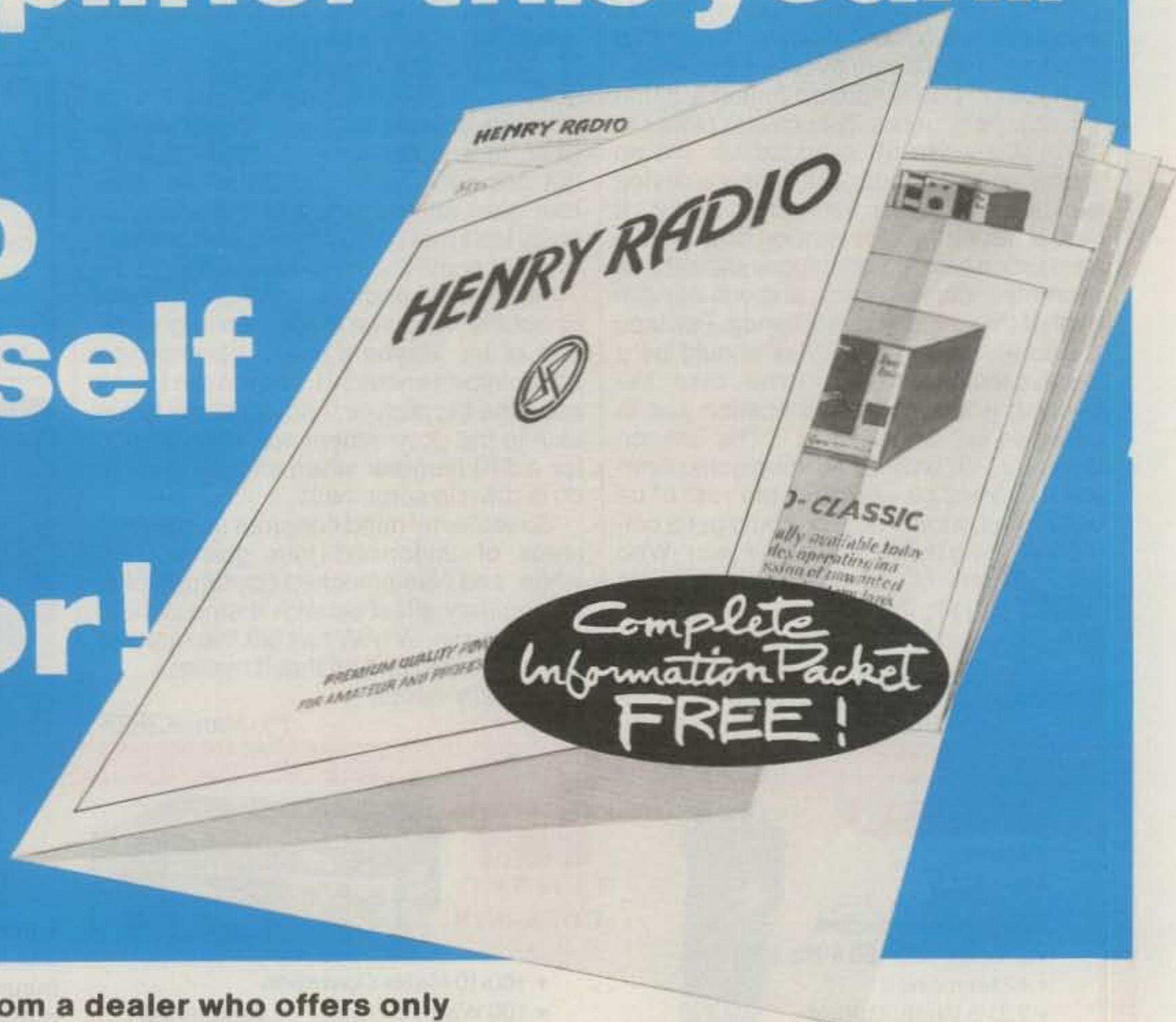
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| F23A   | 2M   | 7.8     | 15' |
| F718A  | 70cm | 11.5    | 15' |
| F1230A | 23cm | 13.5    | 10' |

#### MULTI-BAND

| Model   | Band    | Gain dB  | Lth |
|---------|---------|----------|-----|
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| X-500NA | 2M&70cm | 8.3/11.7 | 17' |
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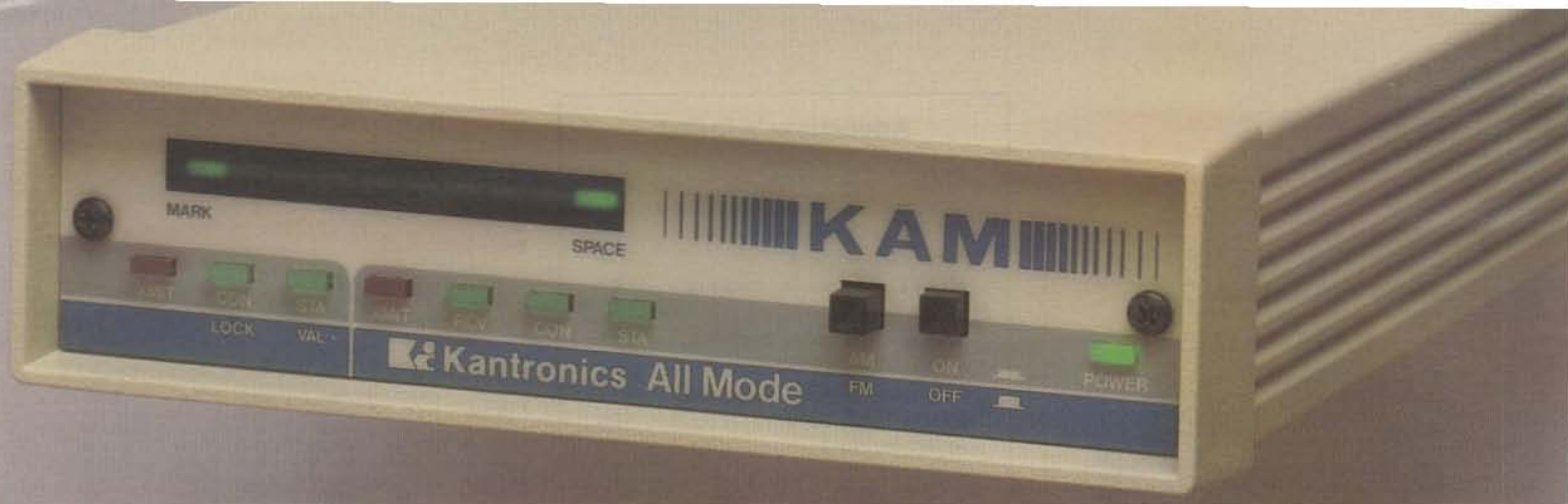
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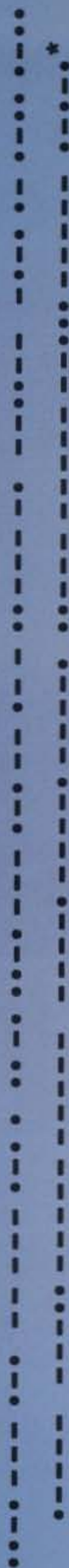
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