45241

# Amateur Radio

http://www.cq-amateur-radio.com

## COMMUNICATIONS & TECHNOLOGY

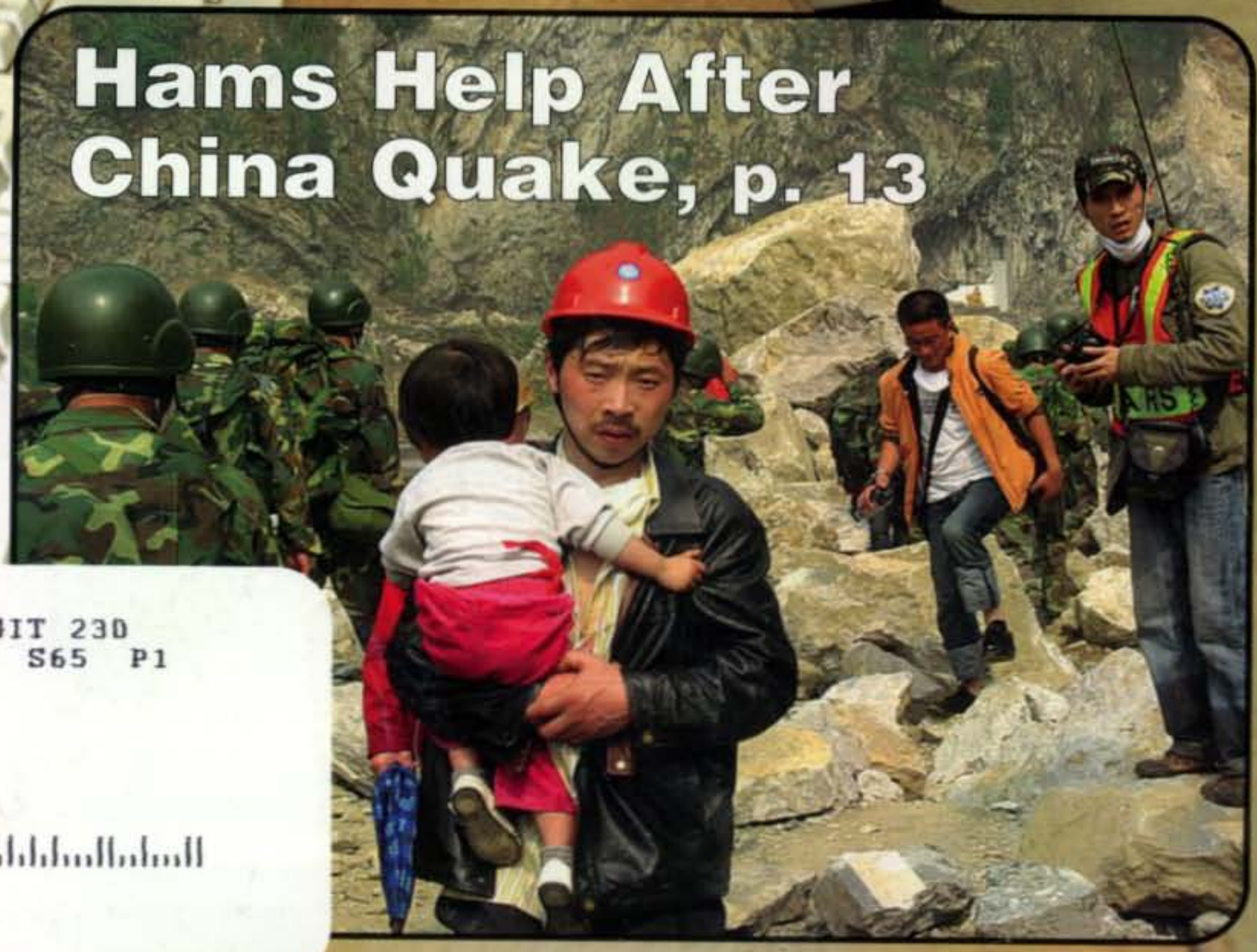
AUGUST 2008

CQ

## SSB Results, 2007 CQ WW DX Contest, p. 20

## What's New at Dayton, p. 30

## Hams Help After China Quake, p. 13



On the Cover:
Frank Donovan, W3LPL, at his contest superstation in Glenwood, Maryland.
Details on page 88.

KENWOOD

Listen to the Future

# New Ver. 2.0 Firmware

| | |
|---|---|
| SmartBeaconing™ (new) | TM-D710A/RC-D710 |
| Simultaneous use on EchoLink® and APRS® | TM-D710A |
| Programmable APRS® Function for MIC PF Key | TM-D710A |
| Improved Auto Brightness (now 2 levels up) | TM-V71A/TM-D710A/RC-D710 |
| Improved APRS® Direction Icon Visibility | TM-D710A/RC-D710 |
| MIC Sensitivity (Low/Mid/High) Selection | TM-V71A/TM-D710 |

SmartBeaconing™ from HamHUD Nichetronix • Echolink® is a registered trademark of Synergenics, LLC • APRS® is a registered trademark of APRS® Engineering LLC

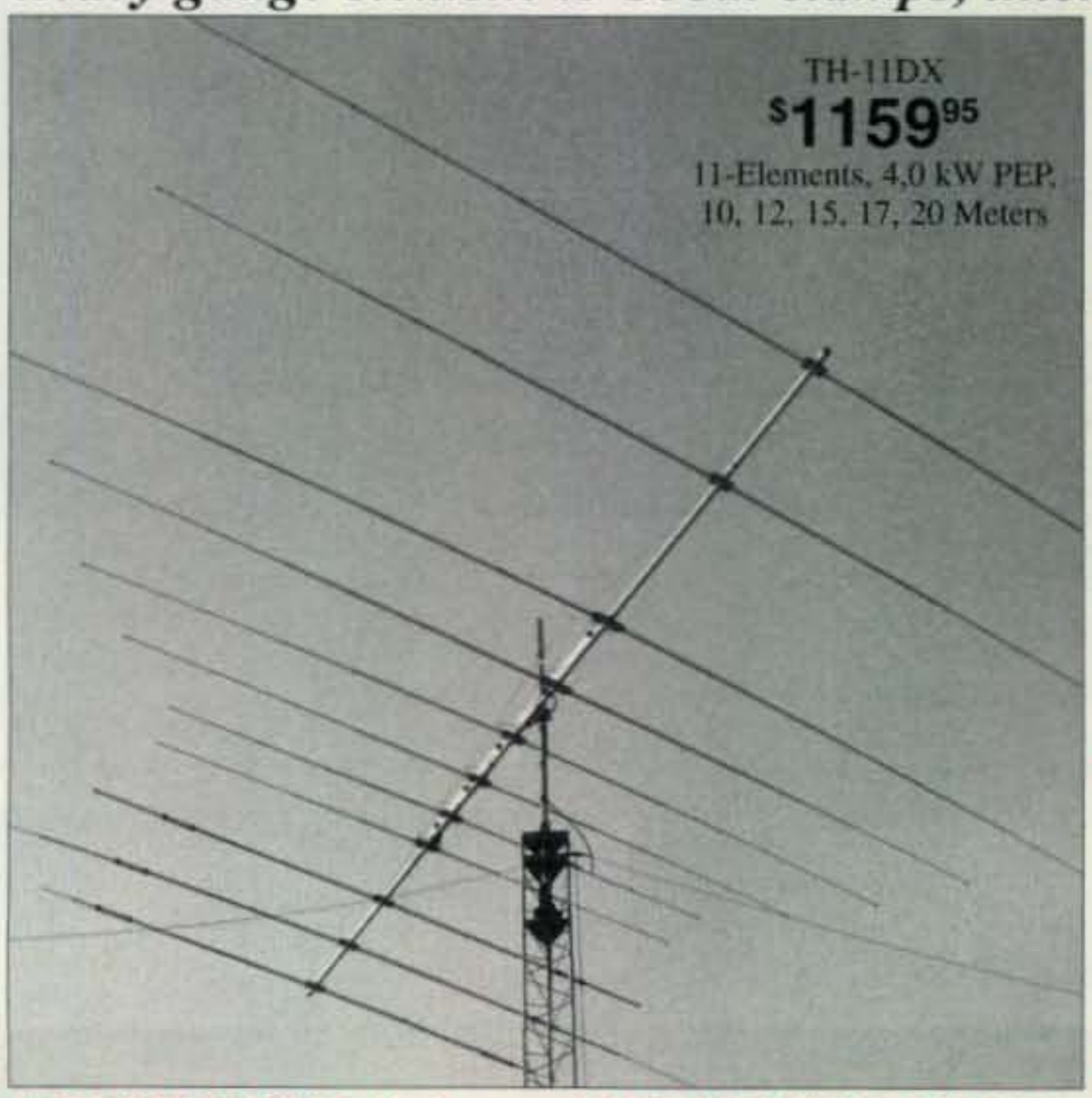

KENWOOD U.S.A. CORPORATION
Communications Sector Headquarters
3970 Johns Creek Court, Suite 100, Suwanee, GA 30024
Customer Support/Distribution
P.O. Box 22745, 2201 East Dominguez St., Long Beach, CA 90801-5745
Customer Support: (310) 639-4200 Fax: (310) 537-8235

www.kenwoodusa.com
ADS#23908

JQA-1205 091-A
ISO9001 Registered

# hy-gain® HF BEAMS...

***. . . are stronger, lighter, have less wind surface and last years longer.***
***Why? Hy-Gain uses durable tooled components -- massive boom-to-mast bracket, heavy gauge element-to-boom clamps, thick-wall swaged tubing -- virtually no failures!***




### *TH-11DX, $1159.95. 11-element, 4.0 kW PEP, 10,12,15,17,20M*

**The** choice of top DXers.

**With** 11-elements, excellent gain and 5-bands, the super rugged TH-11DX is *the "Big Daddy" of all HF beams!*

**Handles** 2000 Watts continuous, 4000 Watts PEP.

**Every** part is selected for durability and ruggedness for years of trouble-free service.

**Features** a low loss log-periodic driven array on all bands with monoband reflectors, BN-4000 high power balun, corrosion resistant wire boom support, hot dipped galvanized and stainless steel parts.

**Stainless** steel hardware and clamps are used on all electrical connections.

### *TH-7DX, $869.95. 7-element, 1.5 kW PEP, 10,15,20 Meters*

**7-Elements** gives you the *highest average gain* of any Hy-Gain tri-bander!

**Dual** driven for broadband operation without compromising gain. SWR less than 2:1 on *all* bands.

**Uniquely** combining monoband and trapped parasitic elements give you an excellent F/B ratio.

**Includes** *Hy-Gain's* diecast aluminum, rugged boom-to-mast clamp, heavy gauge element-to-boom brackets, BN-86 balun. For high power, upgrade to BN-4000.

### *TH-5MK2, $759.95. 5-element, 1.5 kW PEP, 10,15,20 Meters*

**The** broadband *five element* TH5-MK2 gives you outstanding gain.

**Separate** air dielectric *Hy-Q* traps let you adjust for maximum F/B ratio on each band.

**Also** standard is *Hy-Gain's* exclusive *BetaMATCH™*, stainless steel hardware and compression clamps and BN-86 balun.

### *TH-3MK4, $469.95. 3-element, 1.5 kW PEP, 10,15,20 Meters*

**The** super popular TH-3MK4 gives you the *most gain for your money* in a full-power, full-size durable Hy-Gain tri-bander!

**You** get an impressive average gain and a whopping average front-to-back ratio. Handles a full 1500 Watts PEP. 95 MPH wind survival.

**Fits** on average size lot with room to spare -- turning radius is just 15.3 feet. Four piece boom is ideal for DXpeditions. Rotates with CD-45II or HAM-IV rotator.

**Features** *Hy-Gain BetaMatch™* for DC ground, full power *Hy-Q™* traps, rugged boom-to-mast bracket and mounts on standard 2"O.D. mast. Stainless steel hardware. BN-86 balun recommended.

### *TH-2MK3, $369.95. 2-element, 1.5 kW PEP, 10,15,20 Meters*

**The** 2-element TH-2MK3 is Hy-Gain's *most economical* full power (1.5kW PEP) full size tri-bander.

**For** just $339.95 you can greatly increase your effective radiated power and hear far better!

**Ruggedly** constructed, top-performing, compact 6 foot boom, tight 14.3 foot turning radius. Installs almost anywhere. Rotate with CD-45II or HAM-IV. BN-86 balun recommened.

### *EXP-14, $599.95. 4-element, 1.5 kW PEP, 10,15,20 Meters*

**Revolutionary** 4-element compact tri-bander *lets you add 40 or 30 Meters!* Has 14 foot boom and tight 17.25 feet turning radius. Fits on roof tri-pod, mast or medium duty tower.

**Hy-Gain's** *patented* broadbanding *Para Sleeve* gives you less than 2:1 VSWR. 1.5kW PEP.

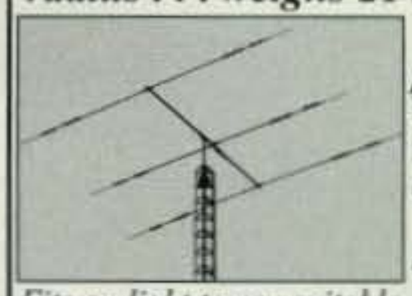
***BetaMATCH™*** provides DC ground to eliminate static. Includes BN-86 balun. Easily assembled.

***Truly** competitive against giant tri-banders at half the cost!*

**QK-710, $179.95.** 30/40 Meter option kit for EXP-14.

### *Compact 3-element 10, 15, 20 Meter Tri-Bander*

***For limited space . . . Installs anywhere . . . 14.75 ft turning radius . . . weighs 21 lbs . . . Rotate with CD-45II, HAM-IV***



*Fits on light tower, suitable guyed TV pole, roof tri-pod*

***TH-3JRS, $359.95.*** Hy-Gain's *most popular* 3-element 10, 15, 20 Meter tri-bander fits on most lots! Same top performance as the full power TH3MK4 in a compact 600 watt PEP design.

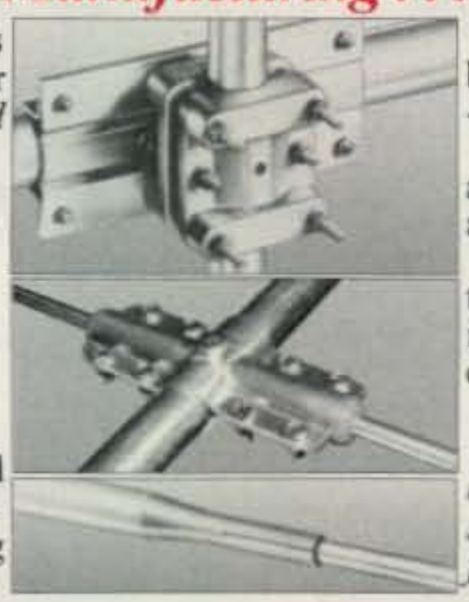
**Excellent** gain and F/B ratio let *you* compete with the "big guns".

**Tooled** manufacturing gives you *Hy-Gain* durability with 80 MPH wind survival.

| Model No. | No. of elements | avg gain dBd | avg F/B dB | MaxPwr watts PEP | Bands Covered | Wind sq.ft. area | Wind (mph) Survival | boom feet | Longest Elem. (ft) | Turning radius(ft) | Weight (lbs.) | Mast dia O.D.(in.) | Recom. Rotator | Sugg. Retail |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH-11DX | 11 | *For Gain and F/B ratio--See...* • www.hy-gain.com • Hy-Gain catalog • Call toll-free 800-973-6572 | | 4000 | 10,12,15,17,20 | 12.5 | 100 | 24 | 37 | 22 | 88 | 1.9-2.5 | T2X | $1159.95 |
| **TH-7DX** | **7** | | | **1500** | **10, 15, 20** | **9.4** | **100** | **24** | **31** | **20** | **75** | **1.5-2.5** | **HAM-IV** | **$869.95** |
| TH-5MK2 | 5 | | | 1500 | 10, 15, 20 | 7.4 | 100 | 19 | 31.5 | 18.42 | 57 | 1.5-2.5 | HAM-IV | $759.95 |
| **TH-3MK4** | **3** | | | **1500** | **10, 15, 20** | **4.6** | **95** | **14** | **27.42** | **15.33** | **35** | **1.9-2.5** | **CD-45II** | **$469.95** |
| TH-3JRS | 3 | | | 600 | 10, 15, 20 | 3.35 | 80 | 12 | 27.25 | 14.75 | 21 | 1.25-2.0 | CD-45II | $359.95 |
| **TH-2MK3** | **2** | | | **1500** | **10, 15, 20** | **3.25** | **80** | **6** | **27.3** | **14.25** | **20** | **1.9-2.5** | **CD-45II** | **$369.95** |
| EXP-14 | 4 | | | 1500 | 10,15,20 (20m 30/40) | 7.5 | 100 | 14 | 31.5 | 17.25 | 45 | 1.9-2.5 | HAM IV | $599.95 |

## *Tooled Manufacturing . . . Highest Quality Materials*

1. **Hy-Gain's** famous super strong *tooled* die cast *Boom-to-Mast Clamp*
2. ***Tooled** Boom-to-Element Clamp*
3. **Thick-wall** *swaged* aluminum tubing



***Tooled** manufacturing* is the difference between Hy-Gain antennas and the others -- they just don't have it (it's expensive!).

**Die-cast** aluminum boom-to-mast bracket and element-to-boom compression clamps are made with specially *tooled* machinery.

**Hy-Gain** antennas feature *tooled* swaged tubing that is easily and securedly clamped in place. All tubing is deburred and cleaned for smooth and easy assembly.

**Durable** precision injection molded parts.

***Hy-Gain** antennas are stronger, lighter, have less wind surface area, better wind survival, need no adjustments, look professional and last years longer.*

**Free Hy-Gain Catalog**
***and Nearest Dealer . . . 800-973-6572***
***Call your dealer for your best price!***

hy-gain®


***Antennas, Rotators & Towers***
308 Industrial Park Road, Starkville, MS 39759 USA
**Toll-free Customer Sales Hotline: 800-973-6572**
• **TECH:** 662-323-9538 • **FAX:** 662-323-6551
***http://www.hy-gain.com***

# CQ contents

AUGUST 2008

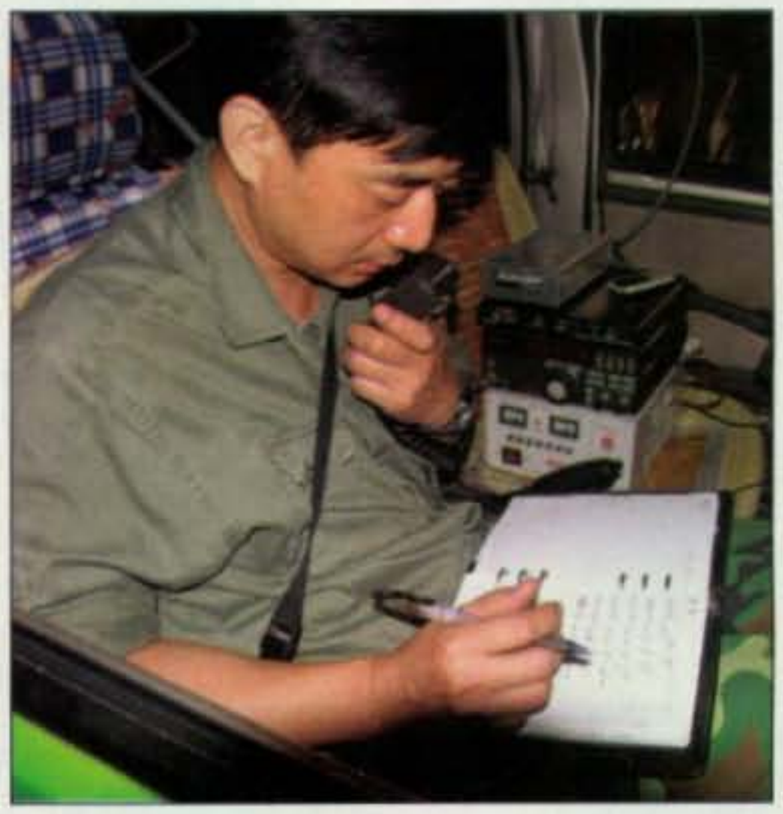

p. 30

p. 54

## features

Vol. 64 No. 8





p. 13

p. 62

## departments

# Alinco gives you Mobiles for all Seasons and for all Reasons!

## Work the DX on 6 and 10 Meter FM

- **DR-03T** (pictured) 10 meters
- **DR-06T** 6 meters

- Same key-operations as DR-135-435 series mobile radios.
- EJ-41U internal TNC board is available as an option for 1200/9600bps packet (DR-06T only), no need to remove mic for packet operation.
- DR-03T 10 watts, H(10W)/M(5W)/L(2W) power settings.
- DR-06T 50 watts, H(50W)/M(20W)/L(5W) power settings.
- 100 memory channels
- Front panel data port
- Rear panel DSUB9 computer connection (DR-06T only)
- CTCSS, DCS encode+decode, DTMF encode and Tone-burst are all standards
- Clean, clear Alinco audio
- Super-wide 7 character alphanumeric display
- Wide and narrow FM modes (16K0 & 8K50F3E / DR-03T is fixed for NFM)
- Theft alarm feature
- A large, palm-fitting commercial-grade backlit microphone with an 8 pin metal connector (not a modular plug) as well as direct frequency input and direct multi-function access such as monitor, call channel, power setting,memory to VFO plus more!
- Stays in mode you select (voice/packet) through power off cycles
- Ten autodial memories

## Work simplex and the VHF and UHF Repeaters

- **144 MHz DR-135TMkIII** 50 watts, H/M/L power settings
- **220 MHZ DR-235TMkIII** (pictured) 25 watts, H/M/L power settings
- **440 MHZ DR-435TMKIII** 35 watts, H/M/L power settings

- EJ-41U internal TNC board is available as an option for 1200/9600bps packet
- 100 memory channels
- Front panel data port
- Rear panel DSUB9 computer connection
- No need to remove mic for packet operation
- Ignition key on/off feature
- CTCSS, DCS encode+decode, DTMF encode and Tone-burst are all standards
- Clean, clear Alinco audio
- Super-wide 7 character alphanumeric display
- Wide and narrow FM modes (16K0 & 8K50F3E)
- Theft alarm feature
- A large, palm-fitting commercial-grade backlit microphone with an 8 pin metal connector (not a modular plug) as well as direct frequency input and direct multi-function access such as monitor, call channel, power setting, memory to VFO plus more!
- Stays in mode you select (voice/packet) through power off cycles
- Ten autodial memories

## Dual Band fun and versatility

- **DR-635T** 144 MHz/440MHz

- VHF/UHF full duplex operation includes V/U and U/V modes.
- Cross-band repeater function (where permitted: standard on DR-635T)
- 200 Memory channels
- H/M/L power output settings- VHF: 50/25/5W UHF: 35/20/5W
- Large 6 character alphanumeric display
- Selectable display color illumination (Blue, Violet or amber)
- Internal duplexer - single antenna connector
- Removable control head can be remotely mounted (requires optional EDS-9 separation kit) or allow transceiver to be inverted for optimal speaker placement.
- Expanded receive range includes FM broadcast band (WFM)
- Power supply voltage display
- Theft alarm feature
- Optional 1200 and 9600 bps packet operation with optional EJ-50U
- Digital voice communications with optional EJ-47U
- Illuminated DTMF EMS-57 microphone allows direct VFO frequency entry and remote control of transceiver
- CTCSS & DCS encode and decode plus four different tone bursts
- CTCSS Tone and DCS scan
- Programmable VFO and Memory scan modes
- "Time Out" timer
- Cable Clone feature
- AM Aircraft band reception
- Temperature Compensated Crystal Oscillator
- Ignition key activated power on/off feature
- Optional Accessories
  - EJ-47U digital modulation unit
  - EJ-50U TNC unit
  - EDS-9 Front-control unit separation kit



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**ALINCO**
www.alinco.com

## Kenwood/JVC Merger Planned by October

The managements of both JVC (Victor Corporation of Japan) and Kenwood released details in early June of their proposed merger, which the companies are calling "management integration." Pending approval by shareholders of both companies at a joint meeting scheduled for June 27, the plan is to delist JVC from the Osaka Securities Exchange by the end of July and to remove both JVC and Kenwood from the Tokyo Stock Exchange by the end of September. Then, as of October 1, a new company, JVC Kenwood Holdings, would be formed. It would own 100% of the shares of each company, and the two would then be merged into a single entity called J&K Technologies.

In an earlier statement, Kenwood said the merger would have no impact on its amateur radio business. However, the joint statement in June said the merged companies' focus would be on auto electronics, home and mobile electronics, professional systems, and entertainment. There was little mention of the communications segment (amateur and land mobile) except to note that it currently accounts for about 35% of Kenwood's business. The merged company, on the other hand, expects the four areas mentioned above to account for 90% of its sales by fiscal year 2011. This is the second merger of a major amateur radio manufacturer in the past year, following Motorola's acquisition of Yaesu's parent company, Vertex-Standard, last year.

## Uncertainty over California Hands-Free Law

California's new hands-free cellphone law took effect July 1, and its impact on amateur radio is still unclear. ARRL General Counsel Chris Imlay, W3KD, said in an ARRL bulletin that "a fair reading of the statute excludes mobile operation of Amateur Radio equipment" because it is not a "wireless telephone" as described by the new law. In addition, *Newsline* quotes a spokesperson for the California Highway Patrol as saying that the new laws "do not concern radios such as your Amateur Radios, unless they are also wireless telephones." However, Imlay noted that there are no guarantees about how broadly the statute will be interpreted, and the League bulletin noted that hams may "have to go through the inconvenience of appearing in court to contest a citation." There is additional concern among some California hams because a Frequently Asked Questions (FAQ) page on the state motor vehicles website originally appeared to exclude amateur radio from the provisions of the new law; and they note that a new version of the FAQ page has omitted both the question and the answer about ham rigs.

## Russia Launches New Ham Satellite

A new amateur radio satellite, RS-30, has been launched by the Russian Federal Space Agency to commemorate the 50th anniversary of the 1957 launch of the first manmade satellite, Sputnik-1. According to the AMSAT News Service (ANS), RS-30 is a downlink-only satellite, sending telemetry, an image, and beeps reminiscent of Sputnik's in a four-minute cycle. It is transmitting on 435.315 MHz.

In other amateur satellite news, ANS reports that China plans to launch a new ham "bird" early next year. The satellite, currently called CAS-1, is expected to include a CW telemetry beacon, a linear transponder, an FM repeater, and a digital store-and-forward transponder. It will have a 2-meter uplink and 70-centimeter downlink. In addition, ANS says the European Space Agency has offered a free launch later this year or early next year for nine student-built "cubesats" from universities across Europe. One from Belgium is planning to use D-Star digital transmissions.

## Motorola Funds School Radio Clubs in Malaysia

Motorola, Inc., now the corporate parent of Yaesu, has announced that its Malaysian subsidiary is working the Malaysian Amateur Radio Transmitters' Society (MARTS) to establish amateur radio clubs in up to 40 secondary schools around the country. According to a news release, each club will receive a base station and three handhelds, as well as "infrastructure and engineering support, training of teacher advisors, and [assistance] in license acquisition." Motorola's Managing Director in the region said the program is intended "to promote the excitement of communications technology to students at a young age and stimulate an interest for electronics and technology, particularly in the subject of engineering."

## Hams in New York Break Balloon Record

A group of "early career engineers" at Lockheed-Martin who are also pursuing graduate degrees at Cornell University have set a new altitude record for amateur high-altitude balloons with a flight on May 20 that soared to 125,000 feet before beginning its descent. According to Lockheed Martin, "onboard GPS and amateur radio technology allow monitoring of the balloon's launch, ascent into 'near space,' descent and recovery." The launch, from Owego, New York, is part of a collaborative effort between Lockheed and Cornell called Project Blue Horizon. This was its seventh launch since last year. Future goals, according to Lockheed, include transatlantic flights, multi-balloon missions and the release of unmanned vehicles from near-space altitudes.

## CW Returns to MARS

The Military Affiliate Radio System (MARS) is bringing back Morse code, which had been banned on MARS frequencies by Defense Department directive since 1997. *CQ* Public Service Editor Bob Josuweit, WA3PZO, reports that the Chief of Navy/Marine Corps MARS in late May authorized area and region directors to establish CW traffic and training nets. Army MARS is surveying members as to their code proficiency and one Army MARS region has been conducting CW nets in anticipation of a unified policy on code operations by all three MARS services.

## ARRL Opposes Two Petitions Based on Interference *From* Hams

The ARRL has filed comments in opposition to two very different petitions before the FCC based on the potential that hams operating on the same frequencies may cause unacceptable interference to the devices in question. One petition seeks FCC approval to operate robotic reconnaissance devices in the 430–448 MHz band, on which hams have a secondary allocation and a widespread repeater network; the other is proposing the use of 2360–2400 MHz for "body sensor networks," which, according to the *ARRL Letter*, appear to be devices intended for short-range transmission of medical data from multiple sensors to nearby hub stations in homes and medical facilities. Amateur radio has a primary allocation at 2390–2400 MHz.

The League's concern in both cases is that amateurs may unwittingly cause interference *to* these devices, perhaps compromising law-enforcement activities with the robots or blocking the accurate transmission of vital medical information. Both comments call on the FCC to direct the manufacturers involved to find different frequencies that will not be subject to interference from amateur operations.

*Additional and updated news is available on the Ham Radio News page of the CQ website at <http://www.cq-amateur-radio.com>. For breaking news stories, plus info on additional items of interest, sign up for CQ's free online newsletter service. Just click on "CQ Newsletter" on the home page of our website.*

# TOKYO HY-POWER

## HL-2.5K$_{FX}$

**Available Now with 12m & 10m Built-In**

### *NEWEST and MOST POWERFUL Full Legal Limit HF Linear Amplifier!*

The HL-2.5K$_{FX}$ is the lightest and most compact self-contained 1.5kW output HF linear amplifier in its class. The amplifier's decoder changes bands automatically with most modern ICOM, Kenwood, and Yaesu HF transceivers. It also has a built-in AC power supply – selectable for 220/230/240/250 VAC input, 3kVA max, and a multifunctional LCD display for instant readout of operating parameters. The HL-2.5K$_{FX}$ is equipped with a control cable connection socket for the HC-1.5KAT automatic antenna tuner by Tokyo Hy-Power Labs for seamless auto tuning operation.

### Specifications
#### SOLID STATE

**Freq Band:**
1.8 – 28 MHz,
all HF amateur bands

**Operation Mode:**
SSB, CW, RTTY

**Exciting Power (RF Drive):**
100W max. (85W, typical)

**Output Power (RF Out):**
1.5kW min., SSB/CW
(1.2kW on 28 MHz)
1kW, RTTY
(5 minutes key down)

**Auto Band Set:**
With most modern
ICOM, Kenwood,
Yaesu HF Transceivers

**Antenna Tuner:**
Compatible with external
Tokyo Hy-Power HC-1.5KAT

**RF Power Transistors:**
ARF 1500 by Microsemi x 2

**Antenna Relay:**
QSK (Full Break-in compatible)

**Power Supply:**
Built-in 220/230/240/250VAC,
3kVA max.

**Dimensions and Weight:**
12.8 x 5.7 x 15.9 inches
(WxHxD),
Approx. 57.3 lbs.

**Another Fine NEW PRODUCT from TOKYO HY-POWER**

## HL-450B

***New High Power for your Mobile, Portable, RV and more!***

### *USER-FRIENDLY, FULLY AUTOMATIC, and REMOTABLE* HF Linear Amplifier!*

The HL-450B is the most user-friendly 400W output (max.) HF linear amplifier available, with fully automatic band switching when used with most amateur SSB/CW HF transceivers. Features include: auto or manual band switching, adjustable ALC level, analog RF power output meter, and extensive, and fast-acting, protection circuits for high SWR, over-current, and over-voltage. Operates from 13.8VDC, 60A, max. The HL-450B is equipped with a control cable connection socket for the optional External Remote Controller HRC-60. With the HRC-60, the HL-450B becomes a fully remotable linear. Perfect for fixed-station, mobile, RV, marine, and portable applications.

### Specifications
#### SOLID STATE

**Freq. Band:**
3.5 – 28 MHz
HF Amateur Bands

**Operation Mode:**
SSB, CW, FM

**Exciting Power (RF Drive):**
50W

**Output Power (RF Out):**
400W max., SSB (PEP)/CW
350W typical, 300W minimum

**Band Select (or Switch):**
RF-Sensed Auto Band Select
or Manual Select

**RF Power Transistors:**
THP – 120 x 4

**Power Supply:**
13.8VDC, 60A. max.

**Dimensions and Weight:**
8.7 x 3.5 x 13 inches
(WxHxD)
Approx. 11lbs.

**Optional Accessories**

***HP-450***
Light-weight
13.8VDC, 60A.
Switching Power
Supply

***HRC-60***
External
Remote
Controller

**When used with optional HRC-60 External Remote Controller.*

***The HL-2.5K$_{FX}$ and HL-450B are fully FCC certified, and comply with the New FCC Rules***


**TOKYO HY-POWER**

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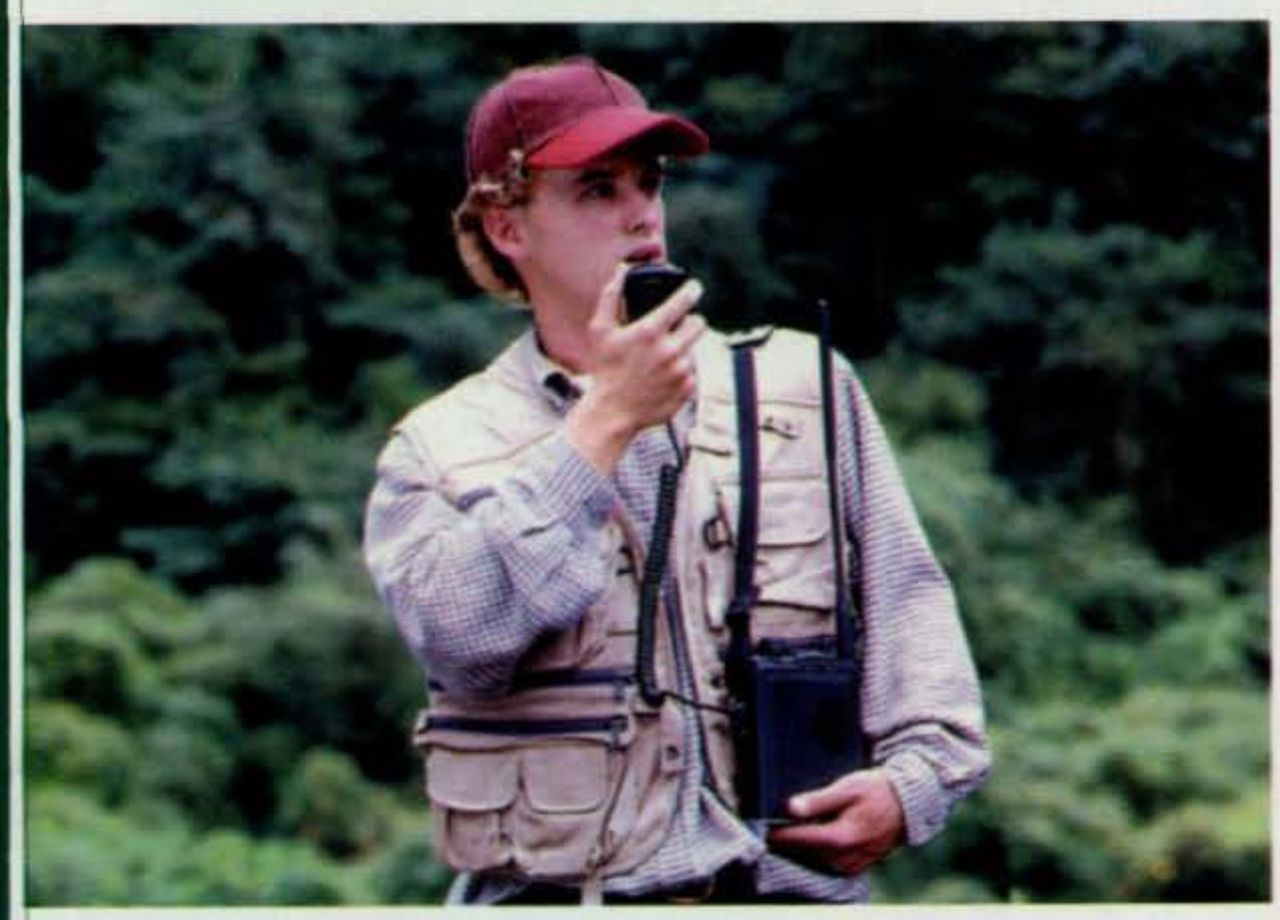
# Yaesu - The Choice of the World's Top DXers ....on the VHF and UHF bands, too



**HF/VHF/UHF Portable Operation Just Got a Lot More Powerful!**

**FT-897D** TCXO DSP 60 m Band

HF/50/144/430 MHz
100 W All Mode Transceiver
(144 MHz 50 W/430 MHz 20 W)

**HF/VHF/UHF Multimode Mobile Transceiver, now Including Built-in DSP**

**FT-857D** DSP 60 m Band

HF/50/144/430 MHz
100 W All Mode Transceiver
(144 MHz 50 W/430 MHz 20 W)

**Automatic Matching for FT-897/857 Series Transceivers**

**FC-40**
Automatic-Matching 200-Memory Antenna Tuner
(160 m ~ 6 m Band)

WATERPROOF

**Mobile Auto-Resonating 7~430 MHz for FT-897/857 Series Transceivers**

**ATAS-120A**
Active Tuning Antenna System
(no separate tuner required)

VHF/UHF Base RadialKit ATBK-100 for ATAS-120A.

**REAL PERFORMANCE, REALLY PORTABLE**

**FT-817ND**
HF/50/144/430 MHz
5 W All Mode Transceiver
(AM 1.5 W)

60 m Band

**ATAS-25**
**Manually-Tuned Portable Antenna**

YAESU
*Choice of the World's top DX'ers℠*

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**For the latest Yaesu news, visit us on the Internet: http://www.yaesu.com**

# Introducing the Yaesu FT-950 transceiver for DX enthusiasts
# Superb receiver performance
# Direct lineage from the legendary FT DX 9000 and FT-2000


## HF/50 MHz 100 W Transceiver
## FT-950

- Triple-conversion super-heterodyne receiver architecture, using 69.450 MHz 1st IF
- Eight narrow, band-pass filters in the RF stage eliminate out of band interference and protect the powerful 1st IF
- 1st IF 3 kHz Roofing filter included
- High-speed Direct Digital Synthesizer (DDS) and high-spec Digital PLL for outstanding Local Oscillator performance
- Original YAESU IF DSP advanced design, provides comfortable and effective reception. IF SHIFT / IF WIDTH / CONTOUR / NOTCH / DNR
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- Optional RF µ -Tune Units for 160 m, 80/40 m and 30/20 m Bands

Optional External Data Management Unit (DMU-2000) Provides Many Display Capabilities

Shown with after-market keyer paddle, keyboard, and monitor (not supplied)

## COMPACT HF/50 MHz TRANSCEIVER WITH IF DSP


**A superb, compact HF/50 MHz radio with state-of-the-art IF DSP technology configured to provide YAESU World-Class Performance in an easy to operate package.**
**New licensees, casual operators, DX chasers, contesters, portable/field enthusiasts, and emergency service providers - *YAESU FT-450...This Radio is for YOU!***

**HF/50 MHz 100 W All Mode Transceiver**

**FT-450** Automatic Antenna Tuner ATU-450 optional
**FT-450AT** With Built-in ATU-450 Automatic Antenna Tuner

Compact size : 9" X 3.3" x 8.5" and Light weight : 7.9 lb

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zero bias — a CQ editorial

BY RICH MOSESON,* W2VU

# Half Empty or Half Full Redux

Back in June, I wrote an editorial titled "Half Empty or Half Full?" which discussed our reader survey results that month about multi-ham families. I was a little unhappy that the survey showed that two out of three *CQ* readers were the only hams in their families. On the other hand, our publisher, K2MGA, thought it was great that one of every three *CQ* readers came from a multi-ham family. Dick's logic eventually won out and he converted me from "half empty" to "half full" on the matter. I'm bringing that back up because just a few weeks later, I had another "half-empty/half-full" experience that kind of fits right in with June's discussion.

At the end of May, en route to the Rochester Hamfest, I stopped off at Syracuse University, where my son, Dan (KC2OOM), had an appointment. I noticed what looked like a ham satellite antenna on the roof of the engineering building and figured that while Dan was in his meeting, I would go look for a ham radio club. The half-empty part of the story is that apparently, the ham club at Syracuse is inactive, and those antennas aren't connected to anything. But the process of finding that out provided the half-full portion of the story. The university's visitor center and information office was in the same building as Dan's appointment, so I figured I'd start there. As the very nice lady in the office started searching for a ham club on her computer (even though she said she didn't think there was one), one of the people who works in the office sat down in the reception area with his lunch and, listening to our conversation, said, "My brother's a ham." At that point, the lady doing my search looked over at him and said, "Really? My son is a ham, too." And he's in high school, by the way.

One question our survey didn't (and couldn't) ask was what percentage of the non-ham public is related to at least one ham. There may be "only" 650,000 of us out there, but virtually all of us have relatives who know that we're hams and have some idea of what ham radio is about. Let's say that, on average, each of us has four relatives with at least a passing understanding of amateur radio. That 2.6 million people. Add the 650,000 licensed hams in the U.S., and that's a group of more than 3 million people with at least a basic understanding of who we are and what we do. And that doesn't include friends, neighbors, and co-workers who know that we're hams. If you add them in, you've probably got more than 10 million people in this country who know a ham and (hopefully) think ham radio is a good thing. And the fact that we are spread across all parts of society (see last month's "Zero Bias") helps even more.

## Don't be a "Justa"

Speaking of there being "only" 650,000 licensed hams in the United States, I made time at the Rochester Hamfest to attend a forum on mentoring—one of my favorite soapbox topics–presented by ARRL Membership Manager Katie Breen, W1KRB. Katie has three characteristics that are *not* widely shared among her colleagues on the ARRL staff who normally attend hamfests and present the "public face" of the League. She is: (1) young, (2) female, and (3) a relatively new ham. This is a powerful combination, since we're trying to attract new people to the hobby who are (1) young, (2) female as well as male, and (3) (obviously) not already experienced hams; and her job is to try to find those people and bring them first into ham radio and second into ARRL membership.

One of Katie's major points in her forum is that you don't need to be a veteran ham to help mentor others. She used her own experiences at ARRL Headquarters as an example. As a new ham with a minimal station at home, she was looking for operating help from experienced hams and operating time at a better-equipped station. W1AW isn't generally a good place to learn, because of a tight bulletin and code-practice schedule and visitors wanting to operate the world's most famous ham station. But little-known to the outside world is W1HQ, the ARRL staff radio club, with its own station hidden away in the recesses of 225 Main St. Apparently, that wasn't too good a place to learn, either, because is was set up for single-person operation, was kind of dingy and not-too-well equipped, and, well, nobody really used it much.

Katie was one of two League staffers who spearheaded an effort to spruce up the station and get it active again. Part of that effort was to get other staffers who were licensed but not active to help others *get* licensed and *get* active. She said several people she approached were hesitant, saying, "I can't do that; I'm just a Technician," or "I'm just a new ham myself." Her response, to them and to us in the audience: "Don't be a *justa*." Don't put yourself down and don't minimize your ability to help others, she said. Even if you're still new at something, helping someone else get up to speed can increase your own skills and confidence. The result at W1HQ was a refurbished station and a newly active staff radio club. (For more on the revitalization of W1HQ, see <http://www.arrl.org/news/stories/2008/02/13/101/?nc=1>).

There are several lessons here that should be taken to heart by radio clubs, especially those having trouble getting people to come out to meetings and activities: (1) *Any* radio club can go through a slow period. If the ARRL's staff radio club can become nearly inactive and then recover, so can yours. (2) All it takes is one "spark-plug" to get things moving again. It doesn't have to be (and maybe shouldn't be) a club elder or a superham. If you've got someone with interest and enthusiasm who's willing to take on the challenge, hand him or her the ball, but be sure to provide backup in terms of support and resources to succeed. (3) There should be no "justas" in your club. Everyone should be encouraged to make the most of his/her abilities and to help others, regardless of whether that person is "justa" new ham or "justa" Technician. (4) A club station can be a focal point for building up club activity, so if you have the facilities available, do your best to make it available to members whenever possible. (5) Success builds on itself. When people start hearing that your club is active and vital, more of them will start coming out to meetings and activities. At the same time, club leaders need to make sure there are interesting speakers and activities to hold the interest of these new and returning members. So if your club is struggling, try to find a Katie out there, provide support and resources, and let him/her loose on your local ham community.

## YHOTY

A funny thing happened on the way to the nominating deadline for this year's Newsline Young Ham of the Year award (*CQ* is a co-sponsor and I am a member of the judging committee). Two weeks before the May 30 deadline, we had no nominations. None. Zero. Worried, award coordinator Bill Pasternak, WA6ITF, e-mailed everyone he could think of with reminders about the upcoming deadline. Well, whatever he did, it worked. By the time the deadline arrived, we had nearly 30 nominations in hand, most likely a record. As I write this, the judging is still going on, so I have no idea who will win. But having read all 30 of those nominations, I can say with confidence that the future of our hobby is in good hands. We've got some great kids out there, doing great things, and it's important that they and their efforts be recognized, even if they're "justa" bunch of kids! Perhaps *because* "justa" bunch of kids! Congratulations to all the nominees. Each one of you is a winner, and the glass is definitely half full. Maybe even more than half.

73, W2VU

*e-mail: <w2vu@cq-amateur-radio.com>

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| *HAM IV and HAM V Rotator Specifications* | |
|---|---|
| Wind Load capacity (inside tower) | 15 square feet |
| **Wind Load (w/mast adapter)** | **7.5 square feet** |
| Turning Power | 800 in.-lbs. |
| **Brake Power** | **5000 in.-lbs.** |
| Brake Construction | Electric Wedge |
| **Bearing Assembly** | **dual race/96 ball bearings** |
| Mounting Hardware | Clamp plate/steel U-bolts |
| **Control Cable Conductors** | **8** |
| Shipping Weight | 26 lbs. |
| **Effective Moment (in tower)** | **2800 ft.-lbs.** |

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| *TAILTWISTER Rotator Specifications* | |
|---|---|
| Wind load capacity (inside tower) | 20 square feet |
| **Wind Load (w/ mast adapter)** | **10 square feet** |
| Turning Power | 1000 in.-lbs. |
| **Brake Power** | **9000** in.-lbs. |
| Brake Construction | Electric Wedge |
| **Bearing Assembly** | **Triple race/138 ball brngs** |
| Mounting Hardware | Clamp plate/steel U-bolts |
| **Control Cable Conductors** | **8** |
| Shipping Weight | 31 lbs. |
| **Effective Moment (in tower)** | **3400 ft.-lbs.** |

### CD-45II

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| *CD-45II Rotator Specifications* | |
|---|---|
| Wind load capacity (inside tower) | 8.5 square feet |
| **Wind Load (w/ mast adapter)** | **5.0 square feet** |
| Turning Power | 600 in.-lbs. |
| **Brake Power** | **800 in.-lbs.** |
| Brake Construction | Disc Brake |
| **Bearing Assembly** | **Dual race/48 ball brings** |
| Mounting Hardware | Clamp plate/steel U-bolts |
| **Control Cable Conductors** | **8** |
| Shipping Weight | 22 lbs. |
| **Effective Moment (in tower)** | **1200 ft.-lbs.** |

### HAM-V

HAM-V
**$1049.95**
with DCU-1

**For** medium antenna arrays up to 15 square feet wind load area. Similar to the HAM IV, but includes *DCU-1 Pathfinder* digital control unit with gas plasma display. Provides automatic operation of brake and rotor, compatible with many logging/contest programs, 6 presets for beam headings, 1 degree accuracy, auto 8-second brake delay, 360 degree choice for center location, *more!*

### ROTATOR OPTIONS

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**TSP-1, $34.95**. Lower spacer plate for HAM-IV and HAM-V.

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**For** compact antenna arrays and large FM/TV up to 3.0 square feet wind load area. Dual 12 ball bearing race. Automatic position sensor never needs resetting. Fully automatic control -- just dial and touch for any desired location. Solid state, low voltage control, safe and silent operation. 2 1/16 inch maximum mast size. MSLD light duty lower mast support included.

| *AR-40 Rotator Specifications* | |
|---|---|
| Wind load capacity (inside tower) | 3.0 square feet |
| **Wind Load (w/ mast adapter)** | **1.5 square feet** |
| Turning Power | 350 in.-lbs. |
| **Brake Power** | **450 in.-lbs.** |
| Brake Construction | Disc Brake |
| **Bearing Assembly** | **Dual race/12 ball bearings** |
| Mounting Hardware | Clamp plate/steel bolts |
| **Control Cable Conductors** | **5** |
| Shipping Weight | 14 lbs. |
| **Effective Moment (in tower)** | **300 ft.-lbs.** |

### HDR-300A

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For ***king-sized*** antenna arrays up to 25 sq.ft. wind load area. Control cable connector, *new* hardened stainless steel output shaft, *new* North or South centered calibration, *new* ferrite beads on potentiometer wires reduce RF susceptibility, *new* longer output shaft keyway adds reliability. Heavy-duty self-centering steel clamp and hardware. Display accurate to 1°. Machined steel output.

| *HDR-300A Rotator Specifications* | |
|---|---|
| Wind load capacity (inside tower) | 25 square feet |
| **Wind Load (w/ mast adapter)** | **not applicable** |
| Turning Power | 5000 in.-lbs. |
| **Brake Power** | **7500 in.-lbs.** |
| Brake Construction | solenoid operated locking |
| **Bearing Assembly** | **bronze sleeve w/rollers** |
| Mounting Hardware | stainless steel bolts |
| **Control Cable Conductors** | **7** |
| Shipping Weight | 61 lbs. |
| **Effective Moment (in tower)** | **5000 ft.-lbs.** |

### Digital Automatic Controller

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# announcements

**The WAE Marathon** – Two contests that are closely related to the WAE award, the WAEDC CW and the WAEDC SSB, will form the cornerstone of this Marathon 60 celebration, to be held August 9 through September 14, 2008. It is sponsored by the DARC Committee for DX and HF Contesting. A certificate will be available, similar to the WAE Award in accordance with the current award rules. Information is available at: <www.wae60.de/>. There is also information about the WAE in general at: <www.dxhf.darc.de/>.

**The following special event stations are scheduled for August:**

**Pittsburgh area clubs /250**, to celebrate the 250th anniversary of the City of Pittsburgh, Pennsylvania; Aug. 2–3 with operations from the Pittsburgh area on 3.850, 7.250, 14.250, 21.350, 28.350, and elsewhere. Each club will operate with its own call /250. For certificate send $2.00 to Edward Oelschlager, N3ZNI, 60 Carl Ave. B2, Eighty Four, PA 15330. <http://pittsburgh250ham.org>

**N7C**, The Navajo Code Talkers, Window Rock, Arizona; 1400–0000Z daily, Aug. 14–17, on 14.265 and 7.265 ±. QSL to Herb Goodluck, N7HG, P.O. Box 3611, Window Rock, AZ 86515.

**N8AIR**, from Wings of Freedom Tour presented by the Collings Foundation and the Military Preservation Society; Airwaves Radio Club and Massillon ARC; 1400–1900Z daily, Aug. 16 and 17, on 14.260–14.270 and 7.260 MHz. For certificate send 9 × 12 SASE to MAPS Air Museum, 2260 International Parkway, North Canton, OH 44720.

**W8AL**, in conjunction with the Pro Football of Fame Festival, Canton, Ohio; 1300Z Aug. 1 to 2400Z Aug. 4 on 7.265, 14.265, 21.365, 28.365 MHz. For certificate send 9 × 12 SASE to Donald Perry, WQ8J, 968 Culverne Ave., Massillon, OH 44647 (e-mail: <wq8j@sssnet.com>.

**W8V**, from West Virginia State ARRL 50th Convention, Jackson's Mill/Weston, West Virginia; Stinewall Jackson ARA; 1300–0100Z Aug. 23–24 on 14.270 and 7.200 MHz. For certificate send 9 × 12 SASE to SJARA, P.O. Box 752, Clarksburg, WV 26301-0752. <www.sjara.org>

**VA3OIL**, from commemoration of first commercial oil well in North America, Oil Museum of Canada, Oil Springs, Ontario; Lambton County RC; 9 AM to 6 PM EDT Aug. 9 on 3.840, 7.240, 14.240 ±QRM. Canadians QSL with SASE to VA3KSF. U.S. QSL with SASE to KB1SF, 3560 Pine Grove Ave. #488, Port Huron, MI 48060. <www.ve3sar.org>

**VE5LGT**, from Cochin Lighthouse, Canada, Aug. 15–17, by VE5EL and VE5MC, two stations, 100 watts, SSB only. QSL: QRZ.com or via the bureau.

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

Aug. 1–3, **Pacific Northwest DX Convention**, Monarch Hotel, southeast Portland, Oregon. For information go to <www.wvdx.org>, or contact Al Rovner, e-mail: K7AR@arrl.net>.

Aug. 1–4, **Alaska 2008 Hamfest & ARRL Alaska State Convention**, Anchorage Sheraton Hotel, Anchorage, Alaska. For details go to: <www.akhamfest.com>.

Aug. 3, **St. Charles ARC Hamfest 2008**, St. Charles American Legion Hall, St. Charles, Missouri. Contact WBØHSI, St. Charles ARC, P.O. Box 658, St. Charles, MO 63302-0658. (Exams)

Aug. 9, **St. Albans Hamfest**, Sno-Devils Snowmobile Club, St. Albans, Maine. For details go to: <http://www.qsl.net/parc/> (Talk-in 146.520 [alternate 146.850]; exams 9 AM)

Aug. 15–16, **Duke City Hamfest**, Sandia Baptist Church, Albuquerque, New Mexico. Contact Mike Langner, K5MGR, e-mail: <k5mgr@arrl.net>, phone 505-898-3212; <www.qsl.net/dchf>. (Talk-in 145.33, 100 Hz tone, and 444.00; exams)

Aug. 16–17, **Huntsville Hamfest**, Von Braun Center, Huntsville, Alabama. For details go to: <http://www.hamfest.org>. ***See us at the CQ Booth.***

Aug. 17, **Northern Berkshire ARC Hamfest**, Agricultural Fairgrounds, Adams, Massachusetts. For details go to: <www.nobarc.org> or e-mail: <k1sav@yahoo.com>.

Aug. 22–24, **Boxboro Hamfest & ARRL New England Convention**, Holiday Inn Boxboro Woods, Boxborough, Massachusetts. For details go to <http://www.boxboro.org>. (Talk-in 53.810, 147.270, 224.880, 449.925) ***See us at the CQ Booth.***

Aug. 23, **Owen/Monroe County Hamfest**, Owen County , Spencer, Indiana. Contact Katie Smith, K9INU, e-mail: <k9inu@arrl.net>, phone 812-829-2140. (Talk-in 146.985, PL 136.5; exams 1 PM)

Aug. 24, **East Central Illinois Hamfest**, Vermilion County Fairgrounds, Danville, Illinois. Contact Josh Kittle, N9WEW, e-mail: <n9wew@arrl.net>, phone 217-442-0578, <www.vcara-hamfest.info>. (talk-in 146.820 (–), PL 88.5; exams 11 AM)




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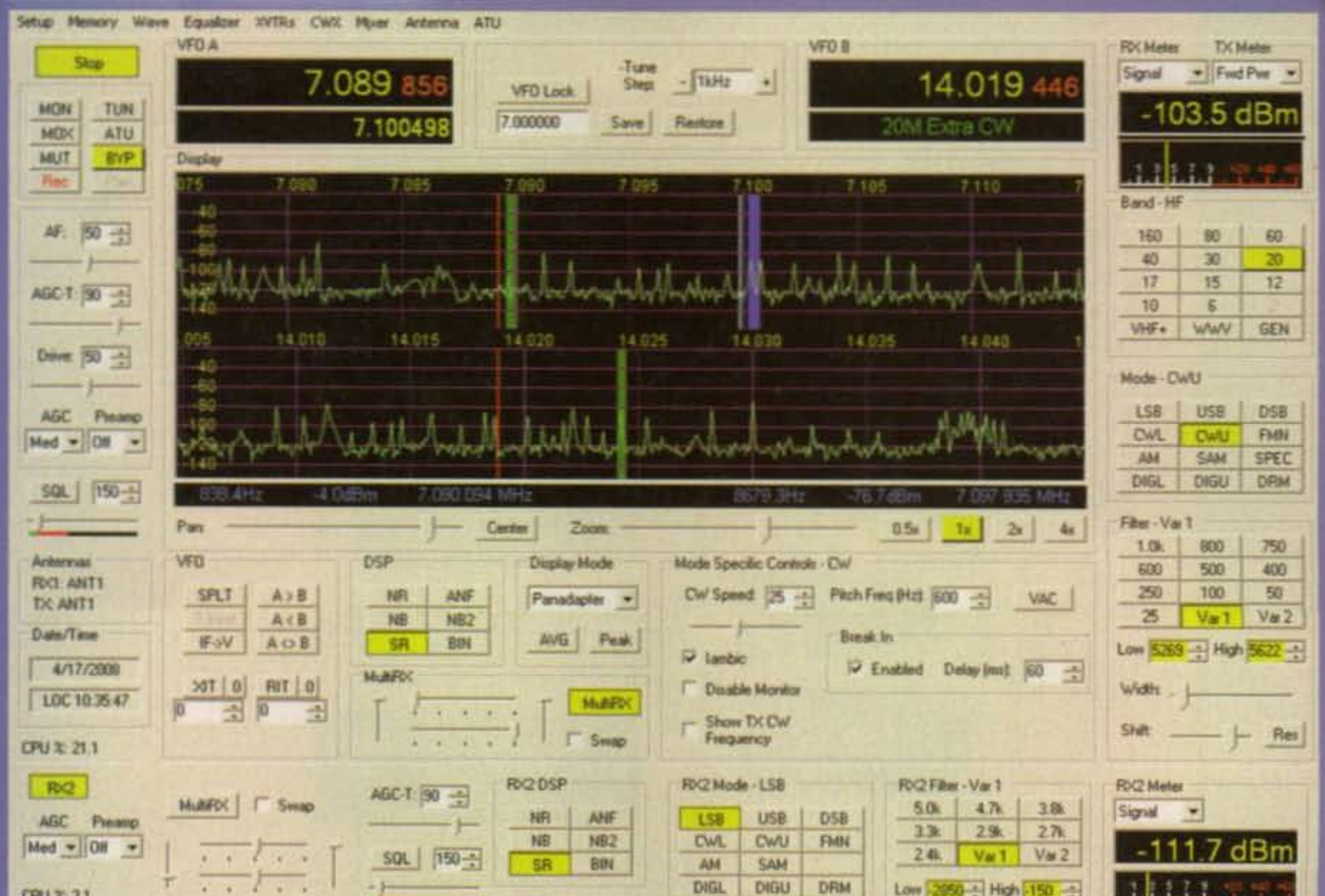


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• 160-10M/6M/2M/70CM • 2x DSP • Digital IF filters • Digital voice recorder • 2.5" color TFT display



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### IC-91AD Digital Dual Band Transceiver

• 2M & 70CM @ 5W • 1304 Memory channels • Independent (dual watch) wide-band RX 495 kHz - 999.999 MHz** • Full dot matrix LCD • New "duplex scan" • D-STAR digital voice • Compliments the ID-800H mobile


### ID-800H Digital Dual Band Mobile

• 55 watt VHF/50 watt UHF • Wide RX: 118-173, 230-549, 810-999 MHz (cellular blocked on US versions) • Analog/Digital Voice & Data • Callsign squelch • CTCSS & DTCS Encode/Decode w/tone scan


### IC-92AD Analog + Digital Dual Bander

• 2M/70CM @ 5W • Wide-band RX 495 kHz - 999.9 MHz** • 1304 alphanumeric memories • Dualwatch capability • IPX7 Submersible*** • Optional GPS speaker Mic HM-175GPS


### IC-V82 2M Transceiver

2M @ 7W • Optional D-STAR format digital operation features include callsign calling, up to 20 character text message, & position exchange*^ • CTCSS/DTCS encode/decode w/tone scan • Also available in a sport version and a 70CM version (IC-U82)

*Except 60M Band. **Frequency coverage may vary. Refer to owner's manual for exact specs. ***Tested to survive after being under 1m of water for 30 minutes. *^ AA Alkaline batteries not included, radio comes with a AA alkaline battery tray. *^ For shock and vibration. *^ When connected to an external GPS. ✦ Icom rebate promotion offers guaranteed through September 30, 2008. Purchase must be made from HRO between 07/01/08 and 9/30/08. Contact HRO for details.



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# Hams Respond to China Disaster

(Photo provided by VR2IO)

BY BOB JOSUWEIT,* WA3PZO

Over 45 million people were affected by a magnitude 8.0 earthquake that struck China's Sichuan Province on May 12, 2008. As the death toll topped 69,000, with over 366,000 people injured and approximately 18,000 missing, amateur radio operators were there to supply much-needed communications. Yet the full magnitude of the disaster was still not known in early June as China reported over 9300 aftershocks and there were concerns about "earthquake lakes" that had formed throughout the disaster area. These lakes were formed as mud and rock slides blocked rivers from flowing. China's state media reported in June that the Tangjiashan "quake lake" was approaching hazardous levels. The lake's water volume was equal to more than 80,000 Olympic-size swimming pools. The area was still receiving aftershocks and Liu Ning, chief engineer at the Ministry of Water Resources, warned that one of the risks was an aftershock could breach the lake at any time, inundating lower-lying areas.

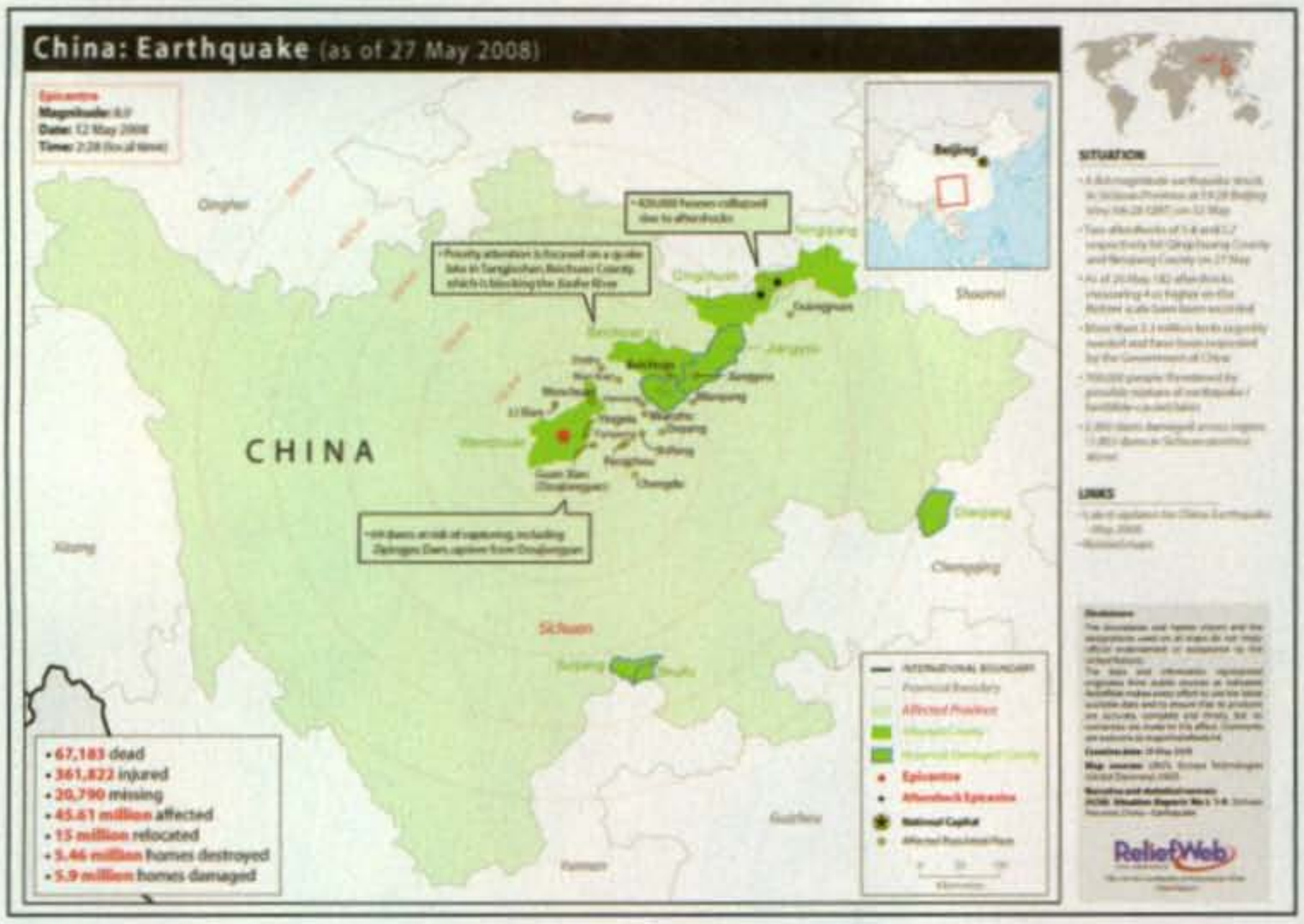
The numbers as reported by the Chinese government are staggering. It said that more than 764,000 people were evacuated, including over 6500 people who were dug out from under debris. It took eight days for Chinese troops to reach over 1000 of the most affected villages. According to the U.N. Office for the Coordination of Humanitarian Affairs (OCHA), "severe infrastructure damage and landslides, coupled with challenging mountainous terrain, had prevented humanitarian access." According to the China Seismological Bureau, the magnitude 8.0 earthquake collapsed nearly 5.4-million buildings and damaged 21-million others throughout Sichuan Province. The Government of China anticipates reconstruction will take a minimum of three years. Widespread shelter needs in rural areas have led most residents to seek shelter and assistance in urban centers.

This month we will take a look at amateur radio emergency communications in China following the devastating earthquake. The report includes information from the front lines of the disaster area to hams in Hong Kong. We hope you find this as interesting reading it as we did covering the story.

## Earthquake!

"Right after the May 12 earthquake, I rushed back home to see my wife and family. The shortwave station had shaken to the ground. After some repair work, it was back in service on 14.270 MHz! The time was 1710." Liu Dan, BD8ABM, described what he experienced in the disaster area. "I immediately made some contacts with BG9HM and VR2GM. They passed on the sad news of the earthquake in Chengdu. The aftershock never stopped. It was not smart to stay inside the building. I then moved out to continue searching for my wife and family." He was relieved when he found them safe and sound. Early the next morning the Sichuan Amateur Radio

*c/o CQ magazine
e-mail: <wa3pzo@cq-amateur-radio.com>




*An 8.0 magnitude earthquake struck China on May 12, 2008, killing over 69,000 people. Map courtesy of U.N. Office for the Coordination of Humanitarian Affairs (OCHA).*

Association (SARA) called for setting up "the emergency communication control center." There were calls for help to transport the casualties.

Dan, his wife, and child drove over 100 kilometers on moonlit roads. He had an HF rig in his car. On the route he said there were a lot of heavy-duty vehicles and buses filled with soldiers. They were all heading towards the disaster zone. He said, "It is a mission that I have to respond to immediately."

Other ham radio operators responded as well. He said with the help of the "Radio Frequency Authority (RFA) and fellow members, the antennas were erected, broadcasting station put into service, the emergency communication control center was established in a short time." SARA members, using the callsign BY8AA, stayed on the air 24 hours a day. They provided updates on the disaster to other radio operators in China, Hong Kong, Taiwan, and several overseas stations. BY8AA coordinated thousands of vehicle trips for transporting the injured and distributing food and other supplies. At the same time the hams passed information requested by the local government.

China's national ham radio organization, the Chinese Radio Sports Association (CRSA), reported the following on its website:

"On the afternoon of May 12, 2008, Wenchuan Area of China's Sichuan province was struck by an earthquake. Communications in some of the surrounding areas are currently cut off, and communications in some other areas are experiencing network congestion because of drastically increased traffic.

"Chinese Radio Sports Association therefore calls on its members to take actions to ensure their amateur radio sta-

*Thousands of tents were needed to provide shelter to those made homeless. Amateur radio operators handled key communications to get victims medical care as well as much-needed supplies. (Photo courtesy VR2XYX)*

*Amateur radio operators quickly responded when normal means of communications were knocked out by a powerful 8.0 earthquake. Here BD8ABM establishes an emergency station in the disaster area. (Photo supplied by VR2IO)*

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*BG8BES, carrying an XD-D2B HF radio, prepares to join a rescue team that was heading into the mountainous villages. The letters "EARS" on his vest stand for Earthquake Amateur Radio Support. (Photo supplied by VR2IO)*

### Olympic Ops Pause to Remember

Six days after the earthquake, the Beijing 2008 Olympic Game Special Event Amateur Radio Station was approved by The Beijing Organizing Committee for the Games of the XXIX Olympiad and State Radio Regulatory Committee. The call-signs issued are BT1OB, BT1OJ, BT1OH, BT1OY, and BT1ON. The last letter of the callsign corresponds to the Chinese name for a color of the Olympic rings—Beibei, Jingjing, Huanhuan, Yingying, Nini. Their first contact was with Sichuan earthquake area amateur radio operators. They contacted BY8AA and the Chinese Red Cross Foundation, BT8RC. Over 1800 QSOs were made the first day. On May 19 China began three days of mourning for the tens of thousands of people killed in the May 12 earthquake.

Now it is time to celebrate not only the athleticism of those participating in the Games, but the Sport of Competition. We hams can celebrate that on- the-air competition as well. The special event stations will be on the air until September 17, 2008. Let the Games begin!

tions to operate properly, and to the extent possible stand by on often-used short-wave frequencies. If any radio signal is heard from the disaster area, please do your best to understand what is most needed by people in that area and report it to the local government authority. If people in the surrounding areas need to pass messages to their loved ones over the radio, please help them to get in touch and get the messages across as soon as possible.

"Amateur radio stations in the disaster area and surrounding areas, if in working condition, should be used unconditionally to assist the local earthquake disaster relief authorities, and subject to permission by the said authorities, to provide communications services to them. For emergency communications purposes, amateur radio stations may also be used to pass messages for local residents on a temporary basis until local telecommunications services resume. Amateur radio stations of all regions should give way to and stand by for emergency communications."

According to reports relayed by Jim Linton, VK3PC, Chairman, International Amateur Radio Union (IARU) Region 3 Disaster Communications Committee, Fan Bin, BA1RB, said that during the first week BY8AA had an operational log of 300 pages. Bin said one main repeater survived the earthquake. This repeater provided 100-km coverage to Mianyang. Among the traffic the repeater carried were communications for the Mayor of Mianzhu City, who gave orders to those on the front-line rescue and recovery activity. Amateur radio operators from Chengdu, Shenzhen, and He'nan went to the center of the disaster area to set up repeaters in Beichuan County, and provided various valuable first-hand information from the center. More repeaters were set up in both Beichuan and Mianyang, among the worst hit areas outside the picenter, to form an effective amateur radio communications network.

On the following day, the team met with BD8AAI, who had just returned from the front-line city of Mianzhu. He reported on the communication breakdown situation. BD8AAI, BG8BES, plus two other volunteers proceeded to the disaster area at Mianzhu in order to restore communication links. When they arrived, the disaster victims were very happy to see them.

Dan's next stop was in Sichuan's Mianzhu County. There he and BG8BES met with Mayor Gao and the party leaders. They set up a repeater for the field command and control center. They also set up a radio link for the local rescue force, local government, the Red Cross Association, and the Hydro Authority. In addition, they provided information on the disaster area to the outside world with the help of BU2AQ, who helped relay the information. Within a few days Dan said the local authority communications network was re-established. He said, "Ham radio operators' immediate response to the need of disaster communications is achieved. I headed my way back home, but our rescue work is far from completed."

## Hams on the Ground

At 1757 UTC on Monday, May 12, Liu Hu, BG8AAS, of Chengdu, a town in the province of Sichuan, reported that a local UHF repeater survived the disaster. "It keeps functioning from the first minute and more than 200 local radio hams are now on that repeater. A group of hams from Chengdu has headed for Wenchuan, the center of the quake, trying to set up emergency communication services there," he said.

Michael Chen, BD5RV/4, said that Yue Shu, BA8AB, also from Chengdu, Sichuan, was reported to be active on the 40-meter emergency frequency on Monday. "Up to now, there has been no further information available from the center zone of the quake. There are a few radio amateurs there, but all of the communications have been cut out, including amateur radio," Chen said.

At 1858 UTC, Liu reported that the local UHF repeater in Chengdu "keeps busy running after the quake. It helps to direct social vehicles to transport the wounded from Dujiangyan, Beichuan, and other regions. Another UHF repeater also started working in Mianyan, supported by generators, but they are going to face a shortage of gas." Chen said that damage in Chengdu was minimal, but the situation was "very very bad

*According to Chinese television, "When all other communication means failed, amateur radio operators came out!" BD8AII was one of the many hams who handled emergency communications. (Photo supplied by VR2IO)*

in the counties around. A few towns are said to be destroyed completely. More than 7000 died in the town of Beichuan. Casualties in several other towns are still unknown and not counted in the published numbers. It is a long and sad day."

## Beijing Volunteers Act Quickly

As with any major disaster, the local phone communications system was either overloaded or not functioning. In Beijing, CRSA members began organizing their equipment to take with them to the disaster area. At the same time, other members collected what information they could from the disaster area.

On May 14, the Chengdu Red Cross said there was an urgent need for communication support. A task force was formed immediately to determine how many vehicles were available, and what equipment and supplies were to be carried. Eighteen CRSA members and eight vehicles headed to Chengdu. The CRSA had assistance from the Fox-hunting Motor Club. After a 2200-kilometer day and night trip, the team arrived Chengdu in just 26 hours. Operating under the callsign BT8RC, the group established a

*BD8AII and BD8ABM set up an HF antenna at their remote command post. (Photo supplied by VR2IO)*

good radio link for the Chinese Red Cross Foundation between Beijing and Chengdu. This provided communications to enable the relief agency to more effectively carry out its work.

BG1GEI, BD1JMJ, and BG1JBR volunteered for the first shift at the Chengdu Red Cross headquarters. One of the ham radio operators' missions was to escort the first batch of relief supplies and the medical personnel to Yao Duzhen. Yao Duzhen is located in the northeast part of Sichuan. There are about 18,000 residents. After the earthquake, the water supply, power, and communication systems were all destroyed. Yao Duzhen lost all contact with the outside world. The RFA approved the installation of two amateur radio repeaters. As more ham radio operators became available to travel to the disaster area, the CRSA had to obtain permission from the local Sichuan disaster department of goods and manpower to enter the disaster region.

## Emergency Frequencies Established

Several HF emergency frequencies were established. Requests went out around the world for hams outside of the disaster area to avoid using these frequencies. The stations operating in the disaster area were operating with portable and backpack antennas, using low power, and operating in mountainous terrain.

IARU R3 Disaster Communications Committee member Fan Bin, BA1RB, said, "We have more ham radio operators ready to go for disaster relief. We will do our best as amateur radio operators for the big disaster."

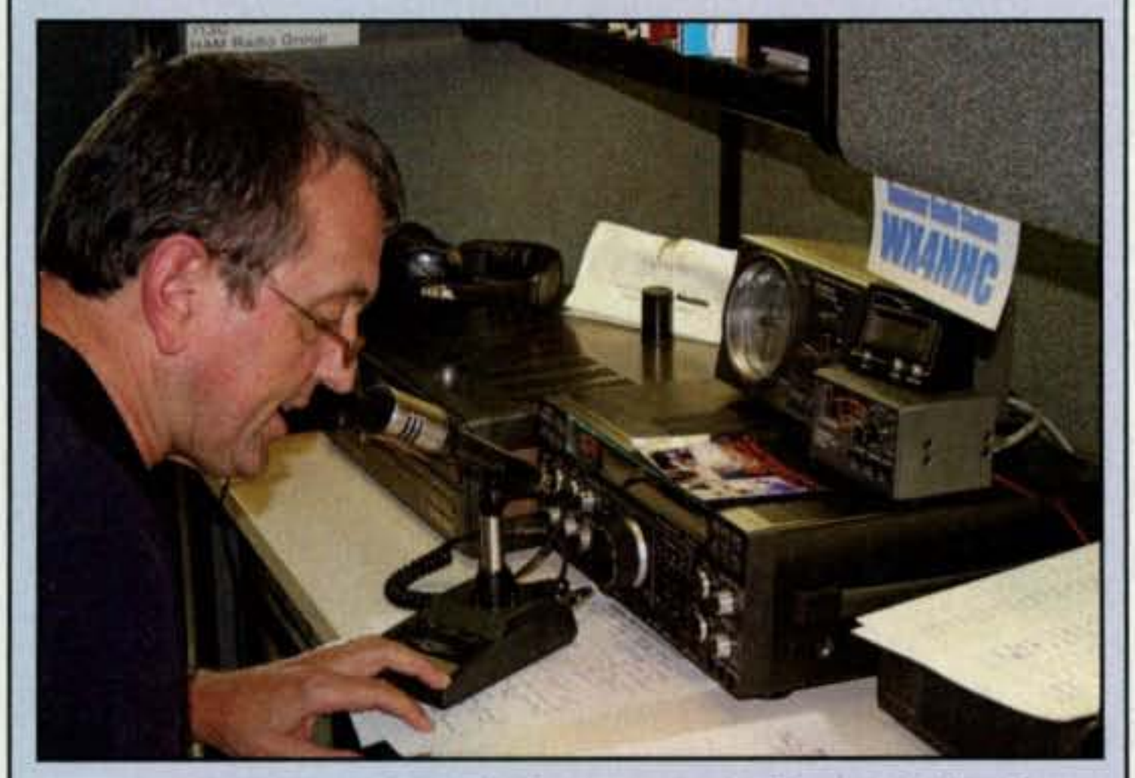
The CRSA appreciated the support given by the amateur radio community in helping to keep clear the emergency communication frequencies of 7050 kHz, 7060 kHz, and 14270 kHz during the critical period after the earthquake. The CRSA said, "Thanks for the cooperation and efforts made by all amateur radio societies." However, there were problems at times. A translated request from the China Radio Sports Association said, "7.050 MHz frequency—because of strong QRM, emergency communications temporary QSY to 7.030 MHz. CRSA headquarters appeals to those causing QRM to show a rational and restrained, all to listen to the main emergency communications. At the same time not to take up emergency communication frequencies for unnecessary communication, such as greetings and asked signal report. Language of communication should be brief."

BA1RB reported that soon after the earthquake hit, the local UHF/VHF repeaters in the Chengdu area were back in operation to provide communications. He said it took three days for the public telecommunications network to be restored in all but the most remote areas, which remained without communications.

## Hams Recognized

As more government and military communications moved into the area, amateur radio operators focused on assisting


*Members of the Hong Kong Amateur Radio Communications Association (VR2HAM) collected amateur radio equipment and supplies for hams helping out in the disaster area. (Photo courtesy VR2IO)*




*During the annual WX4NHC tests at the National Hurricane Center, NHC Director Bill Read, KB5FYA, thanked ham radio operators for their help in supporting the NHC mission to help save lives. (Photo courtesy Julio Ripoll, WD4R)*

### Hurricane Center Director Hams It Up!

National Hurricane Center Director Bill Read, KB5FYA, told *CQ* that he was looking forward to playing with all of the "toys" at WX4NHC, the amateur radio station at the National Hurricane Center. Read said his operation was limited at his home because of space limitations. He hoped to upgrade his license now that he had access to WX4NHC. Read, a Delaware native, spoke to *CQ* at the April meeting of the Delaware– Philadelphia Chapter of the American Meteorological Society.

His opportunity to try out the "toys" came a few weeks later during WX4NHC's annual hurricane season test. During his time on the air he said, "We all know how important it is to maintain communications during a hurricane to relay our hurricane warnings to those in the affected area, which may have no other means to receive this vital information.

"We are also very appreciative for the surface reports from those in the storm which add to our database and help our forecasters better visualize what is actually happening at the ground level in real time. As our own ham radio station, WX4NHC, celebrates its 28th year of volunteer service at the National Hurricane Center, we extend our thanks to all ham radio operators who continue to support our mission to help save lives."

Rob Macedo-KD1CY, Director of Operations for the VoIP Hurricane Net and ARES SKYWARN Coordinator for the National Weather Service Taunton, Massachusetts Forecast Office, said Bill was very comfortable on the HF radio and really enjoyed EchoLink/IRLP, especially the contacts with several colleagues at NWS offices who were also hams. One of his NWS colleagues said, "Bill, I'm tickled to death that you are the new Director of the Hurricane Center."


*VR2HAM members with shipment showing radios. (Photo courtesy VR2IO)*

disaster relief agencies. About five days after the earthquake, operations shifted from using HF radio to using VHF and UHF frequencies. By the end of May, BY8AA had successfully completed its mission and the station was taken down.

Chinese government officials and the local news media recognized that when communications failed it was amateur radio operators who stepped in to provide vital links. Linton said China Central Television (CCTV) reported on 26 May, "When all other communication means failed, amateur radio operators came out! An amateur radio emergency communication network was set up and one of the commanders, Liu Hu, called for amateur radio operators on air to provide services for disaster relief."

## Hong Kong Hams Respond

Although they were miles away from the disaster area, members of the Hong Kong Amateur Radio Communications Association (VR2HAM) were busily collecting donations, relief supplies, and radios. Two days after the disaster, members were working with the CRSA in Beijing and the Amateur Radio Disaster Relief Command Center in Sichuan to get much-needed supplies into the disaster area. Ken Hau, VR2IO, said their first emergency relief shipment was sent to the quake zone within two days.

Hau said, "the first batch of 127 kg shipment (included) 16 sets of UHF radios (programmed with all 12 coordinated frequencies as planned for rescue and support tasks), surgical gloves, medical-grade masks, lighting devices, tents, medical supplies, as well as food and water." Sending the relief shipment was not easy, said Hau. "Since we have no official status in China, plus some logistical issues, dispatching these supplies to an ad hoc Ham Disaster Relief team on disaster site is almost impossible. However, with the help of Railway Authority and CRSA Beijing, the first batch was able hit the road on the fourth day after quake."

VR2HAM members maintained communications with the disaster area on 7.030 MHz. They were able to adjust the types of relief supplies to be sent. Over the next ten days, two additional shipments of tents along with cash donations were sent. CRSA confirmed the shipments were received in good order.

## With Thanks...

Covering a major disaster half a world away could be a challenge. Yet through the friendship of ham radio we made contact with hams in China, Hong Kong, and other places around the globe to bring you this story. A major thank you goes to VR2IO, President, HK Amateur Radio Communications Association, who forwarded several stories from the front lines and the pictures to support it. We also appreciate all of the hams who shared their stories and allowed us to use their pictures. We'll have more on the story next time...

73, Bob, WA3PZO

# Results of the 2007 CQ WW DX SSB Contest

BY BOB COX,* K3EST

**Expanded CQ WW Contest Results on the Web**

A few additional elements of our contest reporting are on the CQ website, including Station Operators of Multi-Op stations and expanded QRM. To view these additional and expanded elements of the 2007 CQ WW SSB results, go to <http://www.cq-amateur-radio.com>, then go to Contests and Awards on the home page, then to CQ WW DX Contest, Expanded Results, 2007 CQ WW SSB.

What can you do at the bottom of the sunspot cycle to enliven the ham bands? Take the medicine the propagation doctor orders and enter the CQ WW DX SSB Contest to overcome band conditions. At this time of the cycle, the bands had shown only marginal signs of life for weeks before the contest. The CQ WW SSB Contest changed all that. There was full activity on all bands that were open. The spectrum was filled with activity, putting to good use our allotted frequencies. After all the logs were counted, an amazing number emerged: There were 5040 received entries representing 42,743 calls worked by more than one person from 286 countries! Not only was this a new record in logs received for any contest, but it happened mostly without 10 meters and most of 15 being open! When the sun begins to show improved high-band activity, one can only hope to find a clear spot on any band.

As has been mentioned before, the CQ WW is a fantastic competition which brings out the best in amateur radio—team work, station construction, antenna design, propagation knowledge, and operating skills. Just turn on your radio during the last weekend of October and you can join in the fun. Most entrants are not trying to win for the world or their country. They are just having a good time, and a good time can be guaranteed. Each year a new group of hams discovers the CQ WW. Their comments can be summed up as "What a great time!" Once you jump into the CQ WW QSO ocean, it is impossible not to swim in it for a while. Following is a summary of the results of the 2007 CQ WW SSB. Everyone who enters the contest is a winner. Come join us in the most exciting contesting event of the year. You will be very welcomed.

## High Power All Band

The two top places in this tough category went to North American stations, an unusual result. Tom, W2SC, rose to the occasion and talked 8P5A to the world high score. Tom seems to have found the groove, as he has been in this position before. Barbados not only hosted the world cricket championship, but the CQ WW SSB champion. If you check out the Top Scores box, you will see that five of the top ten scores were from North America and three from Canada (VY2ZM, VC3J, and VC3A)! Coming in second in the world was Jeff, K1ZM, operating from his Prince Edward Island QTH as VY2ZM. Third place went to long-time world top ten finisher John, W2GD, as P40W.

European top honors went to CU2A operated by Toni, OH2UA. Working the contest from far southeast + a good station + a great operator = a winning combination. Andy, G4PIQ, operating from M6T took second place Europe. One look at the M6T website will point you in the direction of what a great winning station looks like. Third place in Europe went to the Montenegro station of Ranko, 4O3A, founder of SKY Contest Club. In the U.S., Randy, K5ZD, did his usual fabulous job and took top honors. Last year's winner took second position. NN3W, Richard, operated from the N3HBX super station located in southwestern Maryland. Third place went to Doug, K1DG, operating from N1LI.

*Dave, G4BUO, is always among the top scorers in the contest.*

The continental winners were: North America 8P5A (W2SC), Africa EA9LZ, Asia RG9A (UA9AM), Europe CU2A (OH2UA), Oceania KH6LC, South America P40W (W2GD), Japan JH4UYB, and U.S. K5ZD/1.

## Low Power All Band

The CQ WW is famous for hams going on DXpeditions. You can even put a series of vertical antennas in a golf bag, find a beach somewhere, and gett ready for fun. A small transceiver and you are all set. If you choose the right QTH, you can run stations almost as fast as the higher powered stations.

John, KK9A, sure has found the right formula. Operating from the northwest tip of Aruba, John again took the top world low power trophy. Three years in a row is quite an achievement, John! Second place in the world and #1 in Asia was TA3D. Great job, Yasar! Third place went to Ted, HI3TEJ, using his contest call, HI3T. Ted is a perennial top finisher.

CT6A operated by Jose, CT1CJJ, again was first place in Europe. This is the third year in a row that José took the plaque. Congratulations, José! Second place went to Lorenzo, IZ2FOS, operating not far from Lago di Garda. Third place in Europe went to Stefan, OM3CD. In the U.S., we had a new winner, Art, K1BX. He sure has the credentials in terms of operating experience: K6UA,


*Yasar, TA3D, grabbed #2 world Low Power All Band.*

*e-mail: <k3est@cqww.com>

*Joseph, F6CTT, #1 Europe 3.7 MHz.*

N6CW, DLØWW, and WØAIH! Second place went out to Ed, N1UR, who finishes first or near the top almost every time. Again third place went to Marvin, N5AW, from Texas, where he puts his considerable skills to work. A45WD, HZ1GW, UPØL, 9N7JO, A61HH, HSØZDG, ZC4LI, 5B/HA5PP, ZPØR, XE1CQ, and CN2BC all did an excellent job to finish with outstanding scores from interesting locations.

The continental winners were: North America HI3T, Africa CN2BC, Asia TA3D, Europe CT6A (CT1CJJ), Oceania 9M5LSC (JF1SQC), South America P40A (KK9A), Japan JA7LMZ, and U.S. K1BX.

## QRP

The CQ WW offers QRPers a very good opportunity to work rare DX that would otherwise prove elusive. This category sharpens your searching skills and the rewards are very satisfying. Our world winner this time was IK5RUN. Simone lives near Florence and dreams of finishing at the top of the QRP category. Dreams do come true, Simone! A great job from a dedicated QRPer. The battle for second and third place in the world came down to about one QSO. Taking second place in the world and first place in the U.S. was Doug, KR2Q. Chris, KA1LMR, was just barely behind to take third place world and second place U.S. It looks like a real healthy rivalry in the making. The third spot in the U.S. and the top zone 4 score went to Philip, NØKE. He also finished #6 in the world.

*Doug, KR2Q, finished #1 in the U.S. QRP, and #2 world.*

Second place in Europe went to Bob, M3RCV. What a great score from a *really* dedicated ham. Bob was and still is one of the world's best SWLers as BRS 32525. From the SWL ranks many a great contester has sprung. Third place in Europe went to S59D.

Special mention must be made of the fine score of Izuno-san, JR4DAH, #10 in the world and #1 in Asia. The top zone 3 scorer was W6QU operated by QRP aficionado, Bill, W8QZA. 5Z4/YT1CS, YB2OK, and PY2BN are to be congratulated for their outstanding efforts.

The continental winners were: North America KR2Q, Africa 5Z4/YT1CS, Asia

## TROPHY WINNERS AND DONORS

**SINGLE OPERATOR**
**World All Band**
**8P5A (Opr.: Tom Georgens, W2SC)**
**Donor:** Southern California DX Club

**World Low Power**
**P40A (Opr.: John Bayne, KK9A)**
**Donor:** Slovenian Contest Club

**World QRP**
**Simone Sarti, IK5RUN**
**Donor:** Jeff Steinman, N5TJ

**World Assisted**
**Ilshat Valitov, RU9WX**
**Donor:** Glenn Johnson, WØGJ

**U.S.A.**
**Randy Thompson, K5ZD**
**Donor:** Potomac Valley R.C. – KC8C Memorial

**U.S.A. Low Power**
**Arthur Hambleton, K1BX**
**Donor:** North Coast Contesters

**U.S.A. QRP**
**Doug Zwiebel, KR2Q**
**Donor:** Pat Collins, N8VW

**U.S.A. Assisted**
**Rich Saeger, K3OO**
**Donor:** John Rodgers, WE3C

**U.S.A. Zone 3**
**Mitch Mason, K7RL**
**Donor:** Dave Pruett, K8CC & Greg Surma, K8GL

**U.S.A. Zone 4**
**Mike Wetzel, W9RE**
**Donor:** Dave Pruett, K8CC & Greg Surma, K8GL

**Canada**
**VY2ZM (Opr.: Jeffrey Briggs, K1ZM)**
**Donor:** Contest Club Ontario
VE3WT Memorial

**Caribbean/C.A.**
**Paul Young, FS/K1XM**
**Donor:** Alex M. Kasevich, VP2MM

**Europe**
**CU2A (Opr.: Toni Linden, OH2UA)**
**Donor:** Potomac Valley R.C. – W4BVV Memorial

**Europe Low Power**
**CT6A (Opr.: Jose Manuel Farto Lopes, CT1CJJ)**
**Donor:** Scott Jones, N3RA & Tim Duffy, K3LR

**Russia**
**RG9A (Opr.: Yuri Kurinyi, UA9AM)**
**Donor:** Roman Thomas, RZ3AA

**Africa**
**6W1RY (Opr.: Albert Crespo, F5VHJ)**
**Donor:** Gordon Marshall, W6RR

**Asia**
**Yasar Gocet, TA3D**
**Donor:** 2 AM Dayton Pizza Gang

**Japan**
**Masaki Masa Okano, JH4UYB**
**Donor:** Tack Kumagai, JE1CKA

**Japan Low Power**
**Fumi Konno, JA7LMZ**
**Donor:** Western Washington DX Club

**Oceania**
**Lloyd Cabral, KH6LC**
**Donor:** Northern California DX Club

**South America**
**P40W (Opr.: John Crovelli, W2GD)**
**Donor:** Yankee Clipper Contest Club

**SINGLE OPERATOR, SINGLE BAND**
**World – 28 MHz**
**Juan Manuel Morandi, LU1HF**
**Donor:** Joel Chalmers, KG6DX

**World – 21 MHz**
**ZX5J (Opr.: Sergio Almeida, PP5JR)**
**Donor:** Robert Naumann, W5OV

**World – 14 MHz**
**CN4P (Opr.: M'Hamed Kharbouche, CN8NK)**
**Donor:** North Jersey DX Assn. – K2HLB Memorial

**World – 7 MHz**
**Andreas Kretzschmar, 9Y4W**
**Donor:** Fred Laun, K3ZO – K7ZZ Memorial

**World – 3.7 MHz**
**Gia Gvaladze, 4L4WW**
**Donor:** Fred Capossela, K6SSS

**World – 1.8 MHz**
**CN2R (Opr.: James Sullivan, W7EJ)**
**Donor:** Robert Wruble, W7GG

**USA – 28 MHz**
**Charles Dietz, W5PR**
**Donor:** Donald Thomas, N6DT

**USA – 21 MHz**
**Peter Bizlewicz, KU2M**
**Donor:** CQ Magazine

**USA – 14 MHz**
**Saul M. Abrams, K2XA**
**Donor:** Yankee Clipper Contest Club
KC1F Memorial

**USA – 7 MHz**
**Paul H. Newberry, Jr, N4PN**
**Donor:** Stanley Cohen, W8QDQ

**USA – 3.7 MHz**
**Joseph Gagliardi, Jr, AA1BU**
**Donor:** CQ magazine

**USA – 1.8 MHz**
**Yuri Blanarovich, K3BU**
**Donor:** Glenn Johnson, WØGJ

**Carib./C.A. (21 MHz)**
**ZF2AH (Opr.: Joseph Hypnarowski, W6VNR)**
**Donor:** Nate Moreschi, N4YDU

**Europe – 28 MHz**
**Meho Omberbasic, T93O**
**Donor:** Charles Dietz, W5PR

**Europe – 21 MHz**
**YTØZ (Opr.: Milan Milovanovic, YU1ZZ)**
**Donor:** Tine Brajnik, S50A

**Europe – 14 MHz**
**Ivo Jereb, S57AL**
**Donor:** Charles Wooten, NF4A

**Europe – 7 MHz**
**Vinko Gregorcic, S53F**
**Donor:** John Warren, NT5C

**Europe – 3.7 MHz**
**Joseph Cornee, F6CTT**
**Donor:** Ted Demopoulos, KT1V

**Europe – 1.8 MHz**
**SN3R (Opr,: Wieslaw Gebal, SP6HEQ)**
**Donor:** Robert Kasca, S53R

**Oceania (21 MHz)**
**9M8YY (Opr: Yasumasa Yagi, JR3WXA)**
**Donor:** Bruce D. Lee, KD6WW

**Asia –14 MHz**
**Vakhtang Mumladze, 4L6AM**
**Donor:** Charles Shinn, W7MAP

**Japan – 21 MHz**
**Toshohiko Kamimiyata, 7K4XNN**
**Donor:** CQ Magazine

**Japan – 14 MHz**
**Hiroyuki Inaba, JS3CTQ**
**Donor:** Take Yokoyama, JL1BLW

**MULTI-OPERATOR, SINGLE TRANSMITTER**
**World**
**CN3A (Oprs,: K2QEI, IK2SGC, I2WIJ, IZ2FFK, YO3JR, IK2EAD, IK2BCP, CN8WW)**
**Donor:** So. Calif. DX Club – W6AM Memorial

**U.S.A.**
**K9RS/3 (Oprs.: NO2R, N3DXX, K9RS)**
**Donor:** Carolina DX Association

**Carib./C.A.**
**VP5DX (Oprs.: N4KE, W1WON, NU4Y)**
**Donor:** Bob Raymond, WA1Z

**Africa**
**CQ3T (Oprs.: CT3CD, CT3CK, CT3FQ, CT3HF, CT3HV, CT3KN)***
**Donor:** Doc Sayre, W7EW

**Asia**
**P33W (Oprs.: 5B4AGC, 5B4AGN, G3NKC, G4MJS, G4XUM, GJ4CBQ, ZC4VJ)**
**Donor:** Edward L. Campbell, NT4TT
AA6BB and KA6V Memorial

**Japan**
**JA6ZPR (Oprs.: JJ1RJR, JR6CKX, JH6JSR)**
**Donor:** Bob Epstein, K8IA

**Europe**
**9A1P (Oprs.: 9A1UN, 9A2RD, 9A2CW, 9A3ASF, 9A4M, 9A5CW, S59KW, S55M)**
**Donor:** Bob Cox, K3EST

**Oceania**
**AH2R (Oprs.: JI3ERV, JR7OMD, JG3RPL, JO1DFG, JH7QXJ)**
**Donor:** Junichi Tanaka, JH4RHF

**South America**
**FY5YE (Oprs.: F1HAR, F5HRY, F5MZN, F6FGZ, F6FVY, FY5FY)**
**Donor:** Victor Burns, KI6IM –
The Cuba Libra Contest Club

**MULTI-OPERATOR, TWO TRANSMITTERS**
**World**
**AO8A (Oprs.: EA8AH, EA8CAC, EA8ZS, ES2RR, OH5XT, OH6XX, OH9MM)**
**Donor:** Array Solutions

**U.S.A.**
**WE3C (Oprs.: WE3C, NN3Q, KQ3V, NM3E, N3FTI)**
**Donor:** Kimo Chun, KH7U & Mike Gibson, KH6ND
Dan Robbins, KL7Y Memorial

**Europe**
**IR4X (Oprs.: I4TJE, I4VEQ, I4EAT, I4AVG, I4IND, I4IKW, I4EWH, IK4EWK, IK4DCT, IZ4BOY, IZ3EYZ)**
**Donor:** Aki Nagi, JA5DQH

**Oceania**
**AH6XX (Oprs.: AH7C, JA1BK, K1ER, K2WR)**
**Donor:** Japan CQ Ham Radio

**MULTI-OPERATOR, MULTI-TRANSMITTER**
**World**
**TS6A (Oprs.: YT1AD, YT3W, YU1AU, YU1DW, YU1EW, YU1KX, YZ1BX, K1LZ, N2OW, Alea, Lotfi)**
**Donor:** Dave, W6NL and Barb, K6BL Leeson

**U.S.A.**
**K3LR (Oprs.: K3LR, N2NC, K8CX, W9ZRX, N9RV, W2RQ, KI4MTU, K1AR, N2NT, N3SD, K3UA, KL9A, N3GJ, LU7DW)**
**Donor:** Jim Lawson, W2PV Memorial

**Europe**
**DR1A (Oprs.: DB6JG, DF6JC, DF7ZS, DH1NFL, DJ6ET, DJ7EG, DJ7EO, DK9VZ, DL1MFL, DL2YOU, DL3DXX, DL6FBL, DL6LAU, DL8WPX, DL9NDV, JK3GAD)**
**Donor:** Finnish Amateur Radio League

**Japan**
**JR5VHU (Oprs.: JR5VHU, JR5JAQ, JH5FIS, JH5FXP, JH5RXS, JA5JCC, JA5FDJ, JA5FBZ, JM1UWB)**
**Donor:** Ryozo Goto, JH3JYS

**CONTEST EXPEDITIONS**
**World Single Operator**
**HV500VR (Opr.: Carl Cook, AI6V)**
**Donor:** National Capitol DX Assn.
Stuart Meyer, W2GHK Memorial

**World Multi-Single**
**IF9A (Oprs.: IT9ATF, IT9NPR, IT9PPG, IT9WDC)**
**Donor:** Gail Schieber, K2RED

**World Multi-Multi**
**1A3A (Oprs.: C31CT, CT1DVV, CT1ESV, I4UFH, IK2NCJ, IK8UND, IV3SKB, IZ4AKS, IZ4DPV, IZ8CCW, IZ8FWN, YL2KL)**
**Donor:** Tachio Yuasa, JA9VDA

**Second place*

JR4DAH, Europe IK5RUN, Oceania YB2OK, South America PY2BN, Japan JR4DAH, and U.S. KR2Q.

### Assisted

If you want to increase your WPX and DXCC totals and have limited operating time or just want to help your club, the assisted category might be for you. The 2008 Assisted category will be interesting with availability of the skimmer or a skimmer-like tool. Use of this QSO spotting tool places you in the Assisted category. This will be the first time this new technology will be available in the CQ WW. You can help us develop a baseline for what a skimmer log looks like by joining the CQ WW skimmer project at <questions@cqww.com>. Let us know if you use this software in the 2008 CQ WW contests and what you thought of its usefulness under contest conditions. Thanks for helping out.

The number one Assisted score in the world came from Ilshat, RU9WX. Taking advantage of his location in Asia very near Europe, he racked up the largest total score in this category. World second place and the top European spot went to Serge, UT5UDX, operating from ERØWW. Third place world and second place Europe was taken by Andy, UU7J. Reprising the 2006 results, third place in Europe went to Philippe, LX2A, operating with his contest call LX7I. Mike, operating as FM/K9NW, must be mentioned as doing an outstanding job from a 2-point area. In the U.S., the Frankford Radio Club contesters took top honors. Rick, K3OO, won first place. He really made the difference in the QSO department. Second place went to perennial top finisher Charles, K3WW, while third place went to a Noah, K2NG. Special mention should be made of the great job turned in by: B7M, VR10XLN, JT1CO, V8FEO, NHØDX/KH2, ZL1BYZ, ZL3A, and CE4CT. Their enthusiasm gave many contesters the chance to work areas with limited activity.

The continental winners were: North America FM/K9NW, Africa 6W1SE, Asia RU9WX, Europe ERØWW, Oceania V8FEO (9M6DXX), South America LR2F, Japan JQ1BVI, and U.S. K3OO.

### Multi-Single

The Multi-Single category attracts the second largest group of individual contesters after low power. Usually about 1300 people take part worldwide. Getting together with new and old friends for a weekend of Formula 1 contest racing is what it is all about. The rush to find competitive locations in zone 33 also includes the Multi-Single category. Competition in this hotly contested category has always been fierce.

The winners from 2006 switched places in the 2007 competition. Perhaps positioning themselves for the hopefully soon to arrive new sunspot cycle, a multi-national team allowed CN3A to take world first place. What a great job they did. Less than 400,000 points behind the 2006 winner, the all French team operating as FY5YE on the French Guyana coast. Third place went to the Russian team on Cyprus using the call P33W. They were also #1 in Asia.

Multi-Single is very competitive within Europe. This year it was an all Croatian finish. The number one score went to Radio Club Porec, 9A1P. Second place went to the Varazdin Contest Team, 9A7A; what an antenna farm can be seen on its website. Third place in Europe went to the Croatian DX Club, 9A1A, located on a mountain ridge east of Zagreb. Here in the U.S., Ray's team at K9RS/3 led the way from eastern Pennsylvania. Second place was taken by team W3UA/1 located in lovely New Hampshire. As Gene says on his website, his call, W3UA, reminds him of his roots as a UA3. Third place went to Tom, K8AZ, located in the countryside of northeastern Ohio. Congratulations to AH2R. They continue to do an outstanding job from zone 27, and JA6ZPR was the top Multi-Single in Japan. Outstanding performances were turned in by many teams. Some of the rarer ones appearing in many logs were VQ9X, XU7MDY, B4R, BA4T, A71BX, 9K2HN, and ZM4A.

The continental winners were: North

America VP5DX, Africa CN3A, Asia P33W, Europe 9A1P, Oceania AH2R, South America FY5KE, Japan JA6ZPR, and U.S. K9RS/3.

## Multi-Two

Multi-Two is almost as much work as Multi-Multi. You need to have two stations manned all the time and move them correctly as the propagation changes. Doing this smoothly takes a skilled crew. AO8A was such a crew. The EA8, OH, and ES team members finished #1 in the world. Traveling down to HC8N finds the QTH of the world's #2 score. The HC8N QTH has always finished at the top or just after it. Finishing just a few QSOs behind was the all Slovakian team of C50C. It was a very nice to see their entry in the MM category. First place in Europe went to long-time top finisher IR4X. They have been having a good time on a mountaintop in central Italy for a very long time. Second place in Europe went to T93J. Their signal sure was booming into the U.S. It was also very nice to see T70A take third place in Europe. WE3C's station in eastern Pennsylvania has

## TOP SCORES

### WORLD
#### SINGLE OPERATOR
#### ALL BAND
8P5A....11,963,439
VY2ZM....9,571,348
P40W....8,447,550
CU2A....7,556,754
VC3J....7,361,332
P40PA....6,535,684
K5ZD/1....6,200,384
VC3A....6,160,480
M6T....6,149,240
PZ5XX....5,876,735

#### 28 MHz
LU1HF....675,610
ZW5B....533,006
LR4E....429,142
YM2W....383,990
PP5AMP....379,154
PY2YU....366,080

#### 21 MHz
ZX5J....2,265,642
4X2M....1,230,438
P43A....1,086,075
ZF2AH....805,250
YT0Z....811,944
ZC4LI....795,417

#### 14 MHz
CN4P....1,939,653
9Y4D....1,506,832
IG9R....1,416,354
4L6AM....1,363,154
S57AL....1,156,869
CT1JLZ....1,145,700

#### 7 MHz
9Y4W....906,696
S53F....847,134
EA8/OH4NL....772,412
OK5R....752,669
YT8A....575,688
F5FLN....452,751

#### 3.7 MHz
4L4WW....568,294
F6CTT....509,715
CN2FB....450,723
OE4A....426,528
OH0B....371,800
OK7M....320,952

#### 1.8 MHz
CN2R....268,300
CN2FF....207,466
SN3R....152,800
SO2R....146,775
LY2IJ....137,396
S57M....98,296

#### LOW POWER
#### ALL BAND
P40A....7,551,060
TA3D....5,695,606
HI3T....4,035,285
A45WD....3,398,140
5B/HA5PP....2,807,124
ZP0R....2,690,604
XE1CQ....2,680,610
CT6A....2,291,170
CN2BC....2,196,784
IZ2FOS....2,108,160

#### 28 MHz
PU2LSM....306,915
PY2CX....221,548
LU8EOT....212,990
EA8TX....176,072
PY2ZY....128,790
LU6FOV....110,482

#### 21 MHz
6V7G....1,178,590
ZD7X....796,095
HI3K....555,660
CO8LY....499,072
UX0FF....442,336
YE1AA....404,586

#### 14 MHz
9N7JO....830,825
T99W....696,608
HC1JQ....566,370
LZ9X....531,690
9A3B....508,698
AO6DD....440,564

#### 7 MHz
UZ7M....298,197
WP3C....274,281
T99D....208,361
IZ3FJZ....183,680
HI3CCP....164,400
SO6V....142,440

#### 3.7 MHz
UA9BA....88,400
YU0U....81,810
YO5KDX....70,798
YT8T....67,284
YU7W....68,338
LZ2JA....65,040

#### 1.8 MHz
YM0T....125,658
IO1T....85,262
4L2M....65,067
4O/DD5FZ....45,360
SP4XQN....43,026
UA2FT....28,917

#### QRP
#### ALL BAND
IK5RUN....504,878
KR2Q....385,528
KA1LMR....384,780
M3RCV....381,888
S59D....291,332
N0KE....256,520
RX1CQ....253,044
YP8A....240,160
EA3FF....237,744
JR4DAH....231,716

#### ASSISTED
#### ALL BAND
RU9WX....6,758,725
ER0WW....6,682,662
UU7J....6,669,255
FM/K9NW....6,622,850
LX7I....5,601,662
UT7QF....4,755,642
DK1MM....4,435,480
K3OO....4,385,310
HG3DX....4,125,438
HA8JV....4,074,828

#### MULTI-OPERATOR
#### SINGLE TRANSMITTER
CN3A....19,240,832
FY5KE....18,852,327
P33W....15,931,106
ZY7C....11,033,880
CQ3T....10,224,810
9A1P....10,226,322

#### MULTI-OPERATOR
#### TWO TRANSMITTER
AO8A....29,114,691
HC8N....27,743,450
C50C....27,630,123
PJ4E....18,789,080
IR4X....15,502,044
P3F....15,277,836

#### MULTI-OPERATOR
#### MULTI-TRANSMITTER
TS6A....27,154,904
CQ9K....25,935,957
V26B....20,678,280
K3LR....16,925,727
KC1XX....16,330,230
DR1A....16,111,326

### UNITED STATES
#### SINGLE OPERATOR
#### ALL BAND
K5ZD/1....6,200,384
NN3W....5,378,268
N1LI....4,883,592
K4ZW....4,715,200
K3CR....3,903,200
W3BGN....3,309,021
AA1K/3....3,095,859
W9RE....3,055,964
K5TR....2,864,180
K1TO/4....2,771,835

#### 28 MHz
W5PR....53,055
W2RR....13,240

#### 21 MHz
KU2M/3....693,680
N4BP....327,168
N5ZK....122,570
KC7V....66,123
W6SR....48,060
KI7DG....2,624

#### 14 MHz
K2XA....749,760
W7WA....733,894
N7DD....492,466
K4SSU....400,299
K1IM....295,152
W9NY....213,486

#### 7 MHz
N4PN....375,328
N5JB....71,190
KU8E/4....51,207
W0GJ....50,161
ND8DX....41,419
N6AN....40,964

#### 3.7 MHz
AA1BU....184,080
K3ZJ/8....49,777
K7ZV....35,506
WA4TII....32,476
K0KT....27,720
K4KZZ....26,080

#### 1.8 MHz
K3BU/8....37,179
W2VO....7,425
AA4MM....4,653
N6IG....2,220
WW2DX....2,210
K4ADR....1,740

#### LOW POWER
#### ALL BAND
K1BX....1,634,500
N1UR....1,364,270
N5AW....1,094,904
N4TZ/9....1,058,293
K3TC....869,000
K2PS....828,714
KU1CW/0....815,760
N1PGA....681,264
W1JQ....636,870
W4TAA....588,848

#### 28 MHz
W5DJT....5,760
W4GRW....3,660
AA5JG....2,929
N1HRF....1,950
KC8IMB....592
W6GMT....324

#### 21 MHz
W3/T98T....152,064
KK1KW....140,790
N1NK....112,100
K5FP....106,148
N4IJ/5....103,912
K4SQR....82,080

#### 14 MHz
K2MFY....164,970
N4MO....126,630
N4DL....119,560
W7FP....102,297
W4LC....91,271
N3GH....74,900

#### 7 MHz
W4EEH....35,020
WA0KDS/7....16,900
KE2SD....5,658
NR8U....1,050

#### 3.7 MHz
K2YEH....18,881
K8DO....14,674
KU4BP....3,096
WA6WPG....624

#### QRP
#### ALL BAND
KR2Q....385,528
KA1LMR....384,780
N0KE....256,520
N1TM....111,370
W6QU....104,958
K8ZT....103,713
KB3TS....102,884
ND0C....89,265
KT8K....46,690
WB0IWG/3....35,520

#### ASSISTED
#### ALL BAND
K3OO....4,385,310
K3WW....3,691,752
K2NG....3,565,082
W4WTB....3,206,060
WB9Z....2,572,647
KQ3F....2,228,880
W1GD/2....2,199,036
N4WW....2,149,035
AA3B....2,145,220
N8TR....1,914,864

#### MULTI-OPERATOR
#### SINGLE TRANSMITTER
K9RS/3....4,504,524
W3UA/1....3,963,246
K8AZ....3,372,811
K5NA....3,186,414
K3EST/4....3,071,442
N1MM....2,672,544

#### MULTI-OPERATOR
#### TWO TRANSMITTER
WE3C....8,799,505
KI1G....5,689,680
W4RM....4,864,384
N2RM....3,993,606
K2LE/1....3,239,991
W1HH....2,917,830

#### MULTI-OPERATOR
#### MULTI-TRANSMITTER
K3LR....16,925,727
KC1XX....16,330,230
W3LPL....12,533,290
NQ4I....8,689,920
K1TTT....8,090,907
W3PP....5,391,372

### EUROPE
#### SINGLE OPERATOR
#### ALL BAND
CU2A....7,556,754
M6T....6,149,240
4O3A....5,825,955
ES5TV....5,564,372
S50A....5,129,305
T93M....4,750,070
MI0LLL....4,656,816
EA4KR....4,481,695
GW4BLE....3,989,718
OF8X....3,698,400

#### 28 MHz
T93O....189,588
S58D....171,360
G0AEV....120,119
S57S....97,328
CU2AF....50,150
IT9YVO....26,432

#### 21 MHz
YT0Z....811,944
E7/DK6XZ....732,540
9A4W....636,216
S53MM....627,669
YT3M....617,091
IZ8DPL....487,859

#### 14 MHz
S57AL....1,156,869
CT1JLZ....1,145,700
S50K....1,135,134
YT9A....989,800
OH0R....880,230
YT1BB....873,318

#### 7 MHz
S53F....847,134
OK5R....752,669
YT8A....575,688
F5FLN....452,751
SN8R....285,868
RU4SS....225,862

#### 3.7 MHz
F6CTT....509,715
OE4A....426,528
OH0B....371,800
OK7M....320,952
YT3A....249,472
LN9Z....195,676

#### 1.8 MHz
SN3R....152,800
SO2R....146,775
LY2IJ....136,612
S57M....98,296
DF2UU....52,041
YO5OEF....40,880

#### LOW POWER
#### ALL BAND
CT6A....2,291,170
IZ2FOS....2,108,160
OM5CD....1,671,056
F4BKV....1,568,043
LY9A....1,499,496
IS0/K7QB....1,443,520
G4BUO....1,329,525
S51F....1,158,968
YO3FRI....1,091,222
UR5FEL....1,001,728

#### 28 MHz
IW0HBY....87,344
LZ1ND....82,418
SP3LWP....54,720
DH8BQA....54,004
EA6DX....53,406
LZ1NG....48,149

#### 21 MHz
UX0FF....442,336
4N7N....400,225
OM5XX....247,500
EH7R....239,444
RA6YY....201,465
SO9L....189,696

#### 14 MHz
T99W....696,608
LZ9X....531,690
9A3B....508,698
AO6DD....440,564
IQ8OM....394,267
EA7TN....357,700

#### 7 MHz
UZ7M....298,197
T99D....208,361
IZ3FJ....183,680
SO6V....142,440
SN3X....112,454
ES7GM....96,459

#### 3.7 MHz
YU0U....81,810
YO5KDX....70,798
YU7W....68,338
YT8T....67,284
LZ2JA....65,040
S56Y....58,598

#### 1.8 MHz
IO1T....85,262
4O/DD5FZ....45,360
SP4XQN....43,026
UA2FT....28,917
YZ8A....25,862
UA6AIW....14,490

#### QRP
#### ALL BAND
IK5RUN....504,878
M3RCV....381,888
S59D....291,332
RX1CQ....253,044
YP8A....240,160
EA3FF....237,744
DF1DX....218,790
HA6IAM....218,595
YO3APJ....192,185
EA1GT....160,752

#### ASSISTED
#### ALL BAND
ER0WW....6,682,662
UU7J....6,669,255
LX7I....5,601,466
UT7QF....4,755,642
DK1MM....4,435,480
HG3DX....4,125,438
HA8JV....4,074,828
S57DX....3,807,725
TM7F....3,774,157
DL0W....3,255,530

#### MULTI-OPERATOR
#### SINGLE TRANSMITTER
9A1P....10,226,322
9A7A....9,535,840
9A1A....9,189,582
HG6N....9,027,640
OM8A....8,579,935
EI7M....8,101,730

#### MULTI-OPERATOR
#### TWO TRANSMITTER
IR4X....15,502,044
T93J....10,662,225
T70A....7,075,504
DQ4W....6,157,164
EE2W....5,936,068
OM0M....5,215,804

#### MULTI-OPERATOR
#### MULTI-TRANSMITTER
DR1A....16,111,326
DF0HQ....14,486,344
TM6M....12,314,808
1A3A....12,240,173
OT5A....11,060,052
LZ9W....10,229,700


*Vinko, S53F, finished #1 Europe 7 MHz, #2 world.*

made a big splash. We think we will hear a lot more from WE3C. Second place went to the Rhode Island powerhouse of KI1G. Third place in the U.S. again went to the central Virginia team at W4RM. There were several stations that put rare multipliers on the air and made big scores: 3DAØWW, EKØB, B4B, B3C, VR2C, P3F, and 4XØC. Good job.

The continental winners were: North America WE3C, Africa AO8A, Asia P3F, Europe IR4X, Oceania AH6XX, South America HC8N, Japan JA1YPA, and U.S. WE3C.

### Multi-Multi

Entering the Multi-Multi category is always a challenge. Finding a suitable place to set up a fully integrated MM is no easy task. Months of planning the station site, gathering operators together, and waiting to see what nature deals you makes for a combination of satisfaction and excitement.

The world top position in this difficult category went to TS6A. Stepping up from last year's M2 effort to MM was successfully accomplished by this fine team. Several of the team's members have put 3V on the air before, and they put their knowledge to good use. Another zone 33 station, CQ9K, put up a very big score to take second place world. A lot of hard work, months and months of planning, paid off. The sixteen operators included ten CT3s! Their location overlooking the ocean sure helped their fine effort. Finishing in the third position in the world was perennial North American champion V26B. What a great job this long-running competitor always puts together.

The battle of the MM super stations in the U.S. is always push, push, and push some more. Tim's crew at K3LR again broke into the world top ten as #4. The competition in the U.S. for MM is really a fierce, friendly fight. K3LR made all the right moves and that was enough to edge out KC1XX and take the U.S. Multi-Multi crown. In second place was Matt's team, KC1XX, in southern New Hampshire, and in third place was Frank's crew, W3LPL, in central Maryland.

The German team at DR1A again talked their way to the number one position in Europe. What a splendid effort they always put in. The competition between DR1A and DFØHQ is a *real* fight. Second place

*Stig, 9N7JO, came in #1 world 14 MHz.*

## TOP SCORES IN MOST ACTIVE ZONES

**ZONE 3**

K7RL.....1,650,724
K6NA.....1,193,959
K5RR/7.....1,107,645
K6XX.....871,500
W6PH.....782,000
W7WA.....733,894
WA7LT.....513,360
N7DD.....492,466
VE7SZ.....481,217
N7TT.....417,196

**ZONE 4**

W9RE.....3,055,964
K5TR.....2,864,180
N2IC/5.....2,712,103
KØKX.....1,346,345
KØSR.....1,114,990
*N5AW.....1,094,904
N8BI.....1,042,389
N4TZ/9.....1,058,293
WD5K.....1,008,000
W8MJ.....1,042,389

**ZONE 5**

K5ZD/1.....6,200,384
NN3W.....5,378,268
N1LI.....4,883,592
K4ZW.....4,715,200
K3CR.....3,903,200
W3BGN.....3,309,021
AA1K/3.....3,095,859
K1TO/4.....2,771,835
N2LT.....2,569,716
K3ZO.....2,441,664

**ZONE 14**

CU2A.....7,556,754
M6T.....6,149,240
MIØLLL.....4,656,816
EA4KR.....4,481,695
GW4BLE.....3,989,718
GM7V.....3,630,468
DJ8OG.....3,572,475
EA4KD.....3,359,840
DJ4PT.....3,015,408
ON9CMV.....2,994,176

**ZONE 15**

4O3A.....5,825,955
ES5TV.....5,564,372
S50A.....5,129,305
T93M.....4,750,070
OF8X.....3,698,400
SO6X.....2,576,146
II4A.....2,227,350
IZ2FOS.....2,108,160
LY9Y.....1,971,327
OF4R.....1,874,740

**ZONE 16**

RW1AC.....3,590,958
UT5UGR.....2,806,695
US5D.....2,132,268
RG3K.....2,004,367
RS3A.....1,950,984
UA4FER.....1,720,251
RN4AA.....1,373,982
RN3ZC.....1,339,104
*UR5FEL.....1,001,728
*RV6LFE.....826,896

**ZONE 20**

*TA3D.....5,695,606
*5B/HA5PP.....2,807,124
SV9GPV.....2,120,560
YR1C.....1,422,672
4X2M.....1,230,438
*YO3FRI.....1,091,222
LZ5A.....894,250
*YO3CZW.....816,928
*LZ9X.....531,690
YM2W.....383,990

**ZONE 25**

JH4UYB.....2,585,024
JF2QNM.....1,040,514
JA2PAC.....1,007,760
JA7NVF.....818,496
JI2KXK.....599,297
JR3NZC.....488,128
JS3CTQ.....464,677
JA1ELY.....463,710
JF1LFX.....460,965
JR7WAB.....451,470
*Low Power

*Peter, K2PS, was the top Low Power All Band entrant from 2-land.*


*Jerry, WB9Z, always does well in the CQ WW contest.*


in Europe was taken by the well-known club station of DFØHQ. Third place in Europe went to the French team operating from TM6M.

The Chinese teams of B7P and B1Z made a big effort which allowed many contesters to log a new one. The mountaintop QTH of JR5VHU showed its muscle by taking first in Japan, edging out JA3YBK. Over in Europe, 1A3A was a new one for thousands. This was the first activation of the Sovereign Order of Malta in the CQ WW.

The continental winners were: North America V26B, Africa TS6A, Asia JR5VHU, Europe DR1A, Oceania KH7X, South America YV4A, Japan JR5VHU, and U.S. K3LR.

### New Records

Take a look at the record list at the CQWW.com site. You might find that you have a chance to take on the personal challenge of going for a new record. If you discover an error in the record list, please document it and let us know at <questions @cqww.com>. Below are the outstanding efforts of super operators which resulted in setting new SSB records during the 2007 contest. Congratulations to all!

**World:** L1.8 YMØT (TA2RC); Q7 KP4KE; A3.7 OM5M; A7 ZL3A. **North America:** Q7 KP4KE; A7 FM5FJ. **Africa:** None. **Asia:** 3.7 4L4WW; LA TA3D; L14 9N7JO (LA7JO); L1.8 YMØT (TA2RC); Q7 4X/UU4JKY; A7 RW9USA; A1.8 RN9AA; M2 P3F. **Europe:** 3.7 F6CTT; 1.8 SN3R; L7 UZ7M; L1.8 IO1T; A3.7 OM5M. **Oceania:** 3.7 KH7B (K4XS); A7 ZL3A. **Japan:** 3.7 JH1OGC. **U.S.:** A7 NX5M

### Team Contesting

Five contesters from anywhere in the world can join together to form a team. The number 1 team was aptly named Widespread Panic—probably panicked about the conditions, but not to worry, as the CQWW creates its own propagation. Four-fifths of the team was from North America. Second place went to the LU Contest Group. They really had an international team. Third place went to the boys from Finland operating as Contest Club Finland, Team Mannerheim. Besides sending a FAX (516-681-2926) or snail mail to *CQ*, you can submit your team list to <teams@cqww.com>. You will receive an acknowledgement.

**1. Widespread Panic:** P40PA (W4PA), 8P5A (W2SC), VY2ZM (K1ZM), FM/K9NW, K4ZW, **39,408,521**.

**2. LUCG #1:** P40W (W2GD), KG6DX, LT1F (LU1FAM), LR2F (LU5DX), CX6VM, **22,834,241**.

**3. Contest Club Finland, Team Mannerheim:** PZ5XX (OHØXX), OF4R (OH4JFN), OF6NIO (OH6NIO), OF8X (OH6UM), CU2A (OH2UA), **20,374,312**.

**4. Carolina DX Association:** AA4S, KZ2I/4, N4PQX, W3OA/4, W4WTB, **7,656,542**.

**5. KTU RC:** LY1R, LY4T, LY6A, LY9A, **3,477,352**.

**6. VKCC Koalas:** VK6DXI, VK3TZ, 9M2CNC, VK4EMM, **2,368,241**.

**7. Contest Group du Quebec:** VE2XAA, VA2WDQ, VE2AWR, VE2HIT, VA2SG, **1,063,173**.

**8. KOTA Group:** DO1YCL, DC2YY, DL1REM, **984,346**.

### Special Mention

Among the 286 countries on the air for the CQ WW weekend were the following stations, many of which you may have logged. They were just some of the rare stations that made the contest more interesting for everyone by going on DXpeditions or providing rare callsigns. They are: 1A3A, 3A2MG, 3B8GT, 3DAØWW, 3V8SS, 4O3A, 4K9W, 4L6AM, 4L2M, 4O/DD5FZ, 4U1WRC, 4XØC, 4XØM, 4X2M, 5B/HA5PP, 5C5W, 5H3EE, 5K4C, 5R8FU, 5Z4/YT1CS, 6V7G, 6W1RY, 6W1SE, 6Y1V, 7XØRY, 8P5A, 9K2HN, 9K2K, 9M2CNC, 9M2GCN, 9M4DXX, 9M6LSC, 9M6NA, 9M8YY, 9N7JO, 9V1DE, A35RK, A45WD, A52K, A61C, A61HH, A71BX, AF7DX/KH2, AH2R, AO8A, B1Z, B4R, B7M, B7P, BA4T, BV2B, BX5AA, C31LJ, C4I, C4M, C50C, C6APR, C6AQW, CCØY, CN2FB, CN2FF, CN2R, CN3A, CN4P, CQ3T, CQ9T, CT9L, CU2A, D9K, DX1DBT, E21EIC, E51NOU, ED5ON/EA6, EKØB, FM/K9NW, FS/K1XM, FY5YE, HBØ/HB9AON, HC8N, HH2FYD, HI3CCP, HI3T, HQ9R, HSØZDG, HV5PUL, HV50VR, HZ1GW, IF9A, IG9R, IMØ/ IKØFMB, IR8Y, ISØ/IQØAL, ISØ/K7QB, IU9A, J3A, J88DR, JD1BIA, JT1DA, JT1VV, JU1F, LX/LY3Z, LX8M, MD9Y, MMØXAU, MUØFAL, MUØGSY, NHØDX/NH2, OHØ/ SP7VC, OHØB, OHØJFP, OHØR, P33W, P3F, P3J, P40A, P40PA, P40W, PJ2T, PJ4E, PZ5XX, ST2M, SU8BHI, SV9COL, SV9GPV, SX5P, T48K, T6EE, T70A, TA1CM, TA2IB, TA3D, TA7KA, TF3AM, TF8GX, TI5N, TS6A, TT8HA, UK9AA, V26B, V4/NE1RD, V47KP, V51YJ, V8AQM, V8FEO, VP2MDG, VP5DX, VP5T, VP8CXV, VP9I, VQ9X, VR10XMT, VR2C, VR2DS, VU2PTT, VU2SWS, VU3DJQ, WH2D, WP2/AH8DX, WP2Z, XR6T, XU7MDY, XV1X, XW1A, XW3DT, YM2W, YMØT, XX9AU, ZA/IW2JOP, ZB2FK, ZB3B, ZC4LI, ZD7X, ZD8N, ZF2AH, ZL7/DL2AH, ZM4A, and ZS9X.

Congratulations to China for hosting the 2008 summer Olympic

LDG ELECTRONICS

# The #1 Line of Autotuners

*radio not included*

## AT-897 for the Yaesu FT-897

If you own a Yaesu FT-897 and want a broad range automatic antenna tuner, look no further! The AT-897 Autotuner mounts on the side of your FT-897 just like the original equipment. We even added the ability to mount the "feet" on the side of the tuner so when you're transporting your rig by the handle, you can safely set it down and not worry about scratching the case. The AT-897 takes power directly from the CAT port of the FT-897 and provides a second CAT port on the back of the tuner so hooking up another CAT device couldn't be easier. ***Suggested PriceS199***

## NEW! AT-1000Pro

Building on the success of the AT-1000, LDG Electronics has refined and expanded its 1KW tuner. The AT-1000Pro has an Automode that automatically starts a tuning cycle when the SWR exceeds a limit you set. Other features include:

- Operates at any power level between 5 and 1,000 watts peak. RF Relay protection software prevents tuning at greater than 125 watts.
- 2 Antenna connections
- Tunes from 1.8 to 54.0 MHz (inc. 6 meters)
- Tuning time usually under 4 seconds, transmitting near a frequency with stored tuning parameters, under 0.2 seconds.
- 2000 memories.
- All cables included.

***Suggested Price $599***

## AT-100Pro

This desktop tuner covers all frequencies from 1.8 – 54 MHz (including 6 meters), and will automatically match your antenna in no time. It features a two-position antenna switch, allowing you to switch instantly between two antennas. The AT-100Pro requires just 1 watt for operation, but will handle up to 125 watts. All cables included.

***Suggested Price $219***

## Z-11Pro

The original portable Z-11 was one of LDG's most popular tuners, accompanying adventurous hams to their backyards, or to the ends of the earth. Now meet the Z-11Pro, everything you always wanted in a small, portable tuner. Designed from the ground up for battery operation. Only 5" x 7.7" x 1.5", and weighing only 1.5 pounds, it handles 0.1 to 125 watts, making it ideal for both QRP and standard 100 watt transceivers from 160 - 6 meters.

"With 8,000 memories in LDG's exclusive "3-D Memory" array, the Z-11Pro uses LDG's state-of-the-art processor-controlled Switched-L tuning network. It will match dipoles, verticals, inverted-Vs or virtually any coax-fed antenna. With an optional LDG balun, it will also match longwires or antennas fed with ladder-line. All cables included. ***Suggested Price $179***

## AT-200Pro

The AT-200 features LDG's new "3-D memory system" allowing up to eight antenna settings to be stored for each frequency. Handles up to 250 watts SSB or CW on 1.8 – 30 MHz, and 100 watts on 54 MHz (including 6 meters). Rugged and easy-to-read LED bar graphs show power and SWR, and a function key on the front panel allows you to access data such as mode and status. All cables included. ***Suggested Price $249***

*radio not included*

## AT-7000

The AT-7000 is the ideal tuner for IC-7000 & other Icom Radios: Covers all frequencies from 1.8–54 MHz (including 6 meters), and will automatically match your antenna. Requires just 0.1W for operation, but will handle up to 125W (100 W on 6 m), making it suitable for everything from QRP (IC- 703 Plus) to a typical 100 W Icom transceiver. All cables included. ***Suggested Price $169***

## Z-100

Designed from the ground up to provide 100 watt power handling in a small, lightweight package. Perfect for portable as well as sitting on your desk in your shack! The Z-100 will tune with 0.1 to 125 watts (50 watts on 6 meters), making it an excellent choice for almost any radio or operating style. Backpackers and QRP operators will appreciate the latching relays. Power can be removed from the tuner once you have tuned. Additionally, when it's not tuning, it draws nearly zero amps. ***Suggested Price $149***

***Call or visit your favorite dealer today!***

**Visit www.ldgelectronics.com for a complete dealer list.**

**LDG Electronics, Inc.**
1445 Parran Road
St. Leonard, MD 20685
Phone 410-586-2177
Fax 410-586-8475

LDG

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

**Number groups indicate: QSOs/Zones/Countries on each band**

### WORLD TOP SINGLE OPERATOR ALL BAND

| Station | 160 | 80 | 40 | 20 | 15 | 10 |
|---|---|---|---|---|---|---|
| 8P5A | 262/14/38 | 777/21/82 | 1153/29/104 | 2093/30/123 | 2499/27/100 | 924/22/71 |
| VY2ZM | 498/17/75 | 523/20/81 | 751/26/97 | 2109/32/111 | 1868/27/111 | 23/12/19 |
| P4ØW | 147/12/29 | 519/22/79 | 593/24/87 | 1343/28/101 | 1851/26/97 | 1018/19/42 |
| CU2A | 213/10/49 | 512/22/83 | 1011/21/87 | 1697/36/117 | 2601/30/112 | 168/15/ 51 |
| VC3J | 238/13/28 | 629/22/76 | 485/24/77 | 1789/34/129 | 1706/28/115 | 214/12/28 |
| P4ØPA | 27/5/10 | 430/19/55 | 404/16/61 | 1529/24/88 | 2026/21/87 | 852/18/42 |
| K5ZD/1 | 73/11/39 | 264/20/84 | 320/22/81 | 1590/38/124 | 1275/26/112 | 103/13/38 |
| VC3A | 237/9/23 | 633/18/66 | 595/22/75 | 1712/33/126 | 1220/25/111 | 162/12/34 |
| M6T | 207/14/52 | 1073/24/92 | 549/25/90 | 1485/37/112 | 1385/34/122 | 282/15/63 |
| PZ5XX | 23/9/17 | 192/17/38 | 408/25/79 | 722/29/100 | 1946/28/110 | 604/21/72 |

### USA TOP SINGLE OPERATOR ALL BAND

| Station | 160 | 80 | 40 | 20 | 15 | 10 |
|---|---|---|---|---|---|---|
| K5ZD/1 | 73/11/39 | 264/20/84 | 320/22/81 | 1590/38/124 | 1275/26/112 | 103/13/38 |
| NN3W | 59/12/33 | 241/20/71 | 550/25/91 | 1346/34/132 | 1076/26/111 | 98/11/36 |
| N1LI | 65/11/37 | 374/22/84 | 259/24/78 | 1330/31/111 | 967/23/107 | 119/13/33 |
| K4ZW | 45/9/27 | 287/20/80 | 456/25/86 | 1149/34/113 | 1069/25/100 | 79/12/29 |
| K3CR | 53/13/32 | 305/18/74 | 199/22/71 | 1035/34/112 | 921/25/94 | 107/15/34 |
| W3BGN | 65/13/42 | 205/22/76 | 181/22/61 | 964/32/103 | 821/25/96 | 72/8/23 |
| AA1K/3 | 43/9/26 | 150/19/57 | 171/20/59 | 795/28/105 | 1068/24/103 | 72/10/27 |
| W9RE | 51/13/30 | 178/20/64 | 260/24/82 | 803/29/115 | 741/28/105 | 93/14/39 |
| K5TR | 19/9/15 | 140/19/53 | 357/28/79 | 494/26/90 | 1300/32/110 | 124/14/42 |
| K1TO/4 | 25/7/19 | 171/15/51 | 325/24/77 | 870/27/105 | 949/30/99 | 30/7/10 |

### WORLD MULTI-OPERATOR SINGLE TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| CN3A | 69/10/60 | 761/23/102 | 1161/27/108 | 2266/38/145 | 3826/35/145 | 362/23/90 |
| FY5KE | 188/14/58 | 533/24/88 | 958/32/118 | 1824/35/144 | 3125/33/138 | 1554/23/100 |
| P33W | 393/12/69 | 760/22/99 | 1370/27/115 | 1806/32/141 | 2545/33/140 | 620/16/72 |
| ZY7C | 49/9/28 | 417/22/87 | 692/27/90 | 1469/33/131 | 3220/31/126 | 141/17/59 |
| CQ3T | 28/6/24 | 333/18/86 | 732/22/83 | 1550/34/121 | 3211/30/124 | 52/18/52 |
| 9A1P | 312/15/76 | 919/21/98 | 1036/31/123 | 2158/38/153 | 1619/36/154 | 511/24/104 |

### USA MULTI-OPERATOR SINGLE TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| K9RS/3 | 53/12/37 | 298/23/82 | 173/23/83 | 1183/33/123 | 966/29/128 | 71/13/36 |
| W3UA/1 | 27/10/21 | 201/22/77 | 231/25/88 | 1457/34/129 | 586/24/118 | 32/11/32 |
| K8AZ | 33/12/30 | 149/25/78 | 200/26/91 | 686/36/133 | 803/30/126 | 117/16/44 |
| K5NA | 22/12/20 | 114/24/66 | 316/28/87 | 502/36/128 | 1078/31/123 | 171/18/54 |
| K3EST/4 | 36/8/23 | 111/20/64 | 360/21/85 | 1257/33/126 | 454/24/100 | 24/11/23 |
| N1MM | 28/7/17 | 148/18/61 | 258/25/90 | 595/31/126 | 596/25/119 | 134/14/41 |

### WORLD MULTI-OPERATOR TWO TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| AO8A | 173/11/57 | 1248/24/105 | 2017/30/114 | 3022/37/150 | 4777/34/150 | 852/24/107 |
| HC8N | 205/14/32 | 1113/27/97 | 1785/31/121 | 2752/34/137 | 4627/34/138 | 2155/25/85 |
| C5ØC | 135/11/47 | 816/22/89 | 1977/31/108 | 2463/38/153 | 4750/37/151 | 1896/23/107 |
| PJ4E | 176/12/28 | 746/21/68 | 1853/30/108 | 2704/35/133 | 3326/31/130 | 1206/21/63 |
| IR4X | 150/10/61 | 1063/25/104 | 1718/33/131 | 3108/39/155 | 2589/38/157 | 476/23/103 |
| P3F | 349/9/62 | 729/17/84 | 1767/35/126 | 1804/36/125 | 2414/33/141 | 431/18/75 |

### USA MULTI-OPERATOR TWO TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| WE3C | 71/15/51 | 627/25/101 | 656/26/103 | 1812/37/145 | 1319/27/129 | 115/14/42 |
| KI1G | 53/10/33 | 297/21/81 | 293/24/86 | 1499/31/126 | 1095/27/125 | 157/16/48 |
| W4RM | 56/12/33 | 372/23/85 | 516/25/94 | 1311/33/127 | 670/27/114 | 135/12/38 |
| N2RM | 21/7/14 | 123/20/62 | 179/22/69 | 1406/30/115 | 1047/26/118 | 95/11/33 |
| K2LE/1 | 25/9/18 | 154/19/68 | 323/25/95 | 929/34/134 | 570/25/118 | 126/16/40 |
| W1HH | 34/10/17 | 307/21/83 | 248/24/85 | 821/30/117 | 628/25/120 | 57/11/27 |

### WORLD MULTI-OPERATOR MULTI-TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| TS6A | 446/11/75 | 1714/24/96 | 1832/32/118 | 3545/36/140 | 3060/36/134 | 1166/22/88 |
| CQ9K | 229/13/70 | 951/24/102 | 1904/34/128 | 2709/37/145 | 3998/34/150 | 818/26/110 |
| V26B | 315/12/42 | 1492/24/97 | 2134/26/113 | 3261/33/133 | 3705/29/117 | 1416/24/71 |
| K3LR | 392/18/60 | 1015/28/105 | 1277/32/123 | 3273/39/169 | 2018/32/146 | 369/20/61 |
| KC1XX | 231/15/50 | 862/28/110 | 894/28/109 | 3257/39/168 | 2365/28/147 | 353/20/63 |
| DR1A | 940/11/76 | 2133/25/110 | 2395/34/136 | 3059/39/154 | 1836/35/155 | 905/22/106 |

### USA MULTI-OPERATOR MULTI-TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| K3LR | 392/18/60 | 1015/28/105 | 1277/32/123 | 3273/39/169 | 2018/32/146 | 369/20/61 |
| KC1XX | 231/15/50 | 862/28/110 | 894/28/109 | 3257/39/168 | 2365/28/147 | 353/20/63 |
| W3LPL | 309/17/62 | 844/24/104 | 1144/29/121 | 2355/39/153 | 1660/32/139 | 256/18/56 |
| NQ4I | 128/13/33 | 432/26/95 | 706/29/110 | 1986/38/144 | 1477/32/137 | 251/19/54 |
| K1TTT | 234/13/43 | 700/25/99 | 689/27/104 | 1804/36/143 | 1112/27/125 | 308/20/57 |
| W3PP | 78/13/37 | 228/21/74 | 389/25/92 | 931/31/125 | 1447/26/128 | 201/16/48 |

Games and providing a record number of stations on the air during the 2007 contest. We hope the number continues to grow. Please check out the dramatic increase in activity from China, Indonesia, Thailand, and all of Europe.

### Comments

Conditions were far from excellent for the contest. In spite a very limited 10-meter band, as was mentioned in the introduction, the number of entrants in the SSB contest set an all time high! In the 2007 CQ WW SSB test 4862 electronic log submissions were received! Almost all were submitted perfectly, without our help. Your continued submission of an electronic log allows for a more detailed data base and fairer adjudication.

Your UBN/NIL report this time will look a little different. We have tried to simplify it. It still contains all the information which will allow you to improve your operating skills. In addition, we have again provided open logs so that you can learn about propagation and how the top scores do their operating. There is an added reason to submit an electronic log. We have a copy in case you suffer a computer failure. Last year we helped four contesters retrieve their lost log. Our thanks to all the entrants who took taken the time to create a successful electronic submission.

Submitting an electronic log is easy. Send your SSB log and summary to <ssb@cqww.com> (CW to <cw@cqww.com>). Please send your log in Cabrillo format. Remember to name your file with your call with .cbr extension—e.g, A45WD.cbr. If you did everything OK, you will get back an acknowledgment. If there was something wrong, you will get a message telling you what to do to correct the error. The messages are presented in numerous languages. If you don't see your language and you would be willing to help out by translating for your fellow countrymen, please contact us, or if you are having submission problems, we can help you at <questions@cqww.com>. It bears repeating that if you make a mistake on your first submission, you can resubmit your log. It will replace the first submission.

If you have the capability with your logging program, please submit a log with exact frequencies. Exact frequencies help in the log checking and help with statistical analysis of band openings.

It is an exciting time in contesting. There have been recent advances in remote radio control and CW decoding software. Both of these interesting advancements will surely impact future contesting. Remote radio control is already addressed by the present rules: The operator can be anywhere, but the station must comply with the distance rule—i.e., all receivers, transceivers, and antennas must comply with Rule III. Remote radio control offers a new window of opportunity for radio stations located anywhere to make their stations available to apartment/city-bound contesters. Who knows? Someday you may be able to operate remotely from the Caribbean without leaving your condominium in London! Computer decoding of CW, aka skimmer, will be addressed in next month's CW results and in the 2008 rules.

You can help us a great deal by double-checking your Cabrillo submission. Please make sure the correct category is indicated and the call you used in the contest is shown. If you submit a single-band entry, please check to see that your chosen entry matches what is in your log. A lot of time is spent correcting these potential "not in log" problems. The CQ WW has few requirements: Write down the callsign of the station you are talking to, claim the correct category, and do not self-spot. It's not hard.

### Thanks

The CQ WW Contest Committee wants to thank all the entrants who make the CQ WW *the* event each year. It is because of you that the CQ WW is so much fun. The CQWWCC tries to assure that the results are true and accurate. This work is accomplished by lots of people on the committee. The members of the CQWWCC provid-

## EUROPE TOP SINGLE OPERATOR ALL BAND

| Station | 160 | 80 | 40 | 20 | 15 | 10 |
|---|---|---|---|---|---|---|
| CU2A | 213/10/49 | 512/22/83 | 1011/21/87 | 1697/36/117 | 2601/30/112 | 168/15/51 |
| M6T | 207/14/52 | 1073/24/92 | 549/25/90 | 1485/37/112 | 1385/34/122 | 282/15/63 |
| 4O3A | 234/11/56 | 640/19/82 | 597/27/97 | 1721/32/116 | 1402/35/121 | 450/15/70 |
| ES5TV | 487/12/64 | 637/21/88 | 1157/30/116 | 1984/39/129 | 1128/27/104 | 188/11/51 |
| S50A | 163/10/59 | 528/16/70 | 1126/33/113 | 1071/37/113 | 1283/30/102 | 153/15/57 |
| T93M | 251/9/54 | 462/12/66 | 747/21/86 | 1645/32/104 | 1327/31/102 | 491/17/65 |
| MIØLLL | 278/12/54 | 542/17/79 | 674/24/90 | 1327/29/109 | 1317/24/100 | 245/7/39 |
| EA4KR | 24/3/20 | 331/16/71 | 674/23/81 | 1659/30/104 | 932/31/94 | 371/14/48 |
| GW4BLE | 103/5/45 | 576/14/66 | 617/20/83 | 1245/29/99 | 1046/23/80 | 215/13/52 |
| OF8X | 171/8/49 | 307/18/65 | 460/23/84 | 2110/35/109 | 444/22/85 | 147/6/32 |

## EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| 9A1P | 312/15/76 | 919/21/98 | 1036/31/123 | 2158/38/153 | 1619/36/154 | 511/24/104 |
| 9A7A | 195/11/70 | 931/23/103 | 1013/32/121 | 2190/39/149 | 1593/37/152 | 386/21/98 |
| 9A1A | 257/12/71 | 906/19/100 | 905/28/121 | 1720/36/146 | 1671/37/151 | 800/26/112 |
| HG6N | 361/12/68 | 818/20/96 | 983/30/128 | 2280/38/147 | 1662/37/151 | 244/19/93 |
| OM8A | 223/14/67 | 526/28/100 | 1030/33/127 | 1903/38/158 | 1606/37/156 | 325/18/89 |
| EI7M | 257/12/58 | 765/20/95 | 759/28/111 | 2342/36/141 | 1965/30/131 | 319/20/72 |

## EUROPE MULTI-OPERATOR TWO TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| IR4X | 150/10/61 | 1063/25/104 | 1718/33/131 | 3108/39/155 | 2589/38/157 | 476/23/103 |
| T93J | 465/11/67 | 1130/22/92 | 1462/32/113 | 2334/38/147 | 2364/36/147 | 617/17/83 |
| T7ØA | 484/8/57 | 1408/16/80 | 1823/25/106 | 1700/33/114 | 1948/32/117 | 753/10/54 |
| DQ4W | 302/8/59 | 682/17/84 | 997/31/114 | 1755/39/142 | 975/35/132 | 323/18/75 |
| EE2W | 307/10/56 | 849/20/90 | 685/28/103 | 1790/35/126 | 1368/34/128 | 591/15/56 |
| OMØM | 284/12/61 | 487/20/88 | 822/30/117 | 1409/36/129 | 1156/38/142 | 449/15/60 |

## EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

| | | | | | | |
|---|---|---|---|---|---|---|
| DR1A | 940/11/76 | 2133/25/110 | 2395/34/136 | 3059/39/154 | 1836/35/155 | 905/22/106 |
| DFØHQ | 925/14/75 | 1797/24/105 | 2804/36/136 | 2817/40/168 | 1634/35/157 | 814/23/113 |
| TM6M | 423/9/55 | 1214/22/101 | 1917/28/115 | 2975/38/144 | 1768/32/137 | 898/21/90 |
| 1A3A | 649/6/60 | 1398/17/90 | 2930/30/117 | 3315/36/141 | 2349/33/137 | 1201/19/83 |
| OT5A | 952/12/70 | 1972/21/90 | 2131/36/126 | 2519/39/151 | 1126/30/121 | 902/22/95 |
| LZ9W | 582/9/64 | 997/21/95 | 2054/33/130 | 2434/34/139 | 2362/36/130 | 538/23/79 |

ing their expertise are K1DG, K1AR, K3LR, K3WW, K3ZO, K5ZD, K6AW, KM3T, KR2Q, KT3Y, N2AA, N2NC, N2NT, N3ED, N5KO, N6AA, N6TR, N6TW, N8BJQ, N9RV, W3ZZ, W5GN, W5OV, and W6OAT. Our DX members and advisors are CT1BOH, DL6RAI, EA3DU, F6BEE, G3SXW, I2UIY, JE1CKA, OH2KI, OH2MM, PY5EG, S50A, UA9BA, VA7RR, VE3EJ, and E21EIC.

After many years of leading the way in log checking, Dick, N6AA, has decided to pass the CQ WW log-checking baton. Everyone owes a debt of gratitude to Dick for the enormous personal commitment he has made over the years to make the CQWW results as accurate as possible. Stepping up to the plate to carry on the important task of receiving and processing the logs is Ken, K1EA. Dick and Ken have worked together to make the transition as smooth as possible. A special thanks to Larry, N6TW, who provided the website UBN listing and to Barry, W5GN, who allows the CQ WW certificates to be produced and in your hands in a very timely manner. The CQWW records are maintained by N2NC, K3EST, and W5GN, and the All-Time Records by K6SSS. Thanks to John, K1AR, for his advice and hard work to make the CQWW so successful.

Congratulations to all the participants on all levels! We look forward to seeing you in the 2008 contests! 73, Bob, K3EST

## DX QRM

My second CQWW at all and the first one on 80m. Great contest. Could be more lucky with the second day propagation. Invaluable experience for me and looks to be with some decent results. Have almost doubled the Asian record from '99 . . . **4L4WW**. We had a great time even with our tongue-twister callsign . . . .**6F75A**. Got a bad cold as the contest started, so it became a struggle to keep staying up on the band. Had to limit myself to single band to allow enough rest. Oh, well, there is always next year. Very bad condx experienced from Kathmandu, almost nothing from NA and SA . . . **9N7JO**. Great fun! What a thrill to break 6 meg! 40m was the toughest band. 10m was a great surprise! . . . **A71BX**. We operated as Field Day style on a small hill near a lake. The objective for this operation was to show what the contest is and what DXing is to the local hams. Conditions were terrible.10m is dead and low bands could only work big guns, but we had fun. Looking forward to next one! . . . **BA4T**. Thanks for nice contest. Unfortunately we lost one amp. We will see you next year reloaded . . . **CE1W**. After 13 years since my last CQ WW, here I am for my second participation. My main goal due to my cndx was to make more than 100K points. 7 and 14 MHz were too crowded. Thanks all for the nice contest, also to CT1ETE for the PS50 . . . **CT1ENQ**.

Wow, if this was the sunspot minimum, what will we encounter in five years from now? Contesting is THE challenge in ham radio! . . . **DP6A**. The band a lot of QRN! . . . **E20YLM**. It was the first CQWW for most of the operators and they had a very good time . . . **EH2T**. As usual great moments! . . . **F4ETG**. Wow! Much better high band conditions than expected. Maybe we don't need sunspots after all! . . . **GØMTN**. Really hard work in the low power section. On 20m in particular it was impossible to find and hold a run frequency, so just about all the QSOs were S&P. Things were much easier on 15 and 10m. Is this the first time ever with serious entries from 1AØ, T7, and HV as well as Italy? . . . **G4BUO**. For some operators it was their first ever CQWW SSB Contest and glad to say they all coped admirably. MMØPSA, our youngest operator at 16, took to operating like an old professional and great to see. To us this is what it is all about, getting them involved and into contesting . . .

*(Continued on page 100)*

***The big trends in new products seen at this year's big hamfest in Dayton: USB ports finally showing up on ham rigs, add-ons for hands-free communication using Bluetooth® headsets, and rotatable dipoles for hams with limited antenna space. Here's our annual look at "Hot Stuff at Hamvention®."***

# The Magical Mystery Hamvention® Tour Part I

BY RICH MOSESON,* W2VU

Photo by Dan Moseson, KC2OOM

Every Sunday morning at the Dayton Hamvention®, in order to get out of packing up the booth, *CQ* Advertising Manager Don Allen, W9CW, and I head off through the exhibit halls in search of the newest of the new, products introduced either at the show or immediately before it. To make it seem like we were actually working, rather than just trying to get out of packing up, I write up this article each year. This year, *CQ* New Products Editor Anthony Luscre, K8ZT, joined us. We left the booth earlier than usual and returned later than usual, visiting some three dozen manufacturers who brought about 60 brand-new products to the Hallowed Halls of Hara (for the uninitiated, the Hamvention is held at the Hara Arena just outside the city of Dayton). Please note that some of these items are prototypes whose features are not yet finalized and which may look and "play" different when they go on sale.

Here is our "Magical Mystery Tour" of new products seen at Dayton, organized as usual by category (radios & amplifiers, station accessories, antennas & antenna accessories), occasionally by subcategory (e.g., receivers), and then more or less alphabetically by manufacturer within each category or subcategory. We'll start with things that transmit or receive radio frequency energy...

## Radios & Amplifiers

### Transceivers

We've got several new transceivers on the market this year, as well as some refinements to existing models. Elecraft has brought out its long-anticipated K3 transceiver, which covers 160 to 6 meters with either 10 or 100 watts (your option), and


*The Elecraft K3 introduces a new concept in kitbuilding ... and lets you use a keyer paddle to send RTTY and PSK-31 without a computer! (Photos by W2VU unless otherwise noted)*

has an independent subreceiver and 32-bit IF digital signal processing (DSP). There's also built-in software for encoding and decoding the most popular digital modes, allowing you to operate RTTY or PSK-31 without a computer by entering your text with your CW keyer paddle! The K3 also introduces a new concept in kit building—the no-solder, modular kit. If you choose the build-it-yourself option, you will receive modules with all parts mounted, soldered, and tested, which you then assemble into a transceiver—kind of like building your own computer. The K3 is also available factory-assembled.

FlexRadio's newest software defined radio is its Flex-5000C, which features a built-in computer with Windows®

*Editor, CQ
*e-mail: <w2vu@cq-amateur-radio.com>*

# MFJ *Pocket size* Morse Code Reader™

***Hold near your receiver -- it instantly displays CW in English!***

***Automatic Speed Tracking . . . Instant Replay . . . 32 Character LCD . . .***
***High-Performance Modem . . . Computer Interface . . . Battery Saver . . .***

MFJ-461
**$89.95**


***Is your CW rusty?***

***Relax and place this tiny pocket size MFJ Morse Code Reader near your receiver's speaker . . .***

***Then watch CW turn into solid text messages as they scroll across an easy-to-read LCD display.***

***No cables to hook-up, no computer, no interface, nothing else needed!***

***Use it as a backup in case you mis-copy a few characters - - it makes working high speed CW a breeze - - even if you're rusty.***

***Practice by copying along with the MFJ-461. It'll help you learn the code and increase your speed as you instantly see if you're right or wrong.***

***Eavesdrop on interesting Morse code QSOs from hams all over the world. It's a universal language that's understood the world over.***

### *Automatic Speed Tracking*

**MFJ** *AutoTrak*™ automatically locks on, tracks and displays CW speed up to 99 Words-Per-Minute.

**Simply** place your MFJ-461 close to your receiver speaker until the lock LED flashes in time with the CW.

### *Four Display Modes*

**1.** Bottom line scrolls and fills with text, then that entire line is displayed on top line until bottom line refills -- makes reading text extra easy! Automatically displays speed in WPM.

**2.** Same as **1**, without speed display -- gives you maximum text display.

**3.** Top line scrolls, bottom line displays speed in Words-Per-Minute.

**4.** Both top and bottom lines scroll.

**Two-line** LCD display has 32 large 1/4 inch high-contrast characters.

### *MFJ Instant Replay*

**The** last 140 characters can be instantly replayed. This lets you re-read or check your copy if you're copying along side the MFJ-461.

### *High Performance Modem*

**Consistently** get solid copy from MFJ's high performance *PLL* (*phase-lock loop*) modem. Digs out weak signals. Even tracks slightly drifting signals.

**Of** course, nothing can clean up and copy a sloppy fist, especially weak signals with lots of QRM/QRN.

### *Computer Interface*

**The MFJ-461's** serial port lets you display CW text full screen on a bright computer monitor -- just use your computer serial port and terminal program.

### *More Features*

**When** it's too noisy for its microphone pickup, you can connect the MFJ-461 to your receiver with a cable.

**Battery** saving feature puts MFJ-461 to sleep during periods of inactivity. It wakes up and decodes when it hears CW. **Uses** 9 Volt battery (not included).

### *True Pocket Size*

**Fits** in your shirt pocket with room to spare - smaller than a pack of cigarettes. Tiny 2¼x3¼x1 in. 5½ ounces.

### *No Instruction Manual needed!*

**Super** easy-to-use! Just turn it on -- it starts copying instantly!

### *Accessories*

**MFJ-26B, $9.95.** Soft leather protective pouch. Clear plastic overlay for display, push button opening, strong, pocket/belt clip secures MFJ-461.

**MFJ-5161, $16.95.** MFJ-461 to computer serial port cable (DB-9).

**MFJ-5162, $7.95.** Receiver cable connects MFJ-461 to your radio's external speaker 3.5 mm jack.

**MFJ-5163, $10.95.** Cable lets you use external speaker when MFJ-461 is plugged into radio speaker jack. 3.5 mm.

### MFJ *Pocket* Morse Tutor

MFJ-418
**$89.95**

**Learn** Morse code anywhere with this tiny *MFJ Pocket-sized Morse Code Tutor*™! Practice copying letters, numbers, prosigns, punctuations or any combination or words or QSOs. Follows ARRL/VEC format. Start at zero code speed and end up as a high speed *CW Pro!* LCD, built-in speaker.

### MFJ Code Oscillator

MFJ-557
**$39.95**

**MFJ-557** Deluxe Code Practice Oscillator has a Morse key and oscillator unit mounted together on a heavy steel base -- stays put on your table! Portable. 9-Volt battery or 110 VAC with MFJ-1312D, $15.95. Earphone jack, tone and volume controls, speaker. Adjustable key. Sturdy. 8½x2¼x3¾ inches.

### MFJ *Pocket* CW Keyer

MFJ-403P
**$79.95**

**Built-in** Iambic Paddle. Thumbwheel speed control. Adjustable weight. Adjustable sidetone with speaker. Iambic modes A or B. Fully automatic or semi-auto "bug" mode. Reversable paddle. Tune mode. RF-proof. Battery Saver. Tiny 2¼Wx3¼H x1D inches.

### MFJ *miniature* Travel Iambic Paddle

**MFJ-561, $24.95.** 1¾Wx1¾Dx¾H in. *Formed* phosphorous bronze spring paddle, stainless steel base. 4 ft. cord, 3.5 mm plug.

**Free MFJ Catalog**
***and Nearest Dealer . . . 800-647-1800***

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**FAX:**(662)323-6551 8-4:30 CST, Mon.-Fri. ***Add shipping.***




***MFJ . . . the world leader in ham radio accessories!***


*FlexRadio's Flex-5000C software defined radio includes a built-in computer and now has an option for a second receiver that can share the screen with the primary one.*


*The truck tire is not where ICOM recommends that its new IC-7200 transceiver be mounted. It's part of the display to convey an image of toughness for this entry-level HF/6-meter rig.*


*To celebrate its 40th anniversary in the ham radio business, Ten-Tec has released an updated "40th anniversary edition" of its popular Jupiter transceiver.*

XP-Pro operating system, 1 GB of RAM, and a 160 GB hard drive. FlexRadio also introduced its optional second receiver feature. Unlike most other sub-receivers, this one has all the same performance specifications as the main receiver, and both can be shown simultaneously on your computer screen. The second receiver is available for both the Flex-5000A and the Flex-5000C.

Speaking of software-defined radios, and speaking of kits, if you really like to "roll your own" and still want to be at the cutting edge of transceiver technology, Tucson Amateur Packet Radio (TAPR) has introduced its modular HPSDR, or High Performance Software Defined Radio. It consists (so far) of six modules—each a traditional build-it-yourself kit—that provide different functions. Each one has a name, generally rooted in mythology. You start with the Atlas backplane, which doesn't do anything on its own but supports all the other components. Up to six circuit boards will plug into the Atlas, which also has a connector for powering all of the different modules. It's designed to be able to fit into a standard PC enclosure and to be able to use a computer power supply. Other modules include Janus (an analog-to-digital and digital-to-analog converter board); Ozymandeias, or Ozy (an interface controller card that, according to TAPR, "provides the input and output connections to the real world"); Pinocchio (an extender board used for testing and troubleshooting other modules); Penelope, a 1/2-watt transmitter/exciter board; and the brand-new Mercury HF receiver board, a week-old prototype of which was demonstrated at Dayton. This is not a "plug & play" system by any means, but rather a serious project for the serious experimenter who wants to be part of developing ham radio's future.

ICOM unveiled two new HF+6-meter transceivers at Dayton, the entry-level IC-7200 and the higher-end IC-7700. The 7200 was displayed on a truck tire, emphasizing its rugged construction intended for outdoor as well as indoor use, including protection from water intrusion on the buttons and knobs (although the radio is not waterproof) and a "rear bumper" that protects rear-panel connectors and lets you stand the radio on end for packing—but do unplug the antenna first! The 7200 also has a USB port for computer control as well as a host of DSP features. It covers all ham bands between 160 and 6 meters and includes a general-coverage receiver.

The IC-7700 is a home-station transceiver intended for the serious DXer or contester. It runs on AC power (no need for an external supply) and puts out 200 watts on all modes except AM (50 watts). Features include a dynamic range in the receiver of more than 110 dB, a separate preamp and mixer for 6 meters, and two independent 32-bit DSP units, one each for the transmitter and receiver. The 7700 also features two front-panel USB ports and built-in RTTY/PSK-31 software, so you can plug a keyboard into one of those ports and operate these popular digital modes without a computer. It also has four antenna jacks and, once you program in the frequency range for each antenna, the rig will automatically switch you to the appropriate antenna for your operating frequency (there is manual control as well). The fourth

connector can also be set up for receive-only, with automatic switching between the transmit and receive antennas. This can be particularly useful on bands such as 160 meters, where separate antennas are often used.

Ten-Tec is celebrating its 40th anniversary this year by introducing a special 40th anniversary edition of its popular Jupiter transceiver. It features a new black case and bright reversible blue/gray LCD screen and all-new firmware, including a CW decoder right on the screen for those still struggling with copying code. If you're also having trouble sending code, you can plug in a keyboard and send CW without a key.

Finally among our transceivers is Yaesu's new VX-8R triband handheld, covering 2 meters and 70 centimeters with 5 watts out, and the 222-MHz band with 1 1/2 watts. It's submersible, uses lithium-ion batteries, and features a dual receiver. The Yaesu folks tell us that the final version (this was a prototype) may include a GPS (Global Positioning System) option and/or an optional packet TNC (terminal node connector)—either as part of a microphone or as a piggyback unit—presumably for use with APRS® tracking; and they say it may also offer a


*The only new handheld transceiver introduced this year at Dayton was the triband Yaesu VX-8R, which appeared only as a prototype. It will cover 2 meters, 222 MHz and 440 MHz, with additional features that are yet to be finalized.*

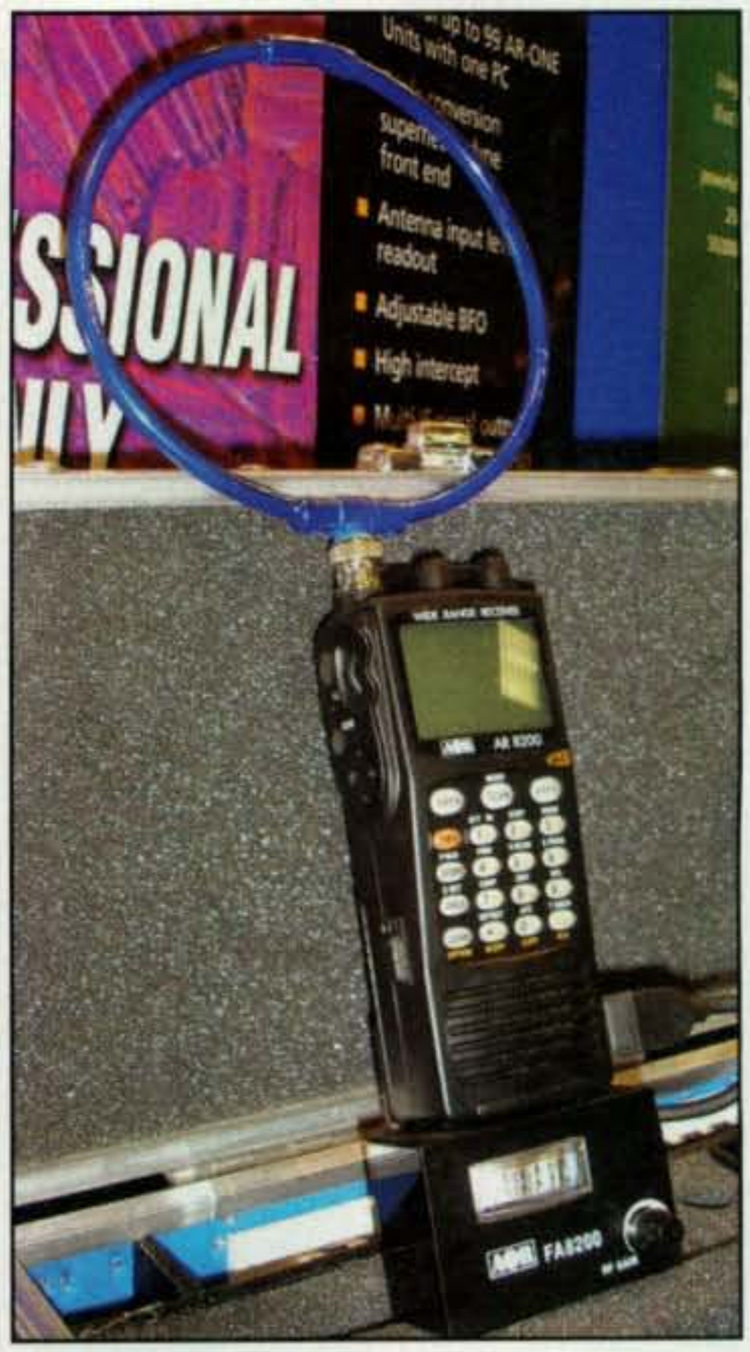
Bluetooth® headset option for hands-free operation.

### Receivers

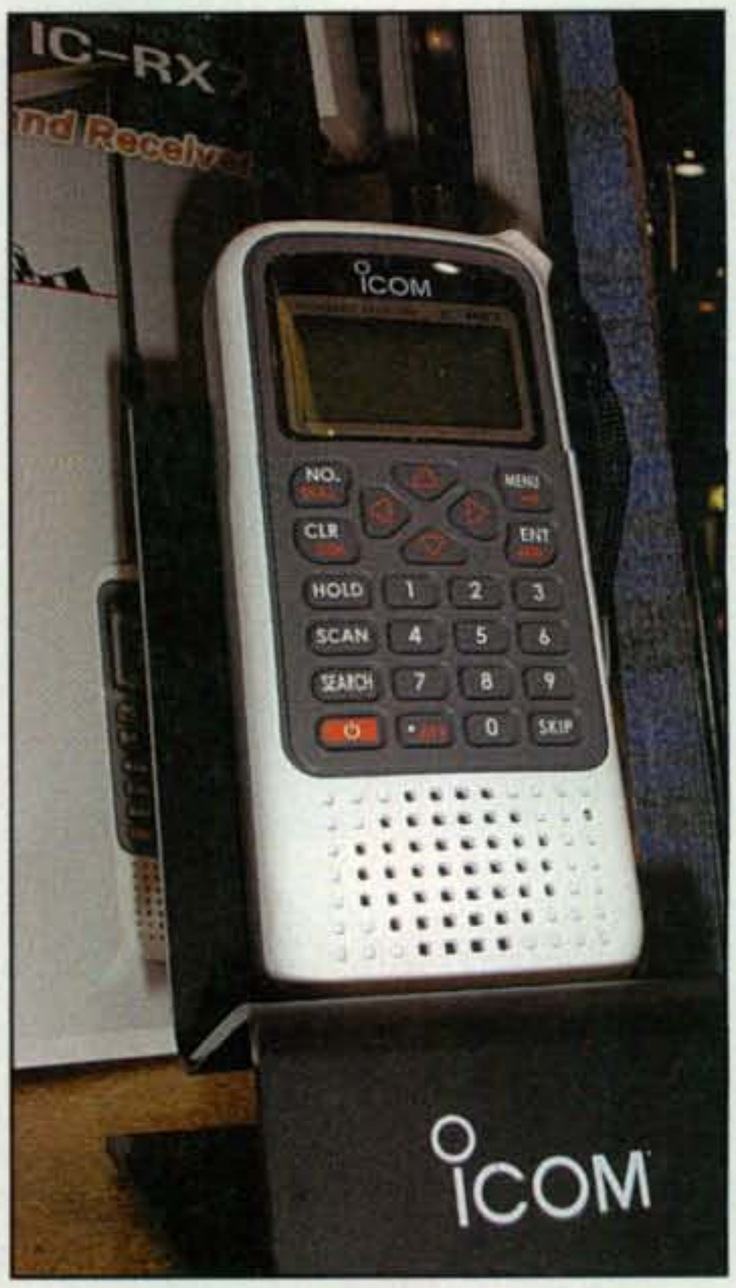
This year's Hamvention saw the introduction of four standalone receivers, covering a wide variety of frequencies and serving a wide variety of roles. AOR brought out its SR-2000M software-controlled surveillance and monitoring receiver. Primarily for law enforcement work, it covers 25–3000 MHz, will be computer-controllable over the internet, and will also feature voice transfer over the internet. This means you won't have to be sitting in the bad guys' back yard in order to monitor their activities. AOR introduced a couple of other law enforcement-related devices, including the AR-STV wireless camera detector, which covers 900–2800 MHz and will not only let you know if you're in the presence of any wireless surveillance cameras but also show you what they're seeing; and the Wings location monitor mobile data terminal. This device will use GPS to locate and track all vehicles in a fleet and plot them on a Google Earth™ map. It's also a digital voice transceiver with scrambling capability, plus you can connect a keyboard and send text, or upload still photos. The final new goodie from AOR this year is the FA-8200, an AR-8200 handheld receiver coupled with a direction-finding antenna and attenuator, tuned to the aircraft band for locating downed aircraft and errantly-activated emergency locator transmitters (ELTs).

ICOM was showing a prototype of its new IC-RX7 wideband handheld receiver. It covers 150 kHz to 1300 MHz (with cellular frequencies blocked in the U.S.) and receives AM, narrow FM, and wide FM. It has 1650 memory channels, which you can organize by category (26 maximum), group (up to 100), and memory name (up to 100). This is different from the alphanumeric tag which may be attached to every memory channel. To make your life easier, the RX-7 will come with preset memories for ham bands, auto racing, aircraft, railroads, and more. You can select your desired activity and a press of the scan button will monitor only those frequencies. It scans and searches 100 channels per second, so you can scan even a fully-loaded memory bank in just 16 seconds.

SSB Electronic introduced its Perseus SDR receiver, which covers 10 kHz to 30 MHz (40 MHz with reduced sensitivity) and receives AM, synchronous AM, CW, SSB, and narrow-band FM, along with RTTY and Digital Radio Mondiale (DRM). Among many cool




*The FA-8200 from AOR is a specialized foxhunting setup for tracking aircraft emergency locator transmitters.*




*This receive-only handheld from ICOM, the RX-7, covers 150 kHz to 1300 MHz and features preset memories for ham bands, aircraft, railroads and NASCAR racing.*

*The Perseus from SSB Electronic is a software defined receiver that requires a computer to use. It has the unique ability to record an 800-kHz chunk of spectrum and let you play it back later, tuning around as if it was in real time.*

features is its ability not only to provide a realtime visual "waterfall" display of an 800-kHz chunk of spectrum, but also to record that entire segment of spectrum for later playback. You can tune through it as though it were in real time! This would let a shortwave listener record a busy band segment across the top of an hour, then go back and pull out the IDs of every broadcast station that was there! Another handy feature is that you can import a variety of frequency lists and "plug them in."


*Dishtronix introduced two related items at Dayton this year, the solid-state Prometheus amplifier for 160-10 meters (large boxes at bottom of photo), as well as the DWM-2104 peak-reading SWR/Wattmeter (little box on top) for HF and 6-meter use.*


*This year's newest entries from Tokyo Hy-Power are the 600-watt solid-state HL-1.1Kfx HF amp shown here, plus the 45-watt HL-45B designed for use with Yaesu's low-power FT-817.*

Finally among our standalone receivers is the Ten-Tec RX-400. It covers 2 MHz to 3 GHz in SSB, ISB (independent sideband), CW, AM, and FM (narrow and wide), offers 1000 memories and will scan them at a rate of 100 per second or faster. It offers more than 50 built-in DSP filter bandwidths between 100 and 300 kHz, and connections to the computer world via your choice of RS-232 or TCP/IP connectors.

### Linear Amplifiers

Dishtronix brought out its Prometheus DX2400L1 HF linear amplifier, which it says is amateur radio's first legal-limit-plus solid-state amp for 160–10 meters (remember that it's now legal for commercially-built amps to include 10 and 12 meters), featuring continuous output of 1500 watts on SSB or CW (375 watts on AM) with instant band-switching and no warm-up time. The unit runs cool with an extra-heavy-duty 4800-watt DC power supply, and can be installed up to 1500 feet away from your operating position with either an optional remote-control head or optional computer adapter and software package. Dishtronix also introduced its DWM-2104 peak-reading SWR/wattmeter for HF and 6 meters.

Tokyo Hy-Power has added two new models to its line. The HL-1.1Kfx is a solid-state amp putting out a maximum of 600 watts on all HF ham bands (500 watts key-down on RTTY for 5 minutes) with an input power of 75–90 watts. Featuring an analog meter on the front with a variety of measurement options, the 1.1K is small (9.1" wide, 5.6" high, and 14.3" deep) and lightweight, weighing in at just over 22 pounds. But if you want to go really lightweight, check out the 3½-pound HL-45B, designed for mobile use as a companion to Yaesu's low-power FT-817 HF/VHF/UHF transceiver. The HL-45B covers the HF ham bands plus 6 meters and boosts the 817's 5-watt output to 45 watts. It's a great option if you want to use the 817 as a QRP rig while operating portable (such as hiking) but to have a little more "oomph" available once you get back in the car.

### Continued Next Month...

Once again, there was so much great stuff to see at this year's Dayton Hamvention® that we don't have space to bring you the full rundown in a single issue. We'll continue next month with a look at what's new in station accessories, antennas, and antenna accessories.

washington readout

BY FREDERICK O. MAIA,* W5YI

# Operating Amateur Radio Internationally

In the year and a half since the FCC eliminated the Morse code requirement from ham radio license exams in the United States, tens of thousands of Technician Class radio amateurs have upgraded to General or Extra Class, allowing them to operate over wide portions of the long-distance, high-frequency (HF) bands. Also, thousands more radio enthusiasts have joined the hobby for the first time. For many, their goal is to "work DX," or contact faraway stations. Making long-range contacts is the number one objective of most beginning HF operators (as well as many veteran HFers).

The HF amateur radio bands technically are considered to be the nine bands of amateur frequencies extending from 3 to 30 MHz—the 80/75, 60, 40, 30, 20, 17, 15, 12, and 10 meter bands. However, for our purposes we are going to include the 160-meter "medium-wave" ham band. The 1800 to 2000 kHz band is located just above the AM broadcast band, which in North America goes up to 1710 kHz. In the rest of the world, the AM broadcast bands cuts off at 1610 kHz.

That makes ten bands of frequencies extending from 1.8 to 28.7 MHz, each with different radiowave propagation characteristics. This month, let's talk about the history of international amateur radio communications and what you need to know about talking with stations located outside of the United States.

## The Need for Global Regulations

The electromagnetic spectrum is an unusual natural resource because, unlike iron, oil, or coal, it is not destroyed by use. It fact, it cannot be consumed at all! When one user stops accessing a portion of the spectrum, another can readily use it.

The spectrum is scarce, because at any given time and place one use of a portion of the spectrum precludes any other use of that portion. Uncoordinated, wasteful use can easily result in everyone suffering interference, which prevents satisfactory operation and denies access to new users.

Thus, the use of the radio spectrum must be regulated, access controlled, and rules for its use enforced because of the possibilities of interference between uncoordinated uses. Since the possible number of stations operating in a band is limited, someone must establish spectrum-use standards. Because of the distances reached by some radio signals, this regulation must be national and even global in scope, since radio waves do not respect international borders.

The Geneva-based International Telecommunication Union (or the ITU, as it is known) is the worldwide body that governs wire and wireless communications. This specialized agency of the United Nations consists of representatives from nearly 200 nations who meet every couple of years at "World Radio Conferences" to agree on future telecommunications guidelines.

The ITU was formed on May 17, 1865 as the International Telegraph Union. Twenty European countries met in Paris to agree on the delivery of wireline telegraphic messages across international borders. The ITU thus became the world's first international coordinating body. The second (convened on September 15, 1874) was the Universal Postal Union. Both had similar obstacles, since the mail and telegraph lines both had to cross national borders.

The International Telegraph Union decided on standardized equipment and operating rules to guarantee interconnection to the European telegraph network, and to use the "international" version of the Morse alphabet. It was also agreed that the organization would serve as a meeting place for future amendments. Today, nearly 150 years later, the factors that led to the formation of the Union still apply and the fundamental goals of the ITU are basically the same.

## Managing the Radio Spectrum

The regulation of radio came about in 1906 when the ITU extended its reach over wireline telegraphy to include wireless radio communication. The International Frequency Registration Board (IFRB) was set up to manage the radio frequency spectrum, which was becoming increasingly congested. The first Table of Frequency Allocations became mandatory in 1912. These initial regulations have since been amended and revised by numerous radio conferences and are now known as the international Radio Regulations (RR).

In 1927, the ITU adopted a system to standardize station callsigns. As an aid to enforcement of the radio laws, the alphabet—and later numerals when letters ran out—was apportioned among the nations of the world for use in radio callsigns which would identify both the nationality and the type of radio station.

The United States, for example, is assigned three prefix letters—K, N, and W—to serve as the initial call letter for its radio stations. It also is assigned the prefix letters AA through AL. All radio stations were (and still are) required to identify themselves at regular intervals using their unique callsign.

Today, the ITU's most important function is the allocation of radio frequencies to eliminate harmful interference among stations of different countries. The ITU allocation plan divides the world into three geographic regions. Roughly speaking, Region 1 consists of Europe, Africa, and the Middle East; Region 2 is North, Central, and South America; and Region 3 is the rest of the world. The frequency allocations in the United States generally conform to those for Region 2.

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Once ratified, the Radio Regulations become part of a treaty between nations and do not of themselves impose obligations on radio amateurs. Instead they provide guidelines to the various countries on how to regulate their Amateur Service. The current international Radio Regulations that deal specifically with the Amateur and Amateur-Satellite Services were updated at WRC-2003. They are very short and are contained in Article 25 of the Radio Regulations.

In a nutshell, it says international amateur communications are permitted unless a country objects, should be "limited to communications incidental to the purposes of the amateur service or remarks of a personal character," should not be secret to "obscure their meaning," and the qualifications of amateur operators should be verified. Article 25 encourages countries to allow amateur communications and third-party traffic during emergencies and disasters. Also, a country may allow a licensed amateur of another country to operate temporarily subject to any conditions it may impose. That is pretty much it.

These guidelines are intentionally very general in scope, thus providing a sizable amount of national flexibility and application. Being internationally authorized, most nations of the world do have an amateur service, but boundaries of the various ham bands, access requirements, and communications permitted on those frequencies can vary somewhat from one country to another.

## Amateur Radio in the United States

National governments enact and enforce radio laws and regulations. However, this regulation must be performed within the framework of existing ITU agreements, both regional and global. In the United States, private sector spectrum management, including that of the Amateur Service, is managed by the Federal Communications Commission, or FCC. The basic document controlling telecommunications in the United States is the *C*ommunications Act of 1934, which has been amended many times. The act applies to all 50 states; the territories of Guam, Puerto Rico, and the Virgin Islands; and several other small U.S. island possessions.

Among its duties, the FCC allocates frequency bands for the various radio services, determines frequencies to be used by individual stations, and licenses and regulates stations and operators. The agency also regulates common carriers involved in wireless and wireline interstate and foreign communications.

The U.S. regulations covering telecommunications are contained in Title 47 of the Code of Federal Regulations.

The Amateur Radio Service is only one of dozens of different telecommunications services. The regulations specifically dealing with amateur radio are contained in Part 97 of Title 47. It is widely available on the internet, and all U.S. ham operators should be familiar with its contents. In fact, this is required by the rules.

Radio operations of the Federal Government are not regulated by the FCC. This function is delegated to the National Telecommunications and Information Administration (NTIA), an agency of the U.S. Department of Commerce. However, the FCC and the NTIA cooperate to prevent interference between government and non-government users.

## Visiting Foreign Amateur Operators

Another aspect of international operating is the set of rules for operating a ham station while visiting another country. These rules vary greatly. The FCC rules provide several ways for foreign amateur radio operators to operate ham radio in the United States. Canadian amateurs are automatically authorized operating privileges in the U.S. and vice versa under a 50-year-old bilateral treaty arrangement.

It used to be that amateur radio operators licensed in other countries needed to first obtain a Reciprocal Operating Permit before they could operate their ham equipment in the U.S, but no more. Citizens of countries holding an Amateur Service license granted *by a country with which the United States has made reciprocal operating arrangements* are *automatically* authorized to operate an amateur station in the U.S. or its possessions. No additional FCC-issued documents are required. See the sidebar "Amateur Reciprocal Operating Arrangements" for a list of countries with which these arrangements are in effect.

Holders of a CEPT (see below) amateur radio license or an IARP (International Amateur Radio Permit) may also operate in the United States or its possessions. CEPT licenses are issued by a country belonging to the European Conference of Postal and Telecommunications Administrations (CEPT). An IARP permit is a document issued by several South American countries, Mexico, and Honduras under the terms of an Inter-American Treaty.

When a foreign radio amateur operates on U.S. soil, station identification is accomplished with location indicators used in conjunction with the foreign amateur's assigned callsign. Canadian amateurs must identify their station by appending to their callsign an indicator consisting of the appropriate letter-numeral designating the station's U.S. operating location (for example, VE1XX/W4.) Hams from countries

### Amateur Reciprocal Operating Arrangements

The countries with which arrangements are in effect are:

Antigua and Barbuda, Argentina, Australia, Austria, The Bahamas, Barbados, Belgium, Belize, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Chile, Colombia, Costa Rica, Croatia, Cyprus, Denmark (including Greenland), Dominica, Dominican Republic, Ecuador, El Salvador, Federated States of Micronesia, Fiji, Finland, France (including French Guiana, French Polynesia [Gambier, Marquesas, Society, and Tubuai Islands and Tuamotu Archipelago], Guadeloupe, Ile Amsterdam, Ile Saint-Paul, Iles Crozet, Iles Kerguelen, Martinique, New Caledonia, Reunion, Saint Pierre and Miquelon, and Wallis and Futuna Islands), Federal Republic of Germany, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Iceland, India, Indonesia, Republic of Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Kiribati, Kuwait, Liberia, Luxembourg, Macedonia, Republic of the Marshall Islands, Mexico, Monaco, Netherlands, Netherlands Antilles, New Zealand, Nicaragua, Norway, Panama, Paraguay, Papua New Guinea, Peru, Philippines, Portugal, Seychelles, Sierra Leone, Solomon Islands, Republic of South Africa, Spain, St. Lucia, St. Vincent and the Grenadines, Surinam, Sweden, Switzerland, Thailand, Trinidad and Tobago, Turkey, Tuvalu, United Kingdom (including Bermuda, British Virgin Islands, Cayman Islands, Channel Islands [including Guernsey and Jersey], Falkland Islands [including South Georgia Islands and South Sandwich Islands], Great Britain, Gibraltar, Isle of Man, Montserrat, Northern Ireland, Saint Helena [including Ascension Island, Gough Island, and Tristan Da Cunha Island], and Turks and Caicos Islands), Uruguay, and Venezuela.

Foreign radio amateurs holding a CEPT radio amateur license or an International Amateur Radio Permit (IARP) are also authorized to operate in the U.S. and its possessions.

### Third-Party Communications

The following countries have made the necessary arrangements with the United States to permit an amateur station regulated by the FCC to exchange messages for a third party with amateur stations in:

Antigua and Barbuda, Argentina, Australia, Belize, Bolivia, Bosnia-Herzegovina, Brazil, Canada, Chile, Colombia, Federal Islamic Republic of Comoros, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, The Gambia, Ghana, Grenada, Guatemala, Guyana, Haiti, Honduras, Israel, Jamaica, Jordan, Liberia, Republic of the Marshall Islands, Mexico, Federated States of Micronesia, Nicaragua, Panama, Paraguay, Peru, Philippines, St. Christopher and Nevis, St. Lucia, St. Vincent and the Grenadines, Sierra Leone, South Africa, Swaziland, Trinidad and Tobago, Turkey, United Kingdom (special event stations with callsign prefix GB followed by a number other than 3), Uruguay, and Venezuela. The United Nations also has arrangements with the United States to permit an amateur station regulated by the FCC to exchange messages for a third party with amateur stations 4U1ITU in Geneva, Switzerland, and 4U1VIC in Vienna, Austria.

No amateur station regulated by the FCC shall transmit messages for a third party to any amateur station located within the jurisdiction of any foreign government not listed above. This prohibition does not apply to a message for any third party who is eligible to be the control operator of the station.

other than Canada must include the location indicator *before* the callsign (for example, W1/G1XXX).

Non-U.S. citizens may also pass the required FCC examinations and be granted licenses in the same manner as U.S. citizens. This latter method is generally used by foreign operators who reside permanently in the U.S. or who are here frequently or for lengthy stays.

## U.S. Citizens Operating in a Foreign Country

When traveling abroad, visiting U.S. amateur operators must follow the rules of the country in which they wish to operate. As a general rule, you need to contact the telecommunications regulatory authority in the country you wish to visit. U.S. radio amateurs holding an Advanced or Extra Class license may operate In Europe without the need to obtain a permit or license—if the country is a member of CEPT. This used to apply more broadly, but last February CEPT decided that the technical requirements for earning a Technician or General Class license in the U.S. have no equivalent in Europe and withdrew automatic reciprocal privileges from U.S. Techs and Generals. For more information regarding specific countries, see the ARRL's International Operating page at <http://www.arrl.org/FandES/field/regulations/io/>.

## Third-Party Traffic

While on the subject of international operating arrangements, the sidebar "Third-Party Communications" includes an up-to-date list of countries with which FCC-licensed radio amateurs may transmit third-party communications.

Third-party traffic is defined as communications on behalf of persons (a third party) other than the two control radio operators on either end of the radio contact (the first and second party).

No FCC-licensed amateur station may transmit messages for a third party to any foreign amateur station whose government has not made arrangements with the United States to allow amateur stations to be used for transmitting international communications on behalf of third parties. However, Section 97.115 of the FCC rules states that "(t)his prohibition does not apply to a message for any party who is eligible to be a control operator of the station." In other words, sending or receiving a message destined for another ham is okay, even in countries with which the United States does not have a third-party agreement. 73, Fred, W5YI

## What You've Told Us...

Our May survey turned up some fascinating information about the on-air activities of *CQ* readers. First of all, 97% of all who responded said they are currently active on the air. Their most frequent operating modes are HF CW (38%), HF voice (37%), VHF FM (18%), and HF digital (10%), followed by VHF/UHF CW/SSB/digital (4%), other (1%) and none (1%). The most common "typical contact length" was 1-5 minutes (37%), a tie between 5-10 minutes and more than 10 minutes (25% each), and less than a minute (12%).

Your replies to our question on what you talk about most frequently on the air were as varied as you are... 77% make the basic exchange of name, location and signal report; 75% provide basic station info, 54% talk about the weather and 47% discuss technical matters. Next, 30% of you talk about things that weren't on our list; 26% discuss interesting things about your town; 25% talk about your work/job; 20% each discuss family and "other personal stuff;" 15% communicate public service/emergency matters; 8% each talk about personal medical matters and pass message traffic. Finally, 7% discuss politics and 5% talk about religion.

For 60% of you, what you talk about varies with band and mode (e.g., do you talk about different things on 2-meter FM than on 40-meter CW?), while 19% say it makes no difference and 17% hadn't thought about it before we asked. Next, we asked if you had had at least one contact that stood out in your mind as being extra-special, and 73% responded yes, more than one; while 5% said yes, only one, and 18% said no. Finally we asked there was a particular person you'd contacted who was extra-special, and the results were nearly identical—70% yes, more than one; 5% yes, only one; and 18% no.

This month's free subscription winner is Richard Oberstaedt, K8RWL, of New Hudson, Michigan.

# Reader Survey August 2008

We'd like to know more about you—about who you are, where you live, what kind(s) of work you do, and of course, what kinds of amateur radio activities you enjoy. Why? To help us serve you better.

Each time we run one of these surveys, we'll ask a few different questions and ask you to indicate your answers by circling numbers on the Survey Card and returning it to us. As a bit of incentive, we'll pick one respondent each month and give that person a complimentary one-year subscription (or subscription extension) to *CQ*.

The ARRL recently decided that technology needs to be one of its organizational "pillars." So this month, we'd like to get an idea of how technically adept you already are.

**Please answer by circling the appropriate numbers on the reply card.**

**1. How technically competent do you consider yourself in terms of radio and electronics?**
- Expert ..... 1
- Highly competent ..... 2
- Competent ..... 3
- Somewhat competent ..... 4
- Not competent ..... 5

**2. Is electronics your profession as well as your hobby?**
- Yes ..... 6
- No ..... 7

**3. Have you ever designed your own circuits?**
- Yes, professionally ..... 8
- Yes, on an amateur basis only ..... 9
- No ..... 10

**4. Have you built at least some of your own equipment (excluding antennas)?**
- Yes, from my own design ..... 11
- Yes, from published designs ..... 12
- Yes, from kits ..... 13
- No ..... 14

**5. Have you built at least some of your own antennas?**
- Yes, from my own design ..... 16
- Yes, from published designs ..... 17
- Yes, from commercial products ..... 18
- No ..... 19

**6. Do you do your own troubleshooting/repairs?**
- Yes, whatever needs to be done ..... 20
- Yes for simple repairs, no for complex ones ..... 21
- Troubleshoot only (send out for repair) ..... 22
- Can make most repairs if someone else figures out what's wrong ..... 23
- No ..... 24

**7. When you do NOT make your own repairs, where do you take/send your rig for service?**
- To another local ham ..... 25
- To a ham dealer's service department ..... 26
- To the manufacturer's service department ..... 27
- To an independent repair person/facility ..... 28
- I haven't needed anything repaired yet ..... 29
- I'm the person everyone else brings their broken stuff to ..... 30

Thank you for your replies. We'll be back with more questions next month.

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- Compact unit. Easy to operate.
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BY IRWIN MATH,* WA2NDM

# The Frequency-to-Voltage Converter

Last month we looked at the voltage-to-frequency converter (VFC) and saw a couple of its many applications. This month we will look at the companion circuit, the frequency-to-voltage converter, or FVC. This device produces a DC voltage that is a function of the input frequency.

*c/o CQ magazine

Fortunately, the same chip can be used for this function as well, and fig. 1 shows how to connect the LM-331 for this application. As in the case of the VFC, a calibration pot is provided for fine-tuning. In operation, the input-frequency pulses control the charging of a capacitor over a fixed time interval. The greater the number of pulses, the higher the DC voltage. Also like the VFC, the qual-

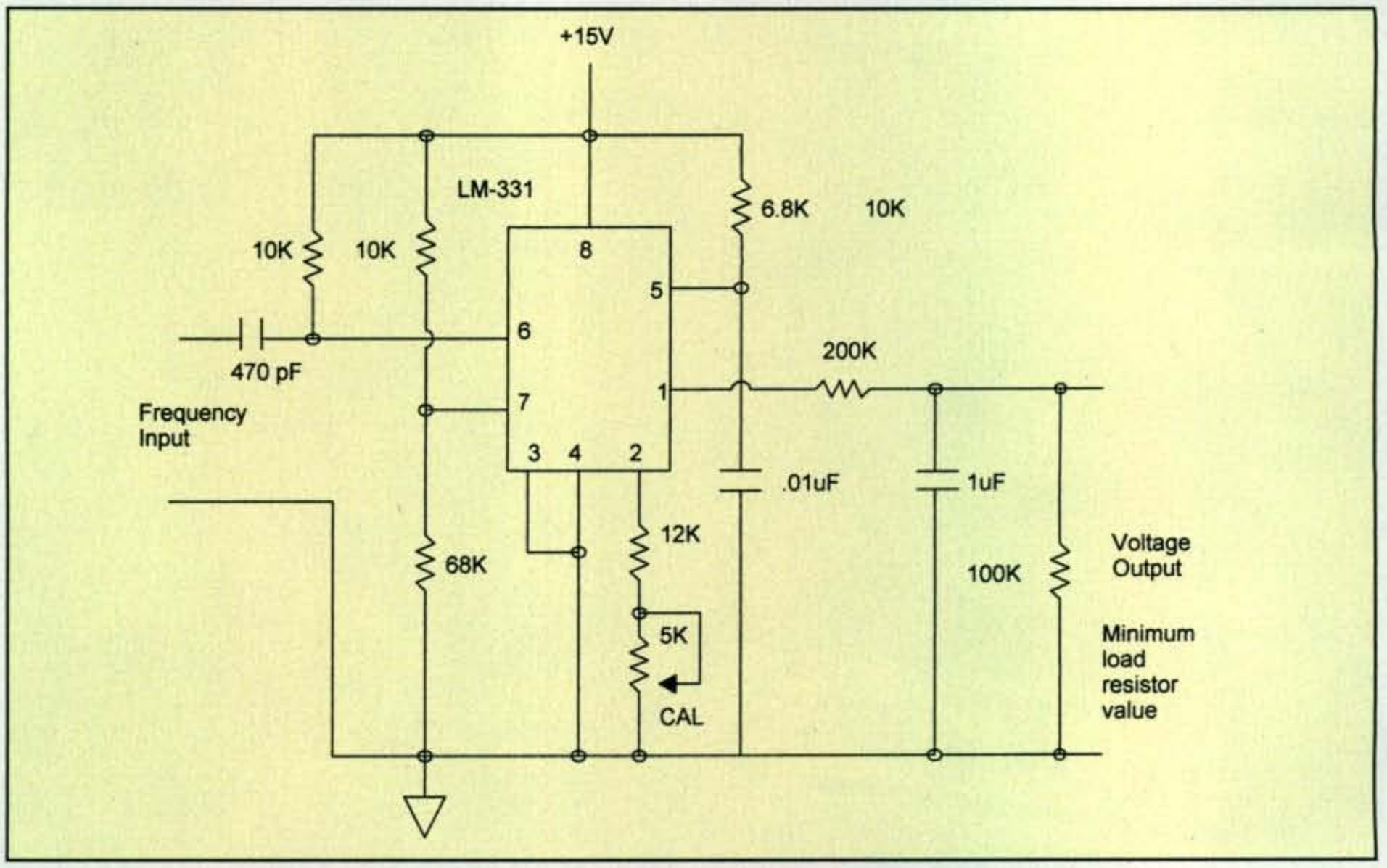


*Fig. 1– Basic frequency-to-voltage converter circuit.*

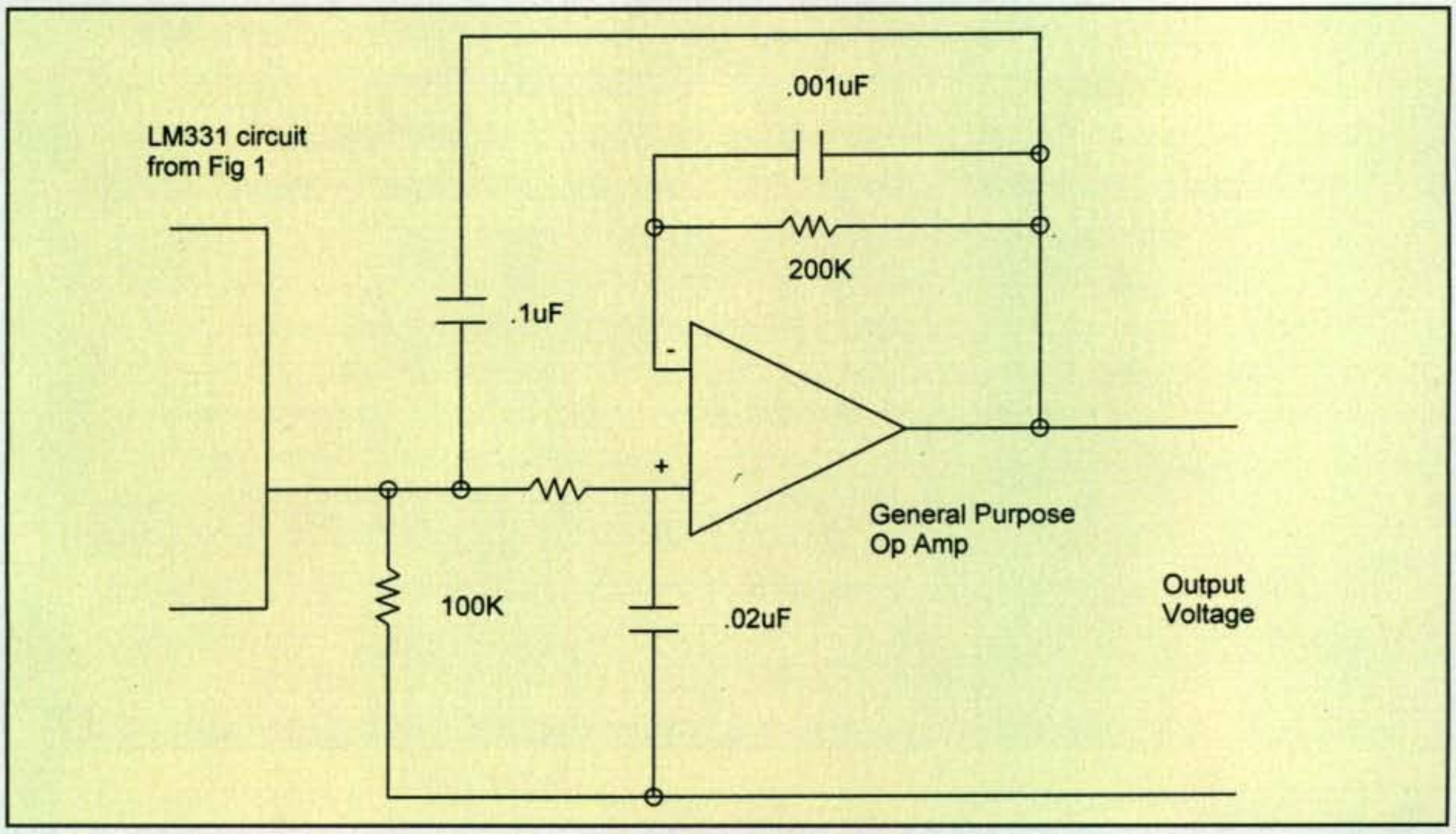


*Fig. 2– A simple op-amp output filter.*

ity of the components used determines the linearity of the circuit. It is capable of better than 0.5%, so use the best you have if you build the circuit.

After construction, apply power and connect a DVM (digital voltmeter) across the output capacitor. Apply a 10.00-kHz TTL (transistor-transistor logic) level pulse train to the input and adjust the CAL potentiometer for a reading of 10.00 volts. Now reduce the frequency to 5.00 kHz and note that the voltage drops to 5.00 volts. If you then connect the output of the VFC circuit of last month to the input of fig. 1, you will have a complete analog-to-digital-to-analog transmission system. Any voltage applied to the input will be converted to a pulse train. The resulting pulse train will then be converted back into a DC signal, which will then be reproduced at the output.

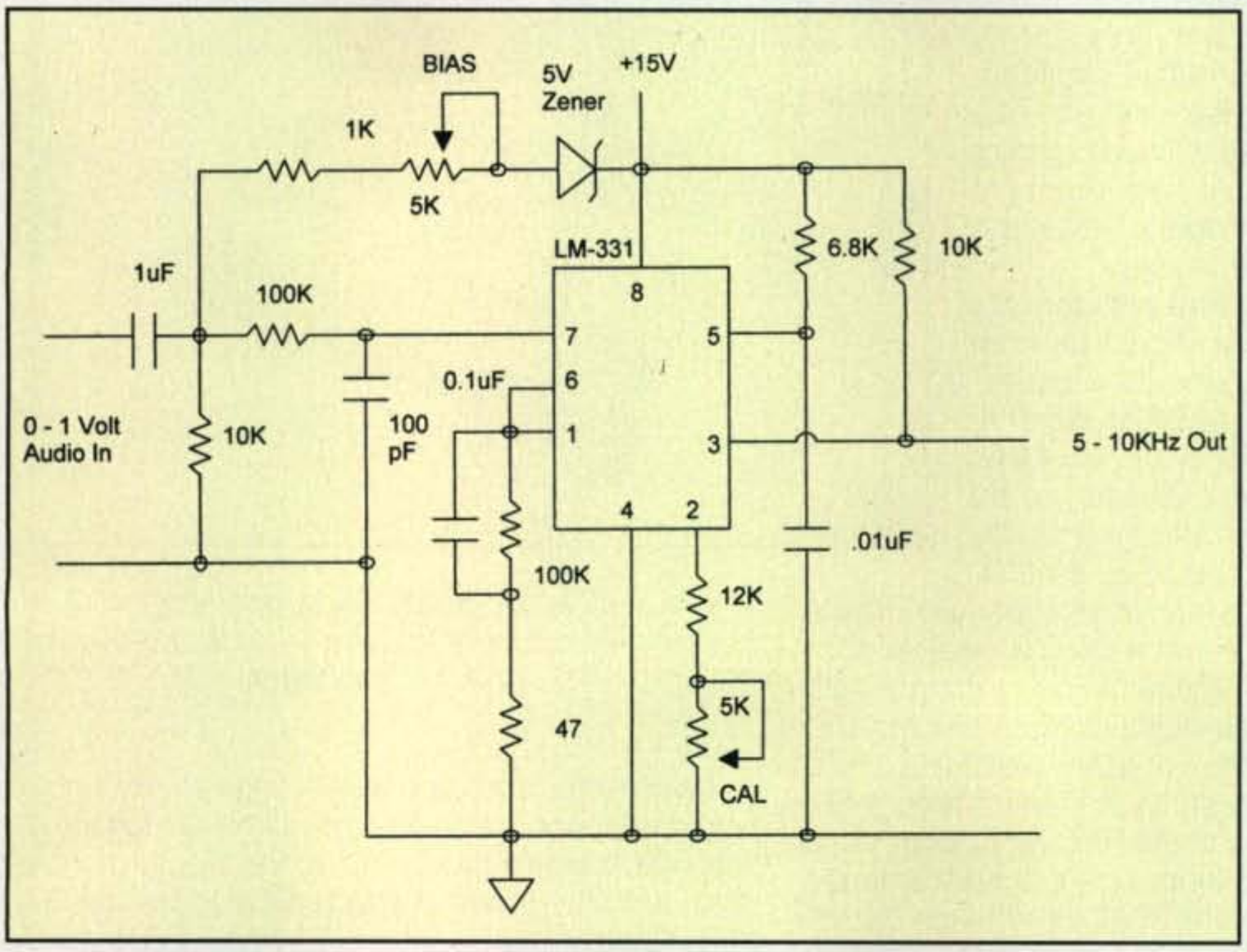


*Fig. 3– Audio transmission voltage to frequency converter circuit.*

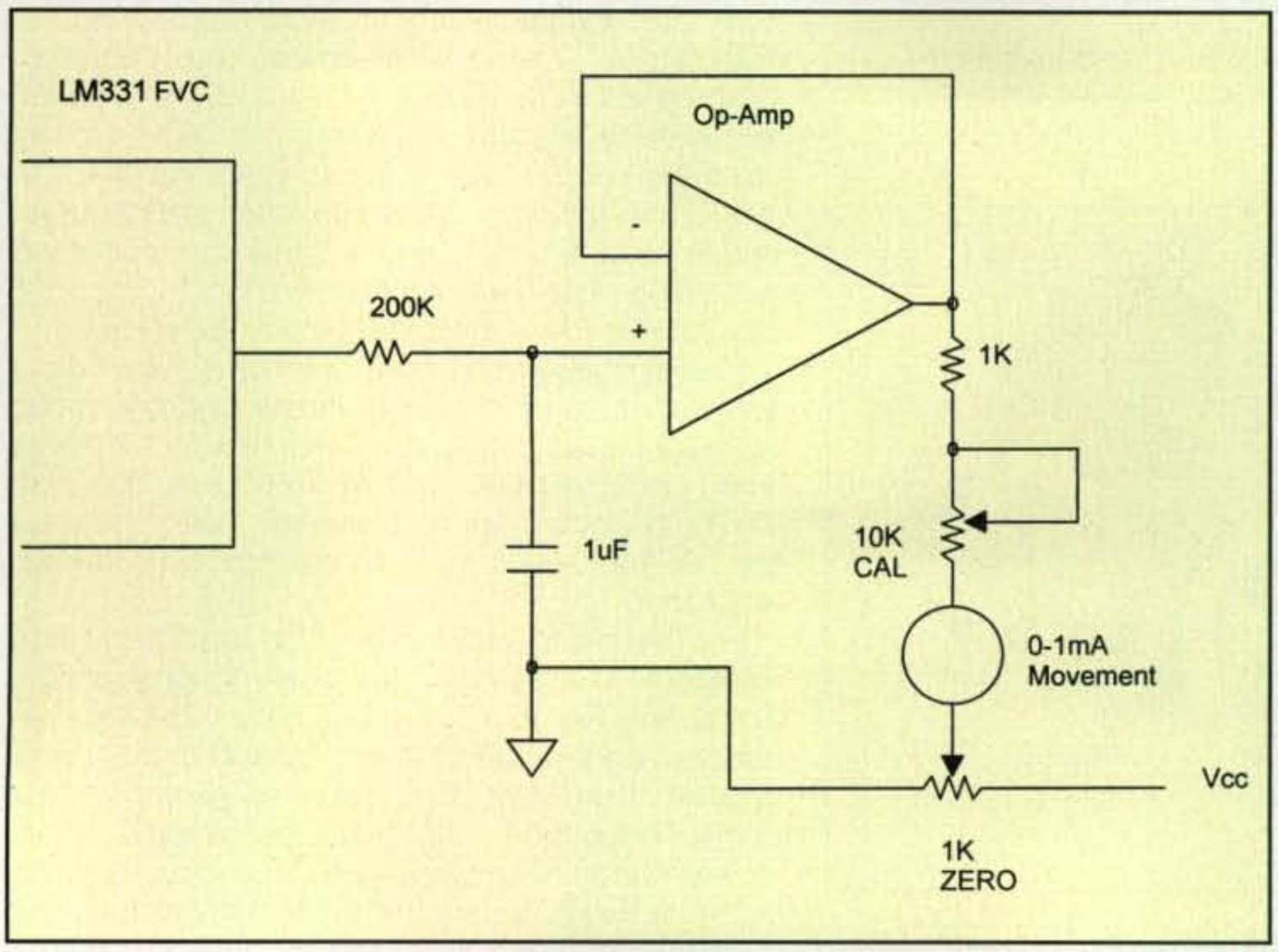


*Fig. 4– The simple audio frequency meter discussed in the text.*

The only drawback of this circuit is the speed of response of the circuit. You will note that a 200K resistor and 1-µF capacitor have been connected to the output of the LM331. These form an RC low-pass filter whose purpose is to reduce the ripple frequency (which is a function of the voltage being transmitted) to a small level. The large values, however, are what slow down the circuit. The speed of response can be increased by lowering the value of the capacitor and/or resistor, but the ripple will then increase. A better method that will speed up the circuit by a factor of about 20 to 30 times is to use an op-amp based active filter such as the one shown in fig. 2.

You can also try to increase the response time to the point where you can actually send audio. This will require you to offset the VFC so that the input voltage varies from 7 kHz to 10 kHz, for example. Fig. 3 shows how to do this.

First adjust the BIAS pot for a reading of 8.5 volts with no audio input. Now adjust the values of the filter in the FVC circuit so that the cutoff frequency is around 6 to 7 kHz. The VFC will now swing from 7 kHz to 10 kHz with an audio line level input of 3 volts pp (1 volt rms), and the receiver should reproduce this with very little ripple. Note that you will have to experiment with the various values for the best result. If you look at the data sheet for the LM-331 as well as other VFCs, you will find methods to increase the frequency range to 100 kHz and higher. This will allow even faster response times.

Keep in mind that a FVC can also be used as a simple audio frequency meter. Connecting an op-amp follower to reduce the high output impedance of the FVC to a level suitable for driving a meter movement will result in a DC level that is a function of frequency. Fig. 4 shows this method. A 0 to 1 mA movement could then be calibrated as 0 to 10 kHz. If you wish to use a 0–100 µA movement, simply replace the 10K pot with a 100K pot and the 1K zero pot with a 10K pot.

Hopefully, this and the July columns have served as a stimulus to experiment with one of the few remaining early digital techniques. By visiting the websites of National Semiconductor (www.national.com) and Analog Devices (www.analog.com) you will find more information on these unique devices.

73, Irwin, WA2NDM

the weekender

BY PHIL SALAS,* AD5X

# Build Your Own Capacitors for Trap Antennas

Last month we looked at a large homemade capacitor that was built by Roger Sullivan, WAØETE, for his Butternut vertical. As I mentioned at the end of that column, this got my brain working on alternative capacitor designs for other applications. As I was already in the process of building traps for a 12/17-meter trap dipole, I thought I'd try to expand on Roger's ideas and build my own trap capacitors.

A rule of thumb for trap components is that their reactance should be from 150–250 ohms, which means a capacitance value of about 43 pF to 26 pF at my trap design frequency of 24.5 MHz.

For the capacitors, I decided to try using aluminum tape attached to the inside and outside of a piece of 1 1/4-inch PVC tubing. The aluminum tape is available at any hardware store and is used to seal air-conditioning duct-work. I chose a PVC tubing length of 1.8 inches, as that is slightly longer than the 1.5-inch width of the aluminum tape I used.

I cut a 4.2-inch length of aluminum tape that I attached to the inside of the PVC pipe, and I cut a 5.5-inch piece of aluminum tape that was wrapped around the outside of the PVC pipe. When I measured the resulting capacitance with my antenna analyzer, I found it to be 35 pF. This was perfect!

Next I attached two #4 stainless-steel screws, lockwashers, nuts, and solder lugs to my homebrew capacitor. I cut away the aluminum tape such that one screw only contacted the upper piece of tape, and one screw contacted the lower piece of tape. Photo A shows this better than I can describe it in words. I built two of these capacitors, as two are needed for the 12/17-meter dipole.

I then coated the capacitors with liquid electrical tape, also available at your local home-improvement store. The liquid electrical tape does two things: First, it seals the aluminum tape in place, and second, it improves voltage isolation around the edges of the tubing. Photo B shows one trap made with my homebrew capacitor alongside an earlier trap I built using a standard doorknob capacitor. The red coating on the homebrew capacitor is the red liquid electrical tape I used.

How do these traps work? Perfectly! Now I don't know what the ultimate breakdown voltage rating of these capacitors is, but there are no problems when using my 600-watt ALS-600 amplifier with the 12/17-meter dipole. However, I can't guarantee that the capacitors won't break down under full legal limit.

For those interested in building traps, next time we'll look at the actual trap design, construction, and tuning. For future reference, the traps are constructed on 1-inch OD fiberglass tubes that I purchased from Max-Gain Systems (www.mgs4u.com). These tubes come in 8-foot lengths, which makes them very expensive to ship. Max-Gain will cut the tubes in half for just 50 cents, which makes them very *inexpensive* to ship. Until next month…

73, Phil, AD5X

*1517 Creekside Drive, Richardson, TX 75081
e-mail: <ad5x@cq-amateur-radio.com>

*Photo A– Homebrew capacitors showing the inside/outside screw contacts.*

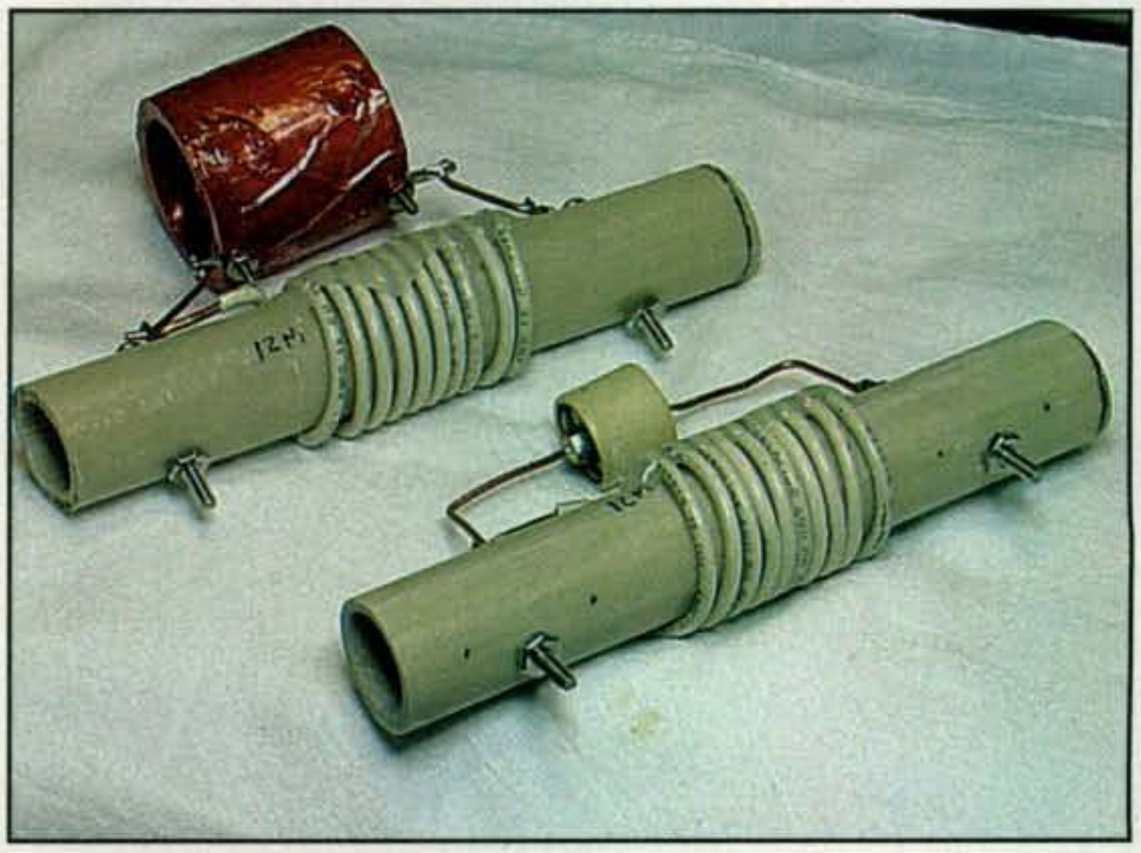

*Photo B– Two12-meter traps, one (top) with the homebrew capacitor and the other (bottom) with a doorknob capacitor.*

# MFJ Dummy Load/Wattmeter

## 1.5 kW Dry Dummy Load has built-in precision, true peak-reading SWR/Wattmeter switchable to external antenna!

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**Reads** *true peak* PEP or average power on 300/3000 Watts forward and 60/600 Watts reflected power ranges 1.8-54 MHz.

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**MFJ-801** has 1¾ inch meter, sensitivity control, 20 inch extended telescoping monopole antenna.

### 81 dB Step Attenuator

MFJ-762
**$89.95**

**81 dB** Attenuator in 1 dB steps. 50 Ohms. Usable to 500 MHz. 250 milliwatt maximum input. BNC connectors. Shielded stages. Connect between receiver and antenna and use S-meter as a precision calibrated field strength meter. Prevent receiver blocking, cross-modulation. Determine gain/loss, ideal for fox hunting. Evaluate linearity. Isolate circuits. Extend range of sensitive equipment. Measure input/output level differences.

### MFJ Frequency Counters

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**MFJ-886** covers 1 MHz to 3 GHz with 300 MHz direct count, 0.1 Hz resolution. 4 gate times. 10-digit high-contrast 3/4 inch LCD display. Lock display button. Bargraph shows RF field strength. Includes rechargeable Ni-Cad batteries, charger, telescopic antenna. Black anodized aluminum. 2¾x2¼x1¼ in.

MFJ-888
**$189.95**

**MFJ-888**, like MFJ-886, but covers *10 Hz*-3 GHz. Measures frequency/period, has 50/1M Ohm input, auto hold, LED backlight, beeper. 2¾x4¼x1¼ in.

## MFJ HF/VHF/UHF Dummy Loads

### Oil-Cooled 1 KW CW 2 KW SSB VersaLoad™

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MFJ-264
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**Ham** radio's most versatile 50 ohm *dry* dummy load. Works with all radios from 160 Meters through 650 MHz. SWR below 1.3 to 650 MHz and below 1.1 at 30 MHz. Handles 100 watts for 10 minutes, 1500 Watts for 10 seconds. 3Wx3H x9D in. SO-239 connector. **MFJ-264N, $84.95.** With type "N" connector.

### Dry 300 Watt HF/VHF Dummy Load

MFJ-260C
**$39.95**

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BY DAVE INGRAM,* K4TWJ

# Giving HF A Go

The recent elimination of the Morse code requirement from license exams has rekindled widespread interest in amateur radio, and as a result, our numbers are now growing rather than declining. That is good news, because whether Morse code is a requirement or an elective, radio amateurs always stand 10 dB above the crowd, and newcomers play an important role in carrying our proud legacies and traditions forward.

We sense many newcomers start (and many stay) on 2 meters, and we encourage you to include HF activities in your amateur radio pursuits as well. That is part of the real heartbeat and the "bright lights and glamour" side of amateur radio, and you should experience it firsthand. In light of that fact, both this and next month's column look at the many attractions and various "getting started" details of working our 160 through 10 meter bands—including CW in those activities. I will explain, it is easy and fun.

Our HF bands support a captivating variety of worldwide DX communications, weekend contests, QSO parties, on-the-air special events operations, and awards programs, and they are priceless assets during emergencies. At least two HF bands are open to one area of the world or another every day, especially during the hours around sunrise and sunset. The thrill of hearing another station in a distant land reply to your call is something that, regardless of the number of times it happens, never wanes. Some "Big Gun" DXers use super-elaborate rigs and monster antennas, but rest assured there is still plenty of room for "Little Pistols" running 100-watt transceivers and dipoles or vertical antennas to also wrangle some terrific DX QSOs. Starting smart and maintaining a positive mindset are the keys. We have some tried-and-proven tips to help you.

*3994 Long Leaf Drive, Gardendale, AL 35071
e-mail: <k4twj@cq-amateur-radio.com>

## Gearing Up

A delightful array of transceivers and accessories is readily available to new HFers, and generally speaking, they all are outstanding performers. Your first concern probably will be how much money to invest in a transceiver and antenna, and that depends entirely on your budget. My main thought here is you need plenty of good results and positive encouragement when starting out, so strive to stretch rather than shortcut your budget. The extra enjoyment will long outlast the initial investment.

Given a choice of purchasing an impressive-looking perhaps costly older transceiver of unknown history or an economy-grade new transceiver complete with warranty and customer support program, I would definitely favor the new transceiver. The sensitivity and overall performance of a new transceiver is top-notch, and you can use it to work the same bands, frequencies, and (in 90 percent of the cases), stations you work





*Photo A– Older model HF transceivers such as this impressive-looking Yaesu FT-102 are often available at an attractive price, but do a thorough checkout before purchasing. If repairs are necessary and beyond your expertise, your overall investment may exceed that of a new "economy" model transceiver. Performance of newer transceivers with their high-tech circuitry is also better than that of older transceivers.*

*Photo B– An example of a smart choice in an "economy" model HF transceiver is Kenwood's popular TS-480SAT (100 watts) or TS-480HX (200 watts). Each sports selectable DSP filters, DSP noise reduction, SSB speech processor, CW keyer, plus numerous other features. They are easy to use, reliable, and surprisingly affordable.*

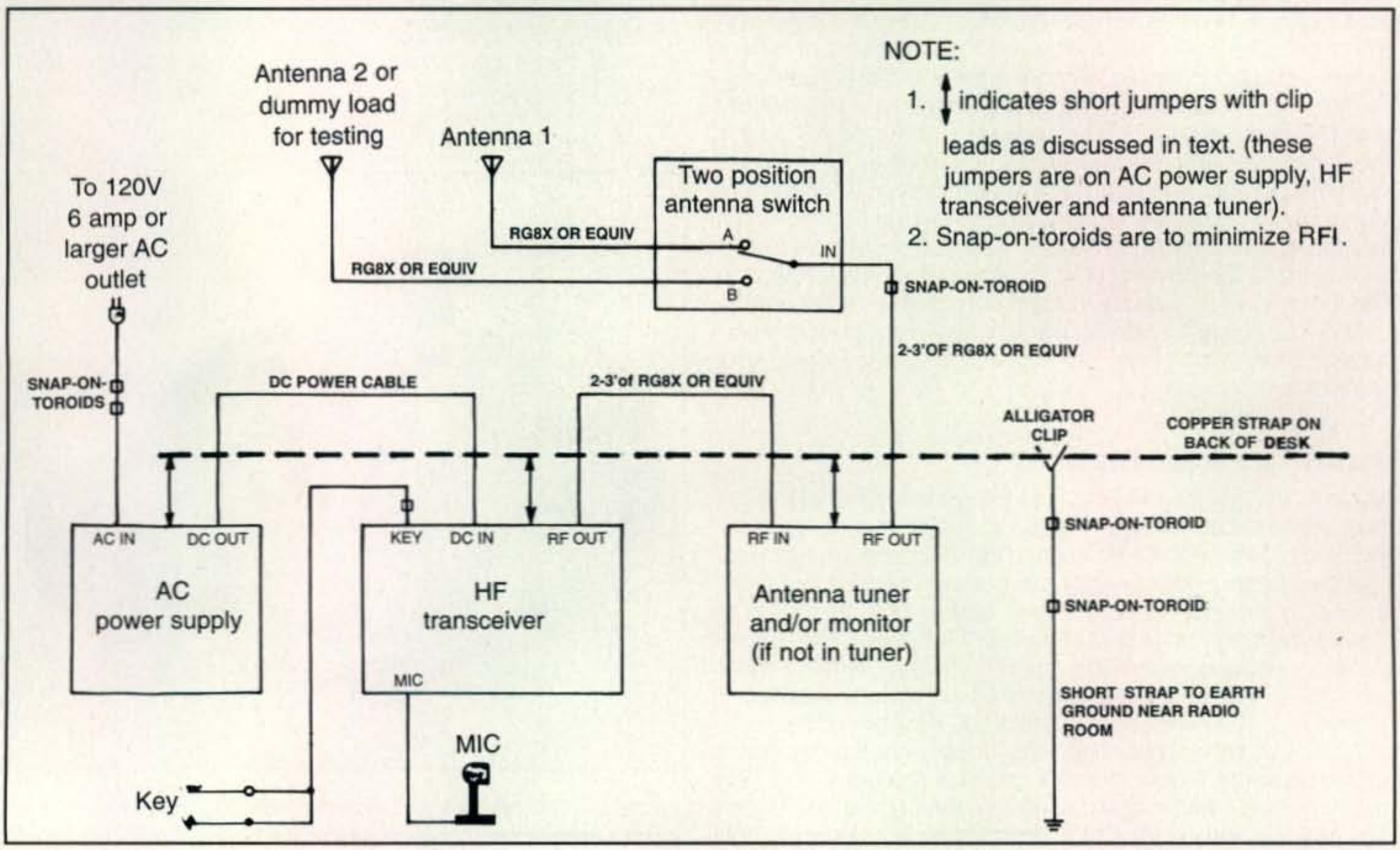


*Fig. 1– Outline of interconnections in a basic HF station, including a few notes on cable lengths and inclusion of toroids to minimize RFI. (Discussion in text.)*

with a super-deluxe transceiver. You may need to listen more carefully with a basic rig, but that helps perfect your operating skills.

When planning your HF station location and layout, try to choose a room or area with its own (or lightly shared) 10- or 15-amp circuit breaker. You can quickly check which circuit breakers in your house supply which rooms by plugging lamps into outlets and then switching/resetting breakers one at a time. In every place I have lived, I found two adjacent bedrooms shared a common circuit breaker, and breaker loading in the second bedroom was minuscule—like a lamp and a clock.

Some amateurs use multi-outlet surge protectors on their stations (always a good idea), but I prefer the full protection concept of unplugging all AC power and antenna cables and moving them away from my gear during any and all periods of non-use. I also avoid placing an AC-powered clock or lamp atop station gear. Surprise electrical storms can occur at the most inopportune times, and there is no logic in leaving damage to chance (the old "ounce of prevention" theory).

Finally, including at least a minimal ground system to reduce the possibility of RFI and/or electrical shock always holds merit. The "quick and easy" solution is driving a 4-foot ground rod into the earth outside your shack, then using copper braid (like that removed from old coax cable) routed indoors and clip-lead connected to a similar copper braid tacked to the back of your operating desk. Short (braid) jumpers with clip-lead ends can then connect each piece of equipment to the ground strap.

After you have operated HF for several months and acquired some good DXing experience, you may notice that some (usually weak) stations report difficulty copying your signals when band conditions are poor. At that time, you might consider adding a small 400- or 500-watt linear amplifier to your setup. Why a medium-power rather than a big legal-limit amplifier? The first 6-dB increase or quadrupling of power makes the most noticeable improvement in transmitted signal strength, but it does not require installing a heavy-duty antenna, large coax cable, or a special 240-volt AC power line. Neither does it produce widespread RFI or "blow away" everyone else on the band. It is a sort of congenial form of higher power. Most homes/apartments are configured with a bathroom near a bedroom and its 120 volt outlets are usually on a separate high-current breaker for use with hair dryers. A heavy-duty extension cord from that outlet to a 400- or 500-watt amplifier usually works well (if your budget won't support having an electrician install a dedicated outlet and breaker for your shack).

## Radiating a Good Signal

As most "old pros" agree, successful HFing typically involves three interrelated factors: a good indoor setup, a best-for-your-location antenna system, and top-notch operating skills. Of those factors, a very important one (and the most challenging to address) is the antenna system. We all dream of a huge Yagi antenna mounted atop a tall tower, but entanglements of cost, installation, maintenance, antenna restrictions (CC&Rs), lightning protection, etc., usually require us to downsize to a small beam, a vertical, or some wire antennas. Do such concessions limit your success and enjoyment? Not necessarily. Your choice of antenna design; its location and orientation with respect to power, telephone, and television cables (both visible and hidden in walls); distance and direction to neighbors; and obstructions are quite important.

Generally speaking, horizontal-type antennas such as Yagis, dipoles, G5RVs, and longwires are good choices if they can be installed up 30 feet or higher so their radiation is not severely blocked by nearby objects. Verticals are a good choice when tall supports or structures are not available or feasible. They also make good low-profile antennas when disguised as flagpoles or used in a "quick up, quick hide" manner. All verticals are not created equal, however, and several points warrant mention here.


*Photo C– Custom accessories make each and every HF setup extra special, and nothing fills that bill better than a Heil hand or desk mic such as the HM-10 shown here in its optional boom and shock mount. It is reasonably priced, and it helps you sound great on the air. Check out <www.heilsound.com> for details.*

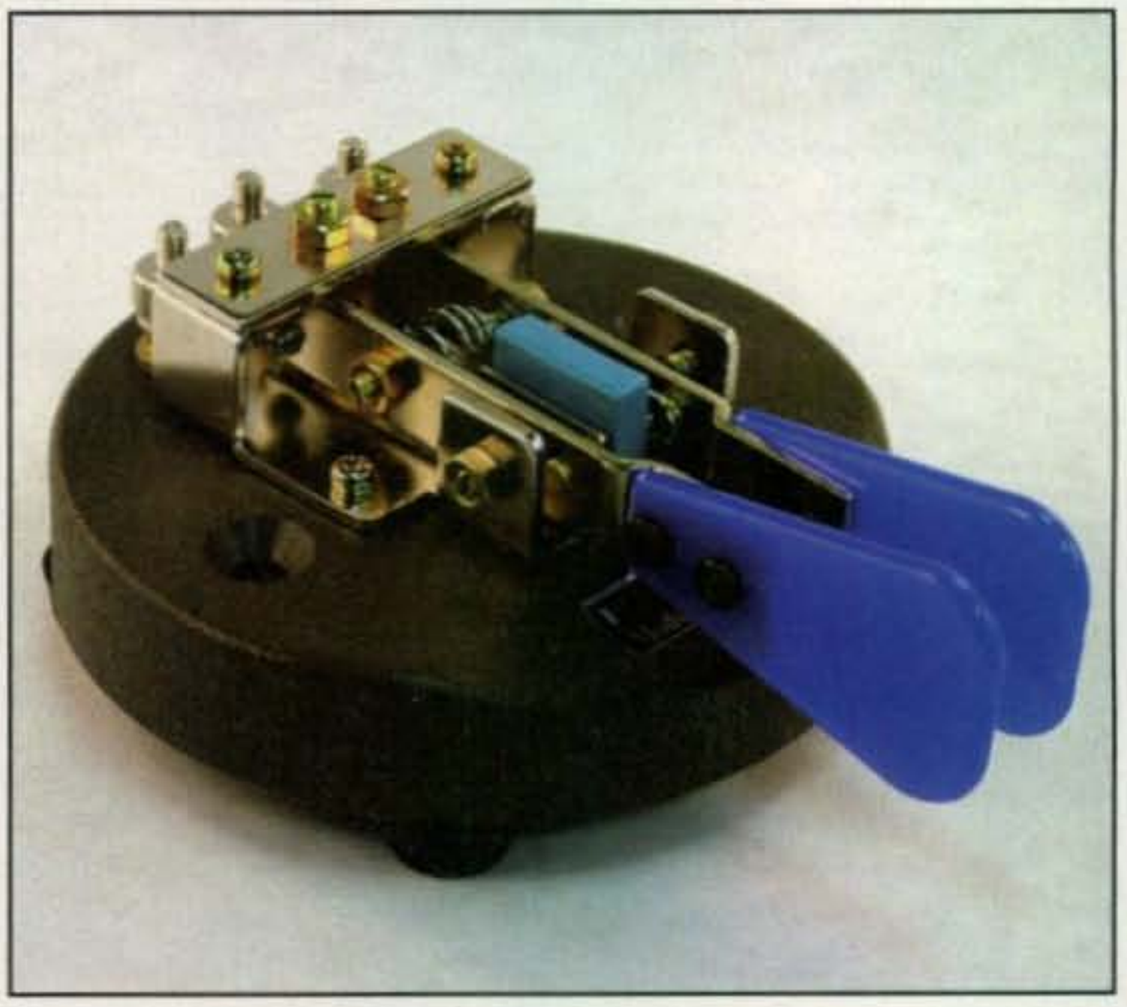

*Photo D– CW operations become a special treat when using a unique-style key such as this round-based and blue-tipped Katsumi paddle. It is low in cost and available from <www.MorseX.com>.*

New-style "no ground radials needed" 3/8-wave and 1/2-wave verticals (those utilizing counterpoise rods and coax matching networks) noticeably outperform regular ground-mounted 1/4-wave verticals with only five or six radials. Also, like any horizontal-type antenna, a vertical needs a clear area around it (typically 30 feet) and a reasonably good view of the far horizon to radiate a good signal in that direction. Also, remember RF interference to telephones, stereos, air-conditioner thermostats, garage-door openers, and other devices can often be eliminated or reduced to acceptable levels by adding snap-on toroids to their lines. Toroids suitable for HF applications are available from <www.radioworks.com>. Use them often and liberally (two or three in-line at a time rather than just one).

As further assistance in choosing a "right for you" antenna, I now offer a few time-acquired observations and notes. I have found a tall "no ground required" vertical such as Hy-Gain's AV-640 usually performs within one S unit of a medium-size triband beam such as Cushcraft's A3, and a Hy-Gain 3-element Thunderbird beam usually "outworks" an A3 by one S unit. I have also found a 400-watt signal from an AV-640 vertical reaches out as well as or possibly a tad better than a 100-watt signal from an A3 beam, a G5RV performs maybe one S unit better than a dipole, and an Extended Double Zepp beats a dipole by two or three S units.

During numerous "A/B antenna checks," I have also noted up to three S units difference between using vertical and horizontal antennas, and the "winning polarity" differs from day to day and according to band conditions of the time. Possibly that explains why some days you can catch DX stations on the first call while other days everyone except you seemingly works DX like a bandit. That is what makes working HF and riding the waves of ether so incredibly exciting!

One additional note warrants mentioning: The coax cable/feedline connecting your transceiver and antenna is your radio lifeline. Never skimp on quality, as precious watts of power may be lost unnecessarily. RG-8x coax is a good economy choice for lengths up to 100 or 150 feet, bands/frequencies up to 6 meters/ 50 MHz, and power levels up to 600 watts. If you prefer larger size low-loss cable at economical cost, check out RG-213U. Always strive for a single and unbroken/unspliced length from rig to antenna, avoid sharp bends, and remember to replace it every seven to ten years.

## Mics and Keys

A fair number of HF transceivers are factory-supplied with a hand mic, and you can purchase a basic hand key at low cost, but a small investment in their personally attractive counterparts can repay you tenfold in long-term enjoyment. Furthermore, you can move mics and keys between transceivers when upgrading later on.

With respect to microphones, Heil Sound's desk mics are world-famous for their excellent sound quality and audio "punch." In particular, the model HM-10 mic (photo C) is priced at under $100 and available with a rich-sounding full-range or DX-grabbing limited-range element. More details are available at <www.heilsound.com>.

While hand keys are good for casual CW operations, a paddle used with an electronic keyer (which is usually built-in with

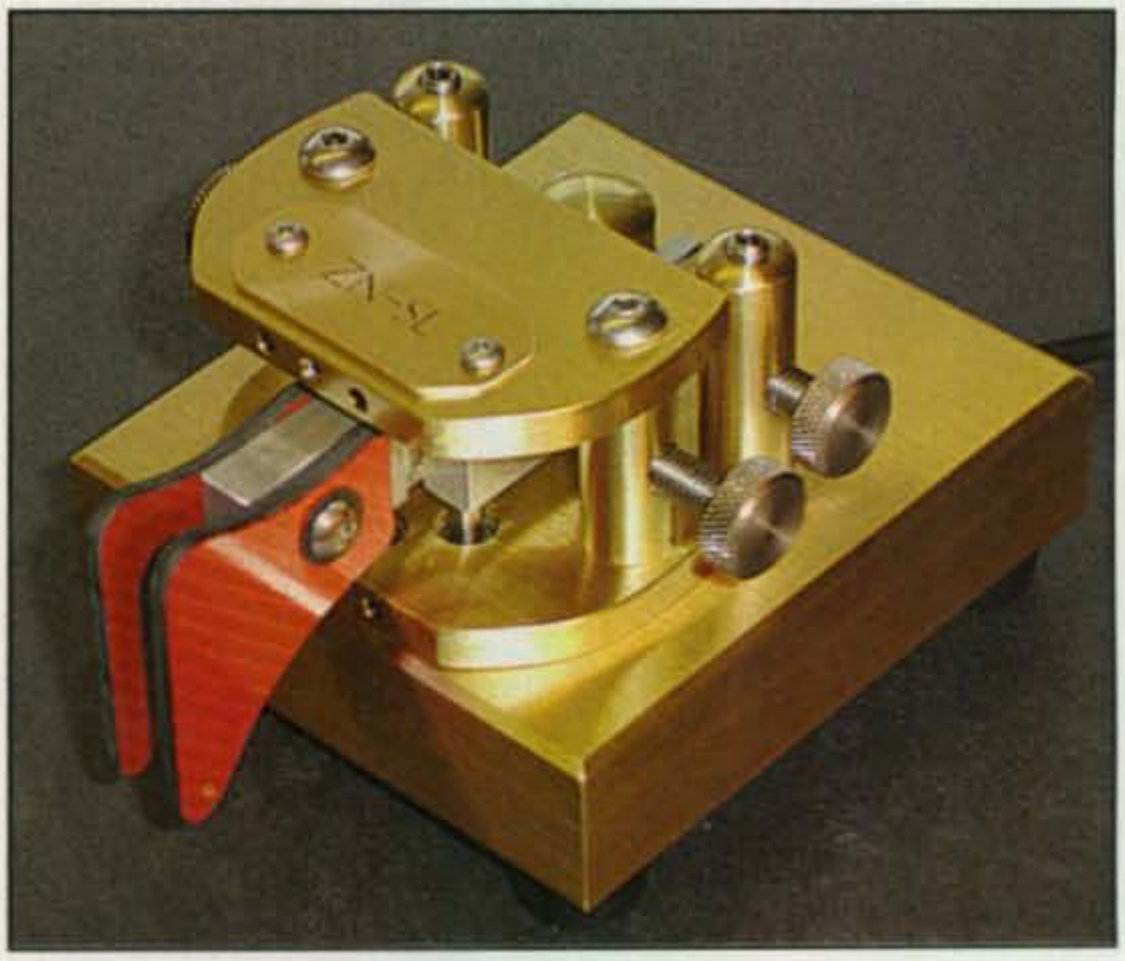

*Photo E– Would you like to add a touch of luxury to your CW operations? Add a custom paddle such as this single-lever beauty made by N3ZN to your station. It uses magnets in lieu of springs for tensioning, has an excellent feel, and looks great. Using a single-lever paddle that can move in only one direction at a time is also the easiest way for newcomers to get started in CW activity. Paddle details at <www.n3znkeys.com>.*

newer model transceivers) is definitely preferred for more frequent CW use. I understand if your interest in CW is presently low or non-existent, but do not write it off until you read next month's column. There is more DX on CW, your signal reaches out better on CW than on SSB, you can copy weak signals easier on CW, language barriers are easier to overcome on CW, and more.

With respect to paddles, there are two basic categories: dual-lever or iambic types and single-lever types. Dual-lever paddles require more practice to use (because their dot and dash levers work independently), but when mastered, using one is more enjoyable than driving a nimble sports car. Honest! A single-lever paddle's arm can only move left or right at any one time, so it is easier and more foolproof to use—a good thought to remember if you have "two left thumbs."

In the under $100 category, the round-based and blue-tipped Katsumi paddle available from <www.MorseX.com> is a popular choice (photo D). In the "affordable exotic category," the dazzling N3ZN paddle available from <www.n3znkeys.com> is superb (photo E). Everyone has his or her own preference, however, so feel free to buy and try various mics and keys as desired. That is how over the years many older amateurs acquired their array of mics and keys (oh, the joys of being a packrat!).

## Conclusion

That overflows available space for this time, friends, but watch for more helpful hints and tips next month when we present a collection of clever operating ideas and show you how to have a ball on CW regardless of your Morse savvy. I also invite you to check out my book *Your Guide to HF Fun* described at <www.k4twj.blogspot.com>.

73, Dave, K4TWJ

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1 tube, 1250 W

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2 tubes, 1.5 kW *Plus*

**These** HF linears with *Eimac*® 3CX800A7 tubes cover 160-15 Meters including WARC bands. Adjustable slug tuned input circuit, grid protection, front panel ALC control, vernier reduction drives, heavy duty 32 lb. grain oriented silicone steel core transformer, high capacitance computer grade filter capacitors. Multi-voltage operation, dual lighted cross-needle meters.

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Replace **5** coax with 1! 1.2 SWR at 250 MHz. Useable to 450 MHz. < .1 dB loss, 1kW@ 150MHz.

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beginner's corner

BY WAYNE YOSHIDA,* KH6WZ

# What Flavor is Your Ham Radio?

I was talking to a small group of new members after a recent radio club meeting. Several of them had one or two things in common: They had recently passed their exams and now they wanted to take the next step—get on the air. All of them had been exposed to ham radio handie-talkies (HTs) and FM repeaters, but not much else. Some of them wondered if there was anything else to do on the radio.

Several of the "old timers" entered the conversation, explaining that FM and repeater operation are only a very small aspect of the ham radio service, and there is so much more to do. I agreed, and perhaps because of the summertime heat, I said that ham radio comes in many forms and is similar to the many flavors of ice cream. Like ice cream, ham radio can go from "plain vanilla" to "fancy chocolate fudge and vanilla swirl with nuts and sprinkles."

Continuing with this analogy, everyone has a different favorite. In selecting a flavor, many people know what flavor or flavors they will like or not like based on a description, without giving them a try. However, if they skip an opportunity to try something new or different, they may never know if the experience can bring a new joy.

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e-mail: <kh6wz@cq-amateur-radio.com>

## A Cornucopia of Stuff

Moving back to ham radio, the cornucopia of ham radio flavors is a lot more than frequency bands and modes of operation. On the "operating" front, ham radio includes public service, contesting, DX chasing (DX refers to distance contacts), QRP (QRP refers to low transmit power), satellite operations, exotic modes such as amateur television (ATV), and even radio control, usually called R/C, for controlling model land and water vehicles and aircraft. (See photos 1, 2, and 3.)

Speaking of radio control, I should mention that there is another version of this term—remotely controlling a ham radio station. There are certain FCC rules about this aspect of operating, and it requires certain hardware and skills to do this. However, for folks living in a place where antennas are not allowed, this may be a viable solution.

Since these days just about all lower band ham radio sets include a "general-coverage receiver," shortwave listening (SWLing) is another activity many hams (and non-hams, too) enjoy. *CQ* magazine's sister publication *Popular Communications* is chock-full of information on this fascinating hobby. It is very interesting to listen to other countries' news and hear different views on cur-

*Photo 1– Public service is a very important ham radio activity. Join a public-service group such as ARES, RACES, or SATERN and then put your amateur radio communications skills to good use in your community.*

*Photo 2– Want to try something out of this world? Try operating the amateur radio satellites. Here Clint Bradford, K6LCS, works a satellite with a dual-band HT and an external antenna. AMSAT-NA is the amateur satellite organization for North America; there are associate groups all over the world.*

rent events. There are also many fascinating radio programs on shortwave, such as Glenn Hauser's DX Listening Digest and BBC World Service. I would include listening to public-service radio scanners in this category, too. Just about all VHF/UHF ham radio sets include the public-service frequency bands, so you can listen to police, fire, military, aircraft, and other radio services in your community. I have a ham friend who has programmed many railroad frequencies into his mobile radio. In case you are curious, the railroad frequencies in North America are in the 160.110-MHz to 161.565-MHz range.

On the "technical" front, ham radio includes many things, such as antenna experimenting and building, as well as building your own equipment or station


*Photo 3– Coming back to Earth, but possibly just as exotic, is VHF-and-above experimenting. I am pictured here with two other millimeter-wave radio contesters, Chip Angle, N6CA, and Steve Gocala, Jr., KB8VAO. CQ's other sister publication, CQ VHF magazine, covers VHF and above and its many fascinating areas of interest.*

*Photo 4– Dave Glawson, WA6CGR, is modifying a surplus telecommunications amplifier for ham radio use. Modifying and building ham gear is a traditional ham radio pastime.*

accessories. Many times the specialized modes require some technical expertise (or access to people who possess these skills). This is where specialty clubs and knowing their members comes in handy (photo 4).

Testing and test equipment can also be an interesting ham radio pastime. My good friend Peter Day, from Sheffield, England, says, "Be careful. Testing and test gear can become an obsessive hobby in its own right! I know folks who obtain test equipment to test other test equipment." Peter is G3PHO. An impressive array of test gear at a local ham's shop is shown in photo 5.

Collecting old radio equipment is another ham radio sub-activity. For some people, just having a classic rig or two on display is good enough. However, there are many people who enjoy restoring these same classic rigs back to operating condition.

## Just a Small Taste

You can get a taste of some of these ham radio specialties by reading *CQ*. In addition, you may want to see if you can

## From the e-mail In-Box

### Comment on "Beginner's Corner" April 2008 issue

Dear Sir,

I read your "Beginner's Corner" column in the April 2008 issue of *CQ* magazine with great interest. I would like to make a comment on the "staying tuned" paragraph of that column. You say, "These days, however, a microprocessor replaces crystals for frequency control. This has many benefits, including an amazing number of frequency selections (memory channels) and frequency control. ... Almost all of the radios were right on frequency as measured using a service monitor."

First, I agree that modern radios do not need multiple crystals for different operating frequencies. However, I sensed from your writing the notion that modern radios being right on frequency is due to a microprocessor. I beg to disagree with this notion.

Modern radios do rely on a reference frequency but only one frequency. This frequency is still obtained by a crystal oscillator. Everything else is derived using this reference frequency. The circuit that generates multiple operating frequencies is either a phase-locked-loop (PLL) or a technique called direct digital synthesis (DDS). While a microprocessor tells the PLL or DDS which frequency to generate based on the memory location in the radio, it is fundamentally the job of the PLL or DDS to generate the frequency of interest for tuning.

Furthermore, the accuracy of any frequency that is generated by the PLL or DDS cannot be any better than its reference frequency, which is still the crystal oscillator. In order to improve the initial accuracy of the reference oscillator, the reference crystal is put in a temperature controlled "oven."

Please keep up the good work. Regards,
Ismail H. Ozguc, Ph.D. EE, KT6LN

*Ismail—*

*You are correct. There must be a reference oscillator somewhere, and most all of them have a crystal in there someplace. And indeed, the reference frequency accuracy and stability contributes to the "system accuracy and stability." 73 and thanks for catching that.* *Wayne, KH6WZ*

### February 2008 "Beginner's Corner"

Hello Wayne,

Just received my February issue of *CQ*. On page 102 you refer to WWV with "... power in the tens of megawatts..."

How did that slip by? The FCC says WWV power is 10 kW. Regards,
Ralph, K1RD

*Ralph—*

*Oops. You caught a good one.*

*For the record, the NIST has a publication that includes information on their transmitters and the powers are:*

*WWV: 10 kW on 5, 10, and 15 MHz, and 2.5 kW each on 2.5 and 20 MHz.*

*WWVH: 10 kW on 5, 10, and 15 MHz, and the 2.5 MHz transmitter is 5 kW.*

*The NIST website has a link to a great brochure on its services, including photos of the equipment and station at: <http://tf.nist.gov/timefreq/general/pdf/1383.pdf>* *KH6WZ*

### January 2008 "Beginner's Corner"

Hi Wayne—

Enjoyed your article in the January 2008 *CQ* magazine, "The Basics of Making Low-band Contacts." As you mention, there are a great many websites with great info for beginners. I'd like to suggest one that I put up last year: "The A, B, C's of DX," which is an online tutorial with many reference links, accessible at: <http://www.deltadx.net/ABCDx/ABCDx.htm>. I'd like to invite you and the *CQ* readers to visit it.

73, Don, W5FKX
Delta DX Association

*Don—*

*Thanks for the kind comments. As you know, there is so much to be learned on DXing and it is hard to cover it all in a single column.*

*I took a quick look at your site, and it is very nice. I will mention it in a future column, maybe we can take another look at DXing from another angle.*

*73 and keep it up!* *KH6WZ*

*Photo 5– This impressive array of test equipment is not in a commercial laboratory. It is a local ham's collection of instruments that are used to test radios from HF to the microwave bands.*

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| 1.250" | .058" | $1.85 |
| 1.375" | .058" | $2.05 |
| 1.500" | .058" | $2.25 |
| 1.625" | .058" | $2.55 |
| 1.750" | .058" | $2.80 |
| 1.875" | .058" | $3.05 |
| 2.000" | .058" | $3.30 |
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| Hygain, HDR-300A | $1269 |
| M2, OR-2800PX | $1379 |
| Yaesu, G-450A | $249 |
| Yaesu G-550 | $299 |
| Yaesu, G-800SA | $329 |
| Yaesu, G-800DXA | $409 |
| Yaesu, G-1000DXA | $499 |
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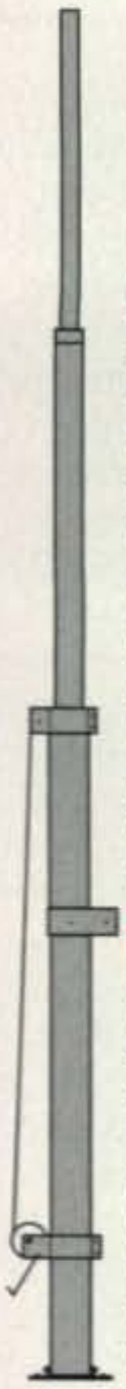

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combine ham radio activities with your other interests. Ham radio and backpacking is a good example. The possibilities are almost endless. Use your favorite internet search engine to find more information on these combinations, and I am sure you will find something that excites you.

I hope this installment of "Beginner's Corner" inspires you to taste—uh, try—something new to enrich your ham radio experience. Find a radio club or maybe a ham radio specialty group in your area and see what they are doing.

*Attention radio clubs:* This is a good opportunity to do some "membership recruitment" by announcing what your club or group has to offer. Update your club website with new images and fresh content. Make sure your club's contact and meeting information is accurate.

With all this activity going on, I want to mention that it would be a good thing to consider writing a story about the interesting things you or your club members are doing, especially if it is something beyond just talking on the local repeater. I will help you spread the word via this column, so the rest of us can get a taste of something new to try.

73, Wayne, KH6WZ

## References

If you are looking for something new, different, and exciting to do with ham radio, take a look at these amateur radio specialty groups to see what's out there. All the websites listed have links to other sites. Use an internet search engine to find more information, too.

**Radio Amateur Civil Emergency Service (RACES)**
<http://www.usraces.org>

**Amateur Radio Emergency Service (ARES)**
<http://www.arrl.org/FandES/field/pscm/sec1-ch1.html>

**ARES® vs RACES FAQ: Two Flavors of Amateur Radio Emergency Operation**
<http://www.arrl.org/FandES/field/regulations/faq-ares-races.html>

**Salvation Army Team Emergency Radio Network (SATERN)**
<http://www.satern.org>

**The Radio Amateur Satellite Corporation (AMSAT)**
<http://www.amsat.org>

**VHF and Above Groups**
San Bernardino Microwave Society: <http://www.ham-radio.com/sbms>

**Collecting and Restoring Old Ham Radio Sets**
Virtual Collins Radio Museum: <http://www.wa3key.com/collins.html>

**Shortwave Listening (SWL)**
North American Shortwave Association: <http://www.naswa.net>

**Radio Control (R/C) Modeling**
Tower Hobbies: <http://www.easyrc.com>

**Controlling a Ham Radio Station Remotely**
"VoIP and Amateur Radio": <http://www.arrl.org/qst/2003/02/VoIP.pdf>

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|---|---|---|---|---|
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| SS-12 | 10 | 12 | 1⅞ x 6 x 9 | 3.4 |
| SS-18 | 15 | 18 | 1⅞ x 6 x 9 | 3.6 |
| SS-25 | 20 | 25 | 2⅞ x 7 x 9⅝ | 4.2 |
| SS-30 | 25 | 30 | 3¾ x 7 x 9⅝ | 5.0 |

MODEL SS-25M

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| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SS-25M* | 20 | 25 | 2⅞ x 7 x 9⅝ | 4.2 |
| SS-30M* | 25 | 30 | 3¾ x 7 x 9⅝ | 5.0 |

MODEL SRM-30

**RACKMOUNT SWITCHING POWER SUPPLIES**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25 | 20 | 25 | 3½ x 19 x 9⅝ | 6.5 |
| SRM-30 | 25 | 30 | 3½ x 19 x 9⅝ | 7.0 |

**WITH SEPARATE VOLT & AMP METERS**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25M | 20 | 25 | 3½ x 19 x 9⅝ | 6.5 |
| SRM-30M | 25 | 30 | 3½ x 19 x 9⅝ | 7.0 |

MODEL SRM-30M-2

**2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25-2 | 20 | 25 | 3½ x 19 x 9⅝ | 10.5 |
| SRM-30-2 | 25 | 30 | 3½ x 19 x 9⅝ | 11.0 |

**WITH SEPARATE VOLT & AMP METERS**

| MODEL | CONT. (Amps) | ICS | SIZE (inches) | Wt.(lbs.) |
|---|---|---|---|---|
| SRM-25M-2 | 20 | 25 | 3½ x 19 x 9⅝ | 10.5 |
| SRM-30M-2 | 25 | 30 | 3½ x 19 x 9⅝ | 11.0 |

MODEL SS-12SM/GTX

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ICOM IC-F11020 & IC-F2020
KENWOOD TK760, 762, 840, 860, 940, 941
KENWOOD TK760H, 762H
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MOTOROLA HIGH POWER SM50, SM120, & GTX
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SS-12EFJ
SS-18EFJ
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SS-12MC
SS-10MG, SS-12MG
SS-101F, SS-121F
SS-10TK
SS-12TK OR SS-18TK
SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V

*ICS – Intermittent Communication Service

# Big Signals from Small Packages

BY JEFF REINHARDT,* AA6JR

Dayton 2008 was an eye-opener in many ways. Those of us who attended the Hamvention® were curious to see if $3.00 a gallon gasoline prices would be a deterrent to the attendance level. While the price of fuel may have kept some from going to ham radio's annual celebration of our "geekiness," the numbers seemed consistent with recent years. Some more good news was found in that those who did attend also seemed motivated to put their federal economic stimulus checks to work on devices that would help liven up the airwaves.

However, how quickly things change! What seemed like high-priced fuel in May now seems like a bargain. As this is being written in early June, a gallon of petrol in southern California has rocketed through the $4.50 price point with no relief or even slowing down of the price escalation in sight.

Perhaps Dayton was prescient in being a showcase for smaller, more fuel-efficient cars serving as radio platforms. Stratospheric fuel prices appear to be here to stay for a while at least, so it's a good time to explore how we can enjoy radio communications in the smaller cars that are sure to become a fact of life here in America.

*5904 Lake Lindero Drive, Agoura Hills, CA 91301
e-mail: <aa6jr@cq-amateur-radio.com>

## Get Smart

No, it's not a plug for the movie, nor a referral to the old TV show some of you may remember, but the Smart car is a pretty interesting vehicle. To be sure, its tiny dimensions make the vehicle a novelty, and its fuel economy, combined with its relatively low cost, make it increasingly attractive. Other notable traits of the Smart are adequate leg room for most full-grown adults and not a lot of room for much else!

*Photos 1 & 2– Tiny on the outside, the Smart car can still put out big signals when properly equipped with a multiband transceiver. Wilmer, N8PGX, demonstrates his mobile "shack" in the Smart. Note the radio control head at the bottom center of the dash.*

*Photos 3 & 4– This Comet "suction cup" antenna is strong, easily removed, and requires no holes. Also note the window-top-mounted antenna on the passenger door.*

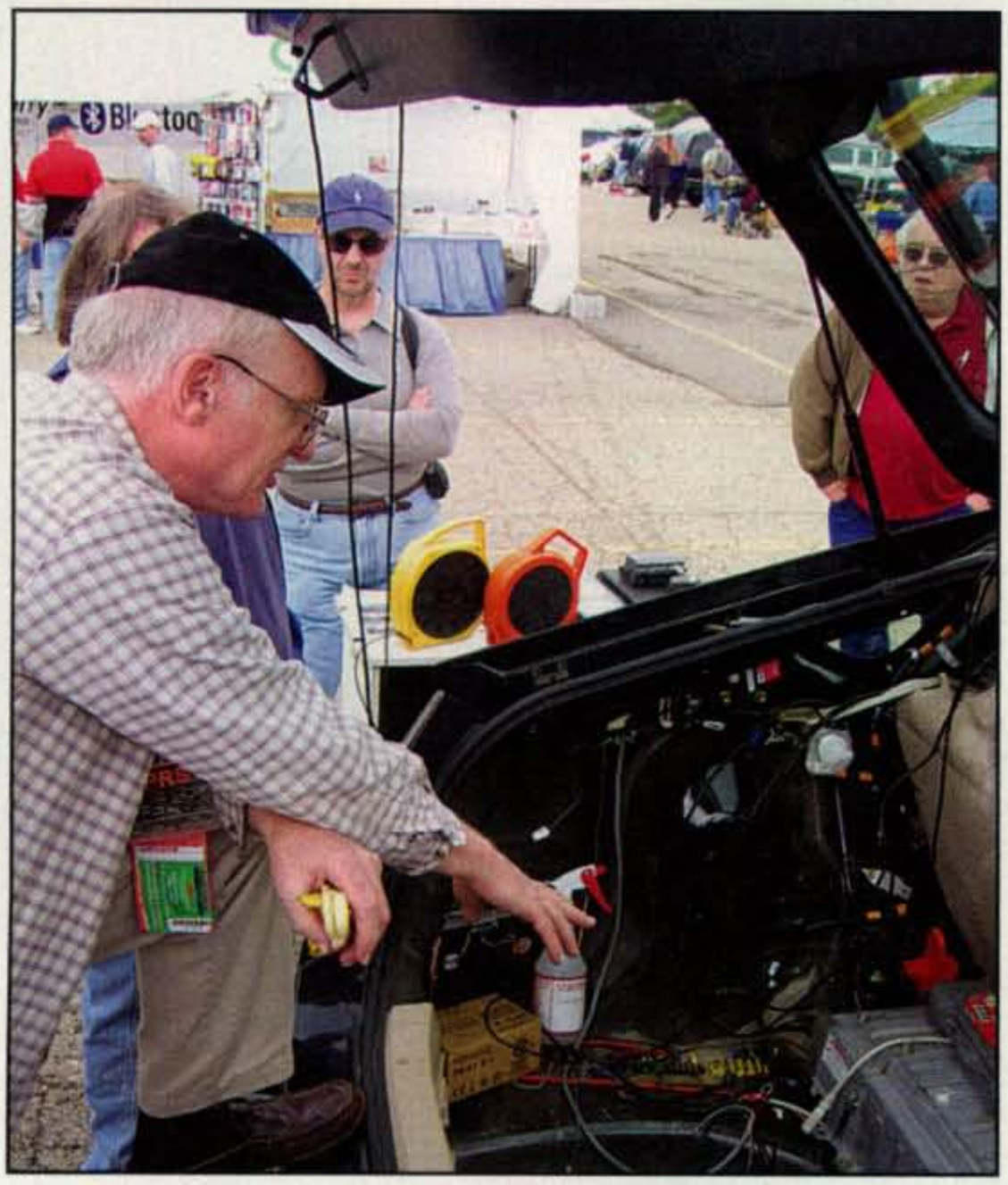

*Photo 5– In the true spirit of experimenters, Bob, WB4APR, explains some of the "mods" to his Prius in the Dayton Hamvention® fleamarket area.*

Wilmer, N8PGX, was kind enough to show his car at the Comet Antenna booth at Dayton while demonstrating that it is possible to shoe-horn a radio into this motorized marvel (photos 1 and 2). The Comet folks also explained that finding suitable locations for an antenna on the Smart was a bit of a challenge. Note the location of the remote mount transceiver control head in one of the photos. The radio itself, along with the antenna and power wires, all are nicely concealed, no small feat in a car that places its battery in the car's space-efficient interior. On the other hand, that's a ready, nearby source of power for hams determined to add a transceiver to the package.

The Comet folks had some excellent antenna solutions for the Smart, but unfortunately the photos of black antennas against the black trim of the car didn't turn out very well. They used a nifty over-the-window unit, a suction-cup mount, and an innovative mount on the cowl of the car to show a variety of antenna options that did not require drilling through the car's exterior body panels (photos 3 and 4).

## Doc Brown's Prius

Each time I enjoy the company of Bob Bruninga, WB4APR, I become more convinced that he served as the basis for the character Dr. Emmett Brown in the *Back to the Future* movie trilogy. When we chat, I keep expecting Marty to appear, needing a way to return to a different decade.

This time, instead of a DeLorean, Bob has been experimenting with Toyota's Prius hybrid (photos 5, 6, and 7), tapping into the big traction battery that provides a few hundred volts of DC to the car's electric motor. Please note that this is not for the faint-of-heart or casual experimenter. Bob buys salvaged cars and pieces them together. He grins and admits

*Photo 6– The roof and hood of Bob Bruninga's Prius are put to work gathering sunlight to charge the batteries, perhaps posing at least one good response to $6.00 a gallon gasoline.*

*Photo 8– A "New Beetle" sports a sturdy screwdriver antenna, but don't ignore the antennas on either side of the hatch as well. "CQ Deutschland?"*

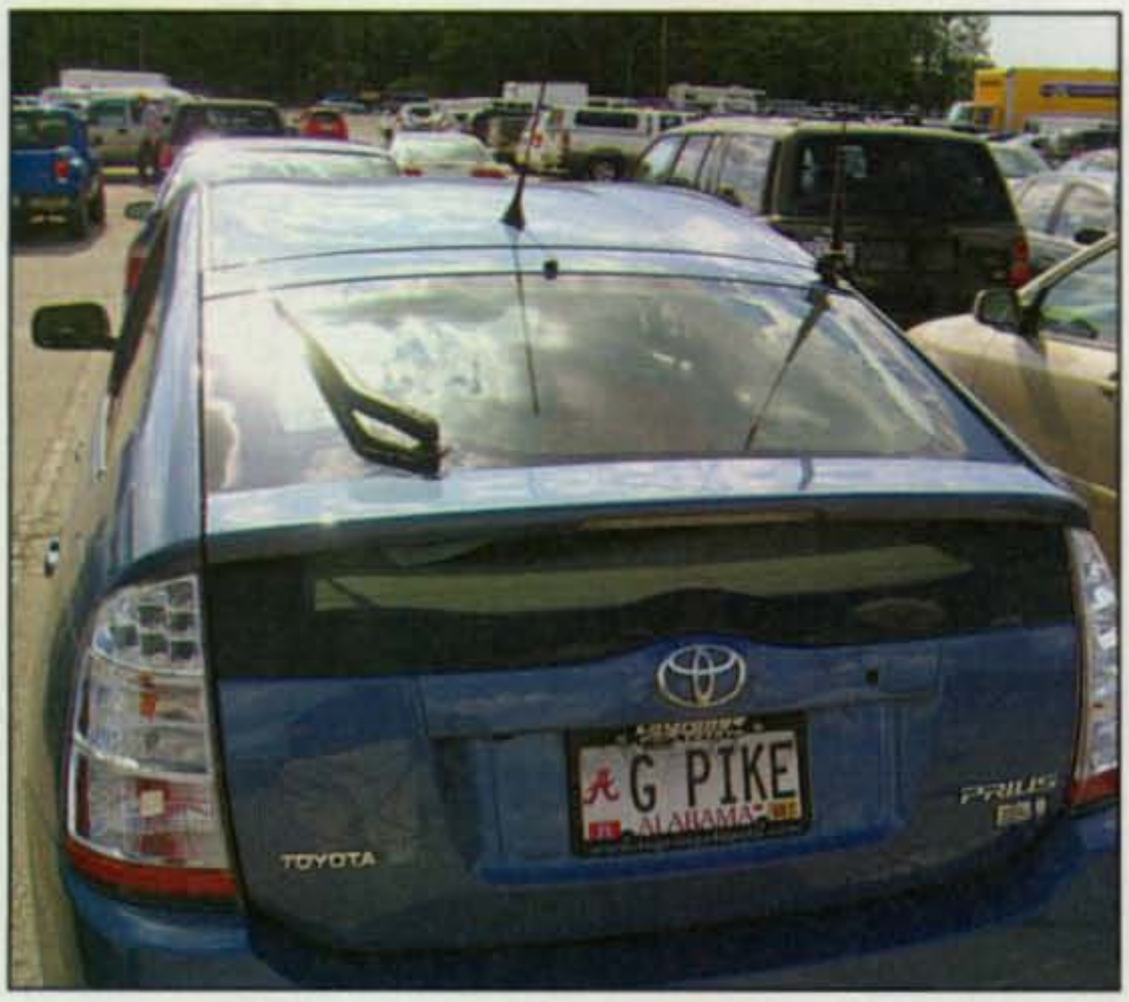


*Photo 7– A more conventional Prius with a hatch-mount antenna. The car gets around 45 miles per gallon; the radio generates more smiles per gallon for the operator.*


*Photos 9 & 10– This Collins van looks like it just arrived from the 1960s, complete with a KWM-2 mobile rig.*

to having had an electrical mishap or two that would prove costly to anyone who relies on his car as a reliable conveyance to his daily workplace.

Bob has fitted the Prius in the photos with several additional batteries, a solar charging system, and more. He touts the vehicle as a portable power pack for a 10-KW Field Day station, but it's also configured as a "plug-in" hybrid that can cruise farther on its electric motor than a standard Prius.

Like I said, this is not work for beginners. However, give credit to WB4APR, who's also the same person who invented APRS (Automatic Position Reporting System) and has been responsible for placing a few satellites in orbit. He is now going where few have gone before in terms of exploring the "inner space" of what's possible in the emerging field of hybrid cars and the very potent—and potentially dangerous—batteries they carry. (I think it's also safe to assume that Bob has

voided the standard vehicle warranty.) All kidding aside, hams experienced with vintage equipment have a healthy respect for high voltage; the voltage and current on tap in a hybrid car battery demands the utmost care, with or without a flux capacitor present.

## Meet the Beetles

I didn't get a chance to chat with the owner of the green "new" Beetle in the photo, but don't let that well-mounted sturdy screwdriver HF skyhook distract you from the other ham antennas mounted on either side of the rear deck lid (photo 8). It's a nice package of antennas, none of which required drilling through the external body panels. And how many Beetles are capable of putting in a direct call to the Fatherland?

## Vintage Mobile

Part of the fun of Dayton is the variety of things to see. Our last featured mobile is a throwback to "those thrilling days of yesteryear," when gasoline engines didn't require computers and radios glowed in the dark. The Collins aficionados brought an early 1960s Ford Econoline van equipped with what else? A KWM-2 HF mobile that could probably double as an interior heater when the weather turns cool (photos 9 and 10). It's a very nice combination that gives proper tribute to the equipment and the place in time it occupied.

## Late Breaking News

Snapping back to today, *Amateur Radio Newsline* reports that Yaesu has announced a new transceiver with Bluetooth® capability. At the time of this writing I do not have details on the VX-8R, but I'm sure they'll be released in pretty quick order. This can be welcome news for mobile operators who may benefit by operating "hands free," similar to that same feature found on many cellular telephones. We can only hope that other manufacturers will soon follow suit.


*Photo 11– Glenn, K3SWZ, believes the Mrs. should also promote ham radio.*

## Not Another Ham Plate!

A post-script to our last column (May issue), which devoted space to amateur radio license plates, comes from Glenn, K3SWZ, who took care of the Mrs., giving her a mobile statement supportive of our hobby and proclaiming her proud status as the spouse of an OM (see photo 11).

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Please be sure to send along photos of your mobile setup and pass along your tips and tricks for installing gear in today's cars. Until next time, happy mobiling! 73, Jeff, AA6JR

BY DAVE INGRAM,* K4TWJ

# Fun Times, Fun Rigs

There is no doubt about it, friends; life in the QRP lane is good. We may be using low-power gear and simple antennas, but we are having a barrel of fun, staying within our budgets, and maintaining a low profile amidst ever-increasing CC&Rs.

Recently, for example, I answered a CQ from Alan, W4MQC, and learned that he was hamming from a restrictive Florida island while using an Argonaut V and Hustler 6BTV vertical hidden on a boat dock behind his house (photos A and B). Checking further revealed his antenna was actually lower in altitude than his house, but he was contacting stations near and far with a mere 5 watts of power. Then, too, Monty, N5ESE/M, and I frequently cross paths and chat on 40 or 30 meters in the morning as he mobiles to work (photo C). Monty's rig is a little Elecraft K1 running 5 watts to a HamStick antenna mag-mounted on his Oldsmobile. Did you think that mobiling required a 100-watt transceiver and a fancy screwdriver antenna? No, it doesn't.

In comparing QRP tales with Monty, incidentally, I learned he is a real Altoids® tin enthusiast. He has built and stuffed dozens of QRP projects into our favorite enclosures—and his "tinned" Pixie inspired us to revisit the little all-time favorite mini rig in this month's column.

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*Photo A– During a recent QRP QSO with Alan, W4MQC, I asked about his rig and antenna, and he shared this photo. Alan uses a Hustler 6BTV Vertical mounted to the boat dock behind his house. A single radial routes down the piling and into the salt water, which is highly conductive and goes right into the Gulf of Mexico. Now that's a big-time ground system for sure!*

## The Pixie Lives On

Can you visualize building a mini transceiver in only one or two hour and at a total cost of less than $20? That is the Pixie (photo D)—a two transistor and one IC transceiver you can quickly assemble for 80, 40, 30, or 20 meters and power from a 9-volt battery for 150 to 250 milliwatts output, or connect to a 12-volt DC supply and get 350 to 450 milliwatts output. It is a bare-bones item (direct-conversion receiver and oscillator-amplifier type transmitter), but it is super-handy for impromptu hamming when hiking, camping, or traveling ultra-light style with all necessities in a coat pocket. Combine it with a thin wire dipole or tall whip with trailing counterpoise, and you are good to go!

The Pixie's circuit diagram has been in circulation since the 1990s, and I am unsure who to credit with its original design. If I remember correctly, GM3OXX introduced the general design concept in his "Foxx" transceiver and NorCal later produced it as a Pixie kit. A bit later, Embedded Research added its Tick keyer to it and kitted it as a Tixie. Both items are now out of production, so modern solder slingers can build their own Pixie "Manhattan" or "ugly construction" style as desired, and, as I will explain, there are a couple of unique ways to have fun with the completed rig. First, however, let's look at the Pixie's circuitry (fig. 1).

Two transistors, Q1 and Q2, form the heart of this mini rig. Q1 operates as a Colpitts oscillator, producing a carrier signal on transmit and a local-oscillator BFO signal on receive. A small inductor and trimmer capacitor connected between the crystal and ground permit shifting Q1's operating frequency a couple of kHz, and a switch in parallel with the trimmer permits returning to the crystal frequency for transmit offset (just remember whether you switch it in or out when receiving and transmitting).

Transistor Q2 serves as a Class C power amplifier on transmit, delivering between 150 and 400 milliwatts output. Q2 is ever so slightly forward-biased on receive, so it functions as an active mixer. The local oscillator signal from Q1 (which runs continuously) drives the base of Q2 while incoming signals from the antenna are input at Q2's collector. The resultant difference is audio signals are output at the emitter of Q2, developed across R3, and coupled into audio amplifier U1 via C85. The IC then boosts detected signals and outputs


*Photo B– The indoor setup of W4MQC reveals an ever-popular Argonaut V transceiver with an LDG Z11 auto tuner plus a few smooth-handling CW keys for flavor. Very nice! (Photo courtesy of W4MQC)*

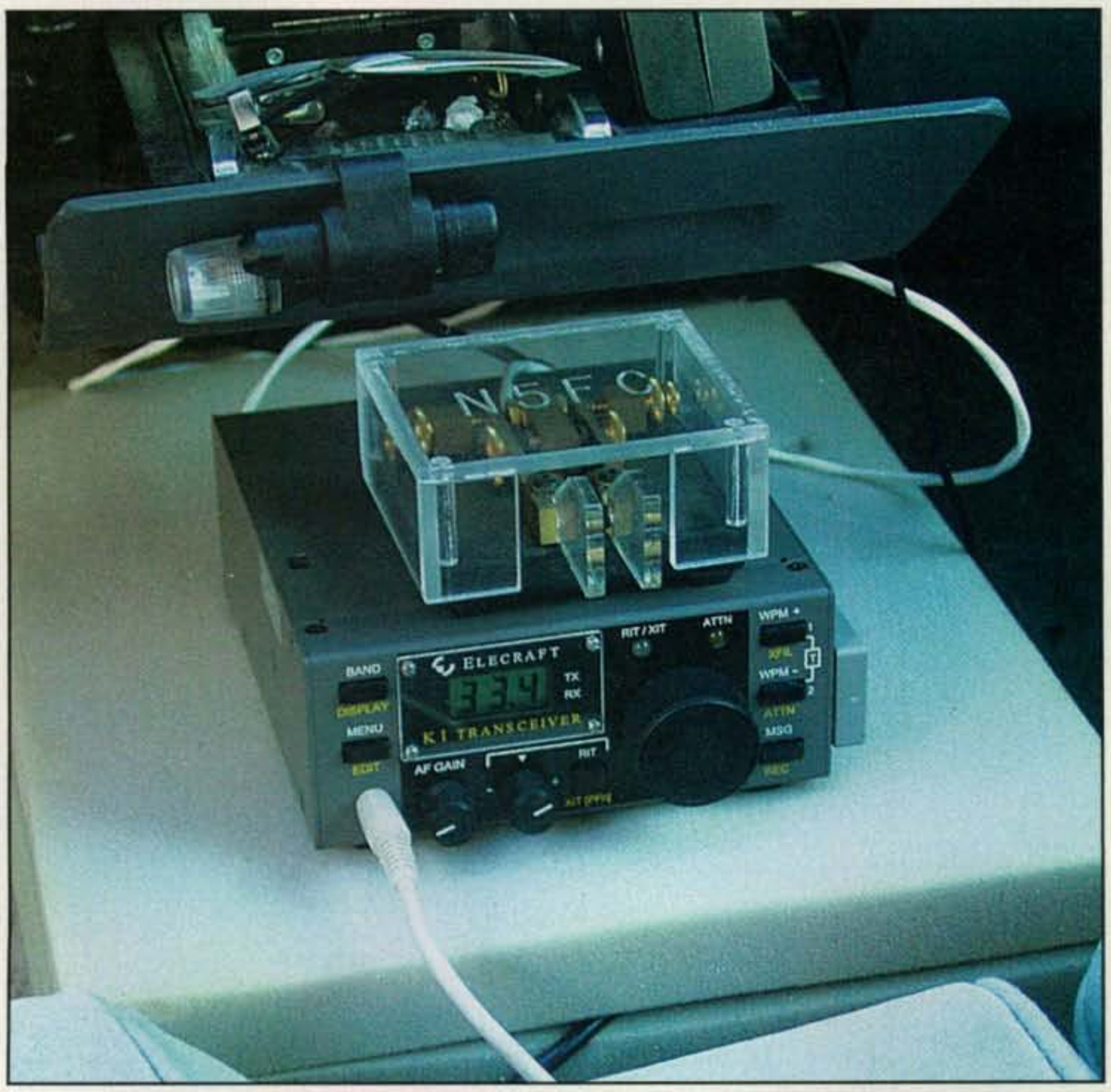


*Photo C– If you have listened on 30 and 40 meters CW mornings around 1200 to 1300 UTC, you have probably heard Monty, N5ESE, mobile en route to work. If you could peek inside his automobile, you would see this neat Elecraft K1 and paddle straddling the transmission hump. Five watts, four wheels, and a romping good time every day! (Photo courtesy of N5ESE)*



them through C9 to an earphone. Incidentally, selection of 80-, 40-, or 30-meter operation simply involves mating a desired frequency crystal with the appropriate value output filter capacitors and inductors as shown in fig. 1.

Keying and T/R switching are accomplished by grounding the emitter of Q2, which shorts the input of audio amplifier U1 to ground while changing emitter resistance from 10K ohms to zero. This causes transistor current (and signal output) to increase from a few microwatts to roughly 250 milliwatts. There is no bandpass filter in the Pixie, so you can hear other signals within 3 or 4 kHz either side of your transmit frequency, but that's fine for casual operations. You just concentrate on one tone and ignore the rest (a hands-free QRP scanner!). There is also no CW sidetone, but light clicks and hums with keying help monitor your sending (what do you expect for under $20?).

Earlier I hinted at unique applications for Pixies. One is connecting it to the audio input/volume control of an AM/FM radio for casually listening to favorite band/frequency activity. Install a Pixie in a clock AM/FM radio, and you can even wake up to the cheerful sound of CW QSOs. I use a lash-up like this when visiting hamfests or vacationing, and it

is a gas. The volume control in most radios is connected between the detector output and ground, with its wiper connected to the audio section's input. Just connect the Pixie's ground to the volume control's ground end, its audio output to the control's other end or center wiper (through a SPDT switch and .01 mFd capacitor so you can select AM/FM or Pixie audio), and enjoy.

Another Trixie for a Pixie is connecting its audio output to the CD/MP3 input socket on newer model car radios. Typically, one of the car radio's pushbuttons has a 3.5-mm socket for accepting external audio. Just plug in, crank up the (car radio's) gain, and enjoy cruising with QRPp.

*Flash . . . a last-minute tip:* I just learned Pixie PC boards are available for $3.50 plus shipping from Far Circuits, e-mail: <mail@farcircuits.net>. Happy Days!

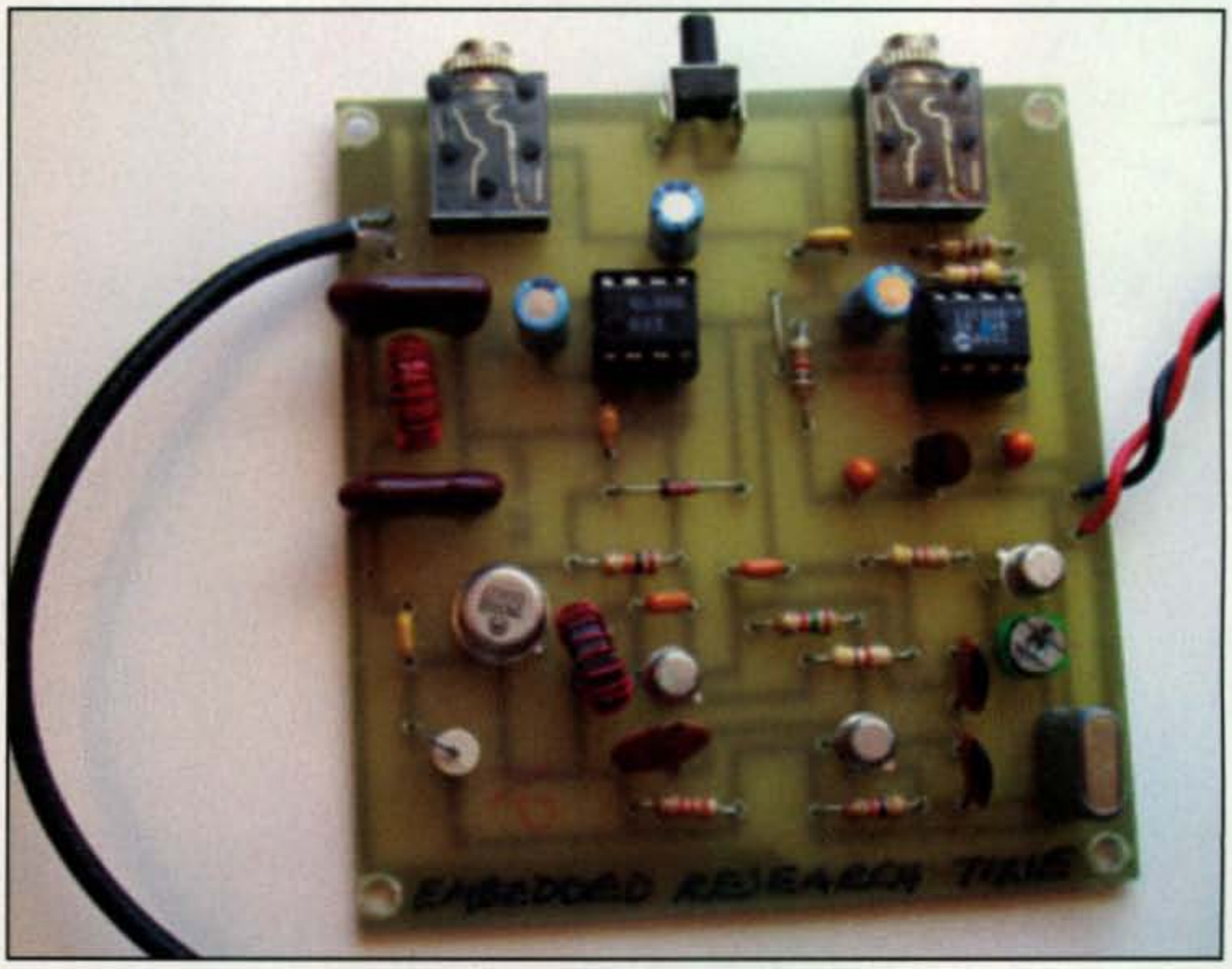

*Photo D– The Pixie transceiver which Embedded Research equipped with a Tick keyer chip and sold as a Tixie a few years ago. Homebrewed copies built on perf board, "ugly construction" or "Manhattan" style, with or without a keyer chip, continue to be popular today.*

## A Big Signal at Low Cost

With sunspot counts low and 40-meter QRP activity high, homebrewing a simple two-element beam for this "band of the day" holds good merit. There is a minor hitch, however. A regular 40-meter beam is large, high profile, and quite expensive. Ah, but there is a low-cost and virtually invisible alternative for QRPers—especially those living near our country's borders (so most other QRPers are located in the same general direction and antenna rotation is not mandatory). The answer is home-assembling a classic ZL Special antenna using 300-ohm twin lead. An antenna of this type exhibits around 4 dB gain, giving your 5-watt signal the communications clout of a 10- or 12-watt signal.

An outline of the 40-meter ZL Special is shown in fig. 2, and as you can see,

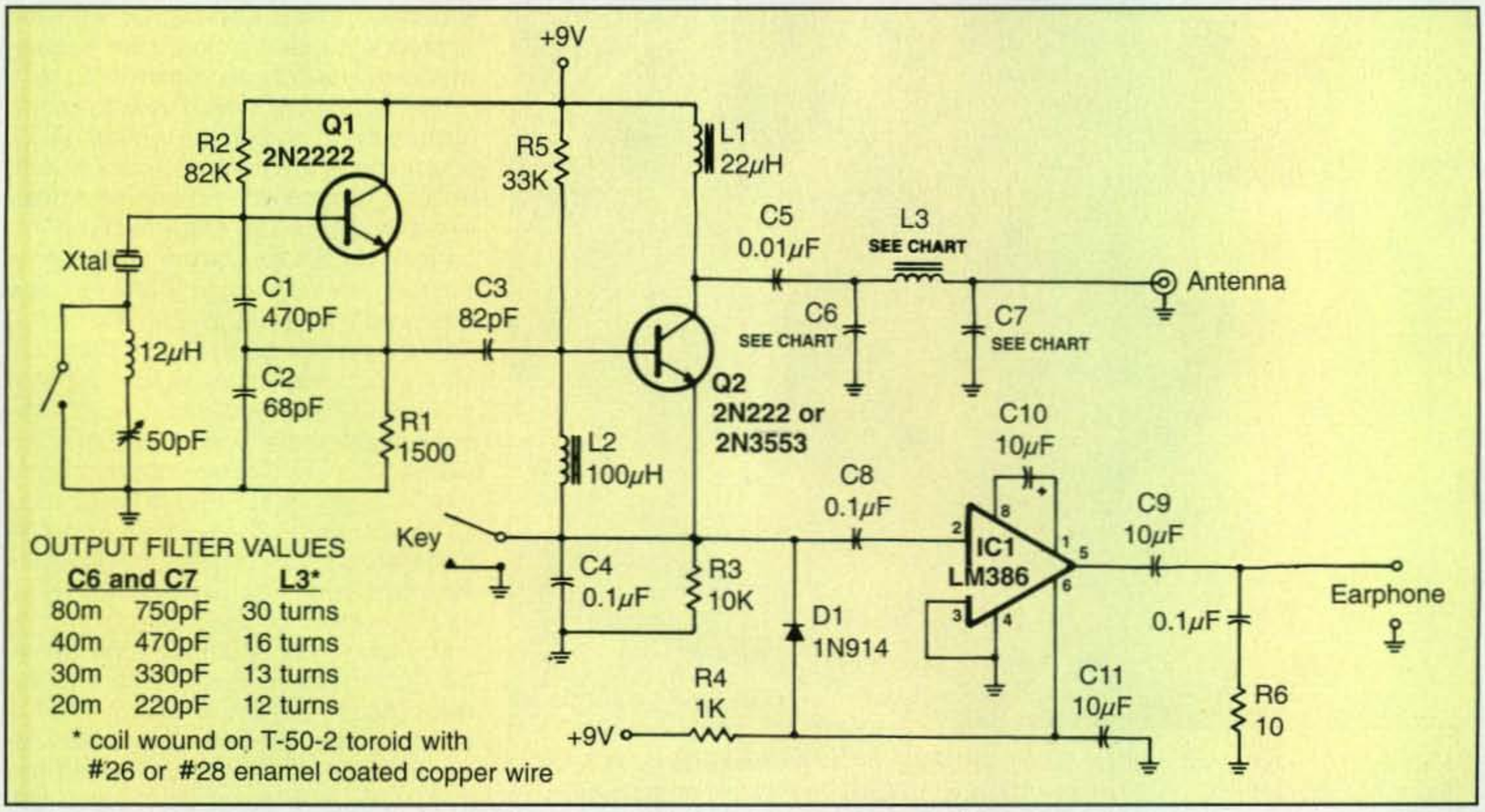


*Fig. 1– Circuit diagram of the little Pixie transceiver. The mini- rig will operate 80, 40, 30, or 20 meters, according to the frequency of the crystal and components in the output filter. (Discussion in text.)*

it basically consists of a folded dipole (driven element) with another 5-percent longer folded dipole (reflector) spaced 1/8 wavelength behind it. The "front" dipole is RF-fed through a 1:1 balun, and the "rear" dipole is electrically connected to it through a 1/8-wavelength section of 300-ohm twin lead twisted a half turn for proper phasing. The antenna's elements are "balanced," and that is why a balun is used at the feed point—which is also closer to 75 ohms than 50 ohms, so the resultant SWR will be between 1.5:1 and 2:1. A basic antenna tuner (manual or automatic) can then reduce the SWR to 1:1 for your rig.

When selecting twin lead to make the ZL Special, be sure to get the plain "ribbon type" rather than the "shielded type" so it will radiate rather than attenuate your signal. If visibility

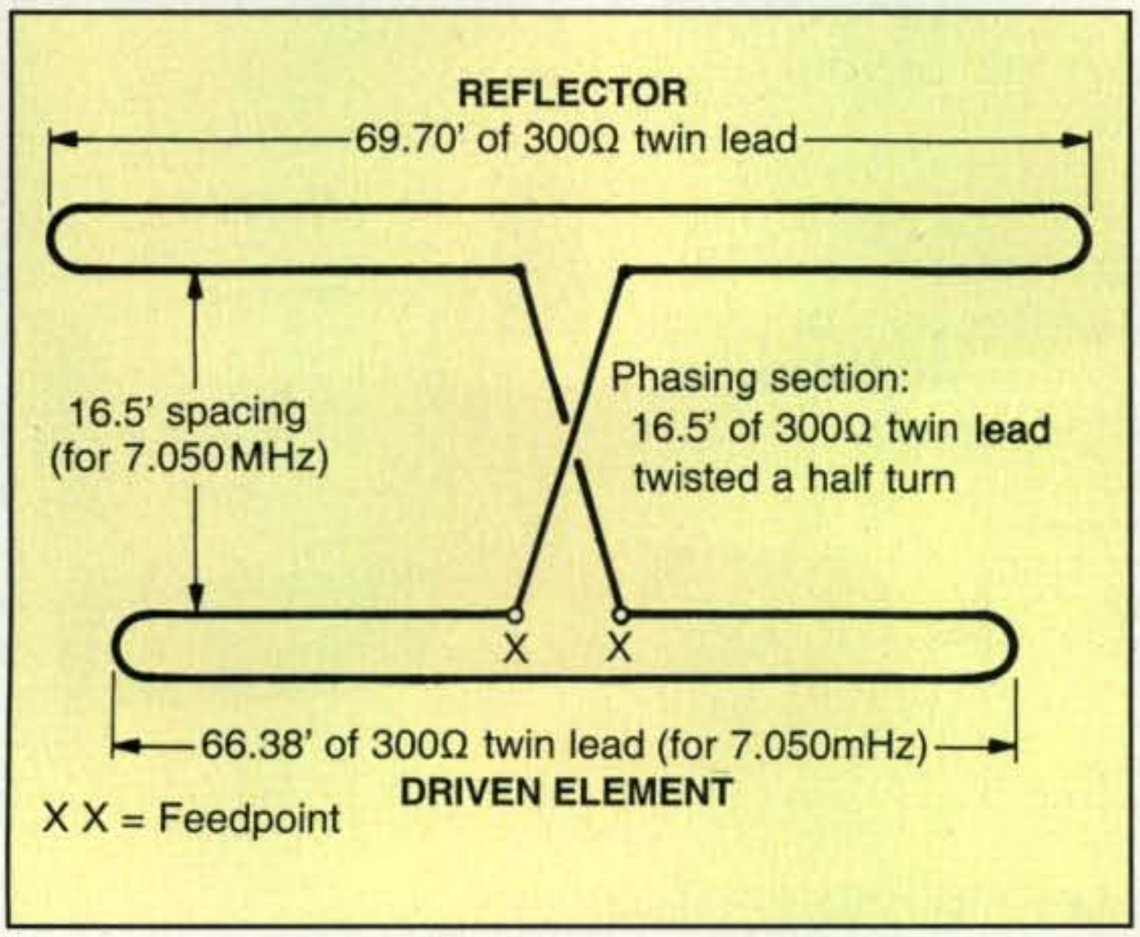


*Fig. 2– Electrical outline of the ZL Special twin-lead/wire beam for 40 meters. Details plus notes on resizing the antenna for other bands are in the text.*


*Photo E– Check out this "High Performance CW Transceiver" built by Dennis Payton, N9JXY. It covers 20 meters beautifully, and the main tuning knob and control are multi-turn Bourne Electronic items with clock or altimeter-type hands for precise readout. Cost of the knob and control? Don't ask! (Photo courtesy of N9JXY)*

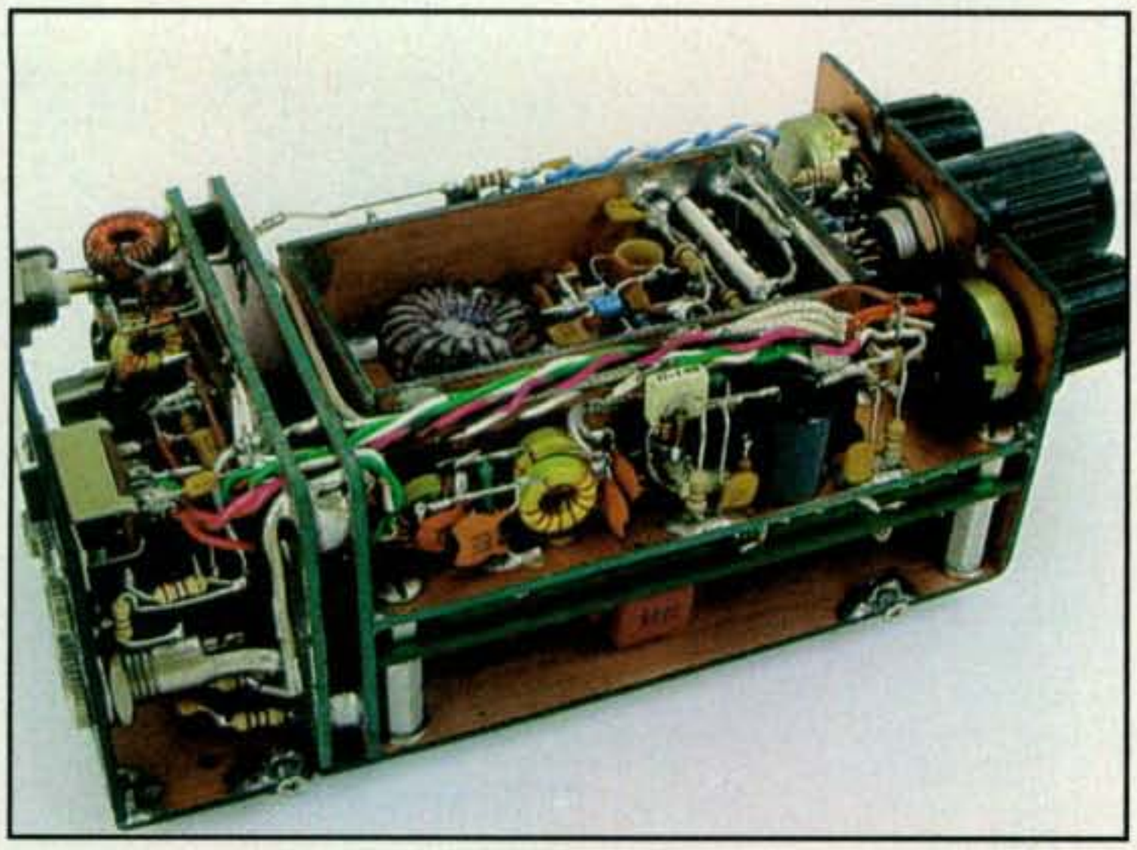

*Photo F– Interior view of N9JXY's High Performance CW Transceiver is a sheer work of art. Notice the cabinet and frame are unetched copper-clad PC-board material. The large toroid near the middle was wound on a Life•Savers® mint and secured with epoxy. Compliments to N9JXY!*

is a concern, hunt for 300-ohm twin lead with a clear (rather than brown) center insulator/ spacer. If you are opting for real invisibility, consider making your own twin lead using super-thin (28 or 30 gauge) wire and tiny clear-plastic spaces plus buttons for insulators. Complexities will then be narrowed down to locating properly oriented tree with branches extending out 8 feet (or more) from center, and maybe a house roof peak 70 feet away, allowing the antenna to face broadside to a desired direction of coverage, is ideal. Concessions (such as installing the ZL Special flat on a (non-metal) roof will be necessary in some situations, however, so go for what best fits your needs and enjoy the results.

Can the ZL Special be resized for operation on other bands? Here are the details. Calculate the driven element's length using the formula 468/frequency (in MHz) = length (in feet)—e.g., 468/14.050 = 33.30 feet for 20 meters. The reflector is 5 percent longer, so 33.30 × .05 = 1.665 added to 33.30, or 34.96 feet. A simple algebraic juggle can then produce a "magic number" for calculating the phasing section's length. First multiply the original frequency and spacing together: 7.050 MHz × 16.5 feet = 116. Next divide the "magic number" 116 by 14.050 MHz, which gives 8.2-foot spacing or phasing section length. I pursued this route rather than calculating spacing as 1/8 wavelength, incidentally, because the "juggle technique" also works for modifying other antennas. It is worth remembering. It is an oldie and a goodie!

## Show Us Your QRP!

We wrap up this month's column with a special invitation for you to share tales and views of your QRP activities with everyone via this column. Do it now while it is fresh in your mind. Folks are always interested in what others are working, what they are using and building, and antennas, so send me the details and I will take it from there.

Following along that path, we close with two more views of Dennis Payton, N9JXY's amazing handiwork (photos E and F). The framework of his homebrewed High Performance Transceiver is copper-clad PC board material assembled with solder, spacers, and screws, and we understand it works as great as it looks. Wow, what a rig!

73, Dave, K4TWJ

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BY DON ROTOLO,* N2IRZ

# HamSphere: A World Inside a Paper Cup

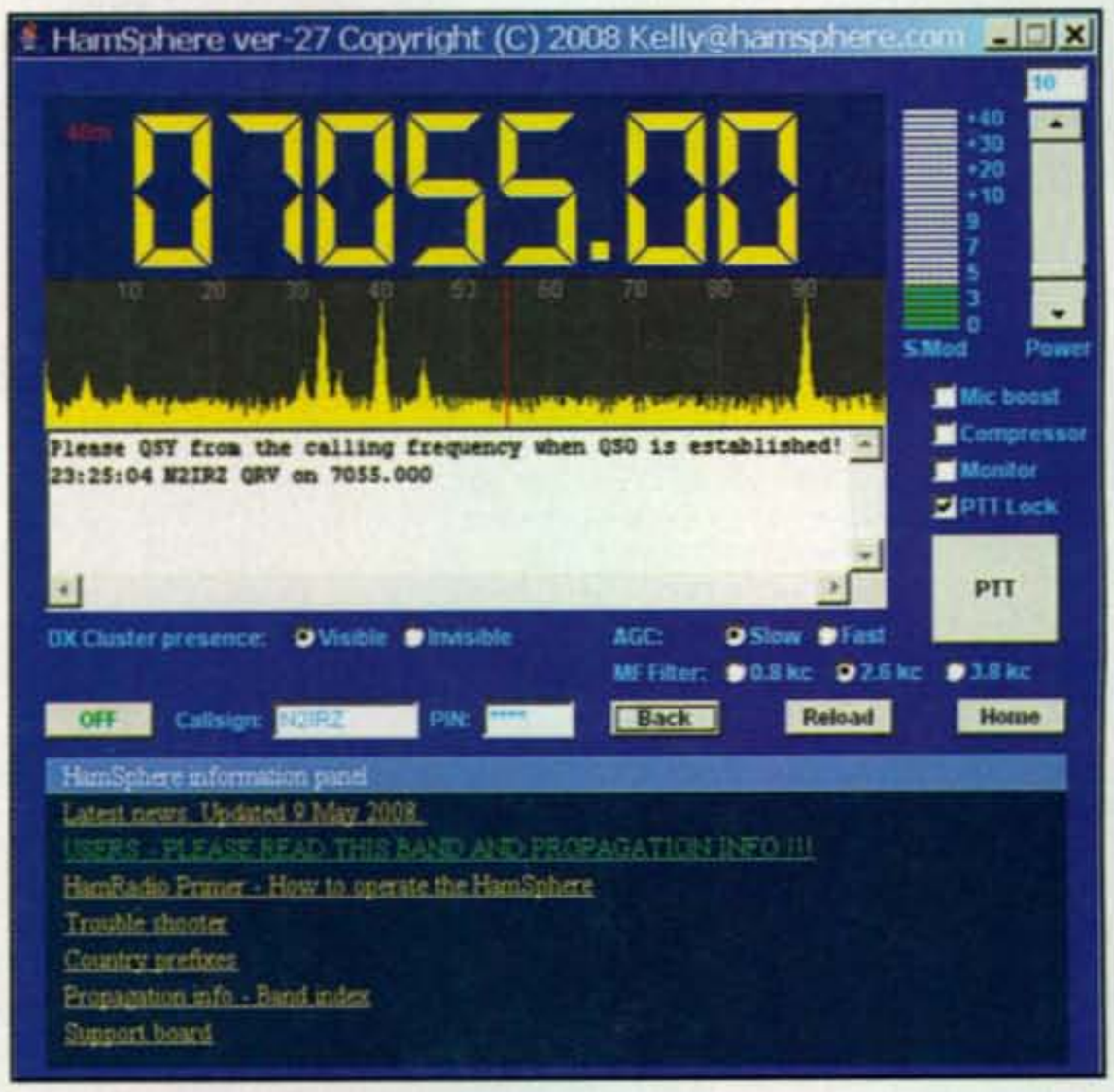
It's an analog world, but we simulate it digitally all the time, and now the ham bands are no exception. A month ago, a friend of mine from FIRST Robotics, Al Skierkiewicz, WB9UVJ, told me about a virtual ham-band simulator. Since then I've had a chance to play around with it some, and I thought some folks might have some fun, too.

The site is called HamSphere, and it's run by Kelly Lindman, SM7NHC. To quote from the website: "HamSphere is a simulated ionosphere based on the natural laws of shortwave radio propagation." Indeed, it is. It's a small portion of the 40-meter band (in the process of being expanded), from 7005 to 7090 MHz, that behaves just like you'd expect—propagation based on time of day, random man-made noise (QRM) and natural noise (QRN), people communicating from all over the place, and even the famous Russian "Woodpecker" station that was the bane of communications back in the day . . . all inside a Linux computer somewhere in cyberspace.

You see, it really is a simulation, although even an experienced ham could be fooled. Not one drop of radio frequency energy is being transmitted anywhere when you use HamSphere, so even folks without a license are more than welcome to come and play around here. The conditions are very realistic, making it a good training ground for HF conversations. I've even managed to make it work with PSK31 and WinDRM, and I suppose it should work just fine with any other digital mode.

The fist step to getting QRV (ready to receive) is to visit <http://www.hamsphere.com> to sign up with the server and download the software. Provide your name, location, and callsign (or something you'll use as a callsign) along with a password. Check off each of the "rules" boxes (there are several, such as "I am not afraid of using the microphone") to acknowledge them and click "Sign me up." You'll immediately be brought to the download page. Follow the instructions, which essentially tell you to download the .EXE file and put it into a directory. I also took a moment to download the instructions, troubleshooting guide and Ham Radio Primer from the site as well.

There is no installation. HamSphere, as downloaded, is all there is, and it runs without a lot of dependencies, so it ran for me out of the box. Well, almost: The .EXE file started up just fine, but I was not receiving any audio. A quick check of the troubleshooting guide, and I was advised that since I could see the spectrum display, but not hear any audio (or get anything on the S-meter display), there was a problem receiving UDP packets on random ports between 1 and 65535.




*The HamSphere main screen. After opening up my hardware firewall so internet packets could be received, HamSphere behaved just like an on-air band would. Just beneath the band scope is the "DX Cluster" announcing who is "on the air." The information panel below it contains helpful troubleshooting and operating tips. Note some of the useful settings, such as power level, audio filters, and AGC.*

Ahh, if only I understood what that meant! Thankfully, one of the network administrators at work knew the lingo and translated for me. UDP packets on the internet are kind of like UI (Unnumbered Information) frames in the AX.25 packet radio protocol: They carry information, but there's no error-checking or even tracking if they reach their destination. It's kind of like APRS transmissions—no guarantees that anyone heard them.

Anyway, he gave me a long list of suggestions on what to try so I could receive these packets. You see, I run my internet connection, house network, and computers with fairly high security, and it was definitely one of those security layers that was blocking the "anonymous" packets.

I have a cable modem facing the internet which is unmanaged. By that, I mean that I am not given access to the modem to adjust its settings. Behind

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e-mail: <n2irz@cq-amateur-radio.com>

that sits my LinkSys broadband router. This is a wired router, since my house is completely wired for CAT5 Ethernet and none of the computers I own are wireless. Behind that sits my local area network, security provided by McAfee Internet Security Suite (a three-license package that was on sale earlier this year, and with the rebate it was free).

In order to find out which security layer was causing my problem, I disabled them one at a time. To my great surprise, I still was seeing those ports blocked, which I verified with a port scan from the Shields UP! Site run by Gibson Research Corporation <http://www.grc.com>, the suppliers of several very useful security-related applications (definitely worth a visit to the site).

To cut a long story short, even after disabling the firewalls in both the router and McAfee (the Windows® firewall is off in my machine because of the McAfee), I was still out of luck. The ultimate fix was to connect my computer to the router's "DMZ" (De-Militarized Zone) port. This is a special port found in many higher-end routers that completely bypasses the router and exposes whatever is connected to it directly to the internet – in this case the cable modem. An effective substitute would be to connect the computer directly to the cable modem.

Once the DMZ was used, HamSphere worked perfectly, even with McAfee switched back on. I'm not a big fan of leaving one of my security layers disabled, so after each HamSphere session I re-enable the firewall for the DMZ port (effectively turning it into a "regular" port). It only takes a moment to switch it off remotely, so it's really not much of a burden.

Using HamSphere requires a sound card, microphone, and speakers. PTT (push-to-talk)is managed by a mouse click, and it will take a few minutes of fiddling with the audio mixer to get all the levels right. Just like a real radio on the ham bands, too much audio will splatter your signal, something to be avoided.

At first, listen to some of the robots on the band. There are SSB signals marking the band edges with repeating announcements to that effect. There's a simulation of a number station reading random number and letter groups, that Russian Woodpecker, and a few other random surprises, which I'll leave for you to discover. The one robot that intrigued me (digital guy that I am) was the PSK31 robot on 7010 kHz. It's not a robot in the strict sense, in that it doesn't respond. It's just a continuous broadcast of some useful instructions and information. However, it got me thinking: Can I do PSK31 on here? What about other digital modes? The answer is yes.

To make the digital modes work, the only adjustment I had to change was to the RX audio source. I opened the mixer control panel and changed the input (recording) source from microphone to stereo mix, instantly lighting up the DigiPan waterfall display. I tweaked the audio levels a bit and was able to send and receive both PSK31 and a WinDRM file. The only other accommodation I needed to make was that I had to manually operate the PTT button in HamSphere, not a big problem once I checked off the "PTT Lock" box, allowing me to click once to toggle PTT on and off.

SSB was a snap, as it's the default mode. Tuning around—click on the band scope for 1-kHz increments, on the numeric display for finer adjustments—I found that mistuned signals really sound like they should. I played with the digital modes, as I mentioned. To check your own signal, there's a monitor mode which reflects your signal back at you. I have yet to figure out

how to make CW work from my straight key, so if you manage to do so, please drop me a line.

On some nights, the band is quiet. You can see who's on by checking the DX Cluster window, which shows as a default. I've seen several "CBers" (anyone without a ham radio callsign is a CBer) and callsign prefixes G, 2E, LU, XE, K, and more all in less than an hour of monitoring. There are probably some lurkers who are just listening without responding to CQs, but for the most part people are eager to start a QSO.

Thus, for those long nights at the bottom of the sunspot cycle, you can get some decent propagation via the internet at HamSphere. Most participants are hams, and those who aren't seem to understand how things work. Give it a try and let me know what you think.

## Digital TV

Hams soon will be the only ones still using the NTSC Fast-Scan TV standard. In case you have been away on a DXpedition (or don't watch TV) and haven't seen any of the dozens of public-service announcements over the past several months, all full-power TV stations in the United States will switch over to 100% digital broadcasting on February 17, 2009. That means your analog TV set will be unable to receive anything over the air.

If you have cable or satellite TV, you probably will not notice any changes. Neither of these service providers are affected by the congressional ruling that has pushed the Federal Communications Commission to action. Some 85% of all the televisions in the United States are connected to something other than an antenna, and these have nothing to worry about.

If you have one of the 15% of TVs that are connected to an antenna, you need to do something about it. Of course, you can connect up to cable or satellite, but maybe you can't or won't. The only other choice is to get a Digital TV converter box. A DTV box looks a lot like a Cable TV box. It has an antenna input and output, some have audio and video outputs, and they come with a remote control. It converts the Over-The-Air (OTA) digital TV signals to conventional analog TV signals, and puts them on Channel 3 or 4 so your old TV can display them. It really is as simple as that.

The federal government has set up a few things to help people with the transition to digital. First is a website, <http:www.dtv.gov> (be sure to get that last part right, since the .com URL is an ugly commercial "vampire" site trying to sucker you into spending money). Visit the website to learn a lot about what's happening, when it will happen, and how to manage it.

The second thing the feds did was offer each family in the U.S. one or two $40 coupons good towards the purchase of a DTV converter box. After signing up at the website (<http://www.dtv2009.gov>, also accessible from the website mentioned above), I received my coupon in just a few weeks.

With my coupon card merrily in hand, I trudged off to the local Radio Shack and found a nice box for $60. A search of the internet found that most boxes were around that price point, not surprising considering the $40 coupon. I could have also gone to Best Buy or K-Mart, as well as several local retailers. Some cautions: First, be careful on the internet, as some sellers don't accept the coupons; and second, once you make your purchase you can't get a refund on the coupon, nor can you get the coupon replaced, so if you want to return the box you'll only get back what you actually paid.

My TVs are all connected to cable, but I got the coupon and box in the interest of journalism. Fashioning a quick and dirty folded dipole form some 300-ohm twinlead, I connected a TV


*The DTV converter box coupon I received in the mail. This program from the federal government provides for a $40 discount on the purchase of a Digital TV converter box. Each family in the USA can request one or two of these coupons.*

to the box and went through the setup routine, where the converter box scans all the available channels to find which ones have signal. Five minutes later, I was watching HDTV from my antenna. Pretty cool, not having to pay for HDTV.

The new digital TV standard is called ATSC, and it has some nifty features, as you'd expect from a wideband digital mode. The basics, such as closed captioning and an on-screen channel guide, are expected. Unexpected are additional channels hanging off the main signal. For example, WNBC-DT in New York City has two auxiliary channels active, one that is all weather all the time, the other showing programming somewhat like what PBS might show—documentaries and the like. Some broadcasters have leveraged these additional channels and features, calling their new digital offerings "Wireless TV." I had to laugh.

The FCC came up with a transition plan so stations could transmit both ATSC and NTSC signals at the same time, which many stations are doing already. Some have chosen temporary channels in the UHF band and will revert back to their standard assigned channel after the transition next February. Others have decided to move their channel into the UHF band permanently, while some will stay on their existing channel and "flash-cut" from analog to digital at midnight. That should be interesting to watch. …

The reason behind the change is not only to provide better TV signals, but to free up a huge block of radio spectrum. Over the course of a few years, the spectrum assigned to channels 52 through 69 will be turned over to the FCC for other uses. At least 40 MHz has been earmarked for public services such as police and fire, with the rest being auctioned off for what is sure to be a new explosion of wireless services.

There's a column in this month's *Popular Communications* magazine in which I explain the transition in greater detail. If you're affected by the transition, have a greater interest in the details, or (like me) see a potential way to supplement my income helping people through the transition, go get a copy of *Pop Comm* and read up on it.

---

In closing, I want to thank the several readers who wrote with excellent questions concerning their first forays into the digital world. As a writer, I can say that there's nothing better than reader feedback, both good and bad. Write early, and write often.

73, Don, N2IRZ

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what's new

BY ANTHONY A. LUSCRE,* K8ZT

# Jupiter HF Transceiver, RIGblaster Duo, Atomic Clocks, and New Books

This month's items include a look at the new version of the Jupiter HF Transceiver, the RIGblaster duo, an Extra Class study manual and new book by VK9NS, and two new and improved atomic clocks. Finally, we visit The Amateur Radio Website of the Month.

## Ten-Tec Jupiter HF Transceiver 40th Anniversary Edition

In celebration of the company's 40th anniversary, Ten-Tec unveiled the newly updated Ten-Tec Jupiter HF Transceiver (photo A). The Jupiter now features a new, easy-to-read, reversible blue/gray LCD screen and black case to cosmetically match other pieces in the Ten-Tec transceiver and accessory line. Features of the new Jupiter include:

• 39 IF-DSP receive filters for voice and CW modes. All receive filters are selectable independent of mode.

• 18 different DSP-generated transmit bandwidths are available for SSB to give your transmit audio a well-rounded sound tailored to your voice characteristics.

• CW decoder on the transceiver screen requires no external computer.

• Software is the heart of the new Jupiter, and it's all stored in Flash ROM. Add any feature released by Ten-Tec for the rig at a later date to your transceiver. Simply visit the <www.rfsquared.com> website, download the latest firmware, and it's as if your rig rolled off the production line a few minutes earlier. Additionally, the new Jupiter can support multiple personalities, allowing you to recall customized settings optimized for current operating conditions—contesting, DXing, CW, digital modes, etc. (Due to the Software Defined aspects of the Jupiter, many of the new features are compatible with the original Jupiter.)

• Spectrum Sweep gives you a snapshot of the entire band in seconds. Find the pile-ups or scout for a clear spot automatically without touching the tuning knob.

• A heavy-duty internal automatic antenna tuner is available as optional equipment and is rated to match up to a 10:1 SWR.

Ten-Tec focused on one major design objective: organize all the features on a front panel that is simple and logical to use without the user being tied to the instruction manual. Price of the model 538 Jupiter HF Transceiver is $1549, or the 538AT (with built-in antenna tuner) is $1849. For more information or to order, visit <http://radio.tentec.com> or telephone 800-833-7373.

## West Mountain Radio RIGblaster Duo

The new RIGblaster duo (photo B) from West Mountain Radio "is designed to make your station better, neater, simpler and easier to operate!" The duo simplifies a station with two radios and one computer. With the duo, you will only need one microphone, one pair of headphones, and one pair of speakers.

The RIGblaster duo, the newest addition to the RIGblaster lineup, is a "station integration console" that makes a two-rig station more versatile and more efficient to operate, as well as neater and better looking. The duo includes a complete transmit and receive audio switching, mixing, and amplification system that is modeled after the ergonomics and function of an aircraft audio panel, with toggle switches and knobs (no zero tactile feedback pushbuttons).

You can listen to any combination of two radios and a computer through speakers and/or headphones. A master receive audio-level knob sets the volume of everything, and a sub-headphone volume knob sets the headphone volume in relation to the speakers. The radio and the computer volume controls allow fully flexible matching of all audio sources. Radios may be internally assigned to provide dual mono, stereo for dual receive, or audio in the right or left channel. The receive audio is amplified by two 3-watt per channel stereo amplifiers.

A transmit selector switch selects either of two radios, and the RIGblaster circuitry automatically switches between computer sound card operation and normal voice operation for the selected radio. Remotely mounted LED indicators are available for the top of the radios to indicate which is selected for transmit.

Dual isolated CW keying and dual FSK keying outputs are always ready to key either or both radios depending on each radio's transmit-mode setting. A built-in dual USB-to-serial converter can be assigned to PTT, CW, FSK, or rig control.

Never get tangled up in headphone or microphone cords again with a RIGblaster duo! The MRSP was not yet available as I wrote this col-

*5441 Park Vista Court, Stow, OH 44224-1663
e-mail: <k8zt@cq-amateur-radio.com>


*Photo A– The Ten-Tec 538 Jupiter HF Transceiver. "All of the major features are at your fingertips with a dedicated control or from a clearly marked 'shift' function." (Photo courtesy of Ten-Tec)*


*Photo B– Front view of the RIGblaster duo, a "station integration console. (Photo courtesy of West Mountain Radio)*

umn. Visit <www.westmountainradio.com> for more information.

## New and Improved Atomic Clocks

MFJ Enterprises has announced two new and improved atomic clocks. The MFJ-121B Dual Time Zone Atomic Clock (photo C) displays both UTC and local time at a single glance. The MFJ-121B display allows you to choose 24/12-hour format independently for UTC and local time. An automatic backlight lights up every day at your preset time for 8 hours.

Mounted in a handsome silver-metallic, hard-plastic frame, it features huge, easy-to-see 2 inches tall by 1 inch wide LCD numerals, an exclusive UTC zone, and has a running seconds display. Compact at 11 3/8" W × 7 1/4" H × 1"D, it can be mounted on a wall or used on a desk. Daylight savings time can be disabled. It uses four long-lasting AA batteries. MRSP is $79.95.

The second clock is the model MFJ-123B Solar Powered Eternity Atomic Clock™. This clock works for an "eternity"! There is no need for batteries or to set the time! It receives WWVB signals. The display is 3 1/2" H × 6 1/4" W with 2-inch time digits. You can choose 24- or 12-hour time display and it includes indoor temperature, running seconds, month/date, and day of the week. The clock measures 9 1/2" W × 6 1/4" H × 1" D. It has an attractive silver metallic frame, and has a power on/off switch for when the clock is in storage or not in use. MRSP is $79.95.


*Photo C– The MFJ-121B Dual Time Zone Atomic Clock displays both UTC and local time at a single glance. (Photo courtesy of MFJ Enterprises)*

For more information, to order, to get a free catalog, or for the location of your nearest dealer, call 1-800-647-1800 or visit <www.mfjenterprises.com>.

## New Books

**Gordon West's *Extra Class Study Manual* & Software.** Gordon West's new *Extra Class Study Manual* (photo D) has been revised to incorporate the new the 2008–2012 Element 4 exam. In addition to covering the new question pool, the book has a host of features to make it easier to get your Extra Class license. The new Element 4 pool has 738 questions, down from 787 in the old pool—6% fewer questions, but a signif-

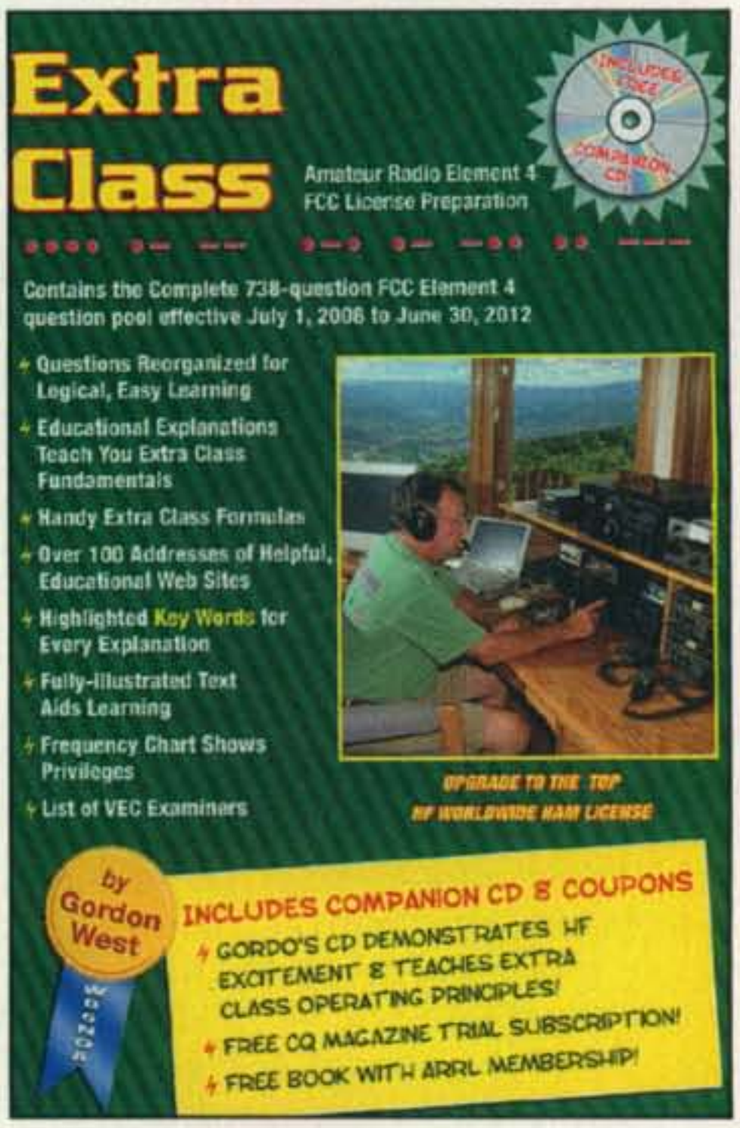



*Photo D– Cover of Gordon West's new* Extra Class Study Manual *& Software. (Photo courtesy of The W5YI Group)*

icantly updated and improved question pool. There are about a hundred brand-new questions, and the Q&A has been rewritten to dramatically improve the exam content to better reflect the Extra Class privileges, operation, equipment, and antennas. As in his Technician and General Class books, Gordo has reorganized the Element 4 Q&A into logical topic groups to follow the syllabus of his famous Radio School ham class, and key words are highlighted in blue throughout the book.

You can also purchase the study manual as a compete package with complementary study software. You can take random generated practice exams at your computer (no internet connection required). The software then scores your exam and shows your strong and weak areas of knowledge. Interactive feedback on incorrect answers with the correct answers, highlighted key words, and Gordo's explanations teach you the right answer. Study one or all sections of the question pool. Print random-generated practice exams with answer and grading keys to prepare for taking the real test.

If you spend a lot of time traveling or just prefer audio instruction, you may want to choose the six audio-CD course. This is a great way to learn the material to pass your upgrade-to-the-top license exam, as you "get one-on-one with Gordo as your personal Elmer." The audio course follows the organization of the written *Extra Class Study Manual,* and is a great study supplement to the book for extended explanations of the theory behind the correct answers to the questions for Extra Class. It includes a user guide that matches the CD tracks to the pages in the book for quick and easy reference. The CDs also include exciting sounds of on-the-air operations and demonstrations, and Gordo's expertise, enthusiasm, and encouraging words will help you stay on track to reach your Extra Class goal.

Pricing is $24.95 for the book, $49.95 for the software/book combo, and $39.95 for the audio course. For more information or to order visit <www.w5yi.org> or call 800-669-9594.

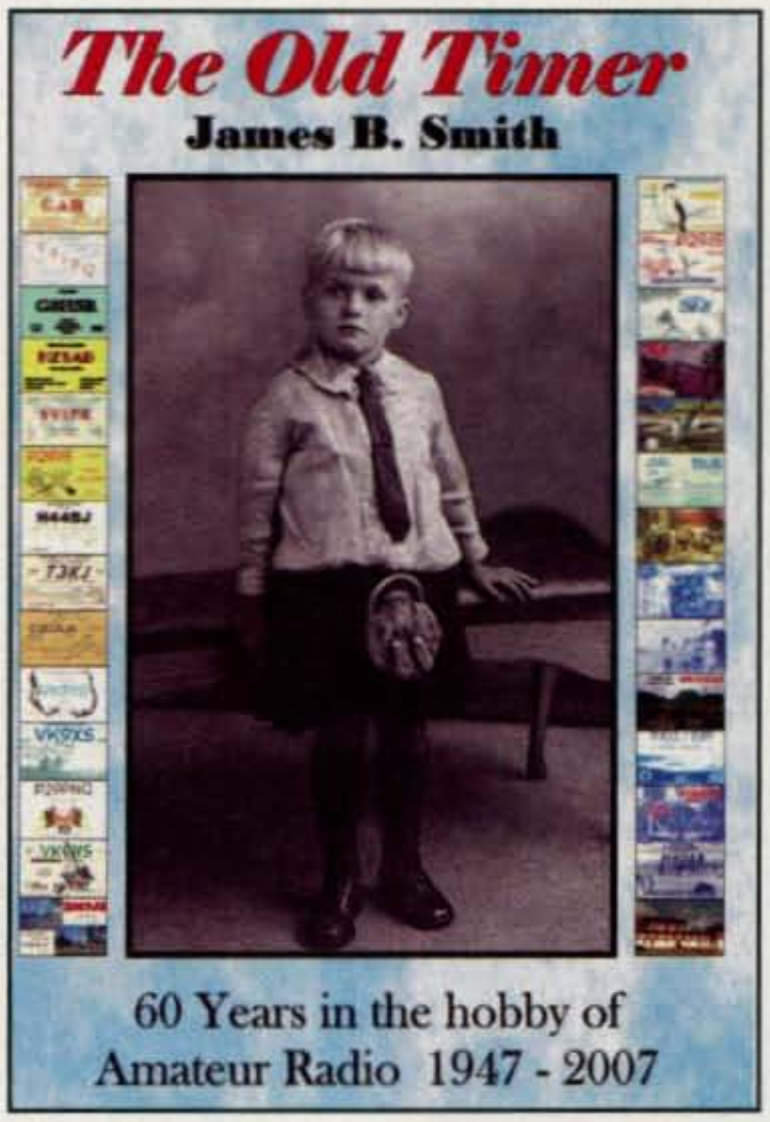



*Photo E–* The Old Timer: 60 Years in the hobby of Amateur Radio 1947–2007, *by Jim Smith, VK9NS, is a 600-page new book written by a legend in ham radio. Jim is well known for his contacts from Norfolk Island, as is his XYL, Kristi, VK9NL. (Photo courtesy of VK9NS)*

***The Old Timer: 60 Years in the hobby of Amateur Radio 1947–2007,* by Jim Smith, VK9NS.** This new book (photo E) is well worth reading, as it is authored by a legend in ham radio. Jim is well known for his contacts from Norfolk Island, as is his XYL, Kristi, VK9NL. They have lived on Norfolk

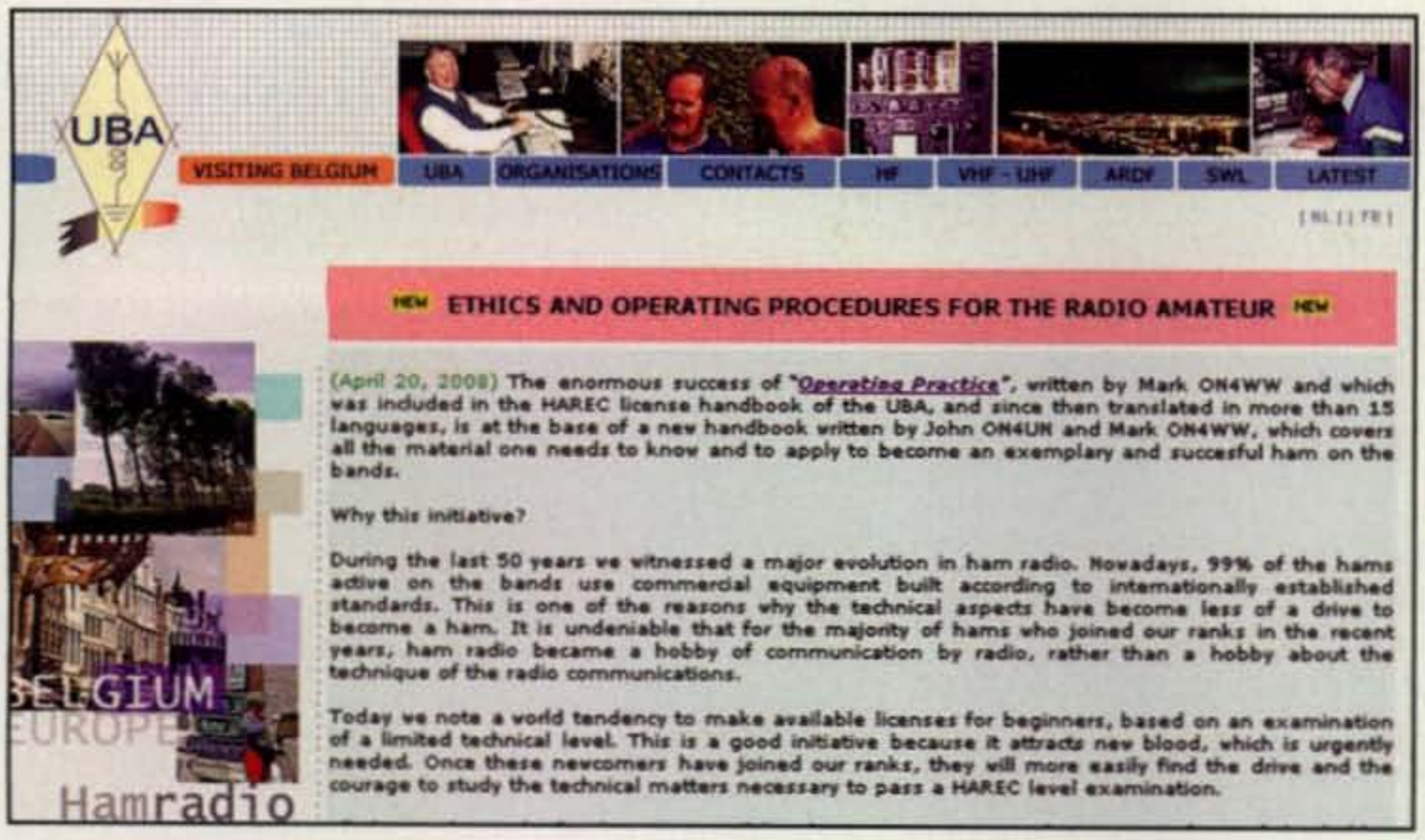



*Fig. 1– Screenshot of the Belgian Amateur Radio Society's website. Follow the links near bottom of the page to download the very informative booklet, "Ethics and Operating Procedures for the Radio Amateur."*

Island for 27 years. The book is divided into 35 chapters, from his early days, through an operation from Tarawa en route to Baker and Howland, full circle to "Singapore 2004." The book includes a myriad of black-and-white photos that relive a past that many will remember, DXpeditions that are a part of the history of ham radio. Jim is also devoted to the old-tube radios, classic radios, a "hard to beat" quality.

Via Jim: "My book is finally written and it is the story of my travel through life and my becoming involved in the hobby of Amateur Radio. I mention being dragged 'kicking and screaming' into the hobby, but once there felt at home. I have participated in the hobby in many ways over the years. Thus, within the almost 600 pages of my soft-cover book you will see that I have 'been there and done that' in no uncertain manner. I have been lucky (if that is the right word) to have traveled extensively and often the travel has been related to Amateur Radio in the sense of DXpeditions. In this first edition of *The Old Timer* it is my hope that you enjoy it and realise just how special our hobby is in an international sense."

For more information, on VK9NS's book, go to <http://ljcap.blogspot.com/search/label/jim%20smith>. E-mail <jimkirsti@ni.net.nf> for book orders and postage costs.

## The Amateur Radio Website of the Month

This time the amateur radio website is from the Belgian Amateur Radio Society (UBA). The English version is at <www.uba.be/en.html> (fig. 1). Our focus is the *Ethics and Operating Procedures for the Radio Amateur* booklet you will find on the site. Written by Mark Demeuleneere, ON4WW, and John Devoldere, ON4UN, the booklet has been translated into more than 15 languages. Do not let the title fool you, as this booklet has tons of practical advice for both the newcomer to HF or the seasoned ham.

## Wrap-up

That's all for this month's column. Last month I started a new feature—a web page with all of the links given in my columns. This will allow you to click on each link instead of having to type them from the written page. It will also allow me to update links as they change over time. The page will include links from all *CQ* articles I have written since my first, in the September 2007 issue. To reach the page, visit <www.k8zt.com/cq>.

Remember, I welcome your feedback, questions and/or comments. If you are a producer of a new product for amateur radio, please feel free to e-mail me or use the address on the first page of this column. Until next month . . .

73, Anthony, K8ZT

***Note:*** *Listings in "What's New" are not product reviews and do not constitute a product endorsement by CQ or the column editor. Information in this column is primarily provided by manufacturers/vendors and has not necessarily been independently verified. The purpose of this column is to inform readers about new products in the marketplace. We encourage you to do additional research on products of interest to you.*



awards

BY TED MELINOSKY,* K1BV

# Short-Term Awards & YLRL Series

Many awards are intended by the sponsors to be issued on a long-term basis. In general, these awards are available for from several to many years. Then there are those awards that are intended to honor a special occasion such as an anniversary or a one-time event. I've arbitrarily broken these down into two major categories—"annual" and "very short term." Annual means that the award honoring the event or occasion may be earned during a one-year period. Very short means that you need to make the contacts during a much shorter time period, which can be from one day to a few months.

Since this column is written about three months prior to publication, it's hard to feature very short term awards unless the information is sent to me well in advance. However, annual awards of interest are often included, since this gives you a chance to make the contacts needed.

If you are interested in this type of challenge, I extend an invitation to visit my website, where this information is always available. I'm writing this column in May 2008, and as of now my website includes 24 annual and 20 very short term awards. These numbers change almost daily. You will get a chance to pick and choose from some very interesting awards. The web address is: <http://www.dxawards.com/>. Links to these two types of awards are on the home page.

## Italy's Diploma Grande Guerra

What is apparently the first award in remembrance of the 90th anniversary of the end of the WW I comes from Italy. It is a very short term award. ARI di Gorizia will have two special event stations, IQ3GO and II3GG, on the air plus will be encouraging its members to be active during early August. A special certificate will be available for contacts made with its members and the special event stations between August 1–10, 2008. SWL okay. Look for activity on 80, 40, and 20 meters on SSB, CW, and RTTY.

Italian stations need 30 points, European stations 20, and all others 15. Members of the ARI di Gorizia count 1 point. IQ3GO counts 3 points and II3GG 5 points. Each station may be contacted only once per day.

Send log extract and fee of 10 Euros or $US15 on or before October 30, 2008 to the Award Manager, Vital Salvatore, IV3YIM, via To Toscanini, 5, I-34170 Gorizia (GO), Italy. E-mail: <awardmanager@arigorizia.org>; internet: <http://www.arigorizia.org/pagine/diplomi/diplomi.htm>.

## YLRL Awards Series

This month features the awards program of the Young Ladies Radio League, the largest organization of female amateur radio operators in the USA. The organization has been representing YLs since 1939 and currently has a membership of about 800, with 100 outside of the USA. The awards program duplicates several of the popular ARRL/IARU awards, with the obvious difference being that the required contacts must be made with YLs. This increases the difficulty factor by several times, especially for YL-DXCC. A good time to look for YL contacts is during the first two weeks in February each year. The YL-OM Contest has a CW weekend and an SSB weekend. There are also operating events during the year directed at YL-only contacts, but I'm sure that they would entertain a call from an OM during a lull in activity.

The YLRL offers the awards free of charge, a nice touch. If you want a copy mailed to you, just provide an SASE. As an alternative, you may apply for the award by e-mail and print the certificate using your own PC and color printer. The YLRL is among the relatively few award sponsors that use this method. As postal costs escalate, I hope that many, many other sponsors get on this bandwagon.

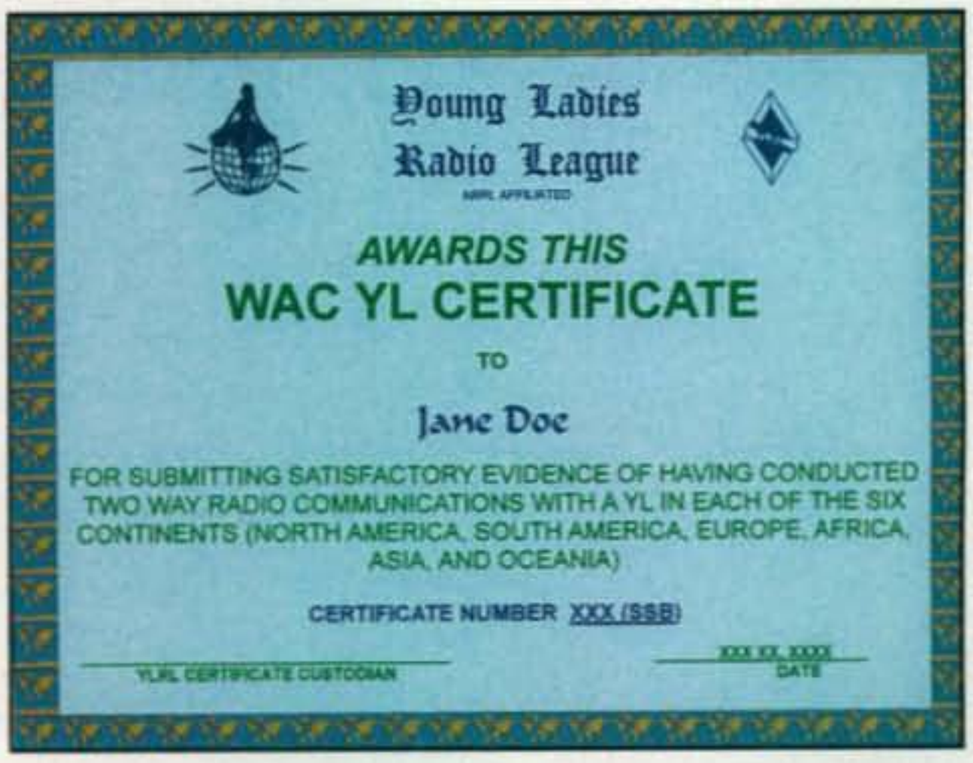
*General Requirements:* No use of repeaters. All contacts must be made from the same country. Do not send cards; a GCR list is encouraged. There is no charge for any of the certificates, but sufficient

### USA-CA Honor Roll

**500**

OM2VL .....3434

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is $6.00. For nonsubscribers it is $12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.




*The Young Ladies Radio League's WAC-YL award requires contacting a YL operator on each of the six continents of the world.*

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@cq-amateur-radio.com>


*Contact a YL in each of the 50 states to earn the YLRL's Worked All States award.*


*YL-DXCC requires contacting YL operators from 100 countries as recognized by the ARRL's DXCC list.*

postage for first-class mail or a stamped, legal-size envelope must accompany the application. E-mail applicants will receive their certificates as an attachment to an e-mail. The certificate will be sent in .pdf format and can be viewed and printed out using the free Adobe® Reader program available for download at <http://www.adobe.com>. Endorsements may be applied for by mail only. Apply to Carolyn Donner, N8ST, P.O. Box 158, Hamersville, OH 45130-0158. E-mail: <n8st@att.net>; internet <http://www.ylrl.org>.

**Worked All Continents (WAC-YL).** Available to all licensed amateurs. Contact a YL operator on each of the six continents. Cross-band contacts are okay. There are no time restrictions.

**Worked All States (WAS-YL).** Available to all amateurs. Contact a licensed YL in each of the 50 United States. The District of Columbia may be counted for Maryland. No time or band limitations. Send GCR list arranged alphabetically by state and include the YL's first name.

**YL Century Club (YLCC).** Available to all licensed ama-

teurs. Contact 100 different YL amateurs. All bands okay. Contacts with YLs anywhere in the world are recognized as long as the stations were operated by licensed female operators. Send GCR list arranged by last name of operator. Endorsements are available for each additional 50 stations. Gold stickers are awarded to applicants who worked their additional contacts from the same country; otherwise, silver stickers are issued.

**YL-DXCC.** Available to all amateurs. Contact licensed YL operators from 100 countries as recognized by the ARRL DXCC list. All bands may be used; no cross-band contacts. Send GCR list in order of ARRL's DXCC countries list and include the YL's name. Endorsements are available for each added 25 DXCC countries.

**YL – Digital Modes.** This award is available to any licensed amateur in the world. Contact 25 YLs using digital modes (PSK-31, RTTY, CW, SSTV, etc.). All contacts must be made using the same mode. After receiving the certificate, a sticker may be issued for each additional digital mode with which 25 YL contacts were made (i.e., if the first 25 contacts were made using PSK-31, an endorsement sticker may be earned for making 25 contacts with YLs using RTTY. An additional endorsement may be earned for CW, SSTV, or Hellschreiber contacts, etc.).

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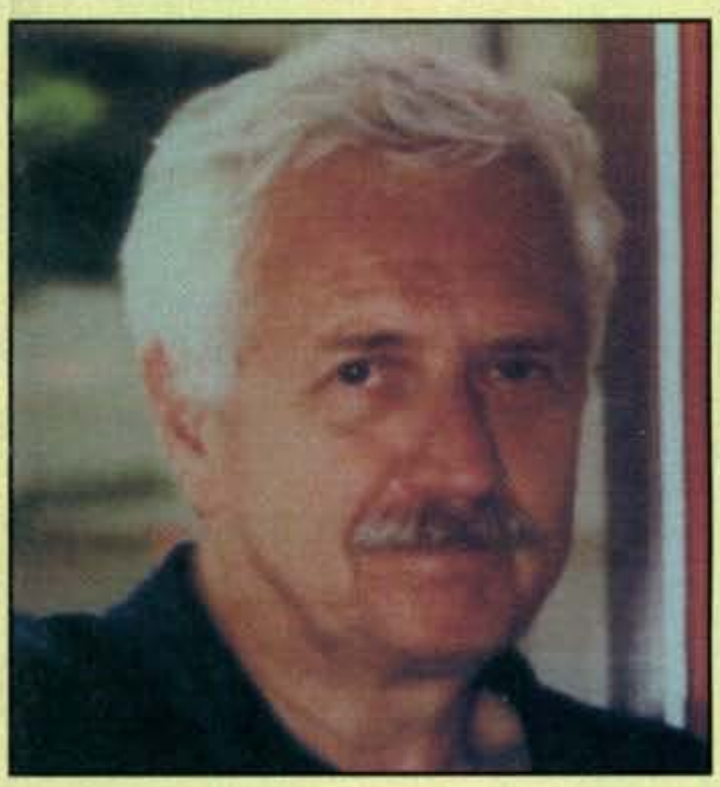
We're always interested in hearing from clubs, special interest groups, or individuals who sponsor an award. Please contact me at the e-mail or snail-mail address shown on the first page of this column.

73, Ted, K1BV

## Bill Barr, N4NX
## USA-CA All Counties #1162, October 9, 2007



*Bill, N4NX, USA-CA All Counties #1162.*

My story spans 50-plus years from beginning to end. I was first licensed in Fitzgerald, Georgia (Ben Hill County) in 1956 as KN4KZP at age 15, and then I was K4KZP in 1957 and for the next 20 years. When I upgraded to Extra class in 1977, I requested my current call, N4NX.

My first exposure to serious county hunting was in 1970, and I maintained a fair amount of interest in the early '70s, receiving USA-CA 1500 #217 in February 1973. However, as many of us have done, my focus changed primarily to DXing, and that was about all I made time for in those days because of a heavy workload at Western Electric (later to become AT&T Network Systems, and today it is Lucent Technologies). After retiring in 2000, I stumbled upon the County Hunters Net and that sparked a renewed interest for me. Still, I was in no hurry and just plugged along working new ones when time allowed.

My wife Leah and I travel a good deal, and when we take a trip we "don't hurry back." As an example, we spent three months in Southeast Asia at the end of 2000. With the help of the fantastic hams we met on that trip, I operated BV2FH, Paul Pai's station; 9M6NXT from Hillview Gardens (hosted by 9M6MU, Alfons, and 9M6DU, Doris Udan) in East Malaysia; and HSØ/N4NX from Thailand at the station of HS1CHB, Gen. John Shaowanasai.

Then back home I continued to pick off a few new counties while still pursuing the last couple of DXCC countries required to complete them all.

By early 2006 I was down to just a handful of counties—my last four, I thought: Ravalli, Petroleum, Wheatland, and Meager, all in Montana. I was resigned to wait for an opportunity, when my friend Wes Lamboley, W3WL (a DXer, but he knew what I needed to complete USA-CA 3077), took a leisurely driving trip from Georgia to Alaska with his wife Beverly. One night I got a call from Wes that he had found a way to alter his route and give me all four of those Montana counties! Naturally, I was thrilled and anxiously awaited more travel details. On June 10, 2007, Wes called from Wyoming and we made a plan to meet on a CW frequency on 20 meters. Sure enough, two days later I worked him in Petroleum, Wheatland, and Meager in a three-hour period!

Only one county left, and I patiently waited for their return trip. On July 27 Wes gave me Ravalli. Finally I had reached this seemingly unreachable goal—all the counties in the U.S.!

As I filled out the paperwork for the "whole ball of wax," much to my dismay I discovered that over the years I had overlooked Kalawo County, Hawaii as part of my "needed" list. Now what?

After a lot of research (Kalawo has an interesting history of being not quite a county but not quite *not* a county) and inquiries, I learned that Marv, K9FD/KH6 lives on the island of Molokai, so I sent him an e-mail query. To my delight, he responded immediately that Kalawo was only about 15 miles from his QTH and that he went near it about once a week. He offered to attempt a contact on CW on 14.050 MHz on September 20 at 1700Z. Since that would be 1 PM local time, I figured it would not be possible, but certainly worth a try. As I tuned across the band on the scheduled day, I found 20 meters to be pretty dead. Without much hope, I began calling Marv, and to my surprise and elation, he came back with a solid 579 signal. We even had a long QSO!

Finally, I completed my old 8½" × 11" "CQ Counties Award Record Book" with maps and applied for the award. The oldest contact on the application was on March 13, 1957 with KN4KRL in McDuffie County, Georgia, and the latest was, of course, with Marv . . . 50 years and 6 months from start to finish.

Fun facts: All 3077 counties were worked without a single relay, and all were worked from one of my four different fixed QTHs in Georgia. It was interesting to see how many county hunters stayed involved over the many years. As an example, in 1972 Dick, K5VYT, gave me 12 new counties in New Mexico, and then gave me my last one in Colorado (Broomfield) 30 years later in 2002. Ted, K1BV, said that my application was only the second one submitted in the old CQ Record Book in the ten years he has been the award custodian. His was the other.

2007 was a great year for me: I reached No. 1, Top of the Honor Roll, in May with my BS7H QSO and also just surpassed 2700 DXCC band countries. Life is good!

Thanks to many, but a special thanks to Wes, W3WL, and his most understanding and lovely XYL Beverly for the (almost last) four Montana counties, and certainly thanks to Marv, K9FD/KH6, for the (real) last one.

County hunters really are a great group of people and no one has ever argued with me on that point!

*—73, Bill, N4NX*

BY CARL SMITH,* N4AA

# Still Waiting for Cycle 24 plus DX Pile-Up Signal Levels

Where, oh where is Cycle 24?? A lot of people are asking that question. As I write this in the first week of June, I've seen the solar flux dip lower and lower, actually hitting 65 at one point. I don't think global warming, or cooling for that matter, is making any difference, but one has to wonder what the heck is going on.

Tad Cook, K7RA, provides some insight through the ARRL Propagation reports. The latest one, for May 30th, says, "If the sun shows no more sunspots May 30–31, we will see a three-month average of daily sunspot numbers centered on April just above the values for every three-month average since the minimum, centered on October 2007." He continues: "If these numbers suggest Cycle 24 is stalled, we can compare with the previous minimum. Using the same scheme, the three-month averages of daily sunspot numbers centered on September 1997 through March 1997 were 8.7, 10.2, 14.2, 16.4, 11.7, 11.3, and 16.4. Those are slightly higher values 11 years ago compared with the current numbers, but notice the six months following the minimum also seemed to flatten out. And, while the last bottom had slightly higher average sunspot numbers, it had one longer period of no spots."

Now that sounds like a lot of "stuff," but what it boils down to is that this cycle is not all that unusual when you look at the "big picture" of historical data. I guess you, like me, just expect too much, too soon. Things will improve, but in the meantime we just have to keep plugging away and find things to do while we are waiting—things like operating on 6 meters, for example. The end of May and first of June had a great "magic band" opening with lots of coast-to-coast contacts U.S. and even DX for many with larger antenna systems. There was

*Dayton fellowship. Don, N6JRL, has hosted a barbeque for members of the 3Y0X team at his home in Dayton, Ohio each year since they returned from Peter I. left to right are Gordon, W0RUN; Andy, UA3AB; George, N4GRN; Bill, N2WB; Bob, K4UEE; Ralph, K0IR; and Don, N6JRL. (Photo courtesy of Bob, K4UEE)*

*P.O. Box DX, Leicester, NC 28748-0249
e-mail: <n4aa@cq-amateur-radio.com>

*Bob, N2OO (right), receives his CQ DX Hall of Fame plaque from Ralph Fedor, K0IR, at the South West Ohio DX Dinner at the Crowne Plaza Hotel in Dayton. (Photo by KF2BQ)*

*A Dayton Hamvention® gathering with calls you may recognize. Left to right: Tom, N4XP; John, W4NU; Dan, W5DNT; Bob, K4UEE; Don, AA1V; and Don, N1DG. (Photo courtesy of Tom, N4XP)*

## The WPX Program

**CW**

| | | | |
|---|---|---|---|
| 3201 | ZS6BQI | 3203 | S51DX |
| 3202 | GØDEZ | | |

**SSB**

| | | | |
|---|---|---|---|
| 3002 | W9HT | 3005 | DH5WB |
| 3003 | WA5VGI | 3006 | S51DX |
| 3004 | EA3GHZ | 3007 | OZ1ADL |

**Mixed**

| | |
|---|---|
| 2010 | S51DX |

**Digital**

| | | | |
|---|---|---|---|
| 10 | AI8P | 12 | JR1BAS |
| 11 | DH5WB | | |

**CW:** 600 ZS6BQI. 750 AE5B. 1500 S51DX. 2400 JN3SAC.
**SSB:** 500 UT7DX. 550 EA3FYD. 1600 JN3SAC. 1750 IK2DZN. 2000 AE5B, OZ1ADL. 2250 WA5VGI. 2250 K4RDU. 2450 EA3GHZ. 2750 S51DX.
**Mixed:** 450 W9HT. 900 DH5MM. 2150 AE5B. 2750 JN3SAC. 3064 S51DX.
**Digital:** 350 AI8P.

**160 Meters:** UT7DX, OZ1ADL, WA5VGI
**80 Meters:** UT7DX, OZ1ADL, WA5VGI
**40 Meters:** UT7DX, OZ1ADL, WA5VGI
**30 Meters:** WA5VGI
**20 Meters:** UT7DX, DH5WB, OZ1ADL, WA5VGI
**17 Meters:** OZ1ADL, WA5VGI
**15 Meters:** UT7DX, OZ1ADL, WA5VGI
**12 Meters:** WA5VGI
**10 Meters:** UT7DX, DH5WB, OZ1ADL, WA5VGI

**Asia:** DH5WB, OZ1ADL, WA5VGI
**Africa:** OZ1ADL, WA5VGI
**Europe:** DH5WB, OZ1ADL, WA5VGI
**Oceania:** OZ1ADL, WA5VGI
**N. America:** DH5WB, OZ1ADL, WA5VGI
**S. America:** OZ1ADL, WA5VGI

**Award of Excellence:** WA5VGI
**160, 30, 17, 12 Meter Bars:** WA5VGI

**Award of Excellence Holders:** N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBF, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, KØDEQ, DKØPM, SV1EOS, UAØFAI, N4GG, UA4RZ, 7K3QPL, EW1CQ., UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY.

**160 Meter Endorsements:** N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, KØDEQ, DKØPM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will not accept prefixes/calls which have been confirmed by computer-generated electronic means.

*Please Note: The price of the bars for the Award of Excellence are $6.50 each.

even a lot of 10-meter activity during that same time period. So, you see, there are things to do while we await those 20 over 9 signals all over 10, 12, and 15 meters. We just have to have patience and wait it out.

## What's Coming Up in DX?

**TO5DX, St. Barthelemy.** The newest addition to the DXCC list will see activity in the upcoming CQ WW DX SSB Contest the last weekend in October. Joe, W8GEX, is organizing a 10-day operation to St. Barthelemy for the contest. They will be a multi-single entry in the test and are planning on CW, SSB, and RTTY operation before the test. The team should be active from October 16–27. The crew will consist of W8GEX, AA4NN, W8CAA, KØRH, K4ZLE, plus others not yet confirmed.

**FR/G, Glorioso.** The French team was still waiting for permission to make the trip as of early June. Permission could come any time, but they are looking at it being sometime in late September or early October. They are dependent on the French military for transportation as well as the actual permission to go to the island. Construction on the island caused the delay earlier in the year. The team's website will be updated as events happen. Go to: <http://glorieuses2008.free.fr/>.

**P29, Papua.** This operation is scheduled for October 18 through November 4. No website has been announced and no further details are available as of this writing.

**VK9W, Willis Island.** No specific date(s) have been announced, but the group has said that October is the month. A website was announced, so watch it for the latest updates: <http://www.vk9dwx.de>.

**ZS8T, Marion Island.** Petrus has been on the island for several weeks now, but no radio activity has been reported. He is there on a working assignment, so radio takes a back seat until his work is done. The team is scheduled to be on Marion until early 2009, so there's plenty of time for him to get on the air. Just keep watching the website: <http:zs8t.net/>.

## DX Pile-up Signal Levels

I've stepped up on my soapbox about operating practices before. A reader sent along a humorous "Scale of DX

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## CQ DX Awards Program

### SSB

2509 .....ON4CAS  2510 .....IKØAZG

### CW

1088 .....ON4CAS

### RTTY

41 .....ON4CAS

### SSB Endorsements

330 .....IK1GPG/339
330 .....IN3DEI/339
330 .....EA2IA/339
330 .....K9BWQ/339
330 .....OZ5EV/338
330 .....K3LC/334
300 .....K7ZM/300

### CW Endorsements

330 .....K9BWQ/338
330 .....K7LAY/335
310 .....WA4DOU/314

The basic award fee for subscribers to *CQ* is $6. For non-subscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 338 active countries. Please make all checks payable to the award manager.

## The CQ DX Field Award Program

### CW

57 .....KB2TGU  58 .....N3YZ

### Mixed

92 .....J68AS  93 .....IWØHOU

### RTTY

11 .....JN3SAC

### Endorsements

#### Mixed

200 .....W1CU/220
200 .....N4MM/201
200 .....N8PR/214
200 .....HA5WA/206
175 .....W6OAT/194
100 .....J68AS/135
50 MHz .....J68AS
28 MHz .....J68AS
3.5/7 MHz .....J68AS

#### SSB

200 .....W1CU/207
175 .....N4MM/184

#### CW

200 .....W1CU/212
175 .....N4MM/179

#### RTTY

100 .....W1CU/138

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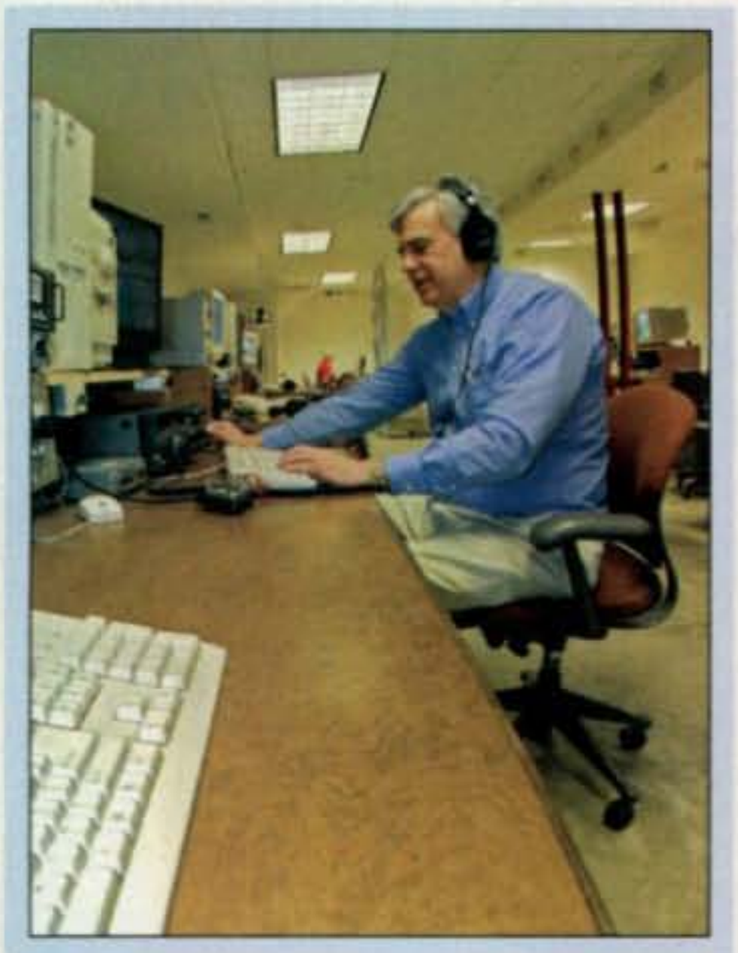


## On the Cover

This month's cover photo features Frank Donovan, W3LPL, in his multi-op contest station in Glenwood, Maryland. The station has 12 operating positions with two devoted to each contesting band from 160 meters to 10 meters (there is no contesting on 60, 30, 17, or 12 meters). Most of the operating positions make use of Yaesu FT-1000MPs with homebrewed 3-1000Z kilowatt amplifiers. The station has many directional transmitting and receiving antennas for each band. Frank tells *CQ* that the W3LPL team has about two dozen operators, perhaps half of whom are on site for any given contest. The station's 12 computers are networked together and used for contest logging.

Frank has been contesting since Field Day of 1959, when he got on the air with the Providence Radio Association, W1OP, before he was even licensed. Frank says that the best contest at his station is "any one that we win; we've been operating from this location for 22 years, and we've won many times, and the best one is always the last one, the last one that we've won." In last year's CQ World-Wide DX SSB Contest weekend, whose scores appear in this issue, the group at W3LPL finished third in the U.S. in the multi-operator/multi-transmitter category.

One of his favorite QSOs, Frank says, was a 12-meter CW contact with the TI9KK DXpedition to Cocos Island, made just a few seconds after this month's cover photo was taken. The inset photo shows Chinese ham BG8BES (far right) with a portable HF transceiver, watching as soldiers move into an earthquake-damaged area and a rescue worker carries a baby out. *(Main cover photo by Larry Mulvehill, WB2ZPI; inset photo provided by Hau Ken, VR2IO; On the Cover text by Dan Moseson, KC2OOM)*

## 5 Band WAZ

**As of June 1, 2008, 750 stations have attained the 200 zone level and 1600 stations have attained the 150 zone level.**

**New recipients of 5 Band WAZ with all 200 zones confirmed:**

N7RO SM6CUK RN6BY

**The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):**

SU1U, 199 (27)
N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
W2YY, 199 (26)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
IK1AOD, 199 (1)
WØCP, 199 (18)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
HB9DDZ, 199 (31)
RU3FM, 199 (1)
N3UN, 199 (18)
OH2VZ, 199 (31)
W1JZ, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
SP5DVP, 199 (31 on 40)
N4NX, 199 (26)
N4MM, 199 (26)
EA7GF, 199 (1)
N6HR/7, 199 (37)
JA5IU, 199 (2)
RU3DX, 199 (6)
N4XR, 199 (27)
HA5AGS, 199 (1)
VE3XN, 199 (26)
YU7GMN, 199 (10)
K7LJ, 199 (37)
RA6AX, 199 (6 on 10m)
RX4HZ, 199 (13)
KØGM, 199 (17)
S58Q, 199 (31)
EA5BCX, 198 (27, 39)
G3KDB, 198 (1, 12)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K4CN, 198 (23, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
F5NBU, 198 (19, 31)
OE2LCM, 198 (1, 31)
HA1RW, 198 (1, 31)
WK3N, 198 (23, 24)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)
W7VJ, 198 (34, 37)
K9MIE, 198 (18, 21)
W9RN, 198 (26, 19 on 40)
W5CWQ,198 (17, 18)
WB9EEE, 198 (17, 18)
YU3VQ, 198 (27, 31)
K9OW,198 (34on10, 2on15)

**The following have qualified for the basic 5 Band WAZ Award:**

IK4CIE (197 zones) DM1TT (177 zones)

**5 Band WAZ updates:**

DF3CB, 200 zones
S58Q (ex-YU3VQ), 199 zones
UA4SKW, 197 zones

***Please note: Cost of the 5 Band WAZ Plaque is $100 shipped within the U.S.; $120 all foreign (sent airmail).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

*Bob, K4UEE, presents the "Scottish Drinking Vessel" by GMDX to Tom, N4XP. The "vessel" was awarded to BS7H as the GMDX DXpedition of the Year. Bob visited the GMDX recently and was the courier for the award. (Photo courtesy of K4DLI and N4XP)*

Pile-up Signal Levels" I'd like to share with you:

PØ: Can't hear the DX. Can't hear the pile-up either. Have critters eaten into the coax again?

P1: Can't hear the DX, but can hear the pile-up working him. Lucky stiffs.

P2: Can't hear the DX. Can hear the pile-up, and can also hear the policemen on the DX's frequency.

P3: Can detect that there might be a DX signal present. Copy a CW letter, SSB word, Data symbol every now and then, but can't copy a complete callsign. Pile-up and policemen are Q5 copy. Keep the rig on in the background while working on that new antenna design.

P4: DX is readable when policemen are not transmitting, and would be workable if it were not for the stronger signals of everyone else in the pile-up. State of maximum frustration.

P5: DX workable after a long, hard battle against propagation, pile-up, and policemen. State of maximum satisfaction.

P6: DX is Q5, and worked after just a few calls. You marvel at how efficient the operator is, and compliment the DXpedition in your spot on the cluster system.

P7: DX worked on the first call. Why do people think this is so hard?

Probably the most popular cluster site used by DXers is the Finnish DX Summit. In late May major changes were made and a "new" website was launched. A new URL (http://www.dxsummit.fi) will take you to the new site. The original site dates back to 1998 and has served the DX community very well. However, technology moves on and so did they. The new site is being operated by Arcala Extremes (OH8X) and is supported by the YASME Foundation, Inc. Congratulations to Arcala and thanks to YASME for the major improvements for our benefit.

### Ham Radio in China

Ham radio in China got a lot of publicity in the aftermath of the huge earthquake that killed thousands and left

## The WAZ Program

### 6 Meters

84.....DF3CB (34 zones)

### 160 Meters

276.....DL6RAI (38 zones)
277.....DF3CB (40 zones)
278...RW4UU (32 zones)

### All Band WAZ

#### Mixed

8510.....IZ8AJX
8511.....N6NPG
8512.....4X4PP
8513.....VE3BGG
8514.....RW4UU

#### SSB

5073.....IZ8EDJ
5074.....LU1DHM
5075.....W1FBN
5076.....W3WR
5077.....RW4UU

#### CW

542.....JF1XQL
543.....UN8GA
544.....RW4UU

#### EME

003....OK1UGA (26 zones)

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for all *CQ* awards is $6.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

more homeless. "Normal" communications, as usually happens in these circumstances, was almost non-existent. China's radio amateurs filled the gap and provided critical communications in those first hectic days. I congratulate those involved for their dedication in coming to the aid of their friends and neighbors. For an extensive report, see the article by Bob Josuweit, WA3PZO, elsewhere in this issue.

### Dayton Report

The 2008 Dayton Hamvention® is now history. Reports indicate attendance was down a bit, but with the price of gasoline I'm not surprised. Whether driving or flying, the cost of "getting there" is pretty high. Anyway, a lot of folks did get there and had a great time.

The annual CQ DX Hall of Fame recipients were announced with the following joining the ranks of those who have had the honor in years past: John Devoldere, ON4UN; Nellie Saltiel de Lazard, XE1CI; and Bob Schenck, N2OO. Congratulations!

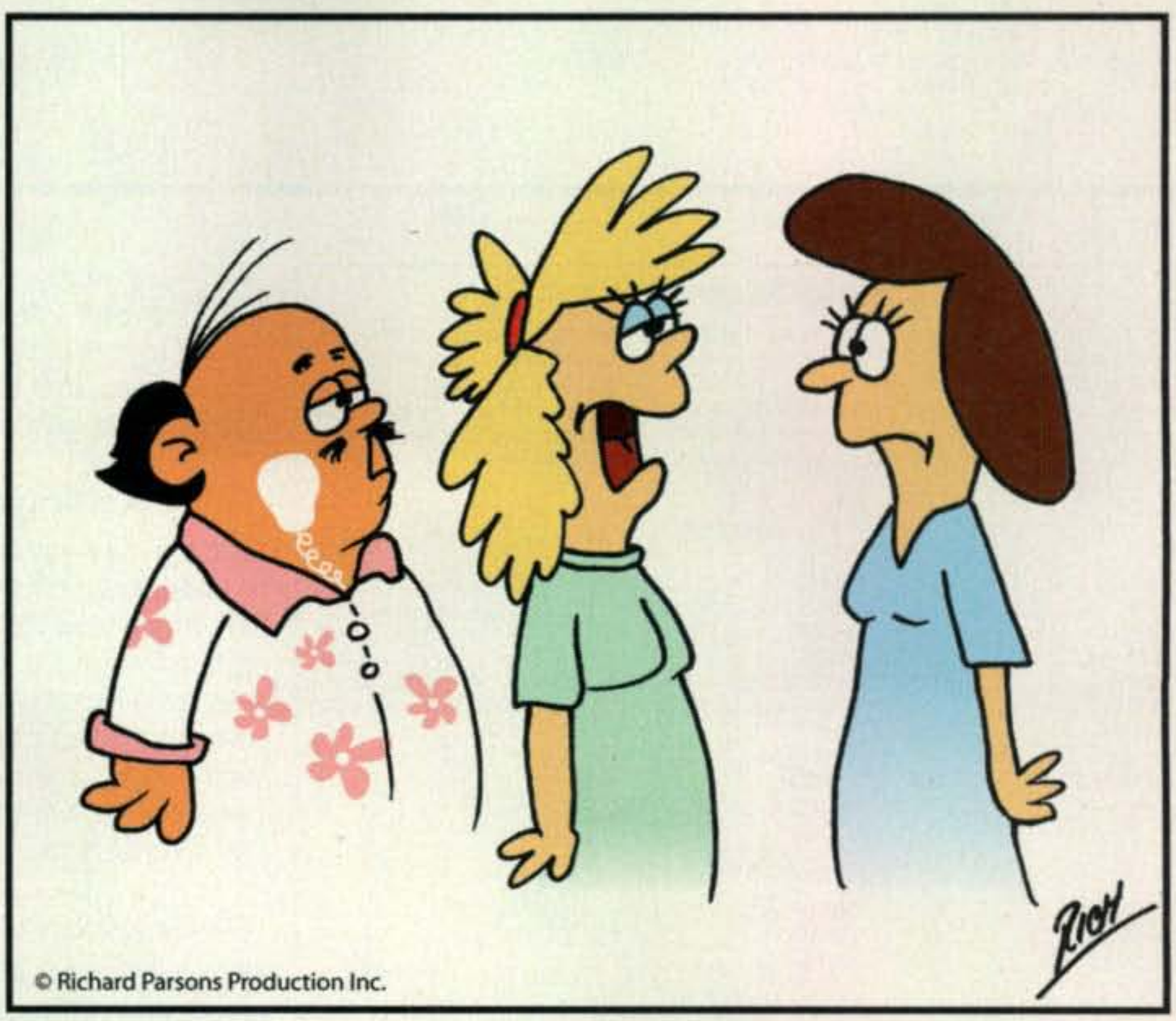
### I4EAT Wins Desoto Cup

The ARRL's Challenge Award has a new winner of the Desoto Cup. Fausto Minardi, I4EAT, with 3129 points, edged out Bob Eshleman, W4DR, with 3124,





**SUCH A HAM** SH-001




You can always tell when Stan uses his radio while on vacation.

## CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 339 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement stickers is $1.00 each plus SASE. Please make checks payable to the awards manager, Billy F. Williams. All updates should be mailed to P.O. Box 9673, Jacksonville, FL 32208.

### CW

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| K9BWQ 337 | W8XD 337 | K8LJG 336 | HB9DDZ 335 | YU1AB 334 | W4UW 330 | SM5HV/HK7 327 | OZ5UR 320 | VE7KDU 300 |
| N7FU 337 | W4OEL 337 | N4CH 336 | K2JLA 334 | WØHZ 333 | W7IIT 330 | F6HMJ 326 | CT1YH 320 | KT2C 300 |
| N4JF 337 | EA2IA 337 | K4JLD 336 | F3AT 334 | W4MPY 333 | G3KMQ 329 | W4LI 325 | YT1AT 317 | WD9DZV 295 |
| K4IQJ 337 | WØJLC 337 | F3TH 335 | WA4IUM 334 | K8JGJ 333 | N5HB 329 | N4OT 325 | EA3ALV 317 | K4IE 291 |
| K2FL 337 | K2TQC 336 | PY2YP 335 | PA5PQ 334 | K6LEB 333 | K1HDO 329 | YV5ANT 324 | W6YQ 315 | G3DPX 284 |
| N4MM 337 | N7RO 336 | N6AW 335 | K3UA 334 | K5RT 332 | K7JS 329 | KF8UN 323 | WA4DOU 314 | KØKG 284 |
| K4MQG 337 | K2OWE 336 | N4AH 335 | K2ENT 334 | K3JGJ 332 | W6OUL 329 | IKØTUG 321 | UA9SG 310 | N2VW 282 |
| W7OM 337 | N5FG 336 | K9IW 335 | NC9T 334 | VE3XN 331 | N7WO 329 | W3II 320 | W9IL 309 | DJ1YH 281 |
| NØFW 337 | K4CN 336 | K5UO 335 | W2VJN 334 | K2JF 331 | KE3A 329 | IKØADY 320 | YU7FW 306 | XE1MD 280 |
| WB4UBD 337 | OK1MP 336 | N5ZM 335 | G4BWP 334 | WA8DXA 331 | K6CU 329 | WG5G/QRPp 320 | ON4CAS 304 | W2JLK 277 |
| K9MM 337 | K9OW 336 | KA7T 335 | W1JR 334 | K8SIX 331 | KA3S 328 | F5OIU 320 | N1KC 302 | |
| W7CNL 336 | DL3DXX 336 | K7LAY 335 | I4LCK 334 | W2UE 330 | K1FK 328 | PY4WS 320 | RA1AOB 300 | |

### SSB

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| K4JLD 339 | WB4UBD 338 | IK8CNT 337 | OE7SEL 335 | OE2EGL 334 | LU4DXU 332 | CP2DL 327 | XE2NLD 315 | N5WYR 300 |
| EA2IA 339 | W8AXI 338 | EA4DO 337 | ZL3NS 335 | WA4IUM 334 | VE4ROY 332 | NI5D 327 | IZ6CST 314 | RA1AOB 300 |
| XE1AE 339 | W9SS 338 | K3UA 337 | K7JS 335 | K5RT 334 | CT1EEN 332 | K7TCL 326 | W6NW 314 | YC9WZJ 300 |
| IN3DEI 339 | VK4LC 338 | CT3BM 337 | PY4OY 335 | W6SHY 334 | YV1JV 331 | YV4VN 326 | EA3ALV 313 | K7ZM 300 |
| K6YRA 338 | K7LAY 338 | YU1AB 337 | VE3XN 335 | W5RUK 334 | N5ORT 331 | SV3AQR 326 | W7GAX 312 | WA1ECF 295 |
| IK1GPG 338 | OZ5EV 338 | K3JGJ 337 | PA5PQ 335 | EA3KB 334 | CT1AHU 331 | KD5ZD 326 | KA1LMR 312 | KW1DX 295 |
| K5TVC 338 | OZ3SK 338 | IØZV 337 | XE1VIC 335 | CT3DL 334 | EA3JL 331 | WR5Y 325 | ON4CAS 312 | W4EJG 295 |
| NØFW 338 | WS9V 338 | K8LJG 337 | K2ENT 335 | VE7WJ 334 | K1HDO 331 | KC4MJ 325 | KD2GC 311 | K7ZM 295 |
| K2TQC 338 | EA3BMT 338 | W3AZD 337 | IK6GPZ 335 | WA4WTG 334 | K7HG 331 | PY2DBU 325 | WA5MLT 310 | XE1MW 293 |
| KZ2P 338 | XE1L 337 | KØKG 337 | NC9T 335 | K5UO 334 | N5YY 331 | YT1AT 325 | RW9SG 310 | XE1MEX 293 |
| K4MZU 338 | W6DPD 337 | W2FKF 337 | K1UO 335 | ZL1BOQ 334 | F6HMJ 331 | KE4SCY 325 | XE1RBV 310 | K1RB 292 |
| N4JF 338 | N7RO 337 | W7FP 337 | I8KCI 335 | N7WR 334 | K3PT 330 | K6GFJ 324 | IØYKN 310 | W9ACE 291 |
| W4WX 338 | OE3WWB 337 | VE2GHZ 337 | I8LEL 335 | K3LC 334 | N1ALR 330 | W6WI 323 | AA1VX 308 | W5PVE 288 |
| K5OVC 338 | K9OW 337 | IKØAZG 337 | DU1KT 335 | HB9DDZ 334 | W9OKL 329 | EA3CYM 323 | WB2AQC 305 | WD9DZV 287 |
| W6BCQ 338 | N5FG 337 | K2FL 337 | CT1EEB 335 | 4N7ZZ 333 | W2FGY 329 | WN9NBT 322 | K3BYV 303 | VE7HAM 285 |
| DJ9ZB 338 | DU9RG 337 | YU3AA 337 | W1JR 335 | VE1YX 333 | CT1CFH 329 | W6OUL 322 | JR4NUN 303 | N8LIQ 284 |
| W6EUF 338 | PY2YP 337 | W4UNP 336 | I4LCK 335 | W2JZK 333 | EA1JG 329 | CT1ESO 321 | YV2FEQ 303 | WØIKD 283 |
| K4MQG 338 | N6AW 337 | N5ZM 336 | ZL1HY 335 | K8LJG 333 | W9IL 329 | VE7SMP 320 | KU4BP 303 | KBØRNC 282 |
| N7BK 338 | VE2PJ 337 | K8SIX 336 | W7BJN 335 | VE4ACY 333 | KF8UN 328 | N1KC 320 | K7SAM 303 | AE9DX 282 |
| N4MM 338 | K9HQM 337 | K4CN 336 | W2CC 335 | VE2WY 333 | WØULU 328 | W5GZI 320 | W5GZI 302 | IK8TMI 281 |
| 4Z4DX 338 | KE5K 337 | W4UW 336 | K9IW 335 | K9PP 333 | K1EY 328 | KD2GC 320 | W4PGC 302 | F5INJ 279 |
| N4CH 338 | VE3MR 337 | DL3DXX 336 | N2VW 335 | EA3EQT 333 | K4DXA 328 | LU3HBO 317 | EA8AYV 302 | W5GT 276 |
| W7OM 338 | VE3MRS 337 | KE3A 336 | WDØBNC 334 | YV1KZ 333 | LU5DV 328 | WB4GMR 317 | N2LM 302 | HSØ/EA4BKA 276 |
| K9MM 338 | AA4S 337 | AB4IQ 336 | WØYDB 334 | YV1AJ 332 | XE1MD 327 | WØROB 317 | 4X6DK 301 | K9DXR 275 |
| K9BWQ 338 | OK1MP 337 | K2JLA 335 | W4NKI 334 | KSØZ 332 | DK5WQ 327 | N8SHZ 316 | 4Z5FL/M 301 | AD7J 275 |

### RTTY

| | | | | | | |
|---|---|---|---|---|---|---|
| WB4UBD 336 | K2ENT 333 | N5ZM 326 | K3UA 321 | EA5FKI 319 | K8SIX 300 | K4CN 283 |
| NI4H 335 | N5FG 331 | OK1MP 325 | G4BWP 320 | PA5PQ 311 | W4EEU 297 | |

## CQ DX Field Award Honor Roll

The CQ DX Field Award Honor Roll recognizes those DXers who have submitted proof of confirmation with 175 or more grid fields. Honor Roll lisiting is automatic upon approval of an application for 175 or more grid fields. To remain on the CQ DX Field Award Honor Roll, annual updates are required. Updates must be accompanied by an SASE if confirmation is desired. The fee for endorsement stickers is $1.00 each plus SASE. Please make all checks payable to the Award Manager, Billy F. Williams. Mail all updates to P.O. Box 9673, Jacksonville, FL 32208.

### Mixed

| | | |
|---|---|---|
| K2TQC 258 | F6HMJ 201 | K8OOK 184 |
| HAØDU 228 | JN3SAC 200 | K2SHZ 182 |
| W1CU 220 | W4UM 198 | K2AU 182 |
| VE3XN 217 | W6OAT 194 | KØCA 181 |
| N8PR 214 | N4NX 192 | K1NU 180 |
| HA1RW 213 | VE3ZZ 191 | ON4CAS 180 |
| KØDEQ 210 | HA9PP 190 | W5ODD 177 |
| HA5WA 206 | BA4DW 188 | NØFW 176 |
| KF8UN 205 | OK1AOV 187 | |
| N4MM 201 | 9A5CY 187 | |

### SSB

| | | |
|---|---|---|
| W1CU 207 | KØDEQ 184 | NØFW 176 |
| W4ABW 191 | N4MM 184 | DL3DXX 175 |
| VE7SMP 190 | W4UM 180 | |

### CW

| | | |
|---|---|---|
| W1CU 212 | JN3SAC 194 | N4MM 179 |
| DL3DXX 203 | W4UM 190 | N4NX 177 |
| KØDEQ 201 | OK2PO 184 | KØCA 175 |

for the top spot this year. In third place was Leif Preben Ottosen, OZ1LO, who had 3119 points. Congratulations to all for their outstanding accomplishments. Also noted was the fact that 16 others have now exceeded the 3000-point level.

### Riley Hollingsworth Retires

Riley Hollingsworth, K4ZDH, has been the "watchdog" for amateur radio for a long time. However, he has finally decided to retire from FCC duties. Riley's dedication to cleaning up amateur radio has been outstanding and he has made "believers" of a lot of people. We will miss him at the helm, but have been assured that the position will be filled with a person who will continue what Riley began. I wish him well in retirement and look forward to seeing him at ham radio events in a "casual" atmosphere.

### Conventions, etc.

August 9–10 in Rochester, Minnesota the Rochester club will be entertaining DXers with its WØ-DXCC Convention. See the website for details: <http://www.rarchams.org/>.

August 23 in Tokyo, Japan during the Japan HamFair there will be a 2008 DXers Banquet. For more information check

*One of the tables at the Dayton DX Dinner. Left to right: JK1OPKL, 7N4TJR, JA1BRK, and W4NL. (Photo courtesy of David, K4PZT, and Lynn, W4NL)*

the website <http://wwwl.jarl.or.jp/English/0-2.htm>, or for the DXers Banquet contact Katsu, JA1DXA/ JH7OXF by e-mail at <jh7oxf@bd6.so-net.ne.jp>.

September 19–20 in Chicago, Illinois the annual W9-DXCC Convention will meet for its 56th year at the Holiday Inn Chicago, 1000 Busse Road (Rt. 83), Elk Grove, Illinois, 60008. See the convention's website for more information: <http://www.w9dxcc.com/>.

September 27 in Pigeon Forge, Tennessee, the 4th annual SEDCO conference will be held at the MainStay Suites. This is a great tourist area with many attraction for the ladies and the kids, too. This event is held immediately following the annual Ten-Tec Factory Hamfest, a very popular activity. Go to the SEDCO website for more information and details about the conference: <http://sedco.homestead.com/>.

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That wraps it for this month. Keep hoping for Cycle 24 to take an upward turn, and in the meantime, enjoy the chase and Have Fun!

73, Carl, N4AA

### QSL Information

**7X5VRK** via N3SL
**8J1SAI** via JA1CG
**8J9HGR** via JH9UYZ
**9A0CI** via DE0MST
**9A0CI/LH** via DE0MST
**9H1PF** via K5YG
**9M2/GM4YXI** via N3SL
**9M4SAB** via 9M6TW
**9M6/KE5CNK** via KE5CNK
**9Y4W** via RA3AUU
**A25/JA1ELY** via JA1ELY
**A52K** via JA1CG
**A52SW** via K2AU
**A61AS** via YO3FRI
**AM4NET** via EA4CT
**BA5HAM** via IK2DUW
**BD5HAM** via IK2DUW
**BY1PK/I0SNY** via I0SNY
**C31LJ** via VE3EXY
**C6AYM** via K9GY
**CE1TT** via EA5KB
**CE1VCZ** via CE1VLY
**CE9/R3RRC** via RW3GW/3
**CN2DX** via EA7FTR
**CN9CR** via I0SNY
**CO/I0SNY** via I0SNY
**CO3JN** via EB7DX
**CO6AP** via N3SL
**CT1LHM** via CT1GFK
**CT9P** via N3SL
**CT9X** via N3SL
**CU3/F5LMJ** via F5LMJ
**CV4Y** via IK2DUW
**CX1TG** via IK2DUW
**CX2CC** via EA5KB
**CX2TQ** via IK2DUW
**CX3TQ** via IK2DUW
**CX4TO** via IK2DUW
**D44TT** via K1BV
**D4B** via K1BV
**D4C** via IZ4DPV

*(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," 106 Dogwood Dr., Paris, TN 38242; phone 731-641-4354; e-mail: <golist@golist.net>.)*

BY JOE LYNCH,* N6CL

# First 70 cm DXCC

As of early June, Jan Bruinier, DL9KR, completed the necessary QSOs with 100 different countries on 432 MHz, thereby making him the first to do so for DXCC 70 cm. His final QSO was with Z3/OK1DFC. Jan stated that it took him about 30 years to complete his goal. ARRL President Joel Harrison, W5ZN, advised me that he planned to check Jan's cards at the ham radio convention in Friedrichshafen in late June. Therefore, by the time you read this Jan should have received that valuable piece of wallpaper. Congratulations, Jan, for accomplishing this monumental goal.

## From the Z3 Side

The following account is from Zdenek Samek at Z3/OK1DFC:

After 650 km of night driving, my son, Zdenek, OK3RM, and I arrived on the 6th of June in Macedonia, KN11BS. Immediately we started to build the station to be QRV as soon as possible and have a chance to work according to our plan from Saturday morning. So approximately at 13:00 UT we were able to start rectifying the dish with sun noise and test how the noise floor looked. First result was great, comparing with 4O QTH we were hearing only velvet noise :-). This result was great and encouraged us to ask Jan, DL9KR, for some signal beacon via moon.

How we expected, his signal was great 579 and very good readable. So we immediately installed also driver and PA with two 3CX800s for echo test. When we finished the installation Jan was still testing echoes and we were ready to call him. After he finished one series of test I had to switch on all units to TX position and started to call Jan. Jan immediately answered our call and gave us first "O" and after 549 report.

We started jumping and dancing around the dish like crazy because after his RRRR series, it was clear that our main issue of mission was done. Jan is the first ham in the world to reach DXCC on 432 MHz all CW. Guys from Stip Radio-Club Z37M, Dime Z35Z, and Kris Z35X did not trust that the signal they were hearing was bounced via Moon. Jan was really strong and immediately readable also for them from loud speaker. So we opened a bottle and each of us drank a glass to cheer Jan's excellent result.

After a couple of QRZs we didn't have any takers and turned the station off. It was time to go for dinner and sleep, because in that time I did not sleep continuously more than 24 hours. When we came back from dinner, we did not trust our own eyes. During that time passed through our location a big thunderstorm which twice hit the 10 kV power line and all fuses there were blown out. There wasn't any piece of ceramic where the fuses were-installed. That was a shock.

Thanks to great relationship of our friends with people from Power Company, they started to work on repairs immediately in the night and recognized that there wasn't a problem with fuses but something else. They promised that at 08:00 in the morning, local time, everything would be OK. On Saturday morning they came again and really turned on the line in our location.

It was in the last minute because time for VK guys was about to close and Moonset was coming. We worked with Doug, VK3UM, in his last couple of minutes...

*e-mail: <n6cl@sbcglobal.net>

**VHF Plus Calendar**

| | |
|---|---|
| Aug. 2 | New Moon |
| Aug. 2–3 | ARRL UHF and Above Contest |
| Aug. 3 | Very Good EME conditions |
| Aug. 8 | First Quarter Moon |
| Aug. 10 | Moon Apogee; very poor EME conditions |
| Aug. 12 | *Perseids* Meteor Shower Peak |
| Aug. 16 | Full Moon |
| Aug. 16–17 | ARRL 10 GHz and Above Cumulative Contest |
| Aug. 17 | Moderate EME conditions |
| Aug. 23 | Last Quarter Moon |
| Aug. 24 | Moderate EME conditions |
| Aug. 26 | Moon Perigee |
| Aug. 31 | New Moon; good EME conditions |

*—EME conditions courtesy W5LUU.*

For more information on their DXpeditions to Z3 and 4O, please see the website: <www.ok1dfc.com/peditions/z3/z3.htm>.

## More Magnetotail Evidence

Last month I commented on the Earth's magnetotail and how it could have been responsible for the June 20–30, 1975 Apollo seismometer readings that have led some to believe that the Moon was bombarded with a huge meteor storm during that timeframe. Subsequent to my report, I did some more research. The following are the results of that research:

Putting together my research has been like assembling a puzzle. Another piece of the puzzle that I found was in the December 7, 2005 Science@NASA story entitled "Moon Storms."[1] In that article authors Trudy E. Bell and Dr. Tony Phillips write about the Lunar Ejecta and Meteorites (LEAM) experiment that was installed by the Apollo 17 astronauts in 1972. The purpose of the experiment was to look for dust kicked up by small meteoroids that would hit the Moon's surface. According to Hunt and Phillips:

Apollo-era scientists wanted to know how much dust is ejected by daily impacts? And what are the properties of that dust? LEAM was to answer these questions using three sensors that could record the speed, energy, and direction of tiny particles: one each pointing up, east, and west.

LEAM's three-decades-old data are so intriguing, they're now being re-examined by several independent groups of NASA and university scientists. Gary Olhoeft, professor of geophysics at the Colorado School of Mines in Golden, is one of them:

"To everyone's surprise," says Olhoeft, "LEAM saw a large number of particles every morning, mostly coming from the east or west—rather than above or below—and mostly slower than speeds expected for lunar ejecta."

What could cause this? Stubbs has an idea: "The dayside of the moon is positively charged; the nightside is negatively charged." At the interface between night and day, he explains, "electrostatically charged dust would be pushed across the terminator sideways," by horizontal electric fields.

Concerning the so-called lunar meteor storm hypotheses, while Kaufmann, et al.[2] dealt with some aspects of this hypothesis, it is necessary to mention two other theories. First, in an article entitled "The Dark Ages: Were They Darker Than We Imagined?"[3] author Greg Bryant makes the following point concerning the annual *Beta Taurids* meteor shower and the June 20–30, 1975 lunar meteor storm:

> When the astronauts went to the Moon, they placed seismometers on the Moon's surface. At the end of June, 1975, they registered their major series of lunar impacts. The impacts were detected only when the nearside of the Moon (where the astronauts landed) was facing the Beta Taurid radiant. At the same time, there was a lot of activity detected in Earth's ionosphere, which has been linked with meteor activity.

Bryant is not unique in his suspecting the *Beta Taurids* meteor shower involvement. Kaufmann, et al. cite K. Brecher ("The Canterbury swarm: Ancient and modern observations of a new feature of the solar system," American Astronomical Society Bulletin 16, 476, 1984) and J. Dorman, S. Evans, Y. Nakamura, and G. V. Latham ("On the time-varying properties of the lunar seismic meteoroid population," *Proceedings* of the Lunar Planetary Science Conference 9, 3615–3626, 1978) as supporters of the *Beta Taurids* meteor shower theory.

Second, in an article entitled "Possible relationship between the Farmington meteorite and a seismically detected swarm of meteoroids impacting the Moon"[4] author Jürgen Oberst suggests a link between the Farmington meteorite[5] and the lunar meteor storm, while at the same time discounting the *Beta Taurids* meteor shower connection because that meteor shower does not show "swarming," which, according to Oberst, was necessary to explain the "observed large seismic signals." He further points out that "for objects in orbits of Taurid meteors, the longitude of the ascending node, $\Omega$, shifts by about 35° on average during such a period (Jones, 1986)." Hence, the suggested association is quite unlikely although it cannot be ruled out. It is also important to note concerning the *Beta Taurids* that their active dates are usually between June 5 and July 17, with a peak of June 28, which may or may not preclude their effect on the Moon during the peak days of June 22–23 and 25–26, 1975.

Finally regarding the *Beta Taurids*, from their first discovery by Jodrell Bank observers during June 20–27, 1947, they have consistently been defined as a weak-stream meteor shower with no clear peak—particularly because it is a daytime shower that relies on radio observation reports for its definition. Additionally, the International Meteor Organization points out in its 2008 calendar of meteor showers that because of its proximity to other radiants, it is difficult to clearly define it from the other radiants.[6] Therefore, it is my opinion that to attribute such a massive lunar storm that, as Kaufmann, et al. noted was not homogenous to Earth, to the *Beta Taurids* is at least problematic. Furthermore, efforts to support the theory that the *Beta Taurids* shower could produce massive amounts of large boulders by way of linking it to the theory of the June 30, 1908 Tunguska explosion is also problematic because the Comet Encke hypothesis is one of many hypotheses that attempt to explain the Tunguska event.[7]

In summary, it is my hypothesis that what Kaufmann et al. investigated as a meteor storm was more likely sandstorms caused by the Earth's magnetotail. The evidence I have found to support my hypothesis seems to indicate that the Moon appears to have crossed through the Earth's magnetotail in the right timeframe (peak of the Moon's nodal period precessional orbit, during the summer solstice, and when the Moon was at full phase) for a series of sandstorms to have occurred that were detected by the seismometers left by the Apollo astronauts. While, as mentioned above, several have tried to tie the lunar events of June 20–30, 1975 to a meteor storm or storms or remnants of the Farmington meteorite (none more thoroughly than Kaufmann, et al.), it is my position that the evidence supports my hypothesis over and against these other hypotheses.

I expect to publish my paper in the *Proceedings* of this year's Central States VHF Society's conference, as well as the Summer 2008 issue of *CQ VHF* magazine.

## Bell-Ringing Moonquakes or Sandstorms?

Between 1969 and 1972, Apollo astronauts placed seismometers at their landing sites at various locations around the Moon. For a number of years the Apollo 12, 14, 15, 16, and 17 instruments radioed data back to Earth, until they were switched off in 1977.

In the March 15, 2006 Science@NASA article entitled "Moonquakes"[8] author Trudy E. Bell wrote about Clive R. Neal, associate professor of civil engineering and geological sciences at the University of Notre Dame, who, along with his 15-member team, spent considerable time identifying and categorizing the four types of Moonquakes. Of importance to me was the identifying of Moonquakes that were caused by meteors striking the Moon's surface. From Bell's article is the following excerpt:

> There are at least four different kinds of moonquakes: (1) deep moonquakes about 700 km below the surface, probably caused by tides; (2) vibrations from the impact of meteorites; (3) thermal quakes caused by the expansion of the frigid crust when first illuminated by the morning sun after two weeks of deep-freeze lunar night; and (4)

shallow moonquakes only 20 or 30 kilometers below the surface.

The first three were generally mild and harmless. Shallow moonquakes on the other hand were doozies. Between 1972 and 1977, the Apollo seismic network saw twenty-eight of them; a few "registered up to 5.5 on the Richter scale," says Neal.... Furthermore, shallow moonquakes lasted a remarkably long time. Once they got going, all continued more than 10 minutes. "The moon was ringing like a bell," Neal says.

In light of my hypothesis concerning the seismometers' recorded lunar activities of June 20–30, 1975, it is my suggestion that maybe some of the relatively long-lasting shallow Moonquakes could actually have been the readings of the ongoing magnetotail-caused sandstorms rather than "bell ringing" Moonquakes.

## Cycle 24 Sunspots No Show?

In the June 9, 2008 Science Daily website,[9] the editor reported that a point of discussion for the scientists who attended an international solar conference at Montana State University was the absence of sunspots associated with the Sun's new cycle. The nearly 100 scientists from Europe, Asia, Latin America, Africa, and North America who gathered June 1–6 to talk about "Solar Variability, Earth's Climate and the Space Environment" heard Saku Tsuneta with the National Astronomical Observatory of Japan, program manager for the Hinode solar mission, report on his solar observations. The Hinode satellite is a Japanese mission with the United States and United Kingdom as partners. One wonders if we might be headed for another Maunder Minimum, that period of 50 or so years of an absence of solar activity which occurred during the years 1650–1700.

## European Space Agency's Vega CubeSat Selection

This past June the European Space Agency announced the selection of nine finalists and two alternates for its CubeSat program which is a part of the new Vega space launch to take place late this year or early next year. Among the nine are two that plan to include an amateur radio payload. They are:

- OUFTI-1 (University of Liège, Belgium): a mission to test the use of the D-STAR amateur radio digital communication protocol in space;
- Xatcobeo (a collaboration of the University of Vigo and INTA, Spain): a mission to demonstrate software-defined radio and solar panel deployment;

The other seven CubeSats include:

- SwissCube (École Polytechnique Fédérale de Lausanne, Switzerland): a mission to characterise the air glow phenomenon in the Earth's atmosphere;
- UNICubeSAT (University of Rome, Italy): performing in-situ measurements of atmospheric neutral density using the Broglio drag balance instrument;
- Robusta (University of Montpellier 2, France): a mission to test and evaluate radiation effects (low dose rate) on bipolar transistor electronic components;
- AtmoCube (University of Trieste, Italy): in-situ monitoring of space environment parameters such as radiation flux, magnetic field and atmospheric density;
- e-st@r (Politecnico di Torino, Italy): demonstration of an active 3-axis Attitude Determination and Control system including an inertial measurement unit;
- Goliat (University of Bucharest, Romania): imaging of the Earth's surface using a digital camera and in-situ measurement of radiation dose and micrometeoroid flux;
- PW-Sat (Warsaw University of Technology, Poland): a mission to test a deployable atmospheric drag augmentation device for de-orbiting CubeSats.

The two alternates are:

- UWE-3 (University of Wuerzburg, Germany): demonstration of an active 3-axis Attitude Determination and Control system using magnetorquers;
- HiNCube (Narvik University College, Norway): imaging of the Earth's surface using a digital camera.

The nine CubeSats will be located within three P-POD deployment systems that are to be mounted on the payload interface of Vega's AVUM upper stage. The P-POD deployers were built by Cal Poly. Each 1-kg CubeSat will be deployed into a high-inclination, low-Earth orbit, and is expected to operate in orbit for up to one year. Tracking of each satellite will be performed by a small ground station that will be based at the respective university.

"By undertaking this first flight we hope to give the European CubeSat community a real boost, and enable tens of students to gain practical experience in qualifying their satellites for launch then actually operating them in orbit," said Roger Walker, head of (hands-on) project activities in ESA's Education Office.

The Vega project is launching the CubeSats free of charge. The ESA Education Office is providing:

- three P-POD deployers built by CalPoly in the United States;
- any supplementary tests of the flight CubeSats at the test facilities at the European Space Research and Technology Centre (ESTEC) if required by the launch authority;
- integration of the CubeSats into the deployers;
- ESTEC expert support for reviews and ad hoc technical support;
- travel and subsistence expenses for up to three students in each CubeSat team to attend the necessary workshops and technical interface meetings at ESTEC, and to participate in the integration and test campaign at ESTEC, as well as the launch campaign in Kourou.

The ESA has taken note of the growing importance of CubeSats as hands-on education tools. In response to this growth, the ESA Education Office has organized the Second European CubeSat Workshop, which is scheduled to take place at the ESTEC on January 20–22, 2009. During the workshop, all of the European CubeSat teams (including the selected teams for the Vega flight) will have the opportunity to present their progress and exchange information.

For more information on the launch and the conference, go to: <http://www.esa.int/esaED/index.html>.

## Weak-Signal Silent Keys

It is with deep sadness that I report the following silent keys: Norm Pedersen, KB6KQ, Rainer Bertelsmeier, DJ9BV, and Frank Bauregger, W6QI. Our hobby has benefitted greatly by each of their contributions. To their families go the ham radio community's sincere condolences.

## Current Contests

There are two important contests this month: The **ARRL UHF and Above Contest** is scheduled for August 2–3. The first weekend of the **ARRL 10 GHz** and above cumulative contest is scheduled for August 16–17. The second weekend is September 15–16. Complete rules for the above contests can be found in the July issue of *QST* and at <www.arrl.org>.

## Calls for Papers

Technical papers are solicited for presentation at the **27th Annual ARRL and TAPR Digital Communications Conference** to be held September 26–28 in Chicago, Illinois and for publication in the conference *Proceedings*. Presentation at the conference is not

required for publication. Submission of papers is due by July 31 to: Maty Weinberg, KB1EIB, ARRL, 225 Main Street, Newington, CT 06111, or via the internet to <maty@arrl.org>. For suitable topics and submission guidelines contact Maty via e-mail; also check <http://www.arrl.org>.

## Meteor Showers

Beginning around July 17 and lasting until approximately August 24, you will see activity tied to the *Perseids* meteor shower. Its predicted peak is around 1130–1400 UTC on August 12. A possible tertiary peak may occur around 1640 UTC. The *κ-Cygnids* meteor shower is expected to peak on August 17. The visually-impossible *γ-Leonids* is expected to peak August 25 at around 0400 UTC. The *α-Aurigids* is expected to peak on August 31.

For more information on the above meteor shower predictions see Tomas Hood, NW7US's propagation column. Also visit the International Meteor Organization's website: <http://www.imo.net/calendar/2008>.

## And Finally . . .

In order for Jan Bruinier, DL9KR, to accomplish his goal of being the first to complete 70 cm DXCC many, many of his fellow amateur radio operators had to provide him with an assist. Among those who did so was his friend, Ranier, DJ9BV, who is now a silent key. Also assisting him was one of his closest contenders, Al Katz, K2UYH, who traveled to Aruba and operated as P43L. This selflessness, cooperation, and teamwork are what make our hobby great and it is what makes my being your columnist one the most fun things that I do.

This month I expect to be at the Huntsville Hamfest. I hope to see you there. If you have a story to tell related to the wonderful world of VHF-plus, please look for me at the hamfest or email me at: <n6cl@sbcglobal.net>.

Until next month . . . 73 de Joe, N6CL

## Notes

1. <http://science.nasa.gov/headlines/ y2005/07dec_moonstorms. htm>
2. Kaufmann, Peter, V. L. R. Kuntz, N. M. Paes Leme, L. R. Piazza, J. W. S. Vilas Boas, K. Brecher, & J. Crouchley, "Effects of the Large June 1975 Meteoroid Storm on Earth's Ionosphere," *Science*, November 10, 1989, vol. 246, pp. 787–790.
3. This article was originally published in the September 1999 *Universe* magazine and is now posted on the internet at: <http://gchbryant.tripod.com/Articles/darkages0999.htm>.
4. See *Meteoritics* 24, 23–28, 1989.
5. On June 25, 1890, at 1PM local time, a brilliant fireball was seen over the Midwest part of the United States. The resulting meteorite landed in Farmington, Kansas. The metal of the meteorite was later determined to be chondrite.
6. <http://www.imo.net/calendar/2008# spring>
7. Lubor Kresák, "The Tunguska object – A fragment of Comet Encke?" *Astronomical Institutes of Czechoslovakia, Bulletin*, vol. 29, no. 3, 1978, pp. 129–134. An abstract is available online at: <http://adsabs.harvard.edu/abs/1978BAICz..29..129K>. A copy of the full text can also be accessed from this URL.
8. <http://science.nasa.gov/headlines/ y2006/15mar_moonquakes.htm>
9. Montana State University (2008, June 9). Sun Goes Longer Than Normal Without Producing Sunspots. *ScienceDaily*. Retrieved June 17, 2008, from <http:// www.sciencedaily.com/releases/2008/ 06/080609124551.htm>.

BY JOHN DORR,* K1AR

# Preparing for Battle

**August's Contest Tip**

Your performance on the air will vary depending on the time of year. For example, summertime conditions, like we are experiencing now, allow for extending operating on 20 meters into parts of the world that are harder to reach in the winter. Use propagation tips (such as propagation is these days) to your advantage and enjoy some improved scores in this summer's contest season!

Be prepared! That's the long-standing slogan of both the Boy Scouts of America and the American Red Cross. In the case of the Boy Scouts, being prepared is not just about emergencies, but is also the idea of complete readiness for whatever life throws at you. The Red Cross is especially concerned about disaster preparations as it works day and night to prepare for the unexpected.

What does this have to do with contesting? As it turns out, preparation for contest operating is almost as important as how well you perform in the event itself, yet it's amazing how few of us really take the time to prepare ourselves for battle.

There are many ways we prepare for other aspects of life. For example, a marathon runner doesn't simply put on his (or her) shoes one sunny morning and run 26 miles. He prepares months and years in advance as part of a rigorous training regimen to build up his body's ability to deliver in such a demanding endeavor. Candidates for senior-level positions do more than show up for their interviews. Rather, they spend long periods of time learning about their prospective company and its products/services. They get to know their competition and prepare for a wide range of questions and discussion topics. Put another way, preparation is an important aspect of life, and those who do it well generally perform better than those who do not.

Much of this notion of preparation applies to contest operating. Our sport mirrors many aspects of life. If we take it seriously, rather than use a more lackadaisical approach, our results will dramatically improve. Amazingly, too, proper preparation for contesting has little to do with the size of your station, operating ability, or competition. It's an intensely private exercise over which you have complete control. The more you invest in preparation the better you will do in a radio contest and the more likely you will pull ahead of those competitors who choose to avoid the business of preparation.

There are many aspects of contest preparation that one can consider. This month we'll touch on a few. I'm sure you can come up with many others. For now, though, let's get the show on the road.

## Station Preparation

This aspect of preparation is perhaps the most basic of all. You can have all of your other preparation goals in order but fail miserably in a contest if you haven't considered the details of the station itself. Like that important interview, it's important to have a checklist of items to consider when preparing your station for battle. Here are a few:

- Are all of your antennas functioning properly? Have you tested them under a variety of conditions and on the air with local hams? Are the antennas free of intermittent connections?
- Are your rotors turning and properly aligned? Do they function equally well in an RF environment?
- Is your station gear fully functional on all bands? How does everything perform under high-heat conditions? Is everything calibrated properly?
- Is all of your switching hardware/software fully functional (e.g., for SO2R [single-op two radios], filters, etc.)? Have you tried all combinations to check for unexpected failures?
- Have you checked your computer setup? Is your latest software installed and operational? Do you have the latest file updates installed and tested? Is your computer fully functional in your station's RF environment? Does your computer generate any noise in your station?
- Have you checked for line noise on all bands and with all antennas? Are there any potential noise-making devices in other parts of your house?
- Do you have a supply of batteries available for your headset and other applications as needed?
- To the extent possible, do you have redundancy in the case of unexpected failures? Have you arranged for, or own, a spare radio and/or amplifier?
- Have you tested your audio/keying quality on the air to ensure there are no problems on any band or any combination of antennas?

## Sleep

Sleep is something that I could use more of right now, but I digress. That said, sleep preparation is a key success factor for contest operating. You

**Calendar of Events**

| | |
|---|---|
| **All year** | **CQ DX Marathon** |
| **July 19–20** | **CQ WW VHF Contest** |
| July 19–20 | North American RTTY QSO Party |
| July 26–27 | RSGB IOTA Contest |
| Aug. 2 | European HF Championship |
| Aug. 2-3 | 10-10 Int'l Summer QSO Party |
| Aug. 2-3 | North American CW QSO Party |
| Aug. 3 | SARL HF SSB Contest |
| Aug. 9–10 | Worked All Europe CW Contest |
| Aug. 9–10 | Maryland-DC QSO Party |
| Aug. 16–17 | SARTG RTTY Contest |
| Aug. 16–17 | Keyman's Club of Japan Contest |
| Aug. 16–17 | North American SSB QSO Party |
| Aug. 16–18 | New Jersey QSO Party |
| Aug. 30–31 | ALARA Contest |
| Aug. 30–31 | SCC RTTY Championship |
| Aug. 30–31 | YO DX HF Contest |
| Aug. 30–31 | Ohio QSO Party |
| Aug. 31 | SARL HF CW Contest |
| Sept. 6 | Russian RTTY WW Contest |
| Sept. 6-7 | All Asia SSB DX Contest |
| Sept. 7 | North American CW Sprint |
| Sept. 13–14 | Worked All Europe SSB Contest |
| **Sept. 27–28** | **CQ WW RTTY DX Contest** |
| **Oct. 25–26** | **CQ WW DX SSB Contest** |

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would never attempt to run the Boston Marathon on two hours sleep. Why would you run the CQ WW marathon with poor sleep habits from the previous week? It's incredibly effective to force yourself to get more than your usual amount of sleep the week before a big contest. In fact, you may actually discover that getting extra sleep has more long-lasting benefits! Grabbing a couple of hours in the afternoon before a contest is also a good idea. Also, doing the best you can to plan a sleep strategy during the contest is critical as well (understanding that there may be unpredicted variables that can enter into the mix).

Use common sense when it comes to sleep. Don't drink four cups of coffee before lunch and wonder why you can't catch those important two hours of nap time in the early afternoon before a contest. No one knows yourself better than you. Take advantage of that fact and use sleep preparation to your strategic advantage!

## Understanding Propagation

Do you plan a long trip without knowing the weather forecast? Well, to be honest, some of us do, but planning a long contest includes understanding the forecast for propagation. Solar conditions dictate some of the most basic aspects of operating strategy, ranging from band selection to operating times. You can give yourself a leg up on the competition by being better informed in this area. Take the time to read the readily available predictions and solar facts found on the internet and here in *CQ* magazine. Understand seasonal propagation dynamics and use them to work stations that others may miss.

## Consider Previous Years

Yes, it's important to learn from your successes and failures in the past. Indeed, they can be a valuable guide to future operating strategy. Whether you've missed that band opening by an hour or finally cracked the 100 QSO/ hour barrier, we all can learn from the past. Success in contesting is partially a cumulative effect that comes from years of experience. Tactically speaking, it's also about executing the mechanics of operating and knowing where your station performs best based on previous experience. While past results cannot predict the future, it's a great place to start and critical to proper preparation.

## Who's On and From Where?

This topic is often overlooked and is so easy to nail down. Complete your preparation checklist by making sure that you have a list of expeditions that will be active in an upcoming contest. Being active on the air, especially a week or two before a contest, is key to not only understanding a DX station's operating habits, but also gaining familiarity with who is on the air and from where. Getting your callsign in their log on many bands is not going to hurt either. Investing in callsign recognition, over time, is a huge advantage over those who choose to be inactive and relatively unknown in the pile-ups.

## Food and Logistics

This is one of my favorite subjects—eating. Preparing for your eating requirements seems obvious to most, but is an often overlooked consideration. It begins by being well stocked with food in the first place, and the right food at that! Again, no one knows your food requirements better than you. Make sure you consider the fact that you're operating a marathon and adjust accordingly. You can save the fine dining for another day.

There are many other considerations as well. Here is a few:

- Consider setting up a special sleep area (with an alarm clock) that is out of the mainstream of the house and its daytime noise.
- Do you have enough fresh clothes? It's amazing how a change of clothes and a warm shower can rejuvenate you during a long contest.
- Have you explained the proper expectations with family members and friends before the contest? For most of us, negotiating a weekend contest commitment is ineffective on the Friday night of a contest.
- Is there a local ham at the ready should you run into equipment problems during the contest?

It's incredible how a few considered hours of preparation can impact a contest effort and your final score. Just like an experienced ball player, preparation is not just for the new guy. In fact, those of us who are a little longer in the tooth will say that we prepare for contests in advance as much as anybody. Give it a try and watch your scores improve. You'll be amazed at the results!

## Regarding AM

You may recall in my June column that I published an anonymous letter from a contester who replayed the "Old Days of Contesting." His views were designed to make all of us think about the future of contesting by remembering some of the great attributes of our past.

Unfortunately, a remark was made that was perceived to be disparaging to AM operators, as if they are a lower class citizen when compared to contesters. For that, we apologize. As recently pointed out to me in a letter, the AM community is one of the more notable technical "hands on" groups in our hobby, taking pride in their ability to build and restore homebrew/old gear. They are hardly a group of old-timers who simply get on the air to talk about their daily medications.

What makes our hobby great is its diversity. As our reader pointed out, "I find that AM and contesting/DXing, on both HF and VHF, are complementary activities that broaden my enjoyment of amateur radio." How true that is!

## Final Comments

I'm out of time and computer ink for this month. If you have any thoughts or positive experiences in the game of "contest preparation," I'd like to hear from you. Drop me a line.

See you in the next contest!

73, John, K1AR

BY TOMAS HOOD,* NW7US

# August Propagation a Mixed Bag

### A Quick Look at Current Solar Cycle Conditions

*(Data rounded to nearest whole number)*

**Sunspots**
Observed Monthly, May 2008: 3
Twelve-month smoothed, November 2007: 6

**10.7 cm Flux**
Observed Monthly, May 2008: 68
Twelve-month smoothed, November 2007: 71

***Ap* Index**
Observed Monthly, May 2008: 6
Twelve-month smoothed, November 2007: 8

Late August and early September is a difficult time of year for which to make accurate band predictions because conditions can change drastically from day to day. On many days, typical summertime conditions will continue much as they were during June and July.

On the other days, conditions may sound typically fall-like, with somewhat higher daytime usable frequencies and somewhat lower nighttime usable frequencies. When you add *equinoctial* conditions that can begin as early as late August, we often experience optimum openings between the Northern and Southern Hemispheres on the one hand, but periods of active to stormy conditions on the other.

Despite being near the end of solar Cycle 23 with low solar activity, during the daylight hours good DX conditions should be possible on 15, 17, and 20 meters. Expect signals on the 17- and 20-meter bands to peak approximately during the two-hour window immediately following sunrise and again during the late afternoon. These two bands, and to a lesser degree the 15-meter band, will see openings for DX throughout the daylight hours. Fairly good DX openings should occur along an arc extending across central Africa, Latin America, and into the far Pacific area. Peak conditions should occur during the afternoon hours, but an increasing number of earlier openings should be possible by early September.

Between sundown and sunrise 20 meters is expected to be the best DX band. However, with lower solar activity, the band in general will suffer compared with the past few years. Openings might be possible to many areas of the world, some with surprisingly strong signal levels. Until midnight good DX conditions should be found for openings toward Latin America, the far Pacific, and into Asia. You might even catch some activity on 17 or even 15 meters. Fairly good conditions are also expected on 30, 40, 60, and 80 meters despite the high static level at times. Openings should be possible before midnight along an arc extending from northern Europe, through Africa, and into Latin America, the far Pacific, and Asia after midnight.

By late August it should be possible to work some DX on 160 meters during the hours of darkness. Conditions on this band—as well as on 40, 60, and 80 meters—will tend to peak just as the sun begins to *rise* on the *light*, or easternmost, terminal of a path.

For short-skip openings during August and early September, try 80 meters during the day for distances less than 250 miles, with 60 and 40 meters also usable. During the hours of darkness, both 80 and 160 meters should provide excellent communications over this distance. For openings between 250 and 750 miles, use 30 and 40 meters during the day for distances up to 500 miles, and 20 and 17 meters between 500 and 750 miles. At night, 40 and 30 meters should be the best bands for this distance until midnight, with 80 meters optimum from midnight to sunrise. Try 60 meters, as well. For openings between 750 and 1300 miles, try 20 and 17 meters, as they should provide optimum propagation during the hours of daylight. Optimum conditions should continue on these bands for this distance range after sundown and until midnight. Between midnight and sunrise the best band should be 40 meters, but check 60 meters, too. For openings between 1300 miles and the one-hop short-skip limit of approximately 2300 miles, try 20 and 17 meters during the day, with 15 meters also usable. After sundown try 30, 40, and 60 meters, with 80 meters also providing good propagation conditions for this distance range.

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### LAST-MINUTE FORECAST

**Day-to-Day Conditions Expected for August 2008**

| | Expected Signal Quality | | | |
|---|---|---|---|---|
| Propagation Index..... | (4) | (3) | (2) | (1) |
| Above Normal: 3-7, 16-17, 23-26, 30-31 | A | A | B | C |
| High Normal:2, 10, 12-15, 19-22, 27, 29 | A | B | C | C-D |
| Low Normal: 1, 8-9, 11, 18, 28 | B | C-B | C-D | D-E |
| Below Normal: N/A | C | C-D | D-E | E |
| Disturbed: N/A | 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 S1 and S3, with considerable fading and noise.
E—No opening expected.

### HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.

2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 1 will be will be poor (D) to nonexistent on Aug. 1st, fair (C) to good (B) on the 2nd, and fair (C) from Aug. 3–7, etc.

3. As an alternative, the Last-Minute Forecast may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the path is ionospherically supported.

## VHF Conditions

Sporadic-*E* propagation usually begins to taper off during August, but it should continue to occur fairly frequently. Some 6-meter sporadic-*E* openings are expected during the month over distances of approximately 750 to 1300 miles. During periods of intense and widespread sporadic-*E* ionization, two-hop openings may be possible considerably beyond this range. Also check the 2-meter band for an occasional sporadic-*E* short-skip opening between approximately 1200 and 1400 miles. While sporadic-*E* short-skip openings may occur at any time, there is a tendency for them to peak between 8 AM and noon, and again between 6 PM and 9 PM local daylight time.

The *Perseids* meteor shower covers the period of July 17 to August 24. The peak is expected to occur August 12, between 1130 and 1400 UTC, and will be most observable in the Northern Hemisphere. The maximum hourly visual rate should reach 100.

Aurora? You would think that aurora would not be a frequent player at this point in the lull between Cycle 23 and Cycle 24, but with the continued expulsion by the Sun of coronal mass into the solar wind, we have been observing occasional moderate auroral activity in the highest latitudes. Some of these have occurred even during the late spring and early summer this year. Auroral-scatter-type openings, on both 6 and 2 meters can range from a few hundred up to about a thousand miles, and they are usually characterized by very rapid flutter and Doppler shift on SSB signals.

For the very patient, check the 6-meter band for possible trans-equatorial (TE) openings between 8 and 11 PM local daylight time. This type of propagation favors openings from the southern tier states into deep South America, with the signal path crossing the magnetic equator at a right angle. TE openings during August are rare, but they can occur. Very weak signals and severe flutter fading usually characterize them.

## Current Solar Cycle Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for May 2008 is 2.9, the same as for April. The lowest daily sunspot value recorded was zero (0) on May 1–3, 6–12, 14, and 21–31. The highest daily sunspot count was 15 on May 18. The 12-month running smoothed sunspot number centered on November 2007 is 5.7. A smoothed sunspot count of 13, give or take 7 points lower to 6 points higher, is expected for August 2008.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 68.4 for May 2008, down from April's 70.3. The 12-month smoothed 10.7-cm flux centered on November 2007 is 71.1. The predicted smoothed 10.7-cm solar flux for August 2008 is 65, give or take about 4 points.

The observed monthly mean planetary *A*-index (*Ap*) for May 2008 is 6, down from April's 9. The 12-month smoothed *Ap*-index centered on November 2007 is 7.8. Expect the overall geomagnetic activity to vary between quiet to active during most days in August.

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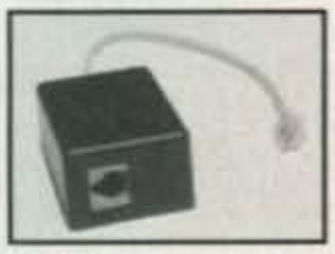
Last month, I mentioned that I would dig into the contribution to ham radio made by L. B. Cebik. I've delayed things, because there's just so much that he did for our hobby that it is taking more time than I have had since his passing. As soon as I can tie all of the major points together, I'll share the story with you here in this column.

As usual, I invite you to visit my online propagation resource at <http://propagation.hfradio.org/>, where you can get the latest space data, forecasts, and more, all in an organized manner. If you have a cell phone with internet capabilities, try <http://wap.hfradio.org/>.

Drop me an e-mail or send me a letter if you have questions or topics you would like to see me explore in this column. Also, I'd love to hear any feedback you might have on what I have written. Until next month . . . 73, de Tomas, NW7US





## Results *(from page 29)*

**GM2T**. As always CQ WW DX SSB makes its own propagation. Awesome contest with conditions better than predicted. Tnx to all the stations that make contact with HR . . . **HR2DMR**. My first contest in High Power category. For the next time I'll improve my receiving antenna systems and hoping for verticals. Enjoyed 80m for the large number of stations working from all over the world. See You all at the next and remember, no time for sleeping! . . . **IW3SSA**. I enjoyed the contest with the new antennas . . . **JA2TTH**.

Friday and Saturday, as usual. By Sunday morning I was hoping to get to 600 but a terrific opening on 15m with about 4 hours to go and had the best run I think I've ever had. Ended up with over 1000 QSOs. Missed everything on 10m because found the SWR on 10 was out of sight plus couldn't get the amp to tune on 80m. Never even heard a contester on 40 and must have been listening at the wrong times. But that run on 15 was so much fun, unbelievable. Decided to waste my 20 QSOs and enter single band 15m . . . **KH6GMP**. Seemed the contest and the bands came to life Sunday afternoon and the last four hours were the best by far! . . . **KL8DX**. QRP 5W, quite good conditions taking into consideration being at the bottom of the sunspot cycle. I was amazed at how far 5W goes, 59 counties and I did much less than half of the contest! . . . **MØLSK**. First time we have all worked together as a team in this contest, but some of us do get together each year to activate GBØSH special event station. I guess you could say we are the rookies in this category. We had to erect all the antennas and stations, invading a friend's home to do this. Thanks to Rob, MWØRLJ, for allowing us to use his home and farm . . . **MW5W**. This was my first Real contest. Could have done better but didn't take this first attempt too seriously. I concentrated work on 15m. Some good runs there on Sunday which gave me abt half of my total QSOs. Mostly S&P on other bands but frequently checked 15 and 10m for multipliers . . . **OH1JO**. Good activity and nice to work in the contest. Conditions were rather good and I could work some stations on 10m. It is always pleasant to work many known stations . . . **ON5WL**.

Didn't really plan on participating seriously. Started out on Friday logging on a piece of paper. Got the taste again and continued on Saturday morning with a more decent approach. On Saturday I had practically one continuous pile-up from start up till the band closed down. FB conditions on 15 meters thru the weekend . . . **P43A**. We participated in the contest with the motto "fun and education" . . . **PI4ZOD**. Very bad propagation on 15m and therefore very difficult to work QRP power. Thanks to all hams, who worked with me . . . **RA3XEV**. Final club activity with special call SC5L to celibrate 300 years birth of scientist Carl Linnaeus (father of taxonomy) and his work in Uppsala. Next year we will have a beam antenna! . . . **SC5L**. The very first time from our radio club's shack in downtown Las Tunas so we really "enjoyed" the very strong city QRM besides such from multiplier station . . . **T48K**. I only had single vertical dipole and 300W but it went well. My highlight was on 15m at 1400Z when there was a great opening and I had the frequency and there were 3 and 4 QSOs every minute. I was amazed how good ears they had, operators at W7WA, CN3A, and PJ4E, as they were able to copy my weak signal through all the QRM . . . **TF3AM**. This was a "100 Pound DXpedition" so all radios and antennas came with us in checked bags. The lightweight tribander performed very well; the poor terrain thwarted low-band operation. EU, AF, SA, and NA were great. AS and OC never appeared . . . **V4/NE1RD**. This is our 5th year operating Multi-Two in Zone 2. This year we beat last year's QSOs and score. This year the weather cooperated with no snow, freezing rain, or nor'easter storms . . . **VE2DXY**. Considering the huge signals heard from the big guns, it is hard to imagine what the bands will sound like when sunspots return . . . **VE7HA**. Wow, don't know if it can get any harder! 2007 CQWW SSB will go down in history as a long hard slog. But amongst the long almost endless hours of white noise there was some pleasure. C50C long path on 15m was the real highlight. 10m opening to KH6 and W6 in the last few hours another plus, if for only a few fleeting moments . . . **VK4CZ**. Before contest two amps bit the dust (only one working). Lost all 160, 80, 40 antennas first night due to winds from approaching soon to be hurricane. Driving rain killed phone lines, no packet, great fun . . . **VP5DX**.

Despite S9 QRN level thrilled to work so many stations at this point in the cycle with a vertical and 100W! . . . **VU3USJ**. Pleased to see the 10 meters open again. Despite the bottom of the actual solar cycle and my urban location got several nice DX's . . . **YO2IS**. My location had rain storm during the weekend and multiple long power outages which limited the operation time. Many thanks to stations that take time to hear me in the noise . . . **YV6BXN**. The contesting world misses KTØR, who went SK just weeks before the 2007 CQWW SSB contest. Dave was a great friend and a terrific CW/SSB contester . . . **ZD7X**. Another enjoyable contest. Bettered our QSO number of last year at sunspot minimum. We even had a couple of runs on 10 metres but 80 metres was very noisy with continual static . . . **ZM2M**.

### USA QRM

I was surprised to have 15m as my main band at this point in the solar cycle . . . **AA6K**. Not much time to do contesting this weekend especially during the day. Decided on a whim to crank up the Henry 2K2 and run about 500 watts. The big surprise was the 10m opening . . . **AD6ZJ**. Not bad for my first serious QRP entry. FT-817 and the ole' tribander at 42 feet. Thanks for the Qs, gang! . . . **AG4RZ**. 10m openings at this time in the cycle were amazing. Made a great contest even more fun! Thanks to all for the QSOs . . . **KØGEO**. Surprisingly good condx for zero sunspots. Seemed at times like the Zone 14 QSO Party. Clearly, the new HF ops in many of those countries are having a positive impact . . . **K1TO**. First contest from the new QTH with real antennas. First contest in a long time with real antennas! A Euro run on 10, Wooo Hooo! Happy Days are here again! . . . **K2EK**. The best part was the last several hours when 15m opened up to the Pacific. Good contest for a sunspot low. I also heard a station calling CQ Field Day near the end but I understood his confusion at that point . . . **K5LAD**. Wow, Morocco on 75 meters. There is life after midnight! . . . **KCØRQH**. Had four new people who had never done contesting before. We all had a good time for a first time effort. Hope to do better next year. Wish 10 meters was in a little while longer, then we heard it was. Oh well, next time . . . **KF4L**. Amazing to hear such propagation at the cycle bottom on 15m here in the southwest USA . . . **KF7E**. Thanks to AO8A for hanging in there to pull me out of the noise on 75m. Africa is not easy to get in October from here on that band and a new prefix to boot made my night! . . . **KS7T**. What a wonderful surprise to have 15m open so strong to Europe on both days. It was also good to work so many new European hams. While it was frustrating to hear the West Coast working Asia and Oceania so easily, it must be true for them as well with the East Coast and Europe. Hopefully next year we'll have some sunspots. Hold on to your hats! . . . **N3RD**. Wow! They call this the sunspot minimum? Then I can't wait for the maximum! . . . **N4KZ**. Zero spots made conditions on 40 to Europe like being on 80! Nothing heard east of Zone 16 and west of Zone 26. Sunday afternoon was great fun handing out points on the high bands . . . **N6AN**. It's amazing how much one-way propagation there was. Either that or there are a lot of poor antennas and receivers out there. Hmmm, couldn't be my signal, could it? . . . **N8WL**. Didn't have time for a serious entry this year. Just played around a little. Conditions were very impressive. 15 meters was incredible at times! Wish I'd had more time to take advantage of the great propagation! . . . **NDØC**. Conditions were good throughout the test. Several nice openings on 15 and 20m. Where was 10m? It didn't show up at my shack . . . **NJ9Z**. DX was so good, I has to check for sunspots! . . . **NNØQ**. In case anyone wants more data to support that a single wire antenna is a bad idea in CQWW here's more proof. 100W and wires is NOT a good idea if you want to be competitive. Had fun anyway! Thanks to all! . . . **NQ3X**. High power 20/15/10. 200 watts 80/40 due to amplifier failure on 80 and 40. 85% S&P. Hard to keep a run frequency. My first time as high power in a contest and the amp died on the bands where it was really needed . . . **W1CTN**. I had a ton of fun operating in my first contest! . . . **W2SFD**. Returned to W4NC after 10 years. Opened our doord to several new operators who got to operate their first contest in the "World Series" . . . **W4NC**. What happened? The bands were HOT . . . **W4NTI**. Who needs sunspots?? . . . **W5UHQ**. The Los Angeles DWP decided to turn my power off about 3 hours before the end of the contest. That's 5 times this month that my power has failed. I'm living in the third world of the Hollywood Hills! . . . **W6AQ**. Conditions were not good and I had to struggle for each Q with my 5 watts and 3 elements. But in the last hour 15m suddenly opened. I had Qs with B7, VR2, E5, 9M8,and VKs, ZLs, and JAs. Maybe that was the start of the new cycle! . . . **W6QU**. Built the SSB board for my K2 just in time for the weekend, which was my first phone contest. Great fun! . . . **W7GH**. Vacuum tubes forever! HF = Collins! . . . **W8JMF**. This was my first CQWW and I had a blast! . . . **W8ZZU**. Not bad for poor propogation. Usually operate from Nevis as V47NS and stayed home because of sunspots this year, but nearly had DXCC worked from Indiana QTH after 24 hours. Wow! . . . **W9NY**. Another great contest. Lots of new players as the bands were swamped as compared to last year . . . **WJ2D**. Condx from my QTH in Denver were good to South America, Japan, and parts of Africa. Very tough to Europe and Asia. Great contest and will be back next year, of course! . . . **WKØP**.

Number groups after call letters denote following: Band (A = all), Final Score, Number of QSOs, Zones, and Countries. An asterisk (*) before a call indicates low power. Certificate winners are listed in bold. (All country terminology reflects the DXCC list at the time of the contest.)

# 2007 SSB RESULTS
## SINGLE OPERATOR
## NORTH AMERICA
### UNITED STATES

| | | | | | |
|---|---|---|---|---|---|
| **K5ZD/1** | **A** | **6,200,384** | **3625** | **130** | **478** |
| **N1LI** | * | **4,883,592** | **3114** | **124** | **450** |
| | | | | (OP: K1DG) | |
| N1DD | * | 850,020 | 886 | 88 | 284 |
| AA1ON | * | 803,916 | 942 | 84 | 242 |
| W1OP | * | 666,936 | 719 | 86 | 268 |
| W1CTN | * | 587,772 | 656 | 84 | 264 |
| W1HIS | * | 466,830 | 560 | 72 | 243 |
| N4CW/1 | * | 400,950 | 552 | 63 | 207 |
| KQ2M/1 | * | 391,170 | 844 | 40 | 130 |
| W1EBI | * | 331,614 | 468 | 62 | 205 |
| W1BYH | * | 324,972 | 407 | 80 | 244 |
| NN1N | * | 306,803 | 401 | 81 | 206 |
| KB1W | * | 253,271 | 421 | 55 | 178 |
| W1AO | * | 252,144 | 362 | 72 | 200 |
| KB1PAJ | * | 206,700 | 364 | 58 | 154 |
| K1EO | * | 202,776 | 384 | 60 | 178 |
| K1SND | * | 125,493 | 321 | 49 | 128 |
| K1NOK | * | 82,782 | 253 | 33 | 113 |
| W1MAW | * | 64,841 | 227 | 38 | 119 |
| K1KU | * | 59,346 | 203 | 33 | 93 |
| N1JW | * | 46,256 | 154 | 30 | 88 |
| K1SEZ | * | 44,902 | 139 | 43 | 100 |
| K1YA | * | 39,816 | 127 | 40 | 86 |
| K1TC | * | 17,577 | 92 | 29 | 64 |
| **K1IM** | **14** | **295,152** | **853** | **26** | **103** |
| K1QS | * | 156,914 | 439 | 26 | 108 |
| AB1EP | * | 47,348 | 202 | 18 | 71 |
| W1OHM | * | 1,914 | 31 | 11 | 22 |
| **W1XX** | **7** | **24,640** | **125** | **22** | **58** |
| **AA1BU** | **3.7** | **184,080** | **569** | **23** | **95** |
| **K1HAP** | **1.8** | **4,318** | **127** | **9** | **25** |
| ***K1BX** | **A** | **1,634,500** | **1289** | **105** | **362** |
| ***N1UR** | * | **1,364,270** | **1123** | **100** | **354** |
| *N1PGA | * | 681,264 | 742 | 76 | 266 |
| *W1JQ | * | 636,870 | 710 | 84 | 261 |
| *W1KT | * | 273,600 | 365 | 67 | 218 |
| *K1HT | * | 252,720 | 359 | 76 | 184 |
| *K1RM | * | 252,358 | 433 | 59 | 170 |
| *K7JE/1 | * | 213,858 | 365 | 64 | 154 |
| *AB1J | * | 149,051 | 292 | 53 | 146 |
| *AK1Q | * | 135,917 | 273 | 51 | 148 |
| *K1BV | * | 102,678 | 325 | 23 | 86 |
| *KA1VMG | * | 76,720 | 248 | 34 | 103 |
| *AI4WB | * | 65,184 | 194 | 56 | 112 |
| *KB1JFG | * | 63,547 | 219 | 27 | 82 |
| *AE1P | * | 57,855 | 158 | 45 | 100 |
| *K1VSJ | * | 50,932 | 162 | 30 | 89 |
| *N1DC | * | 40,584 | 147 | 36 | 78 |
| *K1VU | * | 39,984 | 165 | 35 | 84 |
| *KA1CQR | * | 37,855 | 148 | 33 | 80 |
| *AE1T | * | 31,410 | 131 | 26 | 64 |
| *W1AIR | * | 31,096 | 109 | 30 | 74 |
| *KA1C | * | 28,938 | 121 | 30 | 76 |
| *N1ORK | * | 26,826 | 116 | 31 | 71 |
| *K1LOG | * | 19,952 | 99 | 25 | 61 |
| *K1OQ | * | 19,008 | 84 | 32 | 64 |
| *W1CRK | * | 17,892 | 95 | 22 | 62 |
| *W2JU/1 | * | 17,019 | 72 | 35 | 58 |
| *KB1JUF | * | 16,068 | 76 | 24 | 54 |
| *KB1FRK | * | 15,106 | 93 | 25 | 66 |
| *NJ1Q | * | 14,025 | 84 | 30 | 55 |
| *KK1X | * | 8,840 | 66 | 23 | 45 |
| *N1SXL | * | 3,000 | 39 | 17 | 23 |
| *WB2HTO | * | 2,530 | 43 | 18 | 28 |
| *W1SRB | * | 1,225 | 23 | 15 | 20 |
| *KB1MIC | * | 672 | 22 | 11 | 17 |
| *KB1ILH | * | 520 | 14 | 9 | 11 |
| ***N1HRF** | **28** | **1,950** | **37** | **7** | **19** |
| ***KK1KW** | **21** | **140,790** | **411** | **25** | **105** |
| *N1NK | * | 112,100 | 344 | 23 | 95 |
| *KB1CJ | * | 1,638 | 25 | 7 | 19 |
| *W1DYJ | 14 | 19,368 | 105 | 16 | 56 |
| | | | | | |
| **N2LT** | **A** | **2,569,716** | **1921** | **114** | **378** |
| **N2MM** | * | **1,280,100** | **1246** | **100** | **325** |
| WA2NHA | * | 829,514 | 1030 | 70 | 237 |
| AB3CX/2 | * | 737,155 | 761 | 89 | 290 |
| K2CS | * | 604,476 | 672 | 85 | 263 |
| K2FU | * | 503,082 | 617 | 83 | 259 |
| N2GC | * | 399,504 | 459 | 79 | 249 |
| K2NV | * | 318,750 | 499 | 69 | 181 |
| K2RET | * | 311,741 | 467 | 66 | 191 |
| K3QDV/2 | * | 255,120 | 459 | 60 | 180 |
| KA2LIM | * | 157,976 | 262 | 61 | 187 |
| NA2M | * | 149,187 | 272 | 70 | 153 |
| N2ED | * | 124,344 | 276 | 45 | 153 |
| W2YJ | * | 88,740 | 211 | 53 | 117 |
| W2UDT | * | 83,148 | 215 | 44 | 112 |
| N2SQW | * | 68,045 | 185 | 43 | 112 |
| W2FUI | * | 61,533 | 175 | 33 | 96 |
| N2BEE | * | 56,280 | 197 | 33 | 101 |
| N2CG | * | 43,092 | 151 | 38 | 88 |
| N2WLS | * | 34,662 | 130 | 33 | 73 |
| W2FZ | * | 34,476 | 153 | 30 | 72 |
| KB2DE | * | 9,360 | 70 | 18 | 42 |
| K2GLS | * | 6,272 | 51 | 15 | 34 |
| N2USM | * | 5,670 | 58 | 12 | 33 |
| K2BET | * | 5,568 | 66 | 20 | 44 |
| N2VM | * | 1,156 | 23 | 14 | 20 |
| **W2RR** | **28** | **13,240** | **130** | **11** | **29** |
| **K2XA** | **14** | **749,760** | **1746** | **34** | **131** |
| K2RED | * | 11,640 | 100 | 6 | 34 |
| K2MGA | * | 8,712 | 67 | 13 | 31 |
| KC2USA | * | 3,306 | 35 | 11 | 27 |
| W2XL | 7 | 9,828 | 74 | 13 | 39 |
| **W2VO** | **1.8** | **7,425** | **66** | **14** | **41** |
| WW2DX | * | 2,210 | 43 | 8 | 18 |
| ***K2PS** | **A** | **828,714** | **859** | **76** | **278** |
| ***KV2M** | * | **226,800** | **387** | **54** | **171** |
| *KE2DX | * | 184,667 | 289 | 58 | 201 |
| *NM2L | * | 111,544 | 244 | 61 | 130 |
| *K2DBK | * | 104,880 | 228 | 58 | 132 |
| *AB2TC | * | 93,870 | 245 | 41 | 108 |
| *KX2S | * | 87,764 | 226 | 35 | 113 |
| *WB2OQQ | * | 73,319 | 196 | 41 | 116 |
| *N2MTG | * | 58,515 | 186 | 41 | 100 |
| *KA2CYN | * | 54,236 | 177 | 46 | 103 |
| *N2WSY | * | 49,408 | 173 | 36 | 92 |
| *KM2O | * | 48,608 | 170 | 30 | 82 |
| *W2LP | * | 34,572 | 121 | 42 | 87 |
| *N2OBY | * | 30,520 | 115 | 37 | 72 |
| *K2RNY | * | 28,912 | 130 | 36 | 68 |
| *WA2MCR | * | 25,812 | 111 | 36 | 72 |
| *W2OZO | * | 24,024 | 112 | 24 | 60 |
| *KD2MU | * | 20,475 | 105 | 26 | 65 |
| *WV2ZOW | * | 17,298 | 74 | 33 | 60 |
| *K2BBQ | * | 16,008 | 79 | 26 | 61 |
| *K2PH | * | 14,208 | 77 | 19 | 55 |
| *AI2N | * | 12,567 | 69 | 19 | 52 |
| *KC2OGR | * | 12,390 | 85 | 19 | 51 |
| *N2NYR | * | 11,764 | 76 | 20 | 48 |
| *W2PI | * | 8,694 | 62 | 22 | 47 |
| *WN2Y | * | 6,588 | 50 | 19 | 35 |
| *KD2MX | * | 6,350 | 54 | 19 | 31 |
| *K2YLH | * | 6,161 | 52 | 23 | 38 |
| *KB2NB | * | 4,796 | 47 | 15 | 29 |
| *N2XPW | * | 4,371 | 55 | 14 | 33 |
| *N2TDT | * | 1,640 | 30 | 17 | 23 |
| *KC2PCG | * | 1,134 | 22 | 10 | 17 |
| *KC2LYK | * | 775 | 13 | 13 | 12 |
| *K3QE | * | 208 | 8 | 6 | 7 |
| *WA2IAU | * | 100 | 8 | 6 | 7 |
| *KA2ASU | 21 | 7,729 | 95 | 15 | 44 |
| *W3EH/2 | * | 4,704 | 45 | 12 | 30 |
| KB2RVL | * | 1,128 | 21 | 8 | 16 |
| N3NZ | * | 130 | 6 | 4 | 6 |
| **KU2M/3** | **21** | **693,680** | **1729** | **25** | **120** |
| **K3GW** | **14** | **71,940** | **249** | **22** | **87** |
| **NA3M** | **3.7** | **24,624** | **134** | **17** | **59** |
| **W3NO** | * | **23,247** | **108** | **19** | **62** |
| ***K3TC** | **A** | **869,000** | **867** | **97** | **298** |
| ***W3LL** | * | **587,064** | **627** | **88** | **278** |
| *NS3T | * | 274,032 | 450 | 70 | 194 |
| *W3KB | * | 108,808 | 209 | 62 | 141 |
| *N8NA/3 | * | 97,405 | 228 | 44 | 117 |
| *KB3LIX | * | 96,600 | 237 | 50 | 125 |
| *N3ALN | * | 84,660 | 241 | 46 | 124 |
| *K3WGR | * | 71,391 | 210 | 43 | 116 |
| *KB3HJK | * | 40,544 | 146 | 35 | 77 |
| *WR3H | * | 28,569 | 127 | 19 | 70 |
| *K3VED | * | 28,496 | 113 | 42 | 62 |
| *WB3FXC | * | 27,456 | 115 | 29 | 75 |
| *N3XLS | * | 24,464 | 123 | 27 | 61 |
| *K3ATO | * | 22,695 | 112 | 23 | 62 |
| *KN3A | * | 20,467 | 101 | 35 | 62 |
| *N3CHX | * | 20,400 | 96 | 37 | 65 |
| *K3QF | * | 19,344 | 87 | 25 | 68 |
| *N3TXH | * | 11,076 | 91 | 22 | 49 |
| *KB3KRW | * | 8,296 | 69 | 24 | 44 |
| *N2US/3 | * | 6,288 | 52 | 13 | 35 |
| KD5M/4 | * | 338,904 | 425 | 89 | 235 |
| AB9H/4 | * | 303,600 | 477 | 74 | 190 |
| W4NTI | * | 291,030 | 432 | 70 | 197 |
| N4DW | * | 288,765 | 402 | 71 | 208 |
| N4CU | * | 260,764 | 424 | 80 | 198 |
| W4RQ | * | 219,810 | 343 | 67 | 188 |
| N4EK | * | 209,040 | 417 | 52 | 156 |
| N4KZ | * | 206,080 | 324 | 63 | 167 |
| K4FYM | * | 205,779 | 326 | 66 | 173 |
| W4VIC | * | 205,590 | 395 | 54 | 177 |
| W7QF/4 | * | 204,424 | 316 | 71 | 182 |
| NJ4F | * | 196,420 | 351 | 64 | 166 |
| N4PSE | * | 184,987 | 296 | 69 | 182 |
| KC4D | * | 147,804 | 316 | 52 | 166 |
| NS4L | * | 144,970 | 281 | 54 | 164 |
| WB2QLP/4 | * | 144,921 | 321 | 58 | 143 |
| N4LZ | * | 136,718 | 264 | 51 | 146 |
| N4AA | * | 130,878 | 248 | 52 | 146 |
| K4AMC | * | 113,220 | 247 | 47 | 133 |
| AK4I | * | 107,152 | 245 | 55 | 126 |
| K4DGJ | * | 102,816 | 244 | 45 | 123 |
| KI4FZY | * | 97,744 | 404 | 42 | 107 |
| W4GHD | * | 90,802 | 230 | 46 | 120 |
| W7HJ/4 | * | 73,500 | 154 | 61 | 135 |
| W6UB/4 | * | 55,480 | 144 | 45 | 101 |
| N4DXI | * | 53,448 | 173 | 34 | 102 |
| ***W4TMN** | * | **476,480** | **580** | **76** | **244** |
| *WA4DOU | * | 439,270 | 543 | 75 | 235 |
| *AB4GG | * | 427,479 | 565 | 73 | 218 |
| *NA4K | * | 383,795 | 499 | 77 | 218 |
| *K4GKD | * | 315,486 | 414 | 84 | 222 |
| *KI3O/4 | * | 267,264 | 414 | 65 | 196 |
| *W4YE | * | 256,824 | 410 | 63 | 169 |
| *NA4CW | * | 253,872 | 382 | 72 | 186 |
| *KA8Q/4 | * | 248,799 | 393 | 60 | 179 |
| *N4JF | * | 196,272 | 361 | 60 | 172 |
| *KG4W | * | 183,645 | 320 | 64 | 167 |
| *KF4VTT | * | 170,128 | 331 | 57 | 160 |
| *K9OM/4 | * | 152,768 | 319 | 57 | 160 |
| *N3UA/4 | * | 149,205 | 288 | 56 | 147 |
| *K4WX | * | 137,720 | 263 | 67 | 153 |
| *K3AN/4 | * | 111,056 | 251 | 48 | 128 |
| *NV4B | * | 105,846 | 238 | 51 | 126 |
| *W4MY | * | 101,202 | 208 | 60 | 142 |
| *W4LT | * | 97,900 | 220 | 52 | 126 |
| *KM4RK | * | 90,909 | 222 | 56 | 133 |
| *AA4LR | * | 89,806 | 220 | 57 | 109 |
| *WA4JA | * | 89,142 | 212 | 58 | 121 |
| *WA4LOX | * | 84,177 | 195 | 55 | 144 |
| *N4MIO | * | 72,980 | 194 | 49 | 115 |
| *WB4SQ | * | 62,466 | 203 | 50 | 124 |
| *K4CX | * | 60,768 | 195 | 46 | 98 |
| *WX4TM | * | 57,960 | 198 | 39 | 99 |
| *KB4ZMR | * | 57,130 | 166 | 47 | 98 |
| *N3CZ/4 | * | 57,090 | 138 | 51 | 114 |
| *KR4RO | * | 55,625 | 193 | 36 | 89 |
| *K4EDI | * | 50,490 | 147 | 45 | 108 |
| *K4TVO | * | 49,178 | 145 | 45 | 89 |
| *N4ARO | * | 46,389 | 130 | 47 | 94 |
| *N4WO | * | 45,694 | 139 | 42 | 92 |
| *KI4LRP | * | 45,216 | 157 | 47 | 97 |
| *WA4AEJ | * | 43,168 | 131 | 42 | 100 |
| *NU4I | * | 34,191 | 161 | 43 | 88 |
| *KT4PD | * | 33,558 | 118 | 38 | 81 |
| *AI4GR | * | 27,195 | 105 | 41 | 64 |
| *N4HXI | * | 26,384 | 107 | 32 | 65 |
| *K4ML | * | 25,338 | 106 | 32 | 71 |
| *WB4JVR | * | 25,070 | 107 | 42 | 73 |
| *W4WNT | * | 23,712 | 97 | 35 | 69 |
| *W4UDX | * | 22,078 | 99 | 25 | 58 |
| *W4BUW | * | 21,243 | 88 | 36 | 61 |
| *K4OD | * | 20,150 | 132 | 45 | 85 |
| *KE4UWL | * | 20,055 | 96 | 40 | 65 |
| *K4WNW | * | 19,264 | 84 | 24 | 62 |
| *K4FTO | * | 17,711 | 94 | 30 | 59 |
| *N4JED | * | 17,664 | 102 | 21 | 48 |
| *N4LS | * | 15,664 | 75 | 34 | 54 |
| *N4CI | * | 15,466 | 77 | 23 | 51 |
| *KF4DVG | * | 13,629 | 85 | 27 | 50 |
| *N4UFP | * | 13,500 | 73 | 27 | 48 |
| *W4PTS | * | 12,375 | 77 | 28 | 47 |
| *N4GJ | * | 12,096 | 98 | 30 | 66 |
| *K4BK | * | 11,039 | 67 | 32 | 51 |
| *W4LWW | * | 10,981 | 95 | 25 | 54 |
| *AD2H/4 | * | 10,971 | 81 | 22 | 47 |
| *NZ1D/4 | * | 10,251 | 66 | 22 | 45 |
| *KI4ES | * | 8,960 | 62 | 26 | 44 |
| *WD4KTF | * | 8,784 | 68 | 23 | 38 |
| *KI4IKB | * | 8,687 | 65 | 25 | 48 |
| *KS4S | * | 7,006 | 57 | 22 | 40 |
| *WA4ED | * | 6,216 | 55 | 20 | 36 |
| *WD4LSS | * | 5,712 | 48 | 23 | 33 |
| *K4GOP | * | 5,320 | 78 | 25 | 45 |
| *KD4YUX | * | 5,014 | 64 | 17 | 29 |
| *K4PG | * | 3,864 | 43 | 23 | 33 |
| *W4BCG | * | 2,430 | 29 | 19 | 26 |
| *KD4WUO | * | 2,320 | 50 | 25 | 33 |
| *N6QZS | * | 2,175 | 29 | 14 | 15 |
| *N4US | * | 2,162 | 46 | 15 | 31 |
| *WB4PWZ | * | 2,115 | 33 | 19 | 26 |
| *AA4ZR | * | 2,052 | 43 | 12 | 24 |
| *KC4EZN | * | 2,048 | 54 | 23 | 41 |
| *WA4OSD | * | 1,980 | 24 | 16 | 20 |
| *KT4MM | * | 1,938 | 28 | 17 | 21 |
| *K4GDW | * | 1,426 | 25 | 14 | 17 |
| *KØRRP | * | 860 | 39 | 14 | 29 |
| *W4FRA | * | 513 | 14 | 8 | 11 |
| *KT4RH | * | 168 | 8 | 6 | 8 |
| *KF4ZNL | * | 110 | 7 | 5 | 5 |
| *N4PGW | * | 63 | 14 | 11 | 10 |
| *AI4SX | * | 44 | 6 | 5 | 6 |
| ***K4QVK** | **28** | **5,652** | **61** | **10** | **26** |
| *W4GRW | * | 3,660 | 51 | 8 | 22 |
| ***K4SQR** | **21** | **82,080** | **257** | **25** | **89** |
| *NQ4K | * | 6,624 | 60 | 14 | 32 |
| *AG1H/4 | * | 858 | 21 | 7 | 15 |
| *KD4RSL | * | 136 | 8 | 3 | 5 |
| ***N4MO** | **14** | **126,630** | **385** | **22** | **104** |
| ***N4DL** | * | **119,560** | **379** | **23** | **99** |
| *W4LC | * | 91,271 | 313 | 21 | 86 |
| *KI4LTP | * | 55,300 | 242 | 18 | 82 |
| *KZ5OH/4 | * | 25,134 | 166 | 19 | 52 |
| *WA2ASQ/4 | * | 11,760 | 82 | 17 | 43 |
| *WN4DX | * | 3,780 | 44 | 10 | 32 |
| *K4NVJ | * | 3,393 | 38 | 10 | 29 |
| *KI4MRU | * | 2,146 | 30 | 14 | 23 |
| ***W4EEH** | **7** | **35,020** | **166** | **19** | **66** |
| ***KU4BP** | **3.7** | **3,096** | **59** | **12** | **24** |
| | | | | | |
| **K5TR** | **A** | **2,864,180** | **2434** | **128** | **389** |
| | | | | (OP: N6MJ) | |
| **N2IC/5** | * | **2,712,103** | **2159** | **133** | **354** |
| WD5K | * | 1,008,000 | 958 | 104 | 296 |
| K5ER | * | 462,978 | 623 | 82 | 224 |
| K5EWJ | * | 461,104 | 593 | 93 | 229 |
| K5LAD | * | 406,236 | 550 | 80 | 211 |
| KØGEO/5 | * | 371,795 | 536 | 75 | 190 |
| WW5DX | * | 356,680 | 499 | 81 | 215 |
| | | | | (OP: W5UW) | |
| NQ5D | * | 144,480 | 315 | 67 | 148 |
| KD5JGA | * | 115,506 | 260 | 62 | 124 |
| NA4M/5 | * | 115,232 | 210 | 70 | 138 |
| KZ5J | * | 94,458 | 215 | 56 | 117 |
| N1QXV/5 | * | 61,047 | 193 | 39 | 94 |
| KD5JAA | * | 59,220 | 173 | 52 | 88 |
| W5IL | * | 56,580 | 167 | 47 | 91 |
| WR5G | * | 49,938 | 162 | 44 | 79 |
| KA5BJY | * | 48,645 | 160 | 39 | 102 |
| N5ID | * | 41,019 | 147 | 40 | 81 |
| KC5TA | * | 3,060 | 45 | 30 | 38 |
| N5VYS | * | 2,376 | 46 | 21 | 23 |
| N5TEY | * | 72 | 4 | 3 | 3 |
| **W5PR** | **28** | **53,055** | **303** | **22** | **59** |
| **N5ZK** | **21** | **122,570** | **482** | **27** | **92** |
| | | | | (OP: W5ASP) | |
| **W5FO** | **14** | **142,857** | **427** | **32** | **111** |
| **N5JB** | **7** | **71,190** | **282** | **27** | **86** |
| K5RX | 1.8 | 44 | 4 | 2 | 2 |
| *W2STM | * | 1,034 | 17 | 8 | 14 |
| ***K2MFY** | **14** | **164,970** | **432** | **26** | **115** |
| *K2HVE | * | 9,666 | 80 | 13 | 41 |
| *KC2QJB | * | 1,710 | 26 | 8 | 22 |
| *KC2JCJ | * | 42 | 3 | 3 | 3 |
| *KE2SD | 7 | 5,658 | 50 | 12 | 34 |
| ***K2YEH** | **3.7** | **18,881** | **123** | **19** | **60** |
| | | | | | |
| **NN3W** | **A** | **5,378,268** | **3370** | **128** | **474** |
| **K3CR** | * | **3,903,200** | **2620** | **127** | **417** |
| | | | | (OP: LZ4AX) | |
| **W3BGN** | * | **3,309,021** | **2308** | **122** | **401** |
| **AA1K/3** | * | **3,095,859** | **2299** | **110** | **377** |
| K3ZO | * | 2,441,664 | 1880 | 105 | 381 |
| W6AAN/3 | * | 1,636,762 | 1228 | 115 | 388 |
| N1WR | * | 1,146,180 | 1049 | 93 | 327 |
| N3RJ | * | 465,105 | 599 | 81 | 222 |
| W3PA | * | 248,848 | 443 | 45 | 161 |
| N3KR | * | 238,272 | 398 | 53 | 166 |
| W3GNQ | * | 204,820 | 407 | 57 | 163 |
| N3YW | * | 195,184 | 429 | 37 | 139 |
| K3PU | * | 186,992 | 330 | 66 | 166 |
| W3FVT | * | 172,743 | 367 | 56 | 157 |
| WB3BSA | * | 144,744 | 261 | 61 | 161 |
| N3FP | * | 94,062 | 228 | 53 | 130 |
| K3YG | * | 73,659 | 226 | 30 | 99 |
| N3EHY | * | 65,376 | 208 | 41 | 103 |
| N3RW | * | 55,704 | 181 | 37 | 95 |
| W3USA | * | 42,660 | 142 | 31 | 77 |
| | | | | (OP: K8MR) | |
| K3FIT | * | 23,232 | 100 | 27 | 61 |
| W6NRJ/3 | * | 20,240 | 97 | 26 | 62 |
| K3RMB | * | 3,330 | 36 | 20 | 25 |
| *WA3GNW | * | 4,692 | 42 | 15 | 31 |
| *WA3YMM | * | 4,108 | 36 | 20 | 32 |
| *N3JNX | * | 1,715 | 25 | 14 | 21 |
| *W3MTP | * | 1,215 | 25 | 11 | 16 |
| *KBØFHP/3 | * | 323 | 15 | 6 | 11 |
| *N3XL | * | 63 | 9 | 5 | 4 |
| | | | | | |
| ***W3/T98T** | **21** | **152,064** | **476** | **26** | **118** |
| ***N3GH** | **14** | **74,900** | **257** | **21** | **86** |
| ***WA3JAT** | **7** | **8,892** | **65** | **18** | **50** |
| | | | | | |
| **K4ZW** | **A** | **4,715,200** | **3085** | **125** | **435** |
| **K1TO/4** | * | **2,771,835** | **2370** | **110** | **361** |
| W4WS | * | 1,325,084 | 1543 | 88 | 249 |
| | | | | (OP: KG4NEP) | |
| N6AR/4 | * | 1,257,707 | 1090 | 111 | 362 |
| N4PQX | * | 1,120,210 | 928 | 104 | 351 |
| N4ZC | * | 1,087,361 | 904 | 111 | 340 |
| K4AB | * | 1,038,588 | 983 | 107 | 319 |
| KZ2I/4 | * | 881,280 | 909 | 101 | 304 |
| N4MM | * | 846,880 | 778 | 94 | 301 |
| K4RO | * | 830,830 | 884 | 97 | 288 |
| WJ2D/4 | * | 799,900 | 830 | 87 | 293 |
| W1GQ/4 | * | 772,927 | 877 | 74 | 285 |
| W4KW | * | 627,912 | 727 | 90 | 252 |
| K4SV | * | 553,014 | 683 | 65 | 229 |
| NJ2F/4 | * | 463,400 | 568 | 86 | 245 |
| W2OO/4 | * | 428,336 | 537 | 77 | 227 |
| WØYR/4 | * | 426,272 | 777 | 59 | 165 |
| W2YE/4 | * | 410,256 | 526 | 74 | 222 |
| K4LQ | * | 408,965 | 532 | 73 | 238 |
| NX9T/4 | * | 379,756 | 540 | 79 | 189 |
| K4LTA | * | 351,177 | 599 | 77 | 226 |
| W4ATL | * | 50,268 | 166 | 34 | 84 |
| W4AMP | * | 44,063 | 166 | 46 | 93 |
| W4RIS | * | 39,446 | 140 | 39 | 82 |
| W4ARM | * | 32,804 | 116 | 40 | 78 |
| K4PHE | * | 26,980 | 108 | 27 | 68 |
| AE4EC | * | 20,909 | 102 | 37 | 66 |
| AF4OX | * | 17,424 | 100 | 25 | 63 |
| K4CRM | * | 14,378 | 68 | 34 | 45 |
| W4UHF | * | 14,628 | 78 | 35 | 57 |
| W4ZW | * | 13,706 | 65 | 28 | 49 |
| W4TMO | * | 9,676 | 71 | 27 | 55 |
| KI4VQQ | * | 5,440 | 49 | 26 | 38 |
| KE4CCM | * | 2,072 | 24 | 14 | 23 |
| AI4WN | * | 663 | 13 | 6 | 11 |
| **N4BP** | **21** | **327,168** | **853** | **31** | **111** |
| **K4SSU** | **14** | **400,299** | **1254** | **30** | **111** |
| | | | | (OP: NA4BW) | |
| KO4Y | * | 16,716 | 77 | 19 | 65 |
| AI4WW | * | 4,000 | 48 | 12 | 28 |
| W4OGG | * | 3,398 | 40 | 11 | 23 |
| **N4PN** | **7** | **375,328** | **1140** | **31** | **117** |
| **KU8E/4** | * | **51,207** | **215** | **26** | **75** |
| N4QV | * | 29,068 | 124 | 22 | 64 |
| WX4G | * | 10,780 | 80 | 13 | 42 |
| W3BP/4 | * | 6,566 | 54 | 12 | 37 |
| **WA4TII** | **3.7** | **32,476** | **145** | **23** | **69** |
| K4KZZ | * | 26,080 | 167 | 18 | 62 |
| K4LY | * | 17,424 | 141 | 21 | 67 |
| **AA4MM** | **1.8** | **4,653** | **56** | **11** | **36** |
| K4ADR | * | 1,740 | 42 | 9 | 20 |
| W9IXX/4 | * | 384 | 17 | 6 | 10 |
| ***W4TAA** | **A** | **588,848** | **835** | **64** | **234** |
| ***N4IG** | * | **586,124** | **699** | **70** | **238** |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***N5AW** | **A** | **1,094,904** | **974** | **111** | **333** | KI7AO | * | 32,054 | 151 | 40 | 54 | N9KG | * | 102,538 | 240 | 47 | 120 | NL7V | * | 27,720 | 124 | 33 | 51 | | | | | | | | | | | | | |
| ***KC5R** | " | **473,088** | **563** | **98** | **238** | KC7KPA | * | 30,849 | 137 | 43 | 70 | NZ9R | * | 96,560 | 228 | 48 | 122 | **KL8DX** | **14** | **50,300** | **478** | **21** | **29** | | | | | | | | | | | | | |
| *AC5O | * | 272,650 | 450 | 72 | 194 | KC7UP | * | 29,204 | 118 | 31 | 67 | W9SE | * | 90,888 | 230 | 58 | 110 | *WL7UQ | 14 | 7,194 | 96 | 16 | 17 | | | | | | | | | | | | | |
| *W5GAI | * | 227,912 | 385 | 68 | 180 | K8BN/7 | * | 29,007 | 120 | 34 | 65 | AJ9C | * | 89,208 | 212 | 49 | 119 | | | | | | | | | | | | | | | | | | | |
| *NN5T | * | 124,871 | 262 | 65 | 128 | KS7T | * | 26,085 | 108 | 44 | 67 | K9JIG | * | 73,248 | 185 | 55 | 113 | | | **Bahamas** | | | | | | | | | | | | | | | | |
| *K5KDX | * | 109,563 | 263 | 50 | 127 | WG7X | * | 25,029 | 108 | 41 | 62 | KG9N | * | 69,864 | 218 | 49 | 93 | ***C6AQW** | **14** | **114,900** | **537** | **21** | **79** | | | | | | | | | | | | | |
| *KE5LQ | * | 93,456 | 208 | 55 | 122 | N6MA/7 | * | 22,533 | 104 | 35 | 52 | K9JDV | * | 62,307 | 188 | 51 | 78 | | | **(OP: WQ5W)** | | | | | | | | | | | | | | | | |
| *W5TMC | * | 91,800 | 308 | 50 | 130 | K7BHM | * | 11,200 | 111 | 20 | 30 | N9WKW | * | 56,021 | 159 | 52 | 99 | | | | | | | | | | | | | | | | | | | |
| *WA5ZUP | * | 87,616 | 309 | 49 | 99 | KB7UJI | * | 6,426 | 70 | 21 | 33 | W9COD | * | 26,829 | 108 | 39 | 60 | | | **Barbados** | | | | | | | | | | | | | | | | |
| *KB5FSV | * | 43,160 | 150 | 40 | 90 | K7EG | * | 3,612 | 37 | 15 | 27 | N9RC | * | 22,654 | 101 | 29 | 65 | **8P5A** | **A** | **11,963,439** | **7708** | **143** | **518** | | | | | | | | | | | | | |
| *KD5ZEZ | * | 35,524 | 130 | 42 | 65 | NF7E | * | 2,655 | 42 | 18 | 27 | KK9V | * | 22,572 | 94 | 36 | 63 | | | **(OP: W2SC)** | | | | | | | | | | | | | | | | |
| *K5BZH | * | 22,784 | 118 | 30 | 59 | N7XY | * | 624 | 14 | 7 | 9 | WA9LJK | * | 18,612 | 83 | 37 | 62 | **8P6SH** | **7** | **90,475** | **620** | **18** | **59** | | | | | | | | | | | | | |
| *KE5OG | * | 19,035 | 95 | 30 | 51 | **KC7V** | **21** | **66,123** | **286** | **25** | **68** | WI9WI | * | 18,540 | 85 | 39 | 64 | ***8P6EX** | **A** | **879,937** | **1547** | **78** | **193** | | | | | | | | | | | | | |
| *W5THT | * | 14,720 | 74 | 28 | 52 | KI7DG | * | 2,624 | 52 | 13 | 28 | W3HDH/9 | * | 11,466 | 67 | 29 | 49 | | | **Canada** | | | | | | | | | | | | | | | | |
| *WA5TRX | * | 11,900 | 72 | 25 | 45 | **W7WA** | **14** | **733,894** | **1580** | **38** | **140** | WO9S | * | 6,996 | 68 | 24 | 29 | **VY2ZM** | **A** | **9,571,348** | **5772** | **134** | **494** | | | | | | | | | | | | | |
| *N5UWY | * | 5,564 | 44 | 20 | 32 | **N7DD** | " | **492,466** | **1133** | **38** | **131** | N9PUZ | * | 6,993 | 56 | 27 | 36 | | | **(OP: K1ZM)** | | | | | | | | | | | | | | | | |
| *AD5VJ | * | 5,478 | 64 | 26 | 40 | W7TTE | * | 105,072 | 292 | 31 | 101 | **W9NY** | **14** | **213,486** | **664** | **30** | **108** | VY2LI | * | 1,027,620 | 1568 | 72 | 198 | | | | | | | | | | | | | |
| *K5WW | * | 5,073 | 38 | 27 | 30 | W7KRR | * | 17,270 | 118 | 20 | 35 | **W9EXY** | " | **177,552** | **490** | **33** | **111** | VE1MC | * | 539,748 | 737 | 60 | 222 | | | | | | | | | | | | | |
| *KO5D | * | 4,633 | 66 | 19 | 22 | KN5H/7 | * | 2,686 | 30 | 13 | 21 | K9CAN | * | 76,160 | 240 | 32 | 80 | **VO1HE** | **21** | **340,833** | **1120** | **23** | **100** | | | | | | | | | | | | | |
| *W5WRE | * | 4,161 | 48 | 23 | 34 | NK7C | 7 | 3,952 | 47 | 15 | 23 | W9IIX | * | 34,176 | 184 | 19 | 70 | **VO1TA** | " | **306,471** | **994** | **22** | **89** | | | | | | | | | | | | | |
| *KD5MMM | * | 3,572 | 36 | 16 | 22 | **K7ZV** | **3.7** | **35,506** | **211** | **31** | **51** | K9DN | * | 11,001 | 78 | 15 | 42 | ***VO1KVT** | **A** | **293,260** | **752** | **45** | **127** | | | | | | | | | | | | | |
| *KE5LTZ | * | 3,025 | 47 | 23 | 32 | K9WZB/7 | * | 9,259 | 86 | 16 | 31 | **AG9S** | **7** | **20,572** | **104** | **21** | **53** | ***VE1DT** | " | **182,787** | **380** | **42** | **149** | | | | | | | | | | | | | |
| *W5UHQ | * | 2,940 | 47 | 16 | 26 | ***K7ACZ** | **A** | **257,022** | **376** | **89** | **173** | K9IDQ | 3.7 | 1,377 | 24 | 12 | 15 | ***VE9CEH** | " | **131,215** | **401** | **43** | **120** | | | | | | | | | | | | | |
| *KD5UBC | * | 2,850 | 34 | 18 | 20 | ***NQ7R** | " | **196,344** | **379** | **74** | **128** | ***N4TZ/9** | **A** | **1,058,293** | **904** | **108** | **341** | *VO1BBN | * | 36,300 | 128 | 26 | 84 | | | | | | | | | | | | | |
| *AB5XZ | * | 2,490 | 38 | 13 | 17 | ***N7BK** | " | **171,000** | **373** | **58** | **122** | ***AC9X** | " | **445,068** | **535** | **87** | **230** | *VE1AWP | 7 | 2,516 | 81 | 6 | 11 | | | | | | | | | | | | | |
| *K5VNV | * | 1,980 | 28 | 16 | 20 | *W7RV | * | 122,012 | 251 | 65 | 123 | *K9JE | * | 141,531 | 284 | 53 | 138 | | | | | | | | | | | | | | | | | | | |
| *N5DTT | * | 1,947 | 28 | 14 | 19 | *K7HBN | * | 109,050 | 275 | 46 | 104 | *N9TTX | * | 116,228 | 259 | 62 | 134 | **VE2IM** | **A** | **5,402,925** | **4280** | **110** | **385** | | | | | | | | | | | | | |
| *N5HMH | * | 1,885 | 56 | 26 | 39 | *KE7YF | * | 61,920 | 185 | 47 | 82 | *N9LYE | * | 88,910 | 272 | 52 | 118 | VA2WDQ | * | 89,075 | 206 | 44 | 131 | | | | | | | | | | | | | |
| *KD5J | * | 1,248 | 21 | 11 | 15 | *W7QN | * | 30,096 | 145 | 34 | 54 | *W9VQ | * | 49,005 | 146 | 40 | 95 | VE2DC | * | 88,690 | 204 | 56 | 125 | | | | | | | | | | | | | |
| *KD5QQD | * | 975 | 24 | 13 | 12 | *N7WI | * | 28,908 | 118 | 42 | 57 | *K9OR | * | 46,800 | 125 | 50 | 100 | ***VE2XAA** | **A** | **640,528** | **717** | **84** | **260** | | | | | | | | | | | | | |
| *N5VYN | * | 560 | 17 | 10 | 10 | *AA7DK | * | 28,440 | 141 | 35 | 55 | *N9UPG | * | 36,285 | 157 | 43 | 80 | *VE2HIT | * | 221,450 | 481 | 58 | 157 | | | | | | | | | | | | | |
| *N5PU | * | 504 | 20 | 11 | 17 | *AB1R/7 | * | 23,664 | 98 | 29 | 73 | *K9GY | * | 35,805 | 137 | 34 | 71 | *VE2GSO | * | 156,544 | 602 | 41 | 87 | | | | | | | | | | | | | |
| *N5KEV | * | 102 | 10 | 8 | 9 | *K6UM/7 | * | 22,058 | 109 | 33 | 49 | *NJ9Z | * | 31,900 | 124 | 39 | 77 | *VE2AWR | * | 135,150 | 343 | 40 | 130 | | | | | | | | | | | | | |
| ***W5DJT** | **28** | **5,760** | **77** | **10** | **22** | *N7FLT | * | 21,690 | 100 | 33 | 57 | *AB9KZ | * | 31,136 | 110 | 38 | 74 | *VE2FU | * | 66,576 | 183 | 46 | 106 | | | | | | | | | | | | | |
| *AA5JG | * | 2,929 | 43 | 8 | 21 | *K7TR | * | 20,904 | 116 | 44 | 60 | *W9UM | * | 25,380 | 102 | 28 | 66 | *VA2RIO | * | 58,280 | 210 | 30 | 94 | | | | | | | | | | | | | |
| ***K5FP** | **21** | **106,148** | **326** | **27** | **92** | *K7LAZ | * | 19,418 | 107 | 30 | 43 | *N9UY | * | 21,185 | 126 | 34 | 61 | *VA2LGQ | * | 1,984 | 29 | 10 | 21 | | | | | | | | | | | | | |
| ***N4IJ/5** | " | **103,912** | **329** | **28** | **96** | *W7YVK | * | 16,660 | 91 | 32 | 38 | *K9MI | * | 19,380 | 95 | 29 | 66 | | | (OP: VE3AV) | | | | | | | | | | | | | | | | |
| ***KE5HOB** | **14** | **136** | **8** | **4** | **4** | *NW7E | * | 16,400 | 79 | 33 | 47 | *NV9X | * | 14,028 | 81 | 31 | 53 | *VE2FFE | * | 1,300 | 27 | 12 | 14 | | | | | | | | | | | | | |
| *KE5LHC | * | 100 | 6 | 4 | 3 | *AD7KG | * | 10,176 | 81 | 27 | 37 | *AG9D | * | 11,970 | 91 | 34 | 56 | *VE2PIJ | 28 | 144 | 6 | 4 | 5 | | | | | | | | | | | | | |
| | | | | | | *N7QS | * | 9,815 | 66 | 28 | 37 | *KB9YGD | * | 9,798 | 67 | 26 | 45 | ***VA2SG** | **14** | **41,876** | **217** | **15** | **61** | | | | | | | | | | | | | |
| **K6NA** | **A** | **1,193,959** | **1215** | **121** | **256** | *W7KAM | * | 9,760 | 76 | 25 | 36 | *WR9Y | * | 3,192 | 40 | 17 | 25 | | | | | | | | | | | | | | | | | | | |
| **K6XX** | " | **871,500** | **980** | **105** | **245** | *W4LSC/7 | * | 9,636 | 61 | 28 | 38 | *K9AIH | * | 2,772 | 41 | 20 | 24 | **VC3J** | **A** | **7,361,332** | **5061** | **133** | **453** | | | | | | | | | | | | | |
| W6PH | * | 782,000 | 920 | 99 | 241 | *K6CSL/7 | * | 7,300 | 61 | 24 | 26 | *W9ILY | * | 2,664 | 29 | 14 | 22 | **VC3A** | " | **6,160,480** | **4559** | **119** | **435** | | | | | | | | | | | | | |
| N6VI | * | 393,936 | 582 | 97 | 186 | *W7AML | * | 7,056 | 68 | 25 | 31 | *KK9U | * | 1,953 | 27 | 14 | 17 | | | **(OP: VE3AT)** | | | | | | | | | | | | | | | | |
| W6TK | * | 301,136 | 495 | 71 | 165 | *W7TMT | * | 7,014 | 65 | 21 | 21 | *K9PY | * | 1,530 | 24 | 12 | 18 | VE3CX | * | 1,578,834 | 2098 | 102 | 265 | | | | | | | | | | | | | |
| KI6CG | * | 210,120 | 433 | 64 | 140 | *W7GH | * | 4,346 | 47 | 19 | 22 | *N9GH | * | 1,272 | 21 | 8 | 16 | VC3X | * | 1,192,194 | 1775 | 88 | 233 | | | | | | | | | | | | | |
| N6TV | * | 168,586 | 330 | 70 | 124 | *N7GMT | * | 1,683 | 24 | 13 | 20 | *W9ZEB | * | 1,148 | 21 | 12 | 16 | (OP: VE7VR) | | | | | | | | | | | | | | | | | | |
| N6BU | * | 157,206 | 318 | 70 | 127 | *W7AUM | * | 1,518 | 37 | 12 | 10 | *K9TCD | * | 560 | 12 | 10 | 10 | VE3CR | * | 891,029 | 897 | 89 | 290 | | | | | | | | | | | | | |
| N6WK | * | 67,950 | 178 | 52 | 99 | *KD7AKN | * | 1,495 | 30 | 12 | 11 | *W9WY | * | 459 | 14 | 8 | 9 | VE3TA | * | 734,525 | 1186 | 72 | 203 | | | | | | | | | | | | | |
| WB6JJJ | * | 62,424 | 196 | 57 | 79 | *W7SO | * | 1,419 | 26 | 15 | 18 | *WO9I | * | 384 | 13 | 6 | 10 | VA3YP | * | 557,976 | 981 | 70 | 198 | | | | | | | | | | | | | |
| W6AQ | * | 55,272 | 173 | 58 | 83 | *KC7WWY | * | 1,210 | 23 | 11 | 5 | *N9LAH | * | 252 | 7 | 7 | 7 | VE3HG | * | 354,142 | 677 | 58 | 168 | | | | | | | | | | | | | |
| NK6A | * | 54,398 | 175 | 43 | 75 | *NE7D | * | 1,081 | 23 | 11 | 12 | *KC9KIO | * | 144 | 7 | 5 | 4 | VE3KZ | * | 231,660 | 407 | 64 | 170 | | | | | | | | | | | | | |
| W6EB | * | 46,332 | 148 | 50 | 82 | *KC7FPB | * | 1,029 | 20 | 10 | 11 | *WD9GHK | * | 100 | 4 | 4 | 4 | VE3UZ | * | 189,996 | 329 | 65 | 158 | | | | | | | | | | | | | |
| | | | | (OP: K6QQ) | | *KK7UZ | * | 840 | 26 | 6 | 6 | *K9OWQ | * | 100 | 8 | 4 | 7 | VE3LLL | * | 61,754 | 178 | 50 | 104 | | | | | | | | | | | | | |
| WA6ST | * | 43,561 | 157 | 46 | 81 | *K7RFW | * | 792 | 27 | 12 | 10 | ***KD9AC** | **21** | **23,144** | **124** | **21** | **67** | VE3FTM | * | 50,511 | 146 | 50 | 99 | | | | | | | | | | | | | |
| K6RAD | * | 42,312 | 147 | 46 | 77 | *W7MEW | * | 756 | 15 | 13 | 14 | *W9OA | * | 10,229 | 76 | 15 | 38 | VA3YX | * | 40,612 | 116 | 36 | 107 | | | | | | | | | | | | | |
| N6CK | * | 41,800 | 194 | 42 | 53 | *KC7WDL | * | 209 | 10 | 5 | 6 | ***W9OP** | **14** | **66,933** | **225** | **24** | **87** | VE3SY | * | 36,456 | 124 | 36 | 88 | | | | | | | | | | | | | |
| AD6ZJ | * | 38,586 | 154 | 50 | 68 | *KD7GIM | * | 100 | 14 | 11 | 10 | ***WI9H** | " | **37,240** | **143** | **23** | **75** | VE3EY | * | 21,896 | 206 | 20 | 36 | | | | | | | | | | | | | |
| KI6T | * | 37,736 | 148 | 36 | 70 | ***W7UPF** | **21** | **44,068** | **246** | **24** | **68** | *K9RIM | * | 100 | 44 | 11 | 24 | **VA3XQ** | **21** | **49,196** | **188** | **22** | **76** | | | | | | | | | | | | | |
| W6YRA | * | 31,672 | 148 | 46 | 61 | *K7MY | * | 29,467 | 142 | 22 | 57 | | | | | | | **VE3XD** | **14** | **546,300** | **1515** | **31** | **119** | | | | | | | | | | | | | |
| | | | | (OP: KU6T) | | ***W7FP** | **14** | **102,297** | **307** | **31** | **98** | **KØOU** | **A** | **591,330** | **731** | **94** | **251** | VA3TTU | * | 50,960 | 205 | 23 | 81 | | | | | | | | | | | | | |
| W6SZG | * | 30,008 | 97 | 50 | 71 | *W7ZT | * | 3,864 | 102 | 12 | 16 | **NØHF** | " | **142,506** | **324** | **63** | **126** | **VE3PN** | **1.8** | **14,784** | **249** | **8** | **25** | | | | | | | | | | | | | |
| KG6ZHC | * | 14,805 | 92 | 27 | 36 | *W7YS | * | 1,541 | 31 | 10 | 13 | NØRN | * | 120,862 | 266 | 60 | 118 | ***VE3XAT** | **A** | **404,499** | **504** | **80** | **247** | | | | | | | | | | | | | |
| AF6BS | * | 5,472 | 45 | 23 | 25 | *AD7BN | * | 150 | 10 | 6 | 4 | KØMD | * | 117,477 | 244 | 73 | 156 | ***VA3SWG** | " | **350,672** | **852** | **58** | **144** | | | | | | | | | | | | | |
| W6VNQ | * | 3,384 | 50 | 23 | 24 | ***WAØKDS/7** | **7** | **16,900** | **114** | **21** | **44** | WØZA | * | 102,837 | 242 | 68 | 109 | *VE3BDN | * | 305,856 | 575 | 56 | 180 | | | | | | | | | | | | | |
| N6AJR | * | 3,358 | 45 | 23 | 23 | | | | | | | WKØP | * | 87,048 | 239 | 56 | 100 | *VE3AD | * | 296,724 | 486 | 60 | 177 | | | | | | | | | | | | | |
| KE6QR | * | 3,007 | 42 | 16 | 15 | **N8II** | **A** | **600,093** | **768** | **76** | **223** | WØCEM | * | 81,732 | 270 | 39 | 108 | *VE3NE | * | 262,900 | 564 | 75 | 164 | | | | | | | | | | | | | |
| **W6SR** | **21** | **48,060** | **204** | **26** | **64** | **K8ZZU** | " | **366,270** | **504** | **81** | **209** | WBØN | * | 81,225 | 211 | 60 | 111 | *VE3FDT | * | 204,823 | 374 | 73 | 166 | | | | | | | | | | | | | |
| **K6HNZ** | **14** | **182,268** | **584** | **33** | **89** | W8ZA | * | 247,008 | 404 | 73 | 175 | KØJJR | * | 76,664 | 219 | 49 | 99 | *VE3TW | * | 182,325 | 372 | 47 | 148 | | | | | | | | | | | | | |
| W6AFA | * | 125,265 | 592 | 29 | 76 | K8MR | * | 206,535 | 332 | 74 | 171 | WØBH | * | 73,100 | 183 | 56 | 114 | *VE3OX | * | 135,513 | 301 | 56 | 133 | | | | | | | | | | | | | |
| K6LRN | * | 25,110 | 132 | 25 | 56 | W8OHT | * | 144,727 | 332 | 56 | 167 | K9MWM/Ø | * | 69,350 | 203 | 58 | 88 | *VE3NWA | * | 68,875 | 195 | 40 | 105 | | | | | | | | | | | | | |
| **N6AN** | **7** | **40,964** | **234** | **25** | **52** | W8JMF | * | 108,680 | 231 | 60 | 130 | K2HT/Ø | * | 48,811 | 144 | 47 | 86 | *VE3JDF | * | 64,326 | 200 | 47 | 104 | | | | | | | | | | | | | |
| **K5HT/6** | " | **28,884** | **156** | **26** | **57** | K8VUS | * | 77,578 | 215 | 45 | 113 | WA2MNO/Ø | * | 46,359 | 136 | 54 | 99 | *VE3IAE | * | 52,542 | 173 | 41 | 98 | | | | | | | | | | | | | |
| K6JAT | * | 3,344 | 62 | 15 | 23 | K8CMP | * | 76,260 | 210 | 43 | 112 | KØDAN | * | 35,456 | 119 | 47 | 81 | *VE3BVA | * | 48,120 | 173 | 39 | 81 | | | | | | | | | | | | | |
| **N6IG** | **1.8** | **2,220** | **42** | **10** | **20** | K8ESQ | * | 59,784 | 171 | 38 | 103 | NYØT | * | 27,642 | 106 | 34 | 68 | *VE3MCF | * | 33,920 | 161 | 32 | 74 | | | | | | | | | | | | | |
| ***N6RV** | **A** | **254,538** | **447** | **84** | **153** | W9KB | * | 35,644 | 157 | 41 | 92 | KØGAS | * | 24,072 | 133 | 40 | 62 | *VE3MPT | * | 32,314 | 186 | 34 | 73 | | | | | | | | | | | | | |
| ***W6ZL** | " | **173,184** | **340** | **67** | **125** | K8OT | * | 31,460 | 169 | 50 | 93 | KØFG | * | 12,640 | 63 | 29 | 51 | *VE3NCQ | * | 31,920 | 128 | 41 | 73 | | | | | | | | | | | | | |
| *K6DEX | * | 161,304 | 354 | 69 | 119 | KC8IVC | * | 2,772 | 45 | 6 | 16 | K5VYT/Ø | * | 12,017 | 86 | 19 | 42 | *VA3QWW | * | 31,672 | 259 | 23 | 51 | | | | | | | | | | | | | |
| *WN6K | * | 149,511 | 330 | 66 | 117 | K8THU | * | 88 | 4 | 4 | 4 | KØJV | * | 7,260 | 52 | 22 | 38 | *VA3TPS | * | 31,331 | 134 | 29 | 68 | | | | | | | | | | | | | |
| *AA6K | * | 135,548 | 283 | 71 | 117 | AB8WN | 14 | 1,586 | 26 | 11 | 15 | NØBK | * | 2,516 | 29 | 12 | 22 | *VA3HJ | * | 29,848 | 124 | 35 | 69 | | | | | | | | | | | | | |
| *N6XT | * | 80,445 | 218 | 63 | 110 | **ND8DX** | **7** | **41,419** | **181** | **23** | **74** | N6BXO/Ø | * | 1,224 | 24 | 15 | 19 | *VE3RCN | * | 29,694 | 129 | 35 | 63 | | | | | | | | | | | | | |
| *K7XE/6 | * | 54,827 | 195 | 41 | 68 | WD8E | * | 7,670 | 53 | 18 | 41 | **KØIZ** | **14** | **71,136** | **379** | **26** | **88** | *VA3RNJ | * | 28,152 | 128 | 39 | 63 | | | | | | | | | | | | | |
| *N6EM | * | 51,414 | 194 | 49 | 74 | K9TTT/8 | * | 2,112 | 41 | 16 | 32 | **WØPPF** | " | **6,900** | **115** | **17** | **29** | *VE3GLO | * | 25,584 | 148 | 28 | 54 | | | | | | | | | | | | | |
| *ND6S | * | 47,160 | 201 | 52 | 79 | **K3ZJ/8** | **3.7** | **49,777** | **263** | **20** | **71** | **WØGJ** | **7** | **50,161** | **215** | **25** | **78** | *VA3PL | * | 24,564 | 105 | 31 | 58 | | | | | | | | | | | | | |
| *WI7F/6 | * | 36,396 | 157 | 38 | 70 | W8GG | * | 16,422 | 100 | 16 | 53 | KØGT | * | 16,717 | 85 | 23 | 50 | *VE3NQM | * | 22,654 | 107 | 36 | 58 | | | | | | | | | | | | | |
| *KE6SHL | * | 33,288 | 147 | 46 | 68 | **K3BU/8** | **1.8** | **37,179** | **353** | **18** | **63** | WDØBGZ | * | 12,348 | 91 | 23 | 40 | *VE3ZIN | * | 16,080 | 111 | 26 | 54 | | | | | | | | | | | | | |
| *K6AAB | * | 28,388 | 125 | 43 | 51 | ***WZ8T** | **A** | **421,596** | **570** | **73** | **221** | NØUU | * | 9,381 | 74 | 17 | 36 | *VE3TES | * | 10,878 | 65 | 25 | 49 | | | | | | | | | | | | | |
| *KN6Y | * | 27,540 | 125 | 43 | 59 | ***WB8TLI** | " | **382,432** | **495** | **76** | **220** | **KØKT** | **3.7** | **27,720** | **176** | **20** | **57** | *VE3OBU | * | 10,877 | 62 | 25 | 48 | | | | | | | | | | | | | |
| *KD6PQF | * | 27,168 | 112 | 41 | 55 | *KD5LNO/8 | * | 179,103 | 341 | 68 | 159 | ***KU1CW/Ø** | **A** | **815,760** | **820** | **113** | **299** | *VE3/HA1ZH | * | 9,577 | 79 | 23 | 38 | | | | | | | | | | | | | |
| *N6NF | * | 22,542 | 102 | 35 | 67 | *K8LY | * | 171,892 | 343 | 48 | 148 | ***ACØW** | " | **522,810** | **639** | **89** | **244** | *VE3FU | * | 3,655 | 39 | 18 | 25 | | | | | | | | | | | | | |
| *KQ6ES | * | 20,999 | 102 | 36 | 47 | ***N8WL** | " | **142,594** | **325** | **39** | **127** | *NTØF | * | 282,744 | 428 | 75 | 189 | *VE3LXL | * | 1,947 | 31 | 13 | 20 | | | | | | | | | | | | | |
| *AA6SD | * | 20,350 | 121 | 25 | 49 | *WT8E | * | 133,570 | 302 | 54 | 131 | *NØPKX | * | 215,280 | 390 | 70 | 190 | ***VA3FP** | **21** | **56,072** | **224** | **16** | **70** | | | | | | | | | | | | | |
| *W6OUL | * | 17,347 | 91 | 30 | 53 | *W8KX | * | 120,927 | 213 | 61 | 172 | *KCØDEB | * | 157,030 | 313 | 62 | 143 | *VE3FJ | " | 7,548 | 62 | 14 | 37 | | | | | | | | | | | | | |
| *KE6QET | * | 15,825 | 92 | 33 | 42 | *NO8R | * | 107,822 | 247 | 51 | 118 | *WØETT | * | 140,400 | 306 | 66 | 129 | ***VE3OM** | **14** | **22,640** | **105** | **17** | **63** | | | | | | | | | | | | | |
| *AA6EE | * | 11,682 | 198 | 29 | 30 | *WB8JUI | * | 107,350 | 239 | 63 | 127 | *AB1FY/Ø | * | 130,410 | 247 | 60 | 150 | *VA1XBN | * | 6,720 | 66 | 9 | 31 | | | | | | | | | | | | | |
| *W6RFF | * | 15,678 | 83 | 36 | 42 | *W8KNO | * | 80,920 | 216 | 51 | 119 | *WBØTSR | * | 64,740 | 199 | 39 | 91 | | | | | | | | | | | | | | | | | | | |
| *N6ERD | * | 14,280 | 93 | 36 | 48 | *KB8OCP | * | 59,568 | 180 | 50 | 96 | *KØSQ | * | 59,568 | 167 | 46 | 100 | **VE4EAR** | **A** | **245,728** | **511** | **71** | **153** | | | | | | | | | | | | | |
| *KI6JJW | * | 11,286 | 118 | 29 | 37 | *KE8FO | * | 47,502 | 152 | 40 | 86 | *WBØYJT | * | 47,784 | 171 | 40 | 92 | ***VE4YU** | **A** | **86,372** | **249** | **49** | **94** | | | | | | | | | | | | | |
| *AE6YB | * | 9,114 | 82 | 21 | 28 | *W8GOC | * | 38,440 | 145 | 36 | 88 | *KØMPH | * | 46,784 | 157 | 47 | 89 | | | | | | | | | | | | | | | | | | | |
| *N6OU | * | 7,670 | 55 | 27 | 32 | *N8HC | * | 37,185 | 138 | 36 | 75 | *KØKP | * | 35,520 | 130 | 37 | 74 | **VE5UA** | **A** | **552,945** | **1470** | **63** | **130** | | | | | | | | | | | | | |
| *N6FD | * | 5,130 | 44 | 22 | 23 | *N8HP | * | 36,542 | 120 | 38 | 83 | *KØJJM | * | 35,464 | 143 | 35 | 69 | VE5CPU | * | 117,650 | 487 | 48 | 82 | | | | | | | | | | | | | |
| *K6KWB | * | 4,218 | 50 | 17 | 21 | *AF8C | * | 32,552 | 120 | 28 | 76 | *KAØVXK | * | 28,860 | 134 | 39 | 72 | **VE5ZX** | **14** | **199,290** | **1177** | **22** | **69** | | | | | | | | | | | | | |
| *W6BXQ | * | 2,760 | 28 | 13 | 27 | *W8ZZU | * | 28,782 | 142 | 43 | 80 | *KØTIS | * | 28,392 | 156 | 27 | 77 | *VE5SF | A | 13,104 | 158 | 16 | 26 | | | | | | | | | | | | | |
| *NE6I | * | 2,584 | 29 | 16 | 18 | *W8TM | * | 23,520 | 107 | 23 | 73 | *KØBJ | * | 23,968 | 107 | 43 | 69 | *VE5AAD | 7 | 1,027 | 39 | 7 | 6 | | | | | | | | | | | | | |
| *KQ6X | * | 2,368 | 37 | 17 | 20 | *W8IDM | * | 14,630 | 74 | 24 | 53 | *NNØQ | * | 21,390 | 108 | 36 | 57 | | | | | | | | | | | | | | | | | | | |
| *KE6GFI | * | 348 | 14 | 6 | 6 | *WF8P | * | 13,338 | 73 | 27 | 51 | *ABØSD | * | 14,960 | 87 | 32 | 48 | **VE6WQ** | **14** | **678,524** | **2172** | **35** | **119** | | | | | | | | | | | | | |
| ***W6GMT** | **28** | **324** | **15** | **6** | **6** | *N8TWM | * | 6,348 | 91 | 22 | 47 | *WBØIEL | * | 13,494 | 67 | 30 | 48 | VE6EPK | * | 5,832 | 68 | 11 | 25 | | | | | | | | | | | | | |
| ***KC6ZZT** | **14** | **36** | **4** | **2** | **2** | *W9JJC | * | 6,157 | 55 | 15 | 32 | *KCØRQH | * | 13,067 | 74 | 28 | 45 | **VE6WZ** | **3.7** | **50,592** | **527** | **18** | **33** | | | | | | | | | | | | | |
| ***WA6WPG** | **3.7** | **624** | **19** | **7** | **6** | *W8ASA | * | 5,635 | 53 | 16 | 33 | *NØMSB | * | 9,900 | 75 | 20 | 46 | ***VE6ZC** | **A** | **30,750** | **192** | **34** | **48** | | | | | | | | | | | | | |
| | | | | | | *WA8SDF | * | 4,940 | 60 | 24 | 41 | *WØMDS | * | 9,360 | 61 | 20 | 45 | *VE6LE | * | 6,885 | 77 | 23 | 22 | | | | | | | | | | | | | |
| **K7RL** | **A** | **1,650,724** | **1763** | **127** | **282** | *WA8NVW | * | 4,662 | 49 | 15 | 27 | *KCØTDJ | * | 9,250 | 54 | 31 | 43 | *VE6AID | * | 5,576 | 70 | 18 | 23 | | | | | | | | | | | | | |
| **K5RR/7** | " | **1,107,645** | **1063** | **110** | **275** | *K8IR | * | 4,444 | 41 | 17 | 27 | *KØKRH | * | 8,772 | 70 | 28 | 40 | | | | | | | | | | | | | | | | | | | |
| WA7LT | * | 513,360 | 810 | 89 | 187 | *NF8M | * | 3,864 | 35 | 23 | 23 | *WØJEC | * | 8,601 | 62 | 22 | 39 | **VA7ST** | **A** | **119,139** | **346** | **54** | **97** | | | | | | | | | | | | | |
| N7TT | * | 417,196 | 643 | 88 | 196 | *NØRZT/8 | * | 1,612 | 20 | 12 | 19 | *KCØBS | * | 8,520 | 83 | 26 | 45 | VE2LX | * | 13,248 | 100 | 19 | 45 | | | | | | | | | | | | | |
| K7MM | * | 233,684 | 451 | 78 | 148 | *WA8SSQ | * | 1,302 | 23 | 14 | 17 | *KG4OLG/Ø | * | 7,298 | 106 | 37 | 52 | **VE7SZ** | **14** | **481,217** | **1929** | **31** | **90** | | | | | | | | | | | | | |
| KO7X | * | 221,520 | 364 | 80 | 160 | *KB8M | * | 962 | 23 | 12 | 14 | *KCØOYT | * | 6,466 | 59 | 20 | 33 | | | | | (OP: VA7RR) | | | | | | | | | | | | | | |
| W6AEA/7 | * | 214,000 | 403 | 52 | 148 | *KC8IMB | 28 | 592 | 16 | 5 | 11 | *KAØEIC | * | 5,985 | 53 | 23 | 34 | VA7JW | * | 38,052 | 209 | 22 | 62 | | | | | | | | | | | | | |
| N6TW/7 | * | 180,960 | 359 | 82 | 158 | *KK8MM | 21 | 16,835 | 104 | 16 | 49 | *KBØOLA | * | 4,340 | 51 | 9 | 22 | ***VE7UQ** | **A** | **192,574** | **633** | **56** | **90** | | | | | | | | | | | | | |
| NN7ZZ | * | 149,156 | 347 | 63 | 133 | *N8BV | 14 | 11,460 | 90 | 18 | 42 | *WØCBH | * | 4,116 | 35 | 23 | 26 | ***VE7IN** | " | **152,810** | **647** | **44** | **74** | | | | | | | | | | | | | |
| | | | | (OP: N5LZ) | | *NR8U | 7 | 1,050 | 23 | 6 | 15 | *WAØVPJ | * | 3,960 | 46 | 17 | 23 | *VE7HA | * | 137,862 | 359 | 52 | 110 | | | | | | | | | | | | | |
| AA7PM | * | 148,416 | 302 | 68 | 124 | *KC8UR | * | 100 | 2 | 2 | 2 | *NØGOS | * | 2,835 | 42 | 16 | 19 | *VE7XF | * | 88,391 | 211 | 51 | 106 | | | | | | | | | | | | | |
| KX7M | * | 125,514 | 545 | 37 | 77 | ***K8DO** | **3.7** | **14,674** | **149** | **16** | **42** | *KØERE | * | 2,408 | 28 | 19 | 24 | *VE7FCO | * | 28,700 | 153 | 31 | 51 | | | | | | | | | | | | | |
| NX7TT | * | 80,106 | 190 | 53 | 116 | | | | | | | *WØQQG | * | 1,344 | 62 | 23 | 41 | *VA7BEC | * | 18,396 | 106 | 37 | 47 | | | | | | | | | | | | | |
| K7XV | * | 79,051 | 209 | 56 | 105 | **W9RE** | **A** | **3,055,964** | **2126** | **128** | **435** | *WTØN | * | 420 | 34 | 10 | 10 | *VE7KPB | * | 11,850 | 105 | 23 | 27 | | | | | | | | | | | | | |
| K7LV | * | 74,865 | 235 | 52 | 103 | **K9BGL** | " | **527,307** | **625** | **86** | **233** | *KØREV | * | 364 | 17 | 12 | 14 | *VE7JKZ | * | 10,804 | 75 | 30 | 44 | | | | | | | | | | | | | |
| K7VI | * | 72,996 | 224 | 41 | 91 | K9SG | * | 273,312 | 345 | 86 | 226 | *NØSCK | * | 144 | 7 | 5 | 7 | *VA7CPC | * | 5,004 | 76 | 19 | 17 | | | | | | | | | | | | | |
| K7WP | * | 68,700 | 204 | 57 | 93 | N9FC | * | 195,960 | 371 | 54 | 159 | *N1WQ/Ø | * | 35 | 3 | 3 | 2 | *VA7PX | * | 3,729 | 58 | 16 | 17 | | | | | | | | | | | | | |
| NE9Z/7 | * | 66,744 | 193 | 51 | 111 | W9GXR | * | 195,386 | 344 | 62 | 149 | *WØSMW | 28 | 165 | 9 | 5 | 6 | *VA7PNP | * | 2,232 | 68 | 12 | 12 | | | | | | | | | | | | | |
| N7BF | * | 62,586 | 209 | 42 | 80 | AC9S | * | 171,570 | 328 | 56 | 159 | *KCØVBF | 14 | 3,948 | 51 | 13 | 29 | *VE7SAJ | * | 1,512 | 26 | 11 | 17 | | | | | | | | | | | | | |
| K7SA | * | 49,769 | 145 | 57 | 100 | KF9TI | * | 124,215 | 272 | 43 | 126 | | | | | | | | | | | | | | | | | | | | | | | | | |
| W7CB | * | 46,248 | 141 | 57 | 84 | N9AKR | * | 123,253 | 208 | 70 | 177 | | | **Alaska** | | | | *VY1EI | A | 8,621 | 117 | 18 | 19 | | | | | | | | | | | | | |
| N7EL | * | 

### Madeira Islands

| | | | | | |
|---|---|---|---|---|---|
| *CT3FJ | 14 | 5,624 | 67 | 8 | 29 |

### Mauritius

| | | | | | |
|---|---|---|---|---|---|
| *3B8GT | A | 126,755 | 468 | 24 | 77 |

### Morocco

| | | | | | |
|---|---|---|---|---|---|
| CN4P | 14 | 1,939,653 | 4024 | 34 | 137 |
| | | | (OP: CN8NK) | | |
| CN2FB | 3.7 | 450,723 | 1280 | 24 | 103 |
| | | | (OP: UA2FB) | | |
| CN2R | 1.8 | 268,300 | 932 | 15 | 85 |
| | | | (OP: W7EJ) | | |
| CN2FF | " | 207,466 | 732 | 16 | 82 |
| | | | (OP: UA2FF) | | |
| *CN2BC | A | 2,196,784 | 2217 | 75 | 269 |
| *5C5W | 28 | 24,480 | 157 | 17 | 43 |
| | | | (OP: CN8KD) | | |
| *CN8YE | 14 | 42,225 | 204 | 16 | 59 |

### Namibia

| | | | | | |
|---|---|---|---|---|---|
| *V51YJ | A | 8,004 | 62 | 13 | 33 |

### Saint Helena

| | | | | | |
|---|---|---|---|---|---|
| *ZD7X | 21 | 796,095 | 2085 | 29 | 106 |

### Senegal

| | | | | | |
|---|---|---|---|---|---|
| 6W1RY | A | 5,050,846 | 4181 | 99 | 338 |
| | | | (OP: F5VHY) | | |
| *6V7G | 21 | 1,178,590 | 2754 | 28 | 121 |
| | | | (OP: EA1FDI) | | |

### South Africa

| | | | | | |
|---|---|---|---|---|---|
| *ZS2I | A | 11,913 | 73 | 14 | 43 |
| *ZS9Z | 21 | 46,104 | 271 | 14 | 54 |

### Sudan

| | | | | | |
|---|---|---|---|---|---|
| *ST2M | A | 800,035 | 1156 | 56 | 209 |
| *ST1ØØS | 3.7 | 6 | 1 | 1 | 1 |
| | | | (OP: ST2EO) | | |

### Tanzania

| | | | | | |
|---|---|---|---|---|---|
| 5H3EE | A | 1,988,288 | 1857 | 100 | 276 |

## ASIA

### Afghanistan

| | | | | | |
|---|---|---|---|---|---|
| *T6EE | 14 | 22,272 | 221 | 16 | 48 |

### Armenia

| | | | | | |
|---|---|---|---|---|---|
| EK3SA | 21 | 368,784 | 1136 | 25 | 92 |

### Asiatic Russia

| | | | | | |
|---|---|---|---|---|---|
| RG9A | A | 4,133,025 | 2638 | 121 | 464 |
| | | | (OP: UA9AM) | | |
| UA9CLB | " | 4,090,016 | 3135 | 117 | 379 |
| RT9S | " | 1,390,818 | 1226 | 95 | 334 |
| | | | (OP: UA9SP) | | |
| UA9QA | " | 610,731 | 878 | 63 | 216 |
| UA9JLL | " | 377,872 | 677 | 58 | 168 |
| RU9TO | " | 273,695 | 510 | 52 | 163 |
| UA9MC | " | 231,868 | 443 | 42 | 154 |
| RV9AZ | " | 119,139 | 302 | 34 | 117 |
| RX9JP | " | 94,944 | 256 | 46 | 126 |
| RW9UOB | " | 78,208 | 309 | 32 | 96 |
| RZ9OW | " | 66,430 | 257 | 39 | 91 |
| RX9LW | " | 43,688 | 162 | 36 | 91 |
| RA9SAS | " | 10,512 | 71 | 24 | 48 |
| RZ9CQ | " | 9,180 | 66 | 14 | 40 |
| RA9UN | " | 4,704 | 73 | 16 | 40 |
| RU9UC | " | 104 | 7 | 6 | 7 |
| UA9UR | 28 | 828 | 22 | 11 | 12 |
| RZ9YF | " | 49 | 5 | 3 | 4 |
| UA9SCX | 21 | 121,625 | 401 | 26 | 99 |
| UA9JDP | " | 17,000 | 129 | 18 | 50 |
| RA9UT | " | 10,608 | 111 | 16 | 36 |
| RK9KWI | 14 | 79,025 | 295 | 24 | 85 |
| RA9AP | 7 | 22,365 | 181 | 14 | 49 |
| RV9SV | 1.8 | 51,935 | 354 | 10 | 55 |
| *UA9ACJ | A | 561,719 | 758 | 53 | 228 |
| *RV9CP | " | 389,784 | 731 | 50 | 168 |
| *RX9FR | " | 268,992 | 527 | 39 | 153 |
| *RX9WN | " | 221,733 | 401 | 56 | 157 |
| *RA9FR | " | 202,199 | 351 | 57 | 184 |
| *UA9MQR | " | 187,110 | 398 | 45 | 144 |
| *UA9AL | " | 184,932 | 393 | 49 | 149 |
| *RZ9UGN | " | 167,624 | 400 | 47 | 137 |
| *RW9TP | " | 153,866 | 308 | 45 | 169 |
| *RZ9HG | " | 141,102 | 315 | 55 | 146 |
| *RK9ABJ | " | 112,144 | 286 | 43 | 120 |
| *RX9CCJ | " | 101,706 | 289 | 29 | 105 |
| *RQ9I | " | 88,320 | 314 | 32 | 106 |
| | | | (OP: RW9IM) | | |
| *UA9CEW | " | 63,928 | 227 | 29 | 93 |
| *RX9DJ | " | 61,803 | 212 | 25 | 84 |
| *RA9FHL | " | 54,340 | 209 | 24 | 86 |
| *UA9WZ | " | 53,136 | 146 | 48 | 114 |
| *UA9QQ | " | 52,910 | 204 | 30 | 80 |
| *UA9CBM | " | 47,520 | 188 | 27 | 83 |
| *UA9OW | " | 44,354 | 190 | 43 | 91 |
| *RA9AE | " | 28,520 | 121 | 28 | 64 |
| *UA9ODE | " | 26,487 | 153 | 21 | 60 |
| *RU9AZ | " | 24,318 | 149 | 17 | 46 |
| *RX9CET | " | 22,327 | 123 | 21 | 62 |
| *RK9AX | " | 16,642 | 82 | 39 | 67 |
| *UA9QCZ | " | 15,456 | 99 | 23 | 46 |
| *UA9TF | " | 4,225 | 40 | 27 | 38 |
| *UA9YAB | " | 3,720 | 44 | 26 | 34 |
| *RU9UG | " | 2,450 | 51 | 16 | 19 |
| *UA9FM | " | 918 | 21 | 3 | 14 |
| *RX9FO | " | 100 | 45 | 18 | 35 |
| *RA9FEU | 28 | 336 | 16 | 3 | 4 |
| *RL9AA | 21 | 62,699 | 277 | 21 | 70 |
| *RW9RA | " | 41,440 | 204 | 17 | 63 |
| *UA9FGJ | " | 20,832 | 126 | 13 | 49 |
| *RV9UF | " | 10,740 | 142 | 16 | 44 |
| *RA9AMO | " | 8,190 | 101 | 9 | 36 |
| *UA9XTL | " | 8,094 | 76 | 7 | 31 |
| *RW9UY | " | 3,700 | 110 | 14 | 36 |
| *RK9UAC | " | 2,109 | 39 | 5 | 14 |
| *RA9AU | 14 | 267,288 | 877 | 24 | 87 |
| *RW9DX | " | 179,916 | 681 | 24 | 92 |
| *RK9AJZ | " | 139,230 | 497 | 24 | 95 |
| *RZ9OQ | " | 120,904 | 425 | 25 | 94 |
| *RV9JR | " | 98,536 | 386 | 25 | 84 |
| *RA9FEL | " | 90,360 | 394 | 17 | 73 |
| *RA9XF | " | 77,972 | 307 | 19 | 82 |
| *RA9JR | " | 66,780 | 300 | 15 | 69 |
| *RK9XX | " | 38,250 | 194 | 15 | 60 |
| *RA9MX | " | 27,040 | 117 | 22 | 82 |
| *RA9XU | " | 24,208 | 149 | 13 | 55 |
| *RA9CIN | " | 8,094 | 60 | 15 | 42 |
| *RV9MN | " | 874 | 21 | 9 | 14 |
| *UA9TT | 7 | 49,590 | 273 | 21 | 66 |
| *RU9CD | " | 20,355 | 153 | 11 | 48 |
| *RA9SPF | " | 1,378 | 33 | 8 | 18 |
| *UA9BA | 3.7 | 88,400 | 399 | 15 | 65 |
| *UA9QDV | 1.8 | 720 | 31 | 7 | 17 |
| RZ9SR | A | 1,076,845 | 1540 | 101 | 284 |
| RK9UT | " | 757,855 | 1460 | 85 | 210 |
| UA9APV | " | 214,652 | 491 | 58 | 148 |
| UA9AZ | " | 179,760 | 413 | 61 | 153 |
| UA9ACG | " | 148,242 | 430 | 59 | 127 |
| RA9AA | " | 110,019 | 313 | 47 | 122 |
| RW9UU | " | 33,480 | 178 | 38 | 70 |
| UA9CW | " | 9,450 | 58 | 32 | 43 |
| RU9LL | " | 6,642 | 71 | 22 | 32 |
| UA9YAY | 14 | 123,178 | 474 | 26 | 95 |
| UA9IBX | " | 42,770 | 353 | 28 | 37 |
| UA9SR | " | 32,928 | 148 | 21 | 77 |
| RW9CF | 1.8 | 735 | 22 | 9 | 12 |
| *RV9AL | A | 181,883 | 415 | 59 | 162 |
| *RN9SA | " | 93,800 | 327 | 42 | 98 |
| *UA9SJ | " | 57,129 | 210 | 44 | 93 |
| *RA9SCA | " | 50,516 | 245 | 50 | 96 |
| *UA9CNX | " | 49,140 | 344 | 31 | 60 |
| *RA9AY | " | 48,604 | 171 | 33 | 83 |
| *RZ9AK | " | 37,496 | 205 | 34 | 75 |
| *RW9CV | " | 25,978 | 281 | 25 | 37 |
| *RZ9AO | " | 19,988 | 127 | 21 | 55 |
| *UA9SOX | " | 6,848 | 55 | 22 | 42 |
| *UA9FDX | " | 4,042 | 61 | 19 | 24 |
| *RA9CAH | " | 1,400 | 45 | 13 | 15 |
| *RA9SMS | 14 | 2,088 | 71 | 9 | 20 |
| *UA9LGY | " | 768 | 28 | 9 | 15 |
| *RA9AQL | 7 | 10,706 | 94 | 19 | 34 |
| *UA9SAD | " | 6,440 | 80 | 13 | 27 |
| *RW9AW | 3.7 | 864 | 39 | 9 | 15 |

### Asiatic Turkey

| | | | | | |
|---|---|---|---|---|---|
| YM2W | 28 | 383,990 | 1380 | 19 | 76 |
| | | | (OP: OK1MU) | | |
| *TA3D | A | 5,695,606 | 4066 | 96 | 415 |
| *TA3DD | " | 2,162 | 31 | 20 | 27 |
| *TA7AO | " | 2,135 | 29 | 15 | 20 |
| *TA2IB | 21 | 73,530 | 328 | 20 | 70 |
| *TA2IK | " | 50,406 | 490 | 13 | 49 |
| *TA3YJ | 14 | 300 | 10 | 2 | 8 |
| *TA3J | 7 | 9,205 | 98 | 5 | 30 |
| *YMØT | 1.8 | 125,658 | 561 | 12 | 66 |
| | | | (OP: TA2RC) | | |

### Azerbaijan

| | | | | | |
|---|---|---|---|---|---|
| *4K9W | A | 139,256 | 262 | 55 | 151 |
| *4K6DI | 3.7 | 3,330 | 44 | 8 | 29 |

### Bhutan

| | | | | | |
|---|---|---|---|---|---|
| *A52K | A | 1,672 | 58 | 15 | 23 |
| | | | (OP: JA1CG) | | |

### China

| | | | | | |
|---|---|---|---|---|---|
| BA7IO | A | 437,485 | 756 | 88 | 207 |
| BA5HAM | " | 136,806 | 602 | 57 | 94 |
| BA5DX | " | 125,488 | 398 | 64 | 112 |
| B5TT | 14 | 147,168 | 853 | 30 | 66 |
| | | | (OP: BA5TT) | | |
| *BG7NWF | A | 178,466 | 699 | 61 | 120 |
| *BA6QD | " | 124,586 | 426 | 48 | 106 |
| *BD4QO | " | 70,448 | 337 | 53 | 83 |
| *BL7IN | " | 33,744 | 235 | 41 | 70 |
| *BA5BO | " | 32,560 | 291 | 35 | 53 |
| *BA6IV | " | 32,178 | 292 | 34 | 59 |
| *BG4DVK | " | 27,590 | 190 | 30 | 59 |
| *BG7LDM | " | 25,440 | 196 | 34 | 62 |
| *BG1ND | " | 25,259 | 402 | 30 | 37 |
| *BD4SS | " | 23,128 | 135 | 40 | 58 |
| *BG9AFM | " | 21,484 | 241 | 29 | 53 |
| *BD4RET | " | 20,580 | 167 | 43 | 62 |
| *BD5HIS | " | 16,646 | 192 | 34 | 48 |
| *BD5CFB | " | 16,000 | 128 | 38 | 42 |
| *BD4SX | " | 13,940 | 103 | 36 | 49 |
| *BA4DZ | " | 12,600 | 91 | 34 | 50 |
| *BG4QOJ | " | 11,475 | 88 | 32 | 43 |
| *BG5HHU | " | 8,804 | 75 | 30 | 41 |
| *BG8NCF | " | 4,636 | 129 | 25 | 36 |
| *BG4SXG | " | 2,832 | 38 | 21 | 27 |
| *BD5CDI | " | 2,744 | 45 | 22 | 27 |
| *BD4AGK | " | 2,280 | 43 | 12 | 18 |
| *BD8CIH | " | 1,599 | 31 | 18 | 23 |
| *BD4SI | " | 1,155 | 32 | 15 | 20 |
| *BD8ATI | " | 544 | 24 | 14 | 18 |
| *BG6IAZ | " | 420 | 19 | 9 | 11 |
| *BG4JWU | " | 270 | 23 | 7 | 8 |
| *BG4SOM | " | 180 | 29 | 13 | 17 |
| *BD3NHK | " | 100 | 9 | 5 | 6 |
| *BG4BKU | 28 | 495 | 17 | 6 | 9 |
| *BG7IEU | 21 | 9,750 | 140 | 16 | 34 |
| *BD7IBN | " | 6,624 | 88 | 15 | 33 |
| *BG4KUU | 14 | 21,594 | 255 | 21 | 38 |
| *BG1QMU | " | 16,730 | 188 | 23 | 47 |
| *BG1LEN | " | 312 | 24 | 5 | 7 |
| *BG2RJE | " | 42 | 5 | 3 | 3 |
| *BA5TT | 7 | 3,604 | 69 | 14 | 20 |
| *BD3AIE | 3.7 | 72 | 9 | 4 | 4 |
| *BY4SCS | " | 6 | 1 | 1 | 1 |
| | | | (OP: BG4SOM) | | |

### Cyprus

| | | | | | |
|---|---|---|---|---|---|
| C4M | 3.7 | 226,678 | 782 | 20 | 93 |
| | | | (OP: 5B4AGM) | | |
| *5B/HA5PP | A | 2,807,124 | 2336 | 94 | 352 |

### Georgia

| | | | | | |
|---|---|---|---|---|---|
| 4L6AM | 14 | 1,363,154 | 3023 | 34 | 135 |
| 4L4WW | 3.7 | 568,294 | 1544 | 31 | 103 |
| *4L2M | 1.8 | 65,067 | 357 | 10 | 59 |

### Hong Kong

| | | | | | |
|---|---|---|---|---|---|
| VR2DS | 21 | 120,848 | 969 | 26 | 65 |
| VR1ØXMT | 7 | 16,432 | 226 | 20 | 32 |

### India

| | | | | | |
|---|---|---|---|---|---|
| VU2SWS | A | 214,144 | 386 | 57 | 167 |
| *VU2PTT | A | 255,267 | 456 | 72 | 179 |
| *VU3USJ | " | 10,082 | 80 | 26 | 45 |
| *VU3DJQ | 21 | 46,208 | 255 | 17 | 59 |
| *VU2NIS | 14 | 2,368 | 40 | 14 | 23 |
| *VU3DMP | 7 | 3,444 | 40 | 16 | 26 |

### Israel

| | | | | | |
|---|---|---|---|---|---|
| 4X2M | 21 | 1,230,438 | 2566 | 38 | 143 |
| | | | (OP: 4X4DZ) | | |
| *4Z5MV | H | 208,839 | 371 | 54 | 147 |
| *4XØM | " | 175,812 | 363 | 52 | 144 |
| *4Z5PJ | " | 20,900 | 102 | 31 | 64 |
| *4X/SM8A | 28 | 1,056 | 19 | 9 | 15 |

### Japan

| | | | | | |
|---|---|---|---|---|---|
| JE1LFX | A | 460,965 | 752 | 85 | 152 |
| JF1SEK | " | 239,560 | 479 | 74 | 138 |
| JH1EVD | " | 104,811 | 292 | 57 | 90 |
| JR1LEV | " | 63,792 | 219 | 54 | 90 |
| JM1ZSL | " | 23,114 | 112 | 33 | 58 |
| | | | (OP: JF1NZW) | | |
| 7J1ABD | " | 10,033 | 83 | 32 | 47 |
| JA1ANA | " | 6,649 | 49 | 26 | 35 |
| JN1RQV | " | 504 | 12 | 12 | 12 |
| JH1OCC | 28 | 8,920 | 95 | 16 | 24 |
| JA1ELY | 14 | 463,710 | 1254 | 36 | 109 |
| JH1ACA | " | 180,992 | 561 | 34 | 94 |
| JN1NDY | " | 67,240 | 343 | 26 | 56 |
| JH1OGC | 3.7 | 120,400 | 497 | 29 | 71 |
| *JG1TVK | A | 189,604 | 353 | 82 | 132 |
| *7K3OWM | " | 168,532 | 387 | 73 | 109 |
| *JA1GLE | " | 101,712 | 290 | 65 | 98 |
| *JA1MVK | " | 85,094 | 243 | 57 | 100 |
| *JH1GUO/4 | " | 63,873 | 206 | 56 | 85 |
| *JA1XPU | " | 48,000 | 178 | 48 | 72 |
| *JA1GYO | " | 44,831 | 161 | 50 | 77 |
| *JA1FRQ | " | 41,728 | 148 | 51 | 77 |
| *JA1XRH | " | 36,888 | 136 | 48 | 58 |
| *JA1OQ | " | 29,760 | 160 | 48 | 72 |
| *JJ1MZH | " | 29,391 | 151 | 42 | 55 |
| *JA1KK | " | 28,910 | 139 | 42 | 56 |
| *JA1BUI | " | 28,050 | 126 | 44 | 58 |
| *JE1REU | " | 26,852 | 135 | 40 | 58 |
| *JO1SIM | " | 26,100 | 167 | 36 | 51 |
| *7L2PDJ | " | 25,298 | 122 | 40 | 51 |
| *JH1AEP | " | 22,066 | 197 | 47 | 70 |
| *JH1FNU | " | 20,984 | 114 | 35 | 51 |
| *JA1RQT | " | 19,339 | 101 | 34 | 49 |
| *JQ1AHZ | " | 15,611 | 117 | 25 | 42 |
| *JH1OLB | " | 15,405 | 110 | 28 | 37 |
| *JA1HNW | " | 14,338 | 96 | 27 | 40 |
| *JA1DKU | " | 12,397 | 99 | 34 | 43 |
| *JR1MRG | " | 10,920 | 78 | 27 | 38 |
| *JA1VGV | " | 10,368 | 72 | 30 | 34 |
| *JF1HJX | " | 8,505 | 85 | 18 | 27 |
| *JG1OWV | " | 3,312 | 31 | 22 | 26 |
| *JK1NSR | " | 2,701 | 34 | 17 | 20 |
| *JG1FGL | " | 2,555 | 36 | 15 | 20 |
| *7N1BHO | " | 2,550 | 47 | 23 | 28 |
| *JH1DJD | " | 2,530 | 55 | 23 | 32 |
| *JA1AZR | " | 1,785 | 30 | 15 | 20 |
| *JA1YAI | " | 1,113 | 19 | 9 | 12 |
| *JA1HG | " | 1,104 | 23 | 11 | 13 |
| *JA1LBZ | " | 851 | 18 | 10 | 13 |
| *JK1SDQ | " | 260 | 10 | 5 | 8 |
| *JA1MYW | 28 | 1,242 | 34 | 7 | 11 |
| *7N2UQC | " | 1,083 | 22 | 9 | 10 |
| *JA1IWP | " | 630 | 30 | 7 | 11 |
| *JP1IXV | " | 525 | 20 | 6 | 9 |
| *JA1AAT | " | 352 | 22 | 6 | 10 |
| *7K4XNN | 21 | 58,168 | 299 | 31 | 57 |
| *JK1BII | " | 10,918 | 88 | 22 | 31 |
| *JA1JLP | " | 6,696 | 62 | 14 | 22 |
| *JA1DBG | " | 5,928 | 66 | 15 | 24 |
| *JK1GPD | " | 4,680 | 61 | 15 | 21 |
| *JE1USE | " | 2,204 | 33 | 12 | 17 |
| *JA1RYC | " | 2,047 | 31 | 12 | 11 |
| *JI1UDD | " | 1,750 | 43 | 10 | 15 |
| *JA1FO | " | 943 | 20 | 10 | 13 |
| *JG1GCO | " | 385 | 17 | 3 | 8 |
| *JQ1CDW | " | 247 | 9 | 6 | 7 |
| *JK1PIH | " | 25 | 5 | 2 | 3 |
| *JI1LAI | " | 8 | 2 | 2 | 2 |
| *JI1FDF | 14 | 88,634 | 436 | 29 | 62 |
| *JF1TEU | " | 27,336 | 180 | 24 | 43 |
| *JH1UUT | " | 14,045 | 152 | 21 | 32 |
| *7K1PTO | " | 6,500 | 80 | 20 | 30 |
| *JE1GZB | " | 2,288 | 48 | 12 | 14 |
| *JA1BFN | " | 529 | 16 | 11 | 12 |
| *JH1HGF | " | 405 | 14 | 7 | 8 |
| *JH1RDU | 7 | 152 | 7 | 4 | 4 |
| *JE1SPY | 3.7 | 1,680 | 47 | 10 | 14 |
| JF2QNM | A | 1,040,514 | 1311 | 116 | 211 |
| JA2PAC | " | 1,007,760 | 1270 | 106 | 234 |
| JI2KXK | " | 599,297 | 809 | 107 | 204 |
| JA2BNN | " | 395,580 | 723 | 81 | 147 |
| JF2IWL | " | 302,784 | 575 | 90 | 138 |
| JA2FSM | " | 262,663 | 546 | 86 | 143 |
| JJ2CJB | " | 182,063 | 392 | 84 | 133 |
| JE2DJC | " | 111,496 | 277 | 62 | 119 |
| JH2FXK | " | 38,164 | 147 | 48 | 68 |
| JF2FIU | " | 27,808 | 132 | 39 | 49 |
| JG2REJ | " | 3,780 | 38 | 21 | 21 |
| JF2XLQ | " | 1,170 | 19 | 14 | 16 |
| JA2XCR | 14 | 137,022 | 435 | 33 | 90 |
| JJ2PUG | 7 | 240 | 14 | 5 | 7 |
| JE2OTM | 3.7 | 1,612 | 40 | 11 | 15 |
| *JA2PFO | A | 148,779 | 353 | 68 | 115 |
| *JA2DLM | " | 137,280 | 211 | 97 | 167 |
| *JA2GHP | " | 48,063 | 228 | 46 | 65 |
| *JA2KPW | " | 21,203 | 120 | 38 | 53 |
| *JA2TTH | " | 10,336 | 70 | 29 | 39 |
| *JR2SQU | " | 9,028 | 82 | 24 | 37 |
| *JA2KPV | " | 5,445 | 55 | 19 | 26 |
| *JQ2OUL | " | 2,821 | 35 | 12 | 19 |
| *JH2MYN | 28 | 2,275 | 45 | 10 | 15 |
| *JG2KKG | 14 | 148,866 | 491 | 33 | 96 |
| *JF2WXS | 7 | 18,576 | 121 | 30 | 56 |
| JR3NZC | A | 488,128 | 748 | 90 | 173 |
| JA3AOP | " | 409,299 | 728 | 78 | 159 |
| JA3LEZ | " | 42,319 | 164 | 38 | 63 |
| JN3SAC | " | 26,040 | 129 | 38 | 55 |
| JR3XEX | " | 25,414 | 155 | 39 | 58 |
| JS3CTQ | 14 | 464,677 | 1282 | 35 | 104 |
| *JH3CUL | A | 168,167 | 368 | 75 | 136 |
| *JH3OXM | " | 36,672 | 183 | 37 | 59 |
| *JA3YPL | " | 32,118 | 151 | 49 | 57 |
| | | | (OP: JJ3TBB) | | |
| *JH3PTC | " | 31,200 | 161 | 42 | 54 |
| *JO3EVM | " | 817 | 18 | 10 | 9 |
| *JI3OGI | " | 100 | 6 | 4 | 5 |
| *JL3MCM | 28 | 874 | 21 | 8 | 11 |
| *JA5ND/3 | " | 24 | 2 | 2 | 2 |
| *JR3RIY | 21 | 55,590 | 260 | 28 | 57 |
| *JL3VUL/3 | " | 42,152 | 211 | 29 | 59 |
| *JA3BBG | " | 9,744 | 103 | 16 | 32 |
| *JR3KAH | " | 1,615 | 37 | 7 | 12 |
| *JM3HYL/3 | " | 735 | 18 | 7 | 14 |
| *JI3MCM | " | 168 | 27 | 9 | 15 |
| *JI3BFC | 14 | 105,225 | 389 | 32 | 83 |
| *JA3UWB | " | 25,806 | 194 | 24 | 42 |
| *JA3DAY | " | 1,323 | 21 | 11 | 16 |
| JH4UYB | A | 2,585,024 | 2177 | 143 | 335 |
| JA4EZP | " | 26,462 | 134 | 40 | 61 |
| JM4WUZ | 14 | 106,021 | 474 | 29 | 68 |
| *JH4OYA | A | 10,508 | 68 | 33 | 41 |
| *JF4XUT | " | 1,539 | 28 | 8 | 11 |
| *JN4UUS | " | 800 | 14 | 11 | 14 |
| *JN4NQX | " | 374 | 13 | 11 | 11 |
| *JR4GPA | 21 | 24,050 | 141 | 23 | 51 |
| *JR4LRY | " | 6,864 | 78 | 15 | 24 |
| *JN4KQV | " | 1,170 | 39 | 14 | 16 |
| *JA4CBX | " | 8 | 2 | 2 | 2 |
| *JR4CTF | 14 | 180 | 20 | 3 | 6 |
| *JE4AEJ | 7 | 3,842 | 54 | 16 | 18 |
| *JR4URW | " | 525 | 22 | 9 | 12 |
| JA5APU | 14 | 81,225 | 363 | 30 | 65 |
| *JR5HXU | 21 | 4,978 | 53 | 12 | 26 |
| JA6WJL | 28 | 10,904 | 137 | 19 | 28 |
| JA6WFM | 14 | 52,954 | 280 | 25 | 58 |
| JA6AVT | " | 2,015 | 35 | 12 | 19 |
| *JS6RTJ | A | 4,929 | 43 | 22 | 31 |
| *JH6WHN | 28 | 2,288 | 38 | 11 | 15 |
| *JH6WXF | 21 | 1,173 | 40 | 9 | 14 |
| *JA6FCL | 14 | 20,670 | 127 | 25 | 40 |
| *JA6WW | " | 1,760 | 41 | 14 | 18 |
| JA7NVF | A | 818,496 | 1224 | 97 | 197 |
| JR7WAB | " | 451,470 | 922 | 75 | 127 |
| JA7COI | " | 402,280 | 754 | 89 | 137 |
| JA7ZP | " | 79,870 | 199 | 69 | 94 |
| JA7BME | " | 52,140 | 169 | 56 | 76 |
| JH7DUM | " | 50,464 | 142 | 98 | 54 |
| JA7WQJ | " | 10,877 | 74 | 30 | 43 |
| JA7HYS | " | 1,276 | 20 | 13 | 16 |
| JA7OWD | 28 | 11,440 | 124 | 17 | 27 |
| *JA7LMZ | A | 233,325 | 455 | 85 | 140 |
| *JA7VEI | " | 48,831 | 182 | 45 | 78 |
| *JI7GYU | " | 4,606 | 49 | 21 | 28 |
| *JE7YSS | " | 368 | 11 | 6 | 10 |
| | | | (OP: 7N4TEN) | | |
| *JA7JH | 28 | 4,402 | 57 | 12 | 19 |
| *JL7FBV | " | 456 | 14 | 5 | 7 |
| *JA7ADV | 21 | 703 | 15 | 10 | 9 |
| *JH7CUO | 14 | 44,800 | 237 | 24 | 56 |
| *JI7EMD | " | 1,728 | 54 | 13 | 19 |
| JA8ECS | A | 130,468 | 275 | 71 | 122 |
| *JA8CSY | A | 100,625 | 274 | 61 | 100 |
| *JA8IJI | " | 23,220 | 138 | 34 | 52 |
| *JL8MBF | " | 14,145 | 103 | 31 | 38 |
| *JI8BUR | 21 | 1,122 | 28 | 9 | 13 |
| JF9JTS | A | 109,782 | 256 | 69 | 102 |
| JA9CCG | " | 85,371 | 254 | 54 | 89 |
| JH9KVF | 21 | 56,762 | 262 | 33 | 68 |
| JH9URT | 7 | 6,512 | 63 | 21 | 23 |
| *JF9KVT | A | 35,788 | 189 | 38 | 54 |
| *JA9TQY | " | 16,832 | 117 | 24 | 40 |
| *JA9EJG | " | 2,432 | 30 | 17 | 21 |
| JJØJML | A | 131,974 | 366 | 58 | 93 |
| JRØWZR | " | 81,000 | 225 | 54 | 96 |
| JAØUH | 28 | 4,422 | 66 | 13 | 20 |
| JJØKRD | 14 | 163,856 | 547 | 35 | 98 |
| *JAØBMS | A | 16,848 | 111 | 31 | 47 |
| *JHØCCK | " | 2,948 | 39 | 19 | 25 |
| *JHØNBN | 28 | 3,422 | 62 | 11 | 18 |
| *JAØNFP | " | 2,349 | 41 | 11 | 16 |
| *JAØIOF | " | 666 | 25 | 7 | 11 |
| *JHØMXV | 21 | 19,434 | 123 | 28 | 51 |
| *JHØEPI | 14 | 116,688 | 427 | 29 | 73 |
| *JAØUMV | " | 83,607 | 361 | 28 | 65 |
| *JHØNEC | " | 47,895 | 217 | 29 | 64 |
| *JAØGEY | " | 4,264 | 52 | 18 | 23 |

### Kazakhstan

| | | | | | |
|---|---|---|---|---|---|
| UPØL | A | 4,732,425 | 3565 | 109 | 404 |
| | | | (OP: UN9LW) | | |
| UN7QF | " | 164,400 | 626 | 29 | 91 |
| UN8AA | 28 | 27,552 | 218 | 10 | 38 |
| UN7MMMM | 14 | 570,720 | 1486 | 29 | 116 |
| *UN6G | A | 23,540 | 163 | 16 | 39 |
| *UN6P | 28 | 3,360 | 48 | 9 | 19 |
| *UN6LN | 14 | 402,927 | 1067 | 31 | 116 |
| *UN7JX | " | 111,930 | 398 | 30 | 93 |
| *UN8FM | " | 5,652 | 61 | 9 | 27 |
| *UO6P | 7 | 83,482 | 455 | 19 | 70 |
| | | | (OP: UN7PBY) | | |
| *UN7ECA | 3.7 | 22 | 7 | 4 | 7 |

### Kuwait

| | | | | | |
|---|---|---|---|---|---|
| 9K2K | 14 | 970,278 | 2027 | 39 | 139 |

### Kyrgyzstan

| | | | | | |
|---|---|---|---|---|---|
| EX2X | 14 | 255,320 | 833 | 30 | 100 |
| *EX7ML | 21 | 122,108 | 653 | 19 | 70 |

### Laos

| | | | | | |
|---|---|---|---|---|---|
| *XW3DT | 14 | 60,775 | 389 | 23 | 62 |
| *XW1A | " | 32,164 | 198 | 25 | 61 |

### Macau

| | | | | | |
|---|---|---|---|---|---|
| *XX9AU | 21 | 885 | 64 | 6 | 9 |

### Mongolia

| | | | | | |
|---|---|---|---|---|---|
| JT1BV | A | 485,473 | 1283 | 77 | 180 |
| JT1F | " | 145,838 | 734 | 56 | 98 |
| JU1F | " | 68,208 | 456 | 41 | 75 |
| | | | (OP: JT1AS) | | |
| *JT1DA | A | 161,370 | 737 | 53 | 112 |

### Nepal

| | | | | | |
|---|---|---|---|---|---|
| *9N7JO | 14 | 830,825 | 2066 | 36 | 131 |
| | | | (OP: LA7JO) | | |

### Ogasawara

| | | | | | |
|---|---|---|---|---|---|
| *JD1BIA | 28 | 114 | 7 | 3 | 3 |

### Oman

| | | | | | |
|---|---|---|---|---|---|
| *A45WD | A | 3,398,140 | 2500 | 117 | 407 |
| | | | (OP: YO9HP) | | |

### Saudi Arabia

| | | | | | |
|---|---|---|---|---|---|
| HZ1GW | A | 2,732,832 | 2466 | 100 | 332 |
| | | | (OP: HZ1EX) | | |
| HZ1IK | 7 | 95,128 | 484 | 21 | 71 |
| *HZ1PS | A | 11,682 | 71 | 22 | 37 |
| *HZ1HN | 14 | 6,783 | 56 | 14 | 37 |

### Singapore

| | | | | | |
|---|---|---|---|---|---|
| *9V1DE | A | 21,837 | 115 | 35 | 52 |

### South Korea

| | | | | | |
|---|---|---|---|---|---|
| HL5UOG | A | 104,389 | 424 | 53 | 86 |
| HL2FDW | 14 | 54,404 | 532 | 24 | 43 |
| *DS5TOS | A | 28,480 | 201 | 34 | 55 |
| *DS5DNO | " | 16,254 | 96 | 38 | 48 |
| *HL5YI | " | 10,050 | 80 | 27 | 40 |
| *DS5KJR | " | 4,284 | 74 | 16 | 20 |

### Taiwan

| | | | | | |
|---|---|---|---|---|---|
| BX5AA | A | 730,480 | 1796 | 71 | 159 |
| BU2AI | " | 83,824 | 542 | 43 | 61 |
| BU2AO | " | 12,840 | 146 | 26 | 34 |
| *BU2AE | A | 28,384 | 133 | 36 | 60 |

### Tajikistan

| | | | | | |
|---|---|---|---|---|---|
| EY8MM | 3.7 | 269,100 | 802 | 26 | 104 |

### Thailand

| | | | | | |
|---|---|---|---|---|---|
| HSØZDG | A | 1,140,412 | 1613 | 91 | 247 |
| *HSØZCW | A | 252,068 | 715 | 44 | 120 |
| *HSØGBI | " | 42,693 | 240 | 34 | 73 |
| *E2ØYLM | " | 6,104 | 72 | 20 | 36 |
| *HS1JNB | " | 5,777 | 54 | 20 | 33 |
| *HSØEHF | 21 | 17,408 | 122 | 22 | 46 |
| *E21EIC | 14 | 301,488 | 1079 | 32 | 100 |

### UK Bases on Cyprus

| | | | | | |
|---|---|---|---|---|---|
| ZC4LI | 21 | 795,417 | 2068 | 31 | 116 |

### United Arab Emirates

| | | | | | |
|---|---|---|---|---|---|
| A61HH | A | 1,677,696 | 1825 | 90 | 294 |
| | | | (OP: A61M) | | |
| *A61C | 21 | 158,516 | 641 | 20 | 72 |

### Uzbekistan

| | | | | | |
|---|---|---|---|---|---|
| UK9AA | 1.8 | 19,950 | 163 | 8 | 42 |

### Vietnam

| | | | | | |
|---|---|---|---|---|---|
| XV1X | A | 178,412 | 451 | 58 | 130 |

### West Malaysia

| | | | | | |
|---|---|---|---|---|---|
| 9M2GCN | 21 | 64,780 | 584 | 23 | 59 |
| 9M2CNC | 14 | 256,905 | 903 | 32 | 103 |
| | | | (OP: G4ZFE) | | |
| *9M4DXX | A | 351,936 | 1106 | 65 | 143 |
| | | | (OP: 9M2TO) | | |
| *9W2DRL | 28 | 100 | 17 | 7 | 9 |

## EUROPE

### Aland Islands

| | | | | | |
|---|---|---|---|---|---|
| OHØ/SP7VC | A | 620,230 | 1750 | 55 | 283 |
| OHØR | 14 | 880,230 | 2842 | 39 | 144 |
| | | | (OP: OH2PM) | | |
| OHØJFP | " | 509,640 | 2245 | 36 | 119 |
| OHØB | 3.7 | 371,800 | 2335 | 31 | 112 |
| | | | (OP: OH2BH) | | |

### Albania

| | | | | | |
|---|---|---|---|---|---|
| *ZA/IW2JOP | A | 80,755 | 367 | 39 | 116 |

### Andorra

| | | | | | |
|---|---|---|---|---|---|
| *C31LJ | A | 468,055 | 1172 | 67 | 244 |

### Austria

| | | | | | |
|---|---|---|---|---|---|
| OE6MDF | A | 467,792 | 891 | 69 | 269 |
| OE7AJT | " | 192,896 | 688 | 36 | 140 |
| OE4A | 3.7 | 426,528 | 2291 | 30 | 114 |
| | | | (OP: OE8SKQ) | | |
| *OE3DMA | A | 171,584 | 514 | 49 | 175 |
| *OE3WMW | " | 106,140 | 607 | 29 | 87 |
| *OE1TKW | " | 64,614 | 232 | 45 | 133 |
| *OE1YMA | " | 16,539 | 95 | 30 | 81 |
| *OE2IJL | " | 5,952 | 65 | 18 | 44 |
| *OE/DJ5MW | " | 

| | | | | | | |
|---|---|---|---|---|---|---|
| ***ON4CT** | **A** | **346,458** | **680** | **71** | **268** |
| *ON5UJ | * | 228,846 | 534 | 55 | 203 |
| *OT7E | * | 161,820 | 434 | 57 | 204 |
| | | | (OP: ON8DB) | | |
| *ON6LY | * | 74,106 | 295 | 38 | 141 |
| *ON4KNP | * | 32,670 | 180 | 31 | 90 |
| *ON8VM | * | 27,608 | 144 | 30 | 89 |
| *ON3AR | * | 16,432 | 146 | 17 | 62 |
| *ON5WL | * | 10,823 | 93 | 25 | 54 |
| *ON8NT | * | 8,892 | 89 | 20 | 56 |
| ***ON3TMG** | **28** | **1,456** | **53** | **7** | **21** |
| ***OSØS** | **21** | **65,100** | **383** | **22** | **83** |
| | | | (OP: ON4ZD) | | |
| *ON3ND | * | 42,750 | 257 | 18 | 72 |
| *ON5SV | * | 14,673 | 137 | 16 | 51 |
| ***ON7BBR** | **14** | **46,746** | **290** | **23** | **83** |
| *OO4O | * | 29,029 | 199 | 19 | 72 |
| | | | (OP: ON4APU) | | |
| *ON7IC | * | 11,144 | 159 | 11 | 45 |
| ***OO6U** | **3.7** | **39,130** | **638** | **7** | **58** |
| | | | (OP: ON6UU) | | |
| *ON6OM | * | 414 | 26 | 2 | 16 |

### Bosnia-Herzegovina

| | | | | | |
|---|---|---|---|---|---|
| **T93M** | **A** | **4,750,070** | **4923** | **122** | **477** |
| **T93O** | **28** | **189,588** | **1349** | **22** | **100** |
| **E7/DK6XZ** | **21** | **732,540** | **2508** | **38** | **136** |
| | | | (OP: DK6XZ) | | |
| ***T94WG** | **A** | **48,300** | **241** | **33** | **107** |
| ***T92M** | **28** | **4,407** | **96** | **7** | **32** |
| ***T99W** | **14** | **696,608** | **2605** | **36** | **140** |
| *T94LW | * | 47,348 | 465 | 15 | 61 |
| ***T99D** | **7** | **208,361** | **1309** | **29** | **110** |
| ***T99T** | **1.8** | **7,950** | **149** | **6** | **44** |

### Bulgaria

| | | | | | |
|---|---|---|---|---|---|
| **LZ5A** | **A** | **894,250** | **2237** | **71** | **294** |
| LZ2SX | * | 292,578 | 987 | 56 | 186 |
| LZ1ZF | * | 228,864 | 825 | 41 | 151 |
| LZ2JR | * | 138,458 | 368 | 58 | 156 |
| LZ2PG | * | 98,936 | 237 | 55 | 111 |
| LZ1QZ | * | 9,438 | 131 | 12 | 54 |
| **LZ1MS** | **21** | **302,610** | **1163** | **36** | **118** |
| LZ5Z | * | 18,834 | 165 | 17 | 56 |
| | | | (OP: LZ3DJ) | | |
| **LZ3TL** | **14** | **83,740** | **745** | **26** | **80** |
| **LZ1QN** | **7** | **35,399** | **321** | **20** | **71** |
| ***LZ2HN** | **A** | **222,794** | **520** | **59** | **227** |
| ***LZ1AQ** | **"** | **173,968** | **514** | **61** | **201** |
| *LZ1IKY | * | 169,248 | 535 | 53 | 205 |
| *LZ3SM | * | 102,921 | 281 | 46 | 157 |
| *LZ2UZ | * | 89,856 | 367 | 48 | 144 |
| *LZ1ONK | * | 12,648 | 132 | 25 | 77 |
| *LZ4ZD | * | 2,790 | 70 | 18 | 44 |
| *LZ3TV | * | 2,025 | 27 | 10 | 15 |
| *LZ8A | * | 252 | 9 | 9 | 9 |
| | | | (OP: LZ2BE) | | |
| ***LZ1ND** | **28** | **82,418** | **707** | **20** | **78** |
| *LZ1NG | * | 48,149 | 469 | 18 | 71 |
| *LZ9V | * | 9,152 | 169 | 12 | 40 |
| ***LZ9X** | **14** | **531,690** | **2010** | **36** | **149** |
| | | | (OP: LZ1UK) | | |
| *LZ1ZC | * | 5,762 | 98 | 10 | 33 |
| ***LZ2FM** | **7** | **12,505** | **176** | **10** | **51** |
| ***LZ2JA** | **3.7** | **65,040** | **767** | **13** | **67** |
| ***LZ2SC** | **1.8** | **8,322** | **121** | **8** | **49** |

### Crete

| | | | | | |
|---|---|---|---|---|---|
| **SV9GPV** | **A** | **2,120,560** | **3176** | **108** | **412** |
| SV9COL | * | 292,878 | 797 | 66 | 252 |

### Croatia

| | | | | | |
|---|---|---|---|---|---|
| **9A3ST** | **A** | **345,714** | **669** | **76** | **291** |
| 9A1MM | * | 30,140 | 200 | 32 | 105 |
| **9A4W** | **21** | **636,216** | **2023** | **35** | **133** |
| **9A4D** | **14** | **602,460** | **2171** | **37** | **143** |
| | | | (OP: 9A7DX) | | |
| **9A8M** | **3.7** | **107,744** | **1202** | **16** | **75** |
| **9A2VR** | **"** | **107,180** | **1092** | **15** | **77** |
| 9A5MT | * | 48,126 | 567 | 12 | 66 |
| ***9A2EY** | **A** | **125,400** | **472** | **39** | **161** |
| *9A8A | * | 97,716 | 326 | 47 | 157 |
| *9A4KW | * | 32,944 | 142 | 37 | 79 |
| *9A5ANB | * | 24,219 | 106 | 30 | 87 |
| *9A1DL | * | 2,520 | 38 | 17 | 28 |
| *9A5YY | * | 1,302 | 27 | 9 | 12 |
| *9A5AQA | * | 30 | 3 | 3 | 3 |
| ***9A4VM** | **28** | **7,952** | **124** | **13** | **43** |
| ***9A2TE** | **21** | **59,064** | **325** | **24** | **83** |
| ***9A3B** | **14** | **508,698** | **1874** | **36** | **141** |
| | | | (OP: 9A1AA) | | |
| *9A2TX | * | 13,110 | 164 | 10 | 47 |

### Czech Republic

| | | | | | |
|---|---|---|---|---|---|
| **OL7Y** | **A** | **853,944** | **1722** | **78** | **286** |
| | | | (OP: OK1BOA) | | |
| **OK7Y** | **"** | **670,071** | **1253** | **74** | **327** |
| | | | (OP: OK1FDY) | | |
| OLØL | * | 583,570 | 1786 | 67 | 268 |
| | | | (OP: OK1FNJ) | | |
| OL8R | * | 337,212 | 812 | 70 | 253 |
| | | | (OP: OK1FCJ) | | |
| OK1TFH | * | 129,087 | 444 | 39 | 150 |
| OK1AXB | * | 116,775 | 481 | 46 | 179 |
| OK1FRO | * | 38,152 | 244 | 31 | 121 |
| **OL9Z** | **14** | **501,592** | **1999** | **36** | **133** |
| | | | (OP: OK2PVF) | | |
| **OK5R** | **7** | **752,669** | **2875** | **35** | **132** |
| | | | (OP: OK1RI) | | |
| **OK7M** | **3.7** | **320,952** | **2176** | **23** | **106** |
| | | | (OP: OK1DIG) | | |
| ***OK6Y** | **A** | **604,072** | **1166** | **72** | **320** |
| | | | (OP: OK2PTZ) | | |
| ***OK2BYW** | **"** | **535,428** | **807** | **85** | **332** |
| ***OK1DCF** | **"** | **425,256** | **823** | **73** | **303** |
| *OK1TC | * | 366,196 | 875 | 67 | 265 |
| *OL6P | * | 320,775 | 721 | 61 | 268 |
| | | | (OP: OK2WTM) | | |
| *OK2BDF | * | 247,854 | 728 | 47 | 256 |
| *OK2BEN | * | 233,240 | 707 | 44 | 236 |
| *OK2PBG | * | 230,112 | 512 | 62 | 210 |
| *OK1DKR | * | 216,918 | 539 | 63 | 246 |
| *OK1MKU | * | 200,960 | 450 | 62 | 258 |
| *OK5XX | * | 193,800 | 563 | 56 | 229 |
| *OK1DUT | * | 186,501 | 524 | 53 | 196 |
| *OK1CLD | * | 182,964 | 592 | 48 | 189 |
| *OK4AS | * | 157,661 | 496 | 45 | 178 |
| *OK1SI | * | 157,200 | 488 | 48 | 214 |
| *OK2AB | * | 155,235 | 581 | 55 | 182 |
| *OK2ZDL | * | 139,752 | 460 | 45 | 171 |
| *OK1LO | * | 128,553 | 491 | 44 | 175 |
| *OK1AY | * | 111,020 | 574 | 29 | 153 |
| *OK2WYK | * | 99,552 | 423 | 39 | 165 |
| *OK2BRX | * | 82,800 | 392 | 36 | 148 |
| *OL2T | * | 79,744 | 408 | 30 | 148 |
| *OK1CO | * | 54,285 | 274 | 34 | 131 |
| *OK2BUT | * | 52,706 | 263 | 29 | 117 |
| *OK2KFK | * | 48,772 | 239 | 39 | 139 |
| | | | (OP: OK2ABU) | | |
| *OK1TRA | * | 45,633 | 268 | 32 | 127 |
| *OK4DZ | * | 45,543 | 198 | 40 | 101 |
| *OK2SGY | * | 42,924 | 266 | 31 | 116 |
| *OK1VHV | * | 37,788 | 213 | 27 | 114 |
| *OK1DOZ | * | 34,560 | 224 | 29 | 115 |
| *OK4AZ | * | 33,142 | 192 | 32 | 114 |
| *OK1VKC | * | 28,140 | 164 | 35 | 105 |
| *OK2PHI | * | 28,034 | 176 | 34 | 97 |
| *OK2SWD | * | 23,643 | 198 | 21 | 90 |
| *OK2VX | * | 19,720 | 132 | 29 | 87 |
| *OK2PBG | * | 15,738 | 130 | 22 | 64 |
| *OK1KQI | * | 8,282 | 106 | 23 | 59 |
| | | | (OP: OK1CO) | | |
| *OK1JN | * | 3,782 | 94 | 11 | 51 |
| ***OK2HZ** | **28** | **13,200** | **196** | **9** | **51** |
| *OK1KZ | * | 3,552 | 116 | 5 | 27 |
| *OK2ABU | * | 1,770 | 68 | 6 | 24 |
| ***OK2N** | **21** | **110,366** | **470** | **30** | **109** |
| | | | (OP: OK2NN) | | |
| ***OK1UG** | **7** | **28,520** | **246** | **18** | **74** |
| ***OL4W** | **3.7** | **36,270** | **549** | **8** | **57** |
| | | | (OP: OK1IF) | | |
| *OK1DST | 1.8 | 4,185 | 107 | 5 | 40 |

### Denmark

| | | | | | |
|---|---|---|---|---|---|
| **OZ7AM** | **A** | **696,953** | **1588** | **68** | **281** |
| OZ1JTE | * | 358,905 | 799 | 60 | 277 |
| OZ5EV | * | 207,957 | 420 | 73 | 309 |
| OV1A | * | 113,594 | 392 | 44 | 177 |
| OZ1NE | * | 44,128 | 366 | 21 | 91 |
| OZ7EA | * | 3,712 | 88 | 15 | 43 |
| **OZ7X** | **3.7** | **186,473** | **1465** | **22** | **97** |
| | | | (OP: OZ5KF) | | |
| ***OZ1ACB** | **A** | **204,352** | **630** | **47** | **201** |
| ***OV3X** | **"** | **198,990** | **497** | **66** | **231** |
| | | | (OP: OZ8AE) | | |
| *OZ4NA | * | 108,108 | 476 | 41 | 148 |
| *5P4RT | * | 58,116 | 239 | 40 | 134 |
| *OZ1KKH | * | 44,160 | 160 | 38 | 146 |
| *OZ6OQ | * | 32,562 | 280 | 24 | 110 |
| *5P1B | * | 10,137 | 146 | 20 | 73 |
| *OZ7TTT | * | 7,875 | 96 | 16 | 59 |
| | | | (OP: OZ5WQ) | | |
| *OZ1DGQ | * | 4,182 | 60 | 15 | 36 |
| *OZ3EN | * | 2,346 | 46 | 13 | 33 |
| *OZ1ELY | * | 84 | 9 | 5 | 9 |
| *OZ4MF | * | 100 | 16 | 5 | 15 |
| ***OZ7AEI** | **14** | **1,643** | **58** | **6** | **25** |
| *OZ1BXM | * | 78 | 12 | 4 | 9 |
| ***OZ6TL** | **7** | **2,112** | **62** | **5** | **27** |

### England

| | | | | | |
|---|---|---|---|---|---|
| **M6T** | **A** | **6,149,240** | **4981** | **149** | **531** |
| | | | (OP: G4PIQ) | | |
| **M8C** | **"** | **865,920** | **1525** | **80** | **304** |
| MØWLF | * | 543,918 | 1264 | 54 | 215 |
| G4FAL | * | 470,934 | 1149 | 59 | 283 |
| G2C | * | 179,280 | 424 | 62 | 187 |
| | | | (OP: MØGHQ) | | |
| G3RWF | * | 112,908 | 376 | 43 | 151 |
| GØAZG | * | 56,485 | 305 | 40 | 103 |
| G3PJT | * | 37,647 | 151 | 36 | 105 |
| G7PVZ | * | 18,860 | 193 | 24 | 91 |
| G7RSM | * | 16,124 | 94 | 30 | 86 |
| **GØAEV** | **28** | **120,119** | **896** | **21** | **92** |
| G4WPD | * | 6,664 | 164 | 11 | 38 |
| **G3RAU** | **21** | **219,554** | **718** | **31** | **120** |
| **G3TXF** | **14** | **582,560** | **2028** | **34** | **126** |
| G4ERW | * | 169,126 | 975 | 22 | 81 |
| ***G4BUO** | **A** | **1,329,525** | **1832** | **94** | **381** |
| ***MØWTF** | **"** | **378,880** | **787** | **56** | **240** |
| *GØKDS | * | 268,826 | 747 | 51 | 227 |
| *G4FKA | * | 227,058 | 744 | 42 | 204 |
| *G4WGE | * | 205,504 | 618 | 46 | 201 |
| *G4DDX | * | 158,652 | 528 | 45 | 181 |
| *G8MIA | * | 148,716 | 555 | 39 | 165 |
| *MØMCX | * | 127,347 | 494 | 36 | 191 |
| *G4MKP | * | 114,660 | 460 | 37 | 143 |
| *G7BRZ | * | 92,862 | 466 | 34 | 167 |
| *G6SFP | * | 88,328 | 346 | 43 | 138 |
| *2EØPLA | * | 84,212 | 397 | 33 | 115 |
| *G8ZRE | * | 54,285 | 357 | 26 | 115 |
| *G4DDL | * | 53,802 | 296 | 29 | 118 |
| *MØVBY | * | 53,067 | 209 | 37 | 110 |
| *G4NXG | * | 47,716 | 190 | 42 | 116 |
| *G7RTI | * | 46,624 | 300 | 22 | 102 |
| *MØGBP | * | 42,926 | 259 | 30 | 139 |
| *G3RSD | * | 39,567 | 245 | 24 | 97 |
| *MØOIC | * | 32,224 | 153 | 32 | 120 |
| *MØBMX | * | 26,751 | 206 | 22 | 89 |
| *MØGKC | * | 26,559 | 190 | 22 | 95 |
| *G7VNN | * | 14,896 | 143 | 16 | 82 |
| *G3VQO | * | 13,520 | 118 | 22 | 82 |
| *M3PZT | * | 12,814 | 112 | 26 | 60 |
| *G1KAG | * | 9,792 | 139 | 11 | 57 |
| *G7VJR | * | 7,700 | 96 | 15 | 62 |
| *M3RXO | * | 6,100 | 98 | 12 | 49 |
| *MØCOP | * | 5,475 | 62 | 16 | 59 |
| *MØWWA | * | 4,108 | 58 | 20 | 32 |
| *M3NLK | * | 1,927 | 49 | 8 | 33 |
| *MØPKZ | * | 837 | 21 | 11 | 16 |
| *M3ZRJ | * | 720 | 25 | 9 | 21 |
| *M3VRN | * | 190 | 22 | 5 | 14 |
| *M3USQ | * | 100 | 53 | 9 | 32 |
| ***G4ZOB** | **28** | **3,312** | **82** | **7** | **29** |
| *M1MAJ | 21 | 1,075 | 25 | 7 | 18 |
| ***G8RCK** | **14** | **8,904** | **138** | **11** | **45** |
| *GØVOK | * | 7,800 | 99 | 11 | 41 |
| *GØRPM | * | 2,280 | 93 | 5 | 35 |
| *MØEEE | * | 252 | 22 | 3 | 9 |
| | | | (OP: GØVQR) | | |
| ***G3WW** | **7** | **16,698** | **225** | **10** | **56** |
| *G6CSY | * | 3,182 | 80 | 6 | 31 |
| *G3VYI | 1.8 | 588 | 31 | 3 | 18 |

### Estonia

| | | | | | |
|---|---|---|---|---|---|
| **ES5TV** | **A** | **5,564,372** | **5581** | **140** | **552** |
| ES5MG | * | 69,142 | 262 | 46 | 145 |
| ES2BH | * | 13,080 | 112 | 24 | 85 |
| **ES5MC** | **3.7** | **160,775** | **1315** | **19** | **90** |
| *ES1IP | A | 3,038 | 58 | 10 | 39 |
| *ES4RD | * | 144 | 6 | 3 | 6 |
| ***ES1CN** | **21** | **18,460** | **205** | **12** | **59** |
| *ES1BA | * | 3,168 | 24 | 24 | 24 |
| *ES5RIM | 14 | 4,884 | 89 | 8 | 36 |
| ***ES7GM** | **7** | **96,459** | **780** | **20** | **91** |
| ***ES6KW** | **3.7** | **16,080** | **242** | **10** | **50** |
| *ES6PA | * | 16,020 | 250 | 10 | 50 |

### European Russia

| | | | | | |
|---|---|---|---|---|---|
| **RW1AC** | **A** | **3,565,482** | **3826** | **126** | **453** |
| **RG3K** | **"** | **2,002,011** | **2463** | **113** | **476** |
| | | | (OP: UA3QDX) | | |
| **RS3A** | **"** | **1,948,456** | **2236** | **122** | **510** |
| | | | (OP: RA3CW) | | |
| UA4FER | * | 1,720,251 | 2066 | 102 | 405 |
| RN4AA | * | 1,373,982 | 1964 | 106 | 428 |
| RN3ZC | * | 1,339,104 | 2176 | 96 | 385 |
| RK3ZZ | * | 629,202 | 979 | 90 | 336 |
| RV3RM | * | 469,536 | 945 | 81 | 321 |
| UA3AB | * | 463,062 | 593 | 112 | 314 |
| RT3T | * | 388,992 | 724 | 81 | 303 |
| | | | (OP: UA3TU) | | |
| RK3IM | * | 313,688 | 689 | 74 | 273 |
| RX3AGD | * | 260,440 | 414 | 83 | 257 |
| RU3UR | * | 241,605 | 639 | 69 | 204 |
| RA6AFB | * | 234,910 | 575 | 62 | 216 |
| RK3QS | * | 211,255 | 613 | 59 | 194 |
| RU1AB | * | 203,496 | 580 | 52 | 226 |
| UA3TCJ | * | 181,260 | 439 | 62 | 97 |
| UA3RN | * | 168,018 | 498 | 57 | 189 |
| RZ3DA | * | 146,828 | 350 | 66 | 218 |
| UA4SU | * | 146,168 | 386 | 59 | 183 |
| UA6HMM | * | 129,876 | 251 | 80 | 194 |
| RA3CM | * | 118,250 | 423 | 51 | 164 |
| UA1CEI | * | 102,816 | 518 | 33 | 156 |
| UA3KW | * | 90,598 | 197 | 59 | 135 |
| RU6MD | * | 86,932 | 276 | 49 | 162 |
| RZ3DH | * | 78,760 | 392 | 39 | 140 |
| RA3NC | * | 77,164 | 281 | 45 | 157 |
| RA1ACY | * | 59,551 | 451 | 20 | 93 |
| RK6FZ | * | 58,401 | 247 | 46 | 143 |
| UA4NC | * | 50,137 | 231 | 42 | 139 |
| RZ3QZ | * | 45,220 | 144 | 54 | 116 |
| UA6HHE | * | 35,372 | 242 | 33 | 115 |
| UA6YI | * | 33,984 | 131 | 48 | 96 |
| UA6UDV | * | 32,485 | 337 | 18 | 71 |
| RA3UT | * | 29,329 | 110 | 33 | 106 |
| RA1OD | * | 26,784 | 110 | 29 | 95 |
| UA4NCI | * | 17,480 | 88 | 36 | 56 |
| RX4HX | * | 8,856 | 82 | 19 | 53 |
| RZ3FR | * | 2,072 | 49 | 16 | 40 |
| RL3AW | * | 1,519 | 19 | 14 | 17 |
| UA3BM | * | 72 | 7 | 6 | 6 |
| **RZ3RD** | **28** | **1,575** | **67** | **9** | **36** |
| **RL3BM** | **21** | **234,738** | **1050** | **33** | **129** |
| **RV6LJK** | **"** | **191,724** | **859** | **33** | **123** |
| RC4Q | * | 115,491 | 593 | 26 | 111 |
| | | | (OP: UA4RC) | | |
| **RD3A** | **14** | **484,920** | **1717** | **39** | **141** |
| | | | (OP: RD3AF) | | |
| RZ1ZZ | * | 192,185 | 1171 | 24 | 95 |
| RN3GA | * | 138,233 | 734 | 29 | 108 |
| RW6ATJ | * | 128,384 | 825 | 29 | 99 |
| RW1CW | * | 102,378 | 395 | 31 | 120 |
| UA3EDQ | * | 91,688 | 346 | 30 | 116 |
| RW3FY | * | 84,180 | 500 | 26 | 96 |
| RD3FG | * | 40,414 | 185 | 28 | 93 |
| RV1AT | * | 17,952 | 211 | 14 | 52 |
| UA6FP | * | 16,600 | 153 | 15 | 68 |
| **RU4SS** | **7** | **225,862** | **974** | **31** | **115** |
| RZ3AV | * | 40,194 | 308 | 18 | 81 |
| RX6BZ | * | 20,100 | 108 | 21 | 79 |
| **UA4HOX** | **3.7** | **38,766** | **388** | **18** | **60** |
| **RU6FA** | **"** | **30,176** | **286** | **15** | **67** |
| UA6LPY | * | 1,440 | 22 | 12 | 18 |
| RZ6HDX | 1.8 | 4,128 | 80 | 7 | 36 |
| ***RV6LFE** | **A** | **826,896** | **1478** | **82** | **346** |
| ***RV4HC** | **"** | **729,750** | **1477** | **81** | **269** |
| ***UA4FRL** | **"** | **717,912** | **1124** | **90** | **382** |
| *RN3AHL | * | 654,003 | 944 | 97 | 344 |
| *UA3BL | * | 538,752 | 1116 | 75 | 309 |
| *RA6GW | * | 490,220 | 735 | 89 | 297 |
| *RX6AH | * | 415,172 | 761 | 79 | 304 |
| *UA3LHL | * | 414,687 | 1021 | 59 | 284 |
| *RL3WX | * | 384,444 | 796 | 72 | 282 |
| *UA6YIU | * | 347,760 | 717 | 68 | 277 |
| *RN3QIS | * | 279,565 | 689 | 64 | 235 |
| *RV4LC | * | 266,264 | 478 | 76 | 256 |
| *UA4PJM | * | 245,916 | 608 | 64 | 233 |
| *UA3ABJ | * | 229,732 | 488 | 71 | 245 |
| *RV3LO | * | 222,794 | 674 | 51 | 235 |
| *UA3FDX | * | 204,514 | 527 | 64 | 229 |
| *RZ6FA | * | 203,688 | 310 | 75 | 201 |
| *UA4LA | * | 201,915 | 544 | 69 | 246 |
| *UA3QLQ | * | 198,052 | 592 | 48 | 220 |
| *UA1CUR | * | 177,952 | 529 | 49 | 219 |
| *RW3VZ | * | 175,066 | 495 | 55 | 216 |
| *RU4CS | * | 173,120 | 322 | 62 | 258 |
| *RV3QO | * | 167,706 | 470 | 54 | 188 |
| *RU3ZV | * | 162,597 | 499 | 53 | 196 |
| *RN4CA | * | 124,875 | 382 | 49 | 176 |
| *UA3QU | * | 115,596 | 321 | 52 | 176 |
| *UA6ARR | * | 104,748 | 411 | 49 | 154 |
| *UA6HCA | * | 103,600 | 229 | 55 | 145 |
| *RU4WD | * | 101,115 | 443 | 40 | 149 |
| *RD6LP | * | 97,995 | 223 | 69 | 166 |
| *RA3LZ | * | 93,450 | 366 | 47 | 163 |
| *RW6CW | * | 93,248 | 231 | 68 | 180 |
| *RX3QDF | * | 93,147 | 353 | 38 | 145 |
| *RA3MB | * | 91,142 | 306 | 43 | 186 |
| *U1BA | * | 86,850 | 403 | 33 | 160 |
| *UA3AAP | * | 86,784 | 375 | 39 | 153 |
| *RL3AJ | * | 81,450 | 380 | 35 | 146 |
| *RD3DT | * | 79,875 | 274 | 57 | 156 |
| *RL3FA | * | 72,674 | 195 | 58 | 145 |
| *RU6HJ | * | 71,977 | 398 | 31 | 136 |
| *RA3RGQ | * | 69,552 | 209 | 53 | 136 |
| *UA3OQ | * | 66,340 | 332 | 28 | 127 |
| *RA6HSM | * | 61,776 | 265 | 35 | 121 |
| *RU3XB | * | 59,684 | 292 | 34 | 138 |
| *UA1WGV | * | 59,675 | 308 | 31 | 124 |
| *RA3TUT | * | 58,706 | 190 | 41 | 156 |
| *UA4FEN | * | 55,735 | 275 | 38 | 119 |
| *RD3AN | * | 53,277 | 255 | 31 | 146 |
| *UA1WBV | * | 52,096 | 217 | 39 | 137 |
| *RU6YZ | * | 52,015 | 441 | 22 | 79 |
| *RA3XE | * | 50,948 | 220 | 41 | 147 |
| *RZ3DC | * | 50,869 | 182 | 48 | 121 |
| *UA4FUW | * | 48,393 | 216 | 39 | 132 |
| *UA3ACL | * | 43,524 | 248 | 30 | 126 |
| *UA1ZCX | * | 42,558 | 371 | 26 | 56 |
| *RA1AFR | * | 41,748 | 235 | 28 | 114 |
| *RL3QWA | * | 40,260 | 257 | 28 | 104 |
| | | | (OP: RU3QD) | | |
| *RK3DU | * | 37,264 | 221 | 28 | 109 |
| *RZ3ARO | * | 36,208 | 249 | 25 | 99 |
| *RZ3VA | * | 33,885 | 178 | 37 | 98 |
| *RA6XTD | * | 32,916 | 188 | 36 | 120 |
| *RX3XP | * | 31,974 | 208 | 33 | 113 |
| *RA6FUZ | * | 31,828 | 205 | 26 | 83 |
| *RV1AE | * | 28,427 | 226 | 27 | 104 |
| *RA1TV | * | 27,156 | 196 | 24 | 100 |
| *UA4AZ | * | 26,257 | 123 | 32 | 89 |
| *RX3AU | * | 26,200 | 142 | 35 | 96 |
| *RW3WX | * | 25,296 | 208 | 26 | 98 |
| *UA1WA | * | 22,712 | 127 | 35 | 101 |
| *UA4AN | * | 21,935 | 155 | 22 | 85 |
| *RA4NCC | * | 21,624 | 162 | 27 | 79 |
| *RU3XY | * | 20,520 | 150 | 31 | 89 |
| *RA4FUN | * | 20,384 | 132 | 26 | 78 |
| *UA3AKI | * | 19,998 | 166 | 19 | 82 |
| *UA1AAR | * | 19,055 | 167 | 19 | 84 |
| *RX3VF | * | 18,984 | 151 | 22 | 91 |
| *UA4CCG | * | 18,759 | 130 | 30 | 81 |
| *RX3AEX | * | 18,720 | 131 | 29 | 88 |
| *UA3FX | * | 16,995 | 123 | 27 | 76 |
| *RA6AAW | * | 15,582 | 72 | 37 | 61 |
| *RU3DM | * | 12,240 | 64 | 30 | 60 |
| *RA3DBK | * | 12,100 | 141 | 20 | 80 |
| *RZ3ATE | * | 11,316 | 108 | 23 | 69 |
| *RW3DD | * | 11,088 | 57 | 38 | 46 |
| *RZ6BU | * | 10,947 | 61 | 34 | 55 |
| *RU3OG | * | 10,780 | 59 | 39 | 59 |
| *RA1QKI | * | 10,108 | 111 | 16 | 60 |
| *UA6HFI | * | 10,000 | 115 | 31 | 69 |
| *UA3TN | * | 8,400 | 65 | 24 | 51 |
| *UA3SBW | * | 8,052 | 101 | 17 | 44 |
| *RA3TLA | * | 7,930 | 90 | 18 | 47 |
| *UA4HUR | * | 6,695 | 43 | 22 | 37 |
| *RW3VI | * | 6,636 | 80 | 19 | 60 |
| *RN4AM | * | 5,820 | 45 | 20 | 40 |
| *RW4PJS | * | 4,690 | 67 | 17 | 50 |
| *UA1AFZ | * | 4,392 | 53 | 16 | 45 |
| *UA3MOC | * | 3,520 | 49 | 15 | 40 |
| *RZ3ABC | * | 2,442 | 45 | 9 | 28 |
| *RV3TG | * | 2,226 | 67 | 9 | 33 |
| *UA3DSS | * | 2,064 | 31 | 16 | 27 |
| *RW3DY | * | 1,288 | 19 | 10 | 18 |
| *RA3ZOM | * | 675 | 18 | 10 | 17 |
| *RV3BZ | * | 520 | 31 | 8 | 18 |
| *RA3BQ | * | 285 | 16 | 7 | 12 |
| *RN6DR | * | 180 | 15 | 3 | 9 |
| ***RA6LW** | **28** | **16,188** | **259** | **10** | **47** |
| *RW6BN | * | 8,370 | 143 | 9 | 45 |
| *RA1AW | * | 2,294 | 65 | 6 | 25 |
| *UA6AK | * | 1,025 | 34 | 7 | 18 |
| ***RA6YY** | **21** | **201,465** | **802** | **33** | **132** |
| *UA4LW | * | 24,388 | 161 | 18 | 73 |
| *RN3DY | * | 14,141 | 106 | 17 | 62 |
| *RW4LQ | * | 13,032 | 72 | 19 | 53 |
| *RA4LK | * | 1,080 | 23 | 9 | 21 |
| ***RA3OE** | **14** | **32,592** | **309** | **13** | **71** |
| ***RK6CK** | **"** | **32,277** | **317** | **17** | **70** |
| ***RW6AH** | **"** | **30,175** | **266** | **16** | **69** |
| *RA3DGH | * | 22,648 | 221 | 12 | 64 |
| *RU3UW | * | 9,240 | 122 | 9 | 46 |
| *RX3MM | * | 8,515 | 66 | 17 | 48 |
| *UA3DFR | * | 8,125 | 140 | 13 | 52 |
| *RV3YR | * | 987 | 20 | 8 | 13 |
| ***RN4SN** | **7** | **64,900** | **321** | **22** | **96** |
| *UA1ANA | * | 25,174 | 241 | 15 | 67 |
| *RA3DTN | * | 5,104 | 52 | 16 | 42 |
| *RA1QGK | * | 3,198 | 66 | 7 | 34 |
| *RA1QDP | * | 2,418 | 67 | 8 | 23 |
| *UA4WAG | * | 600 | 21 | 7 | 18 |
| *RN3QPK | * | 399 | 28 | 7 | 14 |
| ***RA3XM** | **3.7** | **22,244** | **342** | **10** | **57** |
| *RZ3AUL | * | 11,872 | 193 | 8 | 48 |
| *RL3AF | * | 5,633 | 107 | 6 | 37 |
| ***UA6AIW** | **1.8** | **14,490** | **212** | **11** | **52** |

### European Turkey

| | | | | | |
|---|---|---|---|---|---|
| ***TA1CM** | **A** | **136,675** | **402** | **70** | **205** |

### Finland

| | | | | | |
|---|---|---|---|---|---|
| **OF8X** | **A** | **3,698,400** | **3639** | **112** | **424** |
| | | | (OP: OH6UM) | | |
| **OF4R** | **"** | **1,874,740** | **3186** | **95** | **395** |
| | | | (OP: OH4JFN) | | |
| OF1F | * | 1,871,844 | 2533 | 102 | 405 |
| | | | (OP: OH1NOA) | | |
| OH1RX | * | 343,036 | 586 | 79 | 303 |
| OH1BV | * | 238,434 | 655 | 54 | 240 |
| OH2CK | * | 230,318 | 392 | 80 | 281 |
| OH1XY | * | 107,426 | 275 | 53 | 156 |
| OH1MM | * | 73,745 | 229 | 55 | 160 |
| OH1SIC | * | 43,684 | 249 | 32 | 131 |
| OH5NE | * | 25,856 | 192 | 24 | 104 |
| OH6TN | * | 285 | 11 | 8 | 11 |
| **OH2XF** | **21** | **24,087** | **140** | **18** | **75** |
| **OF8L** | **14** | **620,024** | **2152** | **40** | **148** |
| OH5NS | * | 24,012 | 169 | 21 | 71 |
| OH2VZ | * | 18,150 | 184 | 16 | 59 |
| **OH1TX** | **3.7** | **131,928** | **894** | **30** | **108** |
| ***OH1JO** | **A** | **289,718** | **836** | **56** | **230** |
| *OH2LP | * | 84,436 | 388 | 36 | 166 |
| *OH2BPA | * | 62,200 | 240 | 36 | 164 |
| *OH2MDC | * | 10,080 | 107 | 19 | 71 |
| *OH8AA | * | 3,150 | 66 | 10 | 35 |
| | | | (OP: OH8KVY) | | |
| *OH3HS | * | 2,958 | 41 | 11 | 40 |
| *OH6GFI | * | 144 | 11 | 7 | 11 |
| ***OH5NZ** | **21** | **14,960** | **115** | **16** | **64** |
| *OH8VJ | 1.8 | 812 | 42 | 5 | 23 |

### France

| | | | | | |
|---|---|---|---|---|---|
| **F5VHY** | **A** | **761,856** | **847** | **82** | **302** |
| **F5BBD** | **"** | **733,698** | **1556** | **66** | **312** |
| F4DSK | * | 612,720 | 1106 | 72 | 342 |
| F5PU | * | 414,252 | 1251 | 60 | 251 |
| F8DVD | * | 162,328 | 483 | 48 | 158 |
| F5IN | * | 125,077 | 405 | 58 | 169 |
| F5PAL | * | 91,344 | 303 | 42 | 131 |
| F4CPF | * | 32,193 | 154 | 40 | 107 |
| **F5FLN** | **7** | **452,751** | **1794** | **31** | **110** |
| **F6CTT** | **3.7** | **509,715** | **2332** | **29** | **112** |
| F5AMH | * | 22,239 | 396 | 10 | 53 |
| ***F4BKV** | **A** | **1,568,043** | **1818** | **100** | **431** |
| ***F4FLQ** | **"** | **825,132** | **1327** | **92** | **370** |
| *F1RHS | * | 597,774 | 964 | 83 | 319 |
| *F8AKS | * | 593,895 | 1221 | 55 | 234 |
| *F6FTB | * | 492,733 | 925 | 65 | 308 |
| *F2AR | * | 388,075 | 843 | 61 | 300 |
| *F4AGR | * | 298,080 | 576 | 56 | 214 |
| *F8AAN | * | 258,352 | 786 | 69 | 199 |
| *F4ETG | * | 247,361 | 682 | 50 | 227 |
| *F5LIW | * | 207,692 | 437 | 62 | 212 |
| *F4DLL | * | 164,640 | 575 | 44 | 180 |
| *F5INJ | * | 149,688 | 533 | 43 | 173 |
| *F5POJ | * | 134,805 | 390 | 45 | 164 |
| *F5RQQ | * | 121,806 | 351 | 54 | 147 |
| *F5LCU | * | 121,402 | 408 | 40 | 162 |
| *F4EUN | * | 116,085 | 387 | 46 | 167 |
| *F6BAT | * | 109,532 | 457 | 43 | 154 |
| *F6DZD | * | 105,792 | 395 | 40 | 152 |
| *F8AEE | * | 99,879 | 336 | 36 | 133 |
| *F8DYD | * | 87,354 | 310 | 45 | 162 |
| *F4MWM | * | 86,464 | 438 | 35 | 158 |
| *F4FEP | * | 73,633 | 314 | 31 | 126 |
| *F5NBK | * | 70,056 | 341 | 37 | 131 |
| *F2RO | * | 68,255 | 296 | 50 | 137 |
| *F8DFP | * | 63,720 | 271 | 40 | 140 |
| *F4EFI | * | 63,360 | 178 | 53 | 112 |
| *F1ICS | * | 58,220 | 287 | 38 | 126 |
| *F6DRP | * | 57,540 | 369 | 29 | 108 |
| *F8CRS | * | 56,917 | 234 | 40 | 133 |
| *F4FIP | * | 55,417 | 193 |

| | | | | | |
|---|---|---|---|---|---|
| *DM3HZN | * | 192,270 | 477 | 64 | 191 |
| *DF3QG | * | 185,220 | 372 | 65 | 205 |
| *DL6AKK | * | 165,808 | 500 | 49 | 192 |
| *DL9LF | * | 157,542 | 459 | 39 | 178 |
| *DK7CH | * | 157,131 | 560 | 43 | 178 |
| *DL1TS | * | 149,872 | 445 | 52 | 220 |
| *DL8DAW | * | 137,025 | 502 | 43 | 182 |
| *DM2AWM | * | 136,080 | 455 | 45 | 195 |
| *DL9ABF | * | 135,801 | 390 | 48 | 189 |
| *DM3KZN | * | 131,544 | 365 | 55 | 148 |
| *DL5XAT | * | 128,205 | 421 | 48 | 183 |
| *DL2DTL | * | 116,760 | 416 | 47 | 163 |
| *DL2VB | * | 114,595 | 394 | 43 | 162 |
| *DL6GV | * | 113,646 | 357 | 43 | 143 |
| *DFØIT | * | 111,300 | 501 | 34 | 178 |
| | | | (OP: DF6QC) | | |
| *DL1DXF | * | 108,192 | 357 | 39 | 185 |
| *DF6WE | * | 105,165 | 407 | 37 | 168 |
| *DL8ULO | * | 101,773 | 400 | 45 | 172 |
| *DC8SG | * | 101,700 | 372 | 46 | 180 |
| *DK7GH | * | 101,268 | 374 | 37 | 157 |
| *DLØDWD | * | 100,947 | 479 | 33 | 176 |
| | | | (OP: DF6QC) | | |
| *DF2FM | * | 99,484 | 318 | 49 | 160 |
| *DL7VX | * | 98,255 | 440 | 33 | 182 |
| *DH2PL | * | 92,974 | 310 | 46 | 183 |
| *DL6EAQ | * | 92,191 | 344 | 38 | 149 |
| *DL4DBM | * | 91,332 | 264 | 39 | 133 |
| *DL6NAL | * | 90,688 | 407 | 39 | 179 |
| *DK7MCX | * | 89,864 | 416 | 40 | 148 |
| *DGØCC | * | 87,234 | 397 | 39 | 162 |
| *DF3IS | * | 84,189 | 339 | 45 | 166 |
| *DL8HCO | * | 82,386 | 322 | 40 | 167 |
| *DL7FA | * | 81,672 | 360 | 27 | 137 |
| *DL7ULM | * | 79,560 | 330 | 39 | 141 |
| *DO9ST | * | 78,560 | 419 | 30 | 130 |
| *DL3SCN | * | 76,018 | 338 | 33 | 158 |
| *DK7FP | * | 75,168 | 330 | 33 | 141 |
| *DG1FBP | * | 73,071 | 269 | 45 | 162 |
| *DK5LF | * | 70,499 | 356 | 39 | 148 |
| *DH3RB | * | 69,120 | 306 | 33 | 127 |
| *DD1RB | * | 68,499 | 381 | 33 | 144 |
| *DL1JGG | * | 67,936 | 354 | 41 | 152 |
| *DH3MAY | * | 67,818 | 317 | 36 | 142 |
| *DL8AAM | * | 67,200 | 202 | 45 | 195 |
| *DL3KVR | * | 64,777 | 237 | 47 | 164 |
| *DK1ROB | * | 64,656 | 272 | 34 | 110 |
| *DKØGV | * | 63,135 | 244 | 40 | 143 |
| | | | (OP: DF5AN) | | |
| *DRØT | * | 63,072 | 235 | 42 | 104 |
| | | | (OP: DH5HV) | | |
| *DL4MNG | * | 60,800 | 321 | 30 | 130 |
| *DL8UGF | * | 58,800 | 307 | 34 | 141 |
| *DL8ZAJ | * | 58,310 | 264 | 35 | 135 |
| *DL1VJL | * | 55,900 | 183 | 47 | 125 |
| *DK1TS | * | 54,766 | 246 | 34 | 105 |
| *DL5JSP | * | 53,785 | 147 | 50 | 105 |
| *DL4KUG | * | 52,870 | 237 | 39 | 131 |
| *DG6OAG | * | 52,185 | 227 | 35 | 112 |
| *DF5LR | * | 52,124 | 305 | 30 | 127 |
| *DL8CKL | * | 51,428 | 222 | 41 | 131 |
| *DO6SR | * | 48,601 | 393 | 15 | 116 |
| *DK6BT | * | 45,999 | 204 | 37 | 134 |
| *DL1DBR | * | 43,935 | 228 | 30 | 115 |
| *DL2AL | * | 42,924 | 232 | 32 | 115 |
| *DK6RF | * | 42,334 | 181 | 35 | 87 |
| *DK6AY | * | 41,613 | 207 | 34 | 109 |
| *DM2GFN | * | 40,736 | 171 | 34 | 100 |
| *DL5SDK | * | 39,960 | 266 | 28 | 120 |
| *DO1HGS | * | 39,690 | 158 | 35 | 127 |
| *DF7GG | * | 38,771 | 166 | 32 | 105 |
| *DL2IAN | * | 38,688 | 155 | 47 | 109 |
| *DM5LK | * | 36,504 | 320 | 26 | 130 |
| *DL8YR | * | 36,408 | 231 | 29 | 135 |
| *DF2PH | * | 35,052 | 214 | 28 | 99 |
| *DL9ZWG | * | 34,224 | 166 | 38 | 100 |
| *DL5MO | * | 34,126 | 164 | 31 | 120 |
| *DO9PL | * | 33,600 | 281 | 20 | 92 |
| *DL7UXG | * | 33,276 | 207 | 28 | 113 |
| *DH6BH | * | 30,654 | 187 | 37 | 94 |
| *DL3ZAI | * | 29,998 | 222 | 21 | 85 |
| *DG8YHO | * | 29,960 | 251 | 25 | 115 |
| *DC8WPA | * | 28,750 | 221 | 29 | 96 |
| *DRØR | * | 27,972 | 161 | 30 | 81 |
| | | | (OP: DK2DQ) | | |
| *DJ8RS | * | 27,846 | 102 | 33 | 86 |
| *DL7EF | * | 27,216 | 266 | 33 | 129 |
| *DK7TM | * | 25,397 | 238 | 23 | 86 |
| *DC2KN | * | 23,562 | 148 | 32 | 87 |
| *DG6DAF | * | 21,460 | 128 | 33 | 83 |
| *DL5ZB | * | 20,064 | 106 | 35 | 97 |
| *DK4DS | * | 19,090 | 116 | 29 | 86 |
| *DH1OK | * | 17,340 | 142 | 25 | 77 |
| *DL8JDX | * | 15,965 | 91 | 29 | 74 |
| *DG4YGW | * | 15,900 | 135 | 26 | 74 |
| *DO1SKJ | * | 15,792 | 150 | 18 | 66 |
| *DJ6XV | * | 15,770 | 115 | 23 | 72 |
| *DL3BRA | * | 15,219 | 193 | 15 | 74 |
| *DL1NSG | * | 15,012 | 152 | 31 | 77 |
| *DO6TPG | * | 14,110 | 101 | 21 | 64 |
| *DO3UWE | * | 13,923 | 142 | 20 | 71 |
| *DL4EBW | * | 13,800 | 113 | 27 | 73 |
| *DJ6UP | * | 13,230 | 132 | 26 | 72 |
| *DL2HRK | * | 12,995 | 176 | 24 | 89 |
| *DO9RE | * | 12,954 | 180 | 21 | 81 |
| *DD8EJ | * | 12,576 | 103 | 25 | 71 |
| *DL8ZVG | * | 12,519 | 116 | 27 | 80 |
| *DL5DSA | * | 11,900 | 88 | 34 | 66 |
| *DO1CDE | * | 11,165 | 135 | 21 | 56 |
| *DM2AJK | * | 11,100 | 119 | 18 | 56 |
| *DO2SMJ | * | 10,921 | 91 | 12 | 55 |
| *DO2MS | * | 10,665 | 105 | 17 | 62 |
| *DJ2IA | * | 10,192 | 86 | 27 | 64 |
| *DL2ZA | * | 10,176 | 121 | 21 | 75 |
| *DO3ME | * | 10,010 | 96 | 20 | 57 |
| *DO1KUB | * | 9,360 | 114 | 14 | 64 |
| *DD8IU | * | 9,216 | 123 | 15 | 57 |
| *DK8AF | * | 9,114 | 72 | 23 | 39 |
| *DL1VTL | * | 8,881 | 102 | 23 | 60 |
| *DJ6TB | * | 8,701 | 83 | 23 | 54 |
| *DL6UAM | * | 8,418 | 116 | 13 | 48 |
| *DC2ZL | * | 7,182 | 90 | 17 | 46 |
| *DO6AL | * | 6,720 | 95 | 15 | 49 |
| *DL2ASK | * | 6,570 | 95 | 22 | 68 |
| *DO7DU | * | 6,320 | 74 | 20 | 60 |
| *DL2EF | * | 6,204 | 93 | 18 | 48 |
| *DO1DJJ | * | 5,985 | 99 | 14 | 43 |
| *DO3AH | * | 5,780 | 80 | 16 | 52 |
| *DO6GZ | * | 5,150 | 82 | 13 | 37 |
| *DG2NMH | * | 4,982 | 100 | 25 | 69 |
| *DL2FJK | * | 4,968 | 51 | 16 | 38 |
| *DG1LS | * | 4,312 | 58 | 19 | 37 |
| *DG5LM | * | 4,002 | 51 | 17 | 41 |
| *DL8UAT | * | 3,504 | 31 | 20 | 28 |
| *DJ2XC | * | 3,192 | 51 | 16 | 41 |
| *DL3APM | * | 3,100 | 30 | 22 | 28 |
| *DK9IP | * | 2,891 | 34 | 19 | 30 |
| *DL2SWN | * | 2,604 | 26 | 18 | 24 |
| *DK4QT | * | 2,516 | 41 | 13 | 21 |
| *DL4NTC | * | 2,408 | 37 | 14 | 29 |
| *DL1ARD | * | 2,392 | 47 | 13 | 33 |
| *DL7CU | * | 1,702 | 39 | 11 | 26 |
| *DL9FB | * | 1,600 | 56 | 14 | 36 |
| *DC2TOM | * | 1,360 | 26 | 11 | 23 |
| *DO5AWE | * | 1,221 | 46 | 5 | 32 |
| *DO9KT | * | 1,056 | 38 | 7 | 25 |
| *DJ3AK | * | 540 | 19 | 6 | 14 |
| *DL8DXL | * | 435 | 20 | 10 | 19 |
| *DL2WJT | * | 418 | 16 | 6 | 13 |
| *DL1XAS | * | 399 | 18 | 7 | 14 |
| *DL8MKG | * | 336 | 9 | 7 | 9 |
| *DO2KJ | * | 273 | 17 | 7 | 14 |
| *DL2YED | * | 255 | 11 | 7 | 10 |
| *DD4MS | * | 100 | 9 | 3 | 8 |
| *DL5EE | * | 77 | 7 | 4 | 7 |
| *DL2DYL | * | 54 | 11 | 8 | 10 |
| *DL8DWW | * | 50 | 6 | 4 | 6 |
| *DL2BMH | * | 25 | 19 | 8 | 17 |
| **DH8BQA** | **28** | **54,004** | **489** | **14** | **78** |
| ***DJ1ZU** | **"** | **26,196** | **285** | **14** | **60** |
| *DL7DZ | * | 11,946 | 126 | 15 | 51 |
| *DJ6BQ | * | 5,292 | 67 | 12 | 37 |
| *DL9NEI | * | 4,368 | 104 | 6 | 36 |
| *DB4SP | * | 3,813 | 91 | 9 | 32 |
| *DL5ANS | * | 1,300 | 48 | 5 | 21 |
| ***DL1EFD** | **21** | **148,911** | **545** | **26** | **121** |
| *DO1CS | * | 7,965 | 103 | 13 | 46 |
| *DG1DRS | * | 1,736 | 43 | 7 | 24 |
| ***DL9URZ** | **14** | **150,632** | **639** | **32** | **120** |
| *DL9LM | * | 44,910 | 371 | 17 | 73 |
| *DH2UHF | * | 34,865 | 274 | 18 | 77 |
| *DL1AL | * | 27,470 | 253 | 16 | 66 |
| *DL1AIW | * | 9,381 | 123 | 12 | 47 |
| *DL5SWB | * | 3,240 | 89 | 5 | 31 |
| *DL2IH | * | 1,020 | 31 | 5 | 25 |
| *DH5WB | * | 504 | 18 | 5 | 16 |
| *DL7LZ | * | 399 | 17 | 6 | 13 |
| *DM5OKR | * | 336 | 53 | 6 | 36 |
| *DL6UAA | 3.7 | 3,458 | 92 | 5 | 33 |
| ***DL2VSF** | **1.8** | **3,999** | **97** | **5** | **38** |
| | | **Gibraltar** | | | |
| ***ZB3B** | **A** | **312** | **8** | **6** | **7** |
| | | **Greece** | | | |
| **SV1GRD** | **A** | **165,880** | **459** | **58** | **202** |
| SV1DPI | * | 1,680 | 30 | 15 | 27 |
| **SX1L** | **14** | **359,709** | **2074** | **32** | **115** |
| | | | (OP: SV1JCZ) | | |
| **J43J** | **3.7** | **33,957** | **379** | **11** | **66** |
| | | | (OP: DJ5JH) | | |
| ***SV4LBA** | **A** | **18,450** | **167** | **20** | **62** |
| ***SV1UT** | **21** | **89,880** | **511** | **28** | **92** |
| *SVØXBA | * | 50,544 | 291 | 25 | 79 |
| | | **Guernsey** | | | |
| ***MUØGSY** | **A** | **375,705** | **1167** | **45** | **208** |
| | | **Hungary** | | | |
| **HA3FT** | **28** | **13,838** | **203** | **19** | **55** |
| **HA3GJ** | **21** | **49,532** | **301** | **29** | **87** |
| HA3FRE | * | 2,021 | 58 | 13 | 30 |
| ***HA3DMF** | **A** | **158,079** | **522** | **47** | **190** |
| *HA3OU | * | 114,862 | 431 | 44 | 183 |
| *HA2MN | * | 77,850 | 390 | 35 | 138 |
| *HA7AVU | * | 66,928 | 294 | 38 | 150 |
| *HA7YS | * | 17,952 | 165 | 28 | 74 |
| *HG3FMZ | * | 5,576 | 79 | 22 | 46 |
| ***HA8TP** | **28** | **30,600** | **346** | **14** | **61** |
| ***HG4F** | **14** | **164,197** | **1057** | **28** | **93** |
| | | | (OP: HA4FF) | | |
| *HA7NK | * | 35,770 | 263 | 20 | 78 |
| *HA2QW | * | 4,472 | 95 | 11 | 41 |
| ***HA8BE** | **7** | **16,068** | **171** | **18** | **60** |
| *HG5Y | 1.8 | 609 | 30 | 3 | 18 |
| | | | (OP: HA1CW) | | |
| | | **Iceland** | | | |
| **TF3AM** | **A** | **36,190** | **247** | **27** | **83** |
| TF3CW | 3.7 | 1,080 | 40 | 6 | 24 |
| ***TF8GX** | **A** | **18,768** | **155** | **25** | **77** |
| ***TF3DC** | **21** | **4,305** | **86** | **10** | **31** |
| | | **Ireland** | | | |
| **EI9FVB** | **A** | **130,356** | **418** | **40** | **164** |
| **EI4CF** | **21** | **199,801** | **1166** | **21** | **98** |
| **EI9HX** | **14** | **332,718** | **1644** | **31** | **107** |
| **EI2JD** | **1.8** | **36,084** | **614** | **8** | **54** |
| ***EI7CC** | **A** | **265,104** | **669** | **51** | **212** |
| *EI4GXB | * | 133,860 | 310 | 55 | 139 |
| *EI4HQ | * | 40,866 | 240 | 28 | 111 |
| *EI4II | * | 36,608 | 210 | 31 | 97 |
| *EI4GAB | * | 16,800 | 139 | 19 | 56 |
| *EI3GYB | 1.8 | 3,162 | 90 | 5 | 29 |
| | | **Isle of Man** | | | |
| **MDØCCE** | **A** | **907,578** | **1515** | **80** | **361** |
| MD9Y | * | 90,440 | 406 | 30 | 89 |
| | | | (OP: GD3YUM) | | |
| | | **Italy** | | | |
| **II4A** | **A** | **2,206,274** | **2860** | **104** | **375** |
| | | | (OP: IK4ADE) | | |
| **IK2DZN** | **"** | **1,447,446** | **2089** | **91** | **338** |
| **IZ8CKT** | **"** | **1,265,660** | **1740** | **104** | **380** |
| IK2UCK | * | 609,000 | 996 | 80 | 326 |
| IV3UTV | * | 499,410 | 1179 | 61 | 218 |
| IR2A | * | 399,630 | 1281 | 35 | 138 |
| | | | (OP: I2UIY) | | |
| IK1JJM | * | 319,516 | 725 | 63 | 239 |
| IV3UHL | * | 318,496 | 853 | 59 | 237 |
| IK2SGB | * | 307,197 | 572 | 69 | 252 |
| IKØXBX | * | 294,954 | 507 | 75 | 252 |
| IK1PMR | * | 144,336 | 317 | 48 | 200 |
| IK2SAU | * | 113,490 | 265 | 56 | 235 |
| IW4EIQ | * | 100,749 | 249 | 55 | 158 |
| IWØHLZ | * | 81,880 | 363 | 48 | 136 |
| IWØBCF | * | 77,865 | 290 | 42 | 103 |
| IZ8GNH | * | 76,006 | 318 | 42 | 136 |
| IZØBVU | * | 61,656 | 221 | 50 | 118 |
| IZ5ILK | * | 44,688 | 185 | 46 | 101 |
| IN3IZT | * | 30,989 | 194 | 30 | 103 |
| IK2IKW | * | 25,284 | 148 | 32 | 97 |
| IZ5ILQ | * | 12,460 | 97 | 26 | 63 |
| I4YUG | * | 6,300 | 75 | 19 | 51 |
| IW3SRC | * | 3,306 | 66 | 14 | 44 |
| IX1CVF | * | 740 | 36 | 10 | 27 |
| **IZØDXI** | **28** | **12,798** | **140** | **17** | **62** |
| **IZ8DPL** | **21** | **487,859** | **1514** | **36** | **127** |
| IZ7CDB | * | 672 | 30 | 5 | 11 |
| **IR5T** | **14** | **663,168** | **2208** | **37** | **139** |
| | | | (OP: IK5ORP) | | |
| **IR2M** | **"** | **526,492** | **1865** | **35** | **137** |
| | | | (OP: IZ2FDU) | | |
| IR4B | * | 364,536 | 1288 | 36 | 130 |
| | | | (OP: IK4AUY) | | |
| IW5ELR | * | 68,052 | 401 | 22 | 85 |
| IKØPHY | * | 21,090 | 173 | 16 | 58 |
| IW1GGN | * | 72 | 4 | 3 | 3 |
| **IK4SPB** | **3.7** | **72,555** | **661** | **17** | **88** |
| IR2W | * | 46,376 | 516 | 15 | 73 |
| | | | (OP: IK2EGL) | | |
| IZ1BII | 1.8 | 5,246 | 69 | 7 | 54 |
| IV3BKH | 1.8 | 270 | 10 | 6 | 9 |
| ***IZ2FOS** | **A** | **2,108,160** | **2644** | **114** | **462** |
| ***IZ6ERS** | **"** | **513,468** | **1549** | **65** | **241** |
| ***IZ3KKE** | **"** | **471,615** | **813** | **79** | **266** |
| *IK6OIN | * | 440,067 | 740 | 85 | 298 |
| *IZ8FFA | * | 436,248 | 857 | 74 | 258 |
| *IZ5ICH | * | 309,918 | 773 | 67 | 215 |
| *IZØEHL | * | 272,490 | 582 | 65 | 228 |
| *IK2QLX | * | 248,064 | 601 | 59 | 213 |
| *IK3SSJ | * | 181,388 | 487 | 61 | 213 |
| *IV3KFB | * | 153,720 | 845 | 41 | 142 |
| *IZ5JMZ | * | 151,636 | 411 | 52 | 175 |
| *IWØGYC | * | 139,893 | 454 | 48 | 173 |
| *IK4QJF | * | 119,566 | 410 | 47 | 144 |
| *IZ2EAS | * | 117,117 | 448 | 37 | 132 |
| *IZ8FBU | * | 115,000 | 404 | 46 | 154 |
| *IZ3GNG | * | 109,837 | 378 | 48 | 173 |
| *IZ2JPN | * | 108,080 | 348 | 43 | 150 |
| *IV3JCC | * | 108,030 | 336 | 52 | 143 |
| *IZ2BKA | * | 104,413 | 311 | 48 | 145 |
| *IZØGYP | * | 104,076 | 313 | 47 | 149 |
| *IZ5ILU | * | 103,680 | 400 | 43 | 149 |
| *IZ6BTN | * | 103,530 | 352 | 40 | 174 |
| *IK2YSJ | * | 102,500 | 431 | 37 | 168 |
| *IZ3GFZ | * | 93,951 | 308 | 50 | 169 |
| *IZ2JCD | * | 91,014 | 350 | 49 | 148 |
| *IK5FKF | * | 86,664 | 329 | 38 | 146 |
| *IØFWD | * | 83,640 | 379 | 42 | 128 |
| | | | (OP: IZØFWD) | | |
| *IK3UNA | * | 83,536 | 323 | 40 | 144 |
| *IZ3EAX | * | 81,900 | 294 | 38 | 118 |
| *IZ8FEW | * | 71,825 | 239 | 57 | 164 |
| *IW2MYH | * | 66,960 | 287 | 44 | 142 |
| *IZ2GTO | * | 62,626 | 292 | 37 | 136 |
| *IK2HLM | * | 60,698 | 256 | 39 | 139 |
| *IR8E | * | 58,996 | 313 | 37 | 135 |
| | | | (OP: IK8PLE) | | |
| *IK7NXU | * | 54,524 | 266 | 41 | 131 |
| *IK6UBY | * | 52,812 | 234 | 38 | 125 |
| *IZ5HPQ | * | 48,498 | 212 | 40 | 97 |
| *IZ1GLX | * | 45,360 | 284 | 36 | 104 |
| *IZ2KPI | * | 41,480 | 211 | 36 | 100 |
| *IZ8IYN | * | 38,760 | 214 | 33 | 119 |
| *IK7SBU | * | 38,080 | 179 | 29 | 83 |
| *IZ5IJY | * | 37,791 | 217 | 35 | 118 |
| *IK2REA | * | 35,464 | 225 | 33 | 91 |
| *IK2VUC | * | 35,245 | 191 | 35 | 98 |
| *IZ1KGY | * | 34,456 | 195 | 34 | 112 |
| *IZØCEZ | * | 31,600 | 201 | 24 | 76 |
| *IZ5HSK | * | 30,855 | 163 | 28 | 93 |
| *IZ8FTW | * | 30,624 | 194 | 31 | 85 |
| *IZ6CLN | * | 28,224 | 319 | 16 | 80 |
| *IZ3MSK | * | 25,252 | 187 | 26 | 92 |
| *II1W | * | 25,004 | 189 | 23 | 53 |
| *IZ2EEV | * | 24,426 | 178 | 28 | 90 |
| *IKØESW | * | 23,391 | 129 | 34 | 79 |
| *IK2WFN | * | 22,149 | 144 | 26 | 81 |
| *IZ2FME | * | 20,988 | 145 | 32 | 67 |
| *IW7ECA | * | 20,196 | 146 | 29 | 79 |
| *IK7PTX | * | 20,048 | 123 | 29 | 83 |
| *IK8IFW | * | 18,590 | 123 | 30 | 80 |
| *IK3MLF | * | 15,336 | 98 | 34 | 74 |
| *IK2CFD | * | 13,825 | 101 | 24 | 55 |
| *IZØCGV | * | 13,600 | 92 | 21 | 64 |
| *IZ8DGR | * | 13,083 | 128 | 25 | 64 |
| *IZ2KRZ | * | 13,066 | 82 | 29 | 65 |
| *IZ4DIG | * | 12,720 | 95 | 25 | 55 |
| *IK2EBP | * | 12,719 | 106 | 21 | 58 |
| *IZ5BSA | * | 12,183 | 123 | 23 | 70 |
| *IZ3DVU | * | 10,512 | 88 | 21 | 51 |
| *IW2GRA | * | 9,877 | 99 | 19 | 64 |
| *IW4EQI | * | 9,717 | 86 | 21 | 58 |
| *IWØBLW | * | 9,225 | 75 | 28 | 47 |
| *IZ7FLP | * | 8,036 | 86 | 25 | 57 |
| *IZ5HQB | * | 7,475 | 90 | 21 | 44 |
| *IZ1DUG | * | 6,820 | 86 | 13 | 42 |
| *I2BZN | * | 5,785 | 85 | 14 | 51 |
| *IZ2GMT | * | 4,806 | 60 | 15 | 39 |
| *IK6VXO | * | 4,290 | 46 | 19 | 36 |
| *IW2NSE | * | 4,288 | 58 | 19 | 48 |
| *IK3XTY | * | 4,118 | 67 | 14 | 44 |
| *IK2YXP | * | 3,900 | 33 | 19 | 33 |
| *IZØGVR | * | 3,770 | 66 | 19 | 46 |
| *IZ8MBW | * | 3,675 | 34 | 19 | 30 |
| *IZ7KHR | * | 3,445 | 34 | 22 | 31 |
| *IZ1AOD | * | 3,355 | 70 | 15 | 46 |
| *IZ2GNQ | * | 3,068 | 35 | 21 | 31 |
| *IV3IDP | * | 2,856 | 68 | 12 | 44 |
| *IZ5DKR | * | 2,331 | 24 | 17 | 20 |
| *IK2SAE | * | 2,223 | 39 | 14 | 25 |
| *IZ2LTN | * | 1,472 | 33 | 11 | 21 |
| *IZ1DXS | * | 1,404 | 29 | 14 | 22 |
| *IK4XQT | * | 1,368 | 46 | 10 | 28 |
| *IZ2KXC | * | 986 | 26 | 9 | 25 |
| *IZ7EQX | * | 91 | 10 | 4 | 9 |
| *IK4WMH | * | 72 | 4 | 3 | 3 |
| *IK2SAV | * | 100 | 8 | 4 | 7 |
| ***IWØHBY** | **28** | **87,344** | **700** | **21** | **85** |
| *IZ5IMD | * | 6,579 | 77 | 15 | 36 |
| *IK5YJK | * | 703 | 36 | 4 | 15 |
| ***IW1QN** | **21** | **185,496** | **827** | **31** | **87** |
| *I2GPT | * | 139,635 | 557 | 31 | 114 |
| *IZ8IYX | * | 73,278 | 412 | 26 | 92 |
| *IZ8EPY | * | 45,920 | 250 | 29 | 83 |
| *IZ8DBJ | * | 44,928 | 256 | 29 | 88 |
| *IZ2LSC | * | 16,212 | 87 | 21 | 63 |
| *IK6ZKI | * | 12 | 3 | 2 | 2 |
| ***IQ8OM** | **14** | **394,267** | **1626** | **34** | **139** |
| *IZ8JAI | * | 68,676 | 422 | 25 | 93 |
| *IKØTUM | * | 51,467 | 290 | 23 | 84 |
| *IK2YGZ | * | 41,905 | 409 | 17 | 68 |
| *IW5ECP | * | 25,596 | 224 | 18 | 63 |
| *IZ8DWL | * | 16,002 | 217 | 11 | 52 |
| *IZ5GSV | * | 13,702 | 152 | 11 | 51 |
| *IZ2JQP | * | 11,214 | 119 | 15 | 48 |
| *IZ1GQI | * | 10,659 | 118 | 12 | 45 |
| *IW2ENA | * | 6,405 | 67 | 17 | 44 |
| *IZ3GYS | * | 6,069 | 78 | 14 | 37 |
| *IZ8CLM | * | 1,200 | 27 | 7 | 18 |
| *IZ3JKI | * | 672 | 32 | 5 | 16 |
| ***IZ3FJZ** | **7** | **183,680** | **1041** | **32** | **96** |
| *IZ5DKJ | * | 77,480 | 438 | 27 | 103 |
| *IW4EGX | * | 3,690 | 88 | 6 | 35 |
| *IZ6IMN | * | 2,457 | 59 | 7 | 32 |
| *IN3JRZ | * | 858 | 46 | 3 | 19 |
| ***IR5B** | **3.7** | **31,428** | **436** | **13** | **68** |
| *IZ1GJH | * | 1,026 | 36 | 5 | 22 |
| ***IO1T** | **1.8** | **85,262** | **955** | **14** | **75** |
| | | | (OP: IK1RQT) | | |
| | | **Kaliningrad** | | | |
| **UA2CZ** | **A** | **274,772** | **811** | **54** | **238** |
| RV2FW | * | 92,742 | 284 | 55 | 191 |
| ***RK2FXG** | **21** | **7,300** | **112** | **9** | **41** |
| ***UA2FT** | **1.8** | **28,917** | **448** | **8** | **55** |
| | | **Latvia** | | | |
| **YL6W** | **A** | **981,585** | **1410** | **105** | **390** |
| | | | (OP: YL2GD) | | |
| YL7A | * | 71,806 | 277 | 37 | 124 |
| | | | (OP: YL2GM) | | |
| **YL2BJ** | **14** | **156,676** | **975** | **29** | **102** |
| **YL2PP** | **1.8** | **12,712** | **225** | **7** | **49** |
| ***YL2CR** | **A** | **99,522** | **442** | **36** | **158** |
| ***YL3AD** | **"** | **99,386** | **401** | **37** | **180** |
| *YL2PJ | * | 94,864 | 376 | 34 | 162 |
| *YL2TQ | * | 78,561 | 376 | 35 | 168 |
| *YL2IP | * | 40,880 | 253 | 32 | 108 |
| *YL2II | * | 17,316 | 147 | 24 | 87 |
| *YL2KF | * | 1,330 | 26 | 12 | 23 |
| ***YL3BZ** | **21** | **11,966** | **129** | **13** | **49** |
| ***YL5W** | **7** | **65,751** | **549** | **19** | **82** |
| | | | (OP: YL2GN) | | |
| | | **Lithuania** | | | |
| **LY9Y** | **A** | **1,971,327** | **2761** | **105** | **432** |
| | | | (OP: LY2CY) | | |
| LY3X | * | 179,465 | 630 | 49 | 202 |
| LY3CY | * | 160,489 | 587 | 37 | 190 |
| LY1CX | * | 107,334 | 500 | 40 | 138 |
| LY3UV | * | 59,006 | 342 | 30 | 133 |
| LY2VA | * | 25,600 | 131 | 30 | 98 |
| **LY2W** | **21** | **55,575** | **463** | **24** | **71** |
| **LY2FN** | **3.7** | **53,746** | **646** | **13** | **64** |
| LY7M | * | 3,956 | 73 | 9 | 37 |
| **LY2IJ** | **1.8** | **136,612** | **1279** | **15** | **83** |
| LY2OU | * | 45,962 | 658 | 9 | 58 |
| ***LY9A** | **A** | **1,499,496** | **2278** | **96** | **420** |
| | | | (OP: LY3BA) | | |
| ***LY4T** | **"** | **567,580** | **1221** | **65** | **305** |
| *LY2MM | * | 355,005 | 821 | 63 | 282 |
| *LY4Q | * | 282,012 | 983 | 53 | 231 |
| *LY2TS | * | 179,676 | 564 | 53 | 199 |
| *LY4DX | * | 137,676 | 533 | 40 | 191 |
| *LY2AE | * | 111,252 | 433 | 41 | 178 |
| *LY2OM | * | 110,334 | 460 | 49 | 164 |
| *LY2N | * | 86,299 | 353 | 44 | 167 |
| *LY4K | * | 73,628 | 391 | 32 | 126 |
| *LY2AT | * | 45,600 | 267 | 32 | 128 |
| *LY2OO | * | 42,250 | 239 | 35 | 134 |
| *LY1DJ | * | 36,120 | 235 | 25 | 115 |
| ***LY4B** | **28** | **1,440** | **55** | **4** | **26** |
| ***LY3QT** | **21** | **10,024** | **144** | **11** | **45** |
| ***LY6A** | **14** | **247,260** | **1148** | **33** | **123** |
| | | | (OP: LY2BM) | | |
| ***LY3S** | **3.7** | **10,050** | **212** | **8** | **42** |
| *LY2O | * | 5,750 | 119 | 7 | 39 |
| *LY4CW | * | 2,112 | 54 | 7 | 26 |
| ***LY1CM** | **1.8** | **4,512** | **116** | **6** | **42** |
| | | **Luxembourg** | | | |
| ***LX1KC** | **A** | **217,701** | **533** | **62** | **235** |
| *LX1HD | * | 104,060 | 552 | 34 | 138 |
| *LX/LY3Z | 14 | 80 | 6 | 4 | 6 |
| | | **Macedonia** | | | |
| **Z35G** | **A** | **107,604** | **400** | **39** | **157** |
| | | **Moldova** | | | |
| **ER1Q** | **3.7** | **169,176** | **1441** | **19** | **87** |
| ***ER5DX** | **A** | **684,110** | **1386** | **75** | **331** |
| ***ER1OO** | **28** | **7,260** | **154** | **7** | **37** |
| | | **Monaco** | | | |
| **3A2MG** | **A** | **101,472** | **453** | **52** | **172** |
| | | **Montenegro** | | | |
| **403A** | **A** | **5,825,955** | **5044** | **139** | **542** |
| ***4O/DD5FZ** | **1.8** | **45,360** | **656** | **8** | **62** |
| | | | (OP: DD5FZ) | | |
| | | **Netherlands** | | | |
| **PAØIJM** | **A** | **1,232,605** | **2858** | **70** | **295** |
| **PA3AAV** | **"** | **763,140** | **1054** | **98** | **362** |
| PAØJNH | * | 448,574 | 930 | 66 | 292 |
| PA4A | * | 294,060 | 824 | 61 | 229 |
| PA1TX | * | 247,604 | 643 | 49 | 190 |
| PA3GCV | * | 115,500 | 347 | 51 | 180 |
| PA1T | * | 95,304 | 254 | 53 | 156 |
| PAØLOU | * | 94,739 | 253 | 53 | 158 |
| PAØABM | * | 90,090 | 244 | 52 | 179 |
| PF5X | * | 50,925 | 200 | 35 | 70 |
| PA9DD | * | 26,592 | 137 | 32 | 64 |
| PAØLSK | * | 7,140 | 76 | 18 | 50 |
| PA1W | * | 2,255 | 43 | 13 | 28 |
| **PC5W** | **21** | **166,992** | **620** | **28** | **119** |
| ***PAØAGA** | **A** | **587,820** | **1397** | **62** | **241** |
| ***PD1DX** | **"** | **458,736** | **1013** | **69** | **235** |
| *PG7V | * | 410,589 | 923 | 58 | 275 |
| *PA8KW | * | 307,499 | 635 | 68 | 263 |
| *PF9A | * | 251,160 | 682 | 51 | 222 |
| *PA1PT | * | 114,016 | 474 | 44 | 180 |
| *PAØCOR | * | 106,169 | 382 | 45 | 158 |
| *PA7RA | * | 105,350 | 393 | 37 | 138 |
| *PA3FMC | * | 103,037 | 392 | 42 | 167 |
| *PA2W | * | 100,500 | 388 | 40 | 161 |
| *PD2J | * | 98,280 | 510 | 27 | 141 |
| *PA2C | * | 92,550 | 348 | 34 | 116 |
| *PE1LTY | * | 80,538 | 301 | 44 | 142 |
| *PHØAS | * | 48,169 | 182 | 34 | 117 |
| *PG2D | * | 46,599 | 251 | 30 | 117 |
| *PE2JMR | * | 46,240 | 247 | 31 | 129 |
| *PAØB | * | 46,150 | 303 | 23 | 119 |
| *PAØDVM | * | 42,900 | 160 | 40 | 103 |
| *PE4BAS | * | 41,454 | 198 | 40 | 107 |
| *PA3ADJ | * | 40,866 | 203 | 33 | 106 |
| *PD5LO | * | 36,663 | 288 | 23 | 98 |
| *PD7BZ | * | 31,130 | 166 | 26 | 84 |
| *PA3EWG | * | 30,702 | 199 | 27 | 102 |
| *PG1R | * | 30,464 | 203 | 29 | 107 |
| *PA3AQU | * | 29,120 | 206 | 25 | 115 |
| *PA3DBS | * | 26,559 | 230 | 23 | 94 |
| *PDØHF | * | 22,896 | 177 | 26 | 82 |
| *PA3AM | * | 21,186 | 161 | 28 | 79 |
| *PAØCGB | * | 17,010 | 177 | 16 | 65 |
| *PA3GBI | * | 14,691 | 109 | 24 | 59 |
| *PA3HGF | * | 12,699 | 108 | 22 | 61 |
| *PA7PYR | * | 9,715 | 100 | 20 | 47 |
| *PAØFAW | * | 8,112 | 97 | 16 | 62 |
| *PA2CVD | * | 7,668 | 100 | 16 | 55 |
| *PA1PAT | * | 7,300 | 97 | 18 | 55 |
| *PAØRBO | * | 6,966 | 107 | 20 | 61 |
| *PA5KT | * | 3,658 | 51 | 17 | 42 |
| *PA4HF | * | 2,739 | 34 | 15 | 18 |
| *PA1GS | * | 1,800 | 34 | 14 | 31 |
| ***PAØMIR** | **28** | **6,500** | **103** | **9** | **41** |
| *PAØRRS | * | 5,124 | 110 | 6 | 36 |
| ***PE2HD** | **21** | **24,072** | **200** | **15** | **53** |
| ***PA1WLB** | **14** | **10,258** | **188** | **10** | **36** |
| ***PA4JJ** | **1.8** | **9,660** | **209** | **6** | **40** |
| | | **Northern Ireland** | | | |
| **MIØLLL** | **A** | **4,656,816** | **4383** | **113** | **471** |
| GI4VIV | * | 425,700 | 660 | 77 | 319 |
| ***MIØJZZ** | **A** | **453,260** | **1341** | **51** | **211** |
| ***GIØKVQ** | **"** | **335,766** | **915** | **48** | **166** |
| *GI7AXB | * | 303,776 | 988 | 38 | 138 |
| *GI4SJQ | * | 128,961 | 415 | 46 | 161 |
| *GI4AAM | * | 102,935 | 492 | 36 | 137 |
| *MI3OZX | * | 27,784 | 212 | 22 | 70 |
| *GI4JTF | * | 23,504 | 158 | 29 | 84 |

| | | | | | | |
|---|---|---|---|---|---|---|
| *SP9DTE | * | 98,490 | 412 | 37 | 173 | |
| *SP2ØVQ | * | 82,944 | 349 | 39 | 177 | |
| *SP6LUV | * | 81,536 | 247 | 51 | 157 | |
| *SP2EWQ | * | 76,744 | 356 | 30 | 151 | |
| *SP3JHY | * | 71,912 | 297 | 44 | 134 | |
| *SP8LNE | * | 70,680 | 337 | 37 | 149 | |
| *SP5ELW | * | 69,144 | 214 | 57 | 144 | |
| *SP6OPZ | * | 65,076 | 388 | 28 | 146 | |
| *SP8ONB | * | 64,728 | 312 | 34 | 140 | |
| *SQ9DIE | * | 63,732 | 303 | 34 | 154 | |
| *SN4ØZDS | * | 57,960 | 371 | 32 | 136 | |
| *SQ9FCH | * | 57,600 | 362 | 30 | 130 | |
| *SP9CLU | * | 55,939 | 237 | 38 | 131 | |
| *SP9FT | * | 52,248 | 280 | 38 | 130 | |
| *SP9IBJ | * | 50,880 | 299 | 30 | 130 | |
| *SP5ELM | * | 49,714 | 322 | 22 | 112 | |
| *SP8HXN | * | 48,675 | 233 | 40 | 125 | |
| *SN8J | * | 46,292 | 219 | 45 | 118 | |
| *SP9BMH | * | 40,565 | 242 | 25 | 108 | |
| *SP8BRE | * | 36,288 | 166 | 29 | 79 | |
| *SP9LAS | * | 34,050 | 194 | 33 | 117 | |
| *SP7TEX | * | 33,891 | 218 | 32 | 111 | |
| *SP2GCE | * | 33,540 | 229 | 27 | 103 | |
| *SP4ICD | * | 30,988 | 226 | 24 | 98 | |
| *SP4Z | * | 29,792 | 137 | 37 | 96 | |
| *SP3IOE | * | 27,816 | 158 | 28 | 86 | |
| *SQ8LSC | * | 25,160 | 98 | 46 | 90 | |
| *SP8NR | * | 24,250 | 155 | 35 | 90 | |
| *SP2ILQ | * | 23,324 | 190 | 27 | 92 | |
| *SP2DKI | * | 20,648 | 137 | 26 | 90 | |
| *SN9N | * | 19,166 | 199 | 19 | 55 | (OP: SQ9ZM) |
| *SQ8T | * | 18,096 | 106 | 30 | 86 | |
| *SP9IKN | * | 16,999 | 171 | 37 | 90 | |
| *SP1TMG | * | 15,573 | 140 | 16 | 71 | |
| *SP3BVI | * | 15,400 | 134 | 23 | 77 | |
| *SP6NVK | * | 14,025 | 157 | 17 | 58 | |
| *SP7TES | * | 13,858 | 77 | 25 | 57 | |
| *SQ1FYX | * | 13,464 | 114 | 20 | 68 | |
| *SQ8AQD | * | 12,927 | 57 | 37 | 56 | |
| *3Z8Z | * | 11,234 | 91 | 26 | 56 | (OP: SP8AJC) |
| *SP1DTG | * | 11,040 | 62 | 36 | 56 | |
| *SQ9IWS | * | 9,453 | 137 | 12 | 57 | |
| *SP4AVG | * | 8,968 | 100 | 19 | 57 | |
| *SP3DOF | * | 8,904 | 107 | 20 | 64 | |
| *SP5CJQ | * | 8,217 | 65 | 28 | 55 | |
| *SP3KPN | * | 7,972 | 74 | 26 | 56 | (OP: SP3GXU) |
| *SP6BEN | * | 7,425 | 56 | 24 | 51 | |
| *SP1YGL | * | 5,850 | 40 | 27 | 38 | (OP: SP1RWA) |
| *SP5XVW | * | 5,510 | 89 | 16 | 42 | |
| *SP9IHP | * | 4,845 | 43 | 18 | 33 | |
| *SP5DDF | * | 4,554 | 53 | 21 | 48 | |
| *SP8SW | * | 4,092 | 53 | 18 | 44 | |
| *SN5K | * | 3,213 | 44 | 20 | 43 | (OP: SQ5NF) |
| *SP6RGC | * | 2,880 | 49 | 14 | 31 | |
| *SP7CXV | * | 2,856 | 30 | 21 | 30 | |
| *SQ6LJA | * | 1,804 | 58 | 7 | 37 | |
| *SP6FIB | * | 1,280 | 29 | 13 | 19 | |
| *SQ3HTX | * | 1,170 | 49 | 4 | 22 | |
| *SP2HFH | * | 75 | 11 | 5 | 10 | |
| ***SP3LWP** | **28** | **54,720** | **471** | **20** | **75** | |
| ***SQ9CNN** | **"** | **26,832** | **243** | **15** | **71** | |
| *SP5LCC | * | 23,332 | 230 | 15 | 61 | |
| *SQ9IAU | * | 6,688 | 133 | 7 | 37 | |
| *SP6EF | * | 6,344 | 88 | 12 | 40 | |
| *SP4DC | * | 2,448 | 69 | 6 | 30 | |
| *SP6EIY | * | 990 | 45 | 9 | 21 | |
| *SP8LZC | * | 882 | 26 | 7 | 14 | |
| ***SO9L** | **21** | **189,696** | **796** | **33** | **123** | |
| | | | | | | (OP: SP9UML) |
| *SQ4HRN | * | 75,636 | 346 | 28 | 104 | |
| *SP2EXN | * | 69,875 | 310 | 27 | 98 | |
| *SN9U | * | 39,260 | 127 | 29 | 101 | (OP: SP9UMJ) |
| *SP3LAU | * | 22,327 | 138 | 22 | 61 | |
| *SP9MRK | * | 15,876 | 141 | 18 | 63 | |
| *SP2AVE | * | 12,456 | 94 | 15 | 57 | |
| ***SP9IEK** | **14** | **73,931** | **441** | **24** | **97** | |
| ***SP9EML** | **"** | **69,122** | **459** | **26** | **81** | |
| *SP9DNO | * | 50,611 | 310 | 21 | 86 | |
| *SQ3WW | * | 40,827 | 349 | 18 | 75 | |
| *SP2AYC | * | 36,800 | 308 | 18 | 74 | |
| *SP4FKS | * | 33,475 | 242 | 25 | 78 | |
| *SP4LVK | * | 29,842 | 261 | 17 | 69 | |
| *SPØPZK | * | 22,240 | 188 | 14 | 66 | (OP: SP2UKB) |
| *SP2KPD | * | 16,932 | 186 | 20 | 48 | |
| *SQ8JLU | * | 15,444 | 171 | 15 | 51 | |
| *SP5DRE | * | 11,426 | 161 | 9 | 49 | |
| *SP8OOB | * | 9,918 | 144 | 10 | 48 | |
| *SNØLOS | * | 2,052 | 28 | 9 | 27 | |
| *SP6FPY | * | 108 | 6 | 6 | 6 | |
| ***SO6V** | **7** | **142,440** | **1089** | **23** | **97** | |
| | | | | | | (OP: SP6DVP) |
| ***SN3X** | **"** | **112,454** | **865** | **23** | **95** | |
| | | | | | | (OP: SP3SLA) |
| *SP5NN | * | 1,269 | 47 | 5 | 22 | |
| ***SN9P** | **3.7** | **35,392** | **407** | **12** | **67** | |
| | | | | | | (OP: SQ9GAI) |
| ***SQ9CWO** | **"** | **33,932** | **489** | **10** | **58** | |
| *SP4SHD | * | 27,510 | 360 | 9 | 61 | |
| *SP3CYY | * | 19,359 | 218 | 14 | 67 | |
| *SP2PUT | * | 15,732 | 251 | 8 | 49 | |
| *SP8KEA | * | 14,136 | 239 | 8 | 49 | (OP: SP8LZC) |
| *SQ9HQ | * | 13,516 | 210 | 8 | 54 | |
| *SP8QJM | * | 11,656 | 298 | 7 | 40 | |
| *SP1RFC | * | 7,849 | 173 | 7 | 40 | |
| *SQ8IFG | * | 7,470 | 171 | 7 | 38 | |
| *SP3WYE | * | 4,860 | 110 | 8 | 37 | |
| *SQ6FHP | * | 1,161 | 56 | 4 | 23 | |
| *SP2QDY | * | 1,116 | 39 | 6 | 25 | |
| *SP7FBQ | * | 546 | 22 | 5 | 16 | |
| *SQ2EAH | * | 240 | 19 | 3 | 12 | |
| ***SP4XQN** | **1.8** | **43,026** | **598** | **9** | **62** | |
| *SP5CJY | * | 12,644 | 206 | 8 | 50 | |
| *SP4TVO | * | 1,458 | 54 | 4 | 23 | |

### Portugal

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|---|---|---|---|---|---|---|
| **CT1JLZ** | **14** | **1,145,700** | **3496** | **37** | **134** | |
| | | | | | | (OP: OK1RF) |
| CT1BNW | * | 40,194 | 215 | 20 | 79 | |
| ***CT6A** | **A** | **2,291,170** | **2331** | **97** | **364** | |
| | | | | | | (OP: CT1CJJ) |
| *CT2HWP | * | 187,922 | 554 | 50 | 167 | |
| *CT1ENQ | * | 182,766 | 537 | 52 | 197 | |
| *CT1FAC | * | 143,073 | 463 | 45 | 144 | |
| *CT1ETX | * | 40,768 | 302 | 21 | 70 | |
| *CT1FHL | * | 2,415 | 46 | 11 | 24 | |
| *CT2FQA | * | 1,400 | 57 | 16 | 40 | |
| *CT1DKS | * | 96 | 4 | 4 | 4 | |
| ***CT4HA** | **21** | **94,607** | **518** | **21** | **68** | |
| *CT1CQK | * | 33,672 | 160 | 26 | 66 | |
| ***CT1HZU** | **14** | **29,197** | **297** | **19** | **78** | |
| ***CT1DHM** | **7** | **61,160** | **430** | **18** | **92** | |
| *CT2GSN | * | 20,216 | 174 | 13 | 63 | |

### Romania

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|---|---|---|---|---|---|---|
| **YR1C** | **A** | **1,422,672** | **2445** | **94** | **334** | |
| | | | | | | (OP: YO4NA) |
| YO8RIJ | * | 202,096 | 674 | 65 | 207 | |
| YO7ARY | * | 193,280 | 650 | 51 | 205 | |
| YO3AK | * | 45,962 | 291 | 30 | 104 | (OP: N1MM) |
| YO2LFP | * | 28,320 | 227 | 29 | 91 | |
| YO4GNJ | * | 16,986 | 149 | 25 | 89 | |
| YO8OH | * | 6,138 | 58 | 18 | 46 | |
| YO7LTQ | * | 5,808 | 105 | 25 | 63 | |
| YO6ADW | * | 1,258 | 35 | 10 | 27 | |
| **YO4RDN** | **21** | **289,224** | **1209** | **34** | **122** | |
| **YO5OEF** | **1.8** | **40,880** | **587** | **11** | **62** | |
| ***YO3FRI** | **A** | **1,091,222** | **1575** | **96** | **418** | |
| ***YO3CZW** | **"** | **816,928** | **1712** | **78** | **322** | |
| *YO7LFV | * | 374,178 | 976 | 62 | 240 | |
| *YO2MAX | * | 199,692 | 633 | 57 | 201 | |
| *YO5PBF | * | 191,416 | 484 | 66 | 218 | |
| *YO7NW | * | 149,784 | 458 | 52 | 185 | |
| *YO5OHY | * | 134,090 | 503 | 46 | 184 | |
| *YO6BHN | * | 121,983 | 288 | 64 | 155 | |
| *YO5FMT | * | 99,684 | 434 | 41 | 172 | |
| *YO3DLK | * | 89,680 | 379 | 42 | 148 | |
| *YO8FZ | * | 82,824 | 329 | 40 | 128 | |
| *YO6AJI | * | 67,860 | 331 | 34 | 140 | |
| *YO3CVG | * | 50,478 | 221 | 41 | 138 | |
| *YO6MT | * | 45,149 | 273 | 30 | 121 | |
| *YO9BFM | * | 40,344 | 201 | 37 | 127 | |
| *YO9IKW | * | 33,517 | 111 | 42 | 79 | |
| *YO6HSU | * | 29,264 | 255 | 22 | 96 | |
| *YO6QT | * | 28,375 | 205 | 31 | 94 | |
| *YO2QY | * | 27,840 | 130 | 38 | 107 | |
| *YO8GF | * | 27,135 | 143 | 28 | 107 | |
| *YO3BL | * | 25,025 | 238 | 21 | 70 | |
| *YO2LXW | * | 23,736 | 176 | 30 | 99 | |
| *YO9KIB | * | 16,132 | 126 | 30 | 79 | |
| *YO8THG | * | 12,360 | 155 | 19 | 84 | |
| *YO6HVQ | * | 11,771 | 135 | 17 | 62 | |
| *YO9AFH | * | 10,148 | 111 | 25 | 61 | |
| *YO5PEZ | * | 8,424 | 131 | 17 | 64 | |
| *YO7LYM | * | 5,628 | 100 | 25 | 59 | |
| *YO5OET | * | 5,022 | 101 | 13 | 41 | |
| *YO8RZE | * | 4,875 | 93 | 20 | 55 | |
| *YO2CJX | * | 4,335 | 73 | 13 | 38 | |
| *YO5OYR | * | 1,175 | 43 | 13 | 34 | |
| *YO2GL | * | 682 | 19 | 13 | 18 | |
| ***YO2IS** | **28** | **9,894** | **178** | **8** | **43** | |
| *YO2LEE | * | 4,312 | 60 | 13 | 36 | |
| *YO9HJY | * | 405 | 17 | 5 | 10 | |
| ***YO5BRZ** | **21** | **81,606** | **453** | **31** | **103** | |
| *YO9BXC | * | 31,114 | 199 | 24 | 70 | |
| *YO5OED | * | 27,810 | 235 | 21 | 69 | |
| *YO3AIL | * | 18,758 | 132 | 22 | 61 | |
| ***YO9CWY** | **14** | **36,456** | **311** | **15** | **69** | |
| *YO7BGB | * | 8,700 | 162 | 11 | 49 | |
| *YO9AGI | * | 5,460 | 168 | 10 | 50 | |
| *YO4AYE | * | 4,361 | 88 | 7 | 42 | |
| *YO4CSL | * | 2,310 | 50 | 10 | 25 | |
| *YO2BPZ | * | 884 | 29 | 6 | 20 | |
| *YO9HI | * | 440 | 17 | 6 | 16 | |
| ***YO7MGG** | **7** | **4,488** | **214** | **13** | **53** | |
| ***YO5KDX** | **3.7** | **70,798** | **730** | **16** | **75** | |
| | | | | | | (OP: YO5BAT) |
| *YO9KPB | * | 2,886 | 81 | 7 | 30 | |

### Sardinia

| | | | | | | |
|---|---|---|---|---|---|---|
| **IMØ/IKØFMB** | **A** | **835,360** | **2320** | **53** | **177** | |
| | | | | | | (OP: IKØFMB) |
| **ISØT** | **14** | **597,744** | **2565** | **31** | **113** | |
| | | | | | | (OP: IN3ZNR) |
| ***ISØ/K7QB** | **A** | **1,443,520** | **2038** | **86** | **330** | |
| *ISØGRB | * | 181,975 | 571 | 48 | 203 | |
| *ISØLLJ | * | 123,848 | 422 | 45 | 181 | |
| *ISØMYN | * | 26,724 | 175 | 31 | 100 | |
| *ISØCLA | * | 2,250 | 37 | 16 | 29 | |

### Scotland

| | | | | | | |
|---|---|---|---|---|---|---|
| **GM7V** | **A** | **3,605,652** | **4175** | **109** | **455** | |
| GMØFGI | * | 101,374 | 444 | 34 | 148 | |
| GM3MZX | * | 47,652 | 219 | 31 | 101 | |
| **GMØEGI** | **21** | **54,324** | **240** | **21** | **87** | |
| ***GM4JYB** | **A** | **240,355** | **566** | **47** | **218** | |
| *GMØNBM | * | 24,750 | 232 | 20 | 90 | |
| ***GM7TUD** | **21** | **85,500** | **349** | **24** | **101** | |
| ***GMØIIO** | **14** | **93,524** | **780** | **20** | **83** | |
| *MMØGOR | * | 11,661 | 83 | 16 | 53 | |

### Serbia

| | | | | | | |
|---|---|---|---|---|---|---|
| **YT2AA** | **A** | **182,520** | **486** | **60** | **210** | |
| **YT1XN** | **28** | **18,906** | **196** | **14** | **55** | |
| **YTØZ** | **21** | **811,944** | **2443** | **38** | **141** | |
| | | | | | | (OP: YU1ZZ) |
| **YT3M** | **"** | **617,091** | **2059** | **35** | **138** | |
| | | | | | | (OP: YU1OJ) |
| YT7Z | * | 442,828 | 1700 | 30 | 119 | (OP: YU7SK) |
| **YT9A** | **14** | **989,800** | **3134** | **40** | **156** | |
| **YT1BB** | **"** | **873,318** | **3159** | **38** | **139** | |
| YU1TT | * | 242,400 | 1258 | 31 | 119 | |
| **YT8A** | **7** | **575,688** | **2449** | **34** | **132** | |
| | | | | | | (OP: YU1EA) |
| **YT3A** | **3.7** | **249,472** | **1645** | **25** | **103** | |
| | | | | | | (OP: YU7AV) |
| ***YU3A** | **A** | **889,720** | **1502** | **85** | **387** | |
| | | | | | | (OP: YT7TY) |
| ***YT5S** | **"** | **806,949** | **1830** | **72** | **291** | |
| | | | | | | (OP: YU1DO) |
| *YU1CC | * | 103,739 | 363 | 48 | 179 | |
| *YU7KM | * | 70,308 | 295 | 41 | 145 | |
| *YU7WI | * | 56,420 | 325 | 34 | 106 | |
| *YT1TA | * | 2,914 | 72 | 10 | 37 | |
| *YU1IZ | * | 736 | 22 | 8 | 15 | |
| ***YT7N** | **28** | **8,056** | **91** | **15** | **38** | |
| | | | | | | (OP: YU7QL) |
| ***4K7N** | **21** | **400,225** | **1372** | **35** | **140** | |
| | | | | | | (OP: YU7WW) |
| ***YU7ZZ** | **14** | **318,990** | **1572** | **34** | **121** | |
| ***YT1VP** | **"** | **220,252** | **984** | **33** | **125** | |
| *YU1EL | * | 65,780 | 417 | 23 | 92 | |
| *YT1B | * | 47,564 | 440 | 17 | 75 | (OP: YU1ADO) |
| *YU5GM | * | 19,053 | 230 | 17 | 56 | |
| *YT2SMS | * | 9,858 | 135 | 13 | 49 | |
| ***YUØU** | **3.7** | **81,810** | **894** | **14** | **76** | |
| ***YU7W** | **"** | **68,338** | **637** | **15** | **79** | |
| | | | | | | (OP: YT2CG) |
| *YT8T | * | 67,284 | 762 | 13 | 71 | |
| *YT9DX | * | 56,610 | 761 | 11 | 63 | |
| ***YZ8A** | **1.8** | **25,862** | **399** | **9** | **58** | |
| | | | | | | (OP: YT1AA) |

### Shetland Islands

| | | | | | | |
|---|---|---|---|---|---|---|
| **MMØXAU** | **21** | **14,880** | **205** | **10** | **52** | |
| **MM5PSL** | **14** | **6,844** | **120** | **12** | **47** | |
| MZ8A | 7 | 2,925 | 67 | 7 | 32 | (OP: MMØXAU) |
| **MSØZCG** | **1.8** | **2,320** | **73** | **4** | **25** | |
| | | | | | | (OP: MMØXAU) |

### Sicily

| | | | | | | |
|---|---|---|---|---|---|---|
| IT9XTP | A | 2,706 | 60 | 8 | 25 | |
| **IT9YVO** | **28** | **26,432** | **448** | **12** | **47** | |
| **IT9ESW** | **14** | **170,112** | **912** | **30** | **98** | |
| ***IUSA** | **A** | **706,208** | **2277** | **51** | **181** | |
| | | | | | | (OP: IT9SSI) |
| *IT9JOF | * | 226,860 | 596 | 53 | 146 | |
| *IT9AJP | * | 194,023 | 567 | 54 | 197 | |
| *IT9PQJ | * | 187,902 | 597 | 54 | 180 | |
| *IT9ZVJ | * | 79,560 | 305 | 41 | 115 | |
| *IT9YAO | * | 52,773 | 283 | 36 | 111 | |
| *IT9IMJ | * | 23,556 | 261 | 17 | 61 | |
| ***IT9STX** | **14** | **42,964** | **382** | **18** | **74** | |

### Slovakia

| | | | | | | |
|---|---|---|---|---|---|---|
| **OM3IAG** | **A** | **376,200** | **987** | **66** | **234** | |
| OM7CA | * | 173,019 | 436 | 54 | 177 | |
| OM1VA | * | 88,264 | 373 | 40 | 147 | |
| OM3DX | 28 | 72 | 9 | 3 | 5 | |
| ***OM5CD** | **A** | **1,671,056** | **2138** | **107** | **461** | |
| *OM4DN | * | 222,498 | 707 | 46 | 217 | |
| *OM7AG | * | 104,647 | 474 | 43 | 184 | |
| *OM6AL | * | 83,224 | 447 | 38 | 164 | |
| *OM8ATP | * | 46,176 | 274 | 25 | 123 | |
| *OM5UM | * | 45,738 | 298 | 28 | 126 | |
| *OM4TW | * | 45,036 | 247 | 36 | 126 | |
| *OM7LM | * | 28,379 | 494 | 9 | 50 | |
| *OM4DA | * | 23,760 | 210 | 20 | 88 | |
| *OM1TD | * | 9,315 | 98 | 22 | 59 | |
| *OM4W | * | 3,876 | 48 | 19 | 38 | (OP: OM4KW) |
| ***OM5FA** | **28** | **25,063** | **326** | **10** | **61** | |
| ***OM5XX** | **21** | **247,500** | **938** | **31** | **119** | |
| *OM5NL | * | 100,282 | 423 | 27 | 106 | |
| ***OM3PQ** | **14** | **15,615** | **178** | **13** | **48** | |
| *OM2AW | * | 10,106 | 191 | 10 | 52 | |
| *OM7YC | 7 | 640 | 30 | 4 | 16 | |
| ***OM6MW** | **3.7** | **34,706** | **507** | **12** | **62** | |
| ***OM7AB** | **"** | **32,775** | **514** | **9** | **59** | |
| *OM6TX | * | 15,288 | 261 | 7 | 49 | |

### Slovenia

| | | | | | | |
|---|---|---|---|---|---|---|
| **S58A** | **A** | **5,129,305** | **4324** | **141** | **514** | |
| S53QD | * | 313,490 | 639 | 64 | 226 | |
| S51SL | * | 197,340 | 524 | 57 | 219 | |
| S59AA | * | 133,770 | 326 | 68 | 177 | |
| S57YX | * | 79,926 | 384 | 30 | 143 | |
| **S58D** | **28** | **171,360** | **1205** | **24** | **102** | |
| S57S | * | 97,328 | 735 | 21 | 91 | |
| **S53MM** | **21** | **627,669** | **1769** | **37** | **152** | |
| **S57AL** | **14** | **1,156,869** | **3276** | **37** | **152** | |
| **S5ØK** | **"** | **1,135,134** | **3187** | **39** | **150** | |
| S56M | * | 274,164 | 1186 | 31 | 101 | |
| S58L | * | 96,800 | 572 | 25 | 96 | |
| **S53F** | **7** | **847,134** | **3134** | **34** | **137** | |
| **S57O** | **3.7** | **115,290** | **1214** | **15** | **75** | |
| **S57M** | **1.8** | **98,296** | **1063** | **14** | **74** | |
| ***S51F** | **A** | **1,158,968** | **1438** | **100** | **423** | |
| ***S59N** | **"** | **922,108** | **1992** | **87** | **331** | |
| *S51A | * | 786,600 | 1378 | 83 | 354 | (OP: S55O) |
| *S57U | * | 641,908 | 1021 | 87 | 332 | |
| *S51DX | * | 128,894 | 492 | 43 | 180 | |
| *S58MU | * | 125,325 | 542 | 39 | 186 | |
| *S53DX | * | 6,831 | 121 | 18 | 51 | |
| ***S57RTH** | **14** | **162,910** | **1081** | **22** | **88** | |
| ***S56Y** | **3.7** | **58,598** | **715** | **11** | **72** | |
| *S59T | * | 140 | 10 | 4 | 10 | |

### Spain

| | | | | | | |
|---|---|---|---|---|---|---|
| **EA4KR** | **A** | **4,481,695** | **3991** | **117** | **418** | |
| **EA4KD** | **"** | **3,359,840** | **3596** | **108** | **398** | |
| **EA5DFV** | **"** | **1,774,812** | **2743** | **78** | **294** | |
| EA3ATM | * | 1,714,586 | 2055 | 109 | 369 | |
| EE3E | * | 914,876 | 1456 | 91 | 348 | (OP: EA3ELZ) |
| AO3R | * | 626,031 | 999 | 89 | 310 | (OP: EA3OR) |
| AO5FCN | * | 386,450 | 924 | 60 | 202 | (OP: DJ6OV) |
| EA3DUM | * | 351,780 | 982 | 51 | 154 | |
| EC1AIJ | * | 345,960 | 451 | 74 | 298 | |
| EA4DXP | * | 198,940 | 454 | 56 | 189 | |
| EA3EIQ | * | 165,186 | 657 | 53 | 154 | |
| EA1OT | * | 123,105 | 455 | 36 | 109 | |
| AO4EEK | * | 109,536 | 402 | 39 | 129 | (OP: EA4EEK) |
| EC4ACS | * | 85,850 | 319 | 39 | 131 | |
| EA4TX | * | 40,643 | 243 | 34 | 63 | |
| EC4ACP | * | 35,836 | 125 | 44 | 80 | |
| EA3CCN | * | 32,913 | 192 | 39 | 120 | |
| EA7HY | * | 25,935 | 127 | 34 | 61 | |
| EC5ANF | * | 3,969 | 41 | 23 | 40 | |
| **EA4EER** | **21** | **225,720** | **871** | **33** | **119** | |
| **EA7ATX** | **"** | **183,608** | **744** | **28** | **90** | |
| EA7HF | * | 137,310 | 598 | 24 | 91 | |
| AN5HRX | * | 3,920 | 140 | 5 | 30 | (OP: EB5HRX) |
| **EA1IR** | **14** | **227,703** | **1162** | **32** | **115** | |
| AM7M | * | 135,198 | 729 | 26 | 98 | (OP: EC7ANC) |
| EC7DX | * | 95,546 | 693 | 25 | 76 | |
| EA1EJ | * | 32,886 | 313 | 17 | 64 | |
| **AO7TV** | **7** | **41,013** | **251** | **18** | **75** | |
| | | | | | | (OP: EA7TV) |
| EB7DIZ | * | 7,182 | 103 | 12 | 51 | |
| EA5JK | * | 5,341 | 124 | 8 | 41 | |
| **EA5EH** | **3.7** | **51,200** | **505** | **13** | **67** | |
| EC1CT | * | 28,952 | 329 | 12 | 65 | |
| ***EF1W** | **A** | **692,244** | **1545** | **64** | **204** | |
| | | | | | | (OP: EA1WS) |
| ***EA3FUM** | **"** | **649,584** | **1491** | **70** | **277** | |
| ***EA4DAT** | **"** | **625,421** | **1439** | **71** | **240** | |
| *EA1ET | * | 567,148 | 990 | 65 | 219 | |
| *EA3EJI | * | 531,377 | 651 | 110 | 359 | |
| *EA3AKA | * | 429,680 | 910 | 66 | 262 | |
| *ED7R | * | 387,300 | 680 | 71 | 229 | |
| *AN1A | * | 262,208 | 698 | 56 | 216 | (OP: EA1AST) |
| *EA1JO | * | 235,304 | 556 | 55 | 213 | |
| *EA1BLI | * | 192,990 | 620 | 50 | 160 | |
| *EC2AWD | * | 180,882 | 545 | 46 | 188 | |
| *EA1BP | * | 175,760 | 542 | 47 | 161 | |
| *EA3NA | * | 172,634 | 491 | 48 | 161 | |
| *EA7AA | * | 139,712 | 387 | 60 | 176 | |
| *EA4EUI | * | 133,509 | 397 | 55 | 178 | |
| *EC2AFI | * | 124,160 | 946 | 31 | 129 | |
| *EA1YR | * | 110,229 | 385 | 42 | 139 | |
| *EA3NP | * | 109,026 | 566 | 38 | 124 | |
| *EB5ARP | * | 91,332 | 371 | 38 | 139 | |
| *AO1A | * | 90,246 | 369 | 40 | 129 | (OP: EA1AHD) |
| *EA3GEO | * | 86,548 | 388 | 36 | 118 | |
| *AM3A | * | 81,503 | 436 | 30 | 119 | (OP: EA3FHP) |
| *EB5ALB | * | 72,864 | 341 | 48 | 128 | |
| *EC7DNX | * | 70,356 | 353 | 39 | 125 | |
| *EA3EYO | * | 67,408 | 320 | 36 | 140 | |
| *AO7C | * | 67,192 | 271 | 45 | 103 | (OP: EA7CWA) |
| *EA3CZ | * | 66,836 | 275 | 36 | 118 | |
| *EC7ANB | * | 62,061 | 260 | 37 | 114 | |
| *EA2CE | * | 51,118 | 250 | 30 | 92 | |
| *EA7FUN | * | 50,220 | 186 | 38 | 97 | |
| *EA1NE | * | 50,112 | 250 | 33 | 75 | |
| *EB1EVX | * | 47,880 | 247 | 32 | 101 | |
| *EA3AQL | * | 45,000 | 195 | 40 | 110 | |
| *EA3ALV | * | 42,639 | 161 | 37 | 146 | |
| *EA4MA | * | 41,140 | 122 | 48 | 122 | |
| *EA5QB | * | 37,994 | 220 | 31 | 90 | |
| *EA3CEC | * | 32,357 | 124 | 47 | 84 | |
| *EA7EYQ | * | 32,128 | 160 | 32 | 96 | |
| *EA5FWW | * | 30,996 | 131 | 34 | 74 | |
| *EA3APS | * | 30,360 | 148 | 34 | 86 | |
| *EA3GNR | * | 30,125 | 183 | 30 | 95 | |
| *EB3CML | * | 26,208 | 188 | 23 | 89 | |
| *EA3WX | * | 23,426 | 125 | 30 | 76 | |
| *EA2AVM | * | 23,180 | 139 | 28 | 67 | |
| *EA1EVR | * | 20,370 | 188 | 25 | 80 | |
| *EA1AQN | * | 20,295 | 178 | 29 | 94 | |
| *EA7HB | * | 18,128 | 106 | 32 | 71 | |
| *EA7EUF | * | 17,672 | 100 | 31 | 63 | |
| *EA7MT | * | 17,372 | 81 | 39 | 62 | |
| *AN5CNK | * | 15,857 | 131 | 26 | 75 | (OP: EB5CNK) |
| *EA1GHI | * | 15,500 | 120 | 25 | 75 | |
| *EA1VM | * | 15,364 | 117 | 23 | 69 | |
| *EA1AJV | * | 14,104 | 103 | 28 | 54 | |
| *EA1AHA | * | 13,193 | 99 | 25 | 54 | |
| *EB1EWE | * | 11,613 | 99 | 21 | 58 | |
| *EA1DKV | * | 11,130 | 88 | 28 | 42 | |
| *AN5AN | * | 11,096 | 82 | 24 | 52 | (OP: EA5AN) |
| *EA4WD | * | 10,150 | 119 | 20 | 50 | |
| *EA2DVT | * | 9,088 | 82 | 19 | 45 | |
| *EA1AUS | * | 8,970 | 49 | 32 | 46 | |
| *EC7AT | * | 7,505 | 57 | 27 | 52 | |
| *EA4ELJ | * | 7,448 | 90 | 20 | 56 | |
| *EA2CHL | * | 5,684 | 84 | 12 | 46 | |
| *EA4EUN | * | 5,589 | 85 | 22 | 47 | |
| *EA2AOO | * | 4,412 | 68 | 24 | 70 | |
| *EA3GLB | * | 4,096 | 58 | 20 | 44 | |
| *EA2BNU | * | 2,538 | 30 | 19 | 28 | |
| *EC1AGO | * | 1,980 | 43 | 12 | 18 | |
| *EA3CS | * | 1,771 | 28 | 10 | 13 | |
| *EA1FCH | * | 1,260 | 32 | 10 | 25 | |
| *EA3FLS | * | 1,147 | 35 | 7 | 24 | |
| *EA5RU | * | 962 | 21 | 16 | 21 | |
| *EA3GOD | * | 532 | 10 | 9 | 10 | |
| *EA7FIQ | * | 210 | 8 | 6 | 8 | |
| *EC5AHR | * | 210 | 10 | 5 | 5 | |
| ***AO1B** | **28** | **38,216** | **511** | **15** | **53** | |
| *EA5DUA | * | 3,984 | 78 | 11 | 37 | |
| *EA4SG | * | 1,914 | 45 | 6 | 16 | |
| *EB1GUE | * | 696 | 35 | 7 | 17 | |
| ***EH7R** | **21** | **239,444** | **895** | **26** | **98** | |
| | | | | | | (OP: EA7FTR) |
| *EB3EPR | * | 123,240 | 598 | 27 | 93 | (OP: EC3CJN) |
| *EA3EYD | * | 109,864 | 446 | 25 | 99 | |
| *EA1JJ | * | 102,802 | 544 | 23 | 75 | |
| *EA5EOR | * | 82,485 | 374 | 25 | 92 | |
| *AO7ANM | * | 47,840 | 397 | 18 | 62 | (OP: EA7ANM) |
| *EA7FRX | * | 30,880 | 178 | 21 | 59 | |
| *EB4FJV | * | 8,500 | 132 | 16 | 52 | |
| *EC7DDZ | * | 6,615 | 68 | 15 | 34 | |
| *EC7DZL | * | 4,998 | 67 | 16 | 35 | |
| ***EA7TN** | **14** | **357,700** | **1430** | **30** | **116** | |
| ***AO3K** | **"** | **290,619** | **1348** | **32** | **115** | |
| | | | | | | (OP: EA3GHZ) |
| *EE1E | * | 193,700 | 856 | 25 | 105 | |
| *EA3AGB | * | 125,156 | 602 | 31 | 103 | |
| *EA1CCM | * | 115,778 | 555 | 25 | 97 | |
| *EA4UV | * | 61,410 | 355 | 25 | 90 | |
| *AO7KJ | * | 60,625 | 574 | 20 | 77 | (OP: EA7KJ) |
| *EA3KN | * | 52,884 | 284 | 24 | 89 | |
| *EA1BIM | * | 51,914 | 371 | 21 | 80 | |
| *EA2IF | * | 14,994 | 128 | 14 | 49 | |
| *EA5ET | * | 12,508 | 128 | 11 | 48 | |
| *EA3DVJ | * | 12,137 | 135 | 12 | 41 | |
| *EA1ASG | * | 12,027 | 106 | 14 | 43 | |
| *EA4EQK | * | 6,960 | 95 | 11 | 37 | |
| *EA5TN | * | 3,760 | 80 | 6 | 34 | |
| *EA5XC | * | 3,740 | 60 | 8 | 26 | |
| *AO5XQ | * | 256 | 14 | 5 | 11 | (OP: EA5XQ) |
| ***EA5TS** | **7** | **45,472** | **339** | **21** | **77** | |
| ***EA5AER** | **"** | **41,769** | **348** | **16** | **75** | |
| *EA3KT | * | 27,224 | 321 | 15 | 68 | |
| *EA4ETR | * | 1,332 | 32 | 10 | 27 | |
| *EB1HRW | * | 588 | 24 | 4 | 17 | |
| *EA4AFP | * | 483 | 17 | 8 | 15 | |
| ***EA7NW** | **3.7** | **15,092** | **126** | **15** | **62** | |
| *EA5FST | * | 1,914 | 44 | 7 | 26 | |
| *EC5AQF | * | 196 | 12 | 4 | 10 | |

### Sweden

| | | | | | | |
|---|---|---|---|---|---|---|
| **SM5Q** | **A** | **815,628** | **1269** | **79** | **358** | |
| **SM6FJY** | **"** | **242,326** | **691** | **45** | **221** | |
| SI3A | * | 113,200 | 455 | 44 | 156 | (OP: SM3LIV) |
| SM5QU | * | 72,540 | 309 | 39 | 156 | |
| SM6BGG | * | 63,085 | 272 | 35 | 120 | |
| 7S5S | * | 60,904 | 285 | 37 | 147 | (OP: SM5CSS) |
| SD3A | * | 50,050 | 232 | 41 | 134 | (OP: SM3FJF) |
| SM7E | * | 17,667 | 146 | 24 | 93 | (OP: SM7BHM) |
| SMØCVI | * | 17,460 | 113 | 27 | 70 | |
| SB6A | * | 4,800 | 90 | 14 | 34 | |
| **SM5CEU** | **21** | **44,440** | **254** | **21** | **80** | |
| SMØKV | * | 10,541 | 164 | 20 | 63 | |
| **SJ2A** | **14** | **150,150** | **1032** | **27** | **83** | |
| | | | | | | (OP: SM3WMV) |
| 7S5C | * | 14,016 | 148 | 19 | 54 | (OP: SM5CBM) |
| 7S6R | * | 210 | 16 | 3 | 11 | (OP: SM6REA) |
| ***SJ4F** | **A** | **152,848** | **524** | **40** | **193** | |
| | | | | | | (OP: SM4DHF) |
| *8SØC | * | 107,219 | 238 | 55 | 234 | (OP: SMØMPV) |
| *SM6XKB | * | 66,220 | 382 | 35 | 137 | |
| *SM7BJW | * | 31,800 | 207 | 30 | 90 | |
| *SE6C | * | 31,088 | 223 | 23 | 93 | (OP: SM6CDN) |
| *SMØFM | * | 28,321 | 129 | 31 | 96 | |
| *SAØAQT | * | 26,751 | 198 | 24 | 87 | |
| *SMØBDS | * | 17,202 | 123 | 25 | 69 | |
| *SM6WZH | * | 14,168 | 139 | 21 | 67 | |
| *SF3E | * | 12,210 | 128

| | | | | | |
|---|---|---|---|---|---|
| *UY5QZ | * | 7,276 | 61 | 18 | 50 |
| *US5ZF | * | 5,184 | 84 | 18 | 46 |
| *US8MX | * | 2,992 | 52 | 13 | 31 |
| *UV5EEO | * | 1,748 | 37 | 9 | 29 |
| *US3QQ | * | 104 | 9 | 6 | 7 |
| ***UT3FM** | **28** | **23,040** | **212** | **16** | **64** |
| *UW1I | * | 12,141 | 213 | 8 | 49 |
| | | | (OP: US6IMA) | | |
| *US2WU | * | 10,304 | 127 | 12 | 52 |
| *UX7UN | * | 5,904 | 108 | 9 | 39 |
| *UR7IHD | * | 154 | 6 | 5 | 6 |
| *UX7LQ | * | 64 | 13 | 6 | 10 |
| ***UXØFF** | **21** | **442,336** | **1558** | **38** | **146** |
| *UX3IO | * | 1,890 | 24 | 12 | 15 |
| *UR5ZLK | * | 24 | 2 | 2 | 2 |
| ***UT4EK** | **14** | **117,180** | **754** | **28** | **96** |
| *UR8QR | * | 55,581 | 408 | 19 | 78 |
| *UY5TE | * | 20,502 | 248 | 10 | 57 |
| *UR5EIH | * | 15,456 | 161 | 18 | 74 |
| *UR5AW | * | 11,460 | 153 | 11 | 49 |
| *UR4MKI | * | 5,992 | 69 | 16 | 40 |
| *UY3AW | * | 2,911 | 42 | 11 | 30 |
| ***USØHZ** | **7** | **48,306** | **397** | **17** | **80** |
| ***UZ7U** | **3.7** | **48,298** | **557** | **12** | **70** |
| | | | (OP: UT3UA) | | |
| *UT5UUV | * | 9,550 | 202 | 6 | 44 |
| *UR5IKN | * | 5,720 | 87 | 8 | 47 |
| *UT5DJ | * | 2,550 | 88 | 4 | 30 |
| *US7IA | 1.8 | 6,808 | 128 | 7 | 39 |
| *US6IKV | * | 4,988 | 96 | 8 | 35 |
| *US5ZCW | * | 3,276 | 93 | 6 | 30 |
| *UT5ZB | * | 2,905 | 107 | 6 | 29 |

### Vatican City

| | | | | | |
|---|---|---|---|---|---|
| **HV5ØVR** | **A** | **976,864** | **2856** | **54** | **170** |
| | | | (OP: AI6V) | | |
| *HV5PUL | A | 294 | 17 | 8 | 13 |
| | | | (OP: IWØDJB) | | |

### Wales

| | | | | | |
|---|---|---|---|---|---|
| **GW4BLE** | **A** | **3,989,718** | **3802** | **104** | **425** |
| GW3JXN | * | 297,275 | 711 | 64 | 211 |
| **GW3NAS** | **3.7** | **114,608** | **803** | **18** | **86** |
| ***MW1MDH** | **A** | **72,352** | **395** | **24** | **128** |
| *GW8NBI | * | 30,744 | 200 | 25 | 97 |
| *GW4EVX | * | 30,208 | 180 | 30 | 98 |
| *GW3NJW | * | 10,179 | 99 | 21 | 66 |
| *GW3YVC | * | 1,147 | 36 | 8 | 23 |
| ***GWØDCK** | **1.8** | **9,476** | **215** | **6** | **40** |
| | | | (OP: GØDCK) | | |

## OCEANIA

### Australia

| | | | | | |
|---|---|---|---|---|---|
| **VK4CZ** | **A** | **1,291,560** | **1682** | **94** | **188** |
| **VK4EMM** | **"** | **841,340** | **1325** | **79** | **151** |
| **VK6DXI** | **"** | **666,532** | **959** | **92** | **189** |
| **VK3TZ** | **"** | **603,464** | **965** | **83** | **158** |
| VK2FHN | * | 65,340 | 263 | 44 | 55 |
| VK3YXC | * | 45,448 | 228 | 44 | 60 |
| VK3AVV | * | 43,450 | 161 | 43 | 67 |
| VK1MJ | * | 24,985 | 100 | 35 | 60 |
| VK2BCQ | * | 24,832 | 125 | 41 | 56 |
| VK3TDX | * | 2,992 | 42 | 21 | 23 |
| | | | (OP: NF6V) | | |
| **VK2UZ** | **28** | **1,600** | **80** | **4** | **4** |
| **VK4AN** | **7** | **39,767** | **178** | **27** | **64** |
| ***VK7WPX** | **A** | **34,782** | **148** | **42** | **60** |
| *VK5MAV | * | 12,110 | 77 | 29 | 41 |
| *VK2XF | * | 8,400 | 64 | 25 | 35 |
| *VK4FJ | * | 5,371 | 50 | 21 | 20 |
| *VK6CR | * | 5,088 | 50 | 21 | 27 |
| *VK6LXU | * | 3,560 | 43 | 16 | 24 |
| *VK2HBG | * | 2,914 | 52 | 21 | 26 |
| *VK7BEN | * | 48 | 6 | 6 | 6 |
| *VK3ZGP | * | 6 | 1 | 1 | 1 |
| ***VK4EJ** | **21** | **82,646** | **502** | **22** | **40** |
| *VK1KLW | 14 | 3,640 | 44 | 16 | 19 |

### Brunei

| | | | | | |
|---|---|---|---|---|---|
| ***V8AQM** | **14** | **11,128** | **107** | **19** | **33** |

### Chatham Islands

| | | | | | |
|---|---|---|---|---|---|
| ***ZL7/DL2AH** | **A** | **28,574** | **140** | **34** | **57** |
| | | | (OP: DL2AH) | | |

### East Malaysia

| | | | | | |
|---|---|---|---|---|---|
| 9M6NA | A | 16,335 | 108 | 23 | 32 |
| | | | (OP: JE1JKL) | | |
| **9M8YY** | **21** | **661,125** | **1782** | **34** | **95** |
| | | | (OP: JR3WXA) | | |
| ***9M6LSC** | **A** | **983,598** | **1535** | **73** | **158** |
| | | | (OP: JF1SQC) | | |
| *9M6YBG | * | 30,415 | 154 | 32 | 47 |

### Guam

| | | | | | |
|---|---|---|---|---|---|
| **KG6DX** | **A** | **1,252,680** | **1643** | **114** | **178** |
| WH2X | * | 667,080 | 1477 | 76 | 94 |
| ***WH2D** | **A** | **154,548** | **689** | **32** | **49** |
| | | | (OP: K3UOC) | | |

### Hawaii

| | | | | | |
|---|---|---|---|---|---|
| **KH6LC** | **A** | **4,629,009** | **5131** | **119** | **200** |
| | | | (OP: N6GQ) | | |
| **KH6YR** | **"** | **2,923,776** | **3555** | **114** | **174** |
| | | | (OP: K1YR) | | |
| KH6FI | * | 964,131 | 1579 | 84 | 133 |
| **KH7Y** | **21** | **470,850** | **2289** | **25** | **50** |
| KH6GMP | * | 113,100 | 623 | 24 | 41 |
| **KH7B** | **3.7** | **304,440** | **1261** | **31** | **55** |
| | | | (OP: K4XS) | | |
| ***KH7T** | **A** | **197,752** | **497** | **63** | **89** |
| *KH6/NØCO | * | 14,973 | 116 | 32 | 37 |
| | | | (OP: NØCO) | | |
| *NH7PE | 28 | 330 | 12 | 5 | 6 |
| *AH6KW | 21 | 702 | 29 | 7 | 11 |

### Indonesia

| | | | | | |
|---|---|---|---|---|---|
| **YB4IR** | **A** | **438,984** | **797** | **65** | **169** |
| YB1TJ | * | 110,760 | 279 | 55 | 101 |
| YBØMJY | * | 7,420 | 59 | 28 | 42 |
| YC2DDL | * | 1,025 | 38 | 16 | 25 |
| **YB2OBL** | **14** | **50,160** | **250** | **20** | **56** |
| YBØBCU | * | 15,975 | 129 | 22 | 49 |
| **YB1KAR** | **7** | **59,250** | **313** | **24** | **55** |
| ***YB2DX** | **A** | **741,888** | **969** | **100** | **222** |
| *YBØNFL | * | 219,551 | 375 | 78 | 163 |
| *YBØKYM | * | 99,599 | 275 | 51 | 86 |
| *YC6JRT | * | 82,800 | 280 | 44 | 94 |
| *YB1UUN | * | 65,720 | 197 | 45 | 79 |
| *YB3IZK | * | 30,772 | 152 | 33 | 65 |
| *YBØIR | * | 24,166 | 100 | 27 | 59 |
| *YB9BZ | * | 9,996 | 78 | 25 | 26 |
| *YC1UGK | * | 4,400 | 47 | 22 | 28 |
| *YBØCOU | * | 1,696 | 19 | 14 | 18 |
| *YC6JHZ | * | 391 | 17 | 9 | 14 |
| ***YE1AA** | **21** | **404,586** | **1131** | **31** | **95** |
| ***YB3KM** | **"** | **320,348** | **952** | **29** | **90** |
| *YC1KAF | * | 215,451 | 695 | 31 | 80 |
| *YC2UTX | * | 15,730 | 107 | 20 | 45 |
| *YC1URC | * | 4,428 | 60 | 15 | 26 |
| ***YB2ECG** | **14** | **54,075** | **292** | **22** | **53** |
| ***YB2VTO** | **7** | **4,472** | **45** | **18** | **25** |

### New Zealand

| | | | | | |
|---|---|---|---|---|---|
| **ZL1ALZ** | **A** | **25,360** | **135** | **33** | **47** |
| ZL2RVW | 14 | 11,285 | 83 | 25 | 36 |
| **ZL1KMN** | **7** | **26,136** | **129** | **27** | **61** |
| ***ZL4JB** | **A** | **28,035** | **132** | **34** | **55** |
| *ZL2MM | * | 25,098 | 115 | 41 | 53 |
| ***ZL2AWH** | **28** | **1,449** | **56** | **5** | **4** |

### Philippines

| | | | | | | |
|---|---|---|---|---|---|---|
| **DU9RG** | **A** | **2,005,150** | **2129** | **106** | **244** |
| DU1IVT | * | 566,370 | 1099 | 65 | 121 |
| DU1BP | * | 429,248 | 1013 | 52 | 100 |
| DV1VEQ | * | 1,218 | 38 | 7 | 14 |
| ***DV1JM** | **A** | **254,904** | **630** | **52** | **104** |
| *DV3DIN | * | 5,472 | 64 | 22 | 35 |
| ***DV1EG** | **21** | **136,188** | **637** | **25** | **53** |

### South Cook Islands

| | | | | | |
|---|---|---|---|---|---|
| ***E51NOU** | **A** | **34,692** | **179** | **38** | **46** |
| | | | | (OP: N7OU) | |

### Tonga

| | | | | | |
|---|---|---|---|---|---|
| ***A35RK** | **21** | **340,466** | **1468** | **27** | **56** |

## SOUTH AMERICA

### Argentina

| | | | | | |
|---|---|---|---|---|---|
| **LT1F** | **A** | **5,112,963** | **3821** | **120** | **357** |
| | | | (OP: LU1FAM) | | |
| **LU4DX** | **"** | **5,085,312** | **4039** | **110** | **346** |
| LU3CT | * | 546,260 | 1038 | 61 | 159 |
| LU7HN | * | 377,330 | 781 | 65 | 129 |
| LT5Y | * | 360,932 | 904 | 54 | 89 |
| | | | (OP: LU1YU) | | |
| LU7MCJ | * | 20,358 | 127 | 33 | 45 |
| **LU1HF** | **28** | **675,610** | **1920** | **25** | **105** |
| **LR4E** | **"** | **429,142** | **1680** | **19** | **79** |
| | | | (OP: LW4EU) | | |
| LU4DXU | * | 258,980 | 1084 | 20 | 72 |
| **LQØD** | **7** | **13,176** | **115** | **27** | **45** |
| | | | (OP: LU3DR) | | |
| LU8VCC | * | 6,625 | 72 | 22 | 31 |
| **LU1VM** | **3.7** | **27,420** | **209** | **24** | **36** |
| ***LU1HLH** | **A** | **1,704,173** | **1847** | **101** | **258** |
| ***LU7HW** | **"** | **344,280** | **746** | **63** | **127** |
| *LW9ETQ | * | 183,436 | 592 | 43 | 78 |
| *LU2EE | * | 175,007 | 428 | 57 | 104 |
| | | | (OP: LW5EE) | | |
| *LU6FEH | * | 121,716 | 357 | 53 | 108 |
| *LU5CAB | * | 112,428 | 350 | 50 | 112 |
| *LU5EVK | * | 63,448 | 252 | 39 | 64 |
| *LV6D | * | 50,220 | 214 | 51 | 104 |
| *LU6KA | * | 40,656 | 243 | 46 | 75 |
| *LU1FDU | * | 37,356 | 156 | 48 | 84 |
| *LU1ARV | * | 33,524 | 152 | 45 | 71 |
| *LU7FTS | * | 29,889 | 215 | 36 | 45 |
| *LR1A | * | 8,400 | 88 | 28 | 47 |
| | | | (OP: LU1AS) | | |
| *LU7DUE | * | 616 | 14 | 11 | 11 |
| ***LU8EOT** | **28** | **212,990** | **839** | **22** | **73** |
| ***LU6FOV** | **"** | **110,482** | **581** | **22** | **52** |
| *LW1HR | * | 79,572 | 526 | 18 | 39 |
| *LU6DU | * | 63,653 | 424 | 16 | 37 |
| *LO7D | * | 17,766 | 184 | 14 | 28 |
| | | | (OP: LW1DRH) | | |
| ***LU4WG** | **21** | **74,536** | **328** | **18** | **70** |
| *LU4HKL | * | 10,192 | 88 | 18 | 34 |

### Aruba

| | | | | | |
|---|---|---|---|---|---|
| **P4ØW** | **A** | **8,447,550** | **5471** | **131** | **435** |
| | | | | (OP: W2GD) | |
| **P4ØPA** | **"** | **6,535,684** | **5268** | **103** | **343** |
| | | | | (OP: W4PA) | |
| **P43A** | **21** | **1,086,075** | **2872** | **29** | **106** |
| ***P4ØA** | **A** | **7,551,060** | **5264** | **120** | **390** |
| | | | | (OP: KK9A) | |

### Brazil

| | | | | | | |
|---|---|---|---|---|---|---|
| **ZX2B** | **A** | **5,402,175** | **3963** | **112** | **363** |
| | | | | (OP: PY2MNL) | | |
| **PY2NY** | **"** | **3,898,368** | **3293** | **111** | **312** |
| PP1CZ | * | 1,139,018 | 1605 | 76 | 198 |
| PY2GA | * | 206,276 | 568 | 51 | 88 |
| PY2KP | * | 97,200 | 340 | 55 | 80 |
| PT7VB | * | 85,007 | 255 | 49 | 120 |
| PP5JN | * | 42,642 | 171 | 49 | 89 |
| PY2KM | * | 31,672 | 177 | 26 | 48 |
| **ZW5B** | **28** | **533,006** | **1789** | **25** | **93** |
| | | | | (OP: PY5KD) | |
| **PP5AMP** | **"** | **379,154** | **1344** | **22** | **79** |
| **PY2YU** | **"** | **366,080** | **1278** | **25** | **79** |
| **ZX5J** | **21** | **2,265,642** | **4299** | **36** | **155** |
| | | | | (OP: PP5JR) | |
| PY2GH | * | 194,098 | 695 | 25 | 82 |
| **PS2T** | **14** | **1,022,196** | **2200** | **36** | **136** |
| | | | | (OP: PY5EG) | |
| PR5Z | * | 231,240 | 750 | 26 | 94 |
| | | | | (OP: PY5ZHP) | |
| PY5QW | * | 115,920 | 417 | 27 | 85 |
| PY5CA | * | 90,902 | 425 | 24 | 62 |
| PY5ZD | * | 23,714 | 140 | 19 | 52 |
| PY7ZY | * | 3,366 | 115 | 5 | 6 |
| **PP5KR** | **7** | **4,950** | **118** | **20** | **35** |
| **PV8DX** | **3.7** | **102,439** | **421** | **20** | **69** |
| PP5FMM | 1.8 | 4 | 2 | 2 | 2 |
| ***ZX7A** | **A** | **1,283,613** | **1601** | **80** | **233** |
| | | | | (OP: PS7TKS) | |
| ***PP5MQ** | **"** | **434,940** | **1033** | **60** | **105** |
| *PY1SX | * | 143,990 | 368 | 39 | 131 |
| *PY2SRB | * | 98,078 | 431 | 31 | 58 |
| *PY5EG | * | 93,068 | 384 | 42 | 64 |
| | | | | (OP: PY5KW) | |
| *PP5JY | * | 85,446 | 321 | 49 | 92 |
| *PY2DU | * | 40,150 | 230 | 20 | 53 |
| *PY1WS | * | 13,664 | 89 | 28 | 33 |
| *PY3EAM | * | 6,042 | 65 | 25 | 32 |
| *PP5EJ | * | 4,278 | 73 | 21 | 25 |
| *PY2DXX | * | 2,852 | 35 | 14 | 20 |
| *PY3BIL | * | 780 | 15 | 9 | 11 |
| *PY3KIM | * | 504 | 26 | 11 | 13 |
| *PS2SR | * | 65 | 8 | 6 | 7 |
| ***PU2LSM** | **28** | **306,915** | **1106** | **25** | **80** |
| ***PY2CX** | **"** | **221,548** | **882** | **22** | **75** |
| ***PY2ZY** | **"** | **128,790** | **653** | **21** | **69** |
| *PU1KGG | * | 104,230 | 566 | 19 | 51 |
| *PU2MTS | * | 84,206 | 467 | 20 | 51 |
| *PY5WH | * | 13,536 | 126 | 16 | 31 |
| *PU2OYO | * | 4,482 | 88 | 9 | 9 |
| *PU2VIR | * | 1,752 | 59 | 10 | 14 |
| *PY1CMT | * | 1,474 | 55 | 11 | 11 |
| *PU2TES | * | 1,320 | 28 | 10 | 14 |
| *PU8TDS | * | 126 | 20 | 3 | 3 |
| *PU1TNT | * | 48 | 16 | 4 | 4 |
| *PU8TFA | * | 100 | 34 | 7 | 11 |
| *PU2YDC | * | 100 | 6 | 3 | 4 |
| ***ZV5E** | **21** | **203,940** | **854** | **24** | **66** |
| | | | | (OP: PP5KE) | |
| *PY2HL | * | 133,632 | 615 | 22 | 65 |
| *PV8AZ | * | 1,827 | 49 | 12 | 17 |
| *PT8CWA | * | 45 | 3 | 2 | 3 |
| ***PS8DX** | **14** | **49,011** | **221** | **22** | **71** |
| *PP2RON | * | 17,550 | 125 | 21 | 44 |
| *PY2ZR | * | 10,918 | 105 | 15 | 38 |
| *PS8ET | * | 6,390 | 53 | 18 | 53 |
| *PS8NF | * | 936 | 17 | 8 | 16 |
| ***PR7DZ** | **7** | **52,350** | **249** | **21** | **54** |
| *PT7ZZ | * | 6,545 | 56 | 14 | 41 |
| *PY2WF | * | 3,904 | 81 | 18 | 43 |
| *PY6KY | * | 2,573 | 40 | 11 | 20 |
| *PY5DC | * | 2,553 | 54 | 11 | 26 |

### Chile

| | | | | | |
|---|---|---|---|---|---|
| **3G1K** | **A** | **812,460** | **1380** | **72** | **148** |
| | | | | (OP: XQ1KY) | |
| CE3P | * | 218,776 | 536 | 56 | 128 |
| | | | | (OP: CE3PG) | |
| CE4B | * | 72,240 | 302 | 28 | 58 |
| | | | | (OP: CE4ETZ) | |
| ***CE1KR** | **A** | **327,988** | **814** | **62** | **105** |
| *CA1UGE | * | 69,856 | 389 | 27 | 47 |
| *CE3SNA | * | 840 | 17 | 12 | 12 |
| ***CE3DNP** | **21** | **71,500** | **272** | **23** | **77** |
| *CE2SQE | 3.7 | 182 | 15 | 6 | 7 |

### Colombia

| | | | | | |
|---|---|---|---|---|---|
| **HK6K** | **A** | **1,792,823** | **2080** | **111** | **272** |
| HK3Q | * | 284,856 | 479 | 67 | 182 |
| HK3J | * | 165,375 | 410 | 54 | 121 |
| ***HK3TU** | **A** | **730,000** | **1328** | **74** | **176** |
| *HK3JJH | * | 318,798 | 588 | 64 | 135 |
| ***HK6P** | **21** | **240,300** | **976** | **25** | **75** |
| ***HK3W** | **3.7** | **36,504** | **200** | **20** | **52** |

### Easter Island

| | | | | | |
|---|---|---|---|---|---|
| ***CCØY** | **21** | **313,984** | **1317** | **21** | **67** |
| | | | | (OP: 9A4K) | |

### Ecuador

| | | | | | |
|---|---|---|---|---|---|
| **HC2SA** | **14** | **232,575** | **877** | **24** | **81** |
| HC2GT | * | 72,800 | 467 | 24 | 67 |
| **HC2AQ** | **7** | **279,165** | **976** | **25** | **86** |
| **HC1HC** | **3.7** | **9,450** | **94** | **11** | **24** |
| ***HC2AD** | **A** | **308,637** | **744** | **55** | **106** |
| ***HC1JQ** | **14** | **566,370** | **1440** | **28** | **117** |

### Falkland Islands

| | | | | | |
|---|---|---|---|---|---|
| ***VP8CXV** | **7** | **8,476** | **93** | **19** | **33** |

### French Guiana

| | | | | | |
|---|---|---|---|---|---|
| **FY1FL** | **A** | **619,983** | **849** | **75** | **198** |

### Paraguay

| | | | | | |
|---|---|---|---|---|---|
| ***ZPØR** | **A** | **2,690,604** | **2991** | **99** | **279** |
| | | | | (OP: ZP5AZL) | |

### Peru

| | | | | | |
|---|---|---|---|---|---|
| **OA4AHW** | **A** | **70,524** | **284** | **40** | **68** |
| **OA4SS** | **14** | **692,240** | **1862** | **30** | **106** |

### Suriname

| | | | | | |
|---|---|---|---|---|---|
| **PZ5XX** | **A** | **5,876,735** | **3895** | **129** | **416** |

### Trinidad & Tobago

| | | | | | |
|---|---|---|---|---|---|
| **9Y4D** | **14** | **1,506,832** | **3359** | **33** | **131** |
| **9Y4W** | **7** | **906,696** | **2195** | **31** | **116** |

### Uruguay

| | | | | | |
|---|---|---|---|---|---|
| **CX6VM** | **A** | **4,238,304** | **3240** | **125** | **351** |
| **CX4DX** | **28** | **265,776** | **1042** | **22** | **76** |
| ***CX9AU** | **A** | **159,544** | **345** | **67** | **129** |
| *CX2TG | * | 98,616 | 255 | 57 | 111 |
| *CX2ABP | * | 85,568 | 315 | 45 | 67 |
| ***CX9DX** | **21** | **39,558** | **334** | **20** | **37** |
| ***CX2CC** | **7** | **13,910** | **124** | **20** | **45** |

### Venezuela

| | | | | | |
|---|---|---|---|---|---|
| **YV6BFE** | **28** | **16,555** | **220** | **17** | **26** |
| ***YV6BXN** | **A** | **43,066** | **166** | **37** | **85** |
| ***YW7A** | **28** | **3,650** | **99** | **11** | **14** |
| | | | | (OP: YV7QP) | |
| ***YY1LCR** | **21** | **323,618** | **1191** | **21** | **85** |
| *YY5PER | * | 54,126 | 231 | 23 | 70 |
| *YV1FYZ | 14 | 9,699 | 123 | 17 | 36 |

## QRP

| | | | | | |
|---|---|---|---|---|---|
| **IK5RUN** | **A** | **504,878** | **655** | **93** | **340** |
| **KR2Q** | **"** | **385,528** | **502** | **69** | **217** |
| **KA1LMR** | **"** | **384,780** | **571** | **85** | **233** |
| **M3RCV** | **"** | **381,888** | **868** | **61** | **290** |
| **S59D** | **"** | **291,332** | **671** | **66** | **280** |
| **NØKE** | **"** | **256,520** | **450** | **79** | **163** |
| **RX1CQ** | **"** | **253,044** | **780** | **50** | **234** |
| **YP8A** | **"** | **240,160** | **631** | **66** | **238** |
| | | | | (OP: YO8WW) | |
| **EA3FF** | **"** | **237,744** | **490** | **66** | **246** |
| **JR4DAH** | **"** | **231,716** | **492** | **77** | **135** |
| **DF1DX** | **"** | **218,790** | **569** | **43** | **212** |
| **HA6IAM** | **"** | **218,595** | **655** | **52** | **243** |
| **YO3APJ** | **"** | **192,185** | **513** | **55** | **234** |
| **VE1AI** | **"** | **168,285** | **355** | **50** | **145** |
| EA1GT | * | 160,752 | 485 | 44 | 160 |
| RW3AI | * | 153,504 | 526 | 40 | 194 |
| VA3DF | * | 133,770 | 279 | 55 | 140 |
| **OM7DX** | **"** | **132,525** | **391** | **56** | **223** |
| N1TM | * | 111,370 | 239 | 51 | 134 |
| **W6QU** | **"** | **104,958** | **268** | **59** | **94** |
| | | | | (OP: W8QZA) | |
| **K8ZT** | **"** | **103,713** | **232** | **57** | **134** |
| **KB3TS** | **"** | **102,884** | **254** | **45** | **133** |
| RD4HD | * | 97,905 | 325 | 43 | 140 |
| **CT1ELF** | **"** | **95,448** | **322** | **42** | **122** |
| **DL1DQY** | **"** | 93,372 | 218 | 46 | 140 |
| **RA9SC** | **"** | **89,440** | **272** | **52** | **156** |
| NDØC | * | 89,265 | 216 | 52 | 113 |
| IZ1JLF | * | 88,924 | 250 | 49 | 139 |
| **LZ2DF** | **"** | **72,890** | **306** | **37** | **148** |
| **ON3SMS** | **"** | **65,041** | **291** | **43** | **150** |
| **PE2KP** | **"** | **61,152** | **356** | **29** | **127** |
| YO3JOS | * | 59,940 | 274 | 35 | 127 |
| ON3MAJ | * | 59,653 | 235 | 42 | 145 |
| **SP2DNI** | **"** | **57,040** | **304** | **39** | **145** |
| **OK1ES** | **"** | **48,556** | **192** | **42** | **157** |
| KT8K | * | 46,690 | 158 | 33 | 82 |
| **YB2OK** | **"** | **43,560** | **153** | **41** | **79** |
| **EU1UA** | **"** | **36,400** | **216** | **40** | **100** |
| WBØIWG/3 | * | 35,520 | 142 | 34 | 77 |
| **KG7HF** | **"** | **35,346** | **140** | **49** | **88** |
| **PY2BN** | **"** | **30,996** | **190** | **37** | **45** |
| N3HU | * | 30,700 | 119 | 31 | 69 |
| UT2AB | * | 29,400 | 159 | 34 | 113 |
| **JA2MWV** | **"** | **29,205** | **153** | **41** | **58** |
| YU1LM | * | 28,928 | 202 | 27 | 101 |
| YO4AAC | * | 27,664 | 182 | 31 | 102 |
| IK1TWC | * | 27,117 | 131 | 40 | 91 |
| **KD4HXT** | **"** | **23,220** | **129** | **37** | **49** |
| **KIØG/5** | **"** | **22,746** | **107** | **37** | **65** |
| KR1ST/4 | * | 22,018 | 97 | 33 | 68 |
| VE3CW | * | 21,948 | 106 | 33 | 60 |
| **LA5FBA** | **"** | **21,924** | **166** | **25** | **91** |
| N8IE | * | 21,408 | 98 | 33 | 63 |
| N8XA | * | 18,569 | 172 | 45 | 74 |
| PA3DDP | * | 18,564 | 156 | 20 | 99 |
| **5Z4/YT1CS** | **"** | **18,357** | **106** | **30** | **57** |
| **US5IND** | **"** | **17,064** | **135** | **23** | **82** |
| N6WG | * | 16,330 | 101 | 31 | 40 |
| KG4IGC | * | 15,300 | 94 | 36 | 54 |
| RK4FB | * | 14,949 | 145 | 23 | 76 |
| HA5BA | * | 14,758 | 156 | 22 | 72 |
| IØUZF | * | 14,276 | 132 | 25 | 58 |
| USØYA | * | 14,136 | 77 | 27 | 66 |
| **T97J** | **"** | **12,960** | **71** | **34** | **62** |
| **VK4ATH** | **"** | **12,640** | **76** | **33** | **46** |
| NU4B | * | 11,988 | 65 | 31 | 50 |
| **VU2UR** | **"** | **11,476** | **85** | **30** | **46** |
| WA8WV | * | 11,250 | 62 | 27 | 48 |
| **KØCD/9** | **"** | **9,600** | **77** | **24** | **36** |
| **7N2NGO** | **"** | **7,320** | **56** | **26** | **35** |
| GØKTN | * | 6,862 | 82 | 17 | 56 |
| N4ZAK | * | 6,549 | 55 | 23 | 36 |
| M5AAV | * | 6,325 | 109 | 11 | 44 |
| **UAØSBQ** | **"** | **5,671** | **84** | **21** | **32** |
| KA9O | * | 5,568 | 54 | 26 | 32 |
| **OE3DSW** | **"** | **5,550** | **84** | **18** | **56** |
| **8D4SP** | **"** | **4,876** | **62** | **20** | **33** |
| **YU8NU** | **"** | **4,500** | **54** | **29** | **46** |
| JA1KEB | * | 4,408 | 50 | 15 | 23 |
| SP4DZT | * | 4,347 | 39 | 26 | 37 |
| W6ISO | * | 4,089 | 37 | 22 | 25 |
| RW6FO | * | 2,688 | 65 | 12 | 30 |
| KD4OFG | * | 2,013 | 30 | 14 | 19 |
| N1SZ | * | 1,776 | 26 | 13 | 24 |
| W2JEK | * | 936 | 24 | 11 | 13 |
| AF9J | * | 893 | 23 | 9 | 10 |
| IZ8FSL | * | 840 | 24 | 9 | 21 |
| ON3AD | * | 759 | 28 | 8 | 15 |
| JK1TCV | * | 702 | 19 | 7 | 11 |
| DO2GMS | * | 696 | 28 | 9 | 20 |
| EA5GVZ | * | 486 | 25 | 8 | 19 |
| WV7T | * | 150 | 13 | 5 | 5 |
| AI2P | * | 81 | 9 | 4 | 5 |
| NT4Q | * | 63 | 4 | 4 | 3 |
| SA1A | * | 50 | 8 | 3 | 7 |
| | | | (OP: SM1TDE) | | |
| N8QE | * | 42 | 3 | 3 | 3 |
| VA3RKM | * | 36 | 4 | 2 | 2 |
| RX9CN | * | 24 | 2 | 2 | 2 |
| OH9/RA1ZM | * | 8 | 2 | 2 | 2 |
| I1BAY | * | 100 | 58 | 21 | 36 |
| KB4QQJ | * | 100 | 61 | 25 | 43 |
| **PY2ZK** | **28** | **37,877** | **307** | **16** | **33** |
| **YO5PCY** | **"** | **23,877** | **309** | **14** | **49** |
| **I5KAP** | **"** | **19,240** | **181** | **18** | **56** |
| **4X6DK** | **"** | **16,170** | **101** | **12** | **43** |
| **IZ8EDL** | **"** | **15,456** | **148** | **15** | **54** |
| **YO5PBW** | **"** | **7,245** | **96** | **12** | **33** |
| **JF2MBF** | **"** | **2,280** | **46** | **9** | **15** |
| **ER3MM** | **"** | **1,855** | **33** | **9** | **26** |
| **SP2FMN** | **"** | **1,650** | **62** | **4** | **26** |
| OM7PY | * | 560 | 19 | 5 | 11 |
| DF7LS | * | 558 | 28 | 5 | 13 |
| F8AKC | * | 464 | 15 | 7 | 9 |
| VR2ZQZ | * | 140 | 24 | 9 | 11 |
| **CT1AOZ** | **21** | **65,067** | **224** | **26** | **97** |
| **AG4RZ** | **"** | **62,167** | **225** | **24** | **83** |
| **YO5AIR** | **"** | **35,838** | **270** | **23** | **76** |
| **SP4GFG** | **"** | **29,520** | **258** | **15** | **65** |
| **JH7RTQ** | **"** | **28,028** | **174** | **29** | **48** |
| **WA6FGV** | **"** | **10,545** | **76** | **19** | **38** |
| **IZØCKO** | **"** | **10,353** | **146** | **12** | **39** |
| **OK1AIJ** | **"** | **9,676** | **137** | **10** | **49** |
| **JR1NKN** | **"** | **9,534** | **104** | **16** | **26** |
| **EW6CU** | **"** | **8,840** | **167** | **9** | **43** |
| **JH3DMQ** | **"** | **7,154** | **59** | **20** | **29** |
| IZ8EWD | * | 4,725 | 72 | 11 | 34 |
| RA3XEV | * | 3,744 | 91 | 7 | 29 |
| JQ6PAQ | * | 3,255 | 42 | 14 | 17 |
| JA1KPF | * | 2,492 | 41 | 11 | 17 |
| HS8KGG | * | 1,368 | 34 | 11 | 13 |
| VA3RJ | * | 1,161 | 25 | 10 | 17 |
| RU3RM | * | 1,032 | 26 | 6 | 18 |
| N1ESE | * | 171 | 8 | 3 | 6 |
| **DH6JL** | **14** | **67,125** | **316** | **30** | **95** |
| **TG9ADQ** | **"** | **37,312** | **293** | **18** | **46** |
| **YO6EX** | **"** | **35,055** | **261** | **17** | **78** |
| **IZ1DGG** | **"** | **25,842** | **283** | **12** | **61** |
| **EW6DX** | **"** | **21,840** | **201** | **16** | **64** |
| **UA1CEC** | **"** | **21,148** | **273** | **10** | **58** |
| **IK3JBP** | **"** | **15,352** | **166** | **18** | **58** |
| **LA8WG** | **"** | **11,330** | **165** | **8** | **47** |
| **ON3TO** | **"** | **10,140** | **176** | **9** | **51** |
| **XE1NW** | **"** | **9,541** | **97** | **15** | **32** |
| **EA4EQD** | **"** | **8,607** | **115** | **10** | **47** |
| KF8BT | * | 6,604 | 66 | 16 | 36 |
| JA4DQX | * | 3,672 | 54 | 15 | 19 |
| SP9RQH | * | 2,739 | 61 | 9 | 24 |
| 9A8MM | * | 1,410 | 36 | 8 | 22 |
| E2ØNMK | * | 1,034 | 25 | 8 | 14 |
| DK5CS | * | 875 | 35 | 4 | 21 |
| K6BBQ | * | 442 | 24 | 7 | 6 |
| W9BNO | * | 255 | 13 | 9 | 8 |
| RAØJEP | * | 154 | 25 | 3 | 4 |
| KO9A | * | 70 | 9 | 3 | 2 |
| LA1TPA | * | 15 | 3 | 2 | 3 |
| M/S56G | * | 8 | 7 | 2 | 6 |
| M/S59TI | * | 6 | 4 | 2 | 4 |
| **KP4KE** | **7** | **323,232** | **1329** | **24** | **88** |
| **OK7CM** | **"** | **35,445** | **345** | **13** | **72** |
| **4X/UU4JKY** | **"** | **28,500** | **190** | **12** | **64** |
| **KO1H** | **"** | **12,474** | **80** | **19** | **44** |
| **HAØGK** | **"** | **7,200** | **132** | **7** | **43** |
| **DL9SXX** | **"** | **4,278** | **94** | **7** | **39** |
| **PG2AA** | **"** | **2,988** | **80** | **4** | **32** |
| RW9LL | * | 896 | 25 | 6 | 10 |
| JL3SBE | * | 81 | 7 | 4 | 5 |
| **WP4EDD** | **3.7** | **35,454** | **432** | **16** | **41** |
| **RU3VD** | **"** | **18,224** | **208** | **11** | **56** |
| **G4CWH** | **"** | **9,065** | **200** | **8** | **41** |
| **IZ3IBL** | **"** | **7,776** | **162** | **7** | **47** |
| HA6VA | * | 1,147 | 76 | 4 | 27 |
| SP2FNC | * | 306 | 21 | 4 | 13 |
| SP2BSD | * | 35 | 5 | 2 | 5 |
| **SP3HLM** | **1.8** | **3,784** | **97** | **6** | **38** |
| **DJ3GE** | **"** | **510** | **33** | **2** | **15** |
| **SQ2BXI** | **"** | **450** | **34** | **3** | **15** |
| RW9QA | * | 200 | 11 | 4 | 6 |
| K3TW | * | 120 | 16 | 3 | 2 |
| WO2N | * | 50 | 21 | 3 | 2 |

## ASSISTED

## NORTH AMERICA

### United States

| | | | | | |
|---|---|---|---|---|---|
| **N1DG** | **A** | **1,790,316** | **1158** | **116** | **432** |
| **N1IW** | **"** | **1,626,174** | **1284** | **107** | **366** |
| WB1DX | * | 1,363,180 | 1141 | 104 | 351 |
| K2TE/1 | * | 1,165,428 | 1013 | 96 | 340 |
| W1CSM | * | 1,052,920 | 894 | 96 | 344 |
| N8RA/1 | * | 958,368 | 879 | 90 | 312 |
| W1RZF | * | 817,330 | 853 | 82 | 288 |
| K2KQ/1 | * | 796,110 | 679 | 99 | 347 |
| AA1V | * | 772,338 | 662 | 97 | 329 |
| W1QK | * | 684,972 | 745 | 84 | 275 |
| W1GUS | * | 684,926 | 796 | 76 | 250 |
| W1NT | * | 616,713 | 752 | 76 | 235 |
| KE1IH | * | 610,650 | 647 | 88 | 266 |
| W1ZT | * | 568,344 | 611 | 79 | 278 |
| W3IZ/1 | * | 556,400 | 666 | 78 | 247 |
| KV1J | * | 467,100 | 525 | 83 | 263 |
| KA2KON/1 | * | 446,814 | 571 | 70 | 239 |
| W1KQ | * | 369,315 | 495 | 63 | 220 |
| N1BC

| | | | | | | |
|---|---|---|---|---|---|---|
| N3ST | * | 98,658 | 208 | 46 | 128 |
| N3NRN | * | 90,888 | 219 | 47 | 121 |
| WØBR/3 | * | 71,574 | 178 | 49 | 109 |
| N3NR | * | 57,456 | 149 | 44 | 108 |
| KB3JGU | * | 50,864 | 150 | 41 | 95 |
| K3PP | * | 50,662 | 132 | 46 | 100 |
| K3SV | * | 26,550 | 98 | 38 | 80 |
| K3STX | * | 9,842 | 54 | 29 | 45 |
| N3KHK | * | 9,450 | 70 | 26 | 49 |
| K3II | * | 924 | 37 | 17 | 27 |
| **N3RD** | **21** | **806,944** | **1778** | **29** | **138** |
| W9GE/3 | * | 191,337 | 507 | 25 | 116 |
| K3MQ | * | 18,164 | 97 | 17 | 59 |
| AD8J/3 | 7 | 15,360 | 98 | 15 | 49 |
| **N3RS** | **3.7** | **47,100** | **207** | **23** | **77** |
| **W4WTB** | **A** | **3,206,060** | **2007** | **129** | **461** |
| **N4WW** | **"** | **2,149,035** | **1377** | **135** | **498** |
| AA4S | * | 1,462,240 | 1114 | 113 | 381 |
| N4KG | * | 1,348,593 | 976 | 120 | 407 |
| K2EK/4 | * | 1,024,650 | 904 | 120 | 330 |
| N2TU/4 | * | 993,564 | 880 | 96 | 333 |
| W3OA/4 | * | 986,752 | 889 | 101 | 315 |
| KI4TZ | * | 965,328 | 846 | 100 | 342 |
| K4SAV | * | 711,424 | 677 | 92 | 305 |
| W4JAM | * | 597,246 | 675 | 73 | 265 |
| N4LR | * | 550,278 | 603 | 85 | 257 |
| K4XD | * | 490,086 | 577 | 85 | 257 |
| NN4F | * | 421,473 | 596 | 85 | 236 |
| N4PJ | * | 408,480 | 500 | 71 | 225 |
| K4EU | * | 342,919 | 444 | 65 | 242 |
| N4ZZ | * | 327,584 | 528 | 54 | 178 |
| W4KTR | * | 296,736 | 430 | 74 | 207 |
| K4YKZ | * | 293,700 | 443 | 70 | 205 |
| KU4V | * | 286,272 | 407 | 80 | 204 |
| K4FPF | * | 258,258 | 418 | 52 | 179 |
| N4FX | * | 246,352 | 305 | 83 | 263 |
| W4JVN | * | 225,096 | 348 | 61 | 188 |
| W5CPT/4 | * | 203,394 | 373 | 58 | 160 |
| K5VIP/4 | * | 187,261 | 290 | 66 | 205 |
| K1ZW/4 | * | 172,326 | 292 | 66 | 165 |
| AD4IE | * | 155,310 | 318 | 45 | 141 |
| K4GHS | * | 137,052 | 272 | 48 | 140 |
| K4CZ | * | 135,949 | 275 | 50 | 137 |
| W4NZ | * | 131,815 | 251 | 70 | 135 |
| K1KO/4 | * | 131,712 | 265 | 53 | 139 |
| N4TL | * | 123,210 | 252 | 49 | 136 |
| K4NAU | * | 117,847 | 250 | 50 | 141 |
| KB4AMA | * | 100,626 | 253 | 58 | 128 |
| KD4SN | * | 94,804 | 215 | 49 | 124 |
| K4DJ | * | 93,155 | 245 | 43 | 112 |
| K4JEB | * | 87,516 | 169 | 60 | 161 |
| WA3OFC/4 | * | 85,120 | 180 | 50 | 140 |
| WA1FCN/4 | * | 82,268 | 215 | 47 | 110 |
| W4/DL4EAX | * | 77,539 | 232 | 35 | 98 |
| W4CU | * | 71,568 | 196 | 43 | 99 |
| N4EEB | * | 67,781 | 180 | 50 | 111 |
| AI4ME | * | 64,380 | 189 | 46 | 99 |
| N4VV | * | 56,695 | 147 | 38 | 107 |
| AD4YQ | * | 51,102 | 155 | 46 | 107 |
| K4DLI | * | 42,712 | 168 | 47 | 105 |
| WW4E | * | 41,022 | 129 | 39 | 90 |
| N4VA | * | 38,822 | 121 | 34 | 84 |
| KA4OTB | * | 38,170 | 161 | 39 | 71 |
| N2YO/4 | * | 36,225 | 123 | 35 | 80 |
| N4DWK | * | 26,712 | 83 | 49 | 77 |
| AB4EJ | * | 23,430 | 101 | 40 | 70 |
| K2SX/4 | * | 22,220 | 97 | 34 | 67 |
| WA2BCK | * | 21,837 | 100 | 26 | 61 |
| K4APG | * | 18,818 | 78 | 32 | 65 |
| K2SD/4 | * | 18,565 | 97 | 25 | 54 |
| KG4ZXK | * | 10,530 | 77 | 28 | 53 |
| KØCOP/4 | * | 9,735 | 77 | 17 | 42 |
| KM9P/4 | * | 8,820 | 50 | 16 | 44 |
| | | | (OP: W4NZ) | | |
| KG4WOJ | * | 6,968 | 53 | 25 | 42 |
| K8YC/4 | * | 4,992 | 42 | 17 | 35 |
| **W4FDA** | **21** | **123,552** | **332** | **28** | **115** |
| KC4HW | * | 48,960 | 196 | 24 | 78 |
| **W5WMU** | **A** | **1,602,576** | **1401** | **120** | **376** |
| N5JR | * | 532,677 | 563 | 88 | 265 |
| K5GH | * | 423,846 | 491 | 97 | 237 |
| W3TZ/5 | * | 290,583 | 445 | 68 | 181 |
| W5GA | * | 184,184 | 366 | 68 | 185 |
| WT5U | * | 64,801 | 214 | 40 | 97 |
| KE5MOZ | * | 24,723 | 93 | 45 | 78 |
| K5NX | * | 12,482 | 76 | 26 | 53 |
| W5TB | * | 1,748 | 31 | 18 | 28 |
| **W5ZO** | **28** | **14,582** | **123** | **12** | **34** |
| **WØVX/5** | **21** | **66,852** | **228** | **26** | **82** |
| **KA5M** | **14** | **100,252** | **260** | **29** | **113** |
| **NX5M** | **7** | **111,875** | **347** | **29** | **96** |
| **K6TA** | **A** | **647,064** | **715** | **101** | **243** |
| **N6QQ** | **"** | **396,864** | **585** | **81** | **207** |
| **N6ED** | **"** | **386,012** | **511** | **88** | **195** |
| N6WS | * | 281,673 | 412 | 85 | 178 |
| K6RIM | * | 281,336 | 419 | 76 | 177 |
| K2RD/6 | * | 271,089 | 414 | 92 | 181 |
| KC6X | * | 222,915 | 383 | 79 | 152 |
| N2NS/6 | * | 198,588 | 329 | 88 | 159 |
| K6QK | * | 180,200 | 343 | 65 | 147 |
| K6GEP | * | 109,736 | 255 | 66 | 106 |
| N6NG | * | 102,850 | 234 | 59 | 128 |
| NW6P | * | 75,862 | 188 | 61 | 105 |
| N6VH | * | 55,573 | 178 | 48 | 71 |
| K6GT | * | 48,006 | 160 | 48 | 79 |
| N6RK | * | 33,516 | 112 | 37 | 77 |
| K6YP | * | 32,045 | 110 | 54 | 91 |
| KJ6RA | * | 31,720 | 123 | 40 | 64 |
| K6ST | * | 24,062 | 101 | 47 | 59 |
| K6UUW | * | 20,793 | 109 | 34 | 53 |
| AE6RR | * | 16,340 | 108 | 31 | 45 |
| K6JEB | * | 11,730 | 75 | 32 | 37 |
| W6RQ | * | 9,112 | 58 | 30 | 37 |
| WA6L | * | 6,875 | 54 | 22 | 33 |
| W6RKC | 14 | 17,507 | 112 | 23 | 38 |
| **WU9B/7** | **A** | **281,792** | **432** | **75** | **184** |
| **K7ABV** | **"** | **149,917** | **309** | **63** | **134** |
| N7RK | * | 145,908 | 313 | 65 | 128 |
| K7BAA | * | 142,308 | 300 | 65 | 136 |
| W7CT | * | 110,357 | 273 | 58 | 111 |
| W6SA/7 | * | 70,956 | 221 | 59 | 87 |
| W7SW | * | 63,840 | 199 | 41 | 79 |
| WAØWWW | * | 58,692 | 174 | 48 | 86 |
| K7EKM | * | 35,814 | 150 | 49 | 78 |
| KY7M | * | 35,760 | 117 | 41 | 79 |
| K4GMH/7 | * | 34,650 | 158 | 25 | 80 |
| W7WHY | * | 30,660 | 143 | 39 | 66 |
| N7YX | * | 19,536 | 112 | 31 | 43 |
| K7VIT | * | 16,632 | 84 | 35 | 42 |
| WG7Y | * | 5,985 | 51 | 24 | 33 |
| K7FL | * | 3,696 | 49 | 22 | 22 |
| KE7FBY | * | 630 | 41 | 18 | 17 |
| **W7UT** | **21** | **126,126** | **400** | **27** | **90** |
| **W7ZR** | **"** | **80,300** | **318** | **27** | **73** |
| KF7E | * | 76,608 | 252 | 28 | 86 |
| WE7K | * | 46,656 | 196 | 24 | 72 |
| N7MAL | 7 | 2,888 | 37 | 15 | 23 |
| **N8TR** | **A** | **1,914,864** | **1260** | **128** | **446** |
| **N8BI** | **"** | **1,042,389** | **897** | **102** | **357** |
| W8MJ | * | 886,620 | 876 | 101 | 319 |
| W8JY | * | 515,080 | 618 | 74 | 242 |
| AJ1M/8 | * | 310,688 | 424 | 81 | 223 |
| WB8ZRL | * | 227,815 | 310 | 80 | 203 |
| AA8LL | * | 174,966 | 278 | 77 | 165 |
| WC8VOA | * | 141,460 | 313 | 66 | 154 |
| | | | (OP: W8ND) | | |
| WA8MCD | * | 79,827 | 216 | 52 | 125 |
| K8SAK | * | 47,680 | 142 | 49 | 100 |
| N8AE | * | 11,920 | 65 | 27 | 53 |
| N8KOJ | * | 9,636 | 59 | 27 | 46 |
| K8GT | * | 1,458 | 20 | 9 | 18 |
| K9TRV/8 | * | 805 | 13 | 12 | 11 |
| **W8CZN** | **14** | **321,261** | **719** | **35** | **138** |
| N9FN/8 | 3.7 | 10,716 | 82 | 16 | 41 |
| W8TN | * | 9,348 | 68 | 15 | 42 |
| **WB9Z** | **A** | **2,572,647** | **1897** | **129** | **410** |
| **K9CT** | **"** | **1,086,076** | **939** | **105** | **331** |
| WE9V | * | 845,467 | 706 | 101 | 348 |
| K9IMM | * | 815,661 | 855 | 89 | 274 |
| WO9Z | * | 574,722 | 602 | 93 | 274 |
| W9JA | * | 465,982 | 551 | 91 | 268 |
| WE9R | * | 463,760 | 542 | 87 | 253 |
| KA9FOX | * | 461,472 | 500 | 101 | 267 |
| N9ZM | * | 405,840 | 539 | 81 | 223 |
| NS9I | * | 256,197 | 429 | 66 | 171 |
| W9GIG | * | 114,062 | 212 | 61 | 153 |
| K9DUR | * | 63,648 | 161 | 48 | 108 |
| WT9U | * | 35,643 | 130 | 31 | 78 |
| N9CO | * | 23,994 | 96 | 21 | 72 |
| **KØKX** | **A** | **1,346,345** | **1108** | **107** | **348** |
| **KØSR** | **"** | **1,114,990** | **994** | **104** | **326** |
| KØRC | * | 700,340 | 707 | 104 | 284 |
| WAØMHJ | * | 633,360 | 700 | 91 | 257 |
| NØAT | * | 513,408 | 534 | 100 | 282 |
| WBØHCH | * | 389,778 | 494 | 88 | 246 |
| KØTI | * | 306,280 | 455 | 76 | 184 |
| KEØL | * | 257,226 | 393 | 68 | 190 |
| K4IU/Ø | * | 193,392 | 342 | 70 | 167 |
| KØPC | * | 152,978 | 266 | 73 | 150 |
| KØYR | * | 149,250 | 311 | 62 | 137 |
| WØTT | * | 143,550 | 275 | 59 | 166 |
| NØODK | * | 115,839 | 232 | 58 | 153 |
| KSØT | * | 112,110 | 270 | 62 | 123 |
| NRØL | * | 85,808 | 205 | 58 | 115 |
| KØBX | * | 81,252 | 207 | 43 | 105 |
| KNØR | * | 60,143 | 172 | 41 | 96 |
| WØLM | * | 48,081 | 134 | 48 | 93 |
| W4RK/Ø | * | 33,288 | 145 | 45 | 69 |
| WGØM | * | 25,856 | 105 | 47 | 81 |
| KØUH | * | 21,804 | 99 | 31 | 61 |
| NØEO | * | 21,600 | 92 | 37 | 63 |
| | | | (OP: AAØAW) | | |
| KØSZ | * | 18,308 | 113 | 37 | 55 |
| NSØB | * | 9,675 | 57 | 30 | 45 |
| NUØJ | * | 624 | 13 | 13 | 11 |
| WØAD | * | 576 | 13 | 7 | 11 |
| **KC6R/Ø** | **21** | **49,248** | **203** | **24** | **72** |
| **KVØQ** | **3.7** | **43,935** | **216** | **25** | **62** |
| **KØRF** | **1.8** | **3,850** | **52** | **10** | **25** |

### Alaska

| | | | | | |
|---|---|---|---|---|---|
| **AL2F** | **A** | **67,040** | **351** | **35** | **45** |
| AL9A | * | 44,713 | 320 | 27 | 34 |

### Belize

| | | | | | |
|---|---|---|---|---|---|
| **V31FB** | **A** | **510,720** | **1268** | **56** | **136** |

### Canada

| | | | | | |
|---|---|---|---|---|---|
| **VO1MP** | **A** | **2,565,810** | **1974** | **106** | **404** |
| VE1DHD | * | 407,997 | 965 | 46 | 161 |
| VE9NC | * | 358,290 | 494 | 57 | 213 |
| **VE1OP** | **14** | **133,338** | **376** | **26** | **116** |
| **VE3UTT** | **A** | **2,391,661** | **1906** | **109** | **382** |
| | | | (OP: W1AJT) | | |
| VE3XN | * | 504,634 | 595 | 84 | 254 |
| VE3SS | * | 74,824 | 161 | 51 | 137 |
| VE3FRX | * | 15,204 | 80 | 25 | 59 |
| VE3AJ | * | 9,652 | 78 | 28 | 48 |
| **VE3MGY** | **1.8** | **5,130** | **293** | **4** | **6** |
| **VE7ABC** | **A** | **48,114** | **264** | **37** | **62** |
| **VE6LB** | **A** | **65,072** | **338** | **42** | **56** |
| **VE6TR** | **14** | **24,346** | **143** | **21** | **53** |
| **VA7FC** | **A** | **328,380** | **802** | **71** | **124** |
| VE7KET | * | 234,954 | 428 | 70 | 159 |
| VE7BZ | * | 152,810 | 619 | 49 | 69 |

### Honduras

| | | | | | |
|---|---|---|---|---|---|
| **HR2DMR** | **A** | **1,388,088** | **2217** | **91** | **221** |

### Martinique

| | | | | | |
|---|---|---|---|---|---|
| **FM/K9NW** | **A** | **6,622,850** | **5203** | **129** | **446** |
| **FM5FJ** | **7** | **204,544** | **617** | **25** | **103** |

### Mexico

| | | | | | |
|---|---|---|---|---|---|
| **XE2K** | **3.7** | **72,176** | **765** | **15** | **37** |

### Puerto Rico

| | | | | | |
|---|---|---|---|---|---|
| **KP4US** | **A** | **612,096** | **1241** | **75** | **181** |

### Virgin Islands

| | | | | | |
|---|---|---|---|---|---|
| **NP2KW** | **A** | **678,040** | **1530** | **66** | **164** |
| NP2L | * | 33,480 | 322 | 26 | 36 |

## AFRICA

### Canary Islands

| | | | | | |
|---|---|---|---|---|---|
| **EA8AJO** | **A** | **267,189** | **452** | **51** | **170** |
| EA8BZH | * | 78,071 | 209 | 41 | 92 |

### Senegal

| | | | | | |
|---|---|---|---|---|---|
| **6W1SE** | **A** | **2,150,390** | **2172** | **73** | **273** |

### South Africa

| | | | | | |
|---|---|---|---|---|---|
| ZS5ZZ | A | 24,108 | 101 | 31 | 53 |
| **ZS4JAN** | **28** | **6,808** | **73** | **10** | **36** |

## ASIA

### Asiatic Russia

| | | | | | |
|---|---|---|---|---|---|
| **RU9WX** | **A** | **6,758,725** | **3980** | **125** | **536** |
| **RK9CYA** | **"** | **452,214** | **786** | **56** | **203** |
| UA9BS | * | 394,305 | 609 | 66 | 225 |
| UA9SAW | * | 77,616 | 244 | 35 | 97 |
| RV9UP | * | 72,640 | 226 | 55 | 105 |
| RM9RZ | * | 71,231 | 220 | 48 | 115 |
| RZ9OJ | * | 53,424 | 205 | 23 | 89 |
| RA9MC | * | 51,840 | 157 | 49 | 113 |
| RA9UAD | * | 39,512 | 221 | 21 | 67 |
| RW9WW | * | 30,470 | 116 | 29 | 81 |
| RW9HZZ | * | 25,010 | 117 | 40 | 82 |
| | | | (OP: RZ9IR) | | |
| RA9UAG | * | 6,279 | 77 | 10 | 29 |
| UA9LGD | * | 252 | 8 | 6 | 8 |
| UA9XLC | 21 | 13,530 | 103 | 12 | 43 |
| RV9YK | * | 6,200 | 76 | 11 | 29 |
| RA9AC | * | 2,520 | 32 | 19 | 23 |
| **RW9USA** | **7** | **482,374** | **1578** | **32** | **110** |
| RU9CK | * | 118,080 | 451 | 25 | 95 |
| **UA9PC** | **3.7** | **162,486** | **628** | **22** | **80** |
| RN9AA | 1.8 | 60 | 4 | 3 | 3 |
| **UAØSE** | **A** | **247,280** | **583** | **62** | **158** |
| RWØUM | * | 57,178 | 298 | 40 | 73 |
| UAØFOO | * | 53,340 | 260 | 53 | 74 |
| RAØBA | 7 | 154 | 8 | 7 | 7 |

### China

| | | | | | |
|---|---|---|---|---|---|
| BA4DW | A | 5,896 | 58 | 20 | 24 |
| **B7M** | **21** | **92,000** | **631** | **26** | **66** |
| | | | (OP: BG7MSN) | | |

### Cyprus

| | | | | | |
|---|---|---|---|---|---|
| **P3J** | **A** | **522,828** | **700** | **69** | **213** |
| | | | (OP: 5B4AHJ) | | |

### Hong Kong

| | | | | | |
|---|---|---|---|---|---|
| **VR1ØXLN** | **A** | **436,995** | **1236** | **83** | **166** |

### Japan

| | | | | | |
|---|---|---|---|---|---|
| **JQ1BVI** | **A** | **718,560** | **997** | **126** | **234** |
| JM1XCW | * | 177,654 | 411 | 75 | 99 |
| JH8SLS/1 | * | 155,610 | 332 | 71 | 119 |
| JS1KQQ | * | 57,084 | 191 | 52 | 82 |
| **JO1WKO** | **7** | **16,348** | **102** | **15** | **46** |
| **JR2PMT** | **A** | **218,828** | **395** | **89** | **152** |
| JK2VOC | * | 36,462 | 168 | 49 | 69 |
| **JH3PRR** | **A** | **601,282** | **665** | **107** | **255** |
| JO3DDD | * | 149,940 | 356 | 76 | 128 |
| JA3PYC | * | 45,510 | 164 | 53 | 70 |
| JH3EQP | * | 25,389 | 137 | 40 | 53 |
| JJ3OFL | * | 8,349 | 69 | 31 | 38 |
| JG3FEA | 21 | 4,576 | 45 | 16 | 28 |
| **JN3DSH** | **14** | **24,336** | **152** | **25** | **47** |
| JR4DHK | A | 18,512 | 98 | 38 | 51 |
| **JO7KMB** | **A** | **171,360** | **414** | **73** | **97** |
| JG7AMD | * | 20,034 | 117 | 25 | 38 |
| JL7IFR | * | 5,719 | 66 | 18 | 25 |
| **JA8RUU** | **A** | **55,328** | **203** | **54** | **98** |
| **JA9XBW** | **3.7** | **168** | **7** | **5** | **7** |
| **JAØFVU** | **14** | **50,160** | **247** | **29** | **59** |

### Kazakhstan

| | | | | | |
|---|---|---|---|---|---|
| **UN9L** | **A** | **363,312** | **1028** | **33** | **111** |

### Kyrgyzstan

| | | | | | |
|---|---|---|---|---|---|
| **EX2T** | **7** | **45,430** | **256** | **16** | **61** |

### Mongolia

| | | | | | |
|---|---|---|---|---|---|
| **JT1CO** | **A** | **1,236,330** | **2465** | **101** | **241** |

### Tajikistan

| | | | | | |
|---|---|---|---|---|---|
| **EY8CQ** | **A** | **360,126** | **945** | **45** | **117** |

### Thailand

| | | | | | |
|---|---|---|---|---|---|
| **E21YDP** | **7** | **68,705** | **313** | **23** | **68** |

### West Malaysia

| | | | | | |
|---|---|---|---|---|---|
| **9M2CCO** | **A** | **138,424** | **530** | **42** | **101** |

## EUROPE

### Austria

| | | | | | |
|---|---|---|---|---|---|
| **OE5UAL** | **A** | **158,218** | **352** | **54** | **185** |
| OE5HSN | * | 100,360 | 339 | 43 | 150 |
| **OE1KDK** | **21** | **154,203** | **601** | **31** | **116** |

### Balearic Islands

| | | | | | |
|---|---|---|---|---|---|
| EA6ADL | A | 3,245 | 42 | 18 | 37 |

### Belarus

| | | | | | |
|---|---|---|---|---|---|
| **EU1AZ** | **14** | **226,083** | **1151** | **30** | **113** |

### Belgium

| | | | | | |
|---|---|---|---|---|---|
| **OQ4B** | **A** | **347,316** | **704** | **63** | **246** |
| | | | (OP: ON4BHQ) | | |
| ON6LR | * | 228,490 | 352 | 78 | 235 |
| ON6FC | * | 67,768 | 334 | 36 | 136 |
| **ON4WW** | **1.8** | **87,220** | **896** | **14** | **75** |

### Bulgaria

| | | | | | |
|---|---|---|---|---|---|
| **LZ2ZG** | **A** | **86,305** | **302** | **53** | **152** |
| LZ1PM | * | 1,089 | 20 | 13 | 20 |
| **LZ7J** | **3.7** | **132,858** | **1035** | **25** | **96** |
| | | | (OP: LZ1YQ) | | |

### Croatia

| | | | | | |
|---|---|---|---|---|---|
| **9A3KS** | **A** | **68,445** | **204** | **51** | **144** |
| **9A2U** | **7** | **152,250** | **1110** | **25** | **100** |
| | | | (OP: 9A3ZA) | | |
| 9A4RV | 3.7 | 10,266 | 152 | 7 | 52 |

### Czech Republic

| | | | | | |
|---|---|---|---|---|---|
| **OK1KT** | **A** | **1,005,712** | **1297** | **107** | **419** |
| OK2VZE | * | 156,468 | 513 | 44 | 192 |
| OK1BA | * | 102,240 | 393 | 33 | 127 |
| OK1AVY | * | 76,356 | 168 | 58 | 131 |
| OK6AB | * | 67,320 | 317 | 32 | 148 |
| OL5Y | * | 59,514 | 284 | 41 | 141 |
| OK2WED | * | 42,570 | 268 | 32 | 97 |
| OK1JOC | * | 36,803 | 245 | 28 | 121 |
| OK3C | * | 26,106 | 130 | 35 | 79 |
| | | | (OP: OK2ZC) | | |
| **OK2FB** | **28** | **9,804** | **143** | **11** | **46** |
| **OK1CDJ** | **14** | **381,465** | **1318** | **36** | **137** |
| OL5M | * | 177,320 | 923 | 29 | 114 |
| **OK1NY** | **1.8** | **61,040** | **759** | **13** | **67** |
| OK1TP | * | 53,379 | 720 | 11 | 70 |

### Denmark

| | | | | | |
|---|---|---|---|---|---|
| **OZ1FAO** | **A** | **153,000** | **427** | **54** | **196** |
| **OZ1ADL** | **14** | **289,814** | **1067** | **36** | **127** |

### England

| | | | | | |
|---|---|---|---|---|---|
| **GØMTN** | **A** | **914,122** | **1645** | **74** | **333** |
| **GØVXE** | **"** | **745,875** | **1267** | **84** | **341** |
| G3RXQ | * | 294,800 | 723 | 52 | 216 |
| G3UEG | * | 29,925 | 207 | 24 | 81 |
| M3ENF | * | 20,500 | 133 | 26 | 74 |
| **G3YBY** | **21** | **191,672** | **637** | **29** | **123** |
| M1P | * | 126,071 | 377 | 31 | 126 |
| | | | (OP: G4TNB) | | |
| **MØLSK** | **14** | **17,710** | **203** | **12** | **58** |
| **G3GAF** | **1.8** | **5,586** | **150** | **6** | **32** |
| GØVDZ | * | 5,330 | 163 | 5 | 36 |

### Estonia

| | | | | | |
|---|---|---|---|---|---|
| **ES375UT** | **A** | **515,780** | **996** | **73** | **337** |
| | | | (OP: ES5RY) | | |
| ES1LS | * | 33,930 | 262 | 21 | 96 |
| **ES5RW** | **7** | **250,332** | **1421** | **29** | **109** |
| **ES5QX** | **1.8** | **13,780** | **197** | **8** | **57** |

### European Russia

| | | | | | |
|---|---|---|---|---|---|
| **RK4FD** | **A** | **2,819,504** | **3556** | **107** | **456** |
| **UA3BS** | **"** | **1,862,106** | **2308** | **120** | **497** |
| **UA3SAQ** | **"** | **1,767,705** | **1990** | **122** | **495** |
| RM3F | * | 1,568,857 | 2306 | 102 | 401 |
| | | | (OP: UA3DPX) | | |
| UA4WKW | * | 1,440,000 | 2171 | 103 | 377 |
| RD4WA | * | 1,126,600 | 1553 | 102 | 422 |
| RW4PL | * | 487,743 | 743 | 91 | 352 |
| RA3DNC | * | 393,400 | 1002 | 58 | 223 |
| RW6HJV | * | 339,750 | 666 | 85 | 290 |
| RV3FF | * | 208,025 | 490 | 69 | 196 |
| RA1AR | * | 205,580 | 338 | 73 | 307 |
| RV3ZQ | * | 163,506 | 448 | 53 | 185 |
| UA4WMA | * | 150,675 | 536 | 52 | 193 |
| RN4WA | * | 128,193 | 397 | 62 | 185 |
| UA3AGW | * | 123,984 | 261 | 73 | 173 |
| RA3RK | * | 101,905 | 319 | 52 | 177 |
| UA4PAN | * | 75,548 | 414 | 35 | 152 |
| RD3DY | * | 73,365 | 320 | 41 | 160 |
| RA4LBS | * | 64,960 | 247 | 37 | 123 |
| UA3DUJ | * | 56,730 | 250 | 35 | 120 |
| RN4NF | * | 48,263 | 162 | 43 | 124 |
| UA6GF | * | 48,000 | 282 | 30 | 120 |
| UA3MQM | * | 27,040 | 126 | 43 | 87 |
| RZ6HF | * | 17,115 | 93 | 35 | 70 |
| RW4PY | * | 15,345 | 103 | 27 | 66 |
| RZ1OM | * | 12,848 | 98 | 19 | 69 |
| RV6LA | * | 10,266 | 165 | 14 | 45 |
| UA4WLI | * | 5,512 | 80 | 14 | 38 |
| RK6ASY | * | 3,510 | 88 | 8 | 37 |
| RX3APM | * | 3,444 | 50 | 12 | 16 |
| RA4NAJ | * | 3,224 | 45 | 18 | 34 |
| RX1AP | * | 1,184 | 18 | 14 | 18 |
| RX3RZ | * | 54 | 3 | 3 | 3 |
| **RU6CQ** | **28** | **120,714** | **901** | **24** | **94** |
| **UA6LV** | **"** | **110,740** | **843** | **22** | **91** |
| **UA6AA** | **21** | **79,315** | **271** | **32** | **113** |
| RA6YDX | * | 17,170 | 110 | 21 | 64 |
| RA6YJ | * | 294 | 7 | 7 | 7 |
| **RN3QO** | **14** | **443,260** | **1602** | **37** | **148** |
| RA4HTX | * | 297,024 | 1243 | 34 | 134 |
| UA1AQA | * | 99,918 | 688 | 23 | 99 |
| RX3RC | * | 25,398 | 186 | 15 | 68 |
| **RV3MI** | **7** | **106,516** | **610** | **23** | **101** |
| UA1CKC | * | 22,008 | 173 | 15 | 69 |
| UA4LU | * | 13,482 | 137 | 12 | 51 |
| **RU6LA** | **3.7** | **190,422** | **1051** | **29** | **113** |

### Finland

| | | | | | |
|---|---|---|---|---|---|
| **OH5BM** | **A** | **1,571,262** | **2061** | **124** | **413** |
| **OF6NIO** | **"** | **1,367,683** | **1535** | **90** | **419** |
| OH6OS | * | 418,905 | 616 | 80 | 355 |
| OH6DX | * | 407,628 | 533 | 89 | 379 |
| OH2XX | * | 119,350 | 319 | 55 | 162 |
| OH7LZB | * | 2,496 | 43 | 15 | 33 |
| OH2FS | 14 | 5,395 | 51 | 15 | 50 |
| **OH2BO** | **1.8** | **12,075** | **147** | **11** | **58** |
| OH3BU | * | 7,950 | 140 | 6 | 47 |

### France

| | | | | | |
|---|---|---|---|---|---|
| **TM7F** | **A** | **3,774,157** | **3138** | **121** | **456** |
| | | | (OP: F6GYT) | | |
| **F1JKJ** | **"** | **1,759,320** | **1980** | **110** | **430** |
| F4FKJ | * | 366,098 | 633 | 74 | 252 |
| F5CQ | * | 356,329 | 604 | 67 | 282 |
| F6IFY | * | 17,346 | 86 | 38 | 60 |
| F4CGJ | * | 2,646 | 71 | 12 | 42 |
| F1IKD | * | 418 | 18 | 5 | 14 |
| **F5MOO** | **21** | **537,540** | **1752** | **34** | **136** |
| **F6KCP** | **7** | **11,935** | **116** | **13** | **64** |
| | | | (OP: F5VHN) | | |
| **F1EBN** | **3.7** | **44,469** | **508** | **13** | **68** |

### Germany

| | | | | | |
|---|---|---|---|---|---|
| **DK1MM** | **A** | **4,435,480** | **3636** | **140** | **590** |
| **DLØWW** | **"** | **3,255,530** | **2597** | **131** | **539** |
| | | | (OP: DK3GI) | | |
| **DJ2YA** | **"** | **2,764,300** | **1966** | **138** | **580** |
| DL7ON | * | 1,730,416 | 1585 | 127 | 505 |
| DF9XV | * | 1,723,233 | 1740 | 108 | 429 |
| DL3LAB | * | 1,159,704 | 1358 | 98 | 433 |
| DL8QS | * | 1,031,040 | 1302 | 102 | 435 |
| DJ9MH | * | 827,670 | 1176 | 84 | 386 |
| DHØGHU | * | 823,338 | 1156 | 89 | 385 |
| DK1QH | * | 780,489 | 1255 | 80 | 331 |
| DL8DAZ | * | 711,500 | 972 | 93 | 407 |
| DL7ANR | * | 699,300 | 965 | 83 | 361 |
| DR1F | * | 677,160 | 1004 | 87 | 318 |
| | | | (OP: DG3FK) | | |
| DJ3WE | * | 598,486 | 1106 | 77 | 357 |
| DL1EJA | * | 586,872 | 606 | 101 | 393 |
| DL2AA | * | 545,296 | 853 | 80 | 314 |
| DL1REM | * | 467,152 | 916 | 73 | 315 |
| DC2YY | * | 452,288 | 704 | 80 | 302 |
| DL2KCK | * | 448,686 | 765 | 80 | 298 |
| DF5ZV | * | 444,400 | 663 | 80 | 324 |
| DJ8EW | * | 422,499 | 851 | 60 | 281 |
| DK6CQ | * | 368,861 | 684 | 73 | 274 |
| DL4LAM | * | 334,593 | 596 | 71 | 268 |
| DJ1OJ | * | 272,250 | 643 | 57 | 218 |
| DF2LH | * | 267,030 | 502 | 67 | 278 |
| DL9EE | * | 265,183 | 468 | 66 | 257 |
| DL5MX | * | 244,062 | 597 | 57 | 241 |
| DF2RG | * | 220,745 | 502 | 58 | 207 |
| DF1QQ | * | 216,476 | 520 | 60 | 239 |
| DL7UIO | * | 216,006 | 604 | 46 | 213 |
| DL6NCY | * | 200,232 | 370 | 76 | 233 |
| DK3WN | * | 197,616 | 608 | 45 | 231 |
| DL2UH | * | 196,950 | 454 | 65 | 238 |
| DM5JBN | * | 194,040 | 657 | 43 | 237 |
| DK7ZH | * | 167,696 | 593 | 40 | 183 |
| DL3OHB | * | 164,016 | 367 | 66 | 202 |
| DJ2ST | * | 131,040 | 392 | 53 | 142 |
| DL6KAC | * | 125,800 | 346 | 44 | 126 |
| DJØIF | * | 121,108 | 306 | 53 | 168 |
| DK4WF | * | 110,000 | 367 | 40 | 110 |
| DM7A | * | 106,040 | 388 | 45 | 175 |
| | | | (OP: DJ1YFK) | | |
| DK5MB | * | 101,343 | 226 | 58 | 191 |
| DK1FW | * | 90,706 | 255 | 49 | 168 |
| DL6QW | * | 87,740 | 298 | 42 | 122 |
| DF9OO | * | 82,044 | 279 | 50 | 162 |
| DO1SAJ | * | 81,982 | 352 | 35 | 144 |
| DL4RCK | * | 74,472 | 211 | 51 | 163 |
| DL5XL | * | 74,298 | 183 | 57 | 146 |
| DL1ARS | * | 69,144 | 290 | 40 | 132 |
| DL1PT | * | 68,448 | 296 | 44 | 140 |
| DO1YCL | * | 64,906 | 283 | 41 | 125 |
| DG9MDM | * | 63,318 | 180 | 47 | 126 |
| DDØDRK | * | 53,935 | 335 | 27 | 134 |
| | | | (OP: DL4HTK) | | |
| DJ4PI | * | 49,456 | 172 | 34 | 142 |
| DF2AP | * | 31,518 | 185 | 22 | 80 |
| DJ2QV | * | 30,480 | 138 | 36 | 84 |
| DG5OBB | * | 25,883 | 166 | 33 | 110 |
| DK5TX | * | 22,260 | 126 | 32 | 74 |
| DJ6OL | * | 22,149 | 147 | 26 | 81 |
| DK6RS | * | 21,560 | 109 | 30 | 58 |
| DL4PY | * | 19,458 | 107 | 24 | 45 |
| DR5A | * | 13,482 | 197 | 18 | 89 |
| | | | (OP: DO7GG) | | |
| DC3FR | * | 13,067 | 85 | 27 | 46 |
| DO8LA | * | 11,352 | 136 | 21 | 67 |
| DL8WX | * | 11,247 | 63 | 28 | 41 |
| DJ5MW | * | 9,956 | 103 | 16 | 60 |
| DL3DRN | * | 9,750 | 97 | 21 | 57 |
| DL2AMD | * | 5,085 | 50 | 19 | 26 |
| DGØOM | * | 3,135 | 59 | 17 | 38 |
| **DL5L** | **28** | **43,878** | **239** | **20** | **83** |
| | | | (OP: DGØOKW) | | |
| DO4DXA | * | 30,996 | 346 | 15 | 67 |
| **DQ4Q** | **21** | **754,974** | **1877** | **37** | **161** |
| | | | (OP: DF9ZP) | | |
| **DL2ARD** | **14** | **1,153,278** | **3034** | **38** | **151** |
| DL4CF | * | 201,951 | 647 | 34 | 137 |
| **DJ1AA** | **7** | **109,498** | **1032** | **17** | **89** |
| DL3EA | * | 92,127 | 586 | 23 | 100 |
| **DK9HN** | **3.7** | **17,316** | **179** | **13** | **65** |
| **DMØY** | **1.8** | **31,088** | **633** | **9** | **58** |
| | | | (OP: DL3BQA) | | |
| DK7ZT | * | 2,964 | 79 | 6 | 32 |

### Greece

| | | | | | |
|---|---|---|---|---|---|
| SV1NK | 7 | 3,784 | 80 | 9 | 34 |
| **SV2GJV** | **1.8** | **14,490** | **208** | **10** | **53** |

### Guernsey

| | | | | | |
|---|---|---|---|---|---|
| **MUØFAL** | **A** | **190,233** | **736** | **36** | **171** |

### Hungary

| | | | | | |
|---|---|---|---|---|---|
| **HG3DX** | **A** | **4,125,438** | **3596** | **146** | **577** |
| | | | (OP: HA3MY) | | |
| **HA8JV** | **"** | **4,074,828** | **4000** | **141** | **582** |
| **HA6PX** | **28** | **123,760** | **900** | **20** | **99** |
| **HA1YI** | **3.7** | **120,682** | **1408** | **12** | **71** |

### Ireland

| | | | | | |
|---|---|---|---|---|---|
| **EI9ES** | **A** | **40,339** | **280** | **20** | **87** |

### Italy

| | | | | | |
|---|---|---|---|---|---|
| **IZ1LBG** | **A** | **1,806,556** | **2097** | **106** | **421** |
| IR6D | * | 361,674 | 1153 | 70 | 213 |
| | | | (

### Netherlands

| | | | | | |
|---|---|---|---|---|---|
| **PA5TT** | **A** | **155,952** | **392** | **53** | **175** |
| PE1FTV | * | 65,472 | 329 | 29 | 147 |
| PG3N | * | 47,520 | 251 | 35 | 109 |
| PAØKHS | * | 30,192 | 203 | 24 | 87 |
| PE1RIK | * | 348 | 29 | 6 | 23 |
| **PA5A** | **14** | **214,970** | **736** | **35** | **131** |
| PE1MMZ | * | 198,720 | 873 | 30 | 114 |
| PA1TT | * | 147,258 | 583 | 32 | 130 |
| PA5O | 7 | 2,100 | 49 | 7 | 28 |

### Norway

| | | | | | |
|---|---|---|---|---|---|
| **LA3ZPA** | **A** | **59,400** | **356** | **53** | **163** |
| LA7GNA | * | 31,500 | 216 | 32 | 94 |
| LN2D | * | 9,990 | 120 | 18 | 72 |
| | | | (OP: LA6ZFA) | | |
| **LA/DL2GLA** | **14** | **100** | **3** | **2** | **3** |

### Poland

| | | | | | |
|---|---|---|---|---|---|
| **SN1I** | **A** | **540,155** | **1102** | **69** | **316** |
| | | | (OP: SP1NQF) | | |
| SP7LI | * | 110,000 | 435 | 46 | 174 |
| SP8LXE | * | 106,872 | 454 | 51 | 193 |
| SQ9NRY | * | 53,836 | 286 | 34 | 138 |
| SQ3LMY | * | 45,288 | 241 | 33 | 103 |
| SP6RLK | * | 42,160 | 148 | 41 | 114 |
| SP8QED | * | 11,102 | 102 | 22 | 69 |
| SQ3RX | * | 1,800 | 49 | 13 | 23 |
| SP5TAM | * | 1,092 | 29 | 10 | 18 |
| SQ1BVG | * | 210 | 11 | 6 | 8 |
| SQ6VY | * | 161 | 23 | 7 | 16 |
| **SN1X** | **28** | **74,338** | **562** | **18** | **91** |
| | | | (OP: SP5XVY) | | |
| SN2J | * | 30,444 | 253 | 17 | 69 |
| | | | (OP: SP2JMB) | | |
| SN9Z | * | 11,466 | 164 | 11 | 52 |
| | | | (OP: SP6EQZ) | | |
| **SP1RKT** | **21** | **35,856** | **215** | **24** | **84** |
| SP1NY | * | 31,114 | 167 | 22 | 72 |
| SP7DQR | * | 21,432 | 115 | 25 | 69 |
| **SN7Q** | **14** | **447,384** | **1519** | **36** | **132** |
| | | | (OP: SP7GIQ) | | |
| **SP5ELA** | **7** | **77,469** | **560** | **24** | **95** |
| SP3GXH | * | 39,060 | 358 | 16 | 74 |
| **SP1GZF** | **3.7** | **44,440** | **515** | **14** | **74** |
| **SQ1K** | **1.8** | **23,340** | **401** | **8** | **52** |
| SP6IHE | * | 6,720 | 165 | 8 | 52 |

### Portugal

| | | | | | |
|---|---|---|---|---|---|
| **CT1IUA** | **A** | **1,252,083** | **1761** | **75** | **252** |

### Romania

| | | | | | |
|---|---|---|---|---|---|
| **YO3RU** | **A** | **433,719** | **1027** | **72** | **265** |
| **YO7FB** | * | **330,400** | **1010** | **61** | **219** |
| YO5OHO | * | 261,960 | 731 | 54 | 241 |
| YO4RST | * | 198,198 | 501 | 60 | 213 |
| YO3JF | * | 188,000 | 563 | 58 | 192 |
| YO9XC | * | 81,200 | 345 | 43 | 160 |
| YO4KDC | * | 55,460 | 322 | 42 | 146 |
| YO9GJX | * | 5,226 | 79 | 21 | 57 |
| YO8DHD | * | 558 | 45 | 6 | 25 |
| **YO5OAG** | **28** | **7,546** | **130** | **9** | **40** |
| **YP3A** | **21** | **274,596** | **1342** | **31** | **116** |
| | | | (OP: YO3XX) | | |
| YO3JW | * | 119,679 | 557 | 29 | 110 |
| **YO9HG** | **7** | **47,310** | **123** | **7** | **31** |

### Sardinia

| | | | | | |
|---|---|---|---|---|---|
| **IS0AFM** | **A** | **446,025** | **1242** | **63** | **222** |

### Scotland

| | | | | | |
|---|---|---|---|---|---|
| **GM0F** | **A** | **485,877** | **906** | **67** | **290** |
| MMØGPZ | * | 265,408 | 820 | 50 | 236 |
| GMØDBW | * | 150,360 | 550 | 32 | 147 |
| GM4EVS | * | 95,764 | 343 | 35 | 143 |

### Serbia

| | | | | | |
|---|---|---|---|---|---|
| **YU9VK** | **A** | **235,584** | **540** | **61** | **227** |
| **YTØW** | **14** | **517,800** | **2443** | **36** | **114** |
| | | | (OP: YU1JW) | | |
| **YT1R** | **7** | **103,090** | **726** | **25** | **97** |
| | | | (OP: YU1UN) | | |
| **YZ7A** | **3.7** | **184,682** | **1584** | **19** | **88** |
| | | | (OP: YU7CM) | | |

### Sicily

| | | | | | |
|---|---|---|---|---|---|
| **IT9ZMX** | **21** | **420,135** | **1266** | **37** | **148** |
| IT9ORA | * | 4,641 | 66 | 13 | 26 |
| **IT9BOR** | **3.7** | **11,560** | **157** | **10** | **58** |
| **IT9BLB** | **1.8** | **38,376** | **436** | **10** | **68** |

### Slovakia

| | | | | | |
|---|---|---|---|---|---|
| **OM3KFF** | **A** | **32,851** | **194** | **32** | **101** |
| | | | (OP: OM4DW) | | |
| **OM5M** | **3.7** | **355,979** | **2219** | **27** | **112** |
| | | | (OP: OM2IB) | | |

### Slovenia

| | | | | | |
|---|---|---|---|---|---|
| **S57DX** | **A** | **3,807,725** | **3691** | **132** | **551** |
| S540 | * | 527,800 | 1044 | 74 | 290 |
| S51AY | * | 353,298 | 811 | 62 | 256 |
| S52W | * | 30,024 | 178 | 33 | 106 |
| **S57EA** | **28** | **9,850** | **187** | **6** | **44** |
| **S530** | **1.8** | **95,670** | **1073** | **13** | **77** |

### Spain

| | | | | | |
|---|---|---|---|---|---|
| **EA7RU** | **A** | **2,866,050** | **2411** | **120** | **474** |
| **EA1DR** | * | **976,758** | **1561** | **76** | **270** |
| AO5YJ | * | 556,661 | 1391 | 68 | 213 |
| | | | (OP: EA5YJ) | | |
| EA1OS | * | 504,948 | 981 | 67 | 281 |
| EA3FKX | * | 430,590 | 945 | 64 | 246 |
| EA5DKU | * | 345,340 | 634 | 69 | 241 |
| EE4E | * | 340,860 | 595 | 62 | 185 |
| EA5FID | * | 311,856 | 562 | 73 | 194 |
| EA5FGE | * | 182,644 | 364 | 79 | 229 |
| AO5J | * | 150,750 | 469 | 50 | 151 |
| | | | (OP: EA5ACO) | | |
| EB1TR | * | 137,562 | 491 | 51 | 176 |
| EA1ASC | * | 114,400 | 414 | 48 | 160 |
| ED1L | * | 100,450 | 272 | 50 | 155 |
| | | | (OP: EA1BLX) | | |
| EA4TA | * | 80,845 | 326 | 47 | 138 |
| EB2CYQ | * | 47,600 | 232 | 38 | 132 |
| EA4DEC | * | 23,660 | 104 | 45 | 85 |
| EA2DR | * | 21,222 | 146 | 23 | 58 |
| EA5JC | * | 14,700 | 106 | 29 | 69 |
| EA1BTK | * | 7,875 | 47 | 27 | 36 |
| **EA1BFZ** | **28** | **9,936** | **188** | **10** | **36** |
| EA7UU | * | 4,485 | 49 | 13 | 26 |
| **EB1BOA** | **21** | **365,000** | **1614** | **30** | **95** |
| EA7OT | * | 158,379 | 579 | 26 | 105 |
| AN5BBA | * | 13,199 | 152 | 16 | 51 |
| | | | (OP: EB5BBA) | | |
| **EA1CUB** | **14** | **224,264** | **960** | **32** | **104** |
| EA1WX | * | 168,611 | 845 | 22 | 81 |
| EA1DDO | * | 138,375 | 729 | 25 | 100 |
| EA1CS | * | 108,570 | 798 | 20 | 85 |
| **EA1DVY** | **1.8** | **2,040** | **70** | **5** | **29** |

### Sweden

| | | | | | |
|---|---|---|---|---|---|
| **SA5D** | **A** | **355,104** | **604** | **76** | **335** |
| | | | (OP: SM5DJZ) | | |
| **SM6WET** | * | **331,150** | **657** | **68** | **302** |
| SAØQ | * | 93,176 | 533 | 24 | 128 |
| | | | (OP: SMØOGQ) | | |
| 8SØW | * | 4,788 | 46 | 23 | 40 |
| | | | (OP: SMØNJO) | | |
| **SM6U** | **14** | **431,288** | **1758** | **36** | **133** |
| SJØX | 3.7 | 8 | 2 | 2 | 2 |
| | | | (OP: SM6U) | | |
| **7SØX** | **1.8** | **48,914** | **643** | **10** | **64** |
| | | | (OP: SMØMDG) | | |

### Ukraine

| | | | | | |
|---|---|---|---|---|---|
| **UU7J** | **A** | **6,669,255** | **5439** | **163** | **632** |
| | | | (OP: UUØJM) | | |
| **UT7QF** | * | **4,755,642** | **3919** | **156** | **606** |
| UZ4E | * | 1,462,050 | 2092 | 103 | 410 |
| | | | (OP: UV5EOZ) | | |
| UY2ZA | * | 68,160 | 296 | 37 | 155 |
| UT1KWA | * | 56,259 | 418 | 30 | 103 |
| | | | (OP: UT1KY) | | |
| UX2MK | * | 52,414 | 311 | 30 | 116 |
| UR1MN | * | 32,292 | 122 | 49 | 107 |
| UR5LO | * | 30,200 | 125 | 44 | 107 |
| UX3HA | * | 9,455 | 171 | 14 | 47 |
| URØIQ | * | 5,487 | 70 | 15 | 44 |
| **UT5ERP** | **28** | **11,286** | **182** | **11** | **43** |
| **UR6IJ** | **21** | **89,735** | **362** | **31** | **100** |
| **US0YW** | **14** | **75,946** | **476** | **28** | **99** |
| **UZ7M** | **7** | **298,197** | **1360** | **29** | **124** |
| | | | (OP: UT9MZ) | | |

### Wales

| | | | | | |
|---|---|---|---|---|---|
| **MW0ZZK** | **28** | **91,875** | **798** | **18** | **87** |

## OCEANIA

### Australia

| | | | | | |
|---|---|---|---|---|---|
| **VK4ZD** | **A** | **49,536** | **291** | **27** | **37** |
| VK6DU | 14 | 7,800 | 69 | 20 | 30 |

### Brunei

| | | | | | |
|---|---|---|---|---|---|
| **V8FEO** | **A** | **1,312,740** | **1650** | **92** | **205** |
| | | | (OP: 9M6DXX) | | |

### East Malaysia

| | | | | | |
|---|---|---|---|---|---|
| **9M6XRO** | **A** | **487,572** | **715** | **75** | **171** |

### Guam

| | | | | | |
|---|---|---|---|---|---|
| **NH0DX/NH2** | **A** | **1,058,584** | **1852** | **82** | **144** |
| | | | (OP: JL3RDC) | | |

### Hawaii

| | | | | | |
|---|---|---|---|---|---|
| **AF7DX/KH6** | **28** | **2,002** | **43** | **10** | **12** |

### Indonesia

| | | | | | |
|---|---|---|---|---|---|
| YC1RIF | 21 | 1,404 | 46 | 11 | 16 |

### New Zealand

| | | | | | |
|---|---|---|---|---|---|
| **ZL1BYZ** | **A** | **906,430** | **1439** | **77** | **153** |
| ZL4PW | * | 254,648 | 463 | 81 | 148 |
| ZL2IFB | * | 6,327 | 49 | 26 | 31 |
| **ZL3A** | **7** | **657,708** | **1715** | **35** | **103** |

## SOUTH AMERICA

### Argentina

| | | | | | |
|---|---|---|---|---|---|
| **LR2F** | **A** | **3,782,744** | **3263** | **111** | **323** |
| | | | (OP: LU5DX) | | |
| **LV5V** | * | **3,012,464** | **3004** | **94** | **270** |
| | | | (OP: LU5VV) | | |
| **LU3JVO** | **28** | **80,476** | **496** | **17** | **45** |
| LW5EAE | * | 19,350 | 185 | 15 | 28 |
| LW3EWZ | 7 | 1,178 | 33 | 13 | 18 |

### Bolivia

| | | | | | |
|---|---|---|---|---|---|
| CP1FF | A | 4,312 | 59 | 12 | 32 |

### Brazil

| | | | | | |
|---|---|---|---|---|---|
| **PY3FOX** | **A** | **690,690** | **1111** | **68** | **162** |
| **PY3DX** | * | **684,040** | **981** | **75** | **205** |
| PY3OL | * | 77,760 | 229 | 53 | 109 |
| PU2MXU | * | 39,920 | 446 | 17 | 23 |
| PY2RH | * | 21,500 | 202 | 17 | 26 |
| PY3OPP | * | 3,465 | 33 | 24 | 31 |
| PY2BRZ | * | 1,178 | 33 | 15 | 16 |
| **PY2TW** | **28** | **10,104** | **170** | **10** | **14** |
| PY5TJ | * | 6,162 | 88 | 13 | 26 |
| PY2XC | * | 286 | 14 | 6 | 7 |
| **PY2BK** | **21** | **739,410** | **1979** | **32** | **115** |
| PY2MTV | * | 114,341 | 449 | 26 | 83 |
| **PP5TR** | **14** | **149,460** | **629** | **25** | **69** |
| PY2IIQ | * | 16,038 | 99 | 17 | 49 |
| **PY2DY** | **7** | **56,055** | **229** | **30** | **81** |
| PY2DEZ | * | 1,131 | 28 | 11 | 18 |

### Chile

| | | | | | |
|---|---|---|---|---|---|
| **CE4CT** | **A** | **2,681,984** | **2706** | **106** | **262** |

### Colombia

| | | | | | |
|---|---|---|---|---|---|
| **HK3O** | **A** | **1,425,690** | **1954** | **84** | **195** |

### Venezuela

| | | | | | |
|---|---|---|---|---|---|
| **YY4RN** | **21** | **57,354** | **369** | **17** | **49** |

## MULTI-OPERATOR SINGLE TRANSMITTER NORTH AMERICA

### United States

| | | | | | |
|---|---|---|---|---|---|
| **W3UA/1** | | **3,963,246** | **2534** | **126** | **465** |
| **N1MM** | | **2,672,544** | **1759** | **120** | **454** |
| W1HR | | 2,417,034 | 1897 | 104 | 375 |
| W1FM | | 217,616 | 382 | 62 | 170 |
| W1YK | | 5,920 | 82 | 28 | 46 |
| **W2ZQ** | | **1,937,486** | **1501** | **109** | **382** |
| N2BZP | | 779,790 | 813 | 92 | 325 |
| AB2DE | | 665,805 | 768 | 88 | 285 |
| KC2NB | | 653,616 | 1030 | 62 | 205 |
| N2LBR | | 619,824 | 645 | 76 | 273 |
| KD2I | | 528,632 | 632 | 81 | 257 |
| W2XT | | 204,088 | 335 | 58 | 205 |
| N2NGW | | 8,322 | 72 | 26 | 47 |
| **K9RS/3** | | **4,504,524** | **2744** | **133** | **489** |
| **W3MF** | | **1,823,120** | **1304** | **108** | **412** |
| WY3P | | 929,600 | 861 | 101 | 347 |
| W3ZGD | | 500,004 | 611 | 88 | 254 |
| K3OQ | | 95,757 | 246 | 49 | 128 |
| WB3CJU | | 75,647 | 217 | 31 | 112 |
| W3LJ | | 68,510 | 186 | 46 | 109 |
| **K3EST/4** | | **3,071,442** | **2242** | **117** | **421** |
| **W3GQ/4** | | **1,689,877** | **1299** | **112** | **399** |
| W4NC | | 1,467,930 | 1144 | 114 | 387 |
| K4PMR | | 630,360 | 664 | 99 | 309 |
| N4TP | | 263,406 | 485 | 77 | 209 |
| N4RI | | 87,792 | 219 | 47 | 139 |
| KI4GUO | | 26,668 | 83 | 39 | 79 |
| KF4L | | 26,329 | 139 | 40 | 73 |
| **K5NA** | | **3,186,414** | **2203** | **149** | **478** |
| K2BA/5 | | 1,331,466 | 1234 | 115 | 359 |
| W5WP | | 1,014,486 | 1081 | 104 | 314 |
| W5BAK | | 597,090 | 654 | 98 | 292 |
| W5LCC | | 109,760 | 248 | 63 | 133 |
| **AI6V** | | **1,079,343** | **1130** | **117** | **270** |
| W6YX | | 642,088 | 875 | 104 | 228 |
| **W7VJ** | | **1,042,362** | **1106** | **116** | **282** |
| **N7RQ** | | **991,416** | **977** | **117** | **292** |
| WX7P | | 465,650 | 707 | 84 | 194 |
| NN7SS | | 321,816 | 454 | 77 | 199 |
| W7TVC | | 54,648 | 198 | 52 | 86 |
| N7VS | | 36,800 | 163 | 47 | 68 |
| K7DPS | | 15,403 | 106 | 33 | 40 |
| KJ7UN | | 5,047 | 49 | 20 | 29 |
| **K8AZ** | | **3,372,811** | **1988** | **145** | **502** |
| K8GL | | 577,944 | 619 | 93 | 256 |
| KZ8E | | 4,959 | 42 | 19 | 38 |
| **KD9ST** | | **1,338,740** | **1085** | **120** | **374** |
| **N2BJ/9** | | **1,131,525** | **1023** | **98** | **325** |
| **WN9O** | | **1,082,685** | **1000** | **102** | **343** |
| WB9AYW/9 | | 13,677 | 88 | 36 | 61 |
| **N0NI** | | **2,661,612** | **1935** | **137** | **449** |
| N0MA | | 358,527 | 508 | 92 | 225 |
| W0SV | | 122,360 | 292 | 63 | 127 |
| KD0S | | 104,159 | 234 | 58 | 129 |
| KI0Y | | 10,010 | 63 | 30 | 47 |

### Bahamas

| | | | | | |
|---|---|---|---|---|---|
| **C6APR** | | **2,235,658** | **3289** | **98** | **239** |

### Bermuda

| | | | | | |
|---|---|---|---|---|---|
| **VP9I** | | **2,290,872** | **3478** | **82** | **236** |

### Canada

| | | | | |
|---|---|---|---|---|
| **VY2TT** | **1,291,062** | **1830** | **82** | **239** |
| **VC2Z** | **858,516** | **1065** | **89** | **259** |
| **VA2ZM** | **609,733** | **969** | **78** | **215** |
| VA2TG | 248,640 | 689 | 51 | 159 |
| **VE3RM** | **4,720,107** | **3771** | **112** | **399** |
| **VA3SK** | **2,202,810** | **2004** | **114** | **391** |
| VA3VO | 492,750 | 975 | 72 | 178 |
| VE3MIS | 492,360 | 845 | 68 | 196 |
| VE3NB | 260,304 | 408 | 69 | 195 |
| VA3OC | 204,160 | 625 | 48 | 112 |
| **VC6S** | **1,806,256** | **2979** | **93** | **223** |
| VE7HL | 16,948 | 105 | 33 | 43 |

### Costa Rica

| | | | | |
|---|---|---|---|---|
| **TI5N** | **2,036,916** | **2964** | **100** | **254** |
| TI8M | 937,440 | 1769 | 92 | 178 |

### Cuba

| | | | | |
|---|---|---|---|---|
| **T48K** | **2,251,829** | **3136** | **92** | **278** |
| T49C | 456,596 | 1494 | 51 | 110 |

### Honduras

| | | | | |
|---|---|---|---|---|
| **HQ9R** | **2,339,519** | **3427** | **93** | **236** |

### Mexico

| | | | | |
|---|---|---|---|---|
| **6F7SA** | **4,402,830** | **4479** | **119** | **366** |

### Montserrat

| | | | | |
|---|---|---|---|---|
| **VP2MDG** | **5,509,275** | **4845** | **114** | **379** |

### Turks & Caicos

| | | | | |
|---|---|---|---|---|
| **VP5DX** | **7,108,265** | **5782** | **124** | **441** |

### Virgin Islands

| | | | | |
|---|---|---|---|---|
| **NP2B** | **2,602,452** | **3072** | **88** | **323** |

## AFRICA

### African Italy

| | | | | |
|---|---|---|---|---|
| **IF9A** | **2,220,900** | **2768** | **117** | **433** |

### Canary Islands

| | | | | |
|---|---|---|---|---|
| EC8AMI | 5,125 | 44 | 15 | 26 |

### Chagos Islands

| | | | | |
|---|---|---|---|---|
| **VQ9X** | **1,309,440** | **1479** | **86** | **224** |

### Madeira Islands

| | | | | |
|---|---|---|---|---|
| **CQ3T** | **10,224,810** | **5906** | **128** | **490** |
| **CT9L** | **9,145,059** | **4806** | **136** | **535** |

### Morocco

| | | | | |
|---|---|---|---|---|
| **CN3A** | **19,240,832** | **8445** | **156** | **650** |

### South Africa

| | | | | |
|---|---|---|---|---|
| **ZS5NK** | **287,224** | **530** | **56** | **167** |

### Tunisia

| | | | | |
|---|---|---|---|---|
| **3V8SS** | **438,900** | **741** | **47** | **173** |

## ASIA

### Asiatic Russia

| | | | | |
|---|---|---|---|---|
| **UA9UZZ** | **2,532,102** | **2402** | **122** | **381** |
| **RK9AWN** | **1,874,887** | **1633** | **98** | **363** |
| RK9LWA | 767,025 | 963 | 73 | 242 |
| RK9SWF | 186,637 | 384 | 53 | 156 |
| RK9CWW | 88,500 | 197 | 48 | 129 |
| RK9XWO | 29,842 | 163 | 20 | 66 |
| RK9JWJ | 2,059 | 37 | 7 | 22 |

### Asiatic Turkey

| | | | | |
|---|---|---|---|---|
| **RW0LT** | **218,122** | **543** | **71** | **120** |
| RW0AA | 64,500 | 225 | 47 | 103 |
| RK0AWQ | 4,407 | 61 | 13 | 26 |
| **TA7KA** | **1,250,096** | **1499** | **76** | **268** |
| TC3EC | 117,300 | 322 | 29 | 109 |

### China

| | | | | |
|---|---|---|---|---|
| **B4R** | **729,036** | **1369** | **97** | **211** |
| **BA4T** | **690,976** | **1226** | **89** | **197** |
| BY1QH | 140,910 | 585 | 54 | 100 |
| B1P | 65,403 | 436 | 50 | 79 |
| BY1DX | 41,275 | 425 | 48 | 79 |

### Cyprus

| | | | | |
|---|---|---|---|---|
| **P33W** | **15,931,106** | **7494** | **142** | **636** |

### India

| | | | | |
|---|---|---|---|---|
| **AT60MY** | **28,860** | **176** | **43** | **87** |

### Israel

| | | | | |
|---|---|---|---|---|
| **4XBC** | **2,567,632** | **2503** | **82** | **301** |

### Japan

| | | | | |
|---|---|---|---|---|
| **JM1LPN** | **992,207** | **1195** | **117** | **232** |
| **JI2ZJS** | **1,583,816** | **1724** | **123** | **265** |
| JI2ZEY | 949,494 | 1257 | 110 | 219 |
| JA2ZJW | 842,400 | 1165 | 93 | 195 |
| **JJ3YBB** | **860,700** | **1412** | **90** | **195** |
| JA3YKC | 231,748 | 517 | 89 | 140 |
| **JA6ZPR** | **1,993,653** | **1907** | **129** | **324** |
| **BN7TU** | **1,647,790** | **1742** | **125** | **285** |
| **JA8RWU** | **1,639,845** | **1615** | **129** | **276** |

### Kampuchea

| | | | | |
|---|---|---|---|---|
| **XU7MDY** | **809,172** | **2440** | **66** | **162** |

### Kuwait

| | | | | |
|---|---|---|---|---|
| **9K2HN** | **9,782,976** | **4911** | **151** | **602** |

### Qatar

| | | | | |
|---|---|---|---|---|
| **A71BX** | **5,728,725** | **3546** | **130** | **491** |

### Singapore

| | | | | |
|---|---|---|---|---|
| 9V1BH | 7,957 | 55 | 29 | 44 |

## EUROPE

### Austria

| | | | | |
|---|---|---|---|---|
| **OE6V** | **2,677,296** | **3079** | **123** | **455** |
| OE5D | 120,080 | 329 | 42 | 110 |

### Belarus

| | | | | |
|---|---|---|---|---|
| **EW8ZO** | **2,988** | **118** | **21** | **62** |
| EW8ZZ | 330 | 21 | 12 | 18 |

### Belgium

| | | | | |
|---|---|---|---|---|
| **OT5L** | **3,472,896** | **3487** | **125** | **521** |
| **OT5P** | **2,421,762** | **2826** | **109** | **420** |
| ON4MCL | 360,412 | 1408 | 53 | 186 |

### Croatia

| | | | | |
|---|---|---|---|---|
| **9A1P** | **10,226,322** | **6555** | **165** | **708** |
| **9A7A** | **9,535,840** | **6308** | **163** | **693** |
| **9A1A** | **9,189,582** | **6259** | **158** | **701** |
| 9A5D | 2,660,640 | 3594 | 116 | 436 |
| 9A5Y | 1,423,372 | 2215 | 100 | 421 |
| 9A3XV | 92,400 | 595 | 25 | 75 |
| 9A0R | 41,004 | 229 | 36 | 117 |

### Czech Republic

| | | | | |
|---|---|---|---|---|
| **OK5W** | **6,903,219** | **4644** | **163** | **686** |
| **OL7R** | **6,147,491** | **4906** | **148** | **615** |
| **OL3Z** | **4,425,785** | **3725** | **140** | **545** |
| OL1C | 1,433,376 | 1845 | 108 | 445 |
| OL7T | 1,224,480 | 2009 | 90 | 390 |
| OK2KDS | 450,660 | 837 | 71 | 299 |
| OL2U | 319,770 | 781 | 61 | 281 |
| OK2KOJ | 243,858 | 620 | 61 | 230 |
| OL50NERA | 60,816 | 338 | 41 | 140 |
| OL2A | 59,202 | 290 | 38 | 105 |
| OK5SWL | 228 | 11 | 8 | 11 |

### Denmark

| | | | | |
|---|---|---|---|---|
| **5P5X** | **875,259** | **1738** | **84** | **337** |
| **OZ2AR** | **726,624** | **1712** | **67** | **281** |

### England

| | | | | |
|---|---|---|---|---|
| **G6PZ** | **6,294,882** | **4874** | **142** | **597** |
| **M4A** | **2,355,210** | **2509** | **116** | **494** |
| G2F | 2,087,895 | 2476 | 100 | 445 |
| G5O | 1,322,510 | 1812 | 92 | 398 |
| G6M | 1,286,472 | 2107 | 84 | 359 |
| G3B | 1,126,120 | 1455 | 87 | 383 |
| M4U | 1,067,220 | 1945 | 73 | 323 |
| G2B | 965,668 | 2176 | 72 | 302 |
| M6Q | 629,340 | 1719 | 53 | 202 |
| G1T | 386,772 | 847 | 67 | 267 |
| G6TW | 358,380 | 934 | 62 | 268 |
| M2T | 43,470 | 386 | 30 | 96 |

### European Russia

| | | | | |
|---|---|---|---|---|
| **RL3A** | **6,055,515** | **5436** | **152** | **643** |
| **RT6A** | **4,963,708** | **4247** | **148** | **616** |
| **RT4M** | **3,364,195** | **3255** | **134** | **525** |
| UA3R | 2,376,864 | 3182 | 107 | 460 |
| RK3DZB | 2,026,233 | 2337 | 124 | 509 |
| RT4D | 1,727,288 | 2236 | 107 | 461 |
| RK3QWW | 1,621,375 | 2105 | 119 | 476 |
| RW3WWW | 1,518,230 | 2122 | 110 | 464 |
| UA3GZ | 1,087,182 | 1591 | 99 | 387 |
| RK4WWF | 610,488 | 1262 | 73 | 293 |
| RK3QWM | 518,800 | 1047 | 85 | 315 |
| RK4HYT | 251,635 | 600 | 62 | 233 |
| RZ4HZW | 237,855 | 609 | 66 | 237 |
| RK3DXS | 93,310 | 363 | 43 | 172 |
| RK3DZF | 88,328 | 342 | 43 | 138 |
| RK3VWA | 84,513 | 413 | 42 | 155 |
| RK3AWK | 77,343 | 357 | 44 | 159 |
| RK4SWA | 3 | 1 | 1 | 1 |

### Finland

| | | | | |
|---|---|---|---|---|
| **OF5Z** | **3,862,365** | **4146** | **131** | **552** |
| OH3MMM | 1,457,776 | 2088 | 101 | 408 |
| OH2K | 700,965 | 1466 | 74 | 259 |

### France

| | | | | |
|---|---|---|---|---|
| **TM2Y** | **6,888,278** | **4466** | **145** | **633** |
| **TM2T** | **4,345,432** | **3599** | **138** | **590** |
| **TM2S** | **2,922,840** | **2942** | **138** | **552** |
| F8KDX | 1,477,817 | 2299 | 87 | 320 |
| F5KKD | 839,085 | 1608 | 63 | 268 |
| F5KAR | 219,696 | 833 | 52 | 224 |
| F6KVP | 161,325 | 517 | 51 | 188 |
| F6KRK | 148,400 | 338 | 46 | 154 |
| F8KFR | 18,560 | 188 | 24 | 92 |

### Germany

| | | | | |
|---|---|---|---|---|
| **DR5N** | **3,437,421** | **3006** | **129** | **560** |
| **DL2MWB** | **3,084,359** | **2616** | **124** | **549** |
| **DA3X** | **1,574,462** | **1831** | **93** | **428** |
| DL0TUM | 1,492,992 | 1988 | 91 | 421 |
| DA3A | 1,200,897 | 1514 | 96 | 405 |
| DR0V | 1,086,342 | 1332 | 105 | 442 |
| DK3W | 1,058,964 | 1568 | 90 | 403 |
| DL1RYD | 857,790 | 1164 | 91 | 395 |
| DP4K | 741,468 | 1045 | 83 | 281 |
| DH0MA | 740,195 | 963 | 87 | 380 |
| DL1NEO | 625,650 | 1099 | 74 | 356 |
| DK1F | 582,164 | 1127 | 78 | 326 |
| DL7AOS | 581,672 | 1205 | 69 | 307 |
| DL1M | 543,744 | 903 | 80 | 304 |
| DJ0A | 450,120 | 1065 | 58 | 190 |
| DF0DA | 340,844 | 679 | 66 | 263 |
| DC0FHB | 105,646 | 429 | 42 | 160 |
| DL0AD | 21,658 | 124 | 27 | 71 |
| DK0ED | 4,717 | 67 | 17 | 36 |

### Greece

| | | | | |
|---|---|---|---|---|
| **J48RT** | **1,698,895** | **3639** | **74** | **317** |
| **J42T** | **1,632,456** | **2762** | **95** | **397** |
| J42WT | 739,746 | 1590 | 80 | 298 |

### Hungary

| | | | | |
|---|---|---|---|---|
| **HG6N** | **9,027,640** | **5348** | **156** | **683** |
| **HG1S** | **6,983,400** | **5241** | **159** | **665** |
| HA6D | 372,300 | 1318 | 54 | 201 |

### Iceland

| | | | | |
|---|---|---|---|---|
| TF3W | 25,489 | 206 | 16 | 55 |

### Ireland

| | | | | |
|---|---|---|---|---|
| **EI7M** | **8,101,730** | **6407** | **146** | **608** |
| EI9E | 1,328,480 | 1880 | 80 | 357 |

### Italy

| | | | | |
|---|---|---|---|---|
| **IR4M** | **8,072,040** | **5472** | **157** | **665** |
| **IO4T** | **4,725,414** | **3750** | **141** | **597** |
| **IO50** | **4,061,800** | **4073** | **128** | **447** |
| IR3Z | 1,720,764 | 2301 | 113 | 451 |
| IQ3UD | 1,260,504 | 1809 | 98 | 390 |
| IQ5LU | 595,128 | 972 | 85 | 326 |
| I1ZHH | 526,431 | 982 | 82 | 297 |
| IQ5FI | 318,896 | 859 | 62 | 242 |
| IQ3EZ | 2,697 | 115 | 24 | 69 |

### Kaliningrad

| | | | | |
|---|---|---|---|---|
| **RW2F** | **4,868,364** | **4579** | **134** | **579** |

### Latvia

| | | | | |
|---|---|---|---|---|
| **YL7X** | **1,342,996** | **2751** | **77** | **354** |
| YL1S | 246,446 | 647 | 59 | 239 |

### Luxembourg

| | | | | |
|---|---|---|---|---|
| **LX8M** | **982,800** | **1980** | **69** | **267** |

### Netherlands

| | | | | |
|---|---|---|---|---|
| **PI4KGL** | **571,119** | **1086** | **76** | **305** |
| PI4ZI | 337,542 | 982 | 62 | 241 |
| PI4RCK | 336,660 | 1140 | 59 | 251 |
| PI4WNO | 91,596 | 454 | 44 | 160 |
| PA60LIM | 57,967 | 314 | 31 | 138 |
| PI4ZOO | 13,872 | 168 | 22 | 80 |

### Norway

| | | | | |
|---|---|---|---|---|
| **LN3Z** | **3,015,040** | **3158** | **125** | **515** |

### Poland

| | | | | |
|---|---|---|---|---|
| **SO9Q** | **3,681,062** | **3147** | **140** | **602** |
| **SN6Z** | **2,729,996** | **2674** | **127** | **519** |
| SN2K | 1,509,948 | 1895 | 116 | 478 |
| SP9KDA | 838,211 | 1718 | 85 | 336 |
| SN10OS | 460,282 | 983 | 69 | 304 |
| SN5T | 402,597 | 1020 | 65 | 286 |
| SP9KRT | 215,736 | 705 | 55 | 248 |
| SP6PCL | 182,016 | 577 | 60 | 228 |
| SP1KZE | 71,890 | 316 | 36 | 122 |

### Portugal

| | | | | |
|---|---|---|---|---|
| **CS2P** | **2,384,640** | **3053** | **94** | **311** |
| **CQ4U** | **1,349,856** | **1746** | **93** | **343** |
| CT1DWT | 1,189,248 | 1760 | 77 | 307 |
| CQ7R | 182,728 | 579 | 52 | 199 |
| CT8CNE | 106,860 | 573 | 36 | 101 |

### Romania

| | | | | |
|---|---|---|---|---|
| **YQ9W** | **1,330,518** | **1994** | **98** | **376** |
| YR2G | 491,241 | 1243 | 81 | 292 |
| YO8KRR | 343,375 | 846 | 65 | 270 |

### Sardinia

| | | | | |
|---|---|---|---|---|
| **IS8/IQ8AL** | **370,336** | **1222** | **62** | **222** |

### Scotland

| | | | | |
|---|---|---|---|---|
| **GM3YS** | **337,272** | **893** | **57** | **242** |

### Serbia

| | | | | |
|---|---|---|---|---|
| **YT2T** | **4,545,533** | **4615** | **129** | **524** |
| YU1ARC | 1,624,050 | 2545 | 91 | 359 |

| | | | | |
|---|---|---|---|---|
| **Sicily** | | | | |
| **IR9Y** | **1,854,762** | **2511** | **89** | **385** |
| IQ9BF | 844,669 | 1189 | 101 | 368 |
| IR9K | 762,879 | 1499 | 82 | 321 |
| **Slovakia** | | | | |
| **OM8A** | **8,579,935** | **5613** | **168** | **697** |
| **OM7M** | **7,556,320** | **5142** | **159** | **671** |
| OM3X | 2,507,932 | 3095 | 118 | 484 |
| OM3RRC | 161,700 | 526 | 55 | 190 |
| **Slovenia** | | | | |
| **S58L** | **1,082,957** | **1782** | **90** | **373** |
| S59ABC | 59,042 | 358 | 27 | 79 |
| **Spain** | | | | |
| **AM3SSB** | **3,911,544** | **3904** | **123** | **474** |
| **EA5EA** | **3,777,192** | **3615** | **123** | **525** |
| **AO3A** | **2,538,336** | **2993** | **113** | **466** |
| EH7H | 1,782,900 | 3046 | 81 | 269 |
| EE2K | 1,324,836 | 1834 | 84 | 339 |
| EA2BXV | 513,024 | 838 | 79 | 305 |
| EA1URO | 351,486 | 740 | 60 | 223 |
| EA1FCR | 260,934 | 595 | 52 | 225 |
| AO4RCT | 255,075 | 783 | 48 | 131 |
| EH2T | 225,624 | 946 | 55 | 183 |
| EA1GA | 185,928 | 575 | 54 | 200 |
| EA4TV | 107,152 | 428 | 41 | 140 |
| **Sweden** | | | | |
| **SK3IK** | **466,147** | **1087** | **57** | **284** |
| **SK7OA** | **422,816** | **1222** | **57** | **235** |
| SC5L | 46,206 | 301 | 34 | 117 |
| SK7A | 43,920 | 243 | 34 | 110 |
| **Switzerland** | | | | |
| **HE7DFG** | **758,560** | **1541** | **68** | **284** |
| HB9DK | 107,835 | 418 | 51 | 186 |
| **Ukraine** | | | | |
| **UZ2M** | **5,363,128** | **4958** | **155** | **633** |
| **UR4Z** | **2,283,032** | **2947** | **104** | **448** |
| UT7L | 2,023,476 | 2199 | 133 | 530 |
| UT8AZA | 1,012,392 | 2081 | 84 | 352 |
| UW4E | 767,142 | 1368 | 83 | 331 |
| UX4E | 146,275 | 499 | 51 | 174 |
| UR4ZYD | 51,997 | 275 | 37 | 126 |
| UR4PWC | 18,620 | 145 | 28 | 67 |
| **Wales** | | | | |
| MW4C | 36,216 | 297 | 23 | 49 |
| **OCEANIA** | | | | |
| **Australia** | | | | |
| **VK4TI** | **844,806** | **1545** | **72** | **134** |
| **Guam** | | | | |
| **AH2R** | **4,805,920** | **3511** | **144** | **346** |
| **KH2INC** | **795,900** | **1592** | **87** | **123** |
| **Hawaii** | | | | |
| **KH6MB** | **1,020,978** | **1997** | **81** | **108** |
| **Indonesia** | | | | |
| YB6ZIR | 5,256 | 58 | 11 | 25 |
| YB2ZY | 3,876 | 65 | 15 | 23 |
| **New Zealand** | | | | |
| **ZM4A** | **1,298,590** | **1589** | **98** | **212** |
| ZL1AA | 9,570 | 119 | 13 | 17 |
| **SOUTH AMERICA** | | | | |
| **Argentina** | | | | |
| **LP1H** | **6,267,408** | **4815** | **122** | **361** |
| **LQ5H** | **1,510,554** | **2298** | **86** | **185** |
| LW6DW | 825,945 | 1228 | 75 | 180 |
| LU4DQ | 143,395 | 478 | 47 | 72 |
| **Brazil** | | | | |
| **ZY7C** | **11,033,880** | **5988** | **139** | **521** |
| PP5CFS | 2,215,647 | 2184 | 113 | 286 |
| PR1T | 937,197 | 1290 | 86 | 223 |
| ZY7EAM | 927,618 | 1613 | 67 | 170 |
| **Chile** | | | | |
| **XR6T** | **2,225,020** | **2797** | **99** | **223** |
| CC2A | 292,125 | 648 | 71 | 134 |
| CE6RCR | 211,400 | 562 | 62 | 138 |
| **French Guiana** | | | | |
| **FY5KE** | **18,852,327** | **8182** | **161** | **646** |
| **MULTI-OPERATOR** | | | | |
| **TWO TRANSMITTER** | | | | |
| **NORTH AMERICA** | | | | |
| **United States** | | | | |
| **KI1G** | **5,689,680** | **3394** | **129** | **499** |
| **K2LE/1** | **3,239,991** | **2127** | **128** | **473** |
| **W1HH** | **2,917,830** | **2095** | **121** | **449** |
| NY1Q | 2,298,192 | 1819 | 108 | 400 |
| K1KP | 1,116,612 | 1226 | 84 | 294 |
| **N2RM** | **3,993,606** | **2871** | **116** | **411** |
| **K2AX** | **2,547,600** | **1869** | **118** | **432** |
| W2CG | 1,054,812 | 987 | 86 | 307 |
| W2VQ | 572,800 | 633 | 92 | 266 |
| **WE3C** | **8,799,505** | **4600** | **144** | **571** |
| **NE3F** | **2,690,898** | **2043** | **116** | **437** |
| WA3EKL | 1,429,780 | 1272 | 108 | 377 |
| K3DI | 1,274,196 | 1062 | 104 | 358 |
| **W4RM** | **4,864,384** | **3060** | **132** | **491** |
| **K5YA** | **1,527,656** | **1185** | **107** | **374** |
| K5MDX | 158,179 | 886 | 101 | 282 |
| **K6IDX** | **875,680** | **849** | **121** | **308** |
| **W7DR/6** | **495,742** | **728** | **100** | **199** |
| **K7ZSD** | **1,410,465** | **1495** | **120** | **279** |
| N7BV | 614,000 | 830 | 95 | 212 |
| N7VF | 164,590 | 391 | 76 | 142 |
| **NØIJ/9** | **861,672** | **816** | **117** | **329** |
| W9VT | 25,724 | 132 | 38 | 71 |
| **Alaska** | | | | |
| **KL7RA** | **2,264,860** | **3299** | **98** | **212** |
| **Canada** | | | | |
| VE9MSR | 7,364 | 141 | 23 | 27 |
| **VE2DXY** | **906,354** | **1941** | **70** | **188** |
| **VE3DC** | **203,775** | **582** | **63** | **146** |
| **VE6FI** | **1,581,060** | **3211** | **79** | **181** |
| VE6AO | 787,635 | 2164 | 73 | 134 |
| **VE7SV** | **3,344,068** | **4406** | **110** | **254** |
| **VE7GL** | **2,051,628** | **3035** | **101** | **238** |
| **St. Kitts & Nevis** | | | | |
| **V47KP** | **6,824,720** | **6546** | **107** | **383** |
| **AFRICA** | | | | |
| **Canary Islands** | | | | |
| **AO8A** | **29,114,691** | **12089** | **160** | **683** |
| **Gambia** | | | | |
| **C5BC** | **27,630,123** | **12037** | **162** | **655** |
| **South Africa** | | | | |
| **ZS9X** | **6,923,028** | **4889** | **120** | **391** |
| **Swaziland** | | | | |
| **3DA0WW** | **6,053,618** | **4519** | **121** | **381** |
| **ASIA** | | | | |
| **Armenia** | | | | |
| **EK0B** | **9,745,145** | **6879** | **98** | **447** |
| **Asiatic Russia** | | | | |
| RK9CZD | 53,406 | 254 | 24 | 62 |
| **UA0AZA** | **2,256,844** | **2624** | **105** | **323** |
| **China** | | | | |
| **B4B** | **696,864** | **1686** | **96** | **176** |
| **B3C** | **462,150** | **1661** | **80** | **145** |
| **Cyprus** | | | | |
| **P3F** | **15,277,836** | **7494** | **148** | **613** |
| **C4I** | **6,846,546** | **3874** | **134** | **535** |
| **Hong Kong** | | | | |
| **VR2C** | **3,737,461** | **4441** | **129** | **340** |
| **Israel** | | | | |
| **4X0V** | **9,949,404** | **6011** | **126** | **502** |
| **Japan** | | | | |
| **JA1YPA** | **2,637,704** | **2498** | **127** | **297** |
| **South Korea** | | | | |
| **D9K** | **327,672** | **1087** | **73** | **149** |
| **EUROPE** | | | | |
| **Austria** | | | | |
| OE5CWL | 64,395 | 289 | 37 | 122 |
| **Bosnia-Herzegovina** | | | | |
| **T93J** | **10,662,225** | **8372** | **156** | **649** |
| **Czech Republic** | | | | |
| **OL1X** | **4,348,536** | **3797** | **132** | **576** |
| OK1OUE | 1,047,045 | 2382 | 81 | 334 |
| **England** | | | | |
| **M2W** | **1,733,312** | **3048** | **90** | **421** |
| **G4UJS** | **1,570,194** | **2073** | **89** | **409** |
| G4IIY | 977,600 | 1361 | 86 | 384 |
| G8D | 616,691 | 1276 | 70 | 283 |
| **Estonia** | | | | |
| **ES1A** | **344,763** | **809** | **76** | **263** |
| **European Russia** | | | | |
| **RK3YZA** | **442,816** | **1029** | **66** | **308** |
| **Finland** | | | | |
| **OF4A** | **4,212,503** | **4535** | **135** | **518** |
| **France** | | | | |
| **F5ODA** | **1,236,466** | **2760** | **89** | **345** |
| **Germany** | | | | |
| **DQ4W** | **6,157,164** | **5034** | **148** | **606** |
| **DR5Z** | **4,324,596** | **3676** | **137** | **594** |
| **DP6A** | **4,011,032** | **3556** | **135** | **581** |
| DR2W | 1,995,430 | 3080 | 98 | 423 |
| DLØWH | 1,134,540 | 1497 | 109 | 464 |
| DL3G | 214,210 | 721 | 61 | 249 |
| **ITU HQ Geneva** | | | | |
| **4U1WRC** | **1,847,010** | **3343** | **83** | **352** |
| **Italy** | | | | |
| **IR4X** | **15,502,044** | **9104** | **168** | **711** |
| IR5A | 1,049,364 | 1824 | 85 | 327 |
| **Netherlands** | | | | |
| **PI4FRG** | **277,056** | **704** | **64** | **232** |
| **Norway** | | | | |
| **LN8W** | **4,000,542** | **4452** | **116** | **547** |
| **San Marino** | | | | |
| **T7BA** | **7,075,504** | **8116** | **124** | **528** |
| **Sicily** | | | | |
| IR9P | 91,164 | 381 | 45 | 168 |
| **Slovakia** | | | | |
| **OMØM** | **5,215,804** | **4607** | **151** | **597** |
| **Slovenia** | | | | |
| **S52ZW** | **4,313,570** | **4037** | **138** | **592** |
| **Spain** | | | | |
| **EE2W** | **5,936,068** | **5590** | **142** | **559** |
| **AM5R** | **4,170,084** | **4834** | **134** | **533** |
| **EB1WW** | **3,206,142** | **4460** | **100** | **386** |
| AM1A | 1,226,880 | 2191 | 81 | 351 |
| AO1O | 1,200,480 | 2088 | 81 | 329 |
| EG4WW | 55,980 | 340 | 36 | 144 |
| **Switzerland** | | | | |
| **HB9BLQ** | **3,778,236** | **3886** | **131** | **527** |
| **OCEANIA** | | | | |
| **Australia** | | | | |
| **VK1CC** | **2,094,448** | **2561** | **99** | **217** |
| **VK4WR** | **1,733,501** | **2020** | **105** | **224** |
| VK6ANC | 377,600 | 673 | 78 | 158 |
| VK2ATZ | 201,951 | 565 | 69 | 102 |
| **Hawaii** | | | | |
| **AH6XX** | **3,221,152** | **3340** | **123** | **229** |
| **Indonesia** | | | | |
| **YBØZZ** | **2,278,800** | **2199** | **115** | **285** |
| **Mariana Islands** | | | | |
| **AHØBT** | **2,044,341** | **2423** | **108** | **195** |
| **New Zealand** | | | | |
| **ZM2M** | **2,402,167** | **2682** | **115** | **234** |
| **Philippines** | | | | |
| **DX1DBT** | **427,800** | **985** | **66** | **118** |
| **SOUTH AMERICA** | | | | |
| **Argentina** | | | | |
| **LS2D** | **4,059,048** | **3854** | **113** | **331** |
| **Brazil** | | | | |
| **PY2NA** | **1,473,960** | **1545** | **96** | **259** |
| **Colombia** | | | | |
| 5K4C | 10,660 | 93 | 30 | 52 |
| **Galapagos Islands** | | | | |
| **HC8N** | **27,743,450** | **12637** | **165** | **610** |
| **Netherlands Antilles** | | | | |
| **PJ4E** | **18,789,080** | **10011** | **150** | **530** |
| **PJ2T** | **13,046,616** | **8059** | **134** | **460** |
| **Uruguay** | | | | |
| **CV5D** | **1,967,190** | **2459** | **88** | **257** |
| **MULTI-OPERATOR** | | | | |
| **MULTI-TRANSMITTER** | | | | |
| **NORTH AMERICA** | | | | |
| **United States** | | | | |
| **K3LR** | **16,925,727** | **8344** | **169** | **664** |
| **KC1XX** | **16,330,230** | **7962** | **158** | **647** |
| **W3LPL** | **12,533,290** | **6568** | **159** | **635** |
| **NQ4I** | **8,689,920** | **4980** | **157** | **573** |
| **K1TTT** | **8,090,907** | **4847** | **148** | **571** |
| **W3PP** | **5,391,372** | **3274** | **132** | **504** |
| KB1H | 5,083,584 | 3127 | 139 | 525 |
| K1RX | 4,574,436 | 2915 | 131 | 487 |
| W4MYA | 3,549,442 | 2287 | 137 | 510 |
| **WBAIH/9** | **1,899,368** | **1712** | **130** | **418** |
| **K8EX** | **1,512,885** | **1412** | **123** | **396** |
| **W2YC** | **1,377,556** | **1155** | **103** | **379** |
| AC4RC | 173,376 | 407 | 63 | 189 |
| **Antigua & Barbuda** | | | | |
| **V26B** | **20,678,280** | **12323** | **148** | **573** |
| **Canada** | | | | |
| **VE5RI** | **646,425** | **1765** | **68** | **127** |
| **Grenada** | | | | |
| **J3A** | **8,163,616** | **7152** | **122** | **429** |
| **Jamaica** | | | | |
| **6Y1V** | **15,461,181** | **11056** | **143** | **514** |
| **Turks & Caicos** | | | | |
| **VP5T** | **8,101,564** | **7487** | **115** | **409** |
| **Virgin Islands** | | | | |
| **WP2Z** | **11,481,600** | **8144** | **135** | **489** |
| **AFRICA** | | | | |
| **Madeira Islands** | | | | |
| **CQ9K** | **25,935,957** | **10609** | **168** | **705** |
| **Tunisia** | | | | |
| **TS6A** | **27,154,904** | **11763** | **161** | **651** |
| **ASIA** | | | | |
| **China** | | | | |
| **B7P** | **3,958,720** | **3960** | **145** | **411** |
| **B1Z** | **2,196,357** | **3376** | **127** | **294** |
| **Japan** | | | | |
| **JR5VHU** | **6,148,336** | **4192** | **159** | **437** |
| **JA3YBK** | **5,744,340** | **3962** | **152** | **430** |
| **JA7YRR** | **3,955,068** | **3247** | **140** | **346** |
| **Taiwan** | | | | |
| BV2B | 129,270 | 749 | 55 | 84 |
| **EUROPE** | | | | |
| **Austria** | | | | |
| **OE2S** | **8,150,004** | **6913** | **158** | **670** |
| **Belgium** | | | | |
| **OT5A** | **11,060,052** | **9602** | **160** | **653** |
| **Bulgaria** | | | | |
| **LZ9W** | **10,229,700** | **8967** | **156** | **637** |
| **Dodecanese** | | | | |
| **SX5P** | **5,551,744** | **5762** | **139** | **565** |
| **France** | | | | |
| **TM6M** | **12,314,808** | **9195** | **150** | **642** |
| **Germany** | | | | |
| **DR1A** | **16,111,326** | **11268** | **166** | **737** |
| **DFØHQ** | **14,486,344** | **10791** | **172** | **754** |
| DLØNT | 389,760 | 878 | 72 | 276 |
| **Liechtenstein** | | | | |
| **HBØ/HB9ADN** | **5,017,761** | **6246** | **99** | **474** |
| **Lithuania** | | | | |
| **LY7A** | **5,462,544** | **6368** | **133** | **585** |
| **Netherlands** | | | | |
| **PA6Z** | **6,795,799** | **6472** | **143** | **608** |
| **PI4COM** | **5,200,719** | **5112** | **131** | **578** |
| **PI4CC** | **3,421,898** | **3922** | **124** | **550** |
| **Scotland** | | | | |
| **GM2T** | **4,416,448** | **5527** | **109** | **495** |
| GM6NX | 531,980 | 1263 | 66 | 269 |
| **Soveign Military Order of Malta** | | | | |
| **1A3A** | **12,240,173** | **11842** | **141** | **628** |
| **Sweden** | | | | |
| **SK6D** | **768,416** | **1654** | **77** | **330** |
| SC3ØVL | 179,214 | 574 | 46 | 192 |
| **Ukraine** | | | | |
| **UZ1H** | **1,367,982** | **1953** | **107** | **410** |
| **Wales** | | | | |
| **MW5W** | **3,717,888** | **4988** | **105** | **459** |
| **OCEANIA** | | | | |
| **Hawaii** | | | | |
| **KH7X** | **12,097,648** | **8035** | **166** | **382** |
| **SOUTH AMERICA** | | | | |
| **Brazil** | | | | |
| **PY2AA** | **608,163** | **1163** | **66** | **153** |
| **Chile** | | | | |
| **CE1W** | **1,940,540** | **2420** | **99** | **235** |
| XR5JA | 621,500 | 1202 | 59 | 167 |
| **Venezuela** | | | | |
| **YV4A** | **4,968,825** | **4017** | **119** | **366** |

## Check Logs

**The following logs were used as check logs. Check logs are always appreciated.** 4L1UN, 8P2K, BG5RAS, CU2DX, CU2JT, DB4RC, DG1BQC, DK3PM, DL1DUO, DL1KLO, DL1KUR, DL2HRE, DL3TC, DL5MG, DL7UCX, DL7UMG, DL8UKE, DL9MRF, DM5JL, EA1DKF, EA2BEP, EA3BJM, EA3KT, EA7GBD, EA7GV, EI3GYB, EI7JK, ES6CO, ES6RMR, F1SMV, F5AAR, F6API, F6DZU, F6HJO, FG/F6HLC, G3NXT, G3RWL, G3UHU, G4MCF, GIØOUM, GU8ITE, HAØDU, HA1SN, HA5AZZ, IR8Z, IV3PGQ, IZ5MMB, IZ5MOQ, KØTG, K4DXU, LB1H, LA4OGA, LA4QR, LA5BBA, LA6BNA, LA6PBA, MØDYI, MØMQV, MØRTI, NØFW, OE6IMD, OH1PY, OK1DMP, OK1FAI, OK2PCL, OK2SG, OK7RJ, OL5Q, OM4F, P43E, PD1EVL, PYØFF, PY2RDS, RAØALM, RA3AD, RA3XDX, RA6EE, RK9JYY, RN6FK, RU1AT, RU3EJ, RU4WE, RU6YY, RV3AMV, RV6FG, RV9MA, RW3CW, RW4FX, RW6AF, RW9UNT, RX1AA, SA2Z, SM4W, SM6CNN, SP2FAV, SP2HPD, SP2QCU, SP3FLQ, SP3YM, SP5AAJ, SP5BUJ, SP5BYC, SP5GDY, SP5ICS, SP6BBE, SP6CZ, SP6KFK, SP6XP, SP7CVW, SP8AJK, SP8BWE, SP8EEX, SP9CVY, SP9EWM, SP9RHN, SQ1EJC, SQ7JZO, SQ8MFX, SQ9E, SV2FLQ, UAØSC, UA3RAW, UA6GU, UA9CSA, UA9MD, UA9PM, UR4UGL, UR7QM, UT8LO, UUØJC, UU2JG, UZ2HZ, VE2TZT, VE2Z, VE3FH, VP9AD, W2NSF, W9WI, WS4C, YL2TD, YL5T, YO2CMI, YO3FOM, YO4AB, YO5BFJ, YO6BZL, YO6KNE, YO9FL, YO9FNP, YT2AAA, ZB2FK.

## Looking Ahead in CQ

Here are some of the articles we're working on for upcoming issues of *CQ*:

- CW Results – 2007 CQ World-Wide DX Contest
- The Magical Mystery Hamvention® Tour, Part 2
- *CQ* Interviews: Mark Stenning, AA1AC, Chief Executive, International Tennis Hall of Fame

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| AOR U.S.A., Inc. | 43 | www.aorusa.com |
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| Advanced Specialties Inc. | 111 | www.advancedspecialties.net |
| Alinco | 3 | www.alinco.com |
| Aluma Towers | 86 | www.alumatower.com |
| Ameritron | 53 | www.ameritron.com |
| Amidon Associates | 65 | www.amidon-inductive.com |
| Antique Radio Classified | 86 | www.antiqueradio.com |
| Array Solutions | 91 | www.arraysolutions.com |
| Astron Corporation | 61 | www.astroncorp.com |
| Atomic Time, Inc. | 33 | www.atomictime.com |
| bhi Ltd. | 49 | www.bhi-ltd.co.uk |
| BATTERIES AMERICA/Mr. Nicd. | 115 | www.batteriesamerica.com |
| Bilal Co./Isotron Antennas | 112 | www.isotronantennas.com |
| Boxboro Hamfest | 34 | www.boxboro.org |
| Buddipole Antennas | 79 | www.buddipole.com |
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| C.A.T.S. | 93 | www.rotor-parts.com |
| CQ Bookstore | 52,77,91 | www.cq-amateur-radio.com |
| Cable X-PERTS, Inc. | 83 | www.cablexperts.com |
| CheapHam.com | 89 | www.CheapHam.com |
| Command Productions | 81 | www.LicenseTraining.com |
| Communication Concepts, Inc | 87 | www.communication-concepts.com |
| Cutting Edge Enterprises | 29 | www.powerportstore.com |
| DX4WIN (Rapidan Data Systems) | 87 | www.dx4win.com |
| DZ Company | 93 | www.dzkit.com |
| Daiwa/NCG | 25 | www.natcommgroup.com |
| Diamond Antenna | 17 | www.diamondantenna.net |
| FlexRadio Systems | 11 | www.flex-radio.com |
| Front Panel Express, LLC | 81 | www.frontpanelexpress.com |
| Ham4Less.com | 113 | www.ham4less.com |
| Ham Radio Outlet | 12,116 | www.hamradio.com |
| HamTestOnline | 38 | www.hamtestonline.com |
| Hy-Gain | 1,9 | www.hy-gain.com |
| ICOM America, Inc | 37,39,101,Cov IV | www.icomamerica.com |
| K-Y Filter | 100 | www.ky-filters.com/cq.htm |
| KJI Electronics, Inc. | 93 | www.kjielectronics.com |
| Kenwood U.S.A. Corporation.. | Cov. II | www.kenwoodusa.com |
| LDG Electronics, Inc. | 27 | www.ldgelectronics.com |
| Lake Washington Ham Club, Inc. | 95 | www.lakewashingtonhamclub.org |
| MFJ Enterprises, Inc. | 31,47 | www.mfjenterprises.com |
| Nemal Electronics International, Inc. | 34 | www.nemal.com |

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### The AB3DI Interview

Editor, *CQ*:

I picked up a copy of the April issue of *CQ* at Barnes and Noble, and I just finished reading your interview with Dr. Haseltine. That's about the best thing I've read anywhere in a *long* time. Fascinating stuff, and I'm no techie. He would sure be an interesting person to get to know, and learn from . . . I mean, to learn a way to look at the world. The only problem for me is it would be like getting a sip of water from Niagara Falls!

Jeff, N8CC

Editor, *CQ*:

In the Dr. Haseltine interview article published in the April issue, Dr. Haseltine mentions a Lloyd Brubaker, WA6KZV, as one of his mentors. The attached letter to *CQ* was written by Lloyd's daughter Sherry and she has asked me to send it on to you.

Harry Hodges, W6YOO

*Harry: Many thanks for the forward. We are happy to hear from Lloyd through his daughter and through you.*

Editor, *CQ*:

My dad taught junior high science for 30-plus years. Besides science he also taught ham radio. The printing of the article on Dr. Eric Haseltine, AB3DI, was a real "day maker" for Dad, right up there with ham radio calls followed by, "Mr. Brubaker, is that you?" Dad, the Lloyd Brubaker Eric had as a science teacher way back in junior high, has been sharing these kinds of success stories with his ham buddies, fellow teachers, and friends. "This," he says "is what made teaching worthwhile."

Dad, now retired from teaching, has spoken of fondly of his Haseltine students (dinner table conversation notwithstanding), stating that he always knew each would go on be a success in their chosen field. Thank you, for printing the article and making Dad's day.

Sherry Brubaker

### Going Subbing

Editor, *CQ*:

I've really enjoyed the recent series of interviews with leaders in technology. I do think that these articles should appeal to young people considering technical careers. ... How to get today's young people interested in technology? One way is for retirees from technology to become substitute math and science teachers in middle and high schools. I've been substitute teaching for over 12 years now, and I get the word out to my students at every opportunity. I tell them that engineering is not only financially rewarding, but it's lots of fun, too! I remind them that "math is the 'engine' that drives engineering." I mention amateur radio whenever I can, too.

Teachers and counselors also encourage the students, but most of them lack "real world" experience. So the retiree from technical fields can, through substitute teaching, open up a whole new world of science and technology to our young people.

Rick Peterson, WA6NUT

### Missing the FCC...

*The following letters were in response to AA6JR's April "Magic in the Sky" column, titled "I Miss the FCC."*

Hello Jeff,

I remember having visions (as a Novice in 1958) of a big truck roaming around town with direction-finding antennas mounted on it. It was like an FCC bloodhound looking for hams to make a mistake. ... The thought of having the FCC listening for mistakes definitely gained my respect back in those days. I also miss the FCC. Thanks for the fantastic article.

73, Phil Arcuri, K2NPN

Jeff,

Bravo on your courageous and intelligent opinion piece in the April issue of *CQ*. The FCC is but one example of the wholesale dismantling of our country's regulatory infrastructure, in favor of private moneyed interests over those of ordinary American people. Look at the scandals that have plagued the FAA recently. The Enron, Tyco, and Worldcom debacles. And, of course, the subprime mortgage crisis which you mentioned in passing. It's not only a shame, it's a crime. Thanks again for your article. Vy 73,

Peter, K1PGV

Editor, *CQ*:

You obviously like loads of governmental control and were most happy when the FCC was "large and in charge." You may get your chance in 2009 for big government to run things for you once again!

In the meantime, most of us read *CQ* for information on ham radio, not your political opinions. If I wanted to read anti-administration crap, I would subscribe to *QST*!

Ron Davidson, W4IA

*AA6JR replies: As Lyndon Johnson once said, "If everyone in a room is of the same mind, only one person is doing the thinking."*

### 700 MHz Spectrum Rush

*The following letter was directed to "Washington Readout" editor Fred Maia, W5YI:*

Fred,

Your discussion of this cumbersome process ("700 MHz: The Spectrum Rush of 2008" [*CQ*, April 2008]) far surpasses the many I've read in broadcasting or communications "trade" publications over the past several years. You took a subject complex on several fronts and made it readily understandable to the layman and professional alike. That I found the most readable work on this challenging topic in a "hobbyist" publication speaks volumes as to the depth of *CQ*'s writing bench. ... Congratulations on an absolutely exemplary job!

Hank Downey, K5QNE

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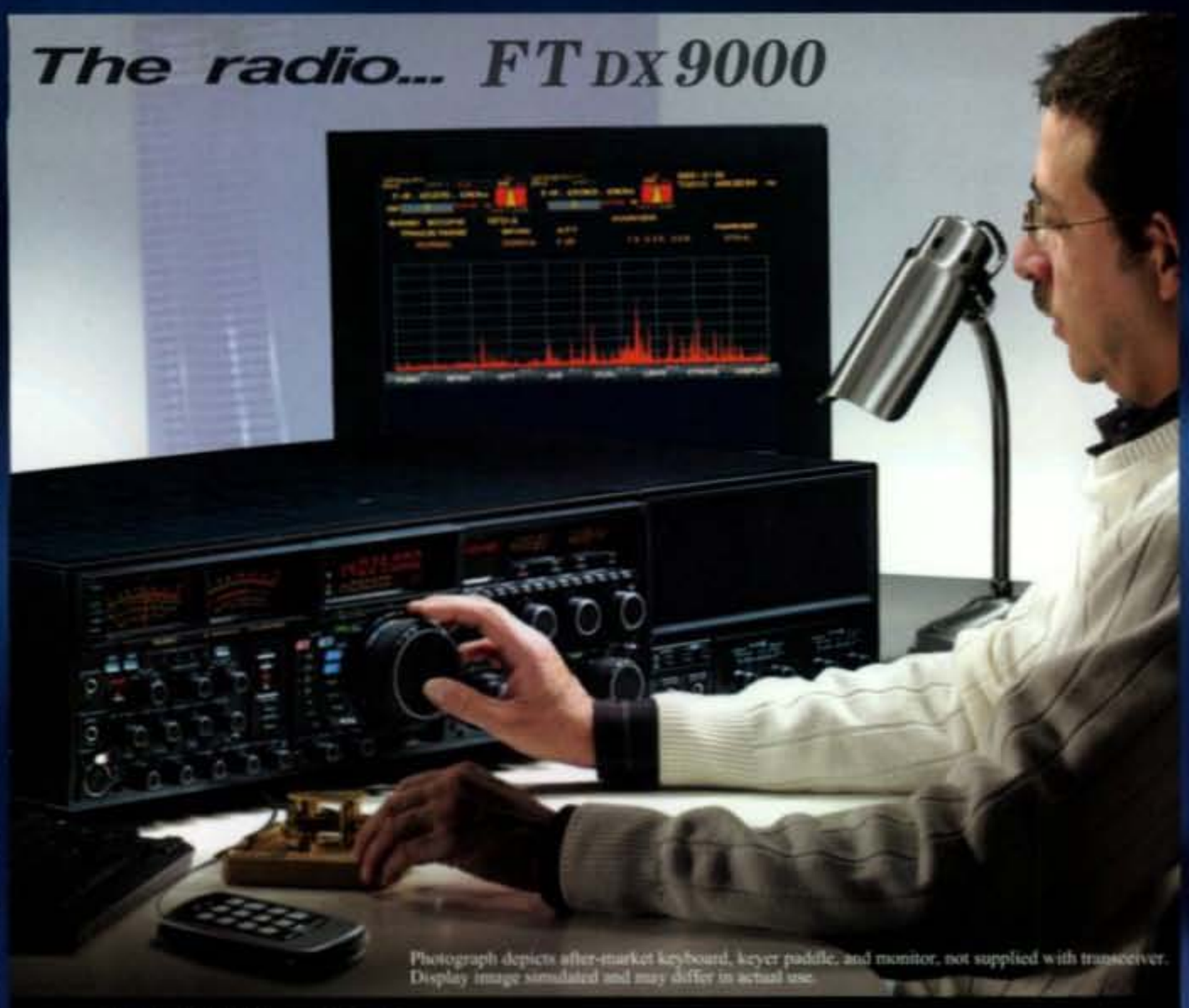


Photograph depicts after-market keyboard, keyer paddle, and monitor, not supplied with transceiver. Display image simulated and may differ in actual use.

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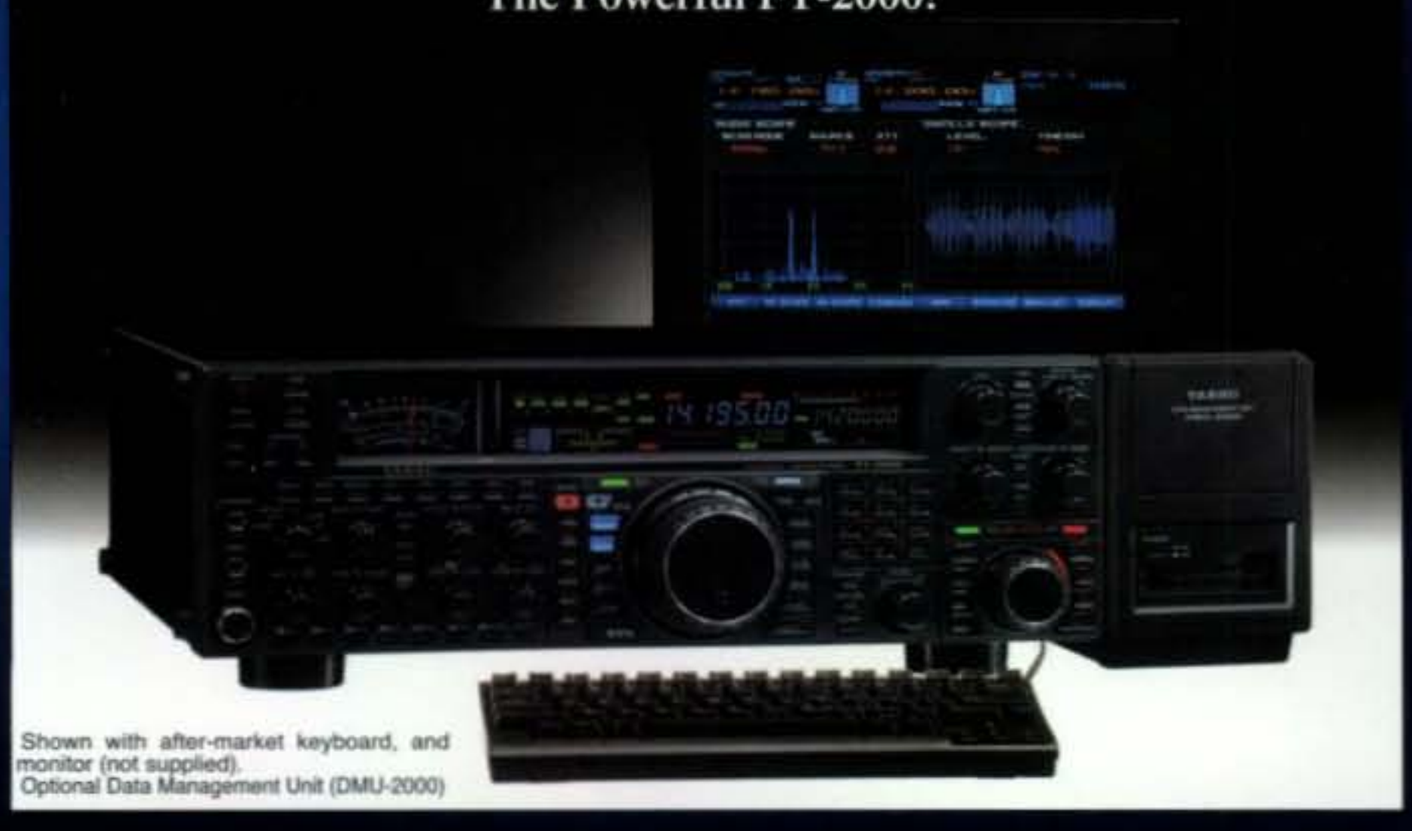

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